# 535-551 Brant Street, Burlington ON Transportation Impact Study, Parking Study and TDM Options Report

Paradigm Transportation Solutions Limited

November 2020

Project 190080

ptsl.com

# Project Summary

## Project Number
190080

**November 2020**

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Burlington ON  L7R 2G3

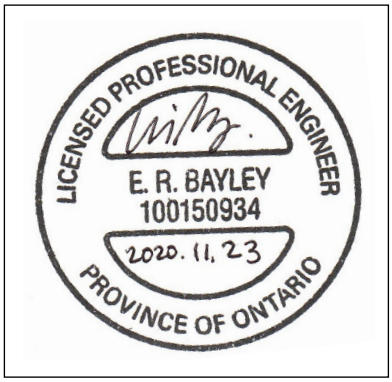
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# 535-551 Brant Street, Burlington ON Transportation Impact Study, Parking Study and TDM Options Report

Signatures and Seals




Signature

Engineer's Seal

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# Executive Summary

## Content

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact, Parking Justification and Transportation Demand Management Study for the proposed redevelopment of the lands known municipally as 535 to 551 Brant Street in the City of Burlington.

The study includes an analysis of existing traffic conditions, a description of the proposed redevelopment, traffic forecasts, parking demand analysis, and outlines recommendations to improve future traffic conditions and strategies to reduce dependency on single occupancy vehicle travel to and from the subject site.

## Development Concept

The subject site is located on the east side of Brant Street between Caroline Street and Victoria Avenue in the City of Burlington. The existing site is currently occupied by a bank, convenience store and barber shop. The redevelopment is proposed to consist of a high-rise mixed-use 26 storey building with 1,068 square metres (11,496 square feet) of ground floor retail space and 248 residential units. A total of 253 parking spaces will be provided on-site located within a four-level underground garage. Vehicular access is proposed via a full-moves driveway to Brant Street and a lay-by area is provided along the west side of John Street.

## Conclusions

### Transportation Impact Study

This study evaluates existing conditions, the impacts of background traffic growth and projected the impacts of the redevelopment.

Full-build out of the redevelopment is projected to generate approximately 75 new vehicle trips during the weekday AM peak hour and 92 new vehicle trips during the weekday PM peak hour.

The traffic analysis conducted as part of this assessment indicates that redevelopment traffic volumes will only result in minor increases to the traffic at the surrounding study area intersections under peak conditions. This analysis indicates that the existing transportation infrastructure and planned improvements to the John Street at Caroline Street intersection is adequate for accommodating additional traffic associated with the proposed redevelopment.

A southbound left-turn lane with 25-metres of storage on Brant Street at the site driveway is warranted under 2025 total traffic volumes. This can be accommodated within the existing two-way centre left-turn lane on Brant Street.

An analysis of off-peak traffic conditions indicates that the site driveway connection to Brant Street will operate with acceptable levels of service and queues are not expected to cause internal conflicts.

The sensitivity analysis for a site driveway on John Street, as a possible replacement of the Brant Street driveway, indicates that the study area intersections under total traffic conditions are forecast to operate with similar levels of service to the operations with a site driveway on Brant Street. There are less potential motor vehicle and pedestrian conflicts anticipated with a driveway on John Street compared to the site driveway on Brant Street. However, John Street north of Caroline Street is currently not a municipal road. It is our understanding that the city is considering extending John Street to Victoria Avenue and would be completing a redesign of John Street and conversion to a municipal road in the future as part of the possible extension to Victoria Avenue. Until then, a driveway connection onto John Street north of Caroline may not be feasible.

**Parking Justification**

The results of the methodologies used in the parking analysis provide a general understanding of parking behavior for mixed-use developments in Downtown Burlington. The parking analysis indicates that the proposed supply of 1.02 parking space per unit (253 parking spaces) will exceed the parking demand for the following reasons:

- The redevelopment conforms to the Burlington Official Plan and the Mixed-Use Activity Areas that encourage greater reliance on non-automotive forms of transportation;
- The redevelopment is located within 500 metres from the Downtown Burlington Mobility Hub;
- Based on 2016 Transportation Tomorrow Survey (TTS) data, approximately 73 percent of residents within apartment buildings in the surrounding area use auto as their primary mode of travel. The proposed parking supply would accommodate parking for all of the units in the building (assuming one space is provided to any specific unit) which exceeds the anticipated proportion of residents who would choose to drive;
- A review of other municipalities, ITE rates, auto ownership and the City of Burlington's City-Wide Parking Standards Review

shows a trend towards lower parking standards within major urban and intensification areas. The proposed redevelopment generally satisfies many of these criteria and the proposed parking rate of 1.02 is noted to be acceptable;

- Parking utilization surveys were undertaken at two different sites with similar land uses to the proposed redevelopment, indicating a rate of between 0.76 and 0.80 spaces per unit;
- Visitor parking can be accommodated through publicly accessible parking lots located within the downtown area and on-street parking spaces located within 800 metres of the subject site; and
- Based on the parking study conducted by MMM in September 2011 and Paradigm in 2015, capacity within the Brant Street and Elizabeth Street lots peaked during the evening hours whereas the remaining lots within the Downtown noted to experience limited use in the evening. Visitors of the site who may have difficulties locating a parking space adjacent to the redevelopment can access available parking in other facilities within less than a 100-metre walking distance.

**Transportation Demand Management**

To further promote the site as a sustainable development a variety of transportation demand management measures (TDM) to reduce parking demand is recommended to be incorporated. The TDM plan will focus on making the site a model of sustainable transportation by promoting alternative modes of transportation over the use of private automobiles. The following TDM measures are proposed

- The redevelopment will provide 28 long term and four short term bicycle parking spaces for residents as well as four bicycle parking spaces for the retail land uses; and
- On-site sidewalks are provided and connect to the existing pedestrian network.

The following additional TMD measures should be incorporated into the development plan:

- Delegating a TDM coordinator, either an interested individual or property manager, to support all on-site TDM programs;
- A car share space in a premium location on site to support those who choose not to own a car;
- Personalized travel information be provided for residents and visitors to the site; and

- Transit, rideshare, car share, and active transportation information be provided in a welcome package to new tenants and posting in a central location to further support all alternative modes.

**Site Design and Layout**

The proposed geometry for the site driveway, loading area and parking garage ramp is sufficient to accommodate the intended design vehicles.

## Recommendations

Based on the findings of this study, it is recommended that:

- The City of Burlington recognize the conclusions drawn above;
- Consideration be given to having the site driveway onto John Street in the future (subject to detailed design completed by the City and conversion to a public road);
- A “Do Not Block Sidewalk” sign be installed for the outbound movement at the site driveway.
- Signal timings at the intersection of Brant Street and Caroline Street be optimized, if necessary, after build-out to better support future traffic volumes and travel patterns;
- The City of Burlington support the proposed Zoning By-law parking rate to allow the provision of 253 parking spaces for the redevelopment (1.02 parking spaces per unit); and
- The developer implements a TDM plan with the additional TDM measures listed above.

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# 1 Introduction

## 1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation, Parking Justification and Transportation Demand Management Study for the proposed redevelopment of the lands known municipally as 535 to 551 Brant Street in the City of Burlington.

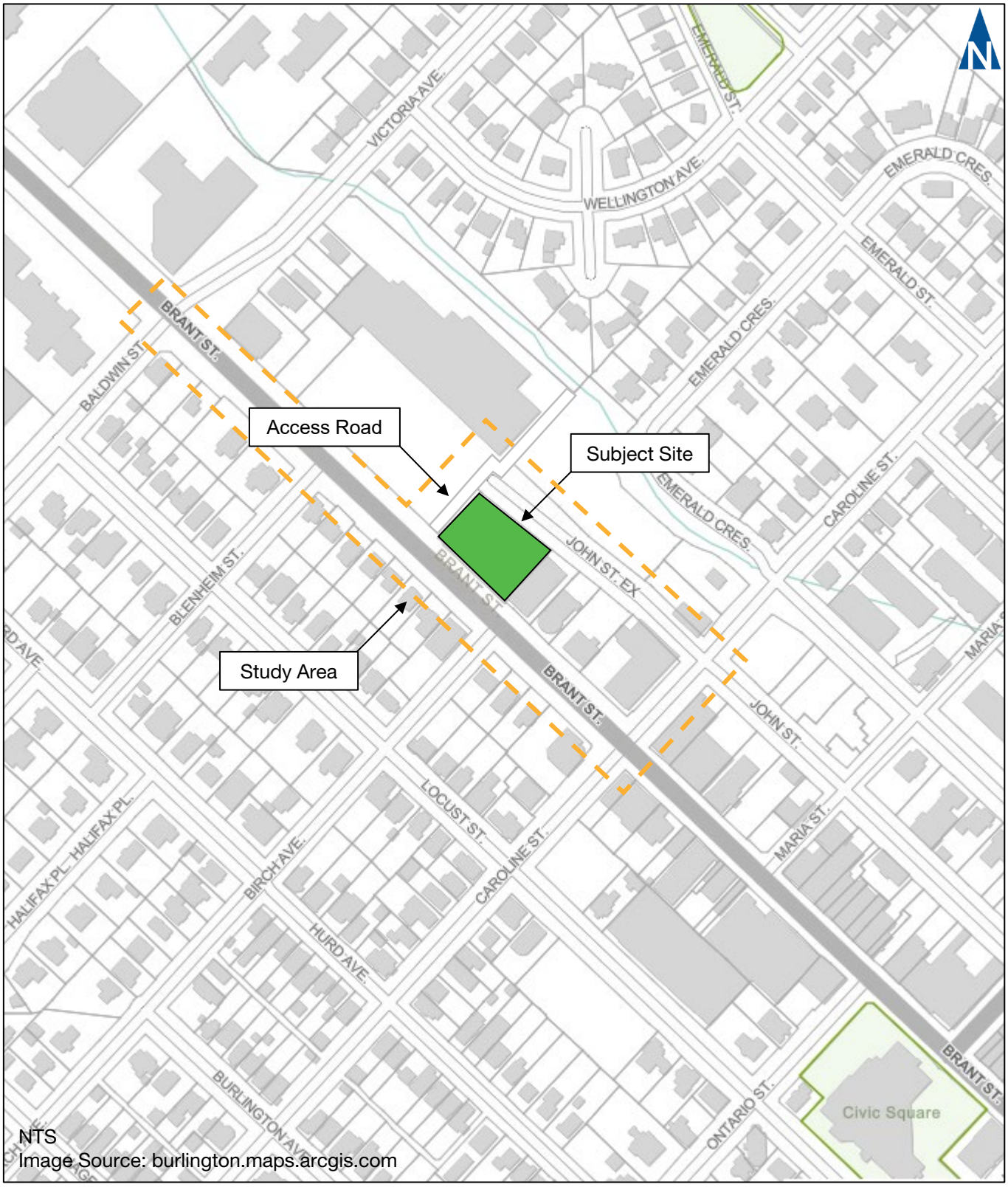
The subject site is proposed to be redeveloped to include a 26-storey building that will consist of 1,068 square metres (11,496 square feet) of ground floor retail space and 248 residential units.

Vehicular access is proposed via a full-moves driveway to Brant Street and a lay-by area is provided along the south side of John Street

The site's parking demand is proposed to be accommodated by an underground parking structure containing 253 parking spaces within four levels.

The scope of the study was developed in consultation with City of Burlington staff via e-mail in January 2020. **Appendix A** contains the pre-study correspondence and comments received from City staff.

**Figure 1.1** details the subject development location.




# Location of Subject Site and Study Area

## 1.2 Purpose and Scope

The purpose of this study is to determine the impacts of the development traffic on the surrounding road network and identify any improvements necessary to accommodate the increase in traffic generated by this development. The scope of this study is to:

- Assess the current traffic and site conditions within the study area;
- Estimate background traffic growth for five-years from date of study (2025);
- Estimate additional traffic generated by the redevelopment of the subject site;
- Analyse the impact of the future traffic on the surrounding road network; and
- Identify any operational or safety concerns and any mitigation measures that may be required to improve operations;
- Review the City of Burlington's Zoning By-Law requirements;
- Provide a technical analysis using secondary source and local parking survey information to estimate the potential parking demand;
- Review the adequacy of the proposed parking supply;
- Review and identify potential Transportation Demand Management (TDM) measures that can be implemented for the proposed redevelopment; and
- Review of the site circulation.

This study has been prepared in accordance with the requirements detailed by the Halton Region Transportation Impact Study Guidelines[1].

## 1.3 Study Area

Based on the pre-study consultation, the following intersections were identified for investigation in this study:

- Brant Street and Caroline Street;
- Brant Street and Victoria Avenue/Baldwin Street;
- John Street and Caroline Street;
- Brant Street and Access Road; and
- John Street and Access Road.

[1] Transportation Impact Study Guidelines, Halton Region, January 2015.





# 2 Existing Conditions

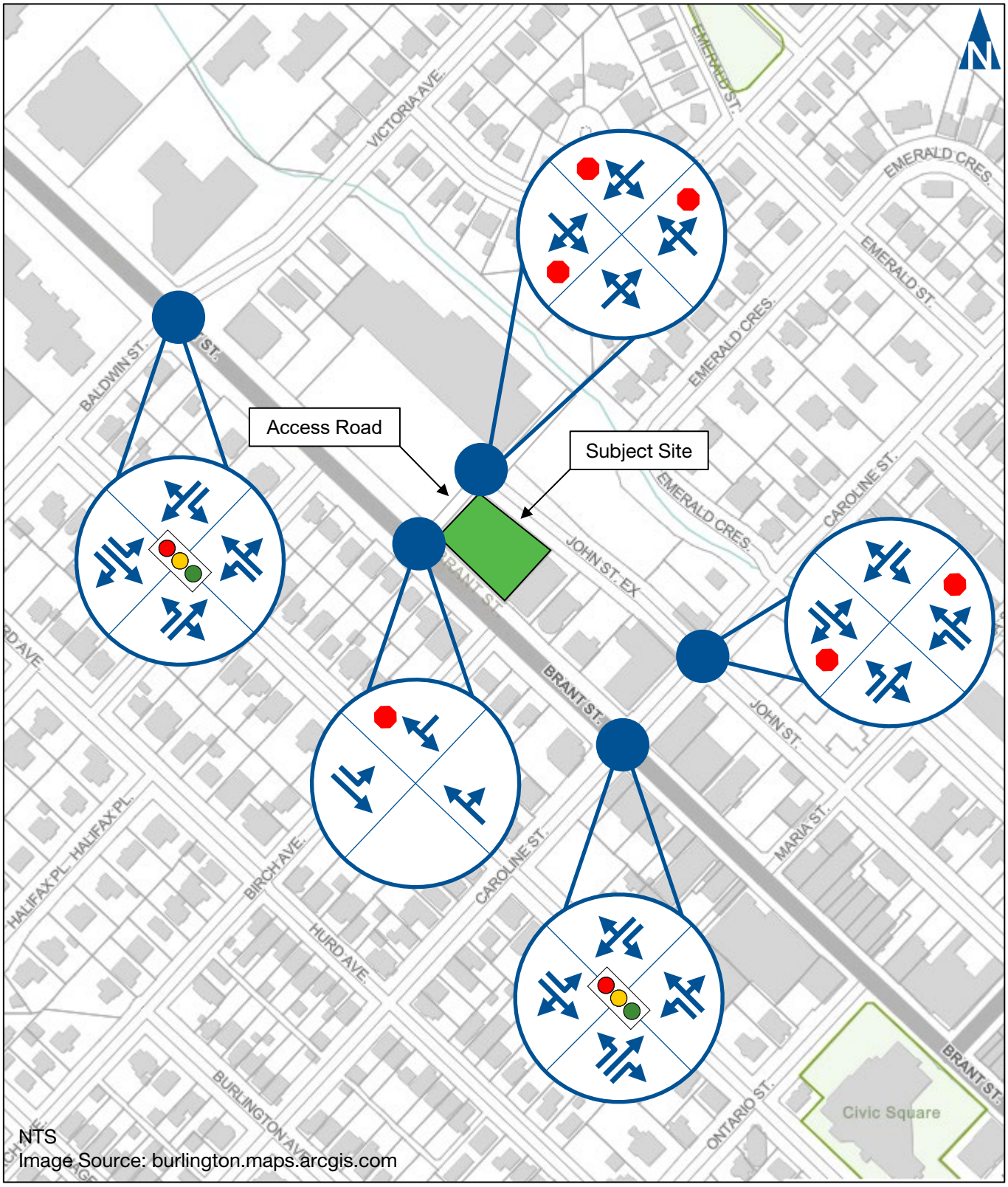
## 2.1 Existing Roadways

The main roadways near the subject site that have been assessed include Brant Street, Caroline Street, Victoria Avenue and John Street. The characteristics of these roadways are as follows:

- **Brant Street** is a north-south two-lane minor arterial[2] roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking, and sidewalks on both sides. The maximum speed limit is unposted and assumed to be 50 kilometres per hour.
- **Caroline Street** is an east-west two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, sidewalks on both sides, and on-street parking on the south side. The maximum posted speed limit is 40 kilometres per hour.
- **Victoria Avenue** is an east-west two-lane local[3] roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, sidewalks, and on-street parking on both sides. The maximum posted speed limit is 40 kilometres per hour.
- **John Street**, south of Caroline Street, is a north-south two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, sidewalks, and on-street parking on both sides. The maximum speed limit is unposted and assumed to be 50 kilometres per hour. It is noted that the portion of John Street north of Caroline Street is not a municipal road. It is our understanding that the city is considering extending John Street to Victoria Avenue and would be completing a redesign of John Street and conversion to a municipal road in the future as part of the possible extension to Victoria Avenue.

**Figure 2.1** displays the traffic control and lane configuration at the study area intersections.

[2] The City of Burlington Official Plan, Schedule K: Classification of Transportation Facilities Downtown Area, October 2006,
[3] The City of Burlington Official Plan, Schedule J: Classification of Transportation Facilities South of No. 1 Side Road, May 2010.




NTS
Image Source: burlington.maps.arcgis.com

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# Existing Lane Configuration and Traffic Control

## 2.2 Transit Service

### 2.2.1 City of Burlington Transit Service

Burlington Transit (BT) is the public transit operator for the City of Burlington and operates several routes within the study area. The main bus terminal in Downtown Burlington is located on John Street, a walk of approximately 500 metres from the subject site.

Currently, BT operates two routes within the study area:

- **Route 2 (Brant North)** runs between the Burlington GO Station and the Highway 407 Carpool Lot via Downtown Burlington. The route runs with approximately 20-minute headways during weekday peak hours, and 30-minute headways during other service hours.
- **Route 52 (Burlington Northwest)** provides late night service around the northwest portion of the City emanating and terminating at the Burlington GO Station. Buses operate with one-hour headways and stop in Downtown Burlington. The service runs between 10:55 PM and 1:22 AM, Monday to Saturday.

The nearest stop for both routes is located on the east side of Brant Street less than 50 metres north of the subject site.

**Figure 2.2** illustrates the existing transit network.

### 2.2.2 GO Transit Service

The Burlington GO station is located about 1.8 kilometres north of the subject site and approximately a 20-minute walk or 4-minute transit ride on Routes 2 and 52. Since this GO line provides train service to Mississauga and Downtown Toronto, it is expected that the subject site will attract residents that will use both City transit and inter-regional transit for commuting purposes.








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Image Source: Burlington Transit

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# Existing Transit Network

## 2.3 Active Transportation

### 2.3.1 Walkability

Pedestrian sidewalks are provided along both sides of the roadways throughout most of the study area. Crosswalks, pedestrian pushbuttons, and indicators are provided for all approaches at the signalized intersections within the study area.

The subject site is located within walking distance (less than 1-kilometre) of numerous significant employment, retail, cultural and recreational opportunities providing for a range of destinations for prospective residents of the proposed building that can be readily accessed without the use of a car. The proximity of the site to such a range of amenities and destinations within walking distance serves to reduce the need for residents of the building to travel on a regular basis using a car.

Walk Score is an online tool that assigns a numerical walkability score between 0 and 100 for addresses in Australia, Canada, United States, and New Zealand. Walk Score ranks communities nationwide based on how many businesses, parks, theatres, schools and other common destinations are within walking distance of any given address. The subject site is noted to have a Walk Score of 90 and is considered a "Walker's Paradise" location which means daily errands do not require a car[4].

### 2.3.2 Cycling

The City's cycling infrastructure consists of on-street and off-street facilities. On-street routes are comprised of bicycle lanes, signed bicycle routes, and paved shoulders. Off-street facilities are in the form of multi-use paths.

The City's 2016 Cycling Map[5] identifies several cycling facilities on the study area roadways. Brant Street south of Caroline Street and Caroline Street currently operate with shared use shoulders (sharrows). Brant Street currently operates with bike lanes north of Caroline Street.

A review of the City's Cycling Master Plan[6] has identified Brant Street south of Caroline Street and Caroline Street as proposed Bicycle Priority Streets.

**Figure 2.3** illustrates the existing cycling network within the study area.

[4] https://www.walkscore.com/score/535-brant-st-burlington-on-canada
[5] City of Burlington: Cycling Network. Civic Plan Mapping, 2016. http://geostreet.ca/bikeburlington/bikemap2016.html
[6] City of Burlington: Cycling Master Plan. Prepared by IBI Group, July 2009.




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Image Source: City of Burlington

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# Existing Cycling Network

## 2.4 Existing Traffic Volumes

To assess intersection operations, turning movement counts are used to quantify the movement of vehicles through the area. Existing traffic data at an intersection or on a road section forms the foundation for the analysis. The counts are usually taken during peak periods at an intersection to complete the level of service analysis under its worst-case operating conditions.

### 2.4.1 Traffic Data

Turning movement counts for the intersections of Brant Street at Caroline Street and Brant Street at Victoria Avenue/Baldwin Street were provided by the City from May 2019.

To supplement this data, Paradigm collected turning movement counts at the remaining study area intersections in February 2020.

**Appendix B** contains the detailed traffic counts for study area intersections.

### 2.4.2 Base Year Adjustments

A growth rate of 1.0 percent per annum, confirmed with City staff, was applied to the 2019 City count data to represent base year (2020) traffic volumes along the study area roadways.

### 2.4.3 Volume Balancing

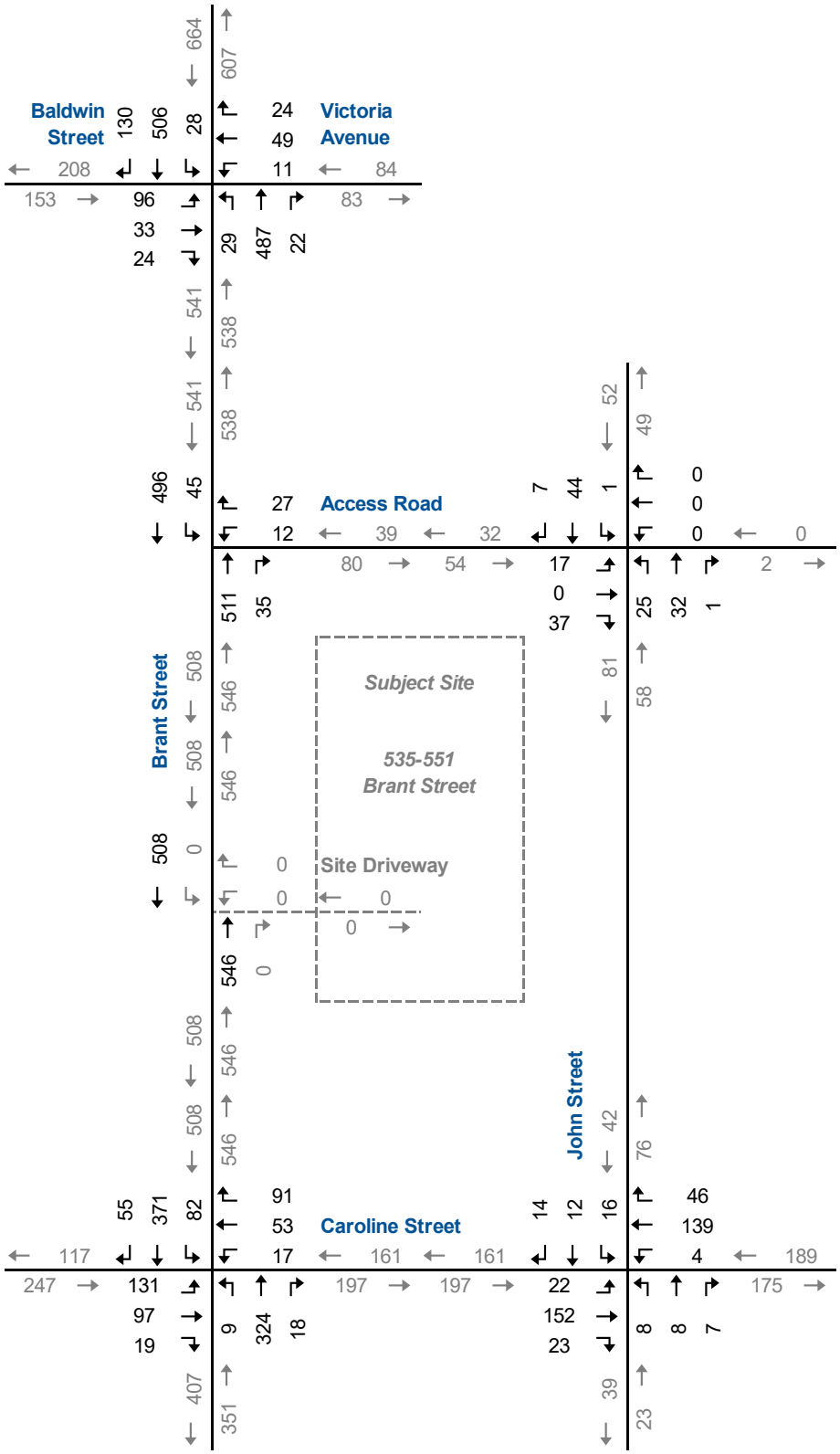
Some discrepancies between the data collected by Paradigm and the counts provided by the City were identified.

Side streets are located on Brant Street between Victoria Avenue/Baldwin Street and Caroline Street. However, to be conservative, volume balancing has been applied to the through traffic volumes at Access Road and Brant Street, Brant Street and Caroline Street, and Caroline Street and John Street, as confirmed with the City during pre-study consultation.

**Figure 2.4a** and **Figure 2.4b** display the existing AM and PM weekday peak hour turning movement traffic volumes, respectively.

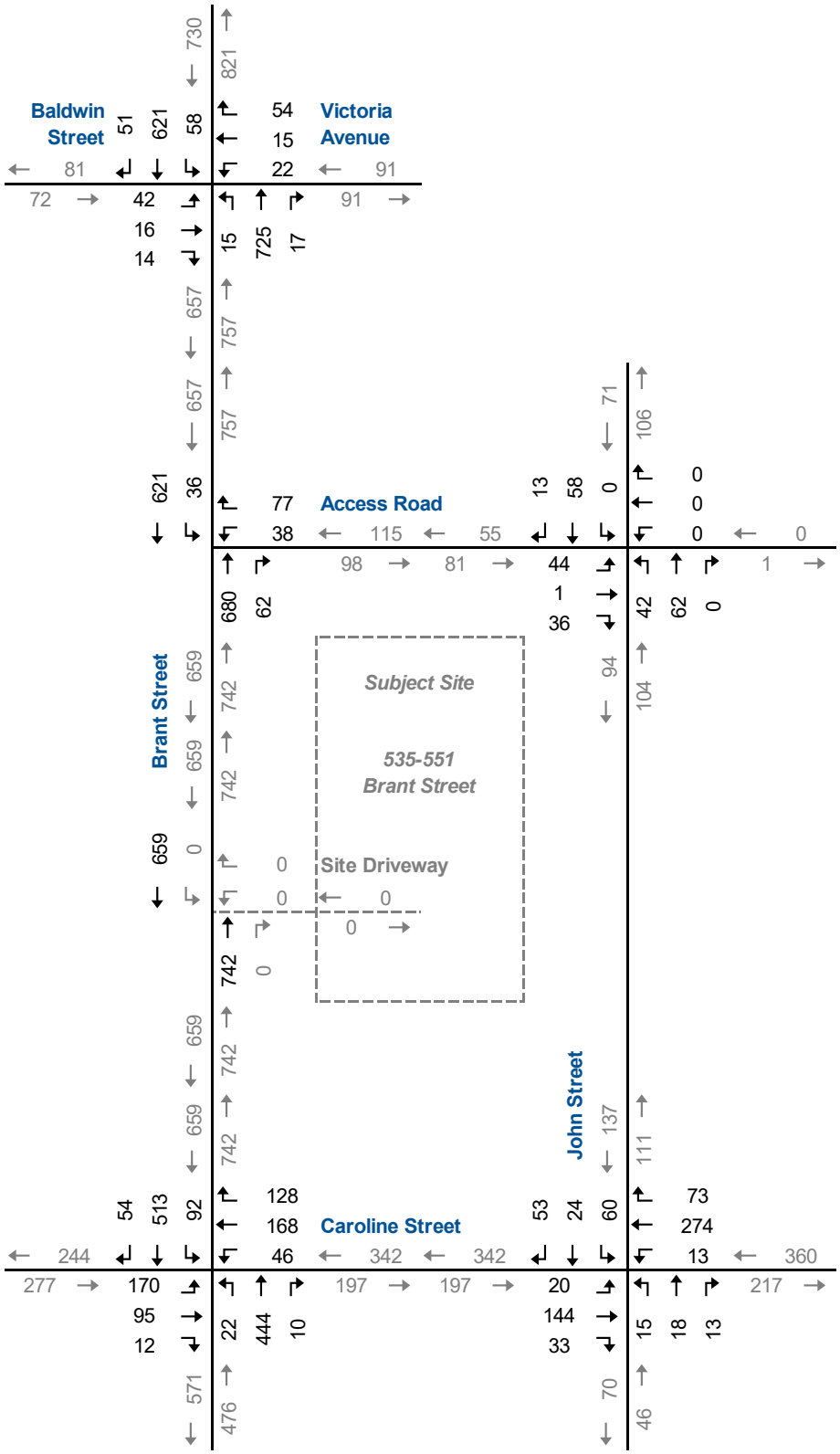







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# Base Year (2020) Traffic Volumes – AM Peak Hour




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# Base Year (2020) Traffic Volumes – PM Peak Hour

## 2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements at an intersection. The delay is related to the number of vehicles desiring to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on several criteria including, but not limited to, vehicle headways, intersection geometry, vehicle composition, opposing traffic flows, and for signalized intersections, signal timing.

**Table 2.1** summarizes the level of service criteria for signalized and stop controlled intersections. The highest possible rating is LOS A, under which the average total delay is equal to or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections or 50 seconds for unsignalized intersections, or when the volume-to-capacity (v/c) ratio is greater than 1.00, the movement is classified as LOS F, and improvements are usually implemented, if feasible. LOS D is typically considered acceptable peak-hour performance in an urban setting, and lower LOS values are tolerable for short term time periods during peak hours when heavier traffic volumes are expected.

### TABLE 2.1: VEHICLE LEVEL OF SERVICE DEFINITIONS

| Level of Service | Signalized Intersections Average Total Delay (sec/veh) | Unsignalized Intersections Average Total Delay (sec/veh) |
|---|---|---|
| A | < = 10 | < = 10 |
| B | > 10 & < = 20 | > 10 & < = 15 |
| C | > 20 & < = 35 | > 15 & < = 25 |
| D | > 35 & < = 55 | > 25 & < = 35 |
| E | > 55 & < = 80 | > 35 & < = 50 |
| F | > 80 | > 50 |

The operations of the intersections in the study area were evaluated with the base year traffic volumes using Synchro 9. The intersection analysis considered the following measures of performance:

- The volume to capacity ratio for each intersection;
- The LOS, based on the average control delay for each vehicle, for each turning movement; and
- The estimated 95th percentile queue length.

Movements are considered critical under the following conditions for signalized intersections:

- Volume/capacity (V/C) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.85 or above;
- V/C ratios for exclusive turning movements increased to 0.95 or above; or
- Queues for an individual movement are projected to exceed available turning lane storage.

Movements are considered critical under the following conditions for unsignalized intersections:

- Level of Service (LOS), based on average delay per vehicle, on individual movements exceeds LOS “D”; or
- The estimated 95$^{th}$ percentile queue length for an individual movement exceeds the available queue storage.

**Table 2.2** summarizes the results of the analysis for the existing weekday AM and PM peak hour intersection operations and indicates the following capacity issues are occurring:

- The eastbound left-turn movement at the intersection of Brant Street and Victoria Avenue/Baldwin Street is operating with queues exceeding the available storage by 9 metres during the AM peak hour.

**Appendix C** contains the detailed Synchro Reports.

# TABLE 2.2: EXISTING TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | OVERALL |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | C | > | D | C | C | > | C | A | A | > | A | A | A | A | A | A |
| | | | Delay | 40 | 33 | > | 37 | 32 | 33 | > | 33 | 3 | 5 | > | 5 | 3 | 5 | 3 | 5 | 9.8 |
| | | | V/C | 0.58 | 0.15 | > | | 0.07 | 0.22 | > | | 0.06 | 0.41 | > | | 0.06 | 0.42 | 0.10 | | 0.44 |
| | | | 95th | 29 | 14 | > | | 6 | 18 | > | | 5 | 63 | > | | 5 | 63 | 6 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | -9 | - | > | | 19 | - | > | | 10 | - | > | | 40 | - | 44 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | B | | > | B | | A | > | A | A | A | | A | |
| | | | Delay | | | | | 13 | | > | 13 | | 0 | > | 0 | 9 | 0 | | 1 | |
| | | | V/C | | | | | 0.09 | | > | | | 0.35 | > | | 0.05 | 0.32 | | | |
| | | | 95th | | | | | 2 | | > | | | 0 | > | | 1 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | B | B | B | B | C | C | > | C | B | C | > | C | B | B | > | B | C |
| | | | Delay | 16 | 14 | 13 | 15 | 21 | 22 | > | 22 | 17 | 27 | > | 26 | 15 | 19 | > | 19 | 21 |
| | | | V/C | 0.31 | 0.13 | 0.02 | | 0.06 | 0.20 | > | | 0.04 | 0.63 | > | | 0.30 | 0.60 | > | | 0.49 |
| | | | 95th | 23 | 18 | 0 | | 7 | 21 | > | | 4 | 76 | > | | 15 | 78 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | 17 | - | 10 | | 13 | - | > | | 21 | - | > | | 5 | - | > | | |
| | 4 - Caroline Street & John Street | TWSC | LOS | A | A | > | A | A | A | > | A | B | B | > | B | < | B | B | B | |
| | | | Delay | 8 | 0 | > | 1 | 8 | 0 | > | 0 | 12 | 11 | > | 12 | < | 12 | 12 | 12 | |
| | | | V/C | 0.02 | 0.11 | > | | 0.00 | 0.12 | > | | 0.02 | 0.03 | > | | < | 0.06 | 0.06 | | |
| | | | 95th | 0 | 0 | > | | 0 | 0 | > | | 0 | 1 | > | | < | 2 | 2 | | |
| | | | Storage | 15 | - | > | | 35 | - | > | | 25 | - | > | | < | - | 30 | | |
| | | | Avail. | 15 | - | > | | 35 | - | > | | 25 | - | > | | < | - | 29 | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | A | < | A | > | A | < | A | > | A | < | A | > | A | |
| | | | Delay | < | 7 | > | 7 | < | 7 | > | 0 | < | 8 | > | 8 | < | 7 | > | 7 | |
| | | | DU | < | 0.06 | > | | < | 0.00 | > | | < | 0.07 | > | | < | 0.06 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |
| PM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | D | > | D | D | D | > | D | A | A | > | A | A | A | A | A | A |
| | | | Delay | 38 | 36 | > | 38 | 37 | 37 | > | 37 | 2 | 5 | > | 5 | 3 | 4 | 2 | 4 | 7.4 |
| | | | V/C | 0.33 | 0.10 | > | | 0.18 | 0.14 | > | | 0.03 | 0.55 | > | | 0.15 | 0.47 | 0.04 | | 0.52 |
| | | | 95th | 17 | 10 | > | | 11 | 14 | > | | 2 | 75 | > | | 6 | 57 | 2 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | 3 | - | > | | 14 | - | > | | 13 | - | > | | 39 | - | 48 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | C | | > | C | | A | > | A | B | A | | A | |
| | | | Delay | | | | | 19 | | > | 19 | | 0 | > | 0 | 10 | 0 | | 1 | |
| | | | V/C | | | | | 0.33 | | > | | | 0.47 | > | | 0.05 | 0.40 | | | |
| | | | 95th | | | | | 11 | | > | | | 0 | > | | 1 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | B | B | B | B | C | C | > | C | B | C | > | C | B | C | > | C | C |
| | | | Delay | 19 | 14 | 13 | 17 | 22 | 31 | > | 30 | 19 | 33 | > | 33 | 17 | 24 | > | 23 | 26 |
| | | | V/C | 0.56 | 0.13 | 0.01 | | 0.15 | 0.62 | > | | 0.14 | 0.79 | > | | 0.45 | 0.74 | > | | 0.71 |
| | | | 95th | 30 | 18 | 0 | | 14 | 63 | > | | 8 | 119 | > | | 16 | 113 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | 10 | - | 10 | | 6 | - | > | | 17 | - | > | | 4 | - | > | | |
| | 4 - Caroline Street & John Street | TWSC | LOS | A | A | > | A | A | A | > | A | C | B | > | B | < | C | C | C | |
| | | | Delay | 8 | 0 | > | 1 | 8 | 0 | > | 0 | 16 | 13 | > | 14 | < | 15 | 15 | 15 | |
| | | | V/C | 0.02 | 0.11 | > | | 0.01 | 0.22 | > | | 0.05 | 0.07 | > | | < | 0.25 | 0.25 | | |
| | | | 95th | 0 | 0 | > | | 0 | 0 | > | | 1 | 2 | > | | < | 8 | 8 | | |
| | | | Storage | 15 | - | > | | 35 | - | > | | 25 | - | > | | < | - | 30 | | |
| | | | Avail. | 15 | - | > | | 35 | - | > | | 24 | - | > | | < | - | 23 | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | A | < | A | > | A | < | A | > | A | < | A | > | A | |
| | | | Delay | < | 8 | > | 8 | < | 7 | > | 0 | < | 8 | > | 8 | < | 8 | > | 8 | |
| | | | DU | < | 0.10 | > | | < | 0.00 | > | | < | 0.13 | > | | < | 0.09 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*V/C - Volume to Capacity Ratio*
*95th - 95th Percentile Queue Length*
*Storage - Existing Storage (m)*
*DU - Degree Utilization*
*Avail. - Available Storage (m)*
*> - Shared Right-Turn Lane*
*< - Shared Left-Turn Lane*

# 3 Development Concept

## 3.1 Development Description

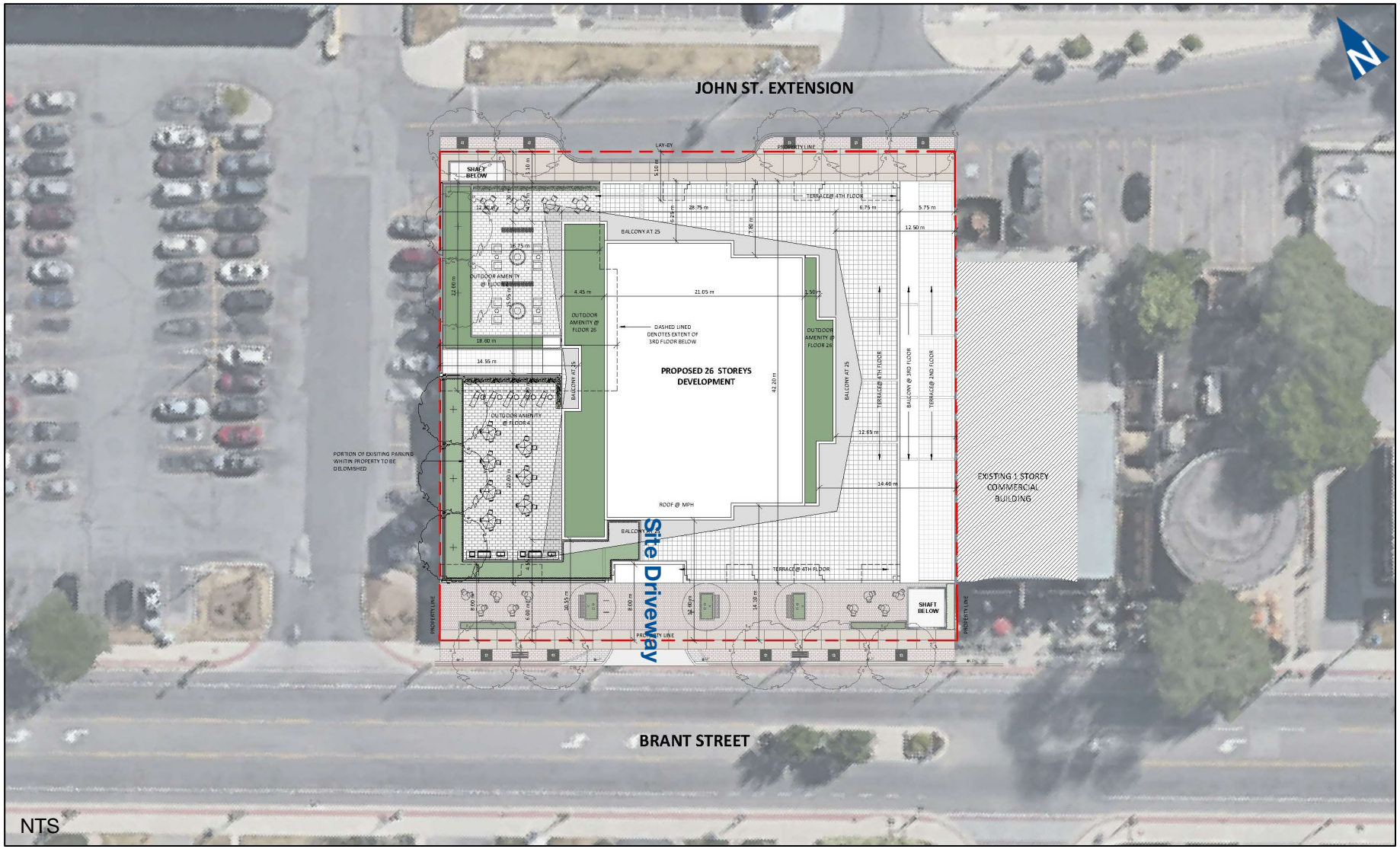
The subject site is located on the east side of Brant Street between Caroline Street and Victoria Avenue in the City of Burlington. The existing site is currently occupied by a bank, convenience store and barber shop. The redevelopment is proposed to consist of a high-rise mixed-use 26 storey building with 1,068 square metres (11,496 square feet) of ground floor retail space and 248 residential units. A total of 253 parking spaces will be provided on-site located within a four-level underground garage. The development is proposing 28 long term and four short term bicycle parking spaces for residents as well as four bicycle parking spaces for the retail land uses.

Vehicular access is proposed via a full-moves driveway to Brant Street approximately 140 metres (centre line to centre line) north of Caroline Street. A lay-by area is provided along the west side of John Street.

**Figure 3.1** shows the development concept.








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# Proposed Site Plan

## 3.2 Development Trip Generation

Trip generation information is used to forecast the anticipated level of traffic activity as a result of the development. Trip generation for each land use type were summed to establish total site trip generation for the respective weekday AM and PM peak hours. The following sub-sections provides the methodology used.

### 3.2.1 Institute of Transportation Engineers (ITE)

The Institute of Transportation Engineers (ITE) Trip Generation Manual[7] provides rates and equations used to estimate the peak hour traffic volumes generated by the Land Use Codes (LUC) of this development:

- LUC 222 – Multifamily Housing (High Rise); and
- LUC 820 – Shopping Centre.

Data for the peak hour of adjacent street traffic was used to estimate trip generation. Fitted curve equations were used for LUC 222 and average rates were used for LUC 820.

### 3.2.2 Internal Trips

The trip generation estimate for mixed use developments should also consider multi-purpose trips. To avoid double-counting of site trips, an estimate of the multi-purpose trips has been deducted from the overall site trip generation.

To account for internal trips within a development, ITE has developed a worksheet that considers all the proposed land uses of a multi-use development and determines how many trips are expected to occur internally and externally. From this information, the capture rate is developed to estimate the effect of multi-purpose trips. The application of the capture rate results in a percentage reduction of the total trip generation for the site. This method was confirmed with the City during the pre-study consultation.

**Appendix D** contains the trip reduction worksheet that has been used in accordance with Chapter 7 of the ITE Trip Generation Handbook for multi-use sites.

### 3.2.3 Modal Split

Due to the proposed redevelopments proximity to transit services and pedestrian facilities, some percentage of the trips generated by the site

[7] Trip Generation Tenth Edition, Institute of Transportation Engineers, 2017





will be made by other modes (transit, walking, etc.). Data on primary modes of travel were extracted from the 2016 Transportation Tomorrow Survey[8] (TTS) for the study area (GTA Zones 4059-4069). It is estimated that 27% are using travel modes other than by personal vehicle (eg. Transit, cycling, walking, carpool, etc.). A conservative reduction of 20% has been applied to account for travel by transit and active travel modes for the residential component.

**Appendix D** contains the TTS Data.

### 3.2.4 Pass-By Trips

The ITE Trip Generation Handbook[9] provides information on average pass-by rates for land use codes. Pass-by rates for LUC 820 were applied to the trip generated by the retail component of the proposed redevelopment. The pass-by rates are applied after all other reductions including internal capture and modal split.

### 3.2.5 Net Trip Generation Estimates

**Table 3.1** summarizes the forecast number of net new trips generated by the proposed redevelopment. These estimates are based on standardized ITE rates with internal and modal split credits made as noted earlier.

Accordingly, no on-site parking is proposed to be provided for visitor and the retail component. These trips are expected to utilize existing on-street and off-street parking facilities near the site. Therefore, the trip assignment has assumed the retail trips would originate from the John Street North Parking Lot immediately east of the subject site.

As shown, with build-out of the redevelopment approximately 75 new trips during the weekday AM peak hour and 92 net new trips during the weekday PM peak hour are forecast to be added to the area roadways.

[8] Transportation Tomorrow Survey (TTS), 2016, Data Management Group, University of Toronto.
[9] Institute of Transportation Engineers Trip Generation Handbook 3rd Edition, September 2017.

### TABLE 3.1: TRIP GENERATION

| Land Use | GFA ($ft^2$) | Units | Trips | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Rate | In | Out | Total | Rate | In | Out | Total |
| LUC 222 - Multifamily Housing (High-Rise) | - | 248 | Total | Eq* | 19 | 63 | **82** | Eq* | 57 | 36 | **93** |
| | | | Internal | | 0 | 1 | 1 | | 6 | 2 | 8 |
| | | | Modal Share | 20% | 4 | 12 | 16 | 20% | 10 | 7 | 17 |
| LUC 820 - Shopping Centre | 11,496 | - | Total | 0.94 | 7 | 4 | **11** | 3.81 | 21 | 23 | **44** |
| | | | Internal | | 1 | 0 | 1 | | 2 | 6 | 8 |
| | | | Pass-by** | 0% | 0 | 0 | **0** | 34% | 6 | 6 | **12** |
| **Total Trip Generation** | | | **Total** | | **26** | **67** | **93** | | **78** | **59** | **137** |
| | | | **Internal** | 2% | 1 | 1 | 2 | 12% | 8 | 8 | 16 |
| | | | **Modal Share** | | 4 | 12 | 16 | | 10 | 7 | 17 |
| | | | **Pass-by**** | | 0 | 0 | 0 | | 6 | 6 | 12 |
| | | | **New** | | **21** | **54** | **75** | | **54** | **38** | **92** |

* LUC 222: AM - T = 0.28(X) +12.86 | PM - T = 0.34(X) + 8.56

** Applied after all other reductions

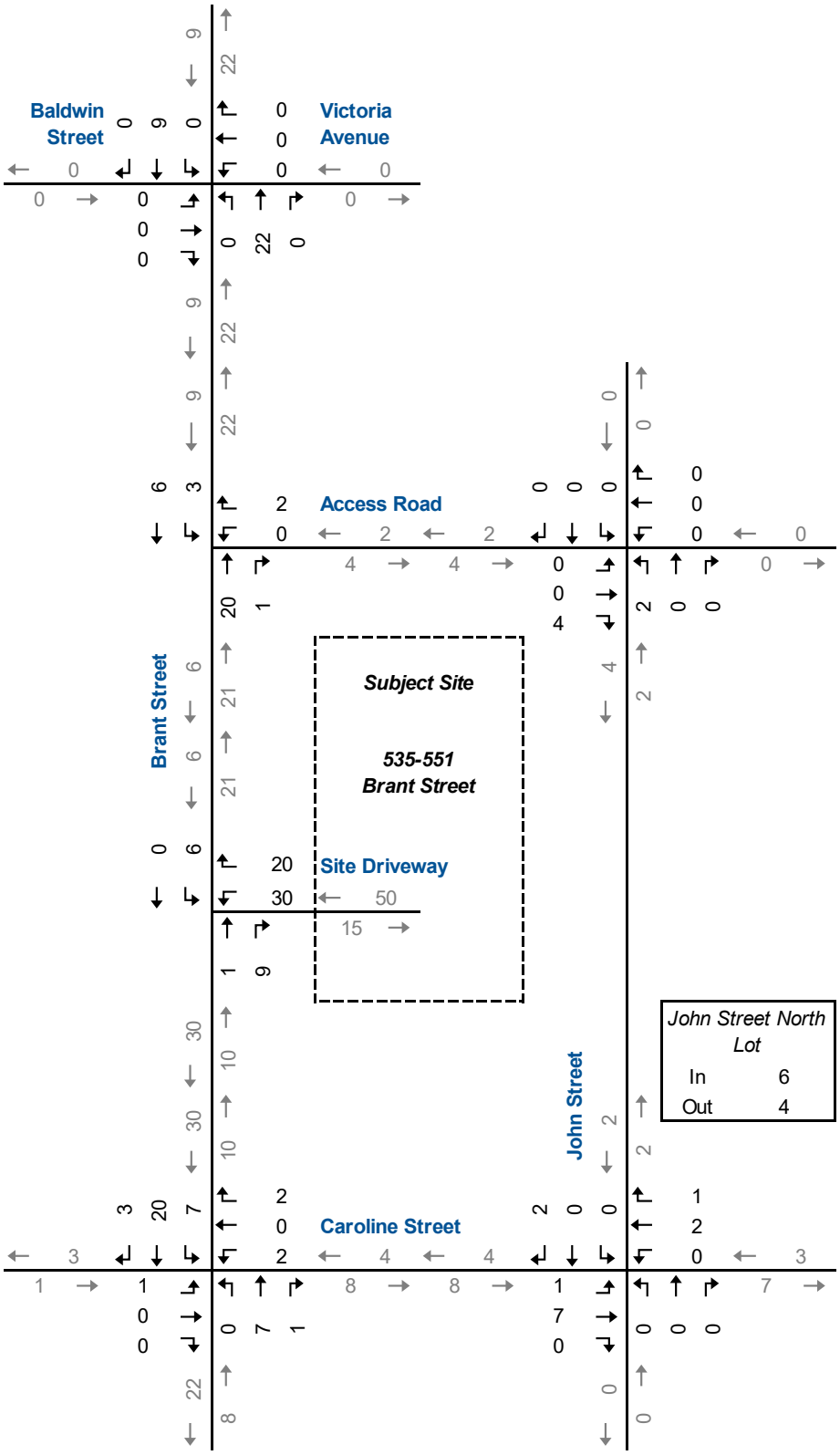
## 3.3 Development Trip Distribution and Assignment

Trips were distributed and assigned to the adjacent roadway network based on the existing distribution along the area roadways as the majority of the surrounding land uses are residential and commercial. **Table 3.3** details the estimated trip distribution for the redevelopment.

### TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

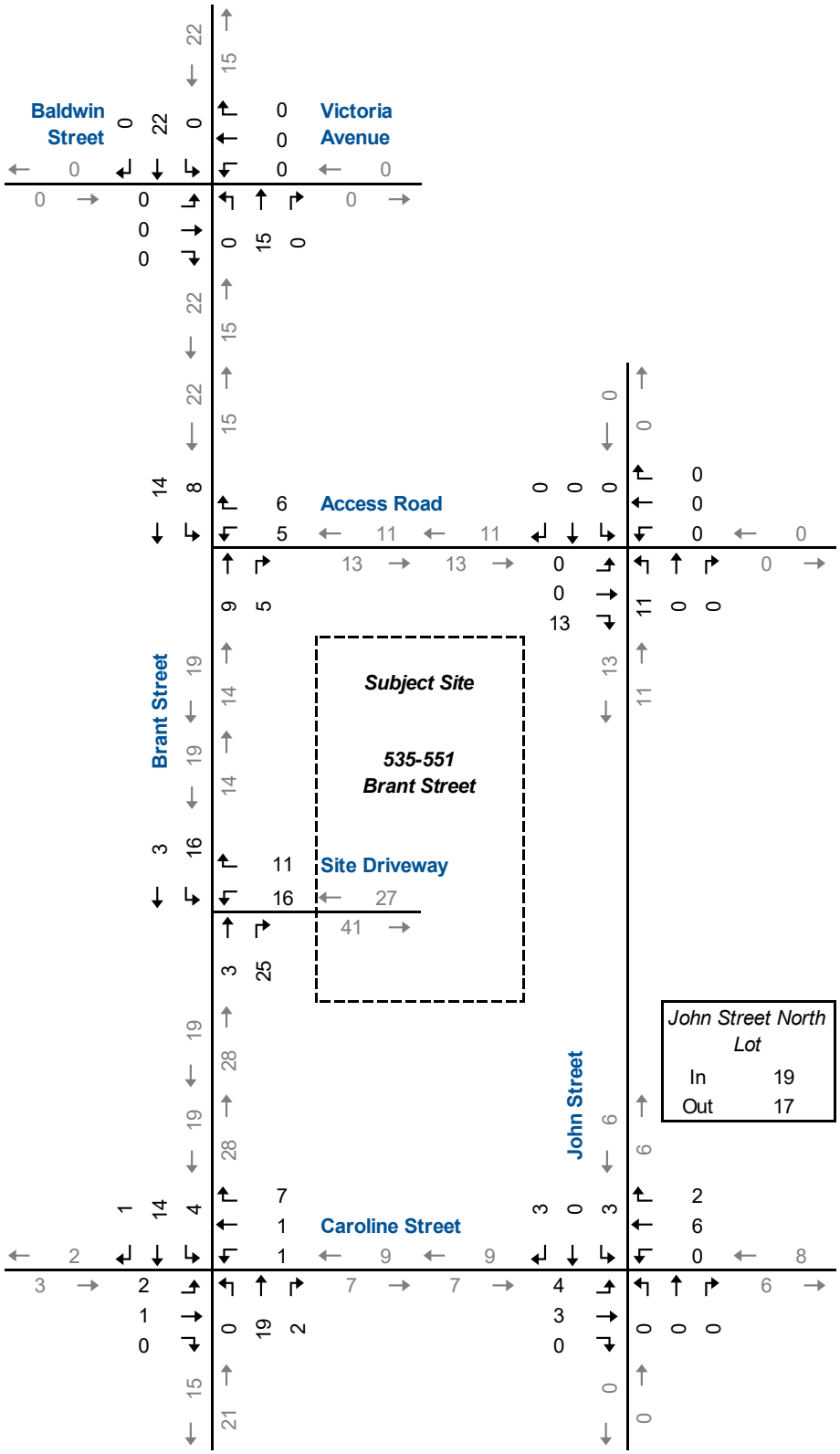
| Origin/Destination | Percentage |
|---|---|
| North via Brant St | 40% |
| South via Brant St | 40% |
| East via Caroline St | 15% |
| West via Caroline St | 5% |
| **Total** | **100%** |

**Figure 3.2a** illustrates the site-generated traffic volumes for the AM peak hour. **Figure 3.2b** illustrates the net site-generated traffic volumes for the PM peak hour and **Figure 3.2c** illustrates the PM pass-by trips assigned to the network.



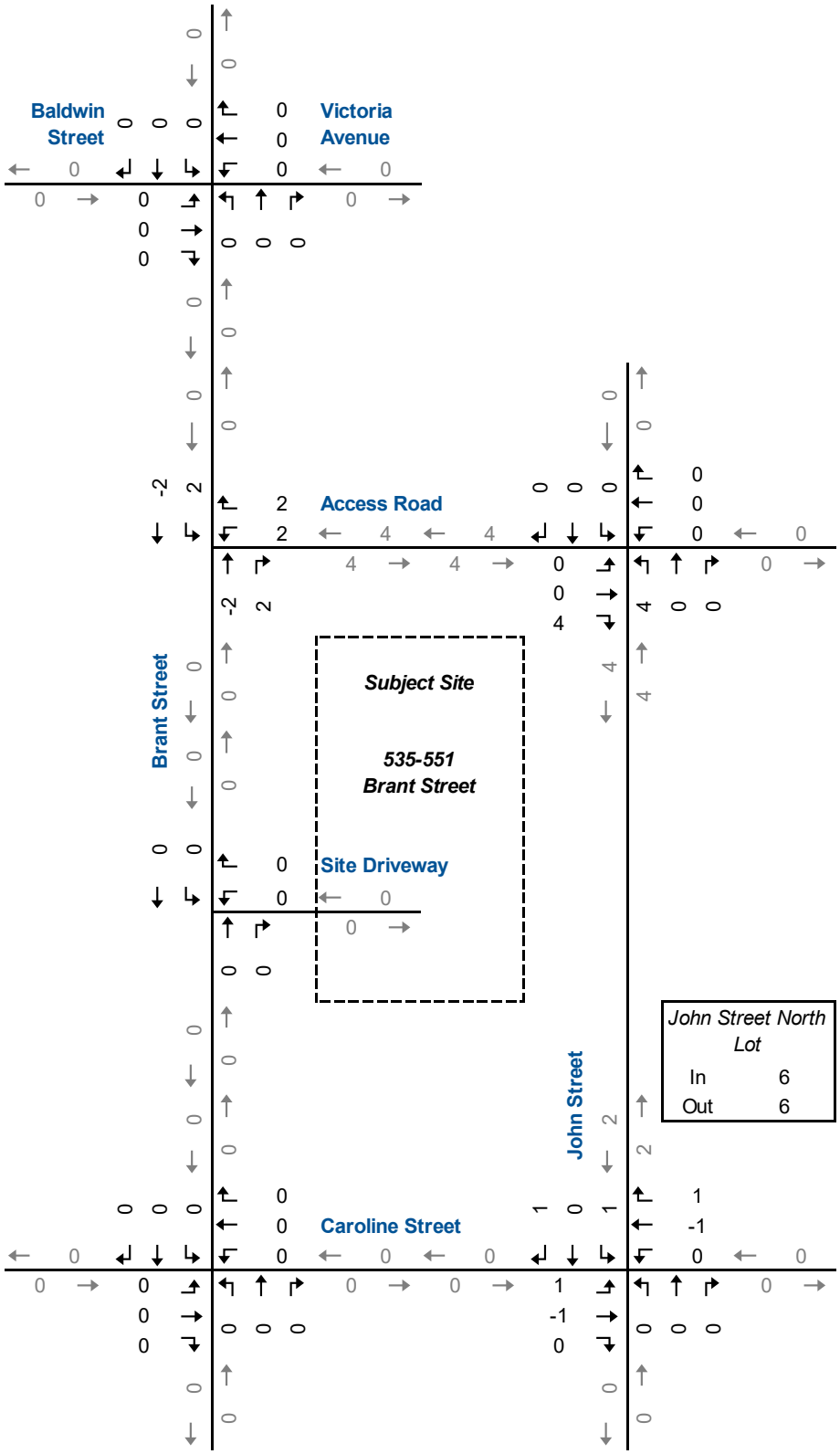

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# Net Site Generated Traffic Volumes – AM Peak Hour




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# Net Site Generated Traffic Volumes – PM Peak Hour




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# Pass-by Site Generated Traffic Volumes – PM Peak Hour

# 4 Future Traffic Conditions

To be consistent with the terms of reference established with the City of Burlington, and with the Region of Halton's Transportation Impact Study Guidelines, a horizon year of 2025, five (5) years beyond the date of TIS, has been used for traffic forecasting and analyses purposes.

## 4.1 Background Growth

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. A frequently used procedure is to estimate an annual percentage increase and apply that increase to the study area traffic volumes. An alternative procedure is to identify estimated traffic generated by specific planned major developments that would be expected to affect the project study area roadways. For this assessment, both methods were used.

### 4.1.1 General Background Growth

Generalized traffic growth was determined by applying a growth rate of 1.0% per annum to the base year volumes. This growth rate was confirmed with City staff during pre-consultation.

### 4.1.2 Approved or In-Stream Developments

In year 2025, it is possible that there will be other new developments in the area that will also increase the traffic volumes on the study area roadways.

The City's Planning Department advised that there are several approved or in-stream residential and commercial developments within close proximity of the study area.

**Figure 4.1** illustrates the general locations of these area developments. **Table 4.1** outlines the expected number of units.

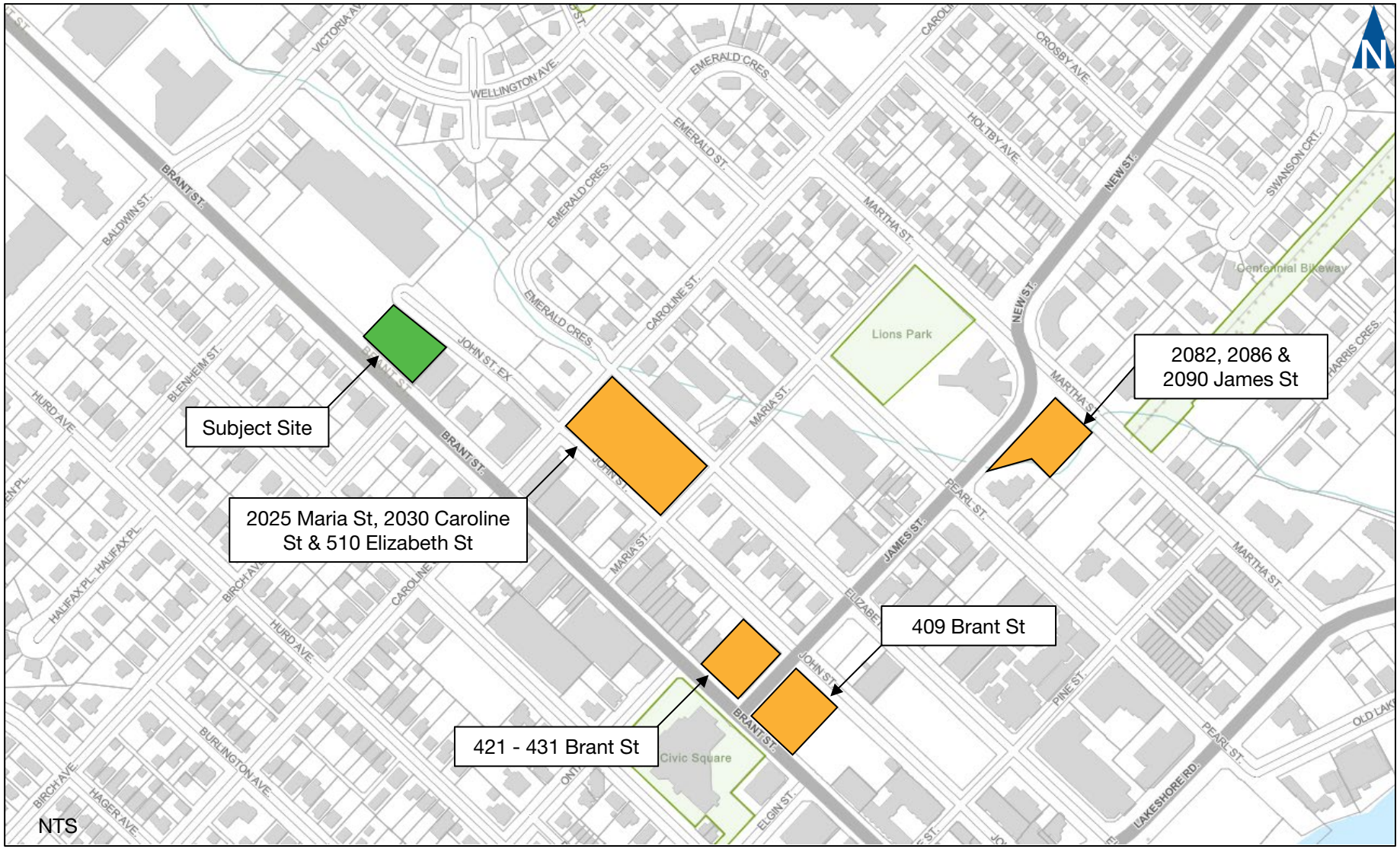
### 4.1.3 Network Improvements

Based on discussions with City staff, an all-way stop control has been proposed for the intersection of Caroline Street and John Street in 2020. In addition, the eastbound and westbound left-turn lanes will be removed, and a westbound right-turn lane will be introduced.

**Figure 4.2** illustrates the future lane configuration and traffic control.

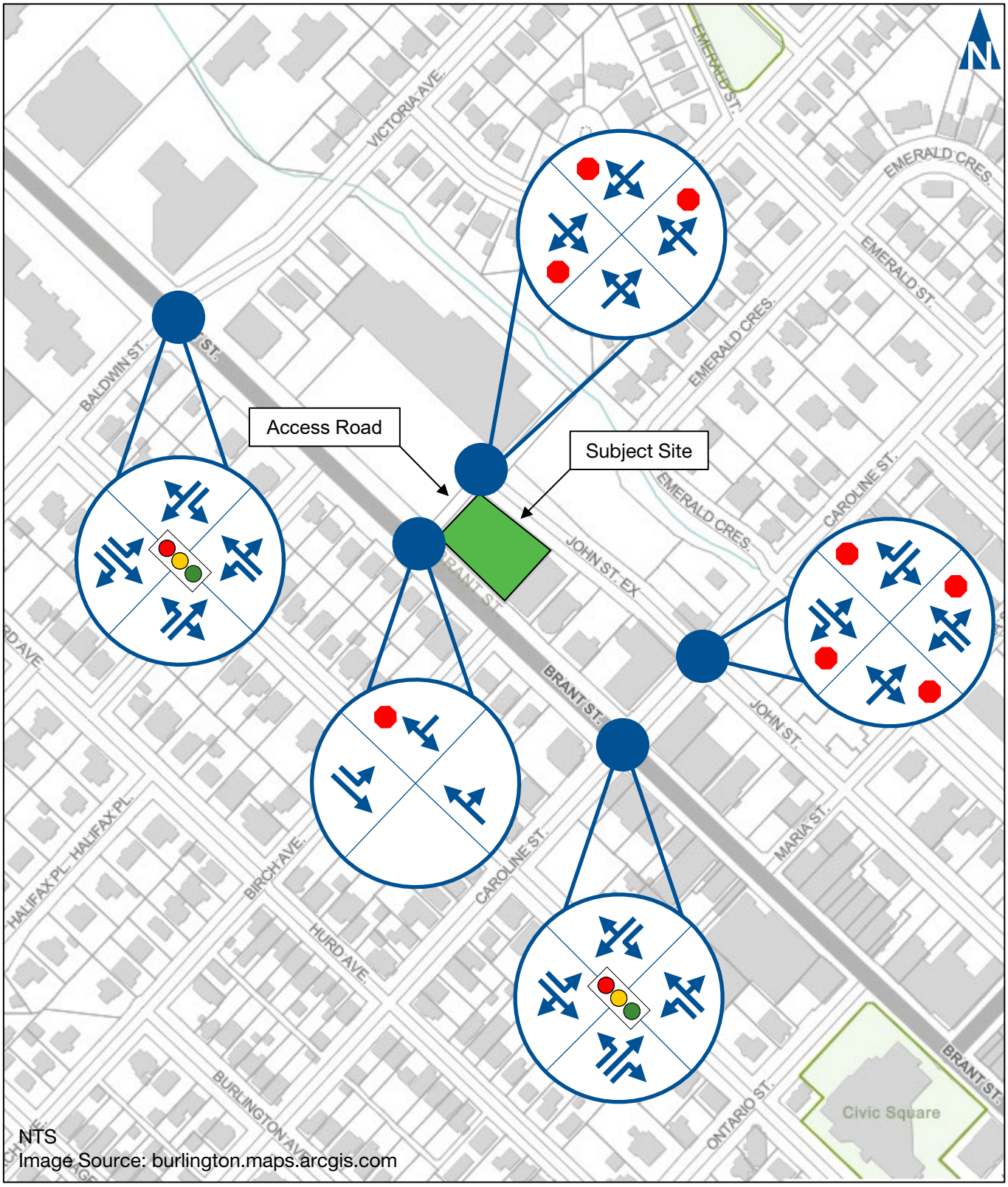







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# Approved or In-Stream Developments




NTS
Image Source: burlington.maps.arcgis.com

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# Future Lane Configuration and Traffic Control

**TABLE 4.1: APPROVED OR IN-STREAM DEVELOPMENTS**

| Development | Development Plans |
|---|---|
| 421 - 431 Brant Street | 183 residential units;<br>1,390 SM (14,961 SF) office land uses; and<br>967 SM (10,407 SF) commercial land uses |
| 409 Brant Street | 227 residential units;<br>597 SM (6,425 SF) commercial land uses |
| 2025 Maria Street, 2030 Caroline Street and 510 Elizabeth Street | 8,860 SM (95,368 SF) medical office land uses; and<br>2,343 SM (25,219 SF) commercial land uses |
| 2082, 2086 and 2090 James Street | 153 residential units |

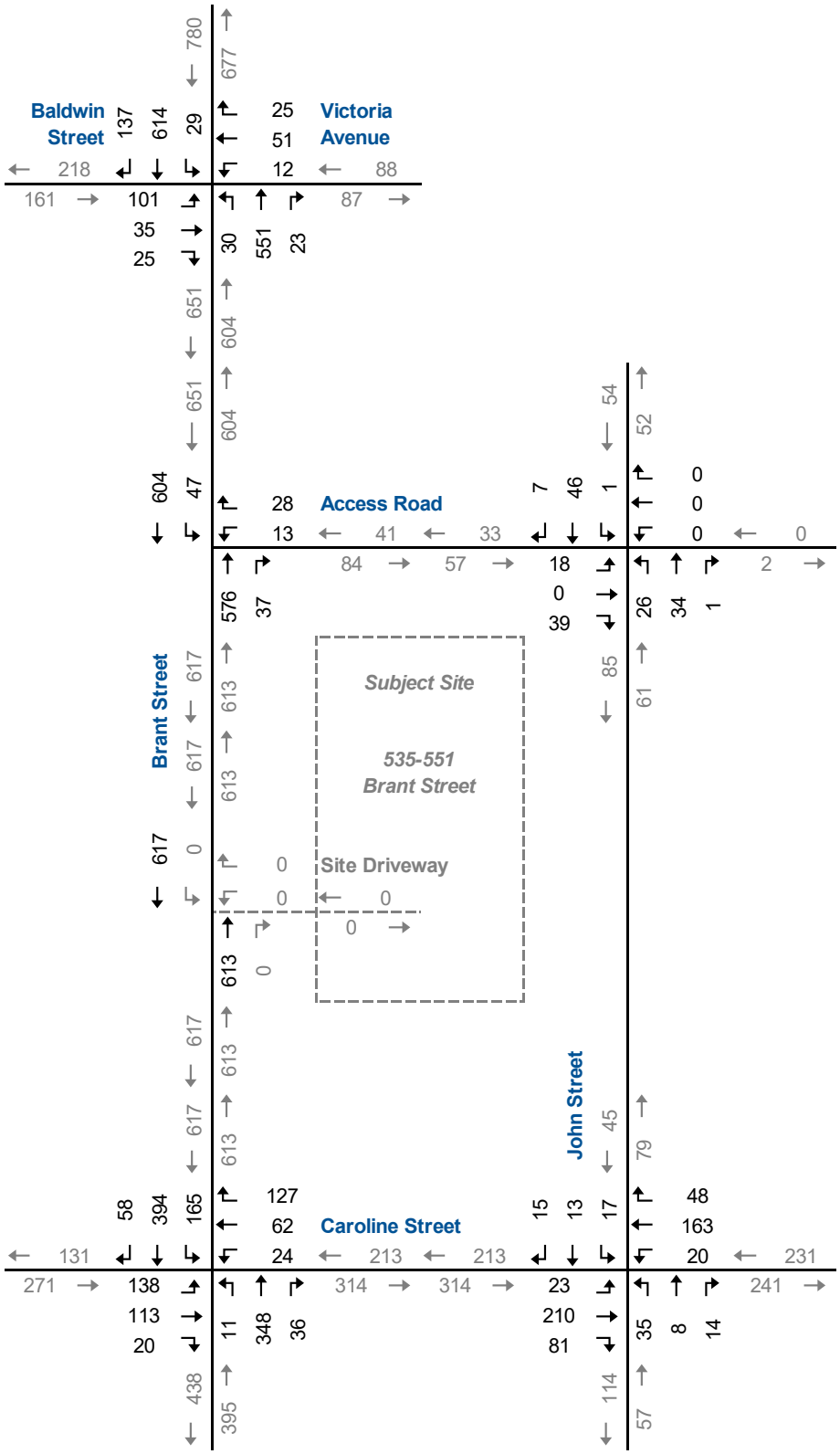
**Appendix E** contains the in-stream development forecast traffic volumes.

### 4.1.4 Background Traffic Volumes

The background traffic volumes within the study area are estimated to consist of generalized background traffic growth of 1.0 percent per annum along with traffic related to the nearby developments. **Figure 4.3a** and **Figure 4.3b** illustrate the 2025 background traffic forecasts for the AM and PM peak hours, respectively.

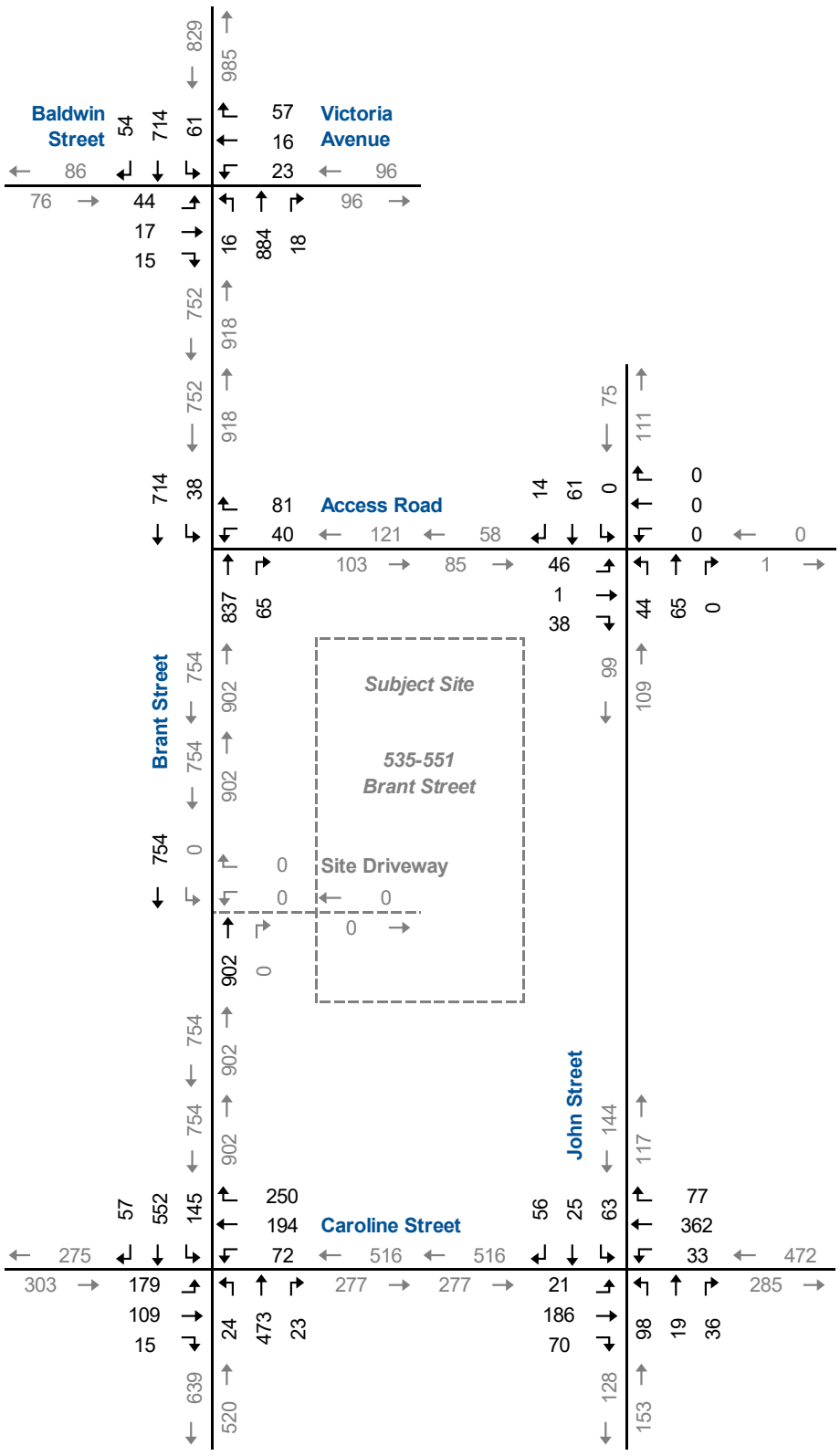
### 4.1.5 Total Traffic Volumes

The total traffic volumes within the study area are estimated to consist of generalized background traffic growth of 1.0 percent per annum, traffic related to the nearby developments and development site-generated traffic. **Figure 4.4a** and **Figure 4.4b** illustrate the 2025 total traffic forecasts for the AM and PM peak hours, respectively.



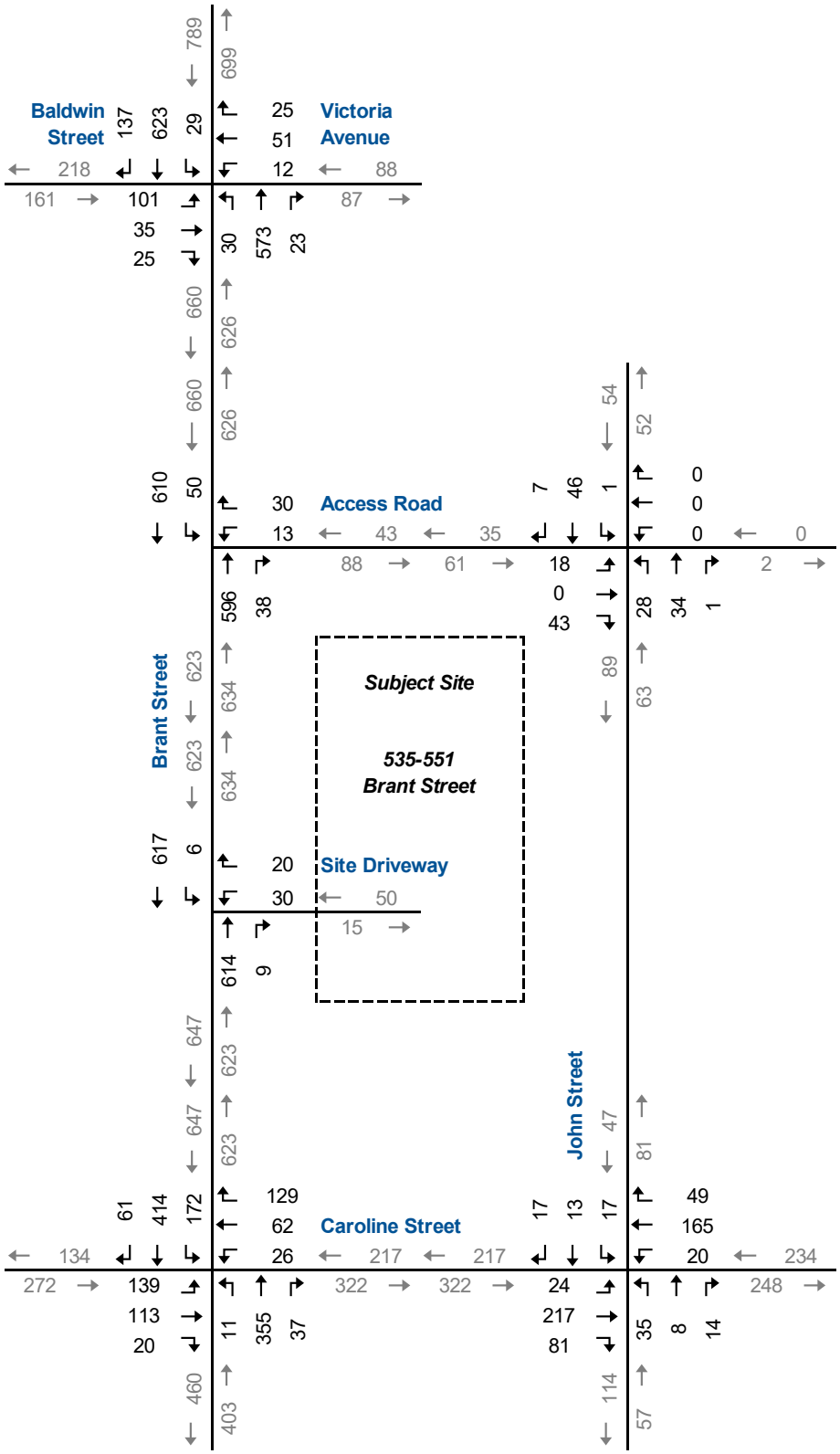

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# 2025 Background Traffic Volumes – AM Peak Hour



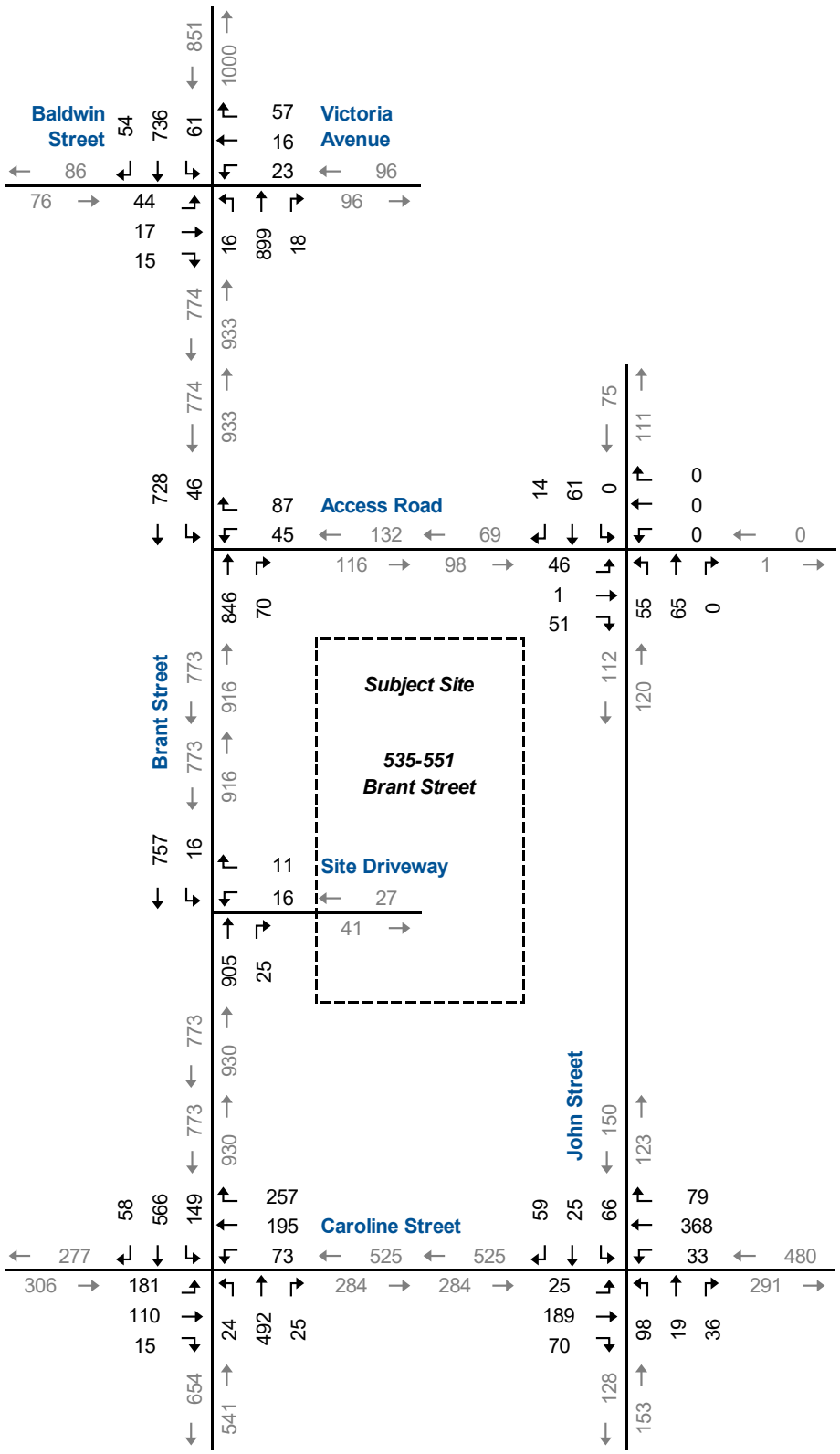

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# 2025 Background Traffic Volumes – PM Peak Hour




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# 2025 Total Traffic Volumes – AM Peak Hour




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# 2025 Total Traffic Volumes – PM Peak Hour

## 4.2 2025 Background Traffic Operations

Level of service analyses have been conducted using Synchro 9 for the weekday AM and PM peak hour conditions at the study area intersections utilizing background traffic forecasts. The intersections within the study area were assessed based on the same parameters as in the analysis of existing conditions. Signal timings were not optimized.

**Table 4.2** summarizes the results of the 2025 background traffic operations. The study area intersections are forecast to operate with acceptable levels of service, except for the following movements:

**Brant Street and Victoria Avenue/Baldwin Street**

- The eastbound left-turn movement at the intersection of Brant Street and Victoria Avenue/Baldwin Street is forecast to operate with queues exceeding the available storage by 11 metres during the AM peak hour.

**Brant Street and Access Road**

- The westbound shared movement is forecast to operate with LOS D during the PM peak hour. The low v/c ratio indicates the delay is likely due to the high volumes of through traffic on Brant Street which limits the number of available gaps for side street/driveway traffic.

**Brant Street and Caroline Street**

- The southbound left-turn movement at the intersection of Brant Street and Caroline Street is forecast to operate with queues exceeding the available storage by 8 metres during the AM peak hour and 13 metres during the PM peak hour; and
- The westbound and northbound shared through/right-turn movements are forecast to operate within the LOS D to E range and v/c ratio greater than 0.85 during the PM peak hour.

**Appendix F** contains the detailed Synchro reports.





# TABLE 4.2: 2025 BACKGROUND TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | OVERALL |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | C | > | **C** | C | C | > | **C** | A | A | > | **A** | A | A | A | **A** | **B** |
| | | | Delay | 36 | 31 | > | **34** | 31 | 32 | > | **32** | 4 | 6 | > | **6** | 4 | 7 | 4 | **6** | **10** |
| | | | V/C | 0.54 | 0.14 | > | | 0.07 | 0.20 | > | | 0.08 | 0.48 | > | | 0.07 | 0.52 | 0.11 | | **0.52** |
| | | | 95th | 31 | 15 | > | | 6 | 18 | > | | 5 | 78 | > | | 5 | 87 | 6 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | -11 | - | > | | 19 | - | > | | 10 | - | > | | 40 | - | 44 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | B | | > | **B** | | A | > | **A** | A | A | | **A** | |
| | | | Delay | | | | | 14 | | > | **14** | | 0 | > | **0** | 10 | 0 | | **1** | |
| | | | V/C | | | | | 0.10 | | > | | | 0.39 | > | | 0.06 | 0.39 | | | |
| | | | 95th | | | | | 3 | | > | | | 0 | > | | 2 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | B | B | B | **B** | C | C | > | **C** | B | C | > | **C** | C | C | > | **C** | **C** |
| | | | Delay | 16 | 14 | 13 | **15** | 21 | 23 | > | **23** | 18 | 33 | > | **32** | 21 | 20 | > | **21** | **23** |
| | | | V/C | 0.36 | 0.16 | 0.02 | | 0.09 | 0.27 | > | | 0.05 | 0.75 | > | | 0.64 | 0.64 | > | | **0.55** |
| | | | 95th | 24 | 21 | 0 | | 9 | 25 | > | | 5 | 96 | > | | 28 | 85 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | 16 | - | 10 | | 11 | - | > | | 20 | - | > | | -8 | - | > | | |
| | 4 - Caroline Street & John Street | AWSC | LOS | < | B | > | **B** | < | A | A | **A** | A | A | > | **A** | < | A | A | **A** | |
| | | | Delay | < | 13 | > | **13** | < | 9 | 7 | **9** | 9 | 8 | > | **8** | < | 9 | 7 | **8** | |
| | | | DU | < | 0.48 | > | | < | 0.29 | 0.06 | | 0.07 | 0.04 | > | | < | 0.06 | 0.02 | | |
| | | | 95th | < | - | > | | < | - | - | | - | - | > | | < | - | - | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | |
| | | | Delay | < | 7 | > | **7** | < | 7 | > | **0** | < | 8 | > | **8** | < | 7 | > | **7** | |
| | | | DU | < | 0.07 | > | | < | 0.00 | > | | < | 0.08 | > | | < | 0.07 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |
| PM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | D | > | **D** | D | D | > | **D** | A | A | > | **A** | A | A | A | **A** | **A** |
| | | | Delay | 38 | 36 | > | **38** | 37 | 37 | > | **37** | 2 | 6 | > | **6** | 4 | 5 | 2 | **4** | **8.2** |
| | | | V/C | 0.34 | 0.10 | > | | 0.19 | 0.15 | > | | 0.04 | 0.67 | > | | 0.21 | 0.54 | 0.04 | | **0.63** |
| | | | 95th | 17 | 11 | > | | 11 | 14 | > | | 2 | 115 | > | | 7 | 73 | 3 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | 3 | - | > | | 14 | - | > | | 13 | - | > | | 38 | - | 47 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | D | | > | **D** | | A | > | **A** | B | A | | **A** | |
| | | | Delay | | | | | 28 | | > | **28** | | 0 | > | **0** | 12 | 0 | | **1** | |
| | | | V/C | | | | | 0.46 | | > | | | 0.58 | > | | 0.07 | 0.46 | | | |
| | | | 95th | | | | | 17 | | > | | | 0 | > | | 2 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | C | B | B | **C** | C | E | > | **D** | C | D | > | **D** | C | C | > | **C** | **D** |
| | | | Delay | 29 | 14 | 13 | **23** | 23 | 60 | > | **55** | 22 | 47 | > | **46** | 27 | 26 | > | **26** | **38** |
| | | | V/C | 0.74 | 0.15 | 0.01 | | 0.24 | 0.95 | > | | 0.18 | 0.92 | > | | 0.70 | 0.80 | > | | **0.90** |
| | | | 95th | 40 | 20 | 0 | | 20 | 121 | > | | 9 | 136 | > | | 33 | 140 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | 0 | - | 10 | | 0 | - | > | | 16 | - | > | | -13 | - | > | | |
| | 4 - Caroline Street & John Street | AWSC | LOS | < | C | > | **C** | < | C | A | **C** | B | A | > | **B** | < | B | A | **B** | |
| | | | Delay | < | 16 | > | **16** | < | 22 | 8 | **20** | 12 | 9 | > | **11** | < | 11 | 9 | **10** | |
| | | | DU | < | 0.52 | > | | < | 0.73 | 0.12 | | 0.23 | 0.11 | > | | < | 0.20 | 0.11 | | |
| | | | 95th | < | - | > | | < | - | - | | - | - | > | | < | - | - | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | |
| | | | Delay | < | 8 | > | **8** | < | 7 | > | **0** | < | 8 | > | **8** | < | 8 | > | **8** | |
| | | | DU | < | 0.11 | > | | < | 0.00 | > | | < | 0.14 | > | | < | 0.09 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*V/C - Volume to Capacity Ratio*
*95th - 95th Percentile Queue Length*
*Storage - Existing Storage (m)*
*DU - Degree Utilization*
*Avail. - Available Storage (m)*
*> - Shared Right-Turn Lane*
*< - Shared Left-Turn Lane*

## 4.3 2025 Total Traffic Operations

Level of service analyses have been conducted using Synchro 9 for the weekday AM and PM peak hour conditions at the study area intersections utilizing total traffic forecasts. The intersections within the study area were assessed based on the same parameters as in the analysis of background condition. Signal timings were not optimized.

The existing pedestrian volumes along the east leg of the Brant Street and Access Road intersection were also assumed to cross the east leg of the Brant Street and Site Driveway intersection.

**Table 4.3** summarizes the results of the 2025 total traffic operations. The study area intersections are forecast to operate with acceptable levels of service, except for the following movements:

**Brant Street and Victoria Avenue/Baldwin Street**

- The eastbound left-turn movement at the intersection of Brant Street and Victoria Avenue/Baldwin Street is forecast to operate with queues exceeding the available storage by 11 metres during the AM peak hour.

**Brant Street and Access Road**

- The westbound shared movement is forecast to operate with LOS D during the PM peak hour. The low v/c ratio indicates the delay is likely due to the high volumes of through traffic on Brant Street which limits the number of available gaps for side street/driveway traffic.

**Brant Street and Caroline Street**

- The southbound left-turn movement at the intersection of Brant Street and Caroline Street is forecast to operate with queues exceeding the available storage by 12 metres during the AM peak hour and 14 metres during the PM peak hour; and
- The westbound and northbound shared through/right-turn movements are forecast to operate within the LOS D to E range and v/c ratio greater than 0.85 during the PM peak hour.

**Appendix G** contains the detailed Synchro reports.

The results of the analysis indicate that the redevelopment of the subject site is anticipated to have a negligible effect on traffic operations within the study area. Some movements at the intersection of Brant Street and Caroline Street are forecast to operate with high

levels of delay; however, this delay is occurring under the background traffic scenario and is not triggered by the proposed redevelopment.

# TABLE 4.3: 2025 TOTAL TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | OVERALL |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | C | > | C | C | C | > | C | A | A | > | A | A | A | A | A | B |
| | | | Delay | 36 | 31 | > | 34 | 31 | 32 | > | 32 | 4 | 7 | > | 6 | 4 | 7 | 4 | 6 | 10 |
| | | | V/C | 0.54 | 0.14 | > | | 0.07 | 0.20 | > | | 0.08 | 0.50 | > | | 0.08 | 0.53 | 0.11 | | 0.53 |
| | | | 95th | 31 | 15 | > | | 6 | 18 | > | | 5 | 82 | > | | 5 | 89 | 6 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | -11 | - | > | | 19 | - | > | | 10 | - | > | | 40 | - | 44 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | B | | > | B | | A | > | A | A | | | A | |
| | | | Delay | | | | | 15 | | > | 15 | | 0 | > | 0 | 10 | 0 | | 1 | |
| | | | V/C | | | | | 0.11 | | > | | | 0.41 | > | | 0.07 | 0.39 | | | |
| | | | 95th | | | | | 3 | | > | | | 0 | > | | 2 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | B | B | B | B | C | C | > | C | B | C | > | C | C | C | > | C | C |
| | | | Delay | 16 | 14 | 13 | 15 | 21 | 23 | > | 23 | 18 | 34 | > | 33 | 23 | 21 | > | 22 | 24 |
| | | | V/C | 0.36 | 0.16 | 0.02 | | 0.09 | 0.27 | > | | 0.05 | 0.77 | > | | 0.68 | 0.67 | > | | 0.57 |
| | | | 95th | 25 | 21 | 0 | | 9 | 25 | > | | 5 | 100 | > | | 32 | 91 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | 15 | - | 10 | | 11 | - | > | | 20 | - | > | | -12 | - | > | | |
| | 4 - Caroline Street & John Street | AWSC | LOS | < | B | > | B | < | A | A | A | A | A | > | A | < | A | A | A | |
| | | | Delay | < | 13 | > | 13 | < | 9 | 7 | 9 | 9 | 8 | > | 8 | < | 9 | 7 | 8 | |
| | | | DU | < | 0.49 | > | | < | 0.29 | 0.07 | | 0.07 | 0.04 | > | | < | 0.06 | 0.03 | | |
| | | | 95th | < | - | > | | < | - | - | | - | - | > | | < | - | - | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | A | < | A | > | A | < | A | > | A | < | A | > | A | |
| | | | Delay | < | 7 | > | 7 | < | 7 | > | 0 | < | 8 | > | 8 | < | 7 | > | 7 | |
| | | | DU | < | 0.07 | > | | < | 0.00 | > | | < | 0.08 | > | | < | 0.07 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |
| | 6- Brant Street & Site Driveway | TWSC | LOS | | | | | B | | > | B | | A | > | A | A | | | A | |
| | | | Delay | | | | | 15 | | > | 15 | | 0 | > | 0 | 9 | 0 | | 0 | |
| | | | DU | | | | | 0.13 | | > | | | 0.40 | > | | 0.01 | 0.39 | | | |
| | | | 95th | | | | | 3 | | > | | | 0 | > | | 0 | 0 | | | |
| PM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | D | > | D | D | D | > | D | A | A | > | A | A | A | A | A | A |
| | | | Delay | 38 | 36 | > | 38 | 37 | 37 | > | 37 | 2 | 7 | > | 6 | 4 | 5 | 2 | 5 | 8.3 |
| | | | V/C | 0.34 | 0.10 | > | | 0.19 | 0.15 | > | | 0.04 | 0.68 | > | | 0.22 | 0.56 | 0.04 | | 0.64 |
| | | | 95th | 17 | 11 | > | | 11 | 14 | > | | 2 | 120 | > | | 7 | 77 | 3 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | 3 | - | > | | 14 | - | > | | 13 | - | > | | 38 | - | 47 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | D | | > | D | | A | > | A | B | A | | A | |
| | | | Delay | | | | | 32 | | > | 32 | | 0 | > | 0 | 12 | 0 | | 1 | |
| | | | V/C | | | | | 0.52 | | > | | | 0.59 | > | | 0.09 | 0.47 | | | |
| | | | 95th | | | | | 21 | | > | | | 0 | > | | 2 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | C | B | B | C | C | E | > | E | C | D | > | D | C | C | > | C | D |
| | | | Delay | 29 | 14 | 13 | 23 | 23 | 64 | > | 58 | 22 | 54 | > | 53 | 28 | 27 | > | 28 | 41 |
| | | | V/C | 0.74 | 0.15 | 0.01 | | 0.24 | 0.97 | > | | 0.20 | 0.96 | > | | 0.72 | 0.82 | > | | 0.92 |
| | | | 95th | 41 | 20 | 0 | | 20 | 123 | > | | 9 | 145 | > | | 34 | 146 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | -1 | - | 10 | | 0 | - | > | | 16 | - | > | | -14 | - | > | | |
| | 4 - Caroline Street & John Street | AWSC | LOS | < | C | > | C | < | C | A | C | B | A | > | B | < | B | A | B | |
| | | | Delay | < | 16 | > | 16 | < | 24 | 8 | 21 | 12 | 9 | > | 11 | < | 11 | 9 | 11 | |
| | | | DU | < | 0.54 | > | | < | 0.74 | 0.13 | | 0.23 | 0.11 | > | | < | 0.21 | 0.12 | | |
| | | | 95th | < | - | > | | < | - | - | | - | - | > | | < | - | - | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | A | < | A | > | A | < | A | > | A | < | A | > | A | |
| | | | Delay | < | 8 | > | 8 | < | 8 | > | 0 | < | 8 | > | 8 | < | 8 | > | 8 | |
| | | | DU | < | 0.12 | > | | < | 0.00 | > | | < | 0.16 | > | | < | 0.09 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |
| | 6- Brant Street & Site Driveway | TWSC | LOS | | | | | C | | > | C | | A | > | A | B | A | | A | |
| | | | Delay | | | | | 21 | | > | 21 | | 0 | > | 0 | 12 | 0 | | 0 | |
| | | | DU | | | | | 0.11 | | > | | | 0.59 | > | | 0.03 | 0.48 | | | |
| | | | 95th | | | | | 3 | | > | | | 0 | > | | 1 | 0 | | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*V/C - Volume to Capacity Ratio*
*95th - 95th Percentile Queue Length*
*Storage - Existing Storage (m)*
*DU - Degree Utilization*
*Avail. - Available Storage (m)*
*> - Shared Right-Turn Lane*
*< - Shared Left-Turn Lane*

### Brant Street and Site Driveway

Approximately 128 metres of queue storage from the site driveway to the southbound stop bar at Brant Street and Caroline Street is available under existing conditions. Given the nature of the intersection, there is a potential for intermittent southbound vehicles queuing on Brant Street that may potentially block the site driveway in limited circumstances. In addition, as a worst-case scenario, vehicles may queue within the site, extending onto the parking garage ramp.

Queue length impacts from the downstream intersection of Brant Street and Caroline Street have been reviewed. Signal timings have not been optimized. SimTraffic simulation has been reviewed for the total traffic forecast to confirm the 95th percentile queue lengths along Brant Street.

SimTraffic was utilized rather than Synchro in this assessment as microscopic models, such as Sim Traffic, individually track each vehicle in the traffic system through the model and collect comprehensive operational measures of effectiveness for every vehicle during each 0.1 second of the simulation. Unlike Synchro, SimTraffic measures the full impact of queuing and blocking. Synchro is best used to determine level of service and delay at the macro level, but is not ideal for assessments simulating real-world conditions.

The analysis consisted of ten (10) iterations of sixty (60) minute simulations to forecast the delay per vehicle in seconds. **Appendix H** provides the SimTraffic results.

Reviewing these results indicates that a queue length of 122 metres during the AM peak hour and 118 metres during the PM peak hour is expected for the southbound approach at the intersection of Brant Street and Caroline Street. As a result, the site driveway is not expected to encounter vehicle blockages during the AM or PM peak hours.

The westbound approach of the driveway connection to Brant Street is forecast to operate with queue lengths of 24 metres during the AM peak hour and 31 metres during the PM peak hour. Queues may occur within the site, extending onto the parking garage ramp with queues that may block the Brant Street sidewalk while vehicles wait to exit the site. Although these potential obstructions may occur, it is noted that they are not uncommon in a downtown environment.

Reviewing counts at Brant Street and Access Road that Paradigm collected in February 2020, approximately 19 and 13 pedestrians crossed the east leg of the intersection during the AM and PM peak





hours, respectively. It was assumed that these pedestrians would also cross the east leg of the Brant Street and Site Driveway intersection. Conflicts may occur for the northbound right-turn and southbound left-turn movements into the site. In addition, as mentioned above, there is potential for vehicles exiting the site to temporarily block the sidewalk on the east side of Brant Street creating conflicts for those pedestrians.

In addition, southbound left turn vehicle queues on Brant Street at the site driveway may occasionally impact northbound left turn vehicles entering 535-551 Brant Street.

# 5 Remedial Measures

## 5.1 Left-Turn Lanes

The need for auxiliary turning lanes at the site driveway on Brant Street follows the requirements and procedures detailed in the Ministry of Transportation Geometric Design Manual[10]. Warrants have been calculated for southbound left-turns at Brant Street and the site driveway. The warrant was calculated using the nomographs for left-turn lanes on a two-lane undivided highway at an unsignalized intersection with a design speed of 10 kilometres per hour over the posted speed limit (60 km/h). Based on this criterion, a southbound left-turn lane with 25 metres of storage on Brant Street at the site driveway is warranted under 2025 total AM and PM peak hour volumes. This can be accommodated within the two-way centre left-turn lane on Brant Street.

**Appendix I** contains the warrant nomographs.

## 5.2 Assessment of Impacts

Based on the analyses, minimal delay and congestion is forecast to occur at the intersections assessed within the study area. A summary of the findings at each intersection is further discussed.

### 5.2.1 Brant Street and Victoria Avenue/Baldwin Street

Under the existing traffic scenario, the intersection currently operates at LOS D or better for all movements and v/c ratios well under capacity. With general background growth and in-stream developments, the intersection is forecast to operate with similar levels of service to the existing conditions. No change in level of service is anticipated as a result of the proposed redevelopment.

### 5.2.2 Brant Street and Access Road

Under the existing traffic scenario, the intersection currently operates at LOS C or better for all movements. With general background growth and in-stream developments, the westbound shared movement is projected to degrade to LOS D, during the weekday PM peak hour. No change in level of service is anticipated as a result of the proposed redevelopment.

[10] Geometric Design Manual for Ontario Highways, Ministry of Transportation of Ontario, Queen's Printer for Ontario, 1986

### 5.2.3 Brant Street and Caroline Street

Under the existing traffic scenario, the intersection currently operates at LOS C or better for all movements. With general background growth and in-stream developments, the westbound and northbound shared through/right-turn movements are projected to degrade to LOS E and LOS D, respectively, during the weekday PM peak hour.

Optimization of signal splits and increasing the cycle length from 80 to 120 seconds during the PM peak hour, will accommodate future projected growth although some queuing is expected to occur. The anticipated southbound left turn queue on Brant Street can be accommodated by the two-way left turn lane.

**Table 5.1** summarizes the results of the signal optimization for the PM peak hour.

**Appendix J** contains the detailed synchro report.

### 5.2.4 Caroline Street and John Street

Under the existing traffic scenario, the intersection currently operates at LOS C or better for all movements. With general background growth and in-stream developments, no change in level of service is anticipated. No change in level of service is anticipated as a result of the proposed redevelopment.

### 5.2.5 John Street and Access Road

Under the existing traffic scenario, the intersection currently operates at LOS A for all movements. With general background growth and in-stream developments, no change in level of service is anticipated. No change in level of service is anticipated as a result of the proposed redevelopment.

### 5.2.6 Brant Street and Site Driveway

Under the 2025 total traffic scenario, all movements are forecast to operate with LOS C or better.

As discussed in **Section 4.3**, the existing pedestrian volumes along the east leg of the Brant Street and Access Road intersection were also assumed to cross the east leg of the Brant Street and Site Driveway intersection.





# TABLE 5.1: 2025 TOTAL TRAFFIC OPERATIONS – SIGNAL OPTIMIZATION

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | OVERALL |
| PM Peak Hour | 3 - Brant Street & Caroline Street | TCS | LOS | E | B | B | **D** | C | D | > | **D** | C | D | > | **D** | D | C | > | **C** | **D** |
| | | | Delay | 63 | 20 | 18 | **45** | 28 | 49 | > | **46** | 27 | 44 | > | **43** | 41 | 33 | > | **35** | **41** |
| | | | V/C | 0.90 | 0.15 | 0.01 | | 0.20 | 0.83 | > | | 0.18 | 0.83 | > | | 0.78 | 0.79 | > | | **0.87** |
| | | | 95th | 62 | 28 | 0 | | 25 | 152 | > | | 11 | 175 | > | | 43 | 179 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | -22 | - | 10 | | -5 | - | > | | 14 | - | > | | -23 | - | > | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*V/C - Volume to Capacity Ratio*
*95th - 95th Percentile Queue Length*
*Storage - Existing Storage (m)*
*DU - Degree Utilization*
*Avail. - Available Storage (m)*
*> - Shared Right-Turn Lane*
*< - Shared Left-Turn Lane*

## 5.3 Off-Peak Analysis

The SimTraffic queue assessment outlined in **Section 4.3** indicates that the site driveway connection to Brant Street is forecast to operate with queues of approximately 3 vehicles during the AM peak hour and 4 vehicles during the PM peak hour. These queues are expected to extend onto the parking ramp.

To determine the length of the queues into the site during off-peak hours throughout the day, the queues at the site driveway during the peak hour with the least amount of traffic based on the eight hours that were counted, from 7:00AM to 8:00AM, was analysed.

### 5.3.1 Existing and Site Generated Traffic Volumes

The ITE Trip Generation Manual does not provide off-peak hour trip generation rates for the land uses within the proposed redevelopment. Therefore, the trip generation for the subject site was estimated based on traffic counts at a driveway for a similar residential development.

Turning movement counts at the existing development at 187 Park Street South in Hamilton were collected by Paradigm from Thursday, February 20, 2020 to Saturday, February 22, 2020. For the purpose of this study, data from the Thursday count date was used.

The number of trips generated by the development at 187 Park Street South was 14 trips from 7:00AM to 8:00AM and 28 trips during the PM peak hour of 5:00PM to 6:00PM. The rate between the off-peak hour and PM peak hour is noted to be 0.50.

Applying this rate to the subject development PM peak hour total trip generation values, 70 total trips are estimated for the off-peak hour. Internal trips and modal split have been accounted for using the same methodology as in **Section 3.2.2**. As the off-peak hour occurs during the morning, pass-by rates have not been applied. The net trip generation then results in 59 trips during the off-peak hour.

**Table 5.2** summarizes the forecast number of off-peak trips generated by the proposed redevelopment.





## TABLE 5.2: OFF-PEAK HOUR TRIP GENERATION

| Land Use | GFA ($ft^2$) | Units | Trips | Off-Peak Hour | | | |
|---|---|---|---|---|---|---|---|
| | | | | Rate | In | Out | Total |
| LUC 222 - Multifamily Housing (High-Rise) | - | 248 | Total | | 29 | 18 | **47** |
| | | | Internal | | 1 | 0 | 1 |
| | | | Modal Share | 20% | 6 | 4 | 10 |
| LUC 820 - Shopping Centre | 11,496 | - | Total | | 11 | 12 | **23** |
| | | | Internal | | 0 | 1 | 1 |
| **Total Trip Generation** | | | **Total** | | **40** | **30** | **70** |
| | | | **Internal** | 3% | 1 | 1 | 2 |
| | | | **Modal Share** | | 6 | 4 | 10 |
| | | | **New** | | **33** | **25** | **58** |

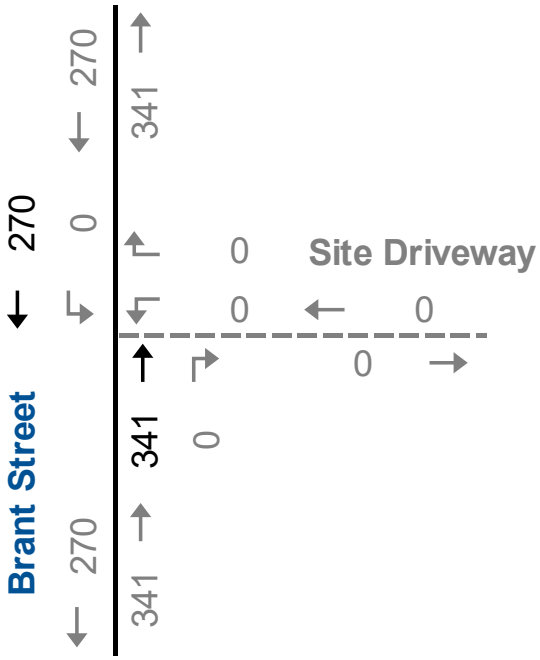
The existing through traffic volumes at the site driveway on Brant Street were determined using the same methodology used in **Section 2.4**.

It is noted that trips were assigned to the network using the same distribution as in **Section 3.3**.

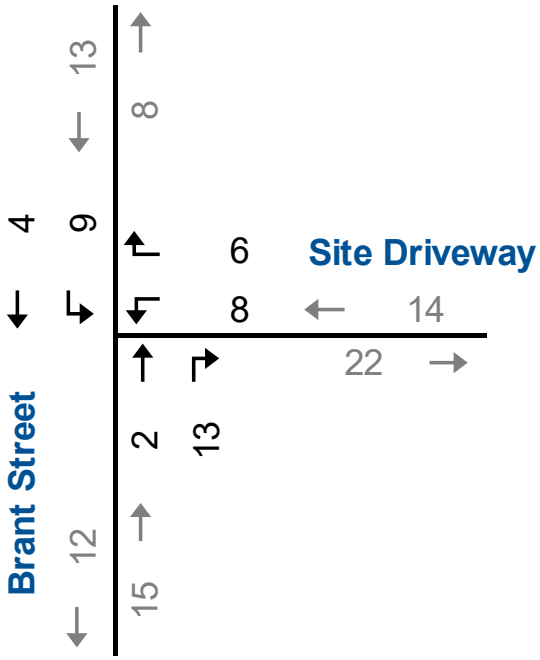
**Figure 5.1** illustrates the existing and site generated off-peak hour traffic volumes at the site driveway on Brant Street.

**Appendix K** contains the proxy site data.

## Existing




## Site Generated




NTS

paradigm TRANSPORTATION SOLUTIONS LIMITED

# Existing and Site Generated Off-Peak Hour Traffic Volumes

### 5.3.2 Background and Total Traffic Volumes

To determine the traffic volumes for the background developments, the same rate was applied to the PM peak hour traffic volumes for each development.

**Figure 5.2** illustrates the off-peak hour background and total traffic volumes.

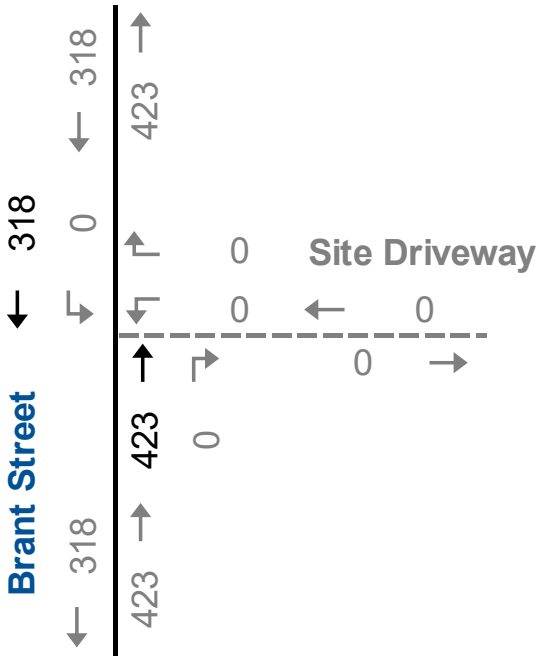
Level of service analyses have been conducted using Synchro 9 for the off-peak conditions at the Site Driveway connection to Brant Street utilizing total traffic forecasts. The intersection was assessed based on the same parameters as in the total AM and PM peak hour analysis.

The existing pedestrian volumes along the east leg of the Brant Street and Access Road intersection were also assumed to cross the east leg of the Brant Street and Site Driveway intersection.

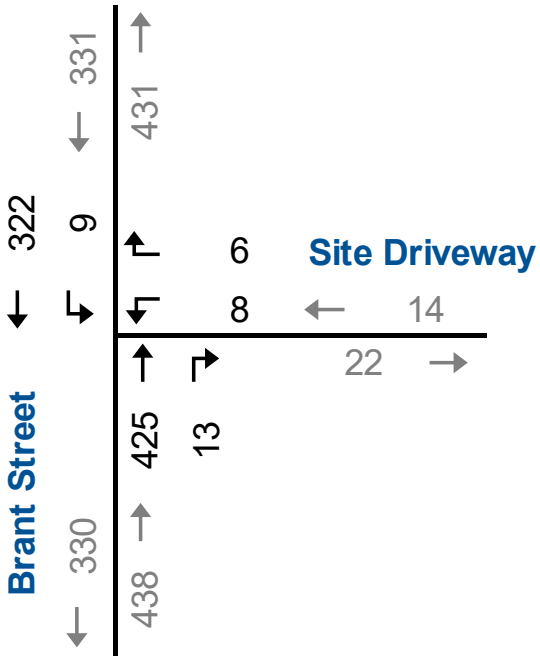
**Table 5.3** summarizes the results of the 2025 off-peak total traffic operations. The site driveway connection to Brant Street is forecast to operate with acceptable levels of service during the off-peak hour.

**Appendix K** contains the detailed synchro reports.

## 2025 Background




## 2025 Total




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# 2025 Background and Total Off-Peak Hour Traffic Volumes

## TABLE 5.3: 2025 TOTAL TRAFFIC OPERATIONS – OFF PEAK ANALYSIS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | OVERALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| Off-Peak | 6- Brant Street & Site Driveway | TWSC | LOS | | | | | B | | > | **B** | | A | > | **A** | A | A | | **A** | |
| | | | Delay | | | | | 12 | | > | **12** | | 0 | > | **0** | 8 | 0 | | **0** | |
| | | | V/C | | | | | 0.03 | | > | | | 0.28 | > | | 0.01 | 0.21 | | | |
| | | | 95th | | | | | 1 | | > | | | 0 | > | | 0 | 0 | | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*V/C - Volume to Capacity Ratio*
*95th - 95th Percentile Queue Length*
*Storage - Existing Storage (m)*
*Avail. - Available Storage (m)*
*> - Shared Right-Turn Lane*
*< - Shared Left-Turn Lane*

### 5.3.3 Queue Assessment

The queue assessment for the off-peak analysis follows the same methodology used in **Section 4.3**.

**Appendix K** provides the SimTraffic results.

Reviewing these results indicates that during the off-peak hour, a queue length of 65 metres is expected for the southbound approach at the intersection of Brant Street and Caroline Street. As a result, the southbound queues are not expected to block the site driveway on Brant Street.

In addition, the westbound approach at the driveway connection to Brant Street is forecast to operate with queue lengths of 10 metres (less than 2 car lengths). The queues into the site are not expected to extend onto the parking garage ramp although the queues could still potentially block the Brant Street sidewalk while vehicles wait to exit the site. To help reduce the potential for vehicles to block pedestrians on the sidewalk a “Do Not Block Sidewalk” sign will be installed for the outbound movement at the site driveway.





# 6 Sensitivity Analysis

## 6.1 John Street Alternative Driveway

As identified in **Section 5.3**, a driveway on Brant Street is expected to create some potential operational concerns.

This section analyzes an alternative access with a site driveway onto John Street, which the City of Burlington has indicated is its preference.

It is noted that John Street north of Caroline Street is currently not a municipal road. Although this section outlines the analysis of a driveway connection onto this section of roadway, the roadway should be redesigned and established by the City of Burlington as a municipal road prior to a connection to John Street being considered.

At the present time, access to the site is restricted to Brant Street as it is the only municipal road from which access can be accommodated. However, should the City of Burlington prefer access from the John Street extension, it must be designed and established as a municipal road by the City of Burlington

### 6.1.1 Trip Generation

The trip generation outlined in **Section 3.2** has been distributed to the network based on the trip distribution in **Section 3.3**, with the exception of a change in the south distribution which is now distributed between Brant Street and John Street. **Table 6.1** details the estimated trip distribution for the redevelopment with the site driveway on John Street.

**TABLE 6.1: ESTIMATED TRIP DISTRIBUTION – JOHN STREET DRIVEWAY**

| Origin/Destination | Percentage |
|---|---|
| North via Brant St | 40% |
| South via Brant St | 10% |
| South via John St | 30% |
| East via Caroline St | 15% |
| West via Caroline St | 5% |
| **Total** | **100%** |

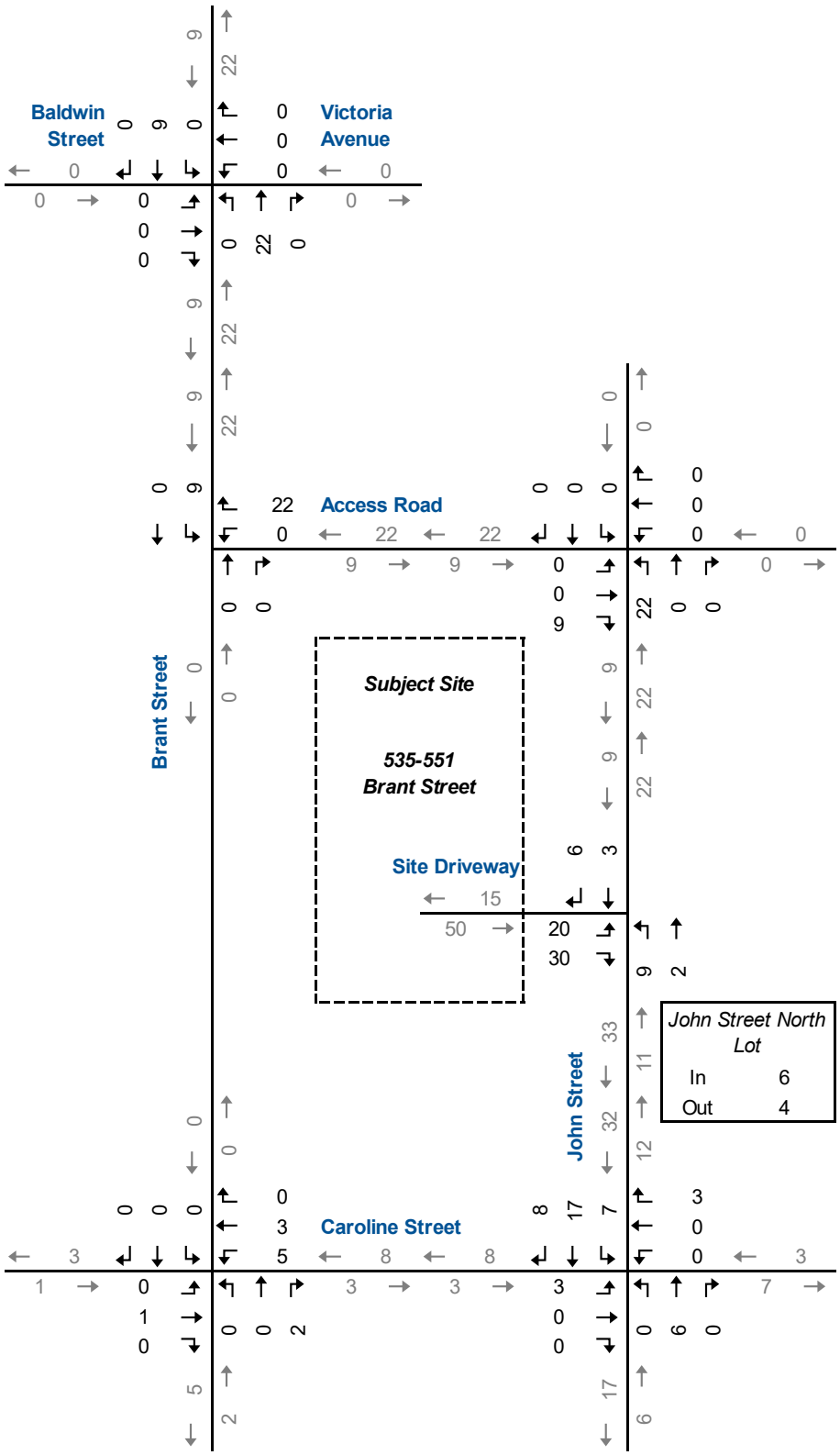
Accordingly, no on-site parking is proposed to be provided for visitor and the retail component. These trips are expected to utilize existing on-street and off-street parking facilities near the site. Therefore, the





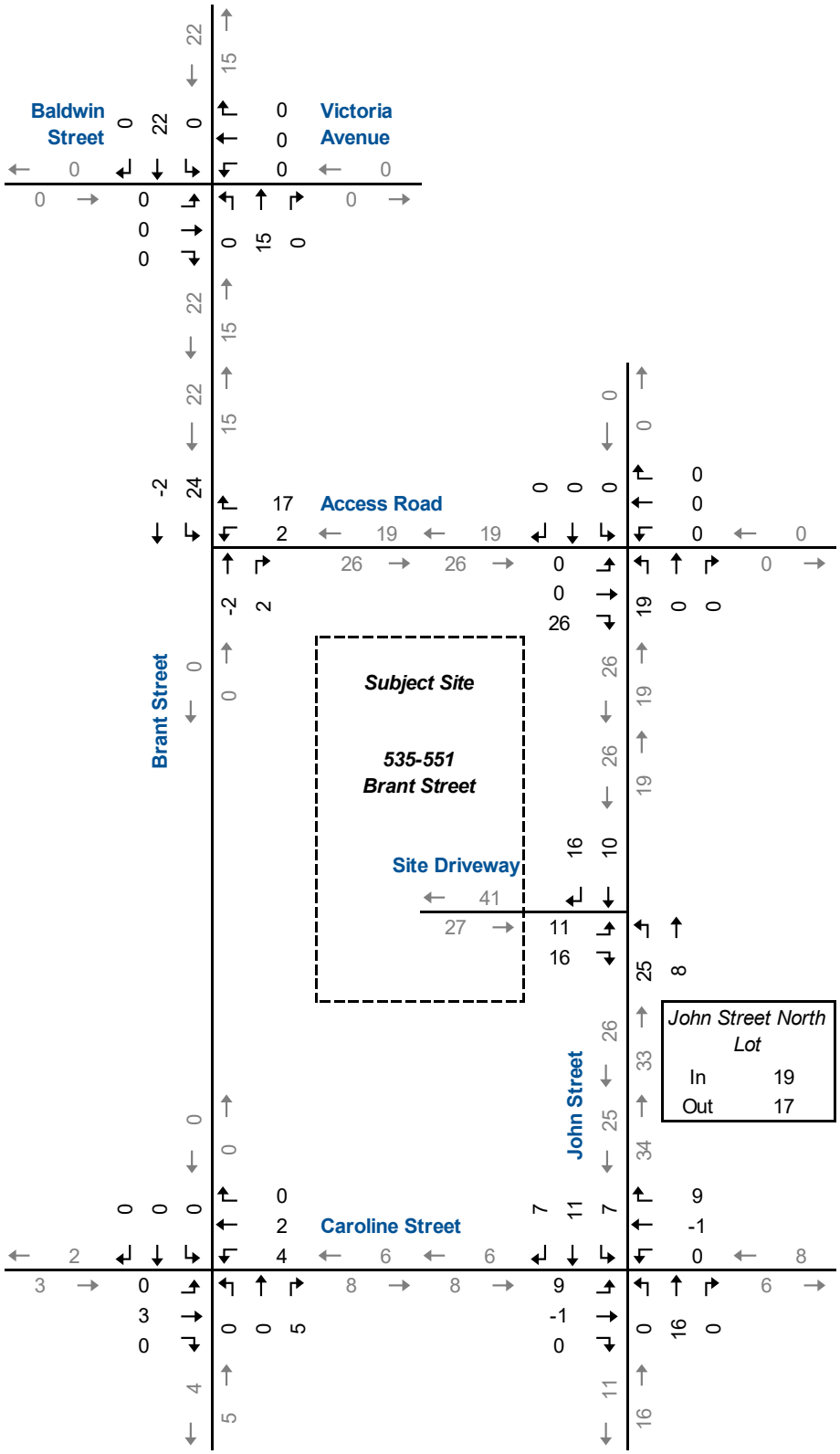
trip assignment has assumed the retail trips would originate from the John Street North Parking Lot immediately east of the subject site.

**Figure 6.1a** illustrates the site-generated traffic volumes for the AM peak hour. **Figure 6.1b** illustrates the net site-generated traffic volumes for the PM peak hour and **Figure 6.1c** illustrates the PM pass-by trips assigned to the network.



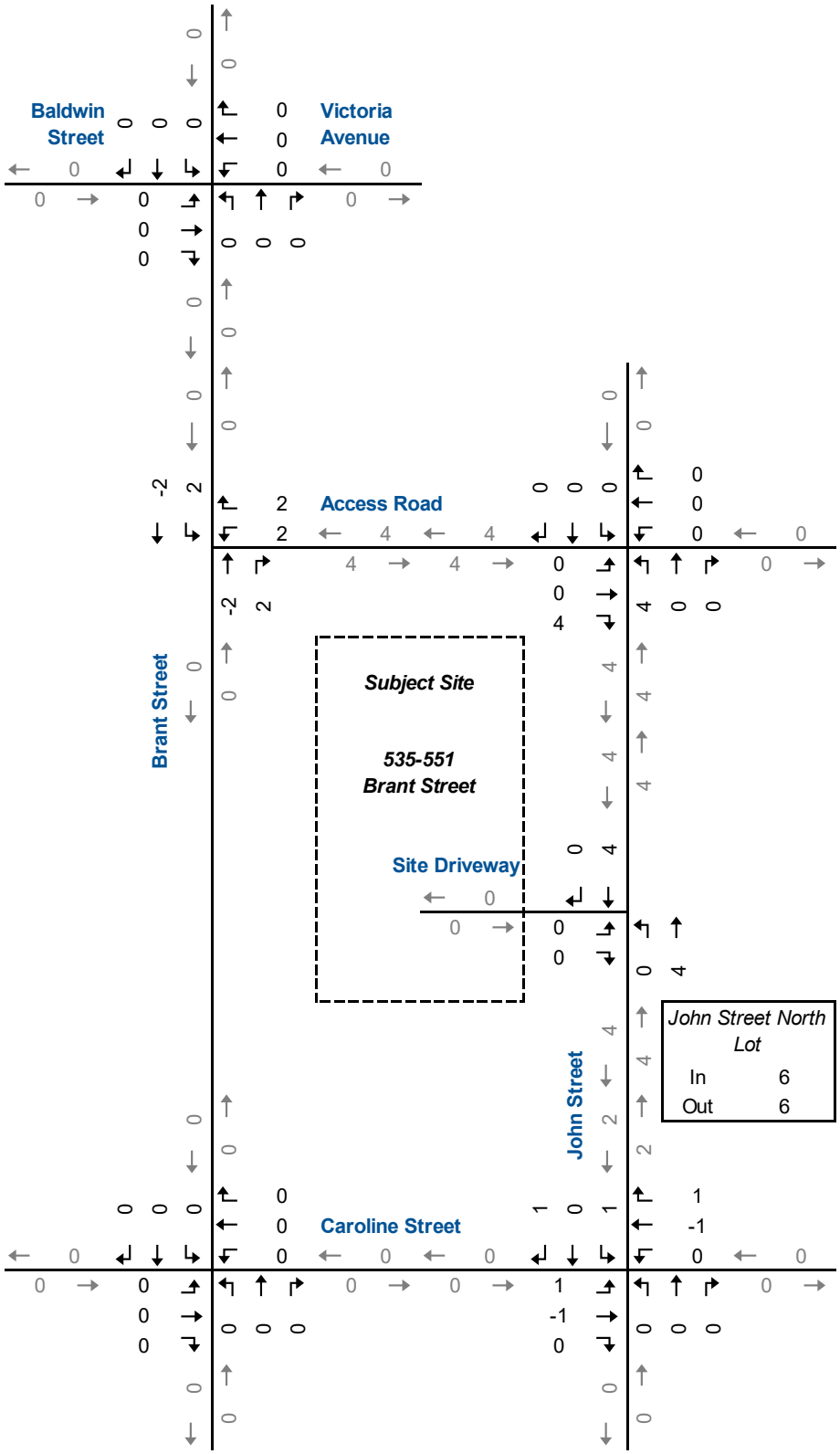

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# Net Site Generated Traffic Volumes – AM Peak Hour John Street Driveway




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# Net Site Generated Traffic Volumes – PM Peak Hour John Street Driveway




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# Pass-by Site Generated Traffic Volumes – PM Peak Hour John Street Driveway

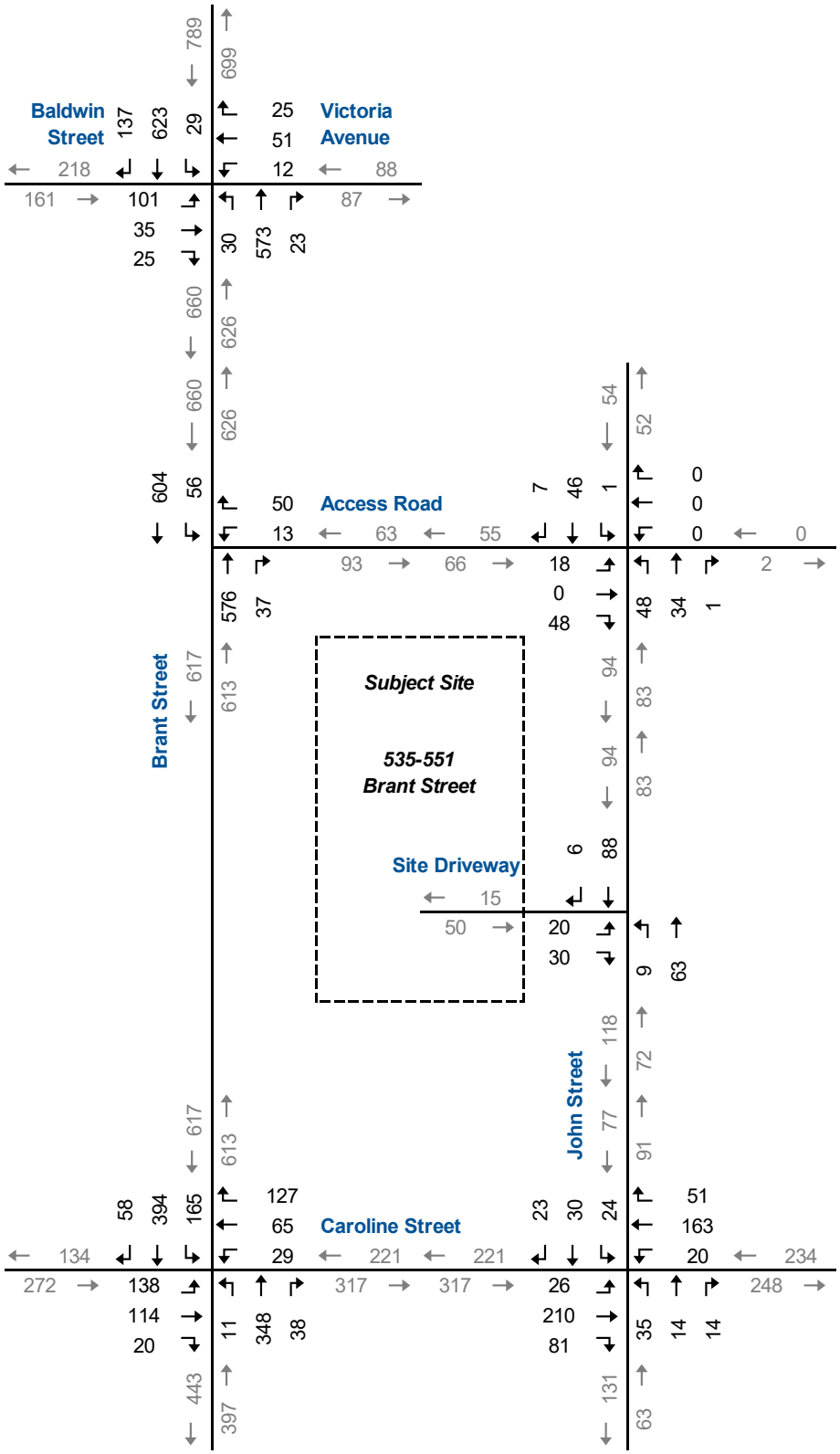
### 6.1.2 2025 Total Traffic Operations

**Figure 6.2a** and **Figure 6.2b** illustrates the 2025 total traffic forecasts for the AM and PM peak hours, respectively.

As in **Section 4.3**, level of service analyses has been conducted using Synchro 9 for the weekday AM and PM peak hour conditions. Signal timings have not been optimized.

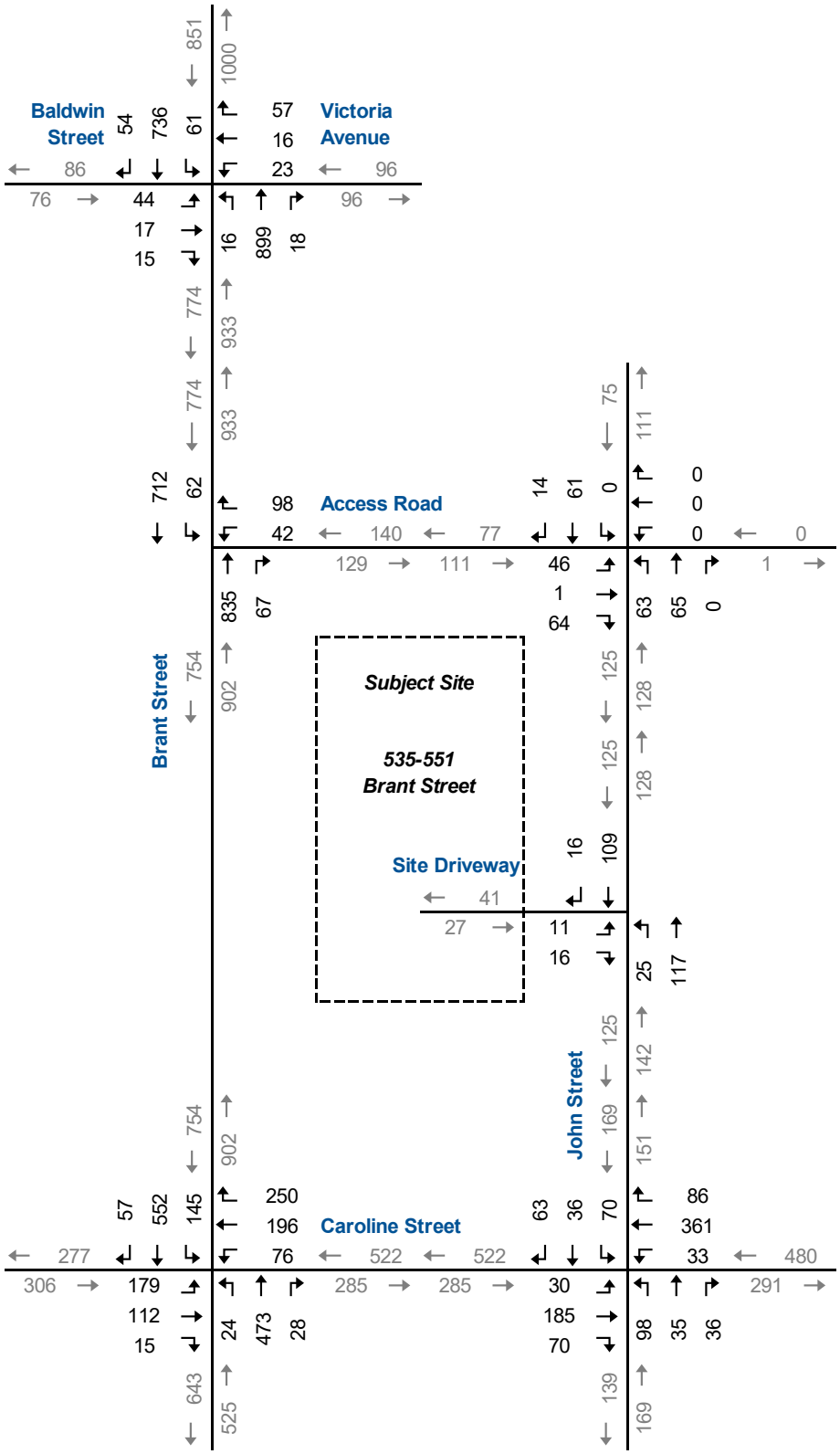
**Table 6.2** summarizes the results of the 2025 total traffic operations. The study area intersections are forecast to operate with similar levels of service to the 2025 total traffic operations with the site driveway on Brant Street.

**Appendix L** contains the detailed Synchro reports.




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# 2025 Total Traffic Volumes – AM Peak Hour John Street Driveway




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# 2025 Total Traffic Volumes – PM Peak Hour John Street Driveway

# TABLE 6.2: 2025 TOTAL TRAFFIC OPERATIONS – JOHN STREET DRIVEWAY

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | OVERALL |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | C | > | **C** | C | C | > | **C** | A | A | > | **A** | A | A | A | **A** | **B** |
| | | | Delay | 36 | 31 | > | **34** | 31 | 32 | > | **32** | 4 | 7 | > | **6** | 4 | 7 | 4 | **6** | **10** |
| | | | V/C | 0.54 | 0.14 | > | | 0.07 | 0.20 | > | | 0.08 | 0.50 | > | | 0.08 | 0.53 | 0.11 | | **0.53** |
| | | | 95th | 31 | 15 | > | | 6 | 18 | > | | 5 | 82 | > | | 5 | 89 | 6 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | -11 | - | > | | 19 | - | > | | 10 | - | > | | 40 | - | 44 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | B | | > | **B** | | A | > | **A** | A | A | | **A** | |
| | | | Delay | | | | | 15 | | > | **15** | | 0 | > | **0** | 10 | 0 | | **1** | |
| | | | V/C | | | | | 0.16 | | > | | | 0.39 | > | | 0.07 | 0.39 | | | |
| | | | 95th | | | | | 4 | | > | | | 0 | > | | 2 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | B | B | B | **B** | C | C | > | **C** | B | C | > | **C** | C | C | > | **C** | **C** |
| | | | Delay | 16 | 14 | 13 | **15** | 21 | 23 | > | **23** | 18 | 33 | > | **32** | 21 | 20 | > | **21** | **23** |
| | | | V/C | 0.36 | 0.16 | 0.02 | | 0.11 | 0.29 | > | | 0.05 | 0.75 | > | | 0.64 | 0.64 | > | | **0.56** |
| | | | 95th | 24 | 21 | 0 | | 10 | 27 | > | | 5 | 97 | > | | 28 | 85 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | 16 | - | 10 | | 10 | - | > | | 20 | - | > | | -8 | - | > | | |
| | 4 - Caroline Street & John Street | AWSC | LOS | < | B | > | **B** | < | A | A | **A** | A | A | > | **A** | < | A | A | **A** | |
| | | | Delay | < | 13 | > | **13** | < | 10 | 7 | **9** | 9 | 8 | > | **9** | < | 9 | 7 | **9** | |
| | | | DU | < | 0.50 | > | | < | 0.30 | 0.07 | | 0.07 | 0.05 | > | | < | 0.11 | 0.04 | | |
| | | | 95th | < | - | > | | < | - | - | | - | - | > | | < | - | - | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | |
| | | | Delay | < | 7 | > | **7** | < | 7 | > | **0** | < | 8 | > | **8** | < | 7 | > | **7** | |
| | | | DU | < | 0.08 | > | | < | 0.00 | > | | < | 0.11 | > | | < | 0.07 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |
| | 6- John Street & Site Driveway | TWSC | LOS | | | | | A | | > | **A** | | A | > | **A** | A | A | | **A** | |
| | | | Delay | | | | | 9 | | > | **9** | | 1 | > | **1** | 0 | 0 | | **0** | |
| | | | DU | | | | | 0.06 | | > | | | 0.01 | > | | 0.06 | 0.00 | | | |
| | | | 95th | | | | | 2 | | > | | | 0 | > | | 0 | 0 | | | |
| PM Peak Hour | 1 - Brant Street & Victoria Avenue/Baldwin Street | TCS | LOS | D | D | > | **D** | D | D | > | **D** | A | A | > | **A** | A | A | A | **A** | **A** |
| | | | Delay | 38 | 36 | > | **38** | 37 | 37 | > | **37** | 2 | 7 | > | **6** | 4 | 5 | 2 | **5** | **8.3** |
| | | | V/C | 0.34 | 0.10 | > | | 0.19 | 0.15 | > | | 0.04 | 0.68 | > | | 0.22 | 0.56 | 0.04 | | **0.64** |
| | | | 95th | 17 | 11 | > | | 11 | 14 | > | | 2 | 120 | > | | 7 | 77 | 3 | | |
| | | | Storage | 20 | - | > | | 25 | - | > | | 15 | - | > | | 45 | - | 50 | | |
| | | | Avail. | 3 | - | > | | 14 | - | > | | 13 | - | > | | 38 | - | 47 | | |
| | 2 - Brant Street & Access Road | TWSC | LOS | | | | | D | | > | **D** | | A | > | **A** | B | A | | **A** | |
| | | | Delay | | | | | 32 | | > | **32** | | 0 | > | **0** | 12 | 0 | | **1** | |
| | | | V/C | | | | | 0.55 | | > | | | 0.58 | > | | 0.12 | 0.46 | | | |
| | | | 95th | | | | | 23 | | > | | | 0 | > | | 3 | 0 | | | |
| | 3 - Brant Street & Caroline Street | TCS | LOS | C | B | B | **C** | C | E | > | **E** | C | D | > | **D** | C | C | > | **C** | **D** |
| | | | Delay | 29 | 14 | 13 | **23** | 24 | 61 | > | **55** | 22 | 49 | > | **47** | 27 | 26 | > | **26** | **38** |
| | | | V/C | 0.74 | 0.16 | 0.01 | | 0.26 | 0.96 | > | | 0.18 | 0.93 | > | | 0.70 | 0.80 | > | | **0.90** |
| | | | 95th | 40 | 21 | 0 | | 21 | 121 | > | | 9 | 138 | > | | 33 | 140 | > | | |
| | | | Storage | 40 | - | 10 | | 20 | - | > | | 25 | - | > | | 20 | - | > | | |
| | | | Avail. | 0 | - | 10 | | -1 | - | > | | 16 | - | > | | -13 | - | > | | |
| | 4 - Caroline Street & John Street | AWSC | LOS | < | C | > | **C** | < | C | A | **C** | B | A | > | **B** | < | B | A | **B** | |
| | | | Delay | < | 17 | > | **17** | < | 25 | 8 | **22** | 12 | 10 | > | **11** | < | 12 | 9 | **11** | |
| | | | DU | < | 0.55 | > | | < | 0.75 | 0.14 | | 0.23 | 0.15 | > | | < | 0.25 | 0.13 | | |
| | | | 95th | < | - | > | | < | - | - | | - | - | > | | < | - | - | | |
| | 5 - John Street & Access Road | AWSC | LOS | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | < | A | > | **A** | |
| | | | Delay | < | 8 | > | **8** | < | 8 | > | **0** | < | 8 | > | **8** | < | 8 | > | **8** | |
| | | | DU | < | 0.14 | > | | < | 0.00 | > | | < | 0.17 | > | | < | 0.09 | > | | |
| | | | 95th | < | - | > | | < | - | > | | < | - | > | | < | - | > | | |
| | 6- John Street & Site Driveway | TWSC | LOS | | | | | A | | > | **A** | | A | > | **A** | A | A | | **A** | |
| | | | Delay | | | | | 10 | | > | **10** | | 1 | > | **1** | 0 | 0 | | **0** | |
| | | | DU | | | | | 0.04 | | > | | | 0.02 | > | | 0.08 | 0.00 | | | |
| | | | 95th | | | | | 1 | | > | | | 0 | > | | 0 | 0 | | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*V/C - Volume to Capacity Ratio*
*95th - 95th Percentile Queue Length*
*Storage - Existing Storage (m)*
*DU - Degree Utilization*
*Avail. - Available Storage (m)*
*> - Shared Right-Turn Lane*
*< - Shared Left-Turn Lane*

### 6.1.3 Queue Assessment

Approximately 132 metres of queue storage from the site driveway to the southbound stop bar at John Street and Caroline Street is available and 16 metres from the site driveway to the northbound stop bar at John Street and Access Road under existing conditions. Given the stop control nature of the intersections, there is the potential for southbound and northbound vehicles queuing on John Street that may potentially block the site driveway. In addition, there is potential for the vehicles queueing into the site to extend into the parking garage ramp.

Queue length impacts from the downstream intersection of John Street and Caroline Street as well as John Street and Access Road have been reviewed.

**Appendix L** provides the SimTraffic results.

Reviewing these results indicates that the following queues lengths are noted:

- **John Street and Caroline Street**: Southbound shared through/left-turn movement is forecast to operate with a 95$^{th}$ percentile queue length of 14 metres during the AM peak hour and 22 metres during the PM peak hour;

  The traffic generated by the proposed development is noted to be 15% of the total traffic entering the southbound approach at John Street and Caroline Street during the PM peak hour.
- **John Street and Access Road:** Northbound shared movement is forecast to operate with a 95$^{th}$ percentile queues length of 14 metres during the AM peak hour and 20 metres during the PM peak hour; and
- **John Street and Site Driveway:** Eastbound shared movement is forecast to operate with a 95$^{th}$ percentile queue length of 15 metres during the AM peak hour and 16 metres during the PM peak hour.

As a result, the site driveway may encounter vehicle blockages of less than a car length during peak periods. This situation is not expected to significantly interfere with traffic operations at the site driveway on John Street. Further, a queue length of two vehicles during the AM and PM peak hours is expected into the site.

As with the Brant Street site driveway, it is expected that driver courtesy will allow space in the queue for vehicles to/from the site to proceed.





# 7 Parking Methodology

## 7.1 Zoning By-Law Requirements

### 7.1.1 Vehicle Parking

Zoning By-law 2020[11] is the current in-force Zoning By-law for the City of Burlington. The requirements stipulated in the Zoning By-law are outlined in **Appendix M**. Based on the City Zoning By-law, the subject site is within the Defined Parking Area which exempts all non-residential properties from providing on-site parking.

The minimum parking rates for the proposed redevelopment are as follows:

- Apartment Dwelling Units: 1.25 spaces per unit.

**Table 7.1** summarizes Zoning By-law 2020 minimum parking standard calculations for the redevelopment.

**TABLE 7.1: ZONING REQUIREMENTS**

| Use | Units | Parking Rate | Parking Spaces Required |
|---|---|---|---|
| Apartment Dwelling | 248 | 1.25 | 310 |
| **Total Parking Required** | | | **310** |

As indicated in **Table 6.1**, under the City's Zoning By-Law, the proposed redevelopment requires 310 parking spaces. The proposed parking supply of 253 spaces is 57 spaces less than the Zoning By-Law requirement.

### 7.1.2 Evolution of Parking Ratios

Parking standards are increasingly seen as an instrument of planning policy, and parking ratios are now looked at as having a main role in determining car use.

Parking ratios have existed in most cities since at least the 1950's and have often been amended incrementally by various means over time. Consequently, it is not surprising to find that municipalities are often unable to trace the justification or reasoning behind some of the older parking ratios found in their current Zoning By-laws.

Given that parking standards reflect an "average" condition, they will rarely prescribe the number of parking spaces to match the parking

[11] City of Burlington Zoning By-law 2020.

demands of any individual development project exactly. The empirical challenge is to develop some understanding of the range over which parking demand for a given use may vary, and the policy question is where in that range should the parking standard or ratio be set.

As noted, the parking ratios of the Zoning By-law provides separate rates for multi-residential developments located within the Defined Parking Area and for areas outside of the Downtown. However, this one-size-fits-all-areas approach to the Downtown does not consider the recent widespread adoption of urban "smart growth" practices, with emphasis on transit-supportive development.

A common trend in other jurisdictions is to lower minimum parking requirements in areas with the best transit service to promote further and attract residents to utilize this form of travel. Lower parking requirements for new developments will encourage active transportation by helping to create a better designed urban environment for pedestrians and cyclists.

The general strategy is that minimum parking requirements would be set lowest in areas adjacent to transit stations/Mobility Hubs then incrementally increased through lower density areas where transit service is least available.

Other municipalities in the GTA are recognizing the advantages of varying parking ratios by planning areas in support of broader Official Plan objectives. For example:

- Oakville's new Zoning By-law (2014-014) introduces parking requirements that vary by district based on the Official Plan's designation of five mixed-use "Growth Areas" where "a more stringent" approach to parking standards is applied. Oakville's new Zoning By-law comments that: "In the Growth Areas, the minimum number of parking spaces required are reduced to support the Town's strategic and policy objectives related to transit, growth management, and design."
- Toronto's new Zoning By-law (569-2013), apart from consolidating the provisions of the six former local municipalities, initiates a new set of parking ratios that vary across the planning policy districts identified in the Official Plan's urban structure map. On this basis, four "Parking Policy Areas" with successively lower levels of transit service are defined. The overall approach is to have minimum parking requirements vary inversely with the level of transit service.
- Vaughan initiated a city-wide review of parking standards in 2007 and recommended that minimum parking requirements





should vary by four "parking geographies" derived from the proposed Official Plan's urban structure map. Parking maximums are proposed for the Higher Order Transit Hubs, along with maximums on surface parking in the Local Centres and Primary Intensification Areas.

- Richmond Hill is also pursuing the introduction of a similar set of spatially varying minimum parking requirements relating to the Official Plan's urban structure. Four types of parking areas are defined: Richmond Hill Regional Centre; Downtown Local Centre and Key Development Areas; Rapid Transit Corridors, and Business Parks including the Rest of Richmond Hill[12].

The strategy of introducing spatially varying parking requirements is consistent with current trends occurring in other municipalities and should be considered by the City of Burlington. Factors such as availability to transit, employment, entertainment, arts and cultural events further dictate how residents within a community intend to travel.

## 7.2 Official Plan

The criteria provided in the Zoning By-law, particularly with minimum parking requirements should have some flexibility with granting a lower parking obligation to reflect the policies set out in Burlington's Official Plan (OP)[13] which states:

**Policy 3.2.2.D**

*"To encourage alternative travel by creating an urban environment that encourages walking, cycling and transit use and increases opportunities to live close to work and satisfy day-to-day needs locally without relying on the automobile."*

**Policy 3.2.2.E**

*"The City will encourage opportunities for developing travel demand management (TDM) measures to reduce single occupancy automobile use, especially during peak travel periods, such as carpooling programs, transit passes, preferential parking for carpool members, telecommuting, flex hours, intranet carpooling and fare incentives."*

**Policy 3.2.2.J**

[12] City of Markham – Task 9: Review & Assessment of Parking and Loading Standards Comprehensive Zoning By-law Project dated August 17, 2015.
[13] Burlington Official Plan, Last Update (July 2015).

*"Reduced parking ratios and standards and/or on-street parking ratios and/or standards may be permitted subject to evaluation by the City of the appropriateness of such standards, and implement through the approval of development applications or other City initiatives."*

**Policy 5.2.2.l**

*"The City may consider the use of reduced parking standards in Mixed Use Activity Areas in order to encourage greater reliance on non-automotive forms of transportation."*

**Policy 5.3.2.l**

*"The design and development of Mixed-Use Corridors shall encourage the use of public transit, pedestrian and bicycle travel as an alternative to the automobile."*

The manner in which intensification can be accommodated is contemplated in a number of Policies within the OP. There is a strong focus on the pedestrian environment and an emphasis on active transportation and transit.

As the redevelopment proposal places a focus on accommodating a suitable pedestrian environment, one that would encourage active transportation based on the de-emphasis on parking, the site's location relative to employment, retail, and recreational opportunities, along with a design emphasis on-street activity is consistent with the goals set out in the OP.

As the OP is a guiding document, it is important to look at the future requirements as opposed to the past requirements to maintain and implement the policies developed and to provide a paradigm shift in encouraging residents of the development as well as citizens to consider sustainable mode choices.

Currently in the Downtown, restaurants, drinking establishments and theaters do not require parking (though they may choose to provide it). Consideration to expanding the list of uses to include other land use types to provide flexibility and to encourage sustainable travel modes is encouraged. Since the Downtown is the best-served multi—modal location in Burlington, it makes sense to give new developments this level of flexibility.

The proposed redevelopment will create and support a better environment for walking, cycling and transit use by improving the pedestrian environment, and adding density to the Downtown. Moreover, residents of the proposed redevelopment will be a short

walking distance from the existing amenities of the Downtown, while at the same time creating new amenities at grade along the street fronts.

## 7.3 New Direction Policy

The new directions policy has been developed by the City of Burlington to set a fundamental change in the way mobility is approached. The proposed policy is to shift towards walking, cycling and transit as opposed to dependency on automobiles[14]. **Appendix N** outlines the proposed transformational policy shift and how these ideals are implemented in 535-551 Brant Street.

## 7.4 Mobility Hub

The Big Move is the regional transportation plan (RTP) published by Metrolinx for the Greater Toronto and Hamilton Area (GTHA). It makes specific recommendations for transit projects. Since its publication, it has been Metrolinx's mandate to implement the RTP, which includes new and improved GO Transit service, local rapid transit, stations, and fare payment systems.

The City's four designated Mobility Hubs include the Burlington GO Station, Downtown Burlington, Appleby GO Station, and Aldershot GO Station. All four areas designated as "Mobility Hubs" encompass an approximately 800 metre radii around the transit station. Downtown Burlington's Mobility Hub is planned to integrate rapid transit, regional transit, and local transit.

Mobility Hubs are more than just a transit station. They are places of connectivity where different modes of transportation — from walking to commuter rail — come together seamlessly and where there is an absolute concentration of places to live, work, shop and play. They serve as a place to wait for and connect with transit whether you are walking, cycling, taking transit or driving.

Burlington envisions a significant increase in density at each of the four designated Mobility Hubs and a shift to compact, higher density, more intense mixed-use developments is encouraged through the revitalization of these areas. The Mobility Hubs are to place emphasis on modes of transportation, including walking, cycling, and transit.

The Big Move has developed strategies that will contribute to the transformation of the GTHA transportation system. One of these strategies focuses on building communities that are pedestrian, cycling, and transit-friendly. How we design our communities is a major factor in determining how we choose to travel. People who live in a

[14] Transportation Plan – Policy Directions

higher density neighborhood with a variety of stores and services near their home are more likely to walk, cycle or take transit. Lower density area's that are far from shops and services, and lacks sidewalks and bike lanes are much more likely to drive[15].

The City's transportation system and land use development are intended to achieve the following minimum transit modal shares when "mature-state" of urban development is reached:

- 15 percent of all trips within Burlington by transit;
- 30 percent of all eastbound trips leaving the City by transit; and
- 10 percent of all westbound trips leaving the City by transit[16].

Based on this projected shift, the demand for automobile parking is also expected to decrease. To contribute to the shift from automobile trips to other modes, reduced parking requirements in and around Mobility Hubs will help contribute to meeting the City's transit modal share targets.

Transit-oriented development does much more than just shift automobile trips to transit. People who live or work in communities with high-quality public transit tend to own fewer automobiles and drive fewer annual miles than they otherwise would. Given the proximity of the subject property to local transit service within and a future Mobility Hub, the reduced parking rate is consistent with the policies set out in the OP. These policies support reduced parking standards in Mixed-Use Activity Areas to encourage the use of alternative forms of transportation including transit, walking and cycling.

**Figure 7.1** illustrates the location of the Downtown Mobility Hub in relation to the redevelopment.

It is noted that given City of Burlington Council's focus on the re-examination of the adopted Official Plan and Interim Control By-Law, passed on March 25, 2019, work on the Mobility Hubs, including development of the Downtown Mobility Hub Area Specific Plan (secondary plan), has been placed on hold[17].

[15] The Big Move, Metrolinx, November 2008
[16] Discussion Paper 1 – Current State of Transportation in Burlington, Prepared by City of Burlington, June 2014
[17] https://www.burlington.ca/en/services-for-you/downtown-mobility-hub-study.asp

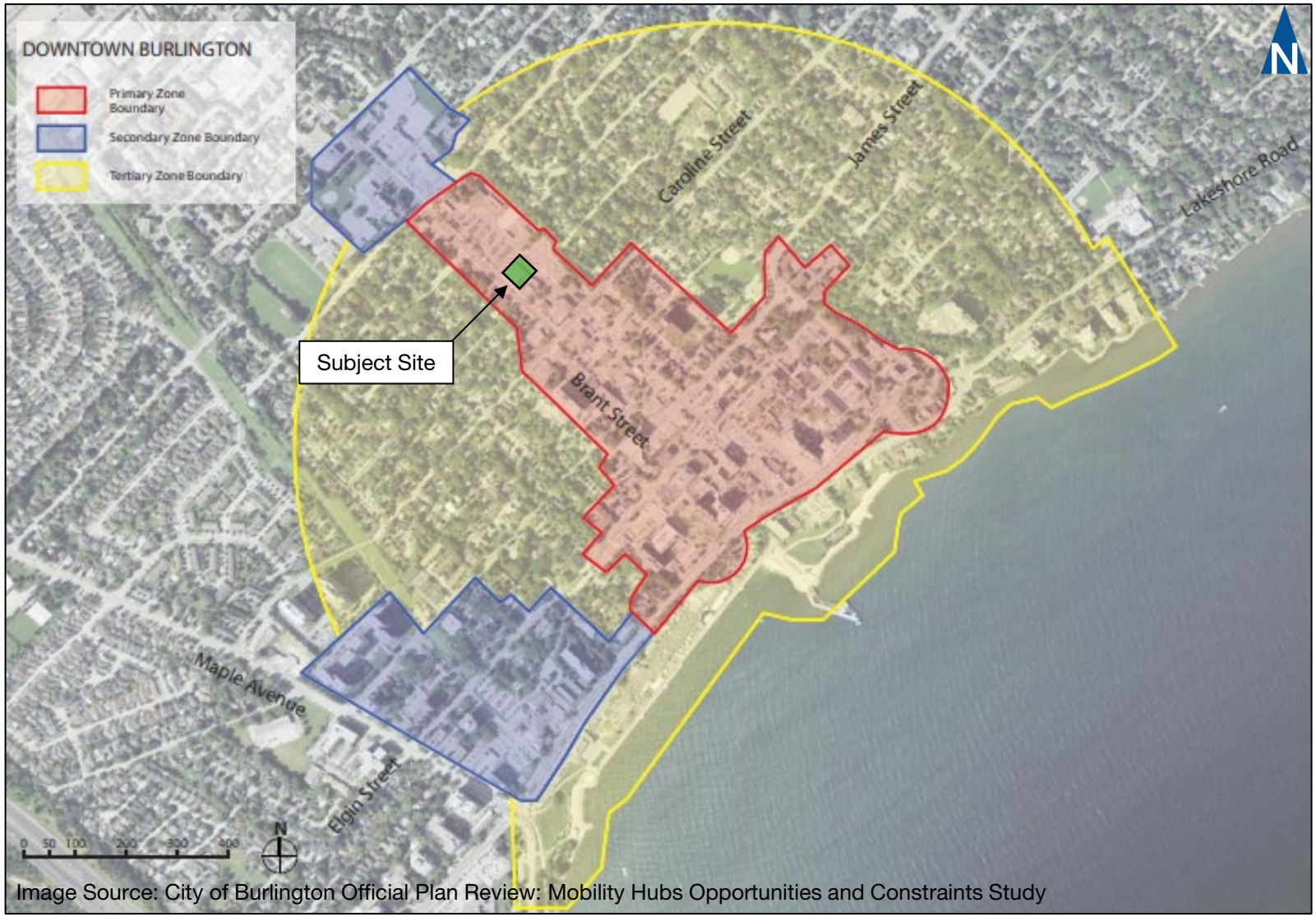



Image Source: City of Burlington Official Plan Review: Mobility Hubs Opportunities and Constraints Study

paradigm TRANSPORTATION SOLUTIONS LIMITED

# Downtown Mobility Hub Location

## 7.5 Travel Characteristics

A review of travel characteristics provided by the 2016 Transportation Tomorrow Survey (TTS) for residents living in the area surrounding the site confirms that a significant proportion of travel undertaken during the morning and afternoon peak periods is by non-auto means.

Information provided by the TTS program for the site area (GTA 2006 Zone 4059-4069) suggests that the proportion of people who choose to drive for travel purposes in the area is on average 73 percent of all travel undertaken. The balance of travel is undertaken as passengers in a car (13 percent), using transit (6 percent) or by bicycle/walking (8 percent).

Furthermore, a review of historical TTS information over the past ten years indicates that the makeup of travel modes has been consistent with automobile usage typically accounting for 70 percent of travel. Based on this trend it is reasonable to assume that only 70 percent of unit owners would require the use of an automobile for everyday errands whereas the remainder of the trips are fulfilled through transit and active modes.

## 7.6 Vehicle Ownership

A review of vehicle ownership provided by the 2016 Transportation Tomorrow Survey (TTS) for the site area (GTA 2006 Zones 4059-4069) suggests that approximately 18 percent of apartments surveyed do not own a vehicle. Further disposition of the survey results can conclude that the actual vehicle ownership, based on a weighted average is 1.01 vehicles per unit.

**Table 7.2** summarizes the vehicle ownership characteristics from 2016.

**TABLE 7.2: VEHICLES PER HOUSEHOLD (2016 TTS)**

| Number of Passenger Vehicles | Number of Households | Total Passenger Vehicles | Percentage |
|---|---|---|---|
| 0 | 1107 | 0 | 18% |
| 1 | 3943 | 3943 | 64% |
| 2 | 992 | 1984 | 16% |
| 3 | 46 | 138 | 1% |
| 4 | 35 | 140 | 1% |
| **Total** | **6123** | **6205** | **100%** |
| **Vehicle Ownership** | **1.01** | | |

With respect to parking, the vehicle ownership evaluation offers insight into parking requirements of apartments within the Downtown. In general, this review indicates that, despite preconceived notions, not all residents in apartment dwellings in Downtown Burlington own a vehicle. This provides further justification that opportunities exist to provide reduced parking requirements associated with the proposed redevelopment given the site's location and proximity to transit, and the access to local amenities within the Downtown can be met through active travel modes.

Applying the 2016 vehicle ownership data set, the potential parking supply for the proposed 248 units is estimated to be 250 spaces. This analysis provides support that the proposed parking supply of 253 spaces would meet and exceed the residential requirements.

## 7.7 Residential User Base

In typical condominium buildings in Downtown areas with greater parking supplies that are consistent with Zoning By-laws; there are three primary user groups from a parking perspective for residential uses:

- Indispensable Users
  - Residents who have a parking space, own a car and who need to use a car on a recurring day-to-day basis;
- Occasional Users
  - Residents who have a parking space, own a car but do not use it on a day-to-day basis to travel during peak periods. The use and need to own a car by this group is discretionary;
- Dispensable Users
  - Residents who do not have a parking space and do not have, nor use, a car.

The parking supply proposed will provide a parking resource that will logically be used by building residents who need a car for day-to-day use; indispensable users. Such residents would place a priority on purchasing a unit and expecting to utilize the on-site parking facilities. The proposed parking supply would accommodate parking of all units in the building (assuming one space is provided to any particular unit) which exceeds the base proportion of building unit occupants who need to drive on a recurring basis, approximately 70 to 73 percent during the peak periods.





Other unit purchasers who do not need to use a car on an ongoing basis would be satisfied by other methods available within the area such that they would not need to own a vehicle and furthermore not require a parking space.

To build upon the site's location and accessibility as well as enhancing the site's ability to promote alternative travel modes, it is highly encouraged that the redevelopment implement a TDM plan for the building with consideration to unbundle parking. This will provide, promote and direct prospective residents to pursue traveling without the use of a car, which ultimately will lead to reduced vehicle car ownership for the overall building.

## 7.8 Secondary Source

### 7.8.1 ITE

There are numerous industry associations and institutions that are dedicated to the survey and review of parking requirements related to various land uses. These associations, such as the Institute of Transportation Engineers (ITE), collect, review and disseminate information related to parking demand, supply, and appropriate design standards. This data is useful in establishing a typical range of requirements.

The ITE Parking Generation Manual (5th Edition) provides data on surveys across the USA and Canada of peak parking demand for different land uses.

The parking demand for the subject site has been estimated using Land Use Code (LUC) 222 (Multifamily Housing High Rise).

**Table 7.3** outlines parking generation estimated from ITE.

**TABLE 7.3: ITE PARKING DEMAND ESTIMATES**

| Land Use Code | Units | Average Parking Rate | Parking Requirement |
|---|---|---|---|
| 222 - Multifamily Housing (HIgh-Rise)[1] | 248 | 0.55 | 136 |
| **Total Parking Required** | | | **136** |

[1] Dense Multi-Use Urban (no nearby rail transit)

The estimated parking demand is noted to be 136 vehicles (0.55 spaces per unit) which is lower than the Zoning By-law. One important point to take from this comparison is that many municipalities are gravitating towards lower standards for residential use within a Downtown area. These trends reflect a recognition that sustainable

travel options are having an increasing impact on parking rates, as a change in demographics.

### 7.8.2 Other Jurisdictions

It is beneficial to look further at parking rates from other jurisdictions to those found in the City's Zoning By-law to help establish and provide further insight in determining potential reductions in parking that are more in line with urban conditions in a Downtown location.

**Table 7.4** outlines parking rates from other jurisdictions.

**TABLE 7.4: OTHER JURISDICTION PARKING RATES**

| Jurisdiction | Type | Parking Rate |
|---|---|---|
| City of Toronto[1] | Occupant | 0.30 - 1.6 spaces per unit |
| | Visitor | 0.10 - 0.20 spaces per unit |
| City of Hamilton[2] | Occupant | 0.30 - 0.7 space per unit |
| | Visitor | N/A |
| City of Vaughan[3] | Occupant | 0.70 - 1.0 spaces per unit |
| | Visitor | 0.15 spaces per unit |

[1] Toronto Zoning By-Law 569-2013

[2] City of Hamilton Zoning By-Law 05-200 - Rates are for Downtown Zones

[3] City of Vaughan Zoning By-Law 1-88 - Rates are for Downtown Zones

This comparison provides further evidence that many municipalities are gravitating towards lower parking standards for residential uses. For example, Hamilton and Toronto are using new draft standards which include rates as low as 0.30 spaces per unit for multi-residential developments. These trends reflect a recognition that sustainable travel options are having an impact on parking rates, as a change in demographics.

It is recognized that Burlington is not the same as Toronto, however it is illustrative to observe trends in similar areas such as Liberty Village (a vibrant urban area just west of the Downtown).

### 7.8.3 Burlington City-Wide Parking Standard Review

IBI Group conducted a City-Wide Parking Standards Review for the City of Burlington in July 2017[18] that reviewed the "Parking Requirements" contained within Zoning By-law 2020. This review provided detailed recommendations on how the requirements should be modified to better reflect the transportation and land use realities and objectives across Burlington.

[18] Final Report Burlington City-Wide Parking Standards Review Consolidated Report, IBI Group, July 2017





The identified rates consider a minimum of 1.0 parking space per unit for residents be provided in intensification areas such as the downtown. Applying the recommended rate to the redevelopment, 248 parking spaces would be required.

As the redevelopment is situated adjacent to high quality public transit, can accommodate active transportation through cycling and walking, is near retail and employment uses, the provision of these amenities as well as robust TDM plan provides grounds and justification that the proposed parking supply of 253 parking spaces (1.02 spaces per unit) will accommodate the parking requirements of the redevelopment.

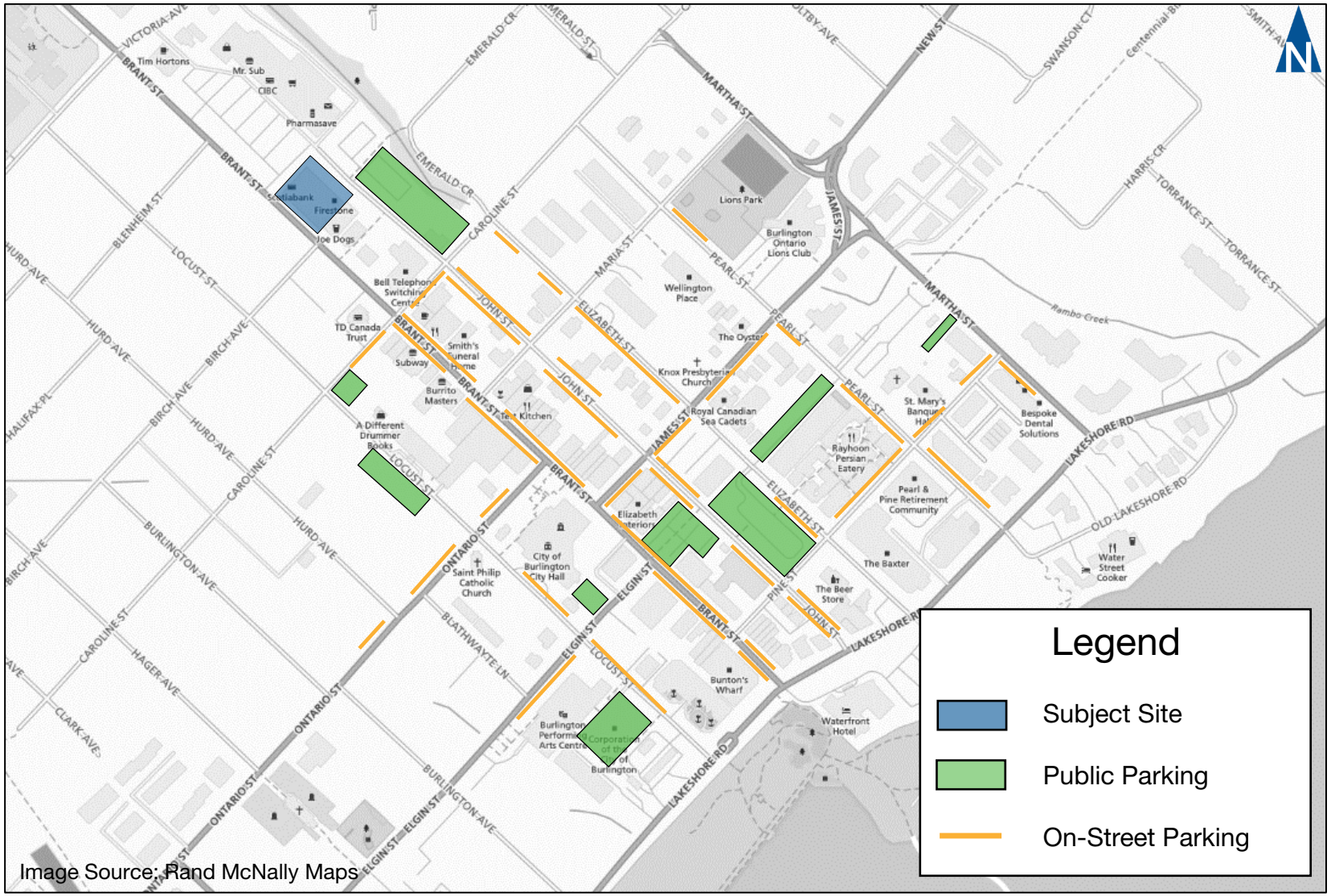
## 7.9 Off-Site Parking Supply

The current parking requirements for residential parking in the Zoning By-law does not require any of the spaces provided be designated for residential visitors.

As the area is well served from a transit perspective and permanent public parking facilities are in the area, no on-site visitor parking is proposed. As the primary purpose of off-site public parking facilities is to provide short-stay parking for visitors to the area, the use of these spaces by visitors of the redevelopment will not negatively impact the surrounding neighborhood.

There are at least 9 publicly accessible parking lots located within the downtown area providing a total of approximately 800 parking spaces. In addition, there are over 200 on-street parking spaces with the majority being metred spaces.

**Figure 7.2** illustrates these parking areas in relation to the proposed redevelopment.




# Local Area Public Parking Facilities

### 7.9.1 2011 Downtown Parking Supply

MMM Group conducted a parking study for the City of Burlington in September 2011[19] that assessed the Downtown parking supply and the parking demand. The study analyzed municipal parking lots/garages, privately owned public parking lots/garages, privately operated parking lots/garages, and on-street parking spaces to determine the total Downtown supply.

The result of this study found that there was a large surplus of capacity in the Downtown area as the peak parking utilization was only 60% during the weekday morning and afternoon and that parking demand during the evening was found to be around 44 percent. This study also noted that peak demand within the Brant Street and Elizabeth Street lots occurred during evening hours with a peak utilization around 93 percent and is noted to be inconsistent with other peak times within the Downtown.

It is understood that some of these off-site parking lots may be developed and replaced with infill developments. Given that there is a surplus of parking within the overall Downtown core and residential developments have off-peak parking demands, the development of a handful of these parking areas will not have a significant impact to the overall availability of parking for visitors of the proposed redevelopment.

Nevertheless, the MMM Group study has recommended that the City investigate the feasibility of providing additional parking garages with the preferred location at the intersection of Elizabeth Street and Pine Street to address the possibility of infill developments. Additional parking areas would provide ample parking within walking distance of the redevelopment and further provides justification and support for limited on-site parking facilities.

### 7.9.2 2015 Downtown Limited Survey

To further determine if the results presented in the 2011 Downtown parking study that was conducted by MMM Group are still relevant, a 2015 comprehensive parking study at a limited number of parking lots and on-street parking stalls was reviewed[20]. The utilization survey included surface parking lots, structure parking, metered on-street parking and non-metered on-street parking within the area bounded by

[19] City of Burlington Downton Parking Study, Prepared for City of Burlington by MMM Group dated September 2011.
[20] 141970 - 374 Martha Street (Downtown Burlington) Parking Study, Prepared by Paradigm dated January 2015.





Brant Street to the west, James Street to the north, Martha Street to the east and Lakeshore Road to the south.

**Appendix O** contains the survey data.

A review of the parking utilization study indicates the following:

**Weekday Morning (9:00 AM to 12:00 PM)**

- Occupancy range of 33 to 68 percent;
- Average occupancy of 57 percent;
- 85th percentile occupancy 80 percent;
- 85th percentile parking space availability is 32 percent.

**Weekday Afternoon (12:00 PM to 6:00 PM)**

- Occupancy range of 60 to 79 percent);
- Average occupancy of 67 percent;
- 85th percentile occupancy is 76 percent);
- 85th percentile parking space availability is 24 percent.

**Weekday Evening (6:00 PM to 10:00 PM)**

- Peak weekday occupancy occurs between 6:20 PM to 7:20 PM;
- Peak weekday occupancy range of 79 to 83 percent;
- Peak weekday average occupancy of 81 percent.
- Parking accumulation decreases after 7:00 PM;

During weekdays, parking activity at off-site lots and on-street spaces within the survey area typically peaked at 7:00 PM and then gradually decreases towards 9:00 PM. This is noted to be consistent with the findings in the 2011 Downtown parking study for this area. In 2011, the peak utilization at the Brant Street and Elizabeth lots is noted to be 10 percent higher than the observations made in the 2015 study. However, this variance could be a direct result that the study was completed in November as opposed to June.

As capacity in the lots may peak during evening hours within the immediate vicinity of the redevelopment, visitors of the site who may have difficulties in locating a parking space, during the individual peak periods, can access available parking in other facilities within less than 100 metres walking distance. This 2011 Downtown parking study further supports this observation:

*"peak parking demands related to individual off-street parking facilities were observed to occur at different times during the survey day and off-street parking is generally available within walking distance to any Downtown destination at any time of the day."*[21]

## 7.10 Comparable Sites

To better understand the actual parking demand that can be expected for a development of this type, a parking utilization survey was undertaken at two different sites with similar land uses to the proposed redevelopment.

The parking utilization surveys were carried out in 15-minute increments from the hours of 4 PM to 10 PM. The parking surveys are provided in **Appendix P**.

### 7.10.1 Strata (551 Maple Avenue, Burlington)

Strata is a twenty-one-storey condominium building. Built in 2012, Strata has 186 units with floor plans ranging from 1 bedroom up to 3 bedrooms with 223 plus 18 tandem spaces provided in an underground parking structure and 47 surface parking spaces for use by visitors. Amenities include indoor pool, hot tub, fitness room, party room, meditation garden and guest suites. This site is located 850 metres west from the proposed redevelopment.

The density of this redevelopment is noted to be similar with 535-551 Brant Street. Exception to this is, Strata does not provide for any commercial or office uses on the ground floor. Additionally, this development is noted to be located outside of the Downtown mixed-use area, thus requires the provision of visitor parking spaces.

The parking survey indicates that residential parking demand at Strata was calculated at 0.80 parking spaces per residential unit. Visitor parking was calculated at 0.10 parking spaces per residential unit.

### 7.10.2 360 on Pearl (360 Pearl Street, Burlington)

360 on Pearl is a seventeen-storey mixed use building. Built in 2009, 360 on Pearl has 75 units with floor plans ranging from 1 bedroom up to 2 bedrooms plus den and 5,660 square feet of commercial uses on the ground floor. An underground parking garage contains 114 parking and 12 surface parking spaces are provided for use by employees of the bank. Amenities include fitness room, party room, billiards, rooftop

[21] City of Burlington Downtown Parking Study, Prepared by MMM Group dated September 2011.

terrace and theater. This site is located 680 metres southeast from the proposed redevelopment.

The development is noted to be a mixed use building similar to 535-551 Brant Street. Additionally, this development is noted to be located within the Downtown, thus does not require the provision of visitor parking spaces.

The parking survey indicates that residential parking demand at 360 on Pearl was calculated at 0.76 parking spaces per residential unit. Visitor parking was calculated at 0.10 parking spaces per residential unit. However, it should be noted that the visitor spaces are assigned to the commercial land use and have noted to peak between the 4:30 PM and 5:30 PM. After peaking, demand steadily declines into the evening.

### 7.10.3 Analysis

A peak resident parking demand of 0.80 spaces per unit and a peak visitor demand of 0.10 spaces per unit were observed throughout the survey period. The peak resident and residential visitor parking demands are substantially lower than the City of Burlington's Zoning By-law requirements of 1.25 spaces per residential unit.

Based on the parking utilization surveys, an appropriate design value for the parking requirements is noted to be 0.80 parking spaces per unit. As mentioned earlier, the development is exempt from providing visitor parking spaces, thus visitor parking requirements have not been included.

As Strata is noted to have similar densities and potentially similar unit sizes, the rate outlined above is noted to be an accurate representation of demand expected for the proposed redevelopment.

Applying the design value of 0.80 parking spaces per unit, the potential daily peak parking demand for the subject site would be in the order of 198 spaces.

## 7.11 Summary of Parking Demand

The proposed site provides for a total of 253 parking spaces that equates to a parking ratio of 1.02 parking spaces per unit. The existing parking requirement for the redevelopment under the City of Burlington's Zoning By-Law 2020 is 310 parking spaces. This, however, would require an additional 57 parking spaces to be added.

Paradigm's approach to the overall parking supply for 535-551 Brant Street is to adopt parking ratios that recognize empirical evidence that





parking demand has many factors and varies according to household size, income, auto ownership, and locational factors such as proximity to other uses and availability of multiple transportation mobility options. Based on the above discussion and analysis, the following is concluded:

- The redevelopment will be constructed to provide housing options within a complete community that would be sustainable given the multiple number of transportation options available. This is of particular importance as the lands are located within the primary zone boundary of the Downtown Mobility Hub which will provide efficient transit service locally and regionally.
- Burlington's OP Policies 3.2.2.D and 3.2.2.J emphasize that all forms of transportation are to be encouraged and that reduced parking standards shall be contemplated to encourage a broader range of land uses and densities to support transit. The proposed redevelopment is considered to balance these parking and transportation policy objectives, through a combination of a parking structure, bicycle parking and overall density of the development that support and promote the use of the existing and extensive transit system within the City of Burlington.
- The redevelopment will be transit supportive and promote active transportation achieving this intent primarily by taking advantage of its geographical location. It will also introduce a significant portion of the residential population of the redevelopment to maximize the benefits of the site's walkable access to a comprehensive and integrated transit system.
- The design value estimated (surveyed sites) is the best predictor of the parking demand as this data is representative of demand at local sources. The parking surveys were conducted on four separate occasions at two separate sites with land uses similar to the proposed redevelopment.

  The surveys demonstrate that parking demand at higher density development in Downtown Burlington is well below the requirements stipulated in the City of Burlington Zoning By-law, and is more likely less than what the development has proposed.
- Collected data at the survey sites are further supported by the vehicle ownership rates and mode split characteristics of apartment units within the immediate area. The 2016 TTS data stipulates that residential automobile use is noted to be just over 1 vehicle per unit. The proposed parking supply of 253 spaces is sufficient and will accommodate the peak parking demands of the subject site.





To estimate the potential parking demand of the proposed redevelopment, four (4) varied methods have been utilized and are discussed in detail above. The proposed redevelopment is estimated to have weekday parking demands in the order of 136 to 250 spaces depending upon the methodology used. All of these methods support the proposed supply of 253 parking spaces.

# 8 Transportation Demand Management

Transportation Demand Management (TDM) refers to ways of making the capacity of our roads more efficient by reducing vehicle demand. TDM approaches consider how people's choices of travel mode are affected by land use patterns, development design, parking availability, parking cost, and the relative cost, convenience and availability of alternative modes of travel. Various TDM strategies are used to influence those factors so that the alternatives are more competitive with driving alone and potentially reduce reliance on motor vehicles.

TDM strategies at a development can be divided into two basic categories.

- **Pre-occupancy:** things that need to be done while a development is being designed and built, and
- **Post-occupancy:** things that can be done once people are using the development.

The pre-occupancy actions are critical because they are most likely to determine how attractive, convenient, and safe alternative travel will be once the site is occupied. Before a site is occupied, or during a remodel/ renovation, it can be designed to be convenient and safe for pedestrians and cyclists, and vehicle parking can be provided to meet but not exceed demand.

After the development is built, incentives can be offered, but those incentives will not work as well if the site and its surroundings are oriented to motor vehicles. The incentives generally include subsidies to use transit or rideshare and information about where and how to use alternatives.

## 8.1 Pre-Occupancy Measures

### 8.1.1 Walkable Environment

The pedestrian accessibility of a development is essential in helping to ensure that those that can walk, have access to convenient pedestrian connections.

Due to the site's proximity to commercial/office neighborhoods within an established urban area, walking is encouraged by the provision of a pedestrian-friendly site layout that provides internal connections to the existing pedestrian network. Sidewalks are currently provided on both sides of Brant Street, Caroline Street and Victoria Avenue/Baldwin Street and on the east side of John Street. The existing pedestrian

network provides access to a number of transit stops and the various municipal car parking areas located within the immediate study area.

An established sidewalk network through the neighbourhood currently exists which provides good connectivity to surrounding communities and is within walking distance (within 1 kilometre of the subject site) of several services, shops and employment opportunities that could substantially minimize the demand for private car ownership. Crosswalks, pedestrian pushbuttons, and indicators are provided for all approaches at the signalized intersections within the study area.

By taking advantage of the public sidewalk to attract and serve pedestrians with multiple connections and offsetting parking underground, the redevelopment offers walkability as one of the key design features.

### 8.1.2 Cycling

The City's Zoning By-Law stipulates that the development is required to provide bicycle parking for the retail and office component only. The minimum bicycle parking rates are as follows:

- Two spaces plus one space per 1,000 m2 GFA

Based on this requirement, the development is required to provide a total of four (4) bicycle parking spaces. A total of four (4) bicycle parking spaces are proposed for the retail component. In addition, 28 bicycle storage lockers will be provided as well as four short term bicycle parking spaces for residents.

Designated bike lanes are provided on Brant Street north of Caroline Street and sharrows south of Caroline Street and on Caroline Street.

### 8.1.3 Transit

The redevelopment will facilitate on-site pedestrian access to the greater sidewalk network, which in turn, will provide access to the transit stops. The redevelopment is located near two well-established bus lines, Routes 2 and 52. These two routes provide access within the City of Burlington, the Burlington GO station and to the downtown terminal which provides access to an additional seven bus routes. The downtown terminal on John Street is approximately a 7-minute walk (500 metres).

## 8.2 Alternative Strategies

### 8.2.1 TDM Coordinator

The condominium board is recommended to oversee site-related transportation demand management and serve as the sites TDM Coordinator. The person (or persons) in this role will coordinate with other parties within the site area to help alleviate the reliance on single-occupant motor vehicle travel to the site.

The duties of the TDM Coordinator would include, but not be limited to:

- Distributing information on alternate modes of transportation;
- Developing related marketing materials;
- Developing and implementing appropriate TDM measures; and
- Administering access to the secured bicycle parking.

### 8.2.2 Car Sharing Program

Car sharing programs are services that provide members with access to a fleet of vehicles, usually on an hourly basis. It is an increasingly effective way of encouraging people to reconsider purchasing a car, or in some cases acquiring a second car. Success of car sharing programs relies upon having cars in conveniently located areas with parking spaces allocated directly to the service.

Providing carshare spaces on site has the benefit of further supporting the alternative modes of transportation available to the site. If tenants can accomplish most their travel via transit, walking, or cycling a carshare vehicle can support the remaining longer haul trips without the burden of owning a vehicle. The availability of a shared vehicle allows residents who normally would not need a vehicle for their daily activities to be comfortable with the decision to not own a vehicle.

The car-share vehicle would be funded through the condominium corporation with an emphasis for the vehicle to be parked in a municipal lot. The rationale behind this is that if the vehicle were to be parked in the underground parking garage, users of the car share vehicle would largely be limited to the development rather than the overall community.  The ideal criteria for the space should be in highly visible and accessible locations to encourage the use of the program.

### 8.2.3 Ride Share

Ride-share involves two or more people sharing a vehicle for a trip. The cost of the journey (fuel, tolls, parking, etc.) can be split between





the driver and passengers, resulting in a saving for all concerned. This also reduces the number of vehicle trips and parking demands.

There are several tools available such as Car Pool World, which allow the setting up of an online ride sharing database. This enables people to enter their journeys so that the database can automatically search out residents or employees whose journeys match.

### 8.2.4 Individualized Travel Planning

Research has indicated that going directly to residents and workplaces increases the likelihood that a shift to more sustainable modes of transportation will occur. The OECD and the Global Environmental Change Program of the UK Economic and Social Research council hosted a workshop that recognized the importance of understanding the forces that motivate and shape individuals' travel behaviour. It identified several key messages of benefit to TDM policy development:

- **Hierarchy of Choice:** An employer can make decisions that influence how all his/her employees travel to work. Similarly, an individual's decision to buy his/her house may affect how all the members of the household travel. A greater understanding of this hierarchy can assist in identifying those high-order organizations and individual choices. TDM strategies and policies should target those key decision makers.
- **The Perception of Individuals:** Individuals' perceptions of time, environment, and alternative modes of travel and travel behaviour, determine whether they feel they have a choice in how they travel. For example, people who have rarely taken public transport or cycled may not perceive these modes as suited to their lifestyle because of perceived disadvantages which they associate with these modes. In many cases, individuals over-estimate the benefits of their current choice and under-estimate the capacity of alternative modes to satisfy their needs. Altering these perceptions can open the range of options available to travelers.
- **Culture:** Culture plays an important role in determining the status, image and acceptability of different types of travel behaviour. For example, the car has social and cultural attributes that go well beyond its role as a mode of transportation. TDM strategies must recognize and take into consideration these cultural factors.
- **Education (Information and Learning):** Individuals need targeted, relevant, effective and positive information to better understand the consequences of different travel choices on their own, and their community's quality of life. This information





would be most effective if available before individuals engage prior to car and home purchases.

Individual travel planning has demonstrated that working directly with residents as well as providing appropriate infrastructure increases the use of sustainable modes and reduces the dependency on vehicles. It is therefore an important component to the encouragement of the use of sustainable modes of transportation at 535-551 Brant Street.

Personalized travel information for residents and visitors to the site would be provided by the TDM coordinator (on-site property manager).

### 8.2.5 Education

Providing a welcome package that outlines the available transit routes, active transportation, rideshare and carsharing options can be helpful to encourage new residents to educate themselves on the support for alternative modes near the subject site. In addition, posting this information in common areas within the building can further support this education.

## 8.3 TDM Summary

Based on the details outlined above, the following actions will help support the use of alternative modes of transportation and reduce the parking demand on site:

- Delegating a TDM coordinator, either an interested individual or property manager, to support all on-site TDM programs;
- A car share space located in a nearby municipal lot to support those who choose not to own a car;
- Personalized travel information be provided for residents and visitors to the site; and
- Transit, rideshare, car share, and active transportation information be provided in a welcome package to new tenants and posting in a central location to further support all alternative modes.

# 9 Site Design & Layout

## 9.1 Vehicle Circulation

The site circulation has been assessed using the following design vehicles:

- Transportation Association of Canada[22] (TAC) Heavy Single Unit (HSU)
- TAC Medium Single Unit (MSU); and
- TAC Passenger Car (P).

**Appendix Q** contains the reduced scale vehicle turning movement diagrams for the site driveway, loading area and parking garage ramps. The diagrams were produced using the site plan and AutoTURN swept path analysis software.

The HSU and MSU design vehicles will enter the site via Brant Street and will turn around on-site to exit the site. The HSU will require the entire driveway width to enter and exit and the MSU will require the entire driveway width to enter the site.

The frequency of delivery vehicles and waste collection vehicles is expected to be low with loading and waste collection times managed by the site operator. The level of conflict between the design vehicles and traffic using Brant Street is expected to be low.

The proposed geometry for the site driveway, loading area and parking garage ramp is sufficient to accommodate the intended design vehicles.

## 9.2 Parking Garage Design

The four-level underground parking garage is accessed via the driveway on Brant Street. The site driveway provides access to the underground parking garage and loading area.

The circulatory ramp for each parking level slopes at a grade of between 2.54 and 2.83%. The ramp between ground level and the first underground parking level slopes at a grade of 3.89%. Convex mirrors are to be provided at all internal corners and at the entry/exit points. A speed limit sign will be posted indicating a maximum speed of 10 km/h within the parking garage.

[22] Transportation Association of Canada. Geometric Design Guide for Canadian Roads (2017).

Within an underground garage, all drivers must exercise an appropriate level of care while circulating the parking structure. As no visitor parking is provided, it is expected that occupants of the building will become familiar with the structure and how to circulate safely.

## 9.3 Brant Street Right-of-Way

According to the analysis contained herein, there are no current or projected capacity deficiencies along Brant Street adjacent to the proposed development. Additionally, no increases in storage requirement for auxiliary turn lanes along the Brant Street corridor between Caroline Street and Victoria Avenue is required. Therefore, there is no need for widening of the right-of-way along Brant Street from a capacity perspective based on the 2025 traffic forecasts.





# 10 Conclusions and Recommendations

## 10.1 Conclusions

**Transportation Impact Study**

This study evaluates existing conditions, the impacts of background traffic growth and projected the impacts of the redevelopment.

Full-build out of the redevelopment is projected to generate approximately 75 new vehicle trips during the weekday AM peak hour and 92 new vehicle trips during the weekday PM peak hour.

The traffic analysis conducted as part of this assessment indicates that redevelopment traffic volumes will only result in minor increases to the traffic at the surrounding study area intersections under peak conditions. This analysis indicates that the existing transportation infrastructure and planned improvements to the John Street at Caroline Street intersection is adequate for accommodating additional traffic associated with the proposed redevelopment.

A southbound left-turn lane with 25-metres of storage on Brant Street at the site driveway is warranted under 2025 total traffic volumes. This can be accommodated within the existing two-way centre left-turn lane on Brant Street.

An analysis of off-peak traffic conditions indicates that the site driveway connection to Brant Street will operate with acceptable levels of service and queues are not expected to cause internal conflicts.

The sensitivity analysis for a site driveway on John Street, as a possible replacement of the Brant Street driveway, indicates that the study area intersections under total traffic conditions are forecast to operate with similar levels of service to the operations with a site driveway on Brant Street. There are less potential motor vehicle and pedestrian conflicts anticipated with a driveway on John Street compared to the site driveway on Brant Street. However, John Street north of Caroline Street is currently not a municipal road. It is our understanding that the city is considering extending John Street to Victoria Avenue and would be completing a redesign of John Street and conversion to a municipal road in the future as part of the possible extension to Victoria Avenue. Until then, a driveway connection onto John Street north of Caroline may not be feasible.





### Parking Justification

The results of the methodologies used in the parking analysis provide a general understanding of parking behavior for mixed-use developments in Downtown Burlington. The parking analysis indicates that the proposed supply of 1.02 parking space per unit (253 parking spaces) will exceed the parking demand for the following reasons:

- The redevelopment conforms to the Burlington Official Plan and the Mixed-Use Activity Areas that encourage greater reliance on non-automotive forms of transportation;
- The redevelopment is located within 500 metres from the Downtown Burlington Mobility Hub;
- Based on 2016 Transportation Tomorrow Survey (TTS) data, approximately 73 percent of residents within apartment buildings in the surrounding area use auto as their primary mode of travel. The proposed parking supply would accommodate parking for all of the units in the building (assuming one space is provided to any specific unit) which exceeds the anticipated proportion of residents who would choose to drive;
- A review of other municipalities, ITE rates, auto ownership and the City of Burlington's City-Wide Parking Standards Review shows a trend towards lower parking standards within major urban and intensification areas. The proposed redevelopment generally satisfies many of these criteria and the proposed parking rate of 1.02 is noted to be acceptable;
- Parking utilization surveys were undertaken at two different sites with similar land uses to the proposed redevelopment, indicating a rate of between 0.76 and 0.80 spaces per unit;
- Visitor parking can be accommodated through publicly accessible parking lots located within the downtown area and on-street parking spaces located within 800 metres of the subject site; and
- Based on the parking study conducted by MMM in September 2011 and Paradigm in 2015, capacity within the Brant Street and Elizabeth Street lots peaked during the evening hours whereas the remaining lots within the Downtown noted to experience limited use in the evening. Visitors of the site who may have difficulties locating a parking space adjacent to the redevelopment can access available parking in other facilities within less than a 100-metre walking distance.





### Transportation Demand Management

To further promote the site as a sustainable development a variety of transportation demand management measures (TDM) to reduce parking demand is recommended to be incorporated. The TDM plan will focus on making the site a model of sustainable transportation by promoting alternative modes of transportation over the use of private automobiles. The following TDM measures are proposed

- The redevelopment will provide 28 long term and four short term bicycle parking spaces for residents as well as four bicycle parking spaces for the retail land uses; and
- On-site sidewalks are provided and connect to the existing pedestrian network.

The following additional TMD measures should be incorporated into the development plan:

- Delegating a TDM coordinator, either an interested individual or property manager, to support all on-site TDM programs;
- A car share space in a premium location on site to support those who choose not to own a car;
- Personalized travel information be provided for residents and visitors to the site; and
- Transit, rideshare, car share, and active transportation information be provided in a welcome package to new tenants and posting in a central location to further support all alternative modes.

### Site Design and Layout

The proposed geometry for the site driveway, loading area and parking garage ramp is sufficient to accommodate the intended design vehicles.

## 10.2 Recommendations

Based on the findings of this study, it is recommended that:

- The City of Burlington recognize the conclusions drawn above;
- Consideration be given to having the site driveway onto John Street in the future (subject to detailed design completed by the City and conversion to a public road);
- A “Do Not Block Sidewalk” sign be installed for the outbound movement at the site driveway.





- Signal timings at the intersection of Brant Street and Caroline Street be optimized, if necessary, after build-out to better support future traffic volumes and travel patterns;
- The City of Burlington support the proposed Zoning By-law parking rate to allow the provision of 253 parking spaces for the redevelopment (1.02 parking spaces per unit); and
- The developer implements a TDM plan with the additional TDM measures listed above.





# Appendix A

## Pre-Study Consultation

## Maddison Murch

**From:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Sent:** April 8, 2020 10:58 AM
**To:** Chris Day; Patrau, Florin; Maddison Murch
**Subject:** Re: 190080: 535-551 Brant S, Burlington Scope of Work

Hi Chris,
I am ok with this approach.
Thanks,
Dan

---

**From:** Chris Day <cday@ptsl.com>
**Sent:** Monday, April 6, 2020 4:20 PM
**To:** Patrau, Florin <Florin.Patrau@burlington.ca>; Maddison Murch <mmurch@ptsl.com>; Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

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Thanks Florin.

Dan we are planning to utilize our traffic counts and the City counts to move this forward and will be balancing the through volumes on Brant Street and Caroline Street for our traffic counts to coincide with the City counts in order to provide a conservative approach (our lower Feb counts will be balanced to the higher May City counts).

Can you please confirm that the City is ok with this approach as soon as possible so we can move forward with the study?

Thanks and stay safe!

Regards,

**Chris Day, C.E.T.**
*Senior Project Manager*

**Paradigm Transportation Solutions Limited**
p: 905.381.2229 x304
m: 905.746.1796

***In these very uncertain times, we want to take this opportunity to assure you that our unique "work at home" business model enables us to offer uninterrupted support to our clients, ensuring we can continue to offer the high-quality service and work product we always have. We are fully operational and our staff are diligently working on our assignments with you.***

***As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.***

***Let's stay safe and look out for each other. We will get through this together.***

**From:** Patrau, Florin <Florin.Patrau@burlington.ca>
**Sent:** April 1, 2020 9:14 AM
**To:** Maddison Murch <mmurch@ptsl.com>; Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** Re: 190080: 535-551 Brant S, Burlington Scope of Work

Hi guys,
May factor is 0.943

Take care,
Florin

---

**From:** Maddison Murch <mmurch@ptsl.com>
**Sent:** Tuesday, March 31, 2020 4:48 PM
**To:** Patrau, Florin <Florin.Patrau@burlington.ca>; Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

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Hi Florin/Dan,

The volumes related to the actual turning movements at the driveway/John Street Extension are not expected to change much between days/months. Therefore, we would like to use volume balancing on the through volumes on Brant St at the Nofrills Driveway and on Caroline St at the John Street Extension (ie. Increase the through volumes within the Paradigm counts so there are no discrepancies between the Paradigm counts and City counts). Please let us know if this is acceptable.

If you would still like us to use the adjustment factor, we would need to know the May factor as this is when the City counts were conducted.

Regards,

**Maddison Murch, EIT**
*Transportation Consultant*

**Paradigm Transportation Solutions Limited**
p: 519.896.3163 x205
e: mmurch@ptsl.com

***In these very uncertain times, we want to take this opportunity to assure you that our unique "work at home" business model enables us to offer uninterrupted support to our clients, ensuring we can continue to offer the high-quality service and work product we always have. We are fully operational and our staff are diligently working on our assignments with you.***

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***Let's stay safe and look out for each other. We will get through this together.***

---

**From:** Patrau, Florin <Florin.Patrau@burlington.ca>
**Sent:** March 27, 2020 10:14 AM
**To:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>; Maddison Murch <mmurch@ptsl.com>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** Re: 190080: 535-551 Brant S, Burlington Scope of Work

Here is what we used for Brant @ Caroline count, I think you should use the same for the driveways
8hr to 24 hrs factor  is 1.882, February factor is 1.179 and for the weekdays he have
Monday- 1.041
Tuesday- 0.964
Wednesday -0.952
Thursday 0.924
Friday -0.905
Saturday -1.009
sunday - 1.292

take care,
florin

---

**From:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Sent:** Friday, March 27, 2020 9:57 AM
**To:** Maddison Murch <mmurch@ptsl.com>; Patrau, Florin <Florin.Patrau@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** Re: 190080: 535-551 Brant S, Burlington Scope of Work

Hi Maddison,
I am glad you were able to connect with Florin. I would just like to mention that we are OK with you applying correction factor for Brant/No Frills access only due to the current situation with COVID-19 and not knowing when things will be back to normal.
If we weren't effected by the current situation, Transportation Planning staff would require you to recount that access.
Thanks,
Dan

---

**From:** Maddison Murch <mmurch@ptsl.com>
**Sent:** Friday, March 27, 2020 9:48 AM
**To:** Patrau, Florin <Florin.Patrau@burlington.ca>; Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

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Hi Florin,

Thank you for the input.

If you could provide us with the City correction factor, that would be great.

Regards,

**Maddison Murch, EIT**
*Transportation Consultant*

**Paradigm Transportation Solutions Limited**
p: 519.896.3163 x205
e: mmurch@ptsl.com

***In these very uncertain times, we want to take this opportunity to assure you that our unique "work at home" business model enables us to offer uninterrupted support to our clients, ensuring we can continue to offer the high-quality service and work product we always have. We are fully operational and our staff are diligently working on our assignments with you.***

***As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.***

***Let's stay safe and look out for each other. We will get through this together.***

---

**From:** Patrau, Florin <Florin.Patrau@burlington.ca>
**Sent:** March 27, 2020 9:40 AM
**To:** Maddison Murch <mmurch@ptsl.com>; Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** Re: 190080: 535-551 Brant S, Burlington Scope of Work

Hi Maddison,

The city does not conduct counts during the winter months when the volumes are lower and we never counted the commercial driveways that you are working on so we don't have a baseline to refer to.

If I can make a suggestion, use the 2019 city counts for intersections and apply a correction factor for the commercial driveways data collected in February. If this works for you I can extract the correction factors we use for our counts.

Take care,
Florin

---

**From:** Maddison Murch <mmurch@ptsl.com>
**Sent:** Thursday, March 26, 2020 3:55 PM
**To:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>; Patrau, Florin <Florin.Patrau@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

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Hi Dan/Florin,

The following table indicates the difference between the counts Paradigm collected at Brant/Nofrills Driveway and the City counts at Brant/Victoria and Brant/Caroline. The main difference is in the PM peak hour.

| Roadway | Direction | AM Peak Hour (8:00AM-9:00AM) | | | PM Peak Hour (3:45PM-4:45PM) | | |
|---|---|---|---|---|---|---|---|
| | | City Count | Paradigm Count | Difference | City Count | Paradigm Count | Difference |
| Brant Street between Victoria & Nofrills Driveway | Northbound | 533 | 405 | 128 | 750 | 540 | 210 |
| | Southbound | 536 | 432 | 104 | 651 | 487 | 164 |
| Brant Street between Caroline & Nofrills Driveway | Northbound | 429 | 413 | 16 | 650 | 525 | 125 |
| | Southbound | 437 | 399 | 38 | 550 | 489 | 61 |

The difference between the Brant/Caroline count from the City and the data collected by Paradigm at John/Caroline is not as significant as the differences above.

These differences would also increase once we apply a 2% growth rate to the 2019 City counts to factor up to 2020.

Thanks,

**Maddison Murch, EIT**
*Transportation Consultant*

**Paradigm Transportation Solutions Limited**
p: 519.896.3163 x205
e: mmurch@ptsl.com

***In these very uncertain times, we want to take this opportunity to assure you that our unique "work at home" business model enables us to offer uninterrupted support to our clients, ensuring we can continue to offer the high-quality service and work product we always have. We are fully operational and our staff are diligently working on our assignments with you.***

***As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.***

***Let's stay safe and look out for each other. We will get through this together.***

---

**From:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Sent:** March 26, 2020 2:32 PM

**To:** Maddison Murch <mmurch@ptsl.com>; Patrau, Florin <Florin.Patrau@burlington.ca>
**Subject:** Re: 190080: 535-551 Brant S, Burlington Scope of Work

Hi Maddison,
Thank you for your email. I am also copying Florin since he is very familiar with City's traffic data.
How much lower are your counts at Brant/No Frills compared to the counts that you received from the City for Brant/Caroline and Brant/Victoria?
Florin, do we have any traffic data for Brant between Caroline and Victoria?

Thanks,
Dan

---

**From:** Maddison Murch <mmurch@ptsl.com>
**Sent:** Tuesday, March 24, 2020 4:17 PM
**To:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Dan,

We obtained traffic counts from the City for the intersections of Brant & Caroline and Brant & Baldwin/Victoria from May 2019. We then proceeded to collect traffic counts for the intersections of John/Caroline, John/Nofrills Driveway and Brant/Nofrills Driveway in February 2020.

There are some discrepancies between traffic volumes collected by the city in 2019 and by Paradigm in 2020. The Paradigm counts along Brant Street at the Nofrills Driveway from February are quite a bit lower than the volumes along Brant at Victoria/Baldwin and at Caroline.

We were planning on re-counting the city intersections recently, however, due to the COVID-19 outbreak/closures we wouldn't be able to proceed with these counts until traffic patterns return to "normal". In the interest of time and the fact that we do have counts for all intersections, we would like to use the 2019 city counts and 2020 paradigm counts to move forward. To ensure that there are no discrepancies, we will increase/factor the through volumes within the 2020 paradigm data collected to match that of the city counts.

Please advise if this approach is acceptable.

Regards,

**Maddison Murch, EIT**
*Transportation Consultant*

**Paradigm Transportation Solutions Limited**
p: 519.896.3163 x205
e: mmurch@ptsl.com

***In these very uncertain times, we want to take this opportunity to assure you that our unique "work at home" business model enables us to offer uninterrupted support to our clients, ensuring we can continue to offer the***

***high-quality service and work product we always have. We are fully operational and our staff are diligently working on our assignments with you.***

***As social distancing is imperative to stop the spread of the COVID-19 virus, we will not be conducting in-person meetings until we are advised by the proper authorities that it is safe to do so. In the meantime, we have the technology to host on-line meetings in various forms and will be using it to communicate with you.***

***Let's stay safe and look out for each other. We will get through this together.***

---

**From:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Sent:** February 24, 2020 3:21 PM
**To:** Maddison Murch <mmurch@ptsl.com>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

Hi Maddison,
Please include 2082, 2086, and 2090 James St. as well. This is the proposed development at the corner of James and Martha.
Thanks,
Dan

---

**From:** Maddison Murch <mmurch@ptsl.com>
**Sent:** Wednesday, February 19, 2020 2:39 PM
**To:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

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Thanks Dan.

I was also wondering if you could confirm if the following background developments are acceptable to include in our analysis/report:

- 409 Brant Street
- 421-431 Brant Street
- 2025 Maria Street, 2030 Caroline Street and 510 Elizabeth Street

Regards,

**Maddison Murch, EIT**
*Transportation Consultant*

**Paradigm Transportation Solutions Limited**
p: 519.896.3163 x205
e: mmurch@ptsl.com

---

**From:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Sent:** February 4, 2020 1:42 PM
**To:** Maddison Murch <mmurch@ptsl.com>
**Subject:** RE: 190080: 535-551 Brant S, Burlington Scope of Work

Hi Maddison,
Thank you for sharing the scope of work with me. Below are my comments:

- Please make sure that the traffic counts are not done during the summer months, stat. holidays, Mondays and Fridays, etc.
- Transportation Planning staff will not be supporting any vehicle accesses on Brant Street.
- Transportation Planning staff will only accept parking rates from the City Wide Parking Standards Review

I also shared your scope of work with the Planning staff and below is the feedback that I received:

As discussed, Planning staff agree with Transportation staff that it is strongly preferred to have all vehicular access to the property be from John Street, not Brant Street.
In the pre-consultation agreement dated November 27, 2019, it was indicated that the applicant should work with the City, No Frills site, and other landowners to develop a comprehensive development plan for the east side of Brant Street between Caroline and Victoria prior to submitting an application. So this is something Planning staff want to see addressed beyond the scope of the TIS.
Also, could you please state somewhere in your Scope of Work that "the proponent should be aware of the land use vision and built form concept for Downtown Burlington that were endorsed in principle by City Council on January 27th, 2020 (report PL-02-20). This vision and concept recognize the lands bounded by Brant Street, Victoria Ave, Rambo Creek, and Caroline Street as an area requiring comprehensive planning and having the potential for a future new transportation corridor connecting Caroline Street to Victoria Ave east of Brant Street."

Please let me know if you have any questions or comments,
Thanks,
Dan

---

**From:** Maddison Murch <mmurch@ptsl.com>
**Sent:** Wednesday, January 29, 2020 5:12 PM
**To:** Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
**Cc:** Chris Day <cday@ptsl.com>
**Subject:** 190080: 535-551 Brant S, Burlington Scope of Work

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Hi Dan,
**Paradigm Transportation Solutions Limited** has been retained to prepare a Transportation Impact Study (TIS), Parking Justification and Transportation Demand Management (TDM) Options Report for the proposed redevelopment of the lands located at 535-551 Brant Street in the City of Burlington. The following details our understanding of the assignment, and our proposed work plan to complete the studies.
The current proposed redevelopment consists of a high-rise, mixed-use 25 storey building with 1,178.4 square metres of ground floor retail space and 246 residential condominium units. Parking is proposed via a four (4) level underground structure containing 250 parking spaces with access to the site via a full-moves driveway on Brant Street and lay-by area off of John Street.

## Transportation Impact Study

**Task 1 – Data Collection:** Paradigm requests recent traffic counts. Should the City not have traffic counts available, Paradigm will arrange for weekday AM and PM traffic counts to be conducted at the study area intersections. Paradigm will conduct a site visit to confirm the existing traffic system, the proposed access arrangement, traffic control, adjacent driveway locations, adjacent land uses and operational conditions within the study area.

In assessing the transportation impacts, we intend to analyze the operation of the following study area intersections subject to the City's concurrence:

- Brant Street and Caroline Street;
- Brant Street and Victoria Avenue;
- John Street and Caroline Street;
- Brant Street and Access Road (Adjacent to Site); and
- John Street and Access Road (Adjacent to Site).

**Task 2 – Traffic Forecasting**: We have assumed that we will be requested to develop traffic forecasts for the weekday AM and PM peak hours for one (1) future horizon five (5) years from the date of study (2025). The components of the traffic forecasts will be as follows:

- Existing (Base Year) – We will develop Existing vehicle traffic volumes for the weekday AM and PM peak hours from traffic counts for the existing study area intersections.
- Future (Horizon Year) Background – We will estimate Future Background (2025) vehicle traffic volumes for the weekday AM and PM peak hours by applying a 1.0% per annum growth rate to the base year volumes and adding anticipated trips from nearby approved and/or in-stream developments, if applicable.
- Future (Horizon Year) Total – We will forecast the weekday AM and PM peak hour vehicle traffic volumes generated by the proposed development based on rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation* (10$^{th}$ Edition). As part of the trip generation, we will look at the internal capture among the uses through the use of the NCHRP worksheet detailed within the ITE Trip Generation Handbook and the existing and expected modal split targets as reductions to the overall trip generation from this site. The site vehicle trips will be distributed and assigned to the study area intersections based on existing traffic patterns and added to the Future Background estimates to produce Future Total traffic volumes for the horizon year.

**Task 3 – Operational Analyses:** Using base year traffic counts and the traffic forecasts developed in **Task 1 and 2**, we will evaluate the operation of the above noted intersections as well as the developments proposed access for the Existing, Future Background and Future Total weekday AM and PM peak hour traffic conditions. The operational analysis will assess volume-to-capacity (v/c) ratios, Level of Services (LOS) and queuing conditions for the intersections and access. Based on the analysis results, we will identify any existing deficiencies, as well as the net impact of the proposed development on the study area road network. The need for road improvements (e.g., provision of auxiliary turn lanes) and/or modifications to traffic control devices (e.g., addition of traffic control signals) to address any deficiencies will be determined. An assessment of whether these measures are required due to non-site traffic (i.e. Existing or Future Background) or the increase in traffic resulting from the proposed development will be completed.

**Task 4 – Report and Recommendations:** Paradigm will prepare a detailed report documenting our investigations, findings and recommendations, including appendices containing relevant traffic data as well as the detailed output generated by the operational analysis software. This report will also include the Parking Justification and TDM Options.

### Parking Justification Study

**Task 5 – Parking Inventory:** Paradigm will inventory the currently available public on-street parking and off-street parking within convenient walking distance of the site, within the downtown and other related features such as pedestrian and cycling amenity, as well as transit service.

**Task 6 – Parking Generation:** We will review the ITE Parking Generation – 5th Edition and Burlington City-Wide Parking Standards Review, July 2017, to access the parking generation for the site based on the proposed land uses. Furthermore, we will look at the TTS data for the area and consider automobile ownership and the percentages of trips made by alternative modes of travel, as well as available in-house parking utilization surveys of comparable sites. The site is located within an “anchor hub” and closed proximity to the Burlington Transit station which will be further consideration to support a parking variance for this site.

**Task 7 – Parking Assessment:** Based on the planned on-site parking supply we will assess the extent to which parking demand can be accommodated on the site and the potential for spill-over parking that may need to be accommodated within the surrounding area.

### Transportation Demand Management Options

**Task 8 – TDM Options**: Paradigm will prepare a TDM Options section within the overall Traffic and Parking study report to identify potential TDM measures that can be implemented during both the pre-occupancy and post-occupancy periods of the development.

Based on the site plan we will evaluate the guidelines and best practice opportunities related to TDM initiatives regarding cycling, walking, transit (buses), parking, carpooling, car share/bikeshare, wayfinding and travel planning and education/promotion as they relate to the site. Based on the above, we will recommend TDM measures to be included in the site plan as well as post-development TDM programs.

If required, we will review other TDM measures with the applicant to make sure that they can be incorporated in the overall plan for the development.

### On-Site Circulation Assessment

**Task 9 – On-site Circulation Assessment:** Paradigm will undertake an AutoTURN assessment to identify any conflicts with the sites proposed loading space. We will also assess the on-site circulation (turning radii and maneuverability) of the parking facilities for standard passenger vehicles.

## Requested Information

To assist in conducting the studies we request the following information:

- Recent turning movement counts for the study area intersections;
- Signal timings at the intersections of Brant/Caroline and Brant/Victoria;
- Recently approved or in-stream developments within the study area, if applicable (please provide any TIS reports unless prepared by Paradigm);
- Any planned road improvements in the study area; and,

- Any comments the City may have on the subject scope of work.

If you have any questions regarding this scope of work please do not hesitate to contact us and we look forward to receiving the City's comments.

Regards,

**Maddison Murch, EIT**
*Transportation Consultant*

**Paradigm Transportation Solutions Limited**
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 519.896.3163 x205
e: mmurch@ptsl.com
w: www.ptsl.com

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# Appendix B

## Existing Traffic Counts & Signal Timings

# *200126-Brant St & Baldwin/Victoria Ave*

## Morning Peak Diagram

**Specified Period**
**From:** 7:00:00
**To:** 9:00:00

**One Hour Peak**
**From:** 8:00:00
**To:** 9:00:00

**Municipality:** Burlington
**Site #:** 0000200126
**Intersection:** Brant St & Baldwin/Victoria Ave
**TFR File #:** 1
**Count date:** 14-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mike
Zack

**** Signalized Intersection ****

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

| | | | | |
|---|---|---|---|---|
| North Leg Total: | 1259 | | | |
| North Entering: | 658 | | | |
| North Peds: | 77 | | | |
| Peds Cross: | ⋈ | | | |
| Cyclists | 2 | 9 | 0 | 11 |
| Trucks | 9 | 42 | 3 | 54 |
| Cars | 118 | 450 | 25 | 593 |
| Totals | 129 | 501 | 28 | |
| Cyclists | 4 | | | |
| Trucks | 28 | | | |
| Cars | 569 | | | |
| Totals | 601 | | | |
| East Leg Total: | 167 | | | |
| East Entering: | 84 | | | |
| East Peds: | 42 | | | |
| Peds Cross: | ⧖ | | | |

Brant St

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 4 | 13 | 190 | 207 |

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 23 | 1 | 0 | 24 |
| 46 | 2 | 1 | 49 |
| 10 | 1 | 0 | 11 |
| 79 | 4 | 1 | |

Baldwin St

N
W E
S

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 1 | 0 | 94 | 95 |
| 0 | 0 | 33 | 33 |
| 0 | 0 | 24 | 24 |
| 1 | 0 | 151 | |

Victoria Ave

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 77 | 5 | 1 | 83 |

Brant St

| | | | | |
|---|---|---|---|---|
| Peds Cross: | ⧖ | | | |
| West Peds: | 56 | | | |
| West Entering: | 152 | | | |
| West Leg Total: | 359 | | | |
| Cars | 484 | | | |
| Trucks | 43 | | | |
| Cyclists | 9 | | | |
| Totals | 536 | | | |
| Cars | 26 | 452 | 19 | 497 |
| Trucks | 2 | 27 | 2 | 31 |
| Cyclists | 1 | 3 | 1 | 5 |
| Totals | 29 | 482 | 22 | |
| Peds Cross: | ⋈ | | | |
| South Peds: | 83 | | | |
| South Entering: | 533 | | | |
| South Leg Total: | 1069 | | | |

### Comments

# 200126-Brant St & Baldwin/Victoria Ave

## Mid-day Peak Diagram

**Specified Period**
**From:** 11:00:00
**To:** 14:00:00

**One Hour Peak**
**From:** 11:45:00
**To:** 12:45:00

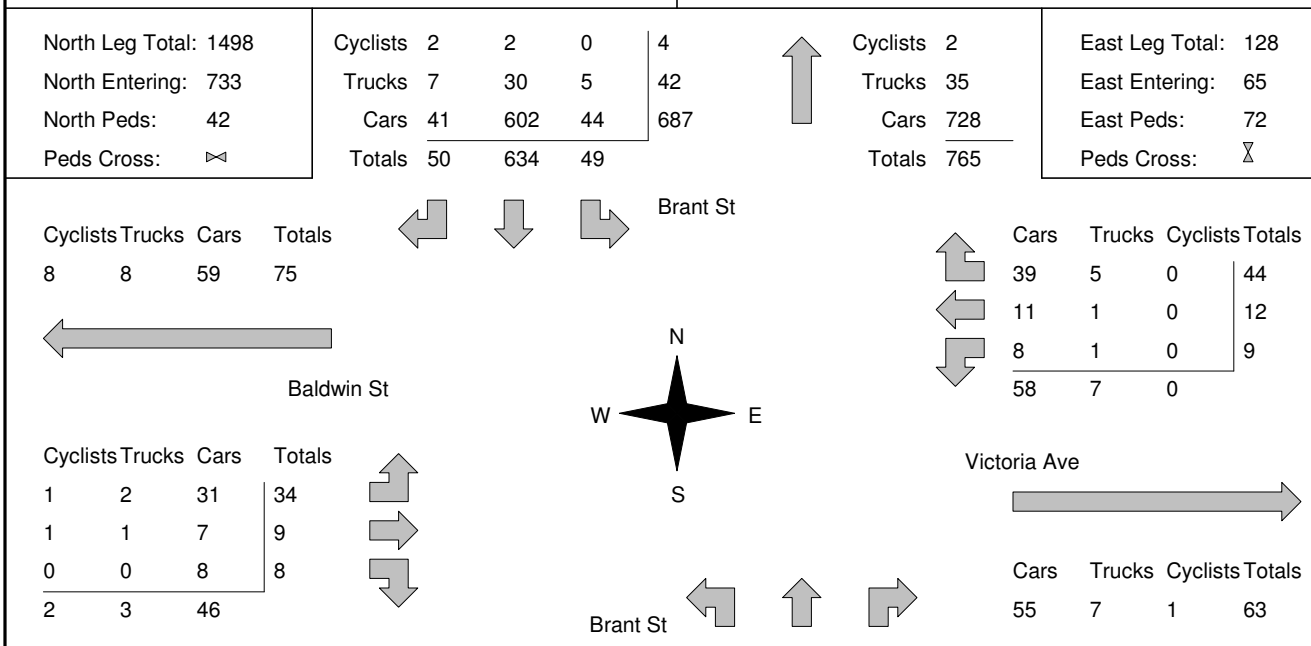
**Municipality:** Burlington
**Site #:** 0000200126
**Intersection:** Brant St & Baldwin/Victoria Ave
**TFR File #:** 1
**Count date:** 14-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mike
Zack

**** Signalized Intersection ****

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




### Comments

# 200126-Brant St & Baldwin/Victoria Ave

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 18:00:00

**One Hour Peak**
**From:** 15:45:00
**To:** 16:45:00

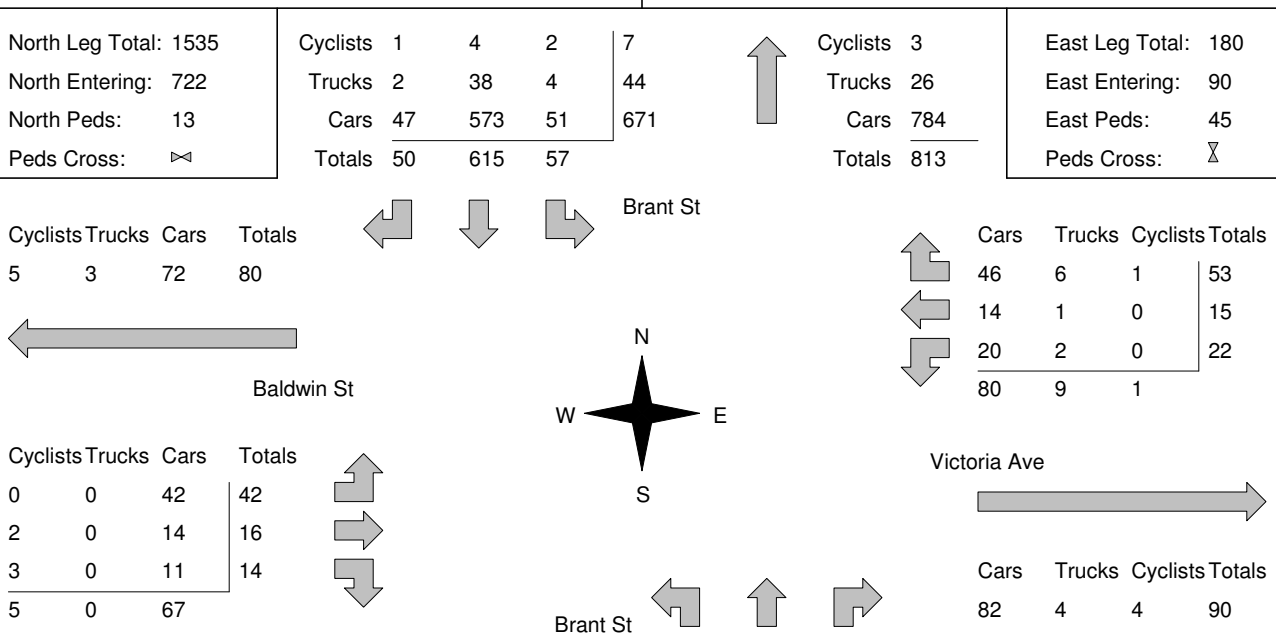
**Municipality:** Burlington
**Site #:** 0000200126
**Intersection:** Brant St & Baldwin/Victoria Ave
**TFR File #:** 1
**Count date:** 14-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mike
Zack

**** Signalized Intersection ****

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




### Comments

# *200126-Brant St & Baldwin/Victoria Ave*

## Total Count Diagram

**Municipality:** Burlington
**Site #:** 0000200126
**Intersection:** Brant St & Baldwin/Victoria Ave
**TFR File #:** 1
**Count date:** 14-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mike
Zack

**** Signalized Intersection ****

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

| | | | | |
|---|---|---|---|---|
| North Leg Total: | 10498 | | | |
| North Entering: | 5162 | | | |
| North Peds: | 347 | | | |
| Peds Cross: | ⋈ | | | |
| Cyclists | 8 | 25 | 2 | 35 |
| Trucks | 42 | 322 | 33 | 397 |
| Cars | 437 | 3961 | 332 | 4730 |
| Totals | 487 | 4308 | 367 | |
| Cyclists | 23 | | | |
| Trucks | 214 | | | |
| Cars | 5099 | | | |
| Totals | 5336 | | | |
| East Leg Total: | 1176 | | | |
| East Entering: | 595 | | | |
| East Peds: | 387 | | | |
| Peds Cross: | ⧖ | | | |

Brant St

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 28 | 56 | 669 | 753 |

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 315 | 34 | 2 | 351 |
| 147 | 7 | 3 | 157 |
| 78 | 8 | 1 | 87 |
| 540 | 49 | 6 | |

Baldwin St

N
W E
S

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 3 | 13 | 355 | 371 |
| 12 | 3 | 107 | 122 |
| 4 | 1 | 92 | 97 |
| 19 | 17 | 554 | |

Victoria Ave

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 526 | 40 | 15 | 581 |

Brant St

| | | | | |
|---|---|---|---|---|
| Peds Cross: | ⧖ | | | |
| West Peds: | 695 | | | |
| West Entering: | 590 | | | |
| West Leg Total: | 1343 | | | |
| Cars | 4131 | | | |
| Trucks | 331 | | | |
| Cyclists | 30 | | | |
| Totals | 4492 | | | |
| Cars | 85 | 4429 | 87 | 4601 |
| Trucks | 7 | 167 | 4 | 178 |
| Cyclists | 17 | 18 | 1 | 36 |
| Totals | 109 | 4614 | 92 | |
| Peds Cross: | ⋈ | | | |
| South Peds: | 378 | | | |
| South Entering: | 4815 | | | |
| South Leg Total: | 9307 | | | |

### Comments

# *200126-Brant St & Baldwin/Victoria Ave*
# Traffic Count Summary

**Intersection:** Brant St & Baldwin/Victoria Ave | **Count Date:** 14-May-2019 | **Municipality:** Burlington

## North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds | North/South Total Approaches |
|---|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 33 | 253 | 75 | 361 | 24 | 695 |
| 9:00:00 | 28 | 501 | 129 | 658 | 77 | 1191 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 51 | 580 | 52 | 683 | 78 | 1291 |
| 13:00:00 | 49 | 626 | 44 | 719 | 31 | 1421 |
| 14:00:00 | 52 | 586 | 45 | 683 | 23 | 1379 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 47 | 601 | 37 | 685 | 74 | 1342 |
| 17:00:00 | 55 | 600 | 52 | 707 | 22 | 1416 |
| 18:00:00 | 52 | 561 | 53 | 666 | 18 | 1242 |
| Totals: | 367 | 4308 | 487 | 5162 | 347 | 9977 |

## South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds |
|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 8 | 314 | 12 | 334 | 32 |
| 9:00:00 | 29 | 482 | 22 | 533 | 83 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 10 | 587 | 11 | 608 | 150 |
| 13:00:00 | 10 | 684 | 8 | 702 | 42 |
| 14:00:00 | 13 | 677 | 6 | 696 | 18 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 16 | 631 | 10 | 657 | 31 |
| 17:00:00 | 16 | 677 | 16 | 709 | 13 |
| 18:00:00 | 7 | 562 | 7 | 576 | 9 |
| Totals: | 109 | 4614 | 92 | 4815 | 378 |

## East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds | East/West Total Approaches |
|---|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 6 | 28 | 43 | 77 | 15 | 142 |
| 9:00:00 | 11 | 49 | 24 | 84 | 42 | 236 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 9 | 14 | 48 | 71 | 122 | 127 |
| 13:00:00 | 5 | 9 | 42 | 56 | 58 | 104 |
| 14:00:00 | 10 | 10 | 50 | 70 | 40 | 125 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 12 | 16 | 40 | 68 | 44 | 168 |
| 17:00:00 | 22 | 17 | 56 | 95 | 43 | 158 |
| 18:00:00 | 12 | 14 | 48 | 74 | 23 | 125 |
| Totals: | 87 | 157 | 351 | 595 | 387 | 1185 |

## West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds |
|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 48 | 5 | 12 | 65 | 7 |
| 9:00:00 | 95 | 33 | 24 | 152 | 56 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 35 | 10 | 11 | 56 | 250 |
| 13:00:00 | 36 | 7 | 5 | 48 | 164 |
| 14:00:00 | 31 | 15 | 9 | 55 | 55 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 62 | 23 | 15 | 100 | 66 |
| 17:00:00 | 36 | 16 | 11 | 63 | 55 |
| 18:00:00 | 28 | 13 | 10 | 51 | 42 |
| Totals: | 371 | 122 | 97 | 590 | 695 |

## Calculated Values for Traffic Crossing Major Street

| Hours Ending: | 8:00 | 9:00 | 12:00 | 13:00 | 14:00 | 16:00 | 17:00 | 18:00 |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | 138 | 315 | 286 | 123 | 97 | 202 | 110 | 81 |

# *200272-Brant St & Caroline St*

## Morning Peak Diagram

**Specified Period**
**From:** 7:00:00
**To:** 9:00:00

**One Hour Peak**
**From:** 8:00:00
**To:** 9:00:00

**Municipality:** Burlington
**Site #:** 0000200272
**Intersection:** Brant St & Caroline St
**TFR File #:** 1
**Count date:** 15-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Tanya

**** Signalized Intersection ****

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

| | | | | |
|---|---|---|---|---|
| North Leg Total: | 866 | | | |
| North Entering: | 437 | | | |
| North Peds: | 1 | | | |
| Peds Cross: | ⋈ | | | |
| Cyclists | 1 | 2 | 0 | 3 |
| Trucks | 7 | 37 | 7 | 51 |
| Cars | 46 | 263 | 74 | 383 |
| Totals | 54 | 302 | 81 | |
| Cyclists | 3 | | | |
| Trucks | 53 | | | |
| Cars | 373 | | | |
| Totals | 429 | | | |
| East Leg Total: | 354 | | | |
| East Entering: | 159 | | | |
| East Peds: | 49 | | | |
| Peds Cross: | ⧖ | | | |

Brant St

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 1 | 14 | 100 | 115 |

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 74 | 16 | 0 | 90 |
| 46 | 6 | 0 | 52 |
| 14 | 3 | 0 | 17 |
| 134 | 25 | 0 | |

Caroline St

N
W E
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| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 0 | 8 | 122 | 130 |
| 0 | 6 | 90 | 96 |
| 0 | 2 | 17 | 19 |
| 0 | 16 | 229 | |

Caroline St

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 180 | 15 | 0 | 195 |

Brant St

| | | | | |
|---|---|---|---|---|
| Peds Cross: | ⧖ | | | |
| West Peds: | 18 | | | |
| West Entering: | 245 | | | |
| West Leg Total: | 360 | | | |
| Cars | 294 | | | |
| Trucks | 42 | | | |
| Cyclists | 2 | | | |
| Totals | 338 | | | |
| Cars | 8 | 177 | 16 | 201 |
| Trucks | 1 | 29 | 2 | 32 |
| Cyclists | 0 | 3 | 0 | 3 |
| Totals | 9 | 209 | 18 | |
| Peds Cross: | ⋈ | | | |
| South Peds: | 15 | | | |
| South Entering: | 236 | | | |
| South Leg Total: | 574 | | | |

### Comments

# *200272-Brant St & Caroline St*

## Mid-day Peak Diagram

**Specified Period**
**From:** 11:00:00
**To:** 14:00:00

**One Hour Peak**
**From:** 11:45:00
**To:** 12:45:00

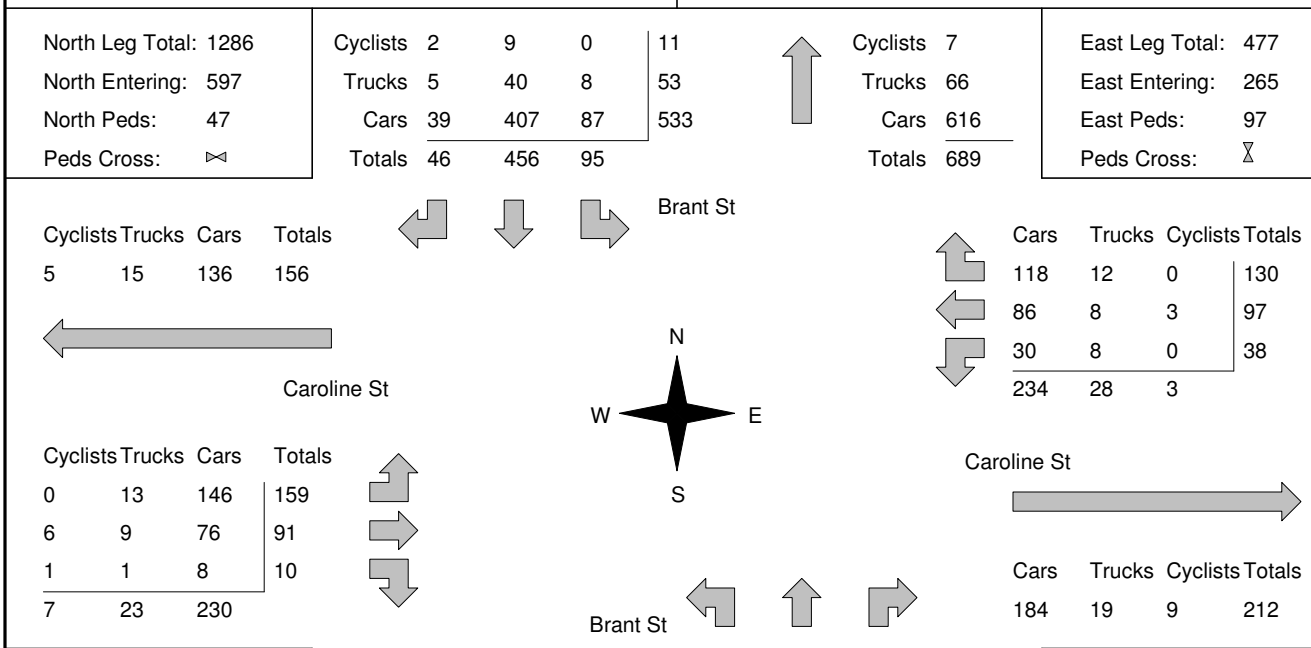
**Municipality:** Burlington
**Site #:** 0000200272
**Intersection:** Brant St & Caroline St
**TFR File #:** 1
**Count date:** 15-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Tanya

**** Signalized Intersection ****

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




### Comments

# *200272-Brant St & Caroline St*

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 18:00:00

**One Hour Peak**
**From:** 16:15:00
**To:** 17:15:00

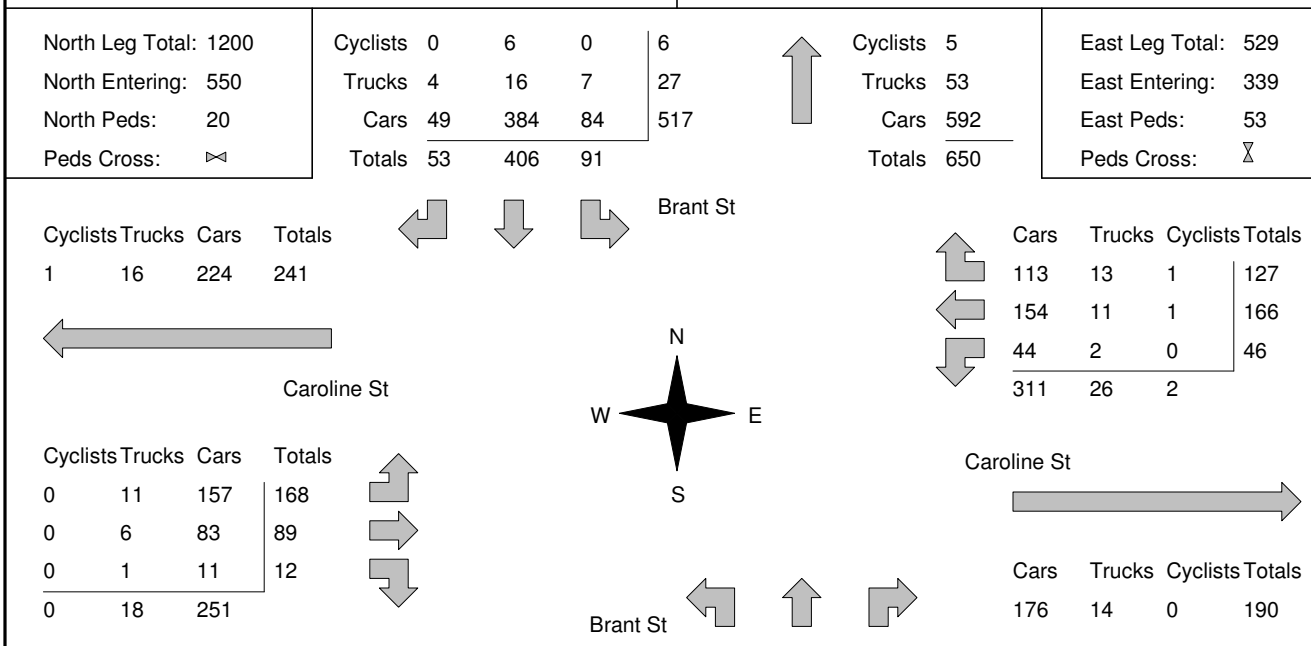
**Municipality:** Burlington
**Site #:** 0000200272
**Intersection:** Brant St & Caroline St
**TFR File #:** 1
**Count date:** 15-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Tanya

**** Signalized Intersection ****

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




### Comments

# *200272-Brant St & Caroline St*

## Total Count Diagram

**Municipality:** Burlington
**Site #:** 0000200272
**Intersection:** Brant St & Caroline St
**TFR File #:** 1
**Count date:** 15-May-2019

**Weather conditions:**
Sunny

**Person(s) who counted:**
Tanya

**** Signalized Intersection ****

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

| | | | | |
|---|---|---|---|---|
| North Leg Total: | 8370 | | | |
| North Entering: | 3869 | | | |
| North Peds: | 206 | | | |
| Peds Cross: | ⋈ | | | |
| Cyclists | 5 | 33 | 2 | 40 |
| Trucks | 34 | 274 | 57 | 365 |
| Cars | 323 | 2565 | 576 | 3464 |
| Totals | 362 | 2872 | 635 | |
| Cyclists | 42 | | | |
| Trucks | 435 | | | |
| Cars | 4024 | | | |
| Totals | 4501 | | | |
| East Leg Total: | 3294 | | | |
| East Entering: | 1892 | | | |
| East Peds: | 556 | | | |
| Peds Cross: | ⧖ | | | |

Brant St

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 12 | 97 | 1131 | 1240 |

Caroline St

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 2 | 82 | 1050 | 1134 |
| 14 | 36 | 560 | 610 |
| 2 | 12 | 116 | 130 |
| 18 | 130 | 1726 | |

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 764 | 98 | 3 | 865 |
| 706 | 55 | 7 | 768 |
| 227 | 30 | 2 | 259 |
| 1697 | 183 | 12 | |

N
W E
S

Caroline St

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 1270 | 109 | 23 | 1402 |

Brant St

| | | | | |
|---|---|---|---|---|
| Peds Cross: | ⧖ | | | |
| West Peds: | 340 | | | |
| West Entering: | 1874 | | | |
| West Leg Total: | 3114 | | | |
| Cars | 2908 | | | |
| Trucks | 316 | | | |
| Cyclists | 37 | | | |
| Totals | 3261 | | | |
| Cars | 102 | 2210 | 134 | 2446 |
| Trucks | 8 | 255 | 16 | 279 |
| Cyclists | 0 | 37 | 7 | 44 |
| Totals | 110 | 2502 | 157 | |
| Peds Cross: | ⋈ | | | |
| South Peds: | 315 | | | |
| South Entering: | 2769 | | | |
| South Leg Total: | 6030 | | | |

### Comments

# *200272-Brant St & Caroline St*
# Traffic Count Summary

**Intersection:** Brant St & Caroline St | **Count Date:** 15-May-2019 | **Municipality:** Burlington

## North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds | North/South Total Approaches |
|---|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 49 | 183 | 29 | 261 | 7 | 432 |
| 9:00:00 | 81 | 302 | 54 | 437 | 1 | 673 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 87 | 354 | 43 | 484 | 47 | 877 |
| 13:00:00 | 105 | 473 | 53 | 631 | 42 | 1051 |
| 14:00:00 | 55 | 388 | 45 | 488 | 38 | 895 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 81 | 386 | 34 | 501 | 34 | 898 |
| 17:00:00 | 88 | 399 | 55 | 542 | 20 | 916 |
| 18:00:00 | 89 | 387 | 49 | 525 | 17 | 896 |
| Totals: | 635 | 2872 | 362 | 3869 | 206 | 6638 |

## South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds |
|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 3 | 151 | 17 | 171 | 0 |
| 9:00:00 | 9 | 209 | 18 | 236 | 15 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 11 | 358 | 24 | 393 | 73 |
| 13:00:00 | 13 | 385 | 22 | 420 | 79 |
| 14:00:00 | 19 | 360 | 28 | 407 | 58 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 17 | 357 | 23 | 397 | 40 |
| 17:00:00 | 25 | 338 | 11 | 374 | 34 |
| 18:00:00 | 13 | 344 | 14 | 371 | 16 |
| Totals: | 110 | 2502 | 157 | 2769 | 315 |

## East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds | East/West Total Approaches |
|---|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 17 | 29 | 82 | 128 | 17 | 282 |
| 9:00:00 | 17 | 52 | 90 | 159 | 49 | 404 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 40 | 77 | 126 | 243 | 106 | 496 |
| 13:00:00 | 31 | 101 | 114 | 246 | 95 | 501 |
| 14:00:00 | 32 | 83 | 112 | 227 | 101 | 482 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 36 | 106 | 103 | 245 | 88 | 472 |
| 17:00:00 | 36 | 158 | 137 | 331 | 54 | 587 |
| 18:00:00 | 50 | 162 | 101 | 313 | 46 | 542 |
| Totals: | 259 | 768 | 865 | 1892 | 556 | 3766 |

## West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Cyclists: Left | Thru | Right | Grand Total | Total Peds |
|---|---|---|---|---|---|
| 7:00:00 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 103 | 36 | 15 | 154 | 8 |
| 9:00:00 | 130 | 96 | 19 | 245 | 18 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 145 | 91 | 17 | 253 | 60 |
| 13:00:00 | 156 | 87 | 12 | 255 | 77 |
| 14:00:00 | 158 | 73 | 24 | 255 | 60 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 142 | 73 | 12 | 227 | 49 |
| 17:00:00 | 155 | 86 | 15 | 256 | 38 |
| 18:00:00 | 145 | 68 | 16 | 229 | 30 |
| Totals: | 1134 | 610 | 130 | 1874 | 340 |

## Calculated Values for Traffic Crossing Major Street

| Hours Ending: | 8:00 | 9:00 | 12:00 | 13:00 | 14:00 | 16:00 | 17:00 | 18:00 |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | 163 | 259 | 396 | 409 | 369 | 358 | 403 | 390 |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


# Turning Movement Data

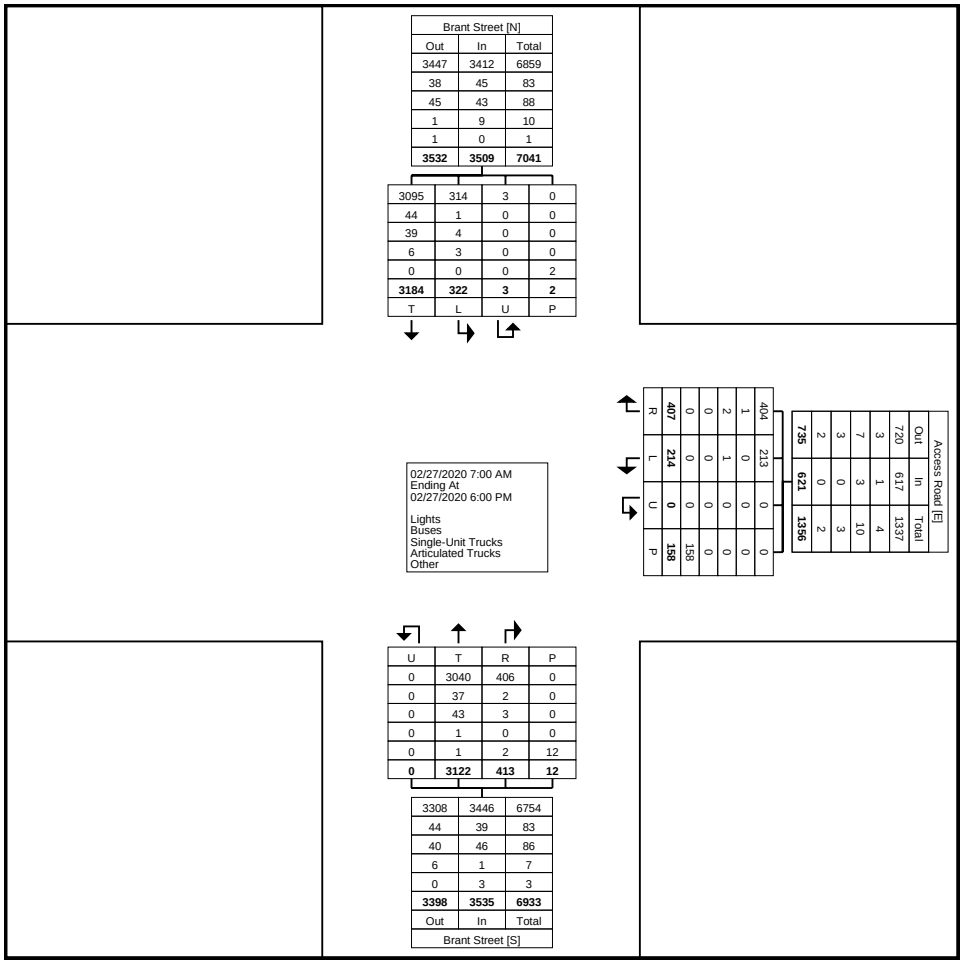
| Start Time | Access Road Westbound | | | | | Brant Street Northbound | | | | | Brant Street Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Int. Total |
| 7:00 AM | 1 | 2 | 0 | 2 | 3 | 61 | 1 | 0 | 0 | 62 | 0 | 49 | 0 | 0 | 49 | 114 |
| 7:15 AM | 3 | 2 | 0 | 2 | 5 | 63 | 4 | 0 | 0 | 67 | 3 | 40 | 0 | 0 | 43 | 115 |
| 7:30 AM | 3 | 5 | 0 | 3 | 8 | 85 | 4 | 0 | 0 | 89 | 3 | 40 | 0 | 0 | 43 | 140 |
| 7:45 AM | 2 | 2 | 0 | 2 | 4 | 99 | 6 | 0 | 0 | 105 | 6 | 68 | 0 | 0 | 74 | 183 |
| Hourly Total | 9 | 11 | 0 | 9 | 20 | 308 | 15 | 0 | 0 | 323 | 12 | 197 | 0 | 0 | 209 | 552 |
| 8:00 AM | 4 | 10 | 0 | 2 | 14 | 100 | 11 | 0 | 1 | 111 | 9 | 89 | 0 | 0 | 98 | 223 |
| 8:15 AM | 0 | 5 | 0 | 7 | 5 | 105 | 5 | 0 | 1 | 110 | 9 | 93 | 0 | 0 | 102 | 217 |
| 8:30 AM | 3 | 5 | 0 | 7 | 8 | 85 | 11 | 0 | 1 | 96 | 14 | 94 | 0 | 0 | 108 | 212 |
| 8:45 AM | 5 | 7 | 0 | 3 | 12 | 88 | 8 | 0 | 1 | 96 | 13 | 111 | 0 | 0 | 124 | 232 |
| Hourly Total | 12 | 27 | 0 | 19 | 39 | 378 | 35 | 0 | 4 | 413 | 45 | 387 | 0 | 0 | 432 | 884 |
| 9:00 AM | 3 | 8 | 0 | 4 | 11 | 70 | 11 | 0 | 0 | 81 | 17 | 85 | 0 | 0 | 102 | 194 |
| 9:15 AM | 8 | 11 | 0 | 4 | 19 | 73 | 10 | 0 | 0 | 83 | 10 | 85 | 0 | 0 | 95 | 197 |
| 9:30 AM | 8 | 14 | 0 | 3 | 22 | 91 | 22 | 0 | 0 | 113 | 11 | 115 | 0 | 0 | 126 | 261 |
| 9:45 AM | 7 | 14 | 0 | 3 | 21 | 89 | 8 | 0 | 1 | 97 | 9 | 94 | 0 | 0 | 103 | 221 |
| Hourly Total | 26 | 47 | 0 | 14 | 73 | 323 | 51 | 0 | 1 | 374 | 47 | 379 | 0 | 0 | 426 | 873 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11:30 AM | 6 | 13 | 0 | 15 | 19 | 93 | 16 | 0 | 0 | 109 | 9 | 85 | 1 | 0 | 95 | 223 |
| 11:45 AM | 10 | 15 | 0 | 20 | 25 | 94 | 17 | 0 | 0 | 111 | 11 | 116 | 0 | 0 | 127 | 263 |
| Hourly Total | 16 | 28 | 0 | 35 | 44 | 187 | 33 | 0 | 0 | 220 | 20 | 201 | 1 | 0 | 222 | 486 |
| 12:00 PM | 8 | 18 | 0 | 0 | 26 | 115 | 16 | 0 | 0 | 131 | 14 | 104 | 0 | 0 | 118 | 275 |
| 12:15 PM | 10 | 17 | 0 | 14 | 27 | 87 | 18 | 0 | 0 | 105 | 12 | 94 | 0 | 0 | 106 | 238 |
| 12:30 PM | 4 | 20 | 0 | 5 | 24 | 106 | 17 | 0 | 1 | 123 | 8 | 104 | 0 | 0 | 112 | 259 |
| 12:45 PM | 10 | 14 | 0 | 5 | 24 | 113 | 15 | 0 | 0 | 128 | 6 | 128 | 1 | 0 | 135 | 287 |
| Hourly Total | 32 | 69 | 0 | 24 | 101 | 421 | 66 | 0 | 1 | 487 | 40 | 430 | 1 | 0 | 471 | 1059 |
| 1:00 PM | 5 | 16 | 0 | 3 | 21 | 101 | 17 | 0 | 0 | 118 | 11 | 98 | 0 | 0 | 109 | 248 |
| 1:15 PM | 9 | 14 | 0 | 5 | 23 | 98 | 14 | 0 | 2 | 112 | 17 | 107 | 0 | 0 | 124 | 259 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 14 | 30 | 0 | 8 | 44 | 199 | 31 | 0 | 2 | 230 | 28 | 205 | 0 | 0 | 233 | 507 |
| 3:00 PM | 5 | 11 | 0 | 10 | 16 | 118 | 24 | 0 | 1 | 142 | 12 | 119 | 0 | 0 | 131 | 289 |
| 3:15 PM | 8 | 16 | 0 | 2 | 24 | 105 | 9 | 0 | 0 | 114 | 14 | 111 | 0 | 0 | 125 | 263 |
| 3:30 PM | 11 | 10 | 0 | 3 | 21 | 117 | 11 | 0 | 0 | 128 | 5 | 100 | 0 | 1 | 105 | 254 |
| 3:45 PM | 9 | 18 | 0 | 6 | 27 | 111 | 19 | 0 | 0 | 130 | 6 | 118 | 0 | 0 | 124 | 281 |
| Hourly Total | 33 | 55 | 0 | 21 | 88 | 451 | 63 | 0 | 1 | 514 | 37 | 448 | 0 | 1 | 485 | 1087 |
| 4:00 PM | 11 | 18 | 0 | 3 | 29 | 122 | 18 | 0 | 1 | 140 | 12 | 110 | 0 | 0 | 122 | 291 |
| 4:15 PM | 11 | 22 | 0 | 0 | 33 | 112 | 13 | 0 | 0 | 125 | 12 | 114 | 0 | 0 | 126 | 284 |
| 4:30 PM | 7 | 19 | 0 | 4 | 26 | 118 | 12 | 0 | 0 | 130 | 6 | 109 | 0 | 0 | 115 | 271 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4:45 PM | 2 | 14 | 0 | 5 | 16 | 90 | 19 | 0 | 0 | 109 | 18 | 125 | 0 | 1 | 143 | 268 |
| Hourly Total | 31 | 73 | 0 | 12 | 104 | 442 | 62 | 0 | 1 | 504 | 48 | 458 | 0 | 1 | 506 | 1114 |
| 5:00 PM | 9 | 20 | 0 | 8 | 29 | 122 | 12 | 0 | 1 | 134 | 11 | 119 | 1 | 0 | 131 | 294 |
| 5:15 PM | 16 | 11 | 0 | 0 | 27 | 94 | 18 | 0 | 0 | 112 | 14 | 128 | 0 | 0 | 142 | 281 |
| 5:30 PM | 9 | 23 | 0 | 0 | 32 | 103 | 19 | 0 | 1 | 122 | 11 | 113 | 0 | 0 | 124 | 278 |
| 5:45 PM | 7 | 13 | 0 | 8 | 20 | 94 | 8 | 0 | 0 | 102 | 9 | 119 | 0 | 0 | 128 | 250 |
| Hourly Total | 41 | 67 | 0 | 16 | 108 | 413 | 57 | 0 | 2 | 470 | 45 | 479 | 1 | 0 | 525 | 1103 |
| Grand Total | 214 | 407 | 0 | 158 | 621 | 3122 | 413 | 0 | 12 | 3535 | 322 | 3184 | 3 | 2 | 3509 | 7665 |
| Approach % | 34.5 | 65.5 | 0.0 | - | - | 88.3 | 11.7 | 0.0 | - | - | 9.2 | 90.7 | 0.1 | - | - | - |
| Total % | 2.8 | 5.3 | 0.0 | - | 8.1 | 40.7 | 5.4 | 0.0 | - | 46.1 | 4.2 | 41.5 | 0.0 | - | 45.8 | - |
| Lights | 213 | 404 | 0 | - | 617 | 3040 | 406 | 0 | - | 3446 | 314 | 3095 | 3 | - | 3412 | 7475 |
| % Lights | 99.5 | 99.3 | - | - | 99.4 | 97.4 | 98.3 | - | - | 97.5 | 97.5 | 97.2 | 100.0 | - | 97.2 | 97.5 |
| Buses | 0 | 1 | 0 | - | 1 | 37 | 2 | 0 | - | 39 | 1 | 44 | 0 | - | 45 | 85 |
| % Buses | 0.0 | 0.2 | - | - | 0.2 | 1.2 | 0.5 | - | - | 1.1 | 0.3 | 1.4 | 0.0 | - | 1.3 | 1.1 |
| Single-Unit Trucks | 1 | 2 | 0 | - | 3 | 43 | 3 | 0 | - | 46 | 4 | 39 | 0 | - | 43 | 92 |
| % Single-Unit Trucks | 0.5 | 0.5 | - | - | 0.5 | 1.4 | 0.7 | - | - | 1.3 | 1.2 | 1.2 | 0.0 | - | 1.2 | 1.2 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | 1 | 3 | 6 | 0 | - | 9 | 10 |
| % Articulated Trucks | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.9 | 0.2 | 0.0 | - | 0.3 | 0.1 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 1 | 2 | 0 | - | 3 | 0 | 0 | 0 | - | 0 | 3 |
| % Bicycles on Road | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.5 | - | - | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 1 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 0.6 | - | - | - | - | 0.0 | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | 157 | - | - | - | - | 12 | - | - | - | - | 2 | - | - |
| % Pedestrians | - | - | - | 99.4 | - | - | - | - | 100.0 | - | - | - | - | 100.0 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020

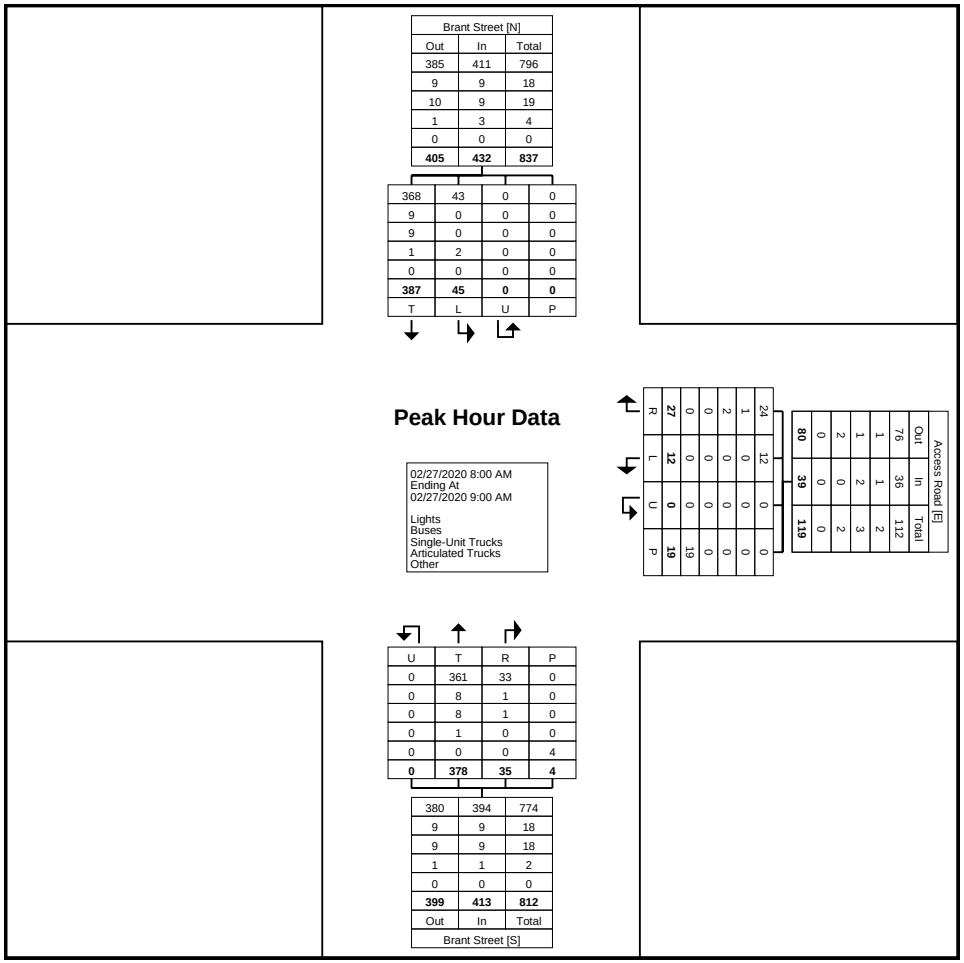

# Turning Movement Peak Hour Data (8:00 AM)

| Start Time | Access Road Westbound | | | | | Brant Street Northbound | | | | | Brant Street Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Int. Total |
| 8:00 AM | 4 | 10 | 0 | 2 | 14 | 100 | 11 | 0 | 1 | 111 | 9 | 89 | 0 | 0 | 98 | 223 |
| 8:15 AM | 0 | 5 | 0 | 7 | 5 | 105 | 5 | 0 | 1 | 110 | 9 | 93 | 0 | 0 | 102 | 217 |
| 8:30 AM | 3 | 5 | 0 | 7 | 8 | 85 | 11 | 0 | 1 | 96 | 14 | 94 | 0 | 0 | 108 | 212 |
| 8:45 AM | 5 | 7 | 0 | 3 | 12 | 88 | 8 | 0 | 1 | 96 | 13 | 111 | 0 | 0 | 124 | 232 |
| Total | 12 | 27 | 0 | 19 | 39 | 378 | 35 | 0 | 4 | 413 | 45 | 387 | 0 | 0 | 432 | 884 |
| Approach % | 30.8 | 69.2 | 0.0 | - | - | 91.5 | 8.5 | 0.0 | - | - | 10.4 | 89.6 | 0.0 | - | - | - |
| Total % | 1.4 | 3.1 | 0.0 | - | 4.4 | 42.8 | 4.0 | 0.0 | - | 46.7 | 5.1 | 43.8 | 0.0 | - | 48.9 | - |
| PHF | 0.600 | 0.675 | 0.000 | - | 0.696 | 0.900 | 0.795 | 0.000 | - | 0.930 | 0.804 | 0.872 | 0.000 | - | 0.871 | 0.953 |
| Lights | 12 | 24 | 0 | - | 36 | 361 | 33 | 0 | - | 394 | 43 | 368 | 0 | - | 411 | 841 |
| % Lights | 100.0 | 88.9 | - | - | 92.3 | 95.5 | 94.3 | - | - | 95.4 | 95.6 | 95.1 | - | - | 95.1 | 95.1 |
| Buses | 0 | 1 | 0 | - | 1 | 8 | 1 | 0 | - | 9 | 0 | 9 | 0 | - | 9 | 19 |
| % Buses | 0.0 | 3.7 | - | - | 2.6 | 2.1 | 2.9 | - | - | 2.2 | 0.0 | 2.3 | - | - | 2.1 | 2.1 |
| Single-Unit Trucks | 0 | 2 | 0 | - | 2 | 8 | 1 | 0 | - | 9 | 0 | 9 | 0 | - | 9 | 20 |
| % Single-Unit Trucks | 0.0 | 7.4 | - | - | 5.1 | 2.1 | 2.9 | - | - | 2.2 | 0.0 | 2.3 | - | - | 2.1 | 2.3 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | 1 | 2 | 1 | 0 | - | 3 | 4 |
| % Articulated Trucks | 0.0 | 0.0 | - | - | 0.0 | 0.3 | 0.0 | - | - | 0.2 | 4.4 | 0.3 | - | - | 0.7 | 0.5 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 1 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 5.3 | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 18 | - | - | - | - | 4 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | 94.7 | - | - | - | - | 100.0 | - | - | - | - | - | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020

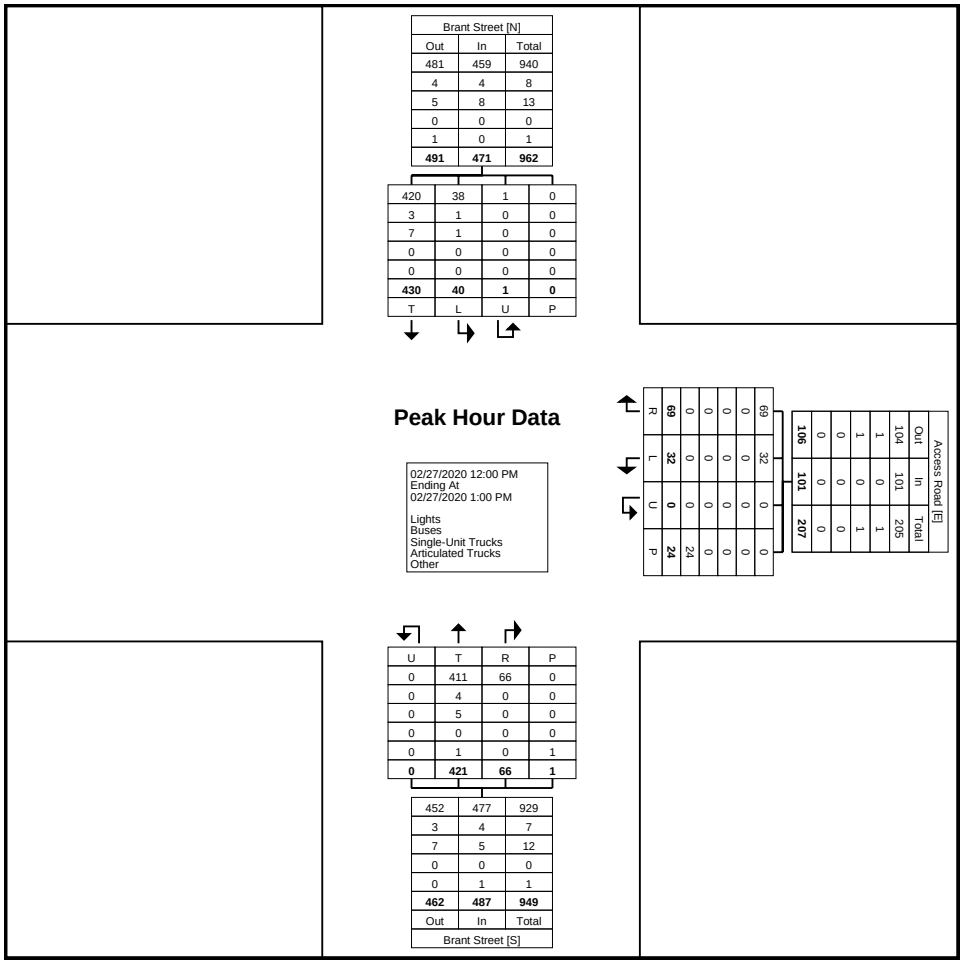

# Turning Movement Peak Hour Data (12:00 PM)

| Start Time | Access Road Westbound | | | | | Brant Street Northbound | | | | | Brant Street Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Int. Total |
| 12:00 PM | 8 | 18 | 0 | 0 | 26 | 115 | 16 | 0 | 0 | 131 | 14 | 104 | 0 | 0 | 118 | 275 |
| 12:15 PM | 10 | 17 | 0 | 14 | 27 | 87 | 18 | 0 | 0 | 105 | 12 | 94 | 0 | 0 | 106 | 238 |
| 12:30 PM | 4 | 20 | 0 | 5 | 24 | 106 | 17 | 0 | 1 | 123 | 8 | 104 | 0 | 0 | 112 | 259 |
| 12:45 PM | 10 | 14 | 0 | 5 | 24 | 113 | 15 | 0 | 0 | 128 | 6 | 128 | 1 | 0 | 135 | 287 |
| Total | 32 | 69 | 0 | 24 | 101 | 421 | 66 | 0 | 1 | 487 | 40 | 430 | 1 | 0 | 471 | 1059 |
| Approach % | 31.7 | 68.3 | 0.0 | - | - | 86.4 | 13.6 | 0.0 | - | - | 8.5 | 91.3 | 0.2 | - | - | - |
| Total % | 3.0 | 6.5 | 0.0 | - | 9.5 | 39.8 | 6.2 | 0.0 | - | 46.0 | 3.8 | 40.6 | 0.1 | - | 44.5 | - |
| PHF | 0.800 | 0.863 | 0.000 | - | 0.935 | 0.915 | 0.917 | 0.000 | - | 0.929 | 0.714 | 0.840 | 0.250 | - | 0.872 | 0.922 |
| Lights | 32 | 69 | 0 | - | 101 | 411 | 66 | 0 | - | 477 | 38 | 420 | 1 | - | 459 | 1037 |
| % Lights | 100.0 | 100.0 | - | - | 100.0 | 97.6 | 100.0 | - | - | 97.9 | 95.0 | 97.7 | 100.0 | - | 97.5 | 97.9 |
| Buses | 0 | 0 | 0 | - | 0 | 4 | 0 | 0 | - | 4 | 1 | 3 | 0 | - | 4 | 8 |
| % Buses | 0.0 | 0.0 | - | - | 0.0 | 1.0 | 0.0 | - | - | 0.8 | 2.5 | 0.7 | 0.0 | - | 0.8 | 0.8 |
| Single-Unit Trucks | 0 | 0 | 0 | - | 0 | 5 | 0 | 0 | - | 5 | 1 | 7 | 0 | - | 8 | 13 |
| % Single-Unit Trucks | 0.0 | 0.0 | - | - | 0.0 | 1.2 | 0.0 | - | - | 1.0 | 2.5 | 1.6 | 0.0 | - | 1.7 | 1.2 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | - | 0 | 1 |
| % Bicycles on Road | 0.0 | 0.0 | - | - | 0.0 | 0.2 | 0.0 | - | - | 0.2 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 0.0 | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 24 | - | - | - | - | 1 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | 100.0 | - | - | - | - | 100.0 | - | - | - | - | - | - | - |

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519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020

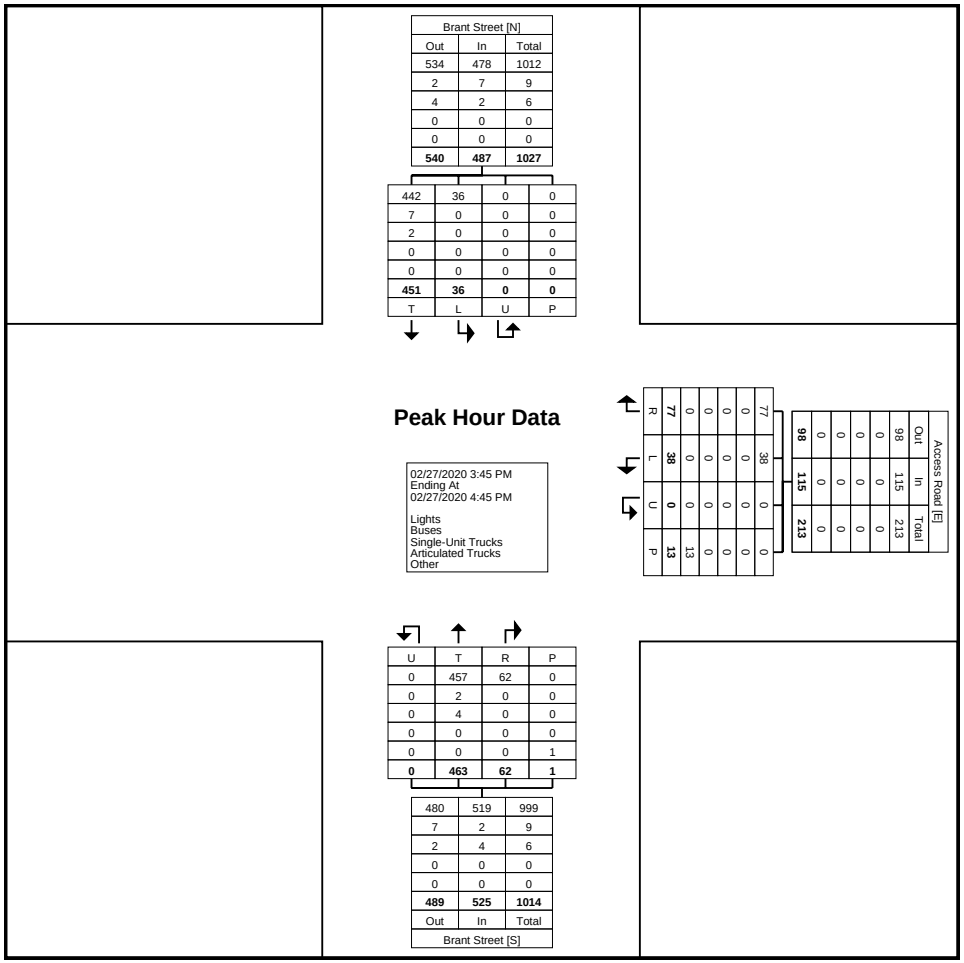

# Turning Movement Peak Hour Data (3:45 PM)

| Start Time | Access Road Westbound | | | | | Brant Street Northbound | | | | | Brant Street Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Right | U-Turn | Peds | App. Total | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | U-Turn | Peds | App. Total | Int. Total |
| 3:45 PM | 9 | 18 | 0 | 6 | 27 | 111 | 19 | 0 | 0 | 130 | 6 | 118 | 0 | 0 | 124 | 281 |
| 4:00 PM | 11 | 18 | 0 | 3 | 29 | 122 | 18 | 0 | 1 | 140 | 12 | 110 | 0 | 0 | 122 | 291 |
| 4:15 PM | 11 | 22 | 0 | 0 | 33 | 112 | 13 | 0 | 0 | 125 | 12 | 114 | 0 | 0 | 126 | 284 |
| 4:30 PM | 7 | 19 | 0 | 4 | 26 | 118 | 12 | 0 | 0 | 130 | 6 | 109 | 0 | 0 | 115 | 271 |
| Total | 38 | 77 | 0 | 13 | 115 | 463 | 62 | 0 | 1 | 525 | 36 | 451 | 0 | 0 | 487 | 1127 |
| Approach % | 33.0 | 67.0 | 0.0 | - | - | 88.2 | 11.8 | 0.0 | - | - | 7.4 | 92.6 | 0.0 | - | - | - |
| Total % | 3.4 | 6.8 | 0.0 | - | 10.2 | 41.1 | 5.5 | 0.0 | - | 46.6 | 3.2 | 40.0 | 0.0 | - | 43.2 | - |
| PHF | 0.864 | 0.875 | 0.000 | - | 0.871 | 0.949 | 0.816 | 0.000 | - | 0.938 | 0.750 | 0.956 | 0.000 | - | 0.966 | 0.968 |
| Lights | 38 | 77 | 0 | - | 115 | 457 | 62 | 0 | - | 519 | 36 | 442 | 0 | - | 478 | 1112 |
| % Lights | 100.0 | 100.0 | - | - | 100.0 | 98.7 | 100.0 | - | - | 98.9 | 100.0 | 98.0 | - | - | 98.2 | 98.7 |
| Buses | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | - | 2 | 0 | 7 | 0 | - | 7 | 9 |
| % Buses | 0.0 | 0.0 | - | - | 0.0 | 0.4 | 0.0 | - | - | 0.4 | 0.0 | 1.6 | - | - | 1.4 | 0.8 |
| Single-Unit Trucks | 0 | 0 | 0 | - | 0 | 4 | 0 | 0 | - | 4 | 0 | 2 | 0 | - | 2 | 6 |
| % Single-Unit Trucks | 0.0 | 0.0 | - | - | 0.0 | 0.9 | 0.0 | - | - | 0.8 | 0.0 | 0.4 | - | - | 0.4 | 0.5 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 0.0 | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 13 | - | - | - | - | 1 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | 100.0 | - | - | - | - | 100.0 | - | - | - | - | - | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Brant Street & Access Road
Site Code: 190080
Start Date: 02/27/2020

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Caroline Street & John Street
Site Code: 190080
Start Date: 02/27/2020


# Turning Movement Data

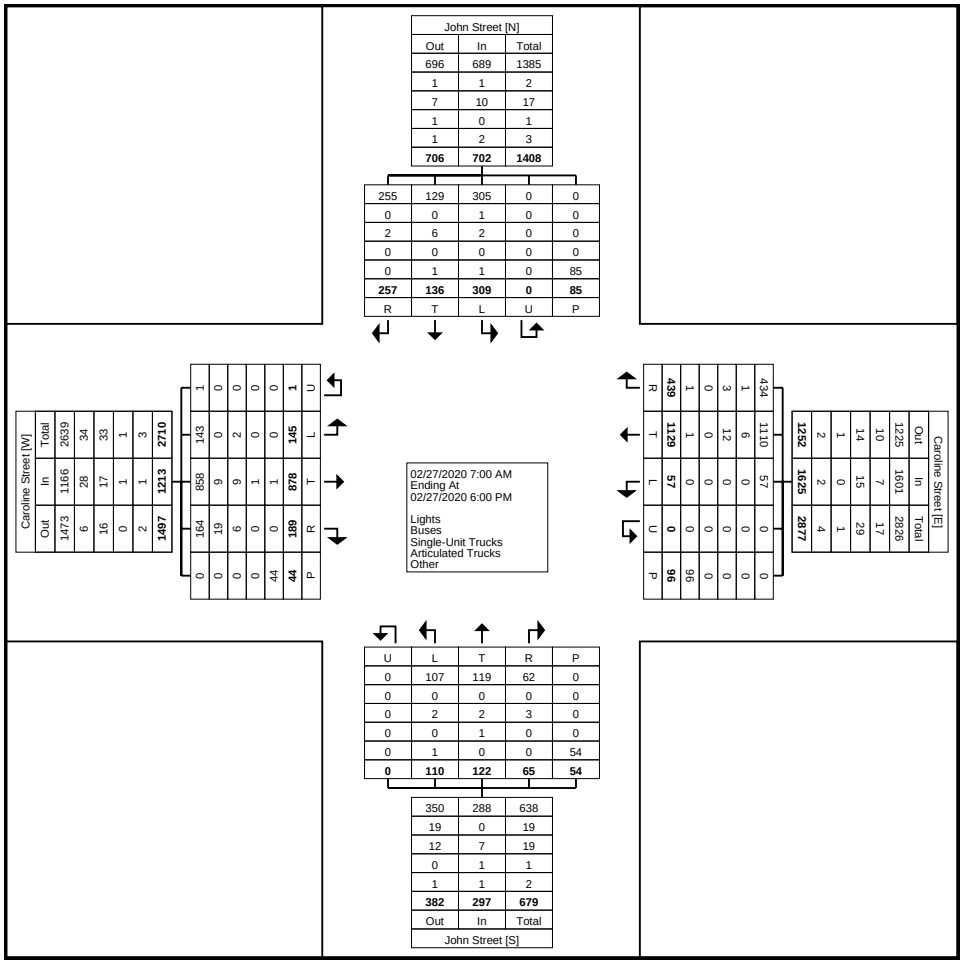
| Start Time | Caroline Street Eastbound | | | | | | Caroline Street Westbound | | | | | | John Street Northbound | | | | | | John Street Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:00 AM | 3 | 18 | 3 | 0 | 0 | 24 | 0 | 16 | 2 | 0 | 0 | 18 | 2 | 1 | 0 | 0 | 2 | 3 | 3 | 0 | 0 | 0 | 1 | 3 | 48 |
| 7:15 AM | 3 | 18 | 1 | 0 | 0 | 22 | 0 | 23 | 1 | 0 | 3 | 24 | 1 | 1 | 2 | 0 | 0 | 4 | 7 | 4 | 0 | 0 | 0 | 11 | 61 |
| 7:30 AM | 2 | 12 | 4 | 0 | 0 | 18 | 2 | 26 | 5 | 0 | 0 | 33 | 7 | 2 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| 7:45 AM | 6 | 25 | 7 | 0 | 1 | 38 | 3 | 41 | 5 | 0 | 2 | 49 | 4 | 3 | 0 | 0 | 2 | 7 | 4 | 1 | 3 | 0 | 1 | 8 | 102 |
| Hourly Total | 14 | 73 | 15 | 0 | 1 | 102 | 5 | 106 | 13 | 0 | 5 | 124 | 14 | 7 | 3 | 0 | 4 | 24 | 14 | 5 | 3 | 0 | 2 | 22 | 272 |
| 8:00 AM | 5 | 29 | 5 | 0 | 0 | 39 | 0 | 47 | 9 | 0 | 4 | 56 | 3 | 2 | 1 | 0 | 3 | 6 | 2 | 1 | 2 | 0 | 3 | 5 | 106 |
| 8:15 AM | 4 | 36 | 3 | 0 | 1 | 43 | 1 | 27 | 4 | 0 | 7 | 32 | 4 | 1 | 3 | 0 | 2 | 8 | 2 | 4 | 5 | 0 | 4 | 11 | 94 |
| 8:30 AM | 6 | 36 | 8 | 0 | 3 | 50 | 1 | 28 | 12 | 0 | 3 | 41 | 0 | 4 | 2 | 0 | 2 | 6 | 9 | 3 | 5 | 0 | 5 | 17 | 114 |
| 8:45 AM | 7 | 28 | 7 | 0 | 4 | 42 | 2 | 26 | 21 | 0 | 1 | 49 | 1 | 1 | 1 | 0 | 0 | 3 | 3 | 4 | 2 | 0 | 2 | 9 | 103 |
| Hourly Total | 22 | 129 | 23 | 0 | 8 | 174 | 4 | 128 | 46 | 0 | 15 | 178 | 8 | 8 | 7 | 0 | 7 | 23 | 16 | 12 | 14 | 0 | 14 | 42 | 417 |
| 9:00 AM | 4 | 15 | 3 | 0 | 4 | 22 | 2 | 24 | 12 | 0 | 4 | 38 | 2 | 6 | 3 | 0 | 0 | 11 | 11 | 5 | 5 | 0 | 3 | 21 | 92 |
| 9:15 AM | 0 | 25 | 8 | 0 | 1 | 33 | 1 | 27 | 15 | 0 | 3 | 43 | 2 | 3 | 4 | 0 | 3 | 9 | 6 | 6 | 2 | 0 | 0 | 14 | 99 |
| 9:30 AM | 2 | 24 | 7 | 0 | 0 | 33 | 1 | 23 | 12 | 0 | 3 | 36 | 4 | 2 | 6 | 0 | 1 | 12 | 7 | 4 | 7 | 0 | 1 | 18 | 99 |
| 9:45 AM | 9 | 16 | 8 | 0 | 1 | 33 | 1 | 25 | 10 | 0 | 2 | 36 | 4 | 2 | 0 | 0 | 1 | 6 | 9 | 7 | 8 | 0 | 2 | 24 | 99 |
| Hourly Total | 15 | 80 | 26 | 0 | 6 | 121 | 5 | 99 | 49 | 0 | 12 | 153 | 12 | 13 | 13 | 0 | 5 | 38 | 33 | 22 | 22 | 0 | 6 | 77 | 389 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11:30 AM | 4 | 21 | 7 | 0 | 1 | 32 | 2 | 32 | 12 | 0 | 7 | 46 | 5 | 6 | 1 | 0 | 1 | 12 | 9 | 0 | 7 | 0 | 1 | 16 | 106 |
| 11:45 AM | 5 | 29 | 5 | 0 | 2 | 39 | 1 | 30 | 14 | 0 | 3 | 45 | 2 | 5 | 2 | 0 | 1 | 9 | 17 | 1 | 10 | 0 | 2 | 28 | 121 |
| Hourly Total | 9 | 50 | 12 | 0 | 3 | 71 | 3 | 62 | 26 | 0 | 10 | 91 | 7 | 11 | 3 | 0 | 2 | 21 | 26 | 1 | 17 | 0 | 3 | 44 | 227 |
| 12:00 PM | 7 | 24 | 6 | 0 | 1 | 37 | 0 | 27 | 15 | 0 | 1 | 42 | 3 | 7 | 4 | 0 | 0 | 14 | 4 | 2 | 11 | 0 | 7 | 17 | 110 |
| 12:15 PM | 5 | 25 | 3 | 0 | 2 | 33 | 5 | 25 | 14 | 0 | 5 | 44 | 4 | 8 | 0 | 0 | 3 | 12 | 16 | 7 | 8 | 0 | 2 | 31 | 120 |
| 12:30 PM | 4 | 20 | 7 | 0 | 2 | 31 | 2 | 33 | 17 | 0 | 6 | 52 | 6 | 8 | 2 | 0 | 2 | 16 | 12 | 5 | 13 | 0 | 2 | 30 | 129 |
| 12:45 PM | 0 | 24 | 6 | 0 | 0 | 30 | 0 | 41 | 15 | 0 | 4 | 56 | 2 | 4 | 0 | 0 | 3 | 6 | 11 | 4 | 13 | 0 | 0 | 28 | 120 |
| Hourly Total | 16 | 93 | 22 | 0 | 5 | 131 | 7 | 126 | 61 | 0 | 16 | 194 | 15 | 27 | 6 | 0 | 8 | 48 | 43 | 18 | 45 | 0 | 11 | 106 | 479 |
| 1:00 PM | 9 | 35 | 7 | 0 | 2 | 51 | 2 | 41 | 13 | 0 | 3 | 56 | 2 | 4 | 3 | 0 | 1 | 9 | 12 | 4 | 7 | 0 | 4 | 23 | 139 |
| 1:15 PM | 4 | 34 | 6 | 1 | 3 | 45 | 1 | 34 | 17 | 0 | 2 | 52 | 3 | 1 | 1 | 0 | 1 | 5 | 14 | 5 | 7 | 0 | 1 | 26 | 128 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 13 | 69 | 13 | 1 | 5 | 96 | 3 | 75 | 30 | 0 | 5 | 108 | 5 | 5 | 4 | 0 | 2 | 14 | 26 | 9 | 14 | 0 | 5 | 49 | 267 |
| 3:00 PM | 3 | 28 | 4 | 0 | 0 | 35 | 2 | 39 | 23 | 0 | 1 | 64 | 5 | 2 | 2 | 0 | 1 | 9 | 10 | 6 | 10 | 0 | 0 | 26 | 134 |
| 3:15 PM | 9 | 32 | 4 | 0 | 3 | 45 | 0 | 38 | 21 | 0 | 6 | 59 | 7 | 6 | 4 | 0 | 2 | 17 | 19 | 6 | 10 | 0 | 2 | 35 | 156 |
| 3:30 PM | 1 | 30 | 6 | 0 | 1 | 37 | 4 | 34 | 17 | 0 | 3 | 55 | 5 | 3 | 1 | 0 | 4 | 9 | 13 | 6 | 10 | 0 | 5 | 29 | 130 |
| 3:45 PM | 3 | 29 | 9 | 0 | 2 | 41 | 3 | 57 | 12 | 0 | 3 | 72 | 6 | 3 | 4 | 0 | 3 | 13 | 3 | 7 | 11 | 0 | 3 | 21 | 147 |
| Hourly Total | 16 | 119 | 23 | 0 | 6 | 158 | 9 | 168 | 73 | 0 | 13 | 250 | 23 | 14 | 11 | 0 | 10 | 48 | 45 | 25 | 41 | 0 | 10 | 111 | 567 |
| 4:00 PM | 7 | 27 | 4 | 0 | 2 | 38 | 4 | 53 | 21 | 0 | 6 | 78 | 1 | 8 | 0 | 0 | 3 | 9 | 11 | 2 | 9 | 0 | 3 | 22 | 147 |
| 4:15 PM | 5 | 40 | 12 | 0 | 0 | 57 | 2 | 43 | 13 | 0 | 1 | 58 | 7 | 6 | 4 | 0 | 2 | 17 | 15 | 5 | 7 | 0 | 3 | 27 | 159 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4:30 PM | 7 | 24 | 9 | 0 | 2 | 40 | 3 | 52 | 16 | 0 | 5 | 71 | 3 | 4 | 3 | 0 | 1 | 10 | 13 | 6 | 17 | 0 | 13 | 36 | 157 |
| 4:45 PM | 5 | 43 | 6 | 0 | 1 | 54 | 6 | 59 | 20 | 0 | 2 | 85 | 3 | 6 | 3 | 0 | 1 | 12 | 11 | 6 | 14 | 0 | 5 | 31 | 182 |
| Hourly Total | 24 | 134 | 31 | 0 | 5 | 189 | 15 | 207 | 70 | 0 | 14 | 292 | 14 | 24 | 10 | 0 | 7 | 48 | 50 | 19 | 47 | 0 | 24 | 116 | 645 |
| 5:00 PM | 3 | 37 | 6 | 0 | 2 | 46 | 2 | 50 | 24 | 0 | 3 | 76 | 2 | 2 | 3 | 0 | 0 | 7 | 21 | 7 | 15 | 0 | 2 | 43 | 172 |
| 5:15 PM | 5 | 36 | 7 | 0 | 2 | 48 | 0 | 40 | 17 | 0 | 0 | 57 | 2 | 6 | 1 | 0 | 2 | 9 | 14 | 7 | 13 | 0 | 6 | 34 | 148 |
| 5:30 PM | 4 | 27 | 7 | 0 | 0 | 38 | 1 | 31 | 15 | 0 | 3 | 47 | 4 | 3 | 2 | 0 | 1 | 9 | 8 | 7 | 15 | 0 | 2 | 30 | 124 |
| 5:45 PM | 4 | 31 | 4 | 0 | 1 | 39 | 3 | 37 | 15 | 0 | 0 | 55 | 4 | 2 | 2 | 0 | 6 | 8 | 13 | 4 | 11 | 0 | 0 | 28 | 130 |
| Hourly Total | 16 | 131 | 24 | 0 | 5 | 171 | 6 | 158 | 71 | 0 | 6 | 235 | 12 | 13 | 8 | 0 | 9 | 33 | 56 | 25 | 54 | 0 | 10 | 135 | 574 |
| Grand Total | 145 | 878 | 189 | 1 | 44 | 1213 | 57 | 1129 | 439 | 0 | 96 | 1625 | 110 | 122 | 65 | 0 | 54 | 297 | 309 | 136 | 257 | 0 | 85 | 702 | 3837 |
| Approach % | 12.0 | 72.4 | 15.6 | 0.1 | - | - | 3.5 | 69.5 | 27.0 | 0.0 | - | - | 37.0 | 41.1 | 21.9 | 0.0 | - | - | 44.0 | 19.4 | 36.6 | 0.0 | - | - | - |
| Total % | 3.8 | 22.9 | 4.9 | 0.0 | - | 31.6 | 1.5 | 29.4 | 11.4 | 0.0 | - | 42.4 | 2.9 | 3.2 | 1.7 | 0.0 | - | 7.7 | 8.1 | 3.5 | 6.7 | 0.0 | - | 18.3 | - |
| Lights | 143 | 858 | 164 | 1 | - | 1166 | 57 | 1110 | 434 | 0 | - | 1601 | 107 | 119 | 62 | 0 | - | 288 | 305 | 129 | 255 | 0 | - | 689 | 3744 |
| % Lights | 98.6 | 97.7 | 86.8 | 100.0 | - | 96.1 | 100.0 | 98.3 | 98.9 | - | - | 98.5 | 97.3 | 97.5 | 95.4 | - | - | 97.0 | 98.7 | 94.9 | 99.2 | - | - | 98.1 | 97.6 |
| Buses | 0 | 9 | 19 | 0 | - | 28 | 0 | 6 | 1 | 0 | - | 7 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 36 |
| % Buses | 0.0 | 1.0 | 10.1 | 0.0 | - | 2.3 | 0.0 | 0.5 | 0.2 | - | - | 0.4 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.3 | 0.0 | 0.0 | - | - | 0.1 | 0.9 |
| Single-Unit Trucks | 2 | 9 | 6 | 0 | - | 17 | 0 | 12 | 3 | 0 | - | 15 | 2 | 2 | 3 | 0 | - | 7 | 2 | 6 | 2 | 0 | - | 10 | 49 |
| % Single-Unit Trucks | 1.4 | 1.0 | 3.2 | 0.0 | - | 1.4 | 0.0 | 1.1 | 0.7 | - | - | 0.9 | 1.8 | 1.6 | 4.6 | - | - | 2.4 | 0.6 | 4.4 | 0.8 | - | - | 1.4 | 1.3 |
| Articulated Trucks | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Articulated Trucks | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.8 | 0.0 | - | - | 0.3 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.1 |
| Bicycles on Road | 0 | 1 | 0 | 0 | - | 1 | 0 | 1 | 1 | 0 | - | 2 | 1 | 0 | 0 | 0 | - | 1 | 1 | 1 | 0 | 0 | - | 2 | 6 |
| % Bicycles on Road | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.1 | 0.2 | - | - | 0.1 | 0.9 | 0.0 | 0.0 | - | - | 0.3 | 0.3 | 0.7 | 0.0 | - | - | 0.3 | 0.2 |
| Bicycles on Crosswalk | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 2.3 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 43 | - | - | - | - | - | 96 | - | - | - | - | - | 54 | - | - | - | - | - | 85 | - | - |
| % Pedestrians | - | - | - | - | 97.7 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Caroline Street & John Street
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Data Plot

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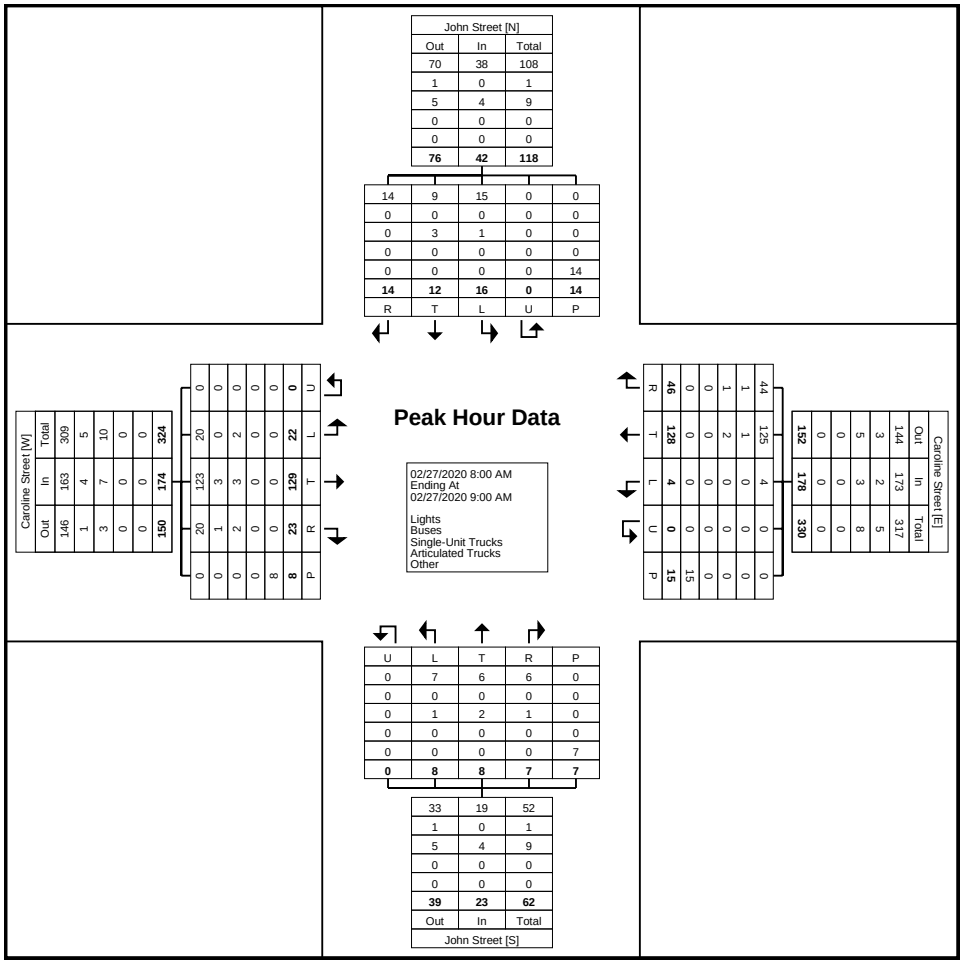

# Turning Movement Peak Hour Data (8:00 AM)

| Start Time | Caroline Street Eastbound | | | | | | Caroline Street Westbound | | | | | | John Street Northbound | | | | | | John Street Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 8:00 AM | 5 | 29 | 5 | 0 | 0 | 39 | 0 | 47 | 9 | 0 | 4 | 56 | 3 | 2 | 1 | 0 | 3 | 6 | 2 | 1 | 2 | 0 | 3 | 5 | 106 |
| 8:15 AM | 4 | 36 | 3 | 0 | 1 | 43 | 1 | 27 | 4 | 0 | 7 | 32 | 4 | 1 | 3 | 0 | 2 | 8 | 2 | 4 | 5 | 0 | 4 | 11 | 94 |
| 8:30 AM | 6 | 36 | 8 | 0 | 3 | 50 | 1 | 28 | 12 | 0 | 3 | 41 | 0 | 4 | 2 | 0 | 2 | 6 | 9 | 3 | 5 | 0 | 5 | 17 | 114 |
| 8:45 AM | 7 | 28 | 7 | 0 | 4 | 42 | 2 | 26 | 21 | 0 | 1 | 49 | 1 | 1 | 1 | 0 | 0 | 3 | 3 | 4 | 2 | 0 | 2 | 9 | 103 |
| Total | 22 | 129 | 23 | 0 | 8 | 174 | 4 | 128 | 46 | 0 | 15 | 178 | 8 | 8 | 7 | 0 | 7 | 23 | 16 | 12 | 14 | 0 | 14 | 42 | 417 |
| Approach % | 12.6 | 74.1 | 13.2 | 0.0 | - | - | 2.2 | 71.9 | 25.8 | 0.0 | - | - | 34.8 | 34.8 | 30.4 | 0.0 | - | - | 38.1 | 28.6 | 33.3 | 0.0 | - | - | - |
| Total % | 5.3 | 30.9 | 5.5 | 0.0 | - | 41.7 | 1.0 | 30.7 | 11.0 | 0.0 | - | 42.7 | 1.9 | 1.9 | 1.7 | 0.0 | - | 5.5 | 3.8 | 2.9 | 3.4 | 0.0 | - | 10.1 | - |
| PHF | 0.786 | 0.896 | 0.719 | 0.000 | - | 0.870 | 0.500 | 0.681 | 0.548 | 0.000 | - | 0.795 | 0.500 | 0.500 | 0.583 | 0.000 | - | 0.719 | 0.444 | 0.750 | 0.700 | 0.000 | - | 0.618 | 0.914 |
| Lights | 20 | 123 | 20 | 0 | - | 163 | 4 | 125 | 44 | 0 | - | 173 | 7 | 6 | 6 | 0 | - | 19 | 15 | 9 | 14 | 0 | - | 38 | 393 |
| % Lights | 90.9 | 95.3 | 87.0 | - | - | 93.7 | 100.0 | 97.7 | 95.7 | - | - | 97.2 | 87.5 | 75.0 | 85.7 | - | - | 82.6 | 93.8 | 75.0 | 100.0 | - | - | 90.5 | 94.2 |
| Buses | 0 | 3 | 1 | 0 | - | 4 | 0 | 1 | 1 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 6 |
| % Buses | 0.0 | 2.3 | 4.3 | - | - | 2.3 | 0.0 | 0.8 | 2.2 | - | - | 1.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 1.4 |
| Single-Unit Trucks | 2 | 3 | 2 | 0 | - | 7 | 0 | 2 | 1 | 0 | - | 3 | 1 | 2 | 1 | 0 | - | 4 | 1 | 3 | 0 | 0 | - | 4 | 18 |
| % Single-Unit Trucks | 9.1 | 2.3 | 8.7 | - | - | 4.0 | 0.0 | 1.6 | 2.2 | - | - | 1.7 | 12.5 | 25.0 | 14.3 | - | - | 17.4 | 6.3 | 25.0 | 0.0 | - | - | 9.5 | 4.3 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 8 | - | - | - | - | - | 15 | - | - | - | - | - | 7 | - | - | - | - | - | 14 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - |

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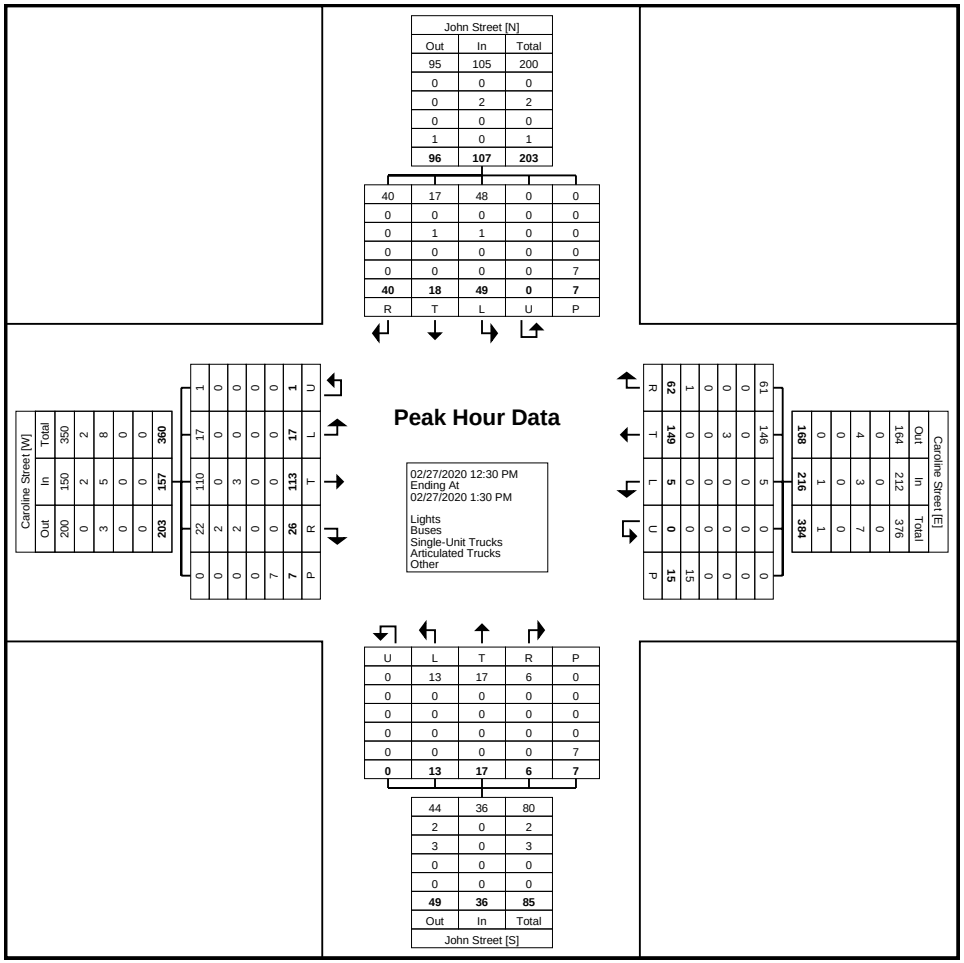

# Turning Movement Peak Hour Data (12:30 PM)

| Start Time | Caroline Street Eastbound | | | | | | Caroline Street Westbound | | | | | | John Street Northbound | | | | | | John Street Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:30 PM | 4 | 20 | 7 | 0 | 2 | 31 | 2 | 33 | 17 | 0 | 6 | 52 | 6 | 8 | 2 | 0 | 2 | 16 | 12 | 5 | 13 | 0 | 2 | 30 | 129 |
| 12:45 PM | 0 | 24 | 6 | 0 | 0 | 30 | 0 | 41 | 15 | 0 | 4 | 56 | 2 | 4 | 0 | 0 | 3 | 6 | 11 | 4 | 13 | 0 | 0 | 28 | 120 |
| 1:00 PM | 9 | 35 | 7 | 0 | 2 | 51 | 2 | 41 | 13 | 0 | 3 | 56 | 2 | 4 | 3 | 0 | 1 | 9 | 12 | 4 | 7 | 0 | 4 | 23 | 139 |
| 1:15 PM | 4 | 34 | 6 | 1 | 3 | 45 | 1 | 34 | 17 | 0 | 2 | 52 | 3 | 1 | 1 | 0 | 1 | 5 | 14 | 5 | 7 | 0 | 1 | 26 | 128 |
| Total | 17 | 113 | 26 | 1 | 7 | 157 | 5 | 149 | 62 | 0 | 15 | 216 | 13 | 17 | 6 | 0 | 7 | 36 | 49 | 18 | 40 | 0 | 7 | 107 | 516 |
| Approach % | 10.8 | 72.0 | 16.6 | 0.6 | - | - | 2.3 | 69.0 | 28.7 | 0.0 | - | - | 36.1 | 47.2 | 16.7 | 0.0 | - | - | 45.8 | 16.8 | 37.4 | 0.0 | - | - | - |
| Total % | 3.3 | 21.9 | 5.0 | 0.2 | - | 30.4 | 1.0 | 28.9 | 12.0 | 0.0 | - | 41.9 | 2.5 | 3.3 | 1.2 | 0.0 | - | 7.0 | 9.5 | 3.5 | 7.8 | 0.0 | - | 20.7 | - |
| PHF | 0.472 | 0.807 | 0.929 | 0.250 | - | 0.770 | 0.625 | 0.909 | 0.912 | 0.000 | - | 0.964 | 0.542 | 0.531 | 0.500 | 0.000 | - | 0.563 | 0.875 | 0.900 | 0.769 | 0.000 | - | 0.892 | 0.928 |
| Lights | 17 | 110 | 22 | 1 | - | 150 | 5 | 146 | 61 | 0 | - | 212 | 13 | 17 | 6 | 0 | - | 36 | 48 | 17 | 40 | 0 | - | 105 | 503 |
| % Lights | 100.0 | 97.3 | 84.6 | 100.0 | - | 95.5 | 100.0 | 98.0 | 98.4 | - | - | 98.1 | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 98.0 | 94.4 | 100.0 | - | - | 98.1 | 97.5 |
| Buses | 0 | 0 | 2 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Buses | 0.0 | 0.0 | 7.7 | 0.0 | - | 1.3 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.4 |
| Single-Unit Trucks | 0 | 3 | 2 | 0 | - | 5 | 0 | 3 | 0 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 1 | 1 | 0 | 0 | - | 2 | 10 |
| % Single-Unit Trucks | 0.0 | 2.7 | 7.7 | 0.0 | - | 3.2 | 0.0 | 2.0 | 0.0 | - | - | 1.4 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 2.0 | 5.6 | 0.0 | - | - | 1.9 | 1.9 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 1.6 | - | - | 0.5 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.2 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 7 | - | - | - | - | - | 15 | - | - | - | - | - | 7 | - | - | - | - | - | 7 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Caroline Street & John Street
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (12:30 PM)

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5A-150 Pinebush Rd

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519-896-3163 cbowness@ptsl.com

Count Name: Caroline Street & John Street
Site Code: 190080
Start Date: 02/27/2020

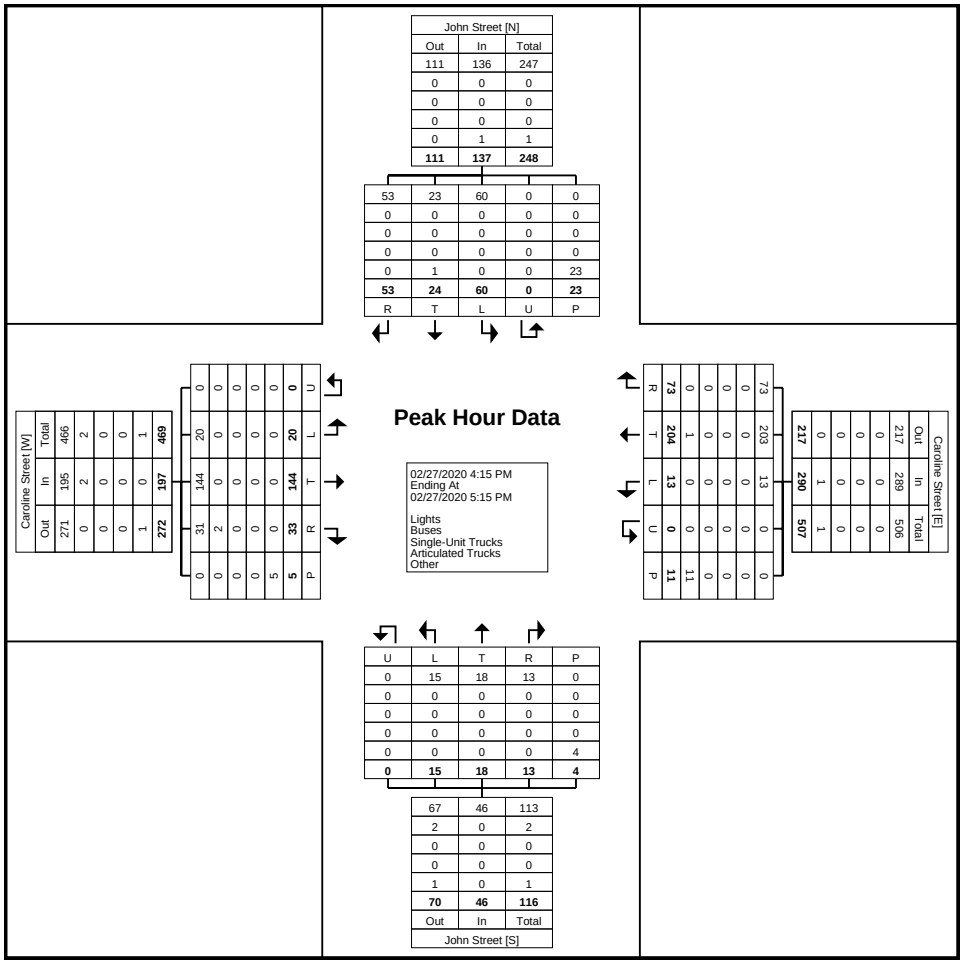

# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | Caroline Street Eastbound | | | | | | Caroline Street Westbound | | | | | | John Street Northbound | | | | | | John Street Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 4:15 PM | 5 | 40 | 12 | 0 | 0 | 57 | 2 | 43 | 13 | 0 | 1 | 58 | 7 | 6 | 4 | 0 | 2 | 17 | 15 | 5 | 7 | 0 | 3 | 27 | 159 |
| 4:30 PM | 7 | 24 | 9 | 0 | 2 | 40 | 3 | 52 | 16 | 0 | 5 | 71 | 3 | 4 | 3 | 0 | 1 | 10 | 13 | 6 | 17 | 0 | 13 | 36 | 157 |
| 4:45 PM | 5 | 43 | 6 | 0 | 1 | 54 | 6 | 59 | 20 | 0 | 2 | 85 | 3 | 6 | 3 | 0 | 1 | 12 | 11 | 6 | 14 | 0 | 5 | 31 | 182 |
| 5:00 PM | 3 | 37 | 6 | 0 | 2 | 46 | 2 | 50 | 24 | 0 | 3 | 76 | 2 | 2 | 3 | 0 | 0 | 7 | 21 | 7 | 15 | 0 | 2 | 43 | 172 |
| Total | 20 | 144 | 33 | 0 | 5 | 197 | 13 | 204 | 73 | 0 | 11 | 290 | 15 | 18 | 13 | 0 | 4 | 46 | 60 | 24 | 53 | 0 | 23 | 137 | 670 |
| Approach % | 10.2 | 73.1 | 16.8 | 0.0 | - | - | 4.5 | 70.3 | 25.2 | 0.0 | - | - | 32.6 | 39.1 | 28.3 | 0.0 | - | - | 43.8 | 17.5 | 38.7 | 0.0 | - | - | - |
| Total % | 3.0 | 21.5 | 4.9 | 0.0 | - | 29.4 | 1.9 | 30.4 | 10.9 | 0.0 | - | 43.3 | 2.2 | 2.7 | 1.9 | 0.0 | - | 6.9 | 9.0 | 3.6 | 7.9 | 0.0 | - | 20.4 | - |
| PHF | 0.714 | 0.837 | 0.688 | 0.000 | - | 0.864 | 0.542 | 0.864 | 0.760 | 0.000 | - | 0.853 | 0.536 | 0.750 | 0.813 | 0.000 | - | 0.676 | 0.714 | 0.857 | 0.779 | 0.000 | - | 0.797 | 0.920 |
| Lights | 20 | 144 | 31 | 0 | - | 195 | 13 | 203 | 73 | 0 | - | 289 | 15 | 18 | 13 | 0 | - | 46 | 60 | 23 | 53 | 0 | - | 136 | 666 |
| % Lights | 100.0 | 100.0 | 93.9 | - | - | 99.0 | 100.0 | 99.5 | 100.0 | - | - | 99.7 | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 100.0 | 95.8 | 100.0 | - | - | 99.3 | 99.4 |
| Buses | 0 | 0 | 2 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Buses | 0.0 | 0.0 | 6.1 | - | - | 1.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.3 |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Single-Unit Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 2 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.5 | 0.0 | - | - | 0.3 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 4.2 | 0.0 | - | - | 0.7 | 0.3 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 5 | - | - | - | - | - | 11 | - | - | - | - | - | 4 | - | - | - | - | - | 23 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - |

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Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (4:15 PM)

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Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: John Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


# Turning Movement Data

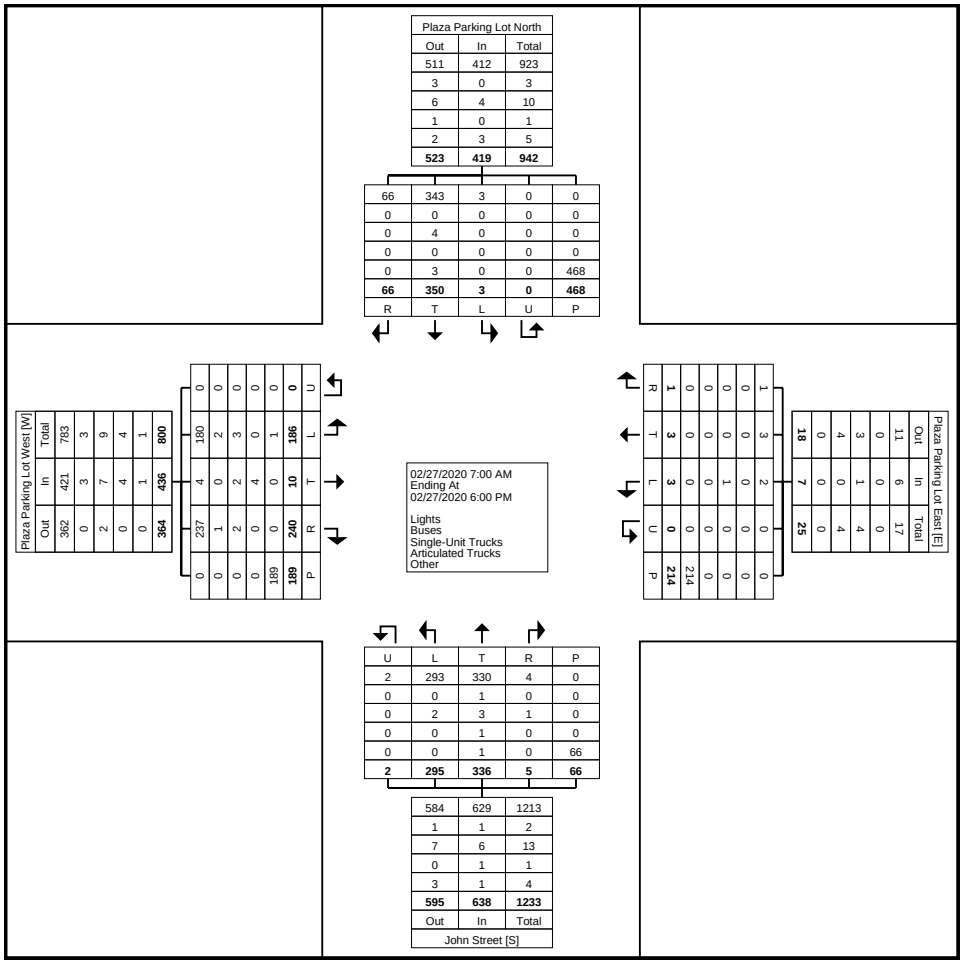
| Start Time | Plaza Parking Lot West Eastbound | | | | | | Plaza Parking Lot East Westbound | | | | | | John Street Northbound | | | | | | Plaza Parking Lot North Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:00 AM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 7:15 AM | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 4 | 0 | 0 | 0 | 4 | 14 |
| 7:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 2 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 2 | 0 | 10 |
| 7:45 AM | 3 | 0 | 4 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 3 | 0 | 1 | 0 | 7 | 0 | 4 | 1 | 0 | 3 | 5 | 19 |
| Hourly Total | 3 | 0 | 11 | 0 | 1 | 14 | 0 | 0 | 0 | 0 | 1 | 0 | 18 | 6 | 1 | 1 | 0 | 26 | 0 | 8 | 1 | 0 | 5 | 9 | 49 |
| 8:00 AM | 0 | 1 | 9 | 0 | 2 | 10 | 0 | 0 | 0 | 0 | 7 | 0 | 11 | 3 | 0 | 0 | 5 | 14 | 0 | 0 | 1 | 0 | 3 | 1 | 25 |
| 8:15 AM | 0 | 0 | 12 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 5 | 0 | 3 | 2 | 0 | 0 | 4 | 5 | 0 | 4 | 0 | 0 | 2 | 4 | 21 |
| 8:30 AM | 1 | 0 | 13 | 0 | 4 | 14 | 0 | 0 | 1 | 0 | 0 | 1 | 6 | 10 | 1 | 0 | 2 | 17 | 0 | 6 | 2 | 0 | 5 | 8 | 40 |
| 8:45 AM | 0 | 2 | 7 | 0 | 5 | 9 | 0 | 0 | 0 | 0 | 2 | 0 | 9 | 11 | 0 | 0 | 1 | 20 | 0 | 5 | 1 | 0 | 3 | 6 | 35 |
| Hourly Total | 1 | 3 | 41 | 0 | 12 | 45 | 0 | 0 | 1 | 0 | 14 | 1 | 29 | 26 | 1 | 0 | 12 | 56 | 0 | 15 | 4 | 0 | 13 | 19 | 121 |
| 9:00 AM | 6 | 0 | 13 | 0 | 5 | 19 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 12 | 1 | 0 | 2 | 18 | 0 | 15 | 0 | 0 | 18 | 15 | 52 |
| 9:15 AM | 0 | 0 | 8 | 0 | 5 | 8 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 6 | 0 | 0 | 1 | 12 | 1 | 9 | 2 | 0 | 9 | 12 | 32 |
| 9:30 AM | 7 | 0 | 8 | 0 | 4 | 15 | 0 | 0 | 0 | 0 | 3 | 0 | 9 | 8 | 0 | 0 | 0 | 17 | 0 | 11 | 2 | 0 | 13 | 13 | 45 |
| 9:45 AM | 4 | 0 | 8 | 0 | 8 | 12 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 6 | 0 | 1 | 0 | 12 | 0 | 9 | 3 | 0 | 15 | 12 | 36 |
| Hourly Total | 17 | 0 | 37 | 0 | 22 | 54 | 0 | 0 | 0 | 0 | 7 | 0 | 25 | 32 | 1 | 1 | 3 | 59 | 1 | 44 | 7 | 0 | 55 | 52 | 165 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11:30 AM | 8 | 0 | 4 | 0 | 10 | 12 | 0 | 0 | 0 | 0 | 47 | 0 | 6 | 16 | 1 | 0 | 0 | 23 | 0 | 10 | 3 | 0 | 18 | 13 | 48 |
| 11:45 AM | 5 | 0 | 9 | 0 | 9 | 14 | 0 | 0 | 0 | 0 | 7 | 0 | 13 | 11 | 0 | 0 | 5 | 24 | 1 | 17 | 4 | 0 | 13 | 22 | 60 |
| Hourly Total | 13 | 0 | 13 | 0 | 19 | 26 | 0 | 0 | 0 | 0 | 54 | 0 | 19 | 27 | 1 | 0 | 5 | 47 | 1 | 27 | 7 | 0 | 31 | 35 | 108 |
| 12:00 PM | 8 | 1 | 2 | 0 | 10 | 11 | 0 | 0 | 0 | 0 | 13 | 0 | 11 | 11 | 0 | 0 | 3 | 22 | 0 | 10 | 4 | 0 | 24 | 14 | 47 |
| 12:15 PM | 11 | 0 | 9 | 0 | 20 | 20 | 0 | 1 | 0 | 0 | 15 | 1 | 14 | 18 | 0 | 0 | 7 | 32 | 0 | 16 | 1 | 0 | 34 | 17 | 70 |
| 12:30 PM | 11 | 1 | 7 | 0 | 13 | 19 | 2 | 0 | 0 | 0 | 7 | 2 | 10 | 10 | 0 | 0 | 0 | 20 | 0 | 12 | 3 | 0 | 24 | 15 | 56 |
| 12:45 PM | 6 | 0 | 8 | 0 | 3 | 14 | 0 | 0 | 0 | 0 | 6 | 0 | 12 | 10 | 0 | 0 | 2 | 22 | 0 | 17 | 0 | 0 | 6 | 17 | 53 |
| Hourly Total | 36 | 2 | 26 | 0 | 46 | 64 | 2 | 1 | 0 | 0 | 41 | 3 | 47 | 49 | 0 | 0 | 12 | 96 | 0 | 55 | 8 | 0 | 88 | 63 | 226 |
| 1:00 PM | 11 | 2 | 5 | 0 | 3 | 18 | 0 | 1 | 0 | 0 | 1 | 1 | 10 | 15 | 0 | 0 | 1 | 25 | 0 | 15 | 2 | 0 | 6 | 17 | 61 |
| 1:15 PM | 6 | 1 | 6 | 0 | 11 | 13 | 0 | 0 | 0 | 0 | 4 | 0 | 8 | 13 | 0 | 0 | 0 | 21 | 0 | 16 | 4 | 0 | 11 | 20 | 54 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 17 | 3 | 11 | 0 | 14 | 31 | 0 | 1 | 0 | 0 | 5 | 1 | 18 | 28 | 0 | 0 | 1 | 46 | 0 | 31 | 6 | 0 | 17 | 37 | 115 |
| 3:00 PM | 21 | 0 | 8 | 0 | 4 | 29 | 0 | 0 | 0 | 0 | 8 | 0 | 7 | 22 | 0 | 0 | 1 | 29 | 0 | 18 | 0 | 0 | 46 | 18 | 76 |
| 3:15 PM | 11 | 1 | 10 | 0 | 3 | 22 | 0 | 0 | 0 | 0 | 5 | 0 | 13 | 17 | 0 | 0 | 0 | 30 | 0 | 16 | 2 | 0 | 33 | 18 | 70 |
| 3:30 PM | 5 | 0 | 9 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 13 | 0 | 9 | 16 | 0 | 0 | 0 | 25 | 0 | 13 | 4 | 0 | 37 | 17 | 56 |
| 3:45 PM | 7 | 0 | 9 | 0 | 5 | 16 | 0 | 0 | 0 | 0 | 12 | 0 | 13 | 7 | 0 | 0 | 1 | 20 | 0 | 11 | 7 | 0 | 25 | 18 | 54 |
| Hourly Total | 44 | 1 | 36 | 0 | 16 | 81 | 0 | 0 | 0 | 0 | 38 | 0 | 42 | 62 | 0 | 0 | 2 | 104 | 0 | 58 | 13 | 0 | 141 | 71 | 256 |
| 4:00 PM | 8 | 0 | 9 | 0 | 20 | 17 | 1 | 0 | 0 | 0 | 8 | 1 | 20 | 15 | 0 | 0 | 13 | 35 | 0 | 8 | 0 | 0 | 16 | 8 | 61 |
| 4:15 PM | 7 | 0 | 7 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 15 | 0 | 9 | 16 | 0 | 0 | 1 | 25 | 0 | 13 | 3 | 0 | 10 | 16 | 55 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4:30 PM | 6 | 0 | 8 | 0 | 5 | 14 | 0 | 0 | 0 | 0 | 10 | 0 | 19 | 10 | 0 | 0 | 6 | 29 | 1 | 11 | 3 | 0 | 23 | 15 | 58 |
| 4:45 PM | 13 | 0 | 12 | 0 | 9 | 25 | 0 | 0 | 0 | 0 | 6 | 0 | 9 | 19 | 0 | 0 | 2 | 28 | 0 | 10 | 5 | 0 | 19 | 15 | 68 |
| Hourly Total | 34 | 0 | 36 | 0 | 38 | 70 | 1 | 0 | 0 | 0 | 39 | 1 | 57 | 60 | 0 | 0 | 22 | 117 | 1 | 42 | 11 | 0 | 68 | 54 | 242 |
| 5:00 PM | 4 | 0 | 11 | 0 | 5 | 15 | 0 | 1 | 0 | 0 | 5 | 1 | 13 | 11 | 1 | 0 | 3 | 25 | 0 | 23 | 1 | 0 | 13 | 24 | 65 |
| 5:15 PM | 8 | 1 | 10 | 0 | 3 | 19 | 0 | 0 | 0 | 0 | 1 | 0 | 10 | 14 | 0 | 0 | 0 | 24 | 0 | 18 | 3 | 0 | 10 | 21 | 64 |
| 5:30 PM | 6 | 0 | 4 | 0 | 6 | 10 | 0 | 0 | 0 | 0 | 4 | 0 | 8 | 13 | 0 | 0 | 3 | 21 | 0 | 12 | 4 | 0 | 13 | 16 | 47 |
| 5:45 PM | 3 | 0 | 4 | 0 | 7 | 7 | 0 | 0 | 0 | 0 | 5 | 0 | 9 | 8 | 0 | 0 | 3 | 17 | 0 | 17 | 1 | 0 | 14 | 18 | 42 |
| Hourly Total | 21 | 1 | 29 | 0 | 21 | 51 | 0 | 1 | 0 | 0 | 15 | 1 | 40 | 46 | 1 | 0 | 9 | 87 | 0 | 70 | 9 | 0 | 50 | 79 | 218 |
| Grand Total | 186 | 10 | 240 | 0 | 189 | 436 | 3 | 3 | 1 | 0 | 214 | 7 | 295 | 336 | 5 | 2 | 66 | 638 | 3 | 350 | 66 | 0 | 468 | 419 | 1500 |
| Approach % | 42.7 | 2.3 | 55.0 | 0.0 | - | - | 42.9 | 42.9 | 14.3 | 0.0 | - | - | 46.2 | 52.7 | 0.8 | 0.3 | - | - | 0.7 | 83.5 | 15.8 | 0.0 | - | - | - |
| Total % | 12.4 | 0.7 | 16.0 | 0.0 | - | 29.1 | 0.2 | 0.2 | 0.1 | 0.0 | - | 0.5 | 19.7 | 22.4 | 0.3 | 0.1 | - | 42.5 | 0.2 | 23.3 | 4.4 | 0.0 | - | 27.9 | - |
| Lights | 180 | 4 | 237 | 0 | - | 421 | 2 | 3 | 1 | 0 | - | 6 | 293 | 330 | 4 | 2 | - | 629 | 3 | 343 | 66 | 0 | - | 412 | 1468 |
| % Lights | 96.8 | 40.0 | 98.8 | - | - | 96.6 | 66.7 | 100.0 | 100.0 | - | - | 85.7 | 99.3 | 98.2 | 80.0 | 100.0 | - | 98.6 | 100.0 | 98.0 | 100.0 | - | - | 98.3 | 97.9 |
| Buses | 2 | 0 | 1 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 4 |
| % Buses | 1.1 | 0.0 | 0.4 | - | - | 0.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.3 |
| Single-Unit Trucks | 3 | 2 | 2 | 0 | - | 7 | 1 | 0 | 0 | 0 | - | 1 | 2 | 3 | 1 | 0 | - | 6 | 0 | 4 | 0 | 0 | - | 4 | 18 |
| % Single-Unit Trucks | 1.6 | 20.0 | 0.8 | - | - | 1.6 | 33.3 | 0.0 | 0.0 | - | - | 14.3 | 0.7 | 0.9 | 20.0 | 0.0 | - | 0.9 | 0.0 | 1.1 | 0.0 | - | - | 1.0 | 1.2 |
| Articulated Trucks | 0 | 4 | 0 | 0 | - | 4 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 5 |
| % Articulated Trucks | 0.0 | 40.0 | 0.0 | - | - | 0.9 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.3 |
| Bicycles on Road | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 3 | 0 | 0 | - | 3 | 5 |
| % Bicycles on Road | 0.5 | 0.0 | 0.0 | - | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | - | 0.2 | 0.0 | 0.9 | 0.0 | - | - | 0.7 | 0.3 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 3 | - | - | - | - | - | 1 | - | - | - | - | - | 2 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 1.4 | - | - | - | - | - | 1.5 | - | - | - | - | - | 0.4 | - | - |
| Pedestrians | - | - | - | - | 189 | - | - | - | - | - | 211 | - | - | - | - | - | 65 | - | - | - | - | - | 466 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 98.6 | - | - | - | - | - | 98.5 | - | - | - | - | - | 99.6 | - | - |

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Turning Movement Data Plot

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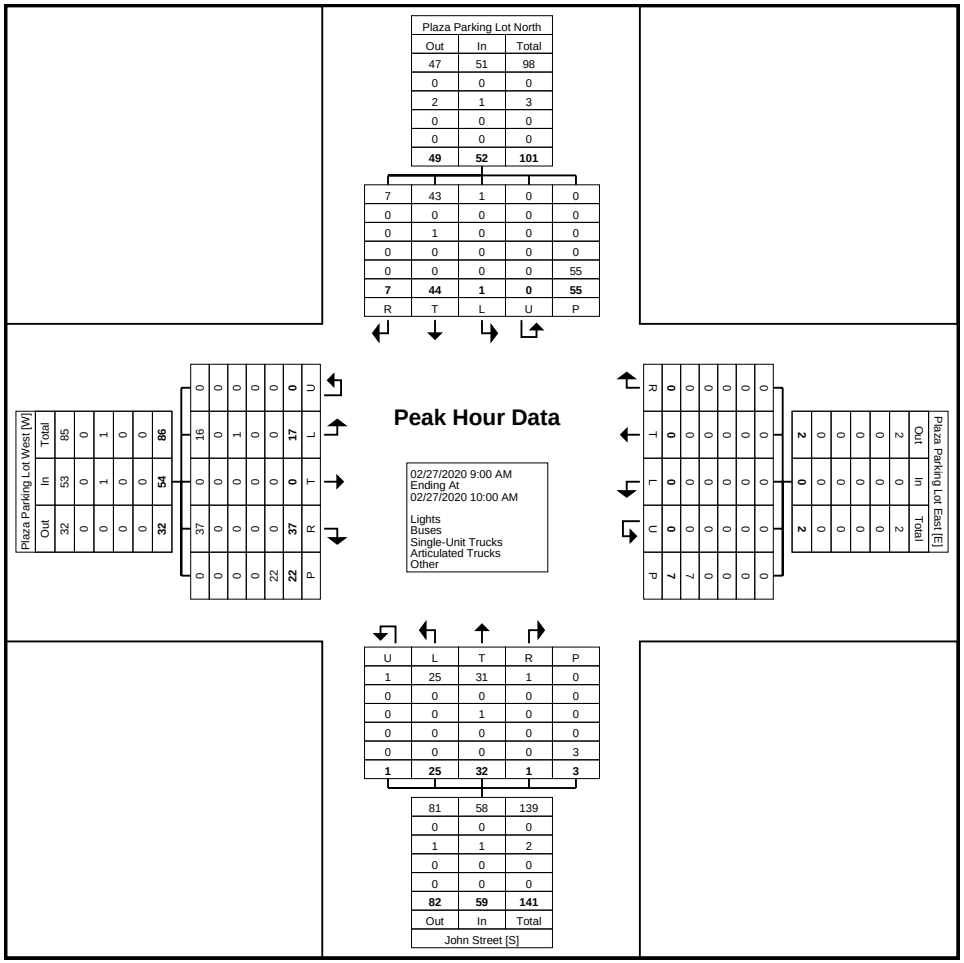

# Turning Movement Peak Hour Data (9:00 AM)

| Start Time | Plaza Parking Lot West Eastbound | | | | | | Plaza Parking Lot East Westbound | | | | | | John Street Northbound | | | | | | Plaza Parking Lot North Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 9:00 AM | 6 | 0 | 13 | 0 | 5 | 19 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 12 | 1 | 0 | 2 | 18 | 0 | 15 | 0 | 0 | 18 | 15 | 52 |
| 9:15 AM | 0 | 0 | 8 | 0 | 5 | 8 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 6 | 0 | 0 | 1 | 12 | 1 | 9 | 2 | 0 | 9 | 12 | 32 |
| 9:30 AM | 7 | 0 | 8 | 0 | 4 | 15 | 0 | 0 | 0 | 0 | 3 | 0 | 9 | 8 | 0 | 0 | 0 | 17 | 0 | 11 | 2 | 0 | 13 | 13 | 45 |
| 9:45 AM | 4 | 0 | 8 | 0 | 8 | 12 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 6 | 0 | 1 | 0 | 12 | 0 | 9 | 3 | 0 | 15 | 12 | 36 |
| Total | 17 | 0 | 37 | 0 | 22 | 54 | 0 | 0 | 0 | 0 | 7 | 0 | 25 | 32 | 1 | 1 | 3 | 59 | 1 | 44 | 7 | 0 | 55 | 52 | 165 |
| Approach % | 31.5 | 0.0 | 68.5 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 42.4 | 54.2 | 1.7 | 1.7 | - | - | 1.9 | 84.6 | 13.5 | 0.0 | - | - | - |
| Total % | 10.3 | 0.0 | 22.4 | 0.0 | - | 32.7 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 15.2 | 19.4 | 0.6 | 0.6 | - | 35.8 | 0.6 | 26.7 | 4.2 | 0.0 | - | 31.5 | - |
| PHF | 0.607 | 0.000 | 0.712 | 0.000 | - | 0.711 | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.694 | 0.667 | 0.250 | 0.250 | - | 0.819 | 0.250 | 0.733 | 0.583 | 0.000 | - | 0.867 | 0.793 |
| Lights | 16 | 0 | 37 | 0 | - | 53 | 0 | 0 | 0 | 0 | - | 0 | 25 | 31 | 1 | 1 | - | 58 | 1 | 43 | 7 | 0 | - | 51 | 162 |
| % Lights | 94.1 | - | 100.0 | - | - | 98.1 | - | - | - | - | - | - | 100.0 | 96.9 | 100.0 | 100.0 | - | 98.3 | 100.0 | 97.7 | 100.0 | - | - | 98.1 | 98.2 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 3 |
| % Single-Unit Trucks | 5.9 | - | 0.0 | - | - | 1.9 | - | - | - | - | - | - | 0.0 | 3.1 | 0.0 | 0.0 | - | 1.7 | 0.0 | 2.3 | 0.0 | - | - | 1.9 | 1.8 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 22 | - | - | - | - | - | 7 | - | - | - | - | - | 3 | - | - | - | - | - | 55 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: John Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (9:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: John Street & Access Road
Site Code: 190080
Start Date: 02/27/2020

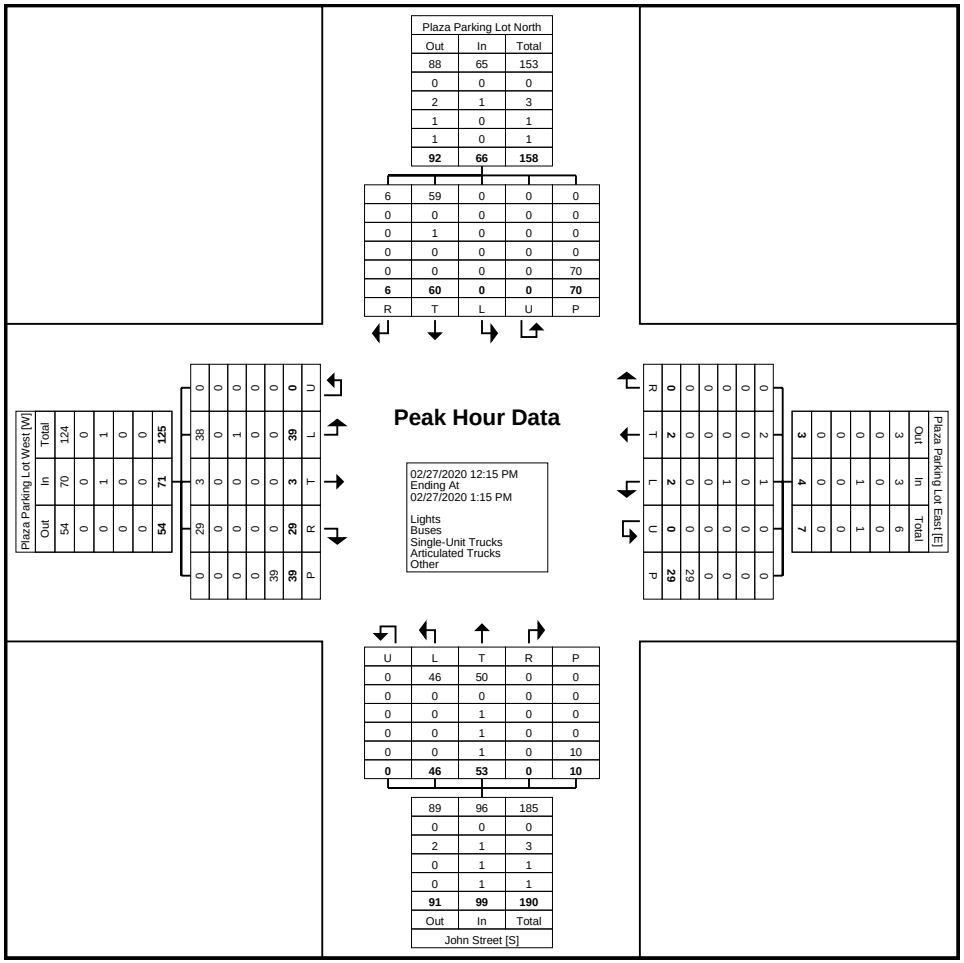

# Turning Movement Peak Hour Data (12:15 PM)

| Start Time | Plaza Parking Lot West Eastbound | | | | | | Plaza Parking Lot East Westbound | | | | | | John Street Northbound | | | | | | Plaza Parking Lot North Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:15 PM | 11 | 0 | 9 | 0 | 20 | 20 | 0 | 1 | 0 | 0 | 15 | 1 | 14 | 18 | 0 | 0 | 7 | 32 | 0 | 16 | 1 | 0 | 34 | 17 | 70 |
| 12:30 PM | 11 | 1 | 7 | 0 | 13 | 19 | 2 | 0 | 0 | 0 | 7 | 2 | 10 | 10 | 0 | 0 | 0 | 20 | 0 | 12 | 3 | 0 | 24 | 15 | 56 |
| 12:45 PM | 6 | 0 | 8 | 0 | 3 | 14 | 0 | 0 | 0 | 0 | 6 | 0 | 12 | 10 | 0 | 0 | 2 | 22 | 0 | 17 | 0 | 0 | 6 | 17 | 53 |
| 1:00 PM | 11 | 2 | 5 | 0 | 3 | 18 | 0 | 1 | 0 | 0 | 1 | 1 | 10 | 15 | 0 | 0 | 1 | 25 | 0 | 15 | 2 | 0 | 6 | 17 | 61 |
| Total | 39 | 3 | 29 | 0 | 39 | 71 | 2 | 2 | 0 | 0 | 29 | 4 | 46 | 53 | 0 | 0 | 10 | 99 | 0 | 60 | 6 | 0 | 70 | 66 | 240 |
| Approach % | 54.9 | 4.2 | 40.8 | 0.0 | - | - | 50.0 | 50.0 | 0.0 | 0.0 | - | - | 46.5 | 53.5 | 0.0 | 0.0 | - | - | 0.0 | 90.9 | 9.1 | 0.0 | - | - | - |
| Total % | 16.3 | 1.3 | 12.1 | 0.0 | - | 29.6 | 0.8 | 0.8 | 0.0 | 0.0 | - | 1.7 | 19.2 | 22.1 | 0.0 | 0.0 | - | 41.3 | 0.0 | 25.0 | 2.5 | 0.0 | - | 27.5 | - |
| PHF | 0.886 | 0.375 | 0.806 | 0.000 | - | 0.888 | 0.250 | 0.500 | 0.000 | 0.000 | - | 0.500 | 0.821 | 0.736 | 0.000 | 0.000 | - | 0.773 | 0.000 | 0.882 | 0.500 | 0.000 | - | 0.971 | 0.857 |
| Lights | 38 | 3 | 29 | 0 | - | 70 | 1 | 2 | 0 | 0 | - | 3 | 46 | 50 | 0 | 0 | - | 96 | 0 | 59 | 6 | 0 | - | 65 | 234 |
| % Lights | 97.4 | 100.0 | 100.0 | - | - | 98.6 | 50.0 | 100.0 | - | - | - | 75.0 | 100.0 | 94.3 | - | - | - | 97.0 | - | 98.3 | 100.0 | - | - | 98.5 | 97.5 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Single-Unit Trucks | 1 | 0 | 0 | 0 | - | 1 | 1 | 0 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 4 |
| % Single-Unit Trucks | 2.6 | 0.0 | 0.0 | - | - | 1.4 | 50.0 | 0.0 | - | - | - | 25.0 | 0.0 | 1.9 | - | - | - | 1.0 | - | 1.7 | 0.0 | - | - | 1.5 | 1.7 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 1.9 | - | - | - | 1.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.4 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 1.9 | - | - | - | 1.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.4 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 3.4 | - | - | - | - | - | 10.0 | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 39 | - | - | - | - | - | 28 | - | - | - | - | - | 9 | - | - | - | - | - | 70 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 96.6 | - | - | - | - | - | 90.0 | - | - | - | - | - | 100.0 | - | - |

Paradigm Transportation Solutions Limited
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519-896-3163 cbowness@ptsl.com

Count Name: John Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (12:15 PM)

Paradigm Transportation Solutions Limited
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519-896-3163 cbowness@ptsl.com

Count Name: John Street & Access Road
Site Code: 190080
Start Date: 02/27/2020

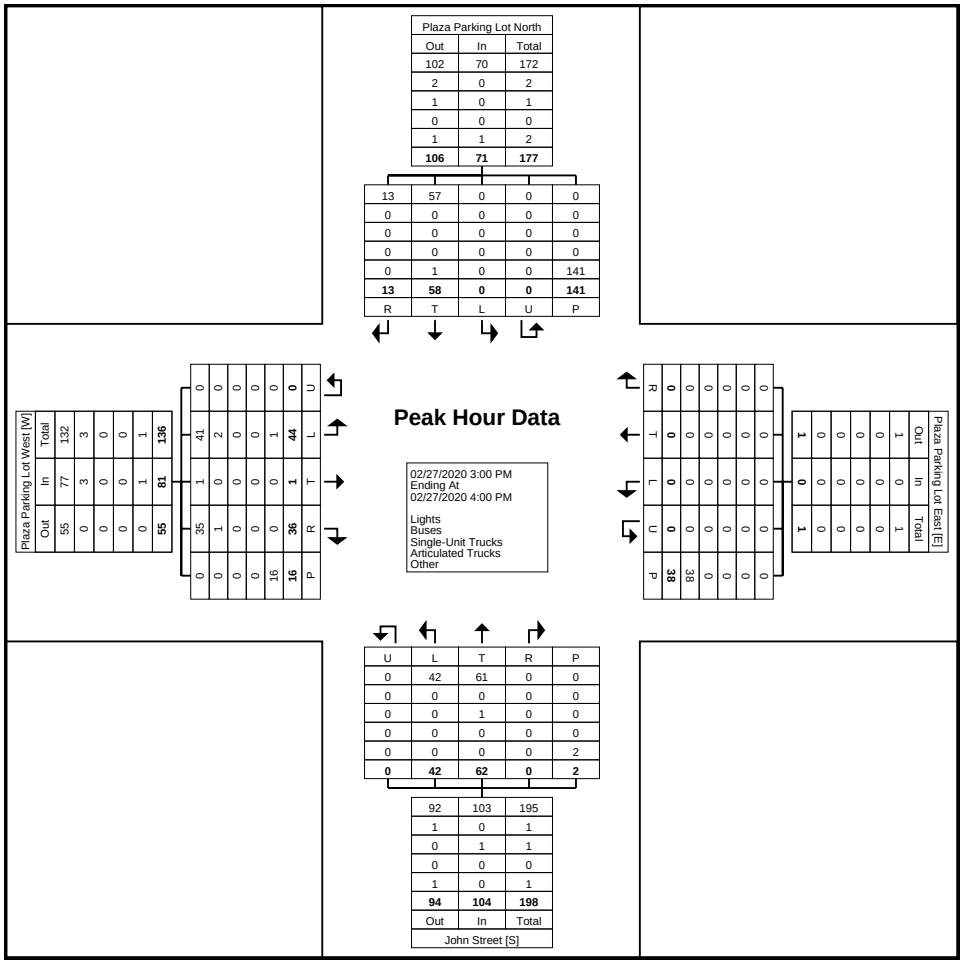

# Turning Movement Peak Hour Data (3:00 PM)

| Start Time | Plaza Parking Lot West Eastbound | | | | | | Plaza Parking Lot East Westbound | | | | | | John Street Northbound | | | | | | Plaza Parking Lot North Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 3:00 PM | 21 | 0 | 8 | 0 | 4 | 29 | 0 | 0 | 0 | 0 | 8 | 0 | 7 | 22 | 0 | 0 | 1 | 29 | 0 | 18 | 0 | 0 | 46 | 18 | 76 |
| 3:15 PM | 11 | 1 | 10 | 0 | 3 | 22 | 0 | 0 | 0 | 0 | 5 | 0 | 13 | 17 | 0 | 0 | 0 | 30 | 0 | 16 | 2 | 0 | 33 | 18 | 70 |
| 3:30 PM | 5 | 0 | 9 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 13 | 0 | 9 | 16 | 0 | 0 | 0 | 25 | 0 | 13 | 4 | 0 | 37 | 17 | 56 |
| 3:45 PM | 7 | 0 | 9 | 0 | 5 | 16 | 0 | 0 | 0 | 0 | 12 | 0 | 13 | 7 | 0 | 0 | 1 | 20 | 0 | 11 | 7 | 0 | 25 | 18 | 54 |
| Total | 44 | 1 | 36 | 0 | 16 | 81 | 0 | 0 | 0 | 0 | 38 | 0 | 42 | 62 | 0 | 0 | 2 | 104 | 0 | 58 | 13 | 0 | 141 | 71 | 256 |
| Approach % | 54.3 | 1.2 | 44.4 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 40.4 | 59.6 | 0.0 | 0.0 | - | - | 0.0 | 81.7 | 18.3 | 0.0 | - | - | - |
| Total % | 17.2 | 0.4 | 14.1 | 0.0 | - | 31.6 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 16.4 | 24.2 | 0.0 | 0.0 | - | 40.6 | 0.0 | 22.7 | 5.1 | 0.0 | - | 27.7 | - |
| PHF | 0.524 | 0.250 | 0.900 | 0.000 | - | 0.698 | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.808 | 0.705 | 0.000 | 0.000 | - | 0.867 | 0.000 | 0.806 | 0.464 | 0.000 | - | 0.986 | 0.842 |
| Lights | 41 | 1 | 35 | 0 | - | 77 | 0 | 0 | 0 | 0 | - | 0 | 42 | 61 | 0 | 0 | - | 103 | 0 | 57 | 13 | 0 | - | 70 | 250 |
| % Lights | 93.2 | 100.0 | 97.2 | - | - | 95.1 | - | - | - | - | - | - | 100.0 | 98.4 | - | - | - | 99.0 | - | 98.3 | 100.0 | - | - | 98.6 | 97.7 |
| Buses | 2 | 0 | 1 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 3 |
| % Buses | 4.5 | 0.0 | 2.8 | - | - | 3.7 | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 1.2 |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Single-Unit Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 1.6 | - | - | - | 1.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.4 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Road | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 2 |
| % Bicycles on Road | 2.3 | 0.0 | 0.0 | - | - | 1.2 | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | - | 1.7 | 0.0 | - | - | 1.4 | 0.8 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.7 | - | - |
| Pedestrians | - | - | - | - | 16 | - | - | - | - | - | 38 | - | - | - | - | - | 2 | - | - | - | - | - | 140 | - | - |
| % Pedestrians | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 99.3 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: John Street & Access Road
Site Code: 190080
Start Date: 02/27/2020


Turning Movement Peak Hour Data Plot (3:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: John Street & Access Road
Site Code: 190080
Start Date: 02/27/2020

| Intersection Name: | TS ID: | Line No: | Model: | IP address: | Controller Make: |
|---|---|---|---|---|---|
| Brant St @ Balwin /Victoria Ave | 144 | 1 | ACS/3 | 172.22.62.2 | Econolite |

**Type of Operation:** 8 Phase Semi-Actuated

*-Start from Main Menu

| No | Date | | | Description | Prepared by |
|---|---|---|---|---|---|
| | Y | M | D | | MA |
| 1 | 2017 | 7 | 20 | Controller upgrade ( Phase 4 & 8 are tied together) | |
| | | | | | |
| | | | | | |

**PHASE DESCRIPTION**

| | | | |
|---|---|---|---|
| Ph1 | | Ph5 | |
| Ph2 | NB - Brant St | Ph6 | SB - Brant St |
| Ph3 | | Ph7 | |
| Ph4 | EB/WB- Baldwin St/ Victoria Ave | Ph8 | |

**PHASE IN USE/EXCLUSIVE PED (MM)** *- 1 - 2

| Phase: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phase in Use | | X | | X | | X | | |
| Exclusive PED | | | | | | | | |

**CONTROLLER TIMING DATA - VEHICLE TIMING** * - 2 - 1

Timing Plan: 1

| | Phase: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Minimum Green | | 8 | | 8 | | 8 | | |
| Walk | | 25 | | 15 | | 25 | | |
| Ped. Clearance | | 9 | | 10 | | 9 | | |
| Pedestrian Carry Over | | | | | | | | |
| Vehicle Extension | | 3 | | 3 | | 3 | | |
| MAX 1 | | 35 | | 20 | | 35 | | |
| MAX 2 | | 35 | | 20 | | 35 | | |
| Yellow Change | | 4 | | 4 | | 4 | | |
| Red Clearance | | 2 | | 2 | | 2 | | |
| **Phase Minimum:** | 1 | 41 | 1 | 32 | 1 | 41 | 1 | 1 |

**PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS** * - 2 - 8

| Phase: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Lock Detector | | | | | | | | |
| Vehicle Recall | | | | | | | | |
| Pedestrian Recall | | X | | | | X | | |
| MAX Recall | | X | | | | X | | |
| Min Recall | | | | | | | | |

**COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN** *** - 3 - 2, - 3 - 3**

| Coordinator Pattern (CP) | Cycle Length | Offset (sec) | Timing Plan | Split Pattern | Phases (sec) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 90 | 82 | 1 | 1 | | 56 | | 34 | | 56 | | |
| 2 | 100 | 27 | 1 | 2 | | 67 | | 33 | | 67 | | |
| 3 | 90 | 36 | 1 | 3 | | 56 | | 34 | | 56 | | |
| 4 | 85 | 32 | 1 | 4 | | 50 | | 35 | | 50 | | |
| 10 | 0 | 0 | 1 | 10 | | 0 | | 0 | | 0 | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

**TIME BASE: ACTION PLAN, DAY PLAN** *** - 5 - 2, - 5 - 3, -5 - 4**

| Day Plan | Sched. # | Action Plan | Time Period | Pattern | Timing Plan | |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 07:30 | 1 | 1 | |
| 1 | 1 | 2 | 09:30 | 2 | 1 | Schedule 1 = Day Plan 1 |
| 1 | 1 | 3 | 15:30 | 3 | 1 | Schedule 2 = Day Plan 2 |
| 1 | 1 | 4 | 19:00 | 4 | 1 | Schedule 3 = Day Plan 3 |
| 1 | 1 | 10 | 22:00 | 254 | 1 | |
| 2 | 2 | 4 | 07:30 | 4 | 1 | Day Plan 1 (Weekday) |
| 2 | 2 | 1 | 09:30 | 1 | 1 | Day Plan 2 (Saturday) |
| 2 | 2 | 4 | 16:00 | 4 | 1 | Day Plan 3 (Sunday, Holidays) |
| 2 | 2 | 10 | 23:00 | 254 | 1 | |
| 3 | 3 | 4 | 08:30 | 4 | 1 | |
| 3 | 3 | 1 | 10:30 | 1 | 1 | |
| 3 | 3 | 4 | 17:00 | 4 | 1 | Action Plan 10 = free (254) |
| 3 | 3 | 10 | 20:30 | 254 | 1 | |

Special Programming:

**TIME BASE DATA - TIME OF YEAR EVENTS** *** - 5 - 5**

| Events | Exception Day | | MON/ MON | DOW/ DOW | WOM/ Year | Day Plan |
|---|---|---|---|---|---|---|
| New Year's Day | 1 | Fixed | 1 | 1 | 0 | 3 |
| Family Day | 2 | Float | 2 | 2 | 3 | 3 |
| Good Friday | 3 | Fixed | XX | XX | XX | 3 |
| Victoria Day | 4 | Float | 5 | 2 | 3 | 3 |
| Canada Day | 5 | Fixed | 7 | 1 | 0 | 3 |
| Civic Day | 6 | Float | 8 | 2 | 1 | 3 |
| Labour Day | 7 | Float | 9 | 2 | 1 | 3 |
| Thanksgiving | 8 | Float | 10 | 2 | 2 | 3 |
| Christmas Day | 9 | Fixed | 12 | 25 | 0 | 3 |

| Intersection Name: | TS ID: | Line No: | Model: | IP address: | Controller Make: |
|---|---|---|---|---|---|
| Brant St @ Caroline St | 145 | 1 | ACS/3 | 172.22.61.2 | Econolite |

**Type of Operation:** 8 Phase Semi-Actuated

*-Start from Main Menu

| No | Date | | | Description | Prepared by |
|---|---|---|---|---|---|
| | Y | M | D | | MA |
| 3 | 2017 | 9 | 21 | Changed Split 4 | |
| | | | | | |
| | | | | | |

**PHASE DESCRIPTION**

| | | | |
|---|---|---|---|
| Ph1 | SBLT - Brant St | Ph5 | |
| Ph2 | NB - Brant St | Ph6 | SB - Brant St |
| Ph3 | | Ph7 | EBLT - Caroline St |
| Ph4 | EB - Caroline St | Ph8 | WB - Caroline St |

**PHASE IN USE/EXCLUSIVE PED (MM)** *- 1 - 2

| Phase: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phase in Use | X | X | | X | | X | X | X |
| Exclusive PED | | | | | | | | |

**CONTROLLER TIMING DATA - VEHICLE TIMING** * - 2 - 1

| Timing Plan: 1 | Phase: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Minimum Green | 6 | 8 | | 8 | | 8 | 6 | 8 |
| Walk | | 15 | | 10 | | 15 | | 10 |
| Ped. Clearance | | 8 | | 8 | | 8 | | 8 |
| Pedestrian Carry Over | | | | | | | | |
| Vehicle Extension | 3 | 3 | | 5 | | 3 | 3 | 5 |
| MAX 1 | 10 | 35 | | 20 | | 35 | 10 | 20 |
| MAX 2 | 10 | 35 | | 20 | | 35 | 10 | 20 |
| Yellow Change | 3 | 4 | | 4 | | 4 | 3 | 4 |
| Red Clearance | | 2 | | 2 | | 2 | | 2 |
| **Phase Minimum:** | 10 | 30 | 1 | 25 | 1 | 30 | 10 | 25 |

**PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS** * - 2 - 8

| Phase: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Lock Detector | | | | | | | | |
| Vehicle Recall | | | | | | | | |
| Pedestrian Recall | | X | | X | | X | | X |
| MAX Recall | | X | | X | | X | | X |
| Min Recall | | | | | | | | |

**COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN** *** - 3 - 2, - 3 - 3**

| Coordinator Pattern (CP) | Cycle Length | Offset (sec) | Timing Plan | Split Pattern | Phases (sec) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 80 | 54 | 1 | 1 | 10 | 31 | | 39 | | 41 | 12 | 27 |
| 2 | 80 | 50 | 1 | 2 | 11 | 31 | | 38 | | 42 | 11 | 27 |
| 3 | 80 | 57 | 1 | 3 | 10 | 31 | | 39 | | 41 | 12 | 27 |
| 4 | 90 | 57 | 1 | 4 | 11 | 31 | | 48 | | 42 | 10 | 38 |
| 10 | 0 | 0 | 1 | 10 | 0 | 0 | | 0 | | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

**TIME BASE: ACTION PLAN, DAY PLAN** *** - 5 - 2, - 5 - 3, -5 - 4**

| Day Plan | Sched. # | Action Plan | Time Period | Pattern | Timing Plan |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 07:30 | 1 | 1 |
| 1 | 1 | 2 | 09:30 | 2 | 1 |
| 1 | 1 | 3 | 15:30 | 3 | 1 |
| 1 | 1 | 4 | 16:00 | 4 | 1 |
| 1 | 1 | 3 | 17:30 | 3 | 1 |
| 1 | 1 | 2 | 19:00 | 2 | 1 |
| 1 | 1 | 10 | 22:00 | 254 | 1 |
| 2 | 2 | 2 | 09:30 | 2 | 1 |
| 2 | 2 | 10 | 18:00 | 254 | 1 |
| 3 | 3 | 2 | 10:30 | 2 | 1 |
| 3 | 3 | 10 | 17:00 | 3 | 1 |

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

Special Programming: side street on Max recall during Pm peak split 4

**TIME BASE DATA - TIME OF YEAR EVENTS** *** - 5 - 5**

| Events | Exception Day | | MON/ MON | DOW/ DOW | WOM/ Year | Day Plan |
|---|---|---|---|---|---|---|
| New Year's Day | 1 | Fixed | 1 | 1 | 0 | 3 |
| Family Day | 2 | Float | 2 | 2 | 3 | 3 |
| Good Friday | 3 | Float | 4 | 6 | 1 | 3 |
| Victoria Day | 4 | Float | 5 | 2 | 3 | 3 |
| Canada Day | 5 | Fixed | 7 | 1 | 0 | 3 |
| Civic Day | 6 | Float | 8 | 2 | 1 | 3 |
| Labour Day | 7 | Float | 9 | 2 | 1 | 3 |
| Thanksgiving | 8 | Float | 10 | 2 | 2 | 3 |
| Christmas Day | 9 | Fixed | 12 | 25 | 0 | 3 |

# Appendix C

## Existing Traffic Operations Reports

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 96 | 33 | 24 | 11 | 49 | 24 | 29 | 487 | 22 | 28 | 506 | 130 |
| Future Volume (vph) | 96 | 33 | 24 | 11 | 49 | 24 | 29 | 487 | 22 | 28 | 506 | 130 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.88 | 0.93 | | 0.86 | 0.95 | | 0.97 | 1.00 | | 0.98 | | 0.91 |
| Frt | | 0.937 | | | 0.951 | | | 0.993 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1656 | 0 | 1601 | 1648 | 0 | 1631 | 1772 | 0 | 1572 | 1759 | 1493 |
| Flt Permitted | 0.706 | | | 0.717 | | | 0.419 | | | 0.417 | | |
| Satd. Flow (perm) | 1136 | 1656 | 0 | 1043 | 1648 | 0 | 699 | 1772 | 0 | 676 | 1759 | 1354 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 26 | | | 26 | | | 4 | | | | 141 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| 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 (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Adj. Flow (vph) | 104 | 36 | 26 | 12 | 53 | 26 | 32 | 529 | 24 | 30 | 550 | 141 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 104 | 62 | 0 | 12 | 79 | 0 | 32 | 553 | 0 | 30 | 550 | 141 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |

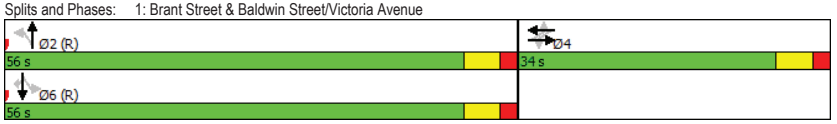




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 15.9 | 15.9 | | 15.9 | 15.9 | | 69.7 | 69.7 | | 69.7 | 69.7 | 69.7 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.77 | 0.77 | | 0.77 | 0.77 | 0.77 |
| v/c Ratio | 0.52 | 0.20 | | 0.07 | 0.25 | | 0.06 | 0.40 | | 0.06 | 0.40 | 0.13 |
| Control Delay | 41.7 | 20.5 | | 28.5 | 23.1 | | 4.9 | 6.1 | | 4.9 | 6.2 | 1.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.7 | 20.5 | | 28.5 | 23.1 | | 4.9 | 6.1 | | 4.9 | 6.2 | 1.3 |
| LOS | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay | | 33.8 | | | 23.8 | | | 6.0 | | | 5.2 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.52 | | | |
| Intersection Signal Delay: 9.6 | | Intersection LOS: A | |
| Intersection Capacity Utilization 64.7% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 104 | 62 | 12 | 79 | 32 | 553 | 30 | 550 | 141 |
| v/c Ratio | 0.52 | 0.20 | 0.07 | 0.25 | 0.06 | 0.40 | 0.06 | 0.40 | 0.13 |
| Control Delay | 41.7 | 20.5 | 28.5 | 23.1 | 4.9 | 6.1 | 4.9 | 6.2 | 1.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.7 | 20.5 | 28.5 | 23.1 | 4.9 | 6.1 | 4.9 | 6.2 | 1.3 |
| Queue Length 50th (m) | 16.5 | 5.3 | 1.8 | 7.9 | 1.3 | 29.6 | 1.2 | 29.8 | 0.0 |
| Queue Length 95th (m) | 29.2 | 14.3 | 5.8 | 17.9 | 4.9 | 63.0 | 4.6 | 63.3 | 5.6 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 378 | 569 | 347 | 566 | 541 | 1372 | 523 | 1361 | 1080 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.28 | 0.11 | 0.03 | 0.14 | 0.06 | 0.40 | 0.06 | 0.40 | 0.13 |

Intersection Summary







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 96 | 33 | 24 | 11 | 49 | 24 | 29 | 487 | 22 | 28 | 506 | 130 |
| Future Volume (vph) | 96 | 33 | 24 | 11 | 49 | 24 | 29 | 487 | 22 | 28 | 506 | 130 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.93 | | 1.00 | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.91 |
| Flpb, ped/bikes | 0.88 | 1.00 | | 0.86 | 1.00 | | 0.97 | 1.00 | | 0.98 | 1.00 | 1.00 |
| Frt | 1.00 | 0.94 | | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1528 | 1656 | | 1381 | 1648 | | 1579 | 1773 | | 1535 | 1759 | 1354 |
| Flt Permitted | 0.71 | 1.00 | | 0.72 | 1.00 | | 0.42 | 1.00 | | 0.42 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1135 | 1656 | | 1042 | 1648 | | 697 | 1773 | | 674 | 1759 | 1354 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 104 | 36 | 26 | 12 | 53 | 26 | 32 | 529 | 24 | 30 | 550 | 141 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 35 |
| Lane Group Flow (vph) | 104 | 40 | 0 | 12 | 57 | 0 | 32 | 552 | 0 | 30 | 550 | 106 |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 12.3 | 12.3 | | 12.3 | 12.3 | | 65.7 | 65.7 | | 65.7 | 65.7 | 65.7 |
| Effective Green, g (s) | 14.3 | 14.3 | | 14.3 | 14.3 | | 67.7 | 67.7 | | 67.7 | 67.7 | 67.7 |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.75 | 0.75 | | 0.75 | 0.75 | 0.75 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 180 | 263 | | 165 | 261 | | 524 | 1333 | | 506 | 1323 | 1018 |
| v/s Ratio Prot | | 0.02 | | | 0.03 | | | 0.31 | | | c0.31 | |
| v/s Ratio Perm | c0.09 | | | 0.01 | | | 0.05 | | | 0.04 | | 0.08 |
| v/c Ratio | 0.58 | 0.15 | | 0.07 | 0.22 | | 0.06 | 0.41 | | 0.06 | 0.42 | 0.10 |
| Uniform Delay, d1 | 35.1 | 32.6 | | 32.2 | 33.0 | | 2.9 | 4.0 | | 2.9 | 4.0 | 3.0 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 4.4 | 0.3 | | 0.2 | 0.4 | | 0.2 | 1.0 | | 0.2 | 1.0 | 0.2 |
| Delay (s) | 39.5 | 32.9 | | 32.4 | 33.4 | | 3.1 | 5.0 | | 3.1 | 5.0 | 3.2 |
| Level of Service | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay (s) | | 37.0 | | | 33.3 | | | 4.9 | | | 4.6 | |
| Approach LOS | | D | | | C | | | A | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 9.8 | HCM 2000 Level of Service | A | |
| HCM 2000 Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 64.7% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 12 | 27 | 511 | 35 | 45 | 496 |
| Future Volume (vph) | 12 | 27 | 511 | 35 | 45 | 496 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.907 | | 0.991 | | | |
| Flt Protected | 0.985 | | | | 0.950 | |
| Satd. Flow (prot) | 1578 | 0 | 1792 | 0 | 1678 | 1810 |
| Flt Permitted | 0.985 | | | | 0.950 | |
| Satd. Flow (perm) | 1578 | 0 | 1792 | 0 | 1678 | 1810 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 168.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 12.1 | | | 13.7 |
| Confl. Peds. (#/hr) | 4 | | | 19 | 19 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 11% | 5% | 6% | 4% | 5% |
| Adj. Flow (vph) | 13 | 29 | 555 | 38 | 49 | 539 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 42 | 0 | 593 | 0 | 49 | 539 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 45.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 12 | 27 | 511 | 35 | 45 | 496 |
| Future Volume (Veh/h) | 12 | 27 | 511 | 35 | 45 | 496 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 13 | 29 | 555 | 38 | 49 | 539 |
| Pedestrians | 19 | | 4 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 2 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.87 | 0.82 | | | 0.82 | |
| vC, conflicting volume | 1234 | 593 | | | 612 | |
| vC1, stage 1 conf vol | 593 | | | | | |
| vC2, stage 2 conf vol | 641 | | | | | |
| vCu, unblocked vol | 941 | 391 | | | 414 | |
| tC, single (s) | 6.4 | 6.3 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.4 | | | 2.2 | |
| p0 queue free % | 97 | 94 | | | 95 | |
| cM capacity (veh/h) | 416 | 513 | | | 911 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 42 | 593 | 49 | 539 |
| Volume Left | 13 | 0 | 49 | 0 |
| Volume Right | 29 | 38 | 0 | 0 |
| cSH | 478 | 1700 | 911 | 1700 |
| Volume to Capacity | 0.09 | 0.35 | 0.05 | 0.32 |
| Queue Length 95th (m) | 2.2 | 0.0 | 1.3 | 0.0 |
| Control Delay (s) | 13.2 | 0.0 | 9.2 | 0.0 |
| Lane LOS | B | | A | |
| Approach Delay (s) | 13.2 | 0.0 | 0.8 | |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.8 | | |
| Intersection Capacity Utilization | 45.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 97 | 19 | 17 | 53 | 91 | 9 | 324 | 18 | 82 | 371 | 55 |
| Future Volume (vph) | 131 | 97 | 19 | 17 | 53 | 91 | 9 | 324 | 18 | 82 | 371 | 55 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | 1.00 | | 0.95 | 0.97 | 0.99 | | 0.98 | 0.99 | | 0.96 | 0.99 | |
| Frt | | | 0.850 | | 0.905 | | | 0.992 | | | 0.981 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1646 | 1792 | 1439 | 1479 | 1464 | 0 | 1572 | 1646 | 0 | 1601 | 1651 | 0 |
| Flt Permitted | 0.540 | | | 0.689 | | | 0.457 | | | 0.312 | | |
| Satd. Flow (perm) | 934 | 1792 | 1363 | 1042 | 1464 | 0 | 744 | 1646 | 0 | 506 | 1651 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 99 | | | 4 | | | 12 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 168.5 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 12.1 | |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| 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% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Adj. Flow (vph) | 142 | 105 | 21 | 18 | 58 | 99 | 10 | 352 | 20 | 89 | 403 | 60 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 142 | 105 | 21 | 18 | 157 | 0 | 10 | 372 | 0 | 89 | 463 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |

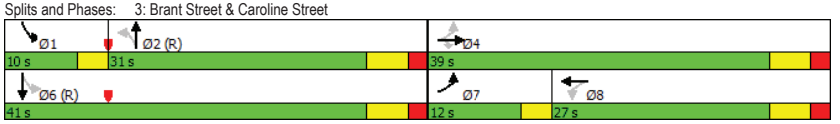




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 29.0 | 29.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.36 | 0.36 | | 0.48 | 0.46 | |
| v/c Ratio | 0.29 | 0.13 | 0.03 | 0.06 | 0.31 | | 0.04 | 0.62 | | 0.27 | 0.60 | |
| Control Delay | 15.0 | 14.1 | 0.1 | 21.5 | 11.3 | | 18.4 | 27.2 | | 13.9 | 19.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 15.0 | 14.1 | 0.1 | 21.5 | 11.3 | | 18.4 | 27.2 | | 13.9 | 19.6 | |
| LOS | B | B | A | C | B | | B | C | | B | B | |
| Approach Delay | | 13.5 | | | 12.3 | | | 27.0 | | | 18.7 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 54 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 75 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.62 | | |
| Intersection Signal Delay: 19.2 | | Intersection LOS: B |
| Intersection Capacity Utilization 65.3% | | ICU Level of Service C |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 142 | 105 | 21 | 18 | 157 | 10 | 372 | 89 | 463 |
| v/c Ratio | 0.29 | 0.13 | 0.03 | 0.06 | 0.31 | 0.04 | 0.62 | 0.27 | 0.60 |
| Control Delay | 15.0 | 14.1 | 0.1 | 21.5 | 11.3 | 18.4 | 27.2 | 13.9 | 19.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 15.0 | 14.1 | 0.1 | 21.5 | 11.3 | 18.4 | 27.2 | 13.9 | 19.6 |
| Queue Length 50th (m) | 12.5 | 9.2 | 0.0 | 2.0 | 6.5 | 1.0 | 47.2 | 7.2 | 48.8 |
| Queue Length 95th (m) | 23.3 | 18.2 | 0.0 | 6.7 | 20.5 | 4.3 | 76.3 | 14.9 | 77.9 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 144.5 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 500 | 784 | 642 | 307 | 502 | 270 | 599 | 336 | 770 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.28 | 0.13 | 0.03 | 0.06 | 0.31 | 0.04 | 0.62 | 0.26 | 0.60 |

Intersection Summary





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 97 | 19 | 17 | 53 | 91 | 9 | 324 | 18 | 82 | 371 | 55 |
| Future Volume (vph) | 131 | 97 | 19 | 17 | 53 | 91 | 9 | 324 | 18 | 82 | 371 | 55 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.95 | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1645 | 1792 | 1363 | 1436 | 1465 | | 1547 | 1646 | | 1584 | 1651 | |
| Flt Permitted | 0.54 | 1.00 | 1.00 | 0.69 | 1.00 | | 0.46 | 1.00 | | 0.31 | 1.00 | |
| Satd. Flow (perm) | 935 | 1792 | 1363 | 1042 | 1465 | | 744 | 1646 | | 520 | 1651 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 142 | 105 | 21 | 18 | 58 | 99 | 10 | 352 | 20 | 89 | 403 | 60 |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 70 | 0 | 0 | 3 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 142 | 105 | 9 | 18 | 87 | 0 | 10 | 369 | 0 | 89 | 457 | 0 |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| Heavy Vehicles (%) | 6% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.6 | 21.6 | | 26.4 | 26.4 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 28.4 | 28.4 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.35 | 0.35 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 460 | 784 | 596 | 307 | 432 | | 264 | 584 | | 301 | 763 | |
| v/s Ratio Prot | c0.03 | 0.06 | | | 0.06 | | | 0.22 | | 0.02 | c0.28 | |
| v/s Ratio Perm | c0.09 | | 0.01 | 0.02 | | | 0.01 | | | 0.11 | | |
| v/c Ratio | 0.31 | 0.13 | 0.02 | 0.06 | 0.20 | | 0.04 | 0.63 | | 0.30 | 0.60 | |
| Uniform Delay, d1 | 15.2 | 13.4 | 12.7 | 20.2 | 21.1 | | 16.9 | 21.5 | | 14.5 | 16.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 0.4 | 0.0 | 0.4 | 1.1 | | 0.3 | 5.1 | | 0.6 | 3.4 | |
| Delay (s) | 15.6 | 13.8 | 12.8 | 20.6 | 22.2 | | 17.1 | 26.6 | | 15.0 | 19.4 | |
| Level of Service | B | B | B | C | C | | B | C | | B | B | |
| Approach Delay (s) | | 14.7 | | | 22.0 | | | 26.4 | | | 18.7 | |
| Approach LOS | | B | | | C | | | C | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 20.5 | HCM 2000 Level of Service | C | |
| HCM 2000 Volume to Capacity ratio | 0.49 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 14.0 | |
| Intersection Capacity Utilization | 65.3% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 22 | 152 | 23 | 4 | 139 | 46 | 8 | 8 | 7 | 16 | 12 | 14 |
| Future Volume (vph) | 22 | 152 | 23 | 4 | 139 | 46 | 8 | 8 | 7 | 16 | 12 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 15.0 | | 0.0 | 35.0 | | 0.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.980 | | | 0.963 | | | 0.929 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | | 0.972 | |
| Satd. Flow (prot) | 1745 | 1780 | 0 | 1745 | 1803 | 0 | 1745 | 1765 | 0 | 0 | 1780 | 1597 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | | 0.972 | |
| Satd. Flow (perm) | 1745 | 1780 | 0 | 1745 | 1803 | 0 | 1745 | 1765 | 0 | 0 | 1780 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 166.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 12.0 | |
| Confl. Peds. (#/hr) | 14 | | 7 | 7 | | 14 | 8 | | 15 | 15 | | 8 |
| 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 (%) | 0% | 3% | 15% | 0% | 2% | 0% | 0% | 0% | 0% | 2% | 6% | 0% |
| Adj. Flow (vph) | 24 | 165 | 25 | 4 | 151 | 50 | 9 | 9 | 8 | 17 | 13 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 24 | 190 | 0 | 4 | 201 | 0 | 9 | 17 | 0 | 0 | 30 | 15 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 34.5% | 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) | 22 | 152 | 23 | 4 | 139 | 46 | 8 | 8 | 7 | 16 | 12 | 14 |
| Future Volume (Veh/h) | 22 | 152 | 23 | 4 | 139 | 46 | 8 | 8 | 7 | 16 | 12 | 14 |
| 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) | 24 | 165 | 25 | 4 | 151 | 50 | 9 | 9 | 8 | 17 | 13 | 15 |
| Pedestrians | | 8 | | | 15 | | | 7 | | | 14 | |
| Lane Width (m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Walking Speed (m/s) | | 1.1 | | | 1.1 | | | 1.1 | | | 1.1 | |
| Percent Blockage | | 1 | | | 1 | | | 1 | | | 1 | |
| Right turn flare (veh) | | | | | | | | | | | | 4 |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | 66 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.99 | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | |
| vC, conflicting volume | 215 | | | 197 | | | 414 | 456 | 200 | 438 | 443 | 198 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 215 | | | 179 | | | 399 | 441 | 182 | 424 | 429 | 198 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 98 | | | 100 | | | 98 | 98 | 99 | 97 | 97 | 98 |
| cM capacity (veh/h) | 1350 | | | 1381 | | | 514 | 487 | 838 | 492 | 486 | 832 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 24 | 190 | 4 | 201 | 9 | 17 | 45 |
| Volume Left | 24 | 0 | 4 | 0 | 9 | 0 | 17 |
| Volume Right | 0 | 25 | 0 | 50 | 0 | 8 | 15 |
| cSH | 1350 | 1700 | 1381 | 1700 | 514 | 606 | 734 |
| Volume to Capacity | 0.02 | 0.11 | 0.00 | 0.12 | 0.02 | 0.03 | 0.06 |
| Queue Length 95th (m) | 0.4 | 0.0 | 0.1 | 0.0 | 0.4 | 0.7 | 1.5 |
| Control Delay (s) | 7.7 | 0.0 | 7.6 | 0.0 | 12.1 | 11.1 | 11.7 |
| Lane LOS | A | | A | | B | B | B |
| Approach Delay (s) | 0.9 | | 0.1 | | 11.5 | | 11.7 |
| Approach LOS | | | | | B | | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 34.5% | 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) | 17 | 0 | 37 | 0 | 0 | 0 | 25 | 32 | 1 | 1 | 44 | 7 |
| Future Volume (vph) | 17 | 0 | 37 | 0 | 0 | 0 | 25 | 32 | 1 | 1 | 44 | 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 | | 0.907 | | | | | | 0.998 | | | 0.981 | |
| Flt Protected | | 0.985 | | | | | | 0.979 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1666 | 0 | 0 | 1900 | 0 | 0 | 1826 | 0 | 0 | 1831 | 0 |
| Flt Permitted | | 0.985 | | | | | | 0.979 | | | 0.999 | |
| Satd. Flow (perm) | 0 | 1666 | 0 | 0 | 1900 | 0 | 0 | 1826 | 0 | 0 | 1831 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 166.3 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 12.0 | | | 4.2 | |
| Confl. Peds. (#/hr) | 55 | | 3 | 3 | | 55 | 22 | | 7 | 7 | | 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% | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 2% | 0% |
| Adj. Flow (vph) | 18 | 0 | 40 | 0 | 0 | 0 | 27 | 35 | 1 | 1 | 48 | 8 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 63 | 0 | 0 | 57 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 28.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 17 | 0 | 37 | 0 | 0 | 0 | 25 | 32 | 1 | 1 | 44 | 7 |
| Future Volume (vph) | 17 | 0 | 37 | 0 | 0 | 0 | 25 | 32 | 1 | 1 | 44 | 7 |
| 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) | 18 | 0 | 40 | 0 | 0 | 0 | 27 | 35 | 1 | 1 | 48 | 8 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 58 | 0 | 63 | 57 |
| Volume Left (vph) | 18 | 0 | 27 | 1 |
| Volume Right (vph) | 40 | 0 | 1 | 8 |
| Hadj (s) | -0.32 | 0.00 | 0.10 | -0.05 |
| Departure Headway (s) | 3.8 | 4.2 | 4.2 | 4.0 |
| Degree Utilization, x | 0.06 | 0.00 | 0.07 | 0.06 |
| Capacity (veh/h) | 906 | 831 | 837 | 874 |
| Control Delay (s) | 7.1 | 7.2 | 7.5 | 7.3 |
| Approach Delay (s) | 7.1 | 0.0 | 7.5 | 7.3 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.3 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 28.9% | 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) | 42 | 16 | 14 | 22 | 15 | 54 | 15 | 725 | 17 | 58 | 621 | 51 |
| Future Volume (vph) | 42 | 16 | 14 | 22 | 15 | 54 | 15 | 725 | 17 | 58 | 621 | 51 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.98 | 0.97 | | 0.97 | 0.97 | | 0.98 | 1.00 | | 0.99 | | 0.92 |
| Frt | | 0.930 | | | 0.882 | | | 0.997 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1723 | 0 | 1601 | 1470 | 0 | 1745 | 1837 | 0 | 1631 | 1792 | 1536 |
| Flt Permitted | 0.708 | | | 0.736 | | | 0.370 | | | 0.309 | | |
| Satd. Flow (perm) | 1273 | 1723 | 0 | 1200 | 1470 | 0 | 668 | 1837 | 0 | 524 | 1792 | 1413 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 15 | | | 59 | | | 2 | | | | 55 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| 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 (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Adj. Flow (vph) | 46 | 17 | 15 | 24 | 16 | 59 | 16 | 788 | 18 | 63 | 675 | 55 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 46 | 32 | 0 | 24 | 75 | 0 | 16 | 806 | 0 | 63 | 675 | 55 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |

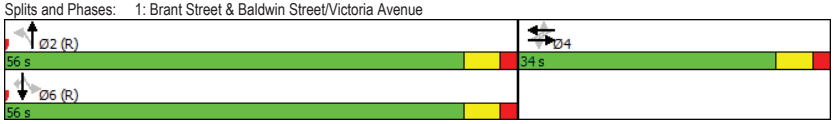




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 11.5 | 11.5 | | 11.5 | 11.5 | | 74.1 | 74.1 | | 74.1 | 74.1 | 74.1 |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.82 | 0.82 | | 0.82 | 0.82 | 0.82 |
| v/c Ratio | 0.28 | 0.14 | | 0.16 | 0.32 | | 0.03 | 0.53 | | 0.15 | 0.46 | 0.05 |
| Control Delay | 39.6 | 23.7 | | 36.5 | 16.8 | | 2.7 | 5.2 | | 3.6 | 4.5 | 0.9 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.6 | 23.7 | | 36.5 | 16.8 | | 2.7 | 5.2 | | 3.6 | 4.5 | 0.9 |
| LOS | D | C | | D | B | | A | A | | A | A | A |
| Approach Delay | | 33.1 | | | 21.6 | | | 5.1 | | | 4.1 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.53 | | | |
| Intersection Signal Delay: 6.8 | | Intersection LOS: A | |
| Intersection Capacity Utilization 69.4% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 46 | 32 | 24 | 75 | 16 | 806 | 63 | 675 | 55 |
| v/c Ratio | 0.28 | 0.14 | 0.16 | 0.32 | 0.03 | 0.53 | 0.15 | 0.46 | 0.05 |
| Control Delay | 39.6 | 23.7 | 36.5 | 16.8 | 2.7 | 5.2 | 3.6 | 4.5 | 0.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.6 | 23.7 | 36.5 | 16.8 | 2.7 | 5.2 | 3.6 | 4.5 | 0.9 |
| Queue Length 50th (m) | 7.4 | 2.7 | 3.8 | 2.5 | 0.4 | 38.1 | 1.9 | 28.9 | 0.0 |
| Queue Length 95th (m) | 16.8 | 10.2 | 10.6 | 14.1 | 2.0 | 74.9 | 6.1 | 56.5 | 2.4 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 424 | 584 | 400 | 529 | 550 | 1513 | 431 | 1476 | 1173 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.05 | 0.06 | 0.14 | 0.03 | 0.53 | 0.15 | 0.46 | 0.05 |

Intersection Summary





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 42 | 16 | 14 | 22 | 15 | 54 | 15 | 725 | 17 | 58 | 621 | 51 |
| Future Volume (vph) | 42 | 16 | 14 | 22 | 15 | 54 | 15 | 725 | 17 | 58 | 621 | 51 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.92 |
| Flpb, ped/bikes | 0.98 | 1.00 | | 0.97 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | 1.00 |
| Frt | 1.00 | 0.93 | | 1.00 | 0.88 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1708 | 1722 | | 1548 | 1470 | | 1707 | 1836 | | 1604 | 1792 | 1413 |
| Flt Permitted | 0.71 | 1.00 | | 0.74 | 1.00 | | 0.37 | 1.00 | | 0.31 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1273 | 1722 | | 1200 | 1470 | | 665 | 1836 | | 521 | 1792 | 1413 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 46 | 17 | 15 | 24 | 16 | 59 | 16 | 788 | 18 | 63 | 675 | 55 |
| RTOR Reduction (vph) | 0 | 13 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Lane Group Flow (vph) | 46 | 19 | 0 | 24 | 22 | 0 | 16 | 806 | 0 | 63 | 675 | 44 |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 7.9 | 7.9 | | 7.9 | 7.9 | | 70.1 | 70.1 | | 70.1 | 70.1 | 70.1 |
| Effective Green, g (s) | 9.9 | 9.9 | | 9.9 | 9.9 | | 72.1 | 72.1 | | 72.1 | 72.1 | 72.1 |
| Actuated g/C Ratio | 0.11 | 0.11 | | 0.11 | 0.11 | | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 140 | 189 | | 132 | 161 | | 532 | 1470 | | 417 | 1435 | 1131 |
| v/s Ratio Prot | | 0.01 | | | 0.02 | | | c0.44 | | | 0.38 | |
| v/s Ratio Perm | c0.04 | | | 0.02 | | | 0.02 | | | 0.12 | | 0.03 |
| v/c Ratio | 0.33 | 0.10 | | 0.18 | 0.14 | | 0.03 | 0.55 | | 0.15 | 0.47 | 0.04 |
| Uniform Delay, d1 | 37.0 | 36.0 | | 36.4 | 36.2 | | 1.8 | 3.2 | | 2.0 | 2.9 | 1.8 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.4 | 0.2 | | 0.7 | 0.4 | | 0.1 | 1.5 | | 0.8 | 1.1 | 0.1 |
| Delay (s) | 38.4 | 36.3 | | 37.0 | 36.6 | | 1.9 | 4.6 | | 2.8 | 4.0 | 1.9 |
| Level of Service | D | D | | D | D | | A | A | | A | A | A |
| Approach Delay (s) | | 37.5 | | | 36.7 | | | 4.6 | | | 3.7 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 7.4 | HCM 2000 Level of Service | A | |
| HCM 2000 Volume to Capacity ratio | 0.52 | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 69.4% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 38 | 77 | 680 | 62 | 36 | 621 |
| Future Volume (vph) | 38 | 77 | 680 | 62 | 36 | 621 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.909 | | 0.989 | | | |
| Flt Protected | 0.984 | | | | 0.950 | |
| Satd. Flow (prot) | 1699 | 0 | 1862 | 0 | 1745 | 1863 |
| Flt Permitted | 0.984 | | | | 0.950 | |
| Satd. Flow (perm) | 1699 | 0 | 1862 | 0 | 1745 | 1863 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 168.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 12.1 | | | 13.7 |
| Confl. Peds. (#/hr) | 1 | | | 13 | 13 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 41 | 84 | 739 | 67 | 39 | 675 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 125 | 0 | 806 | 0 | 39 | 675 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 53.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 38 | 77 | 680 | 62 | 36 | 621 |
| Future Volume (Veh/h) | 38 | 77 | 680 | 62 | 36 | 621 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 41 | 84 | 739 | 67 | 39 | 675 |
| Pedestrians | 13 | | 1 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 1 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.77 | 0.70 | | | 0.70 | |
| vC, conflicting volume | 1540 | 786 | | | 819 | |
| vC1, stage 1 conf vol | 786 | | | | | |
| vC2, stage 2 conf vol | 754 | | | | | |
| vCu, unblocked vol | 1194 | 486 | | | 534 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 88 | 79 | | | 95 | |
| cM capacity (veh/h) | 331 | 408 | | | 727 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 125 | 806 | 39 | 675 |
| Volume Left | 41 | 0 | 39 | 0 |
| Volume Right | 84 | 67 | 0 | 0 |
| cSH | 379 | 1700 | 727 | 1700 |
| Volume to Capacity | 0.33 | 0.47 | 0.05 | 0.40 |
| Queue Length 95th (m) | 10.8 | 0.0 | 1.3 | 0.0 |
| Control Delay (s) | 19.1 | 0.0 | 10.2 | 0.0 |
| Lane LOS | C | | B | |
| Approach Delay (s) | 19.1 | 0.0 | 0.6 | |
| Approach LOS | C | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 53.2% | 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) | 170 | 95 | 12 | 46 | 168 | 128 | 22 | 444 | 10 | 92 | 513 | 54 |
| Future Volume (vph) | 170 | 95 | 12 | 46 | 168 | 128 | 22 | 444 | 10 | 92 | 513 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | 0.98 | | 0.91 | 0.94 | 0.97 | | 0.98 | 1.00 | | 0.97 | 0.99 | |
| Frt | | | 0.850 | | 0.935 | | | 0.997 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1631 | 1776 | 1479 | 1678 | 1595 | 0 | 1662 | 1749 | 0 | 1616 | 1782 | 0 |
| Flt Permitted | 0.301 | | | 0.690 | | | 0.282 | | | 0.179 | | |
| Satd. Flow (perm) | 507 | 1776 | 1343 | 1141 | 1595 | 0 | 484 | 1749 | 0 | 296 | 1782 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 48 | | | 2 | | | 9 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 168.5 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 12.1 | |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Adj. Flow (vph) | 185 | 103 | 13 | 50 | 183 | 139 | 24 | 483 | 11 | 100 | 558 | 59 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 185 | 103 | 13 | 50 | 322 | 0 | 24 | 494 | 0 | 100 | 617 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |

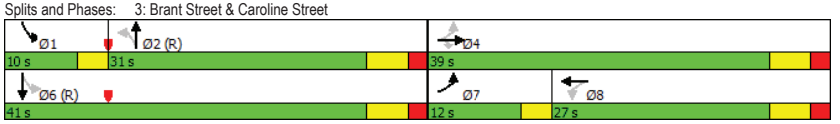




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.3 | 23.3 | | 29.0 | 29.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.36 | 0.36 | | 0.48 | 0.46 | |
| v/c Ratio | 0.53 | 0.13 | 0.02 | 0.15 | 0.65 | | 0.14 | 0.78 | | 0.40 | 0.74 | |
| Control Delay | 19.7 | 14.1 | 0.1 | 22.8 | 28.1 | | 21.1 | 34.1 | | 16.6 | 24.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 19.7 | 14.1 | 0.1 | 22.8 | 28.1 | | 21.1 | 34.1 | | 16.6 | 24.2 | |
| LOS | B | B | A | C | C | | C | C | | B | C | |
| Approach Delay | | 16.9 | | | 27.4 | | | 33.5 | | | 23.1 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 57 (71%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 75 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.78 | | |
| Intersection Signal Delay: 25.8 | | Intersection LOS: C |
| Intersection Capacity Utilization 77.5% | | ICU Level of Service D |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 185 | 103 | 13 | 50 | 322 | 24 | 494 | 100 | 617 |
| v/c Ratio | 0.53 | 0.13 | 0.02 | 0.15 | 0.65 | 0.14 | 0.78 | 0.40 | 0.74 |
| Control Delay | 19.7 | 14.1 | 0.1 | 22.8 | 28.1 | 21.1 | 34.1 | 16.6 | 24.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.7 | 14.1 | 0.1 | 22.8 | 28.1 | 21.1 | 34.1 | 16.6 | 24.2 |
| Queue Length 50th (m) | 16.8 | 9.0 | 0.0 | 5.6 | 36.2 | 2.5 | 68.0 | 8.1 | 72.6 |
| Queue Length 95th (m) | 29.8 | 18.0 | 0.0 | 13.8 | 63.1 | 8.1 | #119.0 | 16.3 | 112.5 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 144.5 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 354 | 777 | 633 | 332 | 498 | 175 | 635 | 256 | 829 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.52 | 0.13 | 0.02 | 0.15 | 0.65 | 0.14 | 0.78 | 0.39 | 0.74 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 170 | 95 | 12 | 46 | 168 | 128 | 22 | 444 | 10 | 92 | 513 | 54 |
| Future Volume (vph) | 170 | 95 | 12 | 46 | 168 | 128 | 22 | 444 | 10 | 92 | 513 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.91 | 1.00 | 0.97 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 0.99 | 1.00 | 1.00 | 0.94 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.94 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1622 | 1776 | 1343 | 1571 | 1596 | | 1631 | 1748 | | 1610 | 1781 | |
| Flt Permitted | 0.30 | 1.00 | 1.00 | 0.69 | 1.00 | | 0.28 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | 515 | 1776 | 1343 | 1142 | 1596 | | 484 | 1748 | | 303 | 1781 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 185 | 103 | 13 | 50 | 183 | 139 | 24 | 483 | 11 | 100 | 558 | 59 |
| RTOR Reduction (vph) | 0 | 0 | 7 | 0 | 34 | 0 | 0 | 1 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 185 | 103 | 6 | 50 | 288 | 0 | 24 | 493 | 0 | 100 | 612 | 0 |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.3 | 21.3 | | 26.4 | 26.4 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.3 | 23.3 | | 28.4 | 28.4 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.35 | 0.35 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 332 | 777 | 587 | 332 | 464 | | 171 | 620 | | 224 | 823 | |
| v/s Ratio Prot | c0.06 | 0.06 | | | c0.18 | | | 0.28 | | 0.03 | c0.34 | |
| v/s Ratio Perm | 0.17 | | 0.00 | 0.04 | | | 0.05 | | | 0.16 | | |
| v/c Ratio | 0.56 | 0.13 | 0.01 | 0.15 | 0.62 | | 0.14 | 0.79 | | 0.45 | 0.74 | |
| Uniform Delay, d1 | 16.6 | 13.4 | 12.7 | 21.0 | 24.5 | | 17.5 | 23.2 | | 15.9 | 17.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.0 | 0.4 | 0.0 | 1.0 | 6.1 | | 1.7 | 10.1 | | 1.4 | 6.0 | |
| Delay (s) | 18.6 | 13.8 | 12.7 | 22.0 | 30.7 | | 19.2 | 33.3 | | 17.4 | 23.7 | |
| Level of Service | B | B | B | C | C | | B | C | | B | C | |
| Approach Delay (s) | | 16.7 | | | 29.5 | | | 32.7 | | | 22.8 | |
| Approach LOS | | B | | | C | | | C | | | C | |

Intersection Summary

| | | | | | |
|---|---|---|---|---|---|
| HCM 2000 Control Delay | 25.8 | HCM 2000 Level of Service | | C | |
| HCM 2000 Volume to Capacity ratio | 0.71 | | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | | 14.0 | |
| Intersection Capacity Utilization | 77.5% | ICU Level of Service | | D | |
| Analysis Period (min) | 15 | | | | |

c Critical Lane Group

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 144 | 33 | 13 | 274 | 73 | 15 | 18 | 13 | 60 | 24 | 53 |
| Future Volume (vph) | 20 | 144 | 33 | 13 | 274 | 73 | 15 | 18 | 13 | 60 | 24 | 53 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 15.0 | | 0.0 | 35.0 | | 0.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.972 | | | 0.969 | | | 0.938 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | | 0.966 | |
| Satd. Flow (prot) | 1745 | 1826 | 0 | 1745 | 1841 | 0 | 1745 | 1782 | 0 | 0 | 1835 | 1597 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | | 0.966 | |
| Satd. Flow (perm) | 1745 | 1826 | 0 | 1745 | 1841 | 0 | 1745 | 1782 | 0 | 0 | 1835 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 166.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 12.0 | |
| Confl. Peds. (#/hr) | 23 | | 4 | 4 | | 23 | 5 | | 11 | 11 | | 5 |
| 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 (%) | 0% | 0% | 6% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 22 | 157 | 36 | 14 | 298 | 79 | 16 | 20 | 14 | 65 | 26 | 58 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 22 | 193 | 0 | 14 | 377 | 0 | 16 | 34 | 0 | 0 | 91 | 58 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 41.0% | 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) | 20 | 144 | 33 | 13 | 274 | 73 | 15 | 18 | 13 | 60 | 24 | 53 |
| Future Volume (Veh/h) | 20 | 144 | 33 | 13 | 274 | 73 | 15 | 18 | 13 | 60 | 24 | 53 |
| 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) | 22 | 157 | 36 | 14 | 298 | 79 | 16 | 20 | 14 | 65 | 26 | 58 |
| Pedestrians | | 5 | | | 11 | | | 4 | | | 23 | |
| Lane Width (m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Walking Speed (m/s) | | 1.1 | | | 1.1 | | | 1.1 | | | 1.1 | |
| Percent Blockage | | 0 | | | 1 | | | 0 | | | 2 | |
| Right turn flare (veh) | | | | | | | | | | | | 4 |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | 66 | | | | | | | | | | |
| pX, platoon unblocked | | | | 0.98 | | | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | |
| vC, conflicting volume | 400 | | | 197 | | | 596 | 651 | 190 | 624 | 630 | 366 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 400 | | | 170 | | | 577 | 633 | 163 | 606 | 611 | 366 |
| 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 % | 98 | | | 99 | | | 95 | 95 | 98 | 82 | 93 | 91 |
| cM capacity (veh/h) | 1145 | | | 1386 | | | 348 | 371 | 858 | 354 | 382 | 667 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 22 | 193 | 14 | 377 | 16 | 34 | 149 |
| Volume Left | 22 | 0 | 14 | 0 | 16 | 0 | 65 |
| Volume Right | 0 | 36 | 0 | 79 | 0 | 14 | 58 |
| cSH | 1145 | 1700 | 1386 | 1700 | 348 | 484 | 593 |
| Volume to Capacity | 0.02 | 0.11 | 0.01 | 0.22 | 0.05 | 0.07 | 0.25 |
| Queue Length 95th (m) | 0.4 | 0.0 | 0.2 | 0.0 | 1.1 | 1.7 | 7.5 |
| Control Delay (s) | 8.2 | 0.0 | 7.6 | 0.0 | 15.8 | 13.0 | 15.4 |
| Lane LOS | A | | A | | C | B | C |
| Approach Delay (s) | 0.8 | | 0.3 | | 13.9 | | 15.4 |
| Approach LOS | | | | | B | | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.1 | | | |
| Intersection Capacity Utilization | 41.0% | 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) | 44 | 1 | 36 | 0 | 0 | 0 | 42 | 62 | 0 | 0 | 58 | 13 |
| Future Volume (vph) | 44 | 1 | 36 | 0 | 0 | 0 | 42 | 62 | 0 | 0 | 58 | 13 |
| 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 | | 0.940 | | | | | | | | | 0.975 | |
| Flt Protected | | 0.973 | | | | | | 0.980 | | | | |
| Satd. Flow (prot) | 0 | 1670 | 0 | 0 | 1900 | 0 | 0 | 1840 | 0 | 0 | 1852 | 0 |
| Flt Permitted | | 0.973 | | | | | | 0.980 | | | | |
| Satd. Flow (perm) | 0 | 1670 | 0 | 0 | 1900 | 0 | 0 | 1840 | 0 | 0 | 1852 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 166.3 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 12.0 | | | 4.2 | |
| Confl. Peds. (#/hr) | 141 | | 2 | 2 | | 141 | 16 | | 38 | 38 | | 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 (%) | 5% | 0% | 3% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 48 | 1 | 39 | 0 | 0 | 0 | 46 | 67 | 0 | 0 | 63 | 14 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 113 | 0 | 0 | 77 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 32.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 44 | 1 | 36 | 0 | 0 | 0 | 42 | 62 | 0 | 0 | 58 | 13 |
| Future Volume (vph) | 44 | 1 | 36 | 0 | 0 | 0 | 42 | 62 | 0 | 0 | 58 | 13 |
| 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) | 48 | 1 | 39 | 0 | 0 | 0 | 46 | 67 | 0 | 0 | 63 | 14 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 88 | 0 | 113 | 77 |
| Volume Left (vph) | 48 | 0 | 46 | 0 |
| Volume Right (vph) | 39 | 0 | 0 | 14 |
| Hadj (s) | -0.09 | 0.00 | 0.10 | -0.11 |
| Departure Headway (s) | 4.2 | 4.4 | 4.3 | 4.1 |
| Degree Utilization, x | 0.10 | 0.00 | 0.13 | 0.09 |
| Capacity (veh/h) | 813 | 784 | 814 | 851 |
| Control Delay (s) | 7.7 | 7.4 | 7.9 | 7.5 |
| Approach Delay (s) | 7.7 | 0.0 | 7.9 | 7.5 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 32.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Appendix D

## ITE Trip Reduction Worksheet & TTS Data

| NCHRP 8-51 Internal Trip Capture Estimation Tool | | | |
|---|---|---|---|
| **Project Name:** | 535-551 Brant Street | **Organization:** | PTSL |
| **Project Location:** | Burlington | **Performed By:** | |
| **Scenario Description:** | | **Date:** | Feb-20 |
| **Analysis Year:** | | **Checked By:** | |
| **Analysis Period:** | **AM Street Peak Hour** | **Date:** | |

**Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)**

| Land Use | Development Data (*For Information Only*) | | | Estimated Vehicle-Trips | | |
|---|---|---|---|---|---|---|
| | ITE LUCs[1] | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 0 | | |
| Retail | 820 | 11,496 | | 11 | 7 | 4 |
| Restaurant | | | | 0 | | |
| Cinema/Entertainment | | | | 0 | | |
| Residential | 222 | | 248 | 82 | 19 | 63 |
| Hotel | | | | 0 | | |
| All Other Land Uses[2] | | | | 0 | | |
| Total | | | | 93 | 26 | 67 |

**Table 2-A: Mode Split and Vehicle Occupancy Estimates**

| Land Use | Entering Trips | | | Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ. | % Transit | % Non-Motorized | Veh. Occ. | % Transit | % Non-Motorized |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |
| All Other Land Uses[2] | | | | | | |

**Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |

**Table 4-A: Internal Person-Trip Origin-Destination Matrix***

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 0 | 0 | 0 | 0 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 1 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 5-A: Computations Summary**

| | Total | Entering | Exiting |
|---|---|---|---|
| All Person-Trips | 93 | 26 | 67 |
| Internal Capture Percentage | 2% | 4% | 1% |
| | | | |
| External Vehicle-Trips[3] | 91 | 25 | 66 |
| External Transit-Trips[4] | 0 | 0 | 0 |
| External Non-Motorized Trips[4] | 0 | 0 | 0 |

**Table 6-A: Internal Trip Capture Percentages by Land Use**

| Land Use | Entering Trips | Exiting Trips |
|---|---|---|
| Office | N/A | N/A |
| Retail | 14% | 0% |
| Restaurant | N/A | N/A |
| Cinema/Entertainment | N/A | N/A |
| Residential | 0% | 2% |
| Hotel | N/A | N/A |

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

*Estimation Tool Developed by the Texas Transportation Institute*

| | |
|---|---|
| **Project Name:** | 535-551 Brant Street |
| **Analysis Period:** | **AM Street Peak Hour** |

**Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends**

| Land Use | Table 7-A (D): Entering Trips | | | Table 7-A (O): Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ. | Vehicle-Trips | Person-Trips* | Veh. Occ. | Vehicle-Trips | Person-Trips* |
| Office | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Retail | 1.00 | 7 | 7 | 1.00 | 4 | 4 |
| Restaurant | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Cinema/Entertainment | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Residential | 1.00 | 19 | 19 | 1.00 | 63 | 63 |
| Hotel | 1.00 | 0 | 0 | 1.00 | 0 | 0 |

**Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 1 | | 1 | 0 | 1 | 0 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 1 | 1 | 13 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 2 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 0 | 0 | 0 | 0 |
| Restaurant | 0 | 1 | | 0 | 1 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 1 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 9-A (D): Internal and External Trips Summary (Entering Trips)**

| Destination Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
|---|---|---|---|---|---|---|
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 1 | 6 | 7 | 6 | 0 | 0 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 0 | 19 | 19 | 19 | 0 | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

**Table 9-A (O): Internal and External Trips Summary (Exiting Trips)**

| Origin Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
|---|---|---|---|---|---|---|
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | 4 | 4 | 4 | 0 | 0 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 1 | 62 | 63 | 62 | 0 | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

| NCHRP 8-51 Internal Trip Capture Estimation Tool | | | |
|---|---|---|---|
| **Project Name:** | 535-551 Brant Street | **Organization:** | PTSL |
| **Project Location:** | Burlington | **Performed By:** | MM |
| **Scenario Description:** | | **Date:** | Feb-20 |
| **Analysis Year:** | | **Checked By:** | |
| **Analysis Period:** | **PM Street Peak Hour** | **Date:** | |

**Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)**

| Land Use | Development Data (*For Information Only*) | | | Estimated Vehicle-Trips | | |
|---|---|---|---|---|---|---|
| | ITE LUCs[1] | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 0 | | |
| Retail | 820 | 11,496 | | 44 | 21 | 23 |
| Restaurant | | | | 0 | | |
| Cinema/Entertainment | | | | 0 | | |
| Residential | 222 | | 248 | 93 | 57 | 36 |
| Hotel | | | | 0 | | |
| All Other Land Uses[2] | | | | 0 | | |
| Total | | | | 137 | 78 | 59 |

**Table 2-P: Mode Split and Vehicle Occupancy Estimates**

| Land Use | Entering Trips | | | Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ. | % Transit | % Non-Motorized | Veh. Occ. | % Transit | % Non-Motorized |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |
| All Other Land Uses[2] | | | | | | |

**Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | 0 | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | 0 | | | | |
| Hotel | | | | | | |

**Table 4-P: Internal Person-Trip Origin-Destination Matrix***

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 0 | 0 | 6 | 0 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 2 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 5-P: Computations Summary**

| | Total | Entering | Exiting |
|---|---|---|---|
| All Person-Trips | 137 | 78 | 59 |
| Internal Capture Percentage | 12% | 10% | 14% |
| | | | |
| External Vehicle-Trips[3] | 121 | 70 | 51 |
| External Transit-Trips[4] | 0 | 0 | 0 |
| External Non-Motorized Trips[4] | 0 | 0 | 0 |

**Table 6-P: Internal Trip Capture Percentages by Land Use**

| Land Use | Entering Trips | Exiting Trips |
|---|---|---|
| Office | N/A | N/A |
| Retail | 10% | 26% |
| Restaurant | N/A | N/A |
| Cinema/Entertainment | N/A | N/A |
| Residential | 11% | 6% |
| Hotel | N/A | N/A |

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

*Estimation Tool Developed by the Texas Transportation Institute*

| Project Name: | 535-551 Brant Street |
|---|---|
| Analysis Period: | **PM Street Peak Hour** |

**Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends**

| Land Use | Table 7-P (D): Entering Trips | | | Table 7-P (O): Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ. | Vehicle-Trips | Person-Trips* | Veh. Occ. | Vehicle-Trips | Person-Trips* |
| Office | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Retail | 1.00 | 21 | 21 | 1.00 | 23 | 23 |
| Restaurant | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Cinema/Entertainment | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Residential | 1.00 | 57 | 57 | 1.00 | 36 | 36 |
| Hotel | 1.00 | 0 | 0 | 1.00 | 0 | 0 |

**Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 7 | 1 | 6 | 1 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 1 | 15 | 8 | 0 | | 1 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 2 | 0 | 0 | 2 | 0 |
| Retail | 0 | | 0 | 0 | 26 | 0 |
| Restaurant | 0 | 11 | | 0 | 9 | 0 |
| Cinema/Entertainment | 0 | 1 | 0 | | 2 | 0 |
| Residential | 0 | 2 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 9-P (D): Internal and External Trips Summary (Entering Trips)**

| Destination Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
|---|---|---|---|---|---|---|
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 2 | 19 | 21 | 19 | 0 | 0 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 6 | 51 | 57 | 51 | 0 | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

**Table 9-P (O): Internal and External Trips Summary (Exiting Trips)**

| Origin Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
|---|---|---|---|---|---|---|
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 6 | 17 | 23 | 17 | 0 | 0 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 2 | 34 | 36 | 34 | 0 | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Tue Jun 16 2020 08:27:04 GMT-0400 (Eastern Daylight Time) - Run Time: 2064ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: Primary travel mode of trip - mode_prime

Filters:
2006 GTA zone of origin - gta06_orig In 4059-4069
and
Trip purpose of origin - purp_orig In H
and
Primary travel mode of trip - mode_prime In B, C, D, G, J, P, W

Trip 2016
ROW : gta06_orig
COLUMN : mode_prime

| gta06_orig | mode_prime | total |
|---|---|---|
| 4059 | B | 61 |
| 4059 | C | 150 |
| 4059 | D | 3416 |
| 4059 | G | 96 |
| 4059 | J | 65 |
| 4059 | P | 492 |
| 4059 | W | 260 |
| 4060 | B | 187 |
| 4060 | C | 59 |
| 4060 | D | 3742 |
| 4060 | G | 49 |
| 4060 | J | 20 |
| 4060 | P | 730 |
| 4060 | W | 321 |
| 4061 | B | 182 |
| 4061 | C | 155 |
| 4061 | D | 2001 |
| 4061 | G | 24 |
| 4061 | J | 23 |
| 4061 | P | 426 |
| 4061 | W | 118 |
| 4062 | B | 45 |
| 4062 | C | 179 |
| 4062 | D | 2484 |
| 4062 | G | 57 |
| 4062 | J | 77 |
| 4062 | P | 431 |
| 4062 | W | 181 |
| 4063 | D | 161 |
| 4063 | P | 14 |
| 4064 | B | 197 |
| 4064 | C | 100 |
| 4064 | D | 2580 |
| 4064 | G | 58 |
| 4064 | J | 77 |
| 4064 | P | 583 |
| 4064 | W | 166 |
| 4065 | C | 53 |
| 4065 | D | 1482 |
| 4065 | G | 37 |
| 4065 | J | 29 |
| 4065 | P | 222 |
| 4065 | W | 18 |
| 4066 | C | 35 |
| 4066 | D | 1150 |
| 4066 | G | 19 |
| 4066 | P | 194 |
| 4066 | W | 149 |
| 4067 | C | 32 |
| 4067 | D | 1590 |
| 4067 | G | 98 |
| 4067 | J | 12 |
| 4067 | P | 481 |
| 4067 | W | 213 |
| 4068 | D | 239 |
| 4068 | P | 77 |
| 4068 | W | 17 |
| 4069 | B | 29 |
| 4069 | D | 1111 |
| 4069 | G | 38 |
| 4069 | J | 64 |
| 4069 | P | 69 |
| 4069 | W | 36 |
| | | 27461 |

Tue Jun 16 2020 08:33:29 GMT-0400 (Eastern Daylight Time) - Run Time: 2295ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: Primary travel mode of trip - mode_prime

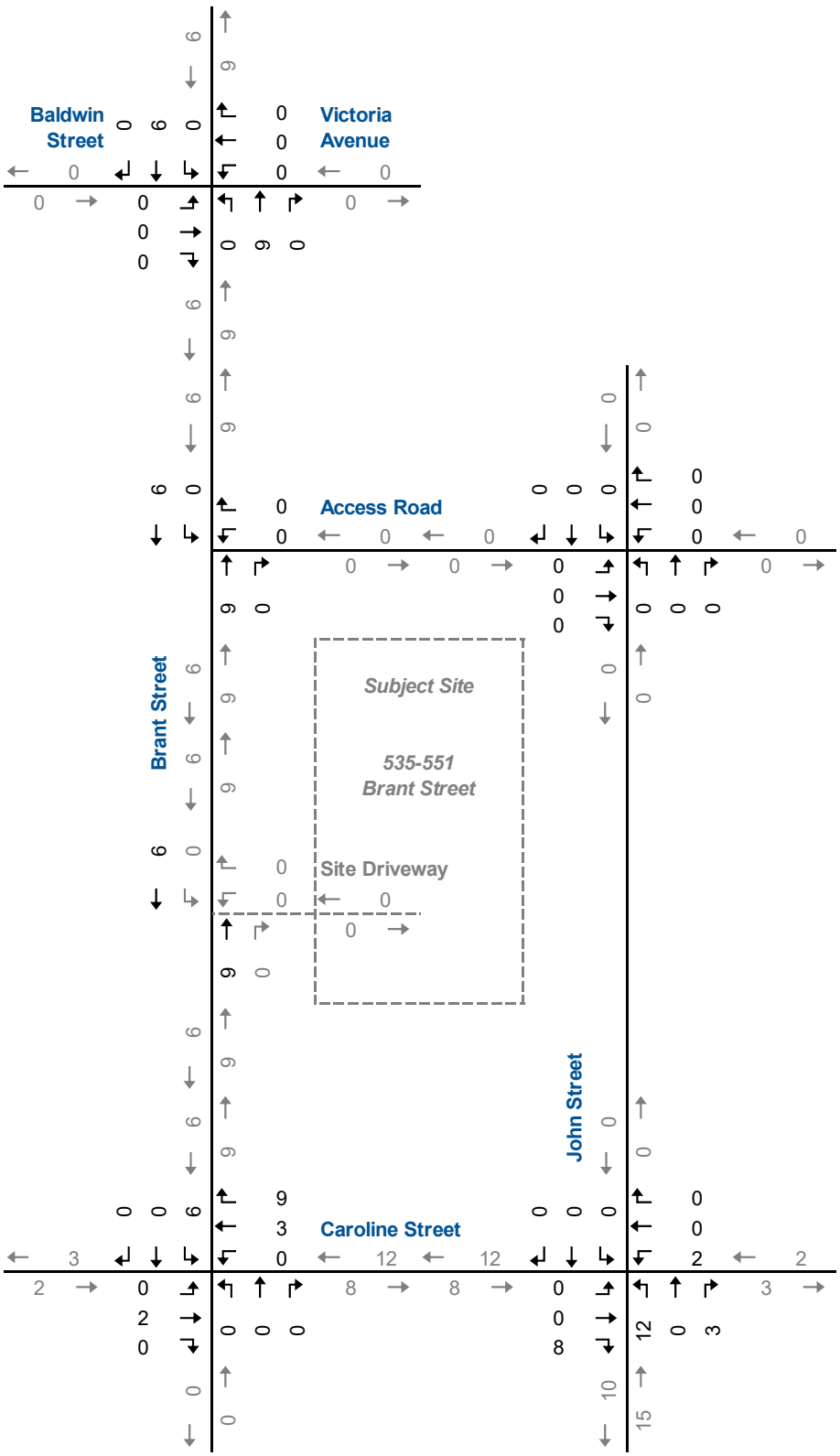
Filters:
2006 GTA zone of destination - gta06_dest In 4059-4069
and
Trip purpose of destination - purp_dest In H
and
Primary travel mode of trip - mode_prime In B, C, D, G, J, P, W

Trip 2016
ROW : gta06_dest
COLUMN : mode_prime

| gta06_dest | mode_prime | total |
|---|---|---|
| 4059 | B | 39 |
| 4059 | C | 150 |
| 4059 | D | 3449 |
| 4059 | G | 84 |
| 4059 | J | 55 |
| 4059 | P | 498 |
| 4059 | W | 328 |
| 4060 | B | 241 |
| 4060 | C | 59 |
| 4060 | D | 3718 |
| 4060 | G | 49 |
| 4060 | J | 66 |
| 4060 | P | 657 |
| 4060 | W | 302 |
| 4061 | B | 182 |
| 4061 | C | 155 |
| 4061 | D | 1917 |
| 4061 | G | 35 |
| 4061 | J | 23 |
| 4061 | P | 312 |
| 4061 | W | 233 |
| 4062 | B | 45 |
| 4062 | C | 179 |
| 4062 | D | 2484 |
| 4062 | G | 84 |
| 4062 | J | 51 |
| 4062 | P | 433 |
| 4062 | W | 139 |
| 4063 | D | 161 |
| 4063 | P | 14 |
| 4064 | B | 159 |
| 4064 | C | 100 |
| 4064 | D | 2582 |
| 4064 | G | 58 |
| 4064 | J | 90 |
| 4064 | P | 547 |
| 4064 | W | 267 |
| 4065 | C | 53 |
| 4065 | D | 1420 |
| 4065 | G | 37 |
| 4065 | J | 29 |
| 4065 | P | 162 |
| 4065 | W | 54 |
| 4066 | C | 35 |
| 4066 | D | 1147 |
| 4066 | G | 19 |
| 4066 | P | 172 |
| 4066 | W | 149 |
| 4067 | C | 32 |
| 4067 | D | 1590 |
| 4067 | G | 98 |
| 4067 | J | 12 |
| 4067 | P | 424 |
| 4067 | W | 271 |
| 4068 | D | 239 |
| 4068 | P | 77 |
| 4068 | W | 17 |
| 4069 | D | 1111 |
| 4069 | G | 19 |
| 4069 | J | 48 |
| 4069 | P | 127 |
| 4069 | W | 36 |
| | | 27323 |

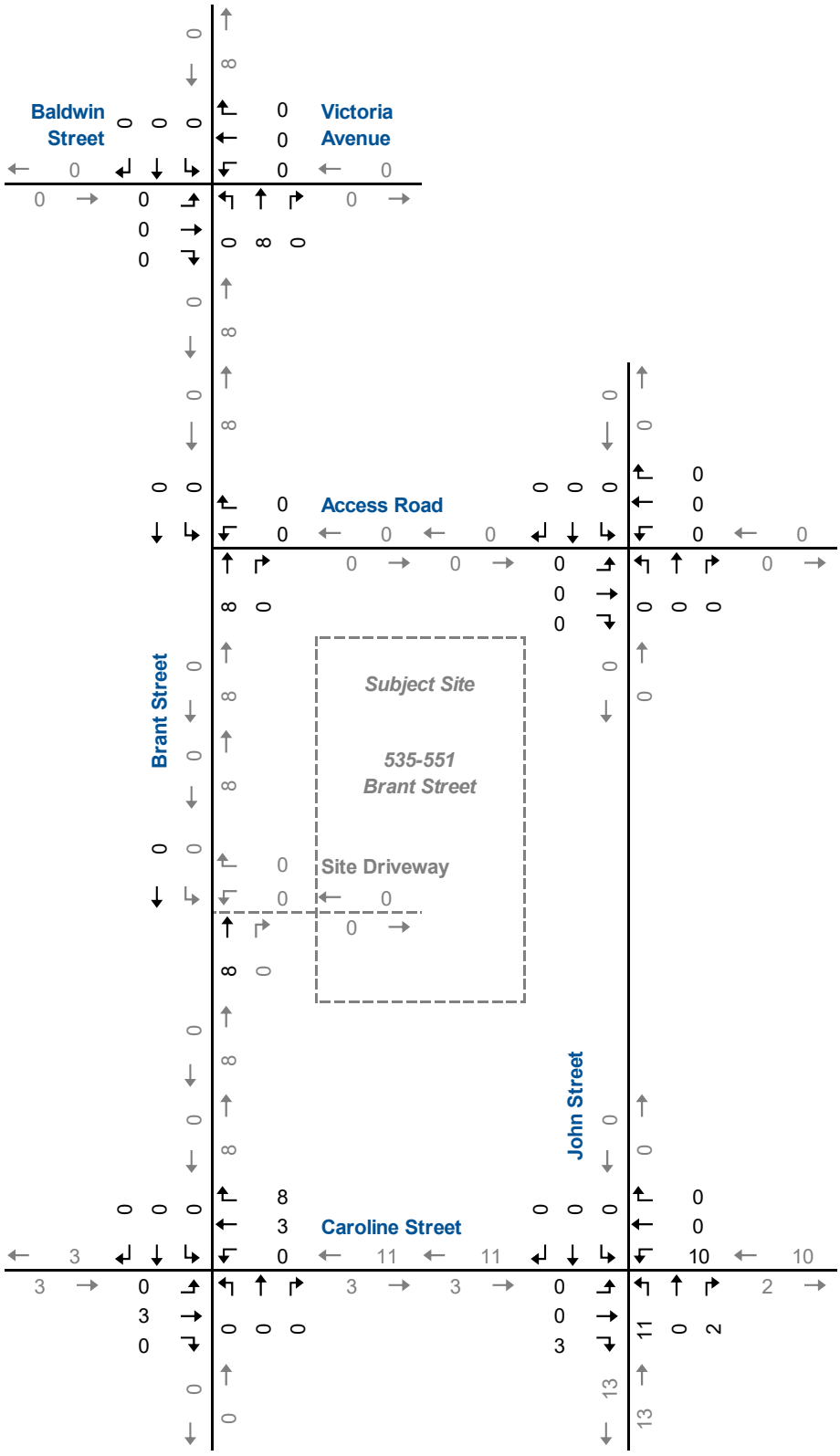
# Appendix E

## In Stream Development Traffic Projections



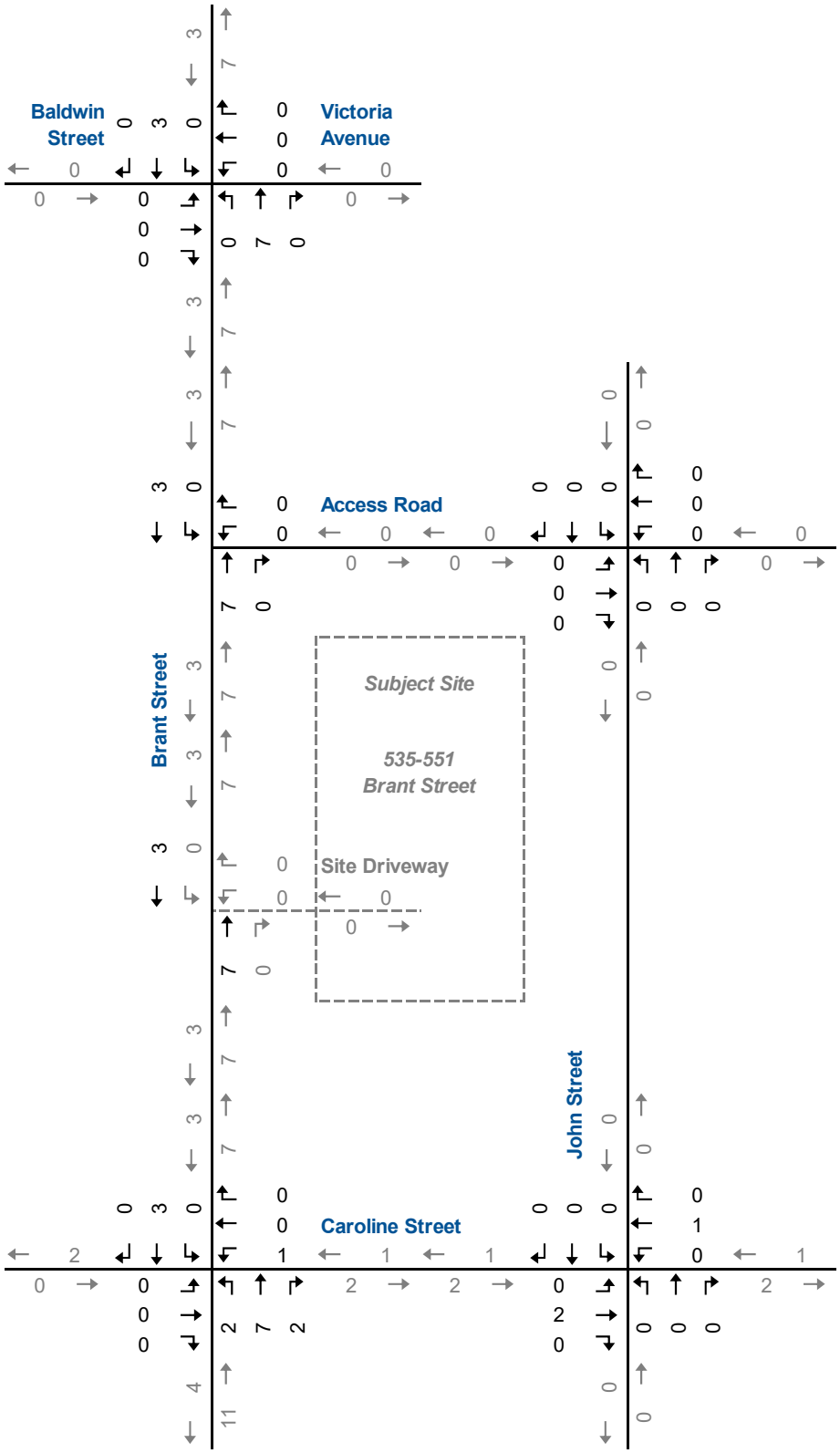

NTS

# In Stream Development Traffic Projections
# 421-431 Brant Street
# AM Peak Hour



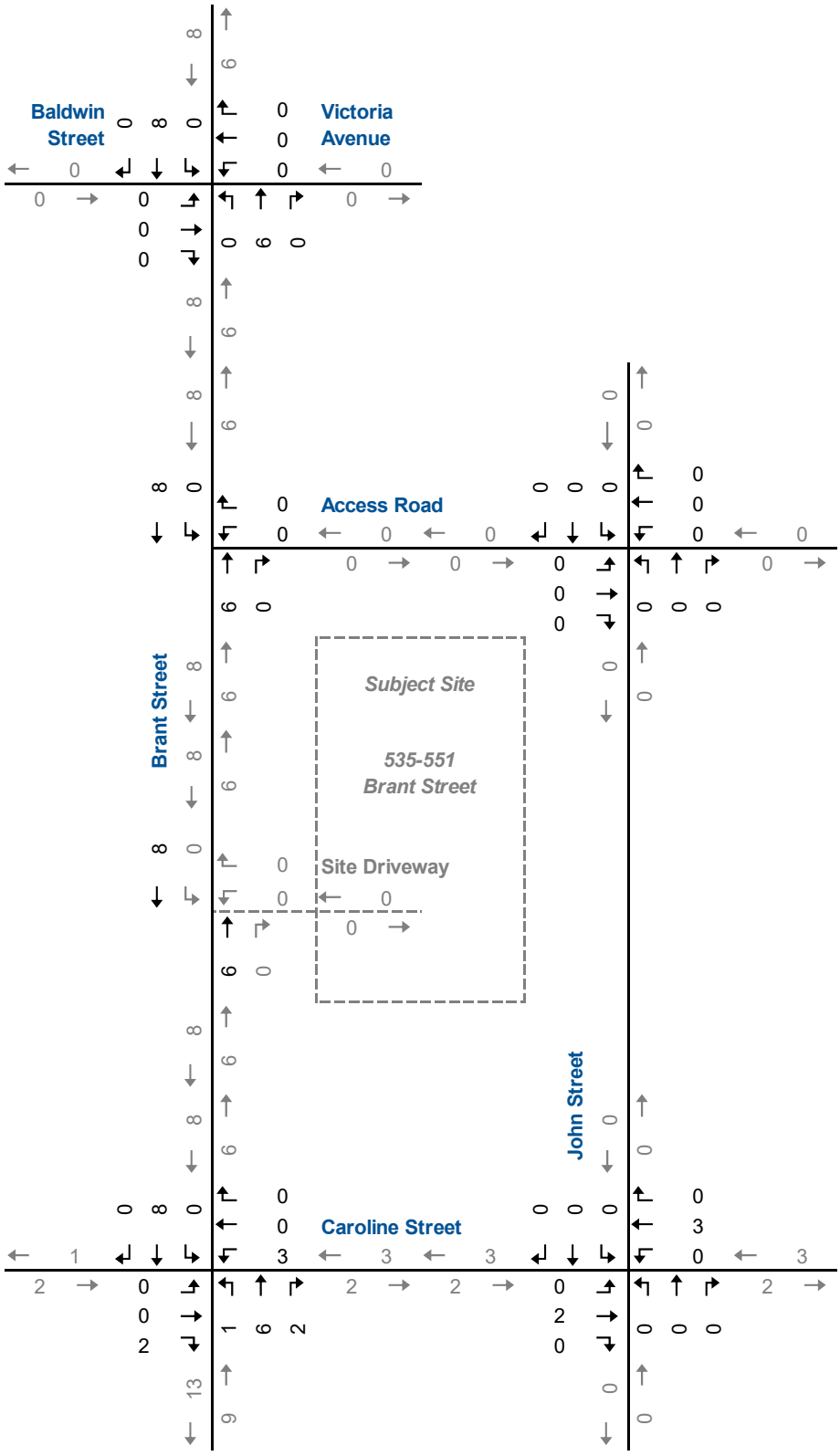

NTS

# In Stream Development Traffic Projections
# 421-431 Brant Street
# PM Peak Hour



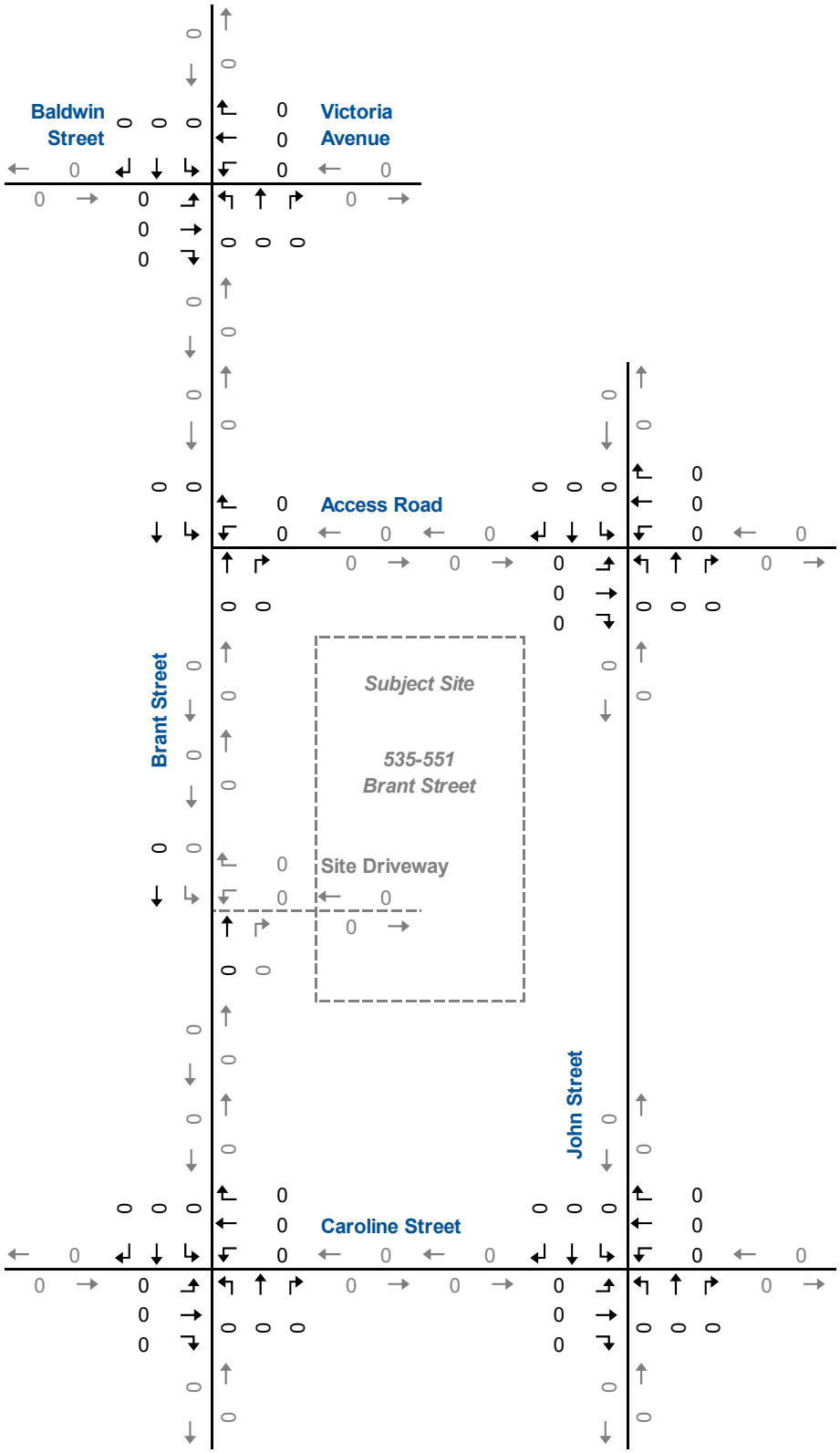

NTS

# In Stream Development Traffic Projections
# 409 Brant Street
# AM Peak Hour



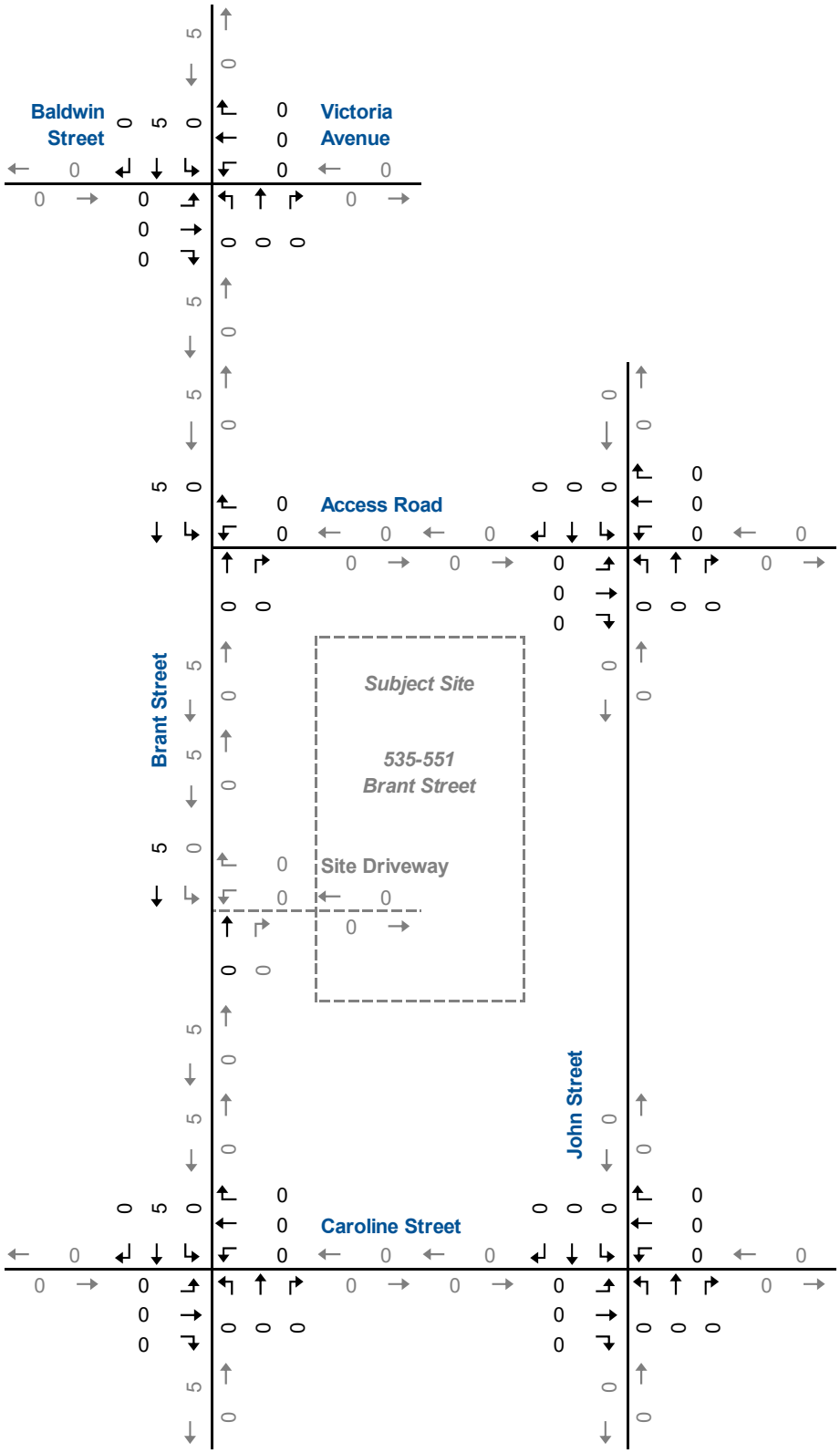

NTS

# In Stream Development Traffic Projections
# 409 Brant Street
# PM Peak Hour



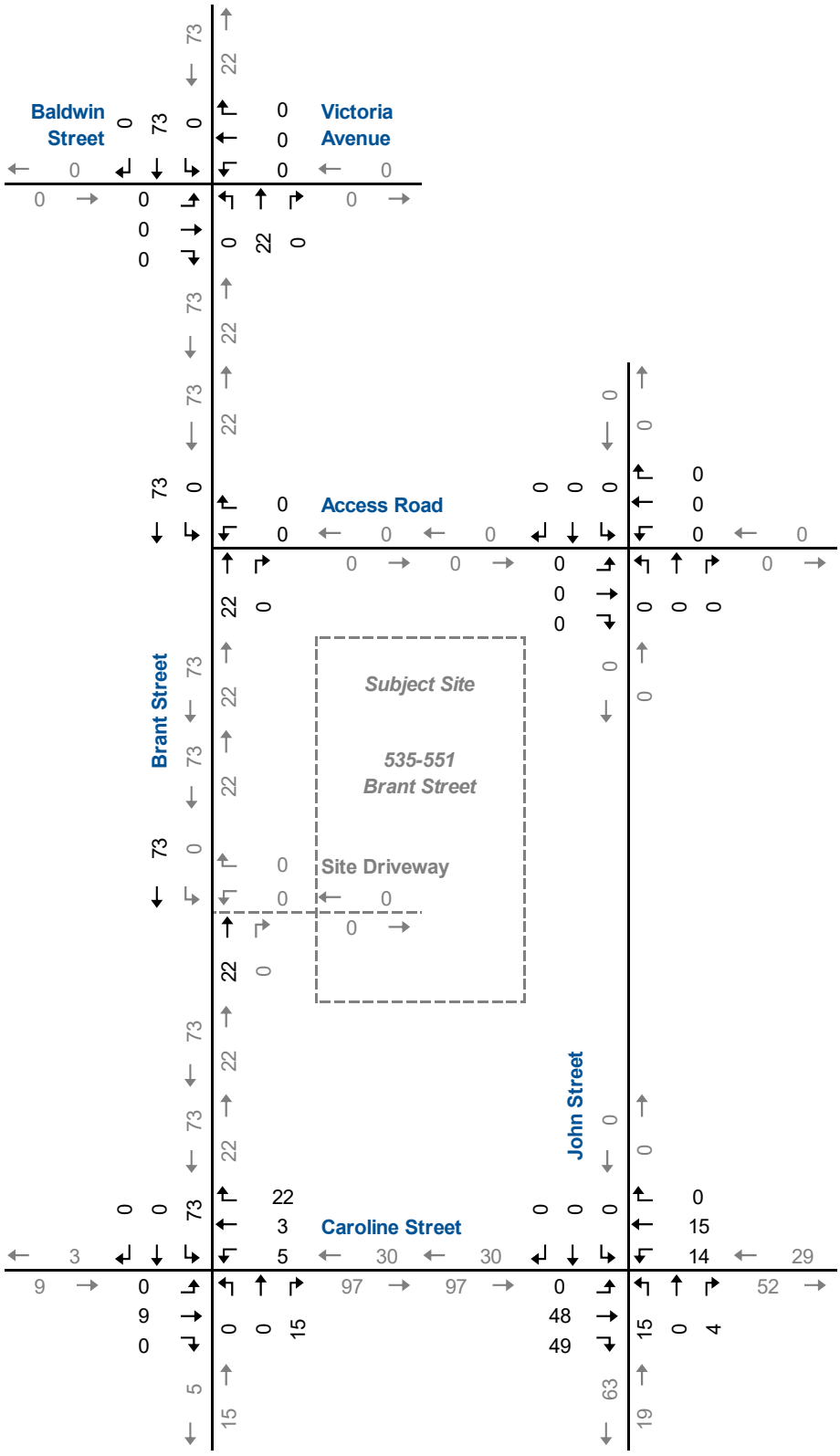

NTS

# In Stream Development Traffic Projections 2082, 2086 & 2090 James Street AM Peak Hour



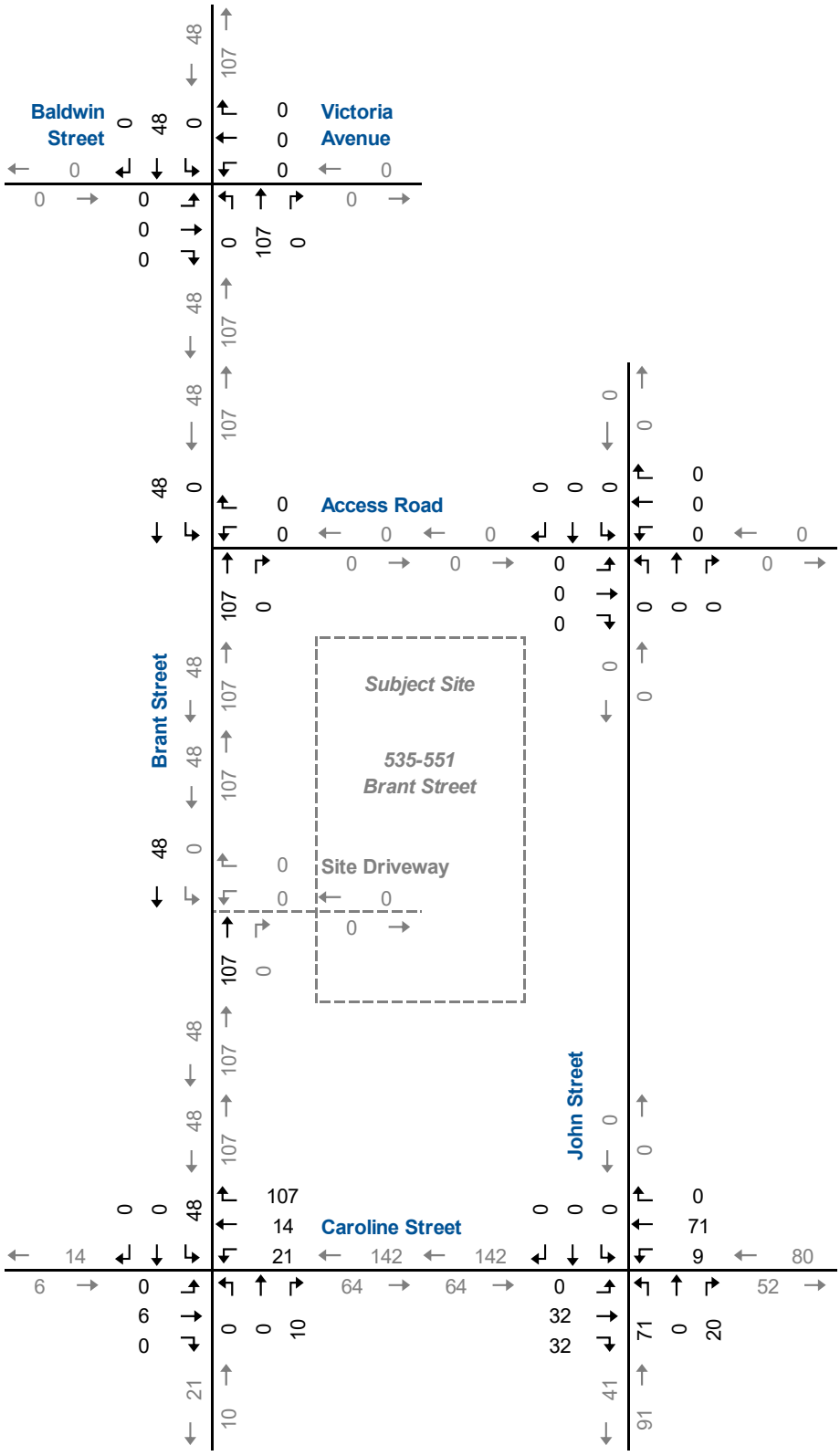

NTS

# In Stream Development Traffic Projections 2082, 2086 & 2090 James Street PM Peak Hour




NTS

# In Stream Development Traffic Projections
# 2025 Maria St, 2030 Caroline St & 510 Elizabeth St
# AM Peak Hour




NTS

# In Stream Development Traffic Projections
# 2025 Maria St, 2030 Caroline St & 510 Elizabeth St
# PM Peak Hour

# Appendix F

## 2025 Background Traffic Operations Reports

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 551 | 23 | 29 | 614 | 137 |
| Future Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 551 | 23 | 29 | 614 | 137 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.88 | 0.93 | | 0.86 | 0.95 | | 0.98 | 1.00 | | 0.98 | | 0.91 |
| Frt | | 0.938 | | | 0.951 | | | 0.994 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1659 | 0 | 1601 | 1648 | 0 | 1631 | 1774 | 0 | 1572 | 1759 | 1493 |
| Flt Permitted | 0.704 | | | 0.715 | | | 0.347 | | | 0.370 | | |
| Satd. Flow (perm) | 1133 | 1659 | 0 | 1040 | 1648 | 0 | 583 | 1774 | 0 | 601 | 1759 | 1354 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 27 | | | 27 | | | 4 | | | | 149 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| 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 (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Adj. Flow (vph) | 110 | 38 | 27 | 13 | 55 | 27 | 33 | 599 | 25 | 32 | 667 | 149 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 110 | 65 | 0 | 13 | 82 | 0 | 33 | 624 | 0 | 32 | 667 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |

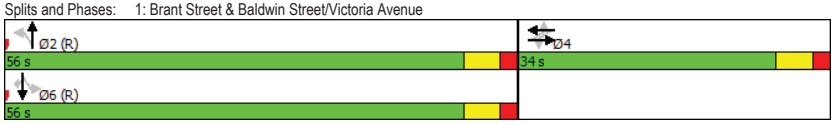


Lanes, Volumes, Timings
1: Brant Street & Baldwin Street/Victoria Avenue
Background AM
190080: 535-551 Brant Street, Burlington

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 65.7 | 65.7 | | 65.7 | 65.7 | 65.7 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| v/c Ratio | 0.54 | 0.20 | | 0.07 | 0.26 | | 0.08 | 0.48 | | 0.07 | 0.52 | 0.14 |
| Control Delay | 41.9 | 20.3 | | 28.2 | 22.6 | | 5.3 | 7.4 | | 5.2 | 8.0 | 1.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 20.3 | | 28.2 | 22.6 | | 5.3 | 7.4 | | 5.2 | 8.0 | 1.3 |
| LOS | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay | | 33.9 | | | 23.4 | | | 7.3 | | | 6.7 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.54 | | | |
| Intersection Signal Delay: 10.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 64.7% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue




Paradigm Transportation Solutions Limited
Synchro 9 Report



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 110 | 65 | 13 | 82 | 33 | 624 | 32 | 667 | 149 |
| v/c Ratio | 0.54 | 0.20 | 0.07 | 0.26 | 0.08 | 0.48 | 0.07 | 0.52 | 0.14 |
| Control Delay | 41.9 | 20.3 | 28.2 | 22.6 | 5.3 | 7.4 | 5.2 | 8.0 | 1.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 20.3 | 28.2 | 22.6 | 5.3 | 7.4 | 5.2 | 8.0 | 1.3 |
| Queue Length 50th (m) | 17.5 | 5.6 | 1.9 | 8.2 | 1.4 | 36.5 | 1.3 | 41.2 | 0.0 |
| Queue Length 95th (m) | 30.5 | 14.6 | 6.2 | 18.2 | 5.3 | 77.5 | 5.1 | 87.0 | 5.8 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 377 | 571 | 346 | 567 | 425 | 1295 | 438 | 1283 | 1028 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.11 | 0.04 | 0.14 | 0.08 | 0.48 | 0.07 | 0.52 | 0.14 |

Intersection Summary







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 551 | 23 | 29 | 614 | 137 |
| Future Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 551 | 23 | 29 | 614 | 137 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.93 | | 1.00 | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.91 |
| Flpb, ped/bikes | 0.88 | 1.00 | | 0.86 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | 1.00 |
| Frt | 1.00 | 0.94 | | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1529 | 1658 | | 1382 | 1648 | | 1590 | 1774 | | 1540 | 1759 | 1354 |
| Flt Permitted | 0.70 | 1.00 | | 0.71 | 1.00 | | 0.35 | 1.00 | | 0.37 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1133 | 1658 | | 1040 | 1648 | | 581 | 1774 | | 600 | 1759 | 1354 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 110 | 38 | 27 | 13 | 55 | 27 | 33 | 599 | 25 | 32 | 667 | 149 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 40 |
| Lane Group Flow (vph) | 110 | 43 | 0 | 13 | 60 | 0 | 33 | 623 | 0 | 32 | 667 | 109 |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 14.3 | 14.3 | | 14.3 | 14.3 | | 63.7 | 63.7 | | 63.7 | 63.7 | 63.7 |
| Effective Green, g (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 65.7 | 65.7 | | 65.7 | 65.7 | 65.7 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 205 | 300 | | 188 | 298 | | 424 | 1295 | | 438 | 1284 | 988 |
| v/s Ratio Prot | | 0.03 | | | 0.04 | | | 0.35 | | | c0.38 | |
| v/s Ratio Perm | c0.10 | | | 0.01 | | | 0.06 | | | 0.05 | | 0.08 |
| v/c Ratio | 0.54 | 0.14 | | 0.07 | 0.20 | | 0.08 | 0.48 | | 0.07 | 0.52 | 0.11 |
| Uniform Delay, d1 | 33.4 | 31.0 | | 30.6 | 31.3 | | 3.5 | 5.1 | | 3.5 | 5.3 | 3.6 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.7 | 0.2 | | 0.2 | 0.3 | | 0.4 | 1.3 | | 0.3 | 1.5 | 0.2 |
| Delay (s) | 36.1 | 31.2 | | 30.7 | 31.6 | | 3.8 | 6.3 | | 3.8 | 6.8 | 3.8 |
| Level of Service | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay (s) | | 34.3 | | | 31.5 | | | 6.2 | | | 6.1 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| HCM 2000 Control Delay | 10.3 | HCM 2000 Level of Service | B | | |
| HCM 2000 Volume to Capacity ratio | 0.52 | | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | | |
| Intersection Capacity Utilization | 64.7% | ICU Level of Service | C | | |
| Analysis Period (min) | 15 | | | | |
| c Critical Lane Group | | | | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 13 | 28 | 576 | 37 | 47 | 604 |
| Future Volume (vph) | 13 | 28 | 576 | 37 | 47 | 604 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.908 | | 0.992 | | | |
| Flt Protected | 0.984 | | | | 0.950 | |
| Satd. Flow (prot) | 1579 | 0 | 1794 | 0 | 1678 | 1810 |
| Flt Permitted | 0.984 | | | | 0.950 | |
| Satd. Flow (perm) | 1579 | 0 | 1794 | 0 | 1678 | 1810 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 168.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 12.1 | | | 13.7 |
| Confl. Peds. (#/hr) | 4 | | | 19 | 19 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 11% | 5% | 6% | 4% | 5% |
| Adj. Flow (vph) | 14 | 30 | 626 | 40 | 51 | 657 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 44 | 0 | 666 | 0 | 51 | 657 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 49.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 13 | 28 | 576 | 37 | 47 | 604 |
| Future Volume (Veh/h) | 13 | 28 | 576 | 37 | 47 | 604 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 14 | 30 | 626 | 40 | 51 | 657 |
| Pedestrians | 19 | | 4 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 2 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.86 | 0.78 | | | 0.78 | |
| vC, conflicting volume | 1428 | 665 | | | 685 | |
| vC1, stage 1 conf vol | 665 | | | | | |
| vC2, stage 2 conf vol | 763 | | | | | |
| vCu, unblocked vol | 989 | 429 | | | 455 | |
| tC, single (s) | 6.4 | 6.3 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.4 | | | 2.2 | |
| p0 queue free % | 96 | 94 | | | 94 | |
| cM capacity (veh/h) | 368 | 465 | | | 839 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 44 | 666 | 51 | 657 |
| Volume Left | 14 | 0 | 51 | 0 |
| Volume Right | 30 | 40 | 0 | 0 |
| cSH | 429 | 1700 | 839 | 1700 |
| Volume to Capacity | 0.10 | 0.39 | 0.06 | 0.39 |
| Queue Length 95th (m) | 2.6 | 0.0 | 1.5 | 0.0 |
| Control Delay (s) | 14.3 | 0.0 | 9.6 | 0.0 |
| Lane LOS | B | | A | |
| Approach Delay (s) | 14.3 | 0.0 | 0.7 | |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.8 | | |
| Intersection Capacity Utilization | 49.1% | 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) | 138 | 113 | 20 | 24 | 62 | 127 | 11 | 348 | 36 | 165 | 394 | 58 |
| Future Volume (vph) | 138 | 113 | 20 | 24 | 62 | 127 | 11 | 348 | 36 | 165 | 394 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | 1.00 | | 0.95 | 0.97 | 0.99 | | 0.98 | 0.99 | | 0.97 | 0.99 | |
| Frt | | | 0.850 | | 0.899 | | | 0.986 | | | 0.981 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1646 | 1792 | 1439 | 1479 | 1450 | 0 | 1572 | 1631 | 0 | 1601 | 1651 | 0 |
| Flt Permitted | 0.469 | | | 0.678 | | | 0.446 | | | 0.241 | | |
| Satd. Flow (perm) | 812 | 1792 | 1363 | 1026 | 1450 | 0 | 727 | 1631 | 0 | 393 | 1651 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 130 | | | 7 | | | 12 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 168.5 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 12.1 | |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| 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% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Adj. Flow (vph) | 150 | 123 | 22 | 26 | 67 | 138 | 12 | 378 | 39 | 179 | 428 | 63 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 150 | 123 | 22 | 26 | 205 | 0 | 12 | 417 | 0 | 179 | 491 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |

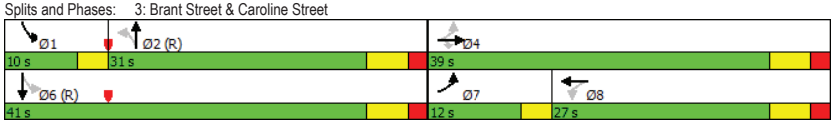




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 27.0 | 27.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.34 | 0.34 | | 0.48 | 0.46 | |
| v/c Ratio | 0.33 | 0.16 | 0.03 | 0.09 | 0.40 | | 0.05 | 0.75 | | 0.61 | 0.64 | |
| Control Delay | 15.6 | 14.3 | 0.1 | 21.9 | 11.7 | | 18.7 | 33.4 | | 22.7 | 20.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 15.6 | 14.3 | 0.1 | 21.9 | 11.7 | | 18.7 | 33.4 | | 22.7 | 20.6 | |
| LOS | B | B | A | C | B | | B | C | | C | C | |
| Approach Delay | | 13.9 | | | 12.8 | | | 33.0 | | | 21.2 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 54 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 75 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.75 | | |
| Intersection Signal Delay: 21.8 | Intersection LOS: C | |
| Intersection Capacity Utilization 67.1% | ICU Level of Service C | |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 150 | 123 | 22 | 26 | 205 | 12 | 417 | 179 | 491 |
| v/c Ratio | 0.33 | 0.16 | 0.03 | 0.09 | 0.40 | 0.05 | 0.75 | 0.61 | 0.64 |
| Control Delay | 15.6 | 14.3 | 0.1 | 21.9 | 11.7 | 18.7 | 33.4 | 22.7 | 20.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 15.6 | 14.3 | 0.1 | 21.9 | 11.7 | 18.7 | 33.4 | 22.7 | 20.6 |
| Queue Length 50th (m) | 13.3 | 10.9 | 0.0 | 2.9 | 8.5 | 1.2 | 54.6 | 15.3 | 53.1 |
| Queue Length 95th (m) | 24.4 | 20.8 | 0.0 | 8.6 | 25.3 | 4.8 | #95.9 | #27.7 | 84.5 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 144.5 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 459 | 784 | 642 | 301 | 518 | 245 | 555 | 292 | 770 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.16 | 0.03 | 0.09 | 0.40 | 0.05 | 0.75 | 0.61 | 0.64 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 113 | 20 | 24 | 62 | 127 | 11 | 348 | 36 | 165 | 394 | 58 |
| Future Volume (vph) | 138 | 113 | 20 | 24 | 62 | 127 | 11 | 348 | 36 | 165 | 394 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.95 | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.90 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1645 | 1792 | 1363 | 1437 | 1450 | | 1548 | 1631 | | 1590 | 1651 | |
| Flt Permitted | 0.47 | 1.00 | 1.00 | 0.68 | 1.00 | | 0.45 | 1.00 | | 0.24 | 1.00 | |
| Satd. Flow (perm) | 813 | 1792 | 1363 | 1026 | 1450 | | 727 | 1631 | | 403 | 1651 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 150 | 123 | 22 | 26 | 67 | 138 | 12 | 378 | 39 | 179 | 428 | 63 |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 92 | 0 | 0 | 5 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 150 | 123 | 10 | 26 | 113 | 0 | 12 | 412 | 0 | 179 | 485 | 0 |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| Heavy Vehicles (%) | 6% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.6 | 21.6 | | 25.0 | 25.0 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 27.0 | 27.0 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.34 | 0.34 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 422 | 784 | 596 | 302 | 427 | | 245 | 550 | | 280 | 763 | |
| v/s Ratio Prot | c0.04 | 0.07 | | | 0.08 | | | c0.25 | | 0.06 | c0.29 | |
| v/s Ratio Perm | c0.11 | | 0.01 | 0.03 | | | 0.02 | | | 0.22 | | |
| v/c Ratio | 0.36 | 0.16 | 0.02 | 0.09 | 0.27 | | 0.05 | 0.75 | | 0.64 | 0.64 | |
| Uniform Delay, d1 | 15.5 | 13.6 | 12.7 | 20.4 | 21.6 | | 17.9 | 23.5 | | 16.0 | 16.4 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.4 | 0.0 | 0.6 | 1.5 | | 0.4 | 9.1 | | 4.7 | 4.0 | |
| Delay (s) | 16.0 | 14.0 | 12.8 | 21.0 | 23.1 | | 18.2 | 32.6 | | 20.8 | 20.4 | |
| Level of Service | B | B | B | C | C | | B | C | | C | C | |
| Approach Delay (s) | | 14.9 | | | 22.8 | | | 32.2 | | | 20.5 | |
| Approach LOS | | B | | | C | | | C | | | C | |

Intersection Summary

| | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 22.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 67.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 23 | 210 | 81 | 20 | 163 | 48 | 35 | 8 | 14 | 17 | 13 | 15 |
| Future Volume (vph) | 23 | 210 | 81 | 20 | 163 | 48 | 35 | 8 | 14 | 17 | 13 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 15.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.965 | | | | 0.850 | | 0.906 | | | | 0.850 |
| Flt Protected | | 0.996 | | | 0.995 | | 0.950 | | | | 0.973 | |
| Satd. Flow (prot) | 0 | 1725 | 0 | 0 | 1857 | 1615 | 1745 | 1721 | 0 | 0 | 1782 | 1597 |
| Flt Permitted | | 0.996 | | | 0.995 | | 0.950 | | | | 0.973 | |
| Satd. Flow (perm) | 0 | 1725 | 0 | 0 | 1857 | 1615 | 1745 | 1721 | 0 | 0 | 1782 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 166.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 12.0 | |
| Confl. Peds. (#/hr) | 14 | | 7 | 7 | | 14 | 8 | | 15 | 15 | | 8 |
| 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 (%) | 0% | 3% | 15% | 0% | 2% | 0% | 0% | 0% | 0% | 2% | 6% | 0% |
| Adj. Flow (vph) | 25 | 228 | 88 | 22 | 177 | 52 | 38 | 9 | 15 | 18 | 14 | 16 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 341 | 0 | 0 | 199 | 52 | 38 | 24 | 0 | 0 | 32 | 16 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 49.0% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 23 | 210 | 81 | 20 | 163 | 48 | 35 | 8 | 14 | 17 | 13 | 15 |
| Future Volume (vph) | 23 | 210 | 81 | 20 | 163 | 48 | 35 | 8 | 14 | 17 | 13 | 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 |
| Hourly flow rate (vph) | 25 | 228 | 88 | 22 | 177 | 52 | 38 | 9 | 15 | 18 | 14 | 16 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total (vph) | 341 | 199 | 52 | 38 | 24 | 32 | 16 |
| Volume Left (vph) | 25 | 22 | 0 | 38 | 0 | 18 | 0 |
| Volume Right (vph) | 88 | 0 | 52 | 0 | 15 | 0 | 16 |
| Hadj (s) | -0.04 | 0.09 | -0.70 | 0.50 | -0.44 | 0.34 | -0.70 |
| Departure Headway (s) | 5.1 | 5.2 | 4.4 | 6.5 | 5.6 | 6.4 | 5.4 |
| Degree Utilization, x | 0.48 | 0.29 | 0.06 | 0.07 | 0.04 | 0.06 | 0.02 |
| Capacity (veh/h) | 687 | 666 | 779 | 505 | 581 | 509 | 602 |
| Control Delay (s) | 12.7 | 9.1 | 6.5 | 8.8 | 7.6 | 8.6 | 7.3 |
| Approach Delay (s) | 12.7 | 8.6 | | 8.4 | | 8.2 | |
| Approach LOS | B | A | | A | | A | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Delay | 10.5 | | | | |
| Level of Service | B | | | | |
| Intersection Capacity Utilization | 49.0% | 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) | 18 | 0 | 39 | 0 | 0 | 0 | 26 | 34 | 1 | 1 | 46 | 7 |
| Future Volume (vph) | 18 | 0 | 39 | 0 | 0 | 0 | 26 | 34 | 1 | 1 | 46 | 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 | | 0.909 | | | | | | 0.998 | | | 0.982 | |
| Flt Protected | | 0.984 | | | | | | 0.979 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1667 | 0 | 0 | 1900 | 0 | 0 | 1826 | 0 | 0 | 1833 | 0 |
| Flt Permitted | | 0.984 | | | | | | 0.979 | | | 0.999 | |
| Satd. Flow (perm) | 0 | 1667 | 0 | 0 | 1900 | 0 | 0 | 1826 | 0 | 0 | 1833 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 166.3 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 12.0 | | | 4.2 | |
| Confl. Peds. (#/hr) | 55 | | 3 | 3 | | 55 | 22 | | 7 | 7 | | 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% | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 2% | 0% |
| Adj. Flow (vph) | 20 | 0 | 42 | 0 | 0 | 0 | 28 | 37 | 1 | 1 | 50 | 8 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 66 | 0 | 0 | 59 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 29.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 18 | 0 | 39 | 0 | 0 | 0 | 26 | 34 | 1 | 1 | 46 | 7 |
| Future Volume (vph) | 18 | 0 | 39 | 0 | 0 | 0 | 26 | 34 | 1 | 1 | 46 | 7 |
| 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) | 20 | 0 | 42 | 0 | 0 | 0 | 28 | 37 | 1 | 1 | 50 | 8 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 62 | 0 | 66 | 59 |
| Volume Left (vph) | 20 | 0 | 28 | 1 |
| Volume Right (vph) | 42 | 0 | 1 | 8 |
| Hadj (s) | -0.31 | 0.00 | 0.10 | -0.05 |
| Departure Headway (s) | 3.9 | 4.2 | 4.2 | 4.0 |
| Degree Utilization, x | 0.07 | 0.00 | 0.08 | 0.07 |
| Capacity (veh/h) | 900 | 827 | 834 | 870 |
| Control Delay (s) | 7.1 | 7.2 | 7.5 | 7.3 |
| Approach Delay (s) | 7.1 | 0.0 | 7.5 | 7.3 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.3 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 29.1% | 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) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 884 | 18 | 61 | 714 | 54 |
| Future Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 884 | 18 | 61 | 714 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.98 | 0.97 | | 0.97 | 0.97 | | 0.99 | 1.00 | | | | 0.92 |
| Frt | | 0.929 | | | 0.882 | | | 0.997 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1721 | 0 | 1601 | 1470 | 0 | 1745 | 1837 | 0 | 1631 | 1792 | 1536 |
| Flt Permitted | 0.706 | | | 0.735 | | | 0.322 | | | 0.232 | | |
| Satd. Flow (perm) | 1269 | 1721 | 0 | 1198 | 1470 | 0 | 584 | 1837 | 0 | 398 | 1792 | 1413 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 16 | | | 62 | | | 2 | | | | 55 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| 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 (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Adj. Flow (vph) | 48 | 18 | 16 | 25 | 17 | 62 | 17 | 961 | 20 | 66 | 776 | 59 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 48 | 34 | 0 | 25 | 79 | 0 | 17 | 981 | 0 | 66 | 776 | 59 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |

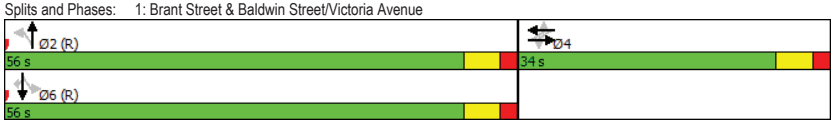




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 11.6 | 11.6 | | 11.6 | 11.6 | | 74.0 | 74.0 | | 74.0 | 74.0 | 74.0 |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.82 | 0.82 | | 0.82 | 0.82 | 0.82 |
| v/c Ratio | 0.29 | 0.14 | | 0.16 | 0.33 | | 0.04 | 0.65 | | 0.20 | 0.53 | 0.05 |
| Control Delay | 39.7 | 23.3 | | 36.5 | 16.8 | | 2.8 | 7.1 | | 4.7 | 5.2 | 1.0 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.7 | 23.3 | | 36.5 | 16.8 | | 2.8 | 7.1 | | 4.7 | 5.2 | 1.0 |
| LOS | D | C | | D | B | | A | A | | A | A | A |
| Approach Delay | | 32.9 | | | 21.5 | | | 7.0 | | | 4.9 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.65 | | | |
| Intersection Signal Delay: 7.8 | | Intersection LOS: A | |
| Intersection Capacity Utilization 72.0% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 48 | 34 | 25 | 79 | 17 | 981 | 66 | 776 | 59 |
| v/c Ratio | 0.29 | 0.14 | 0.16 | 0.33 | 0.04 | 0.65 | 0.20 | 0.53 | 0.05 |
| Control Delay | 39.7 | 23.3 | 36.5 | 16.8 | 2.8 | 7.1 | 4.7 | 5.2 | 1.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.7 | 23.3 | 36.5 | 16.8 | 2.8 | 7.1 | 4.7 | 5.2 | 1.0 |
| Queue Length 50th (m) | 7.7 | 2.8 | 3.9 | 2.7 | 0.5 | 56.8 | 2.1 | 37.1 | 0.2 |
| Queue Length 95th (m) | 17.3 | 10.7 | 10.7 | 14.4 | 2.1 | 115.2 | 7.3 | 73.0 | 2.6 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 423 | 584 | 399 | 531 | 480 | 1511 | 327 | 1473 | 1172 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.06 | 0.06 | 0.15 | 0.04 | 0.65 | 0.20 | 0.53 | 0.05 |

Intersection Summary







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 884 | 18 | 61 | 714 | 54 |
| Future Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 884 | 18 | 61 | 714 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.92 |
| Flpb, ped/bikes | 0.98 | 1.00 | | 0.97 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | 1.00 |
| Frt | 1.00 | 0.93 | | 1.00 | 0.88 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1708 | 1721 | | 1549 | 1471 | | 1714 | 1837 | | 1612 | 1792 | 1413 |
| Flt Permitted | 0.71 | 1.00 | | 0.73 | 1.00 | | 0.32 | 1.00 | | 0.23 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1269 | 1721 | | 1198 | 1471 | | 581 | 1837 | | 393 | 1792 | 1413 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 48 | 18 | 16 | 25 | 17 | 62 | 17 | 961 | 20 | 66 | 776 | 59 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Lane Group Flow (vph) | 48 | 20 | 0 | 25 | 24 | 0 | 17 | 981 | 0 | 66 | 776 | 48 |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 70.0 | 70.0 | | 70.0 | 70.0 | 70.0 |
| Effective Green, g (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 72.0 | 72.0 | | 72.0 | 72.0 | 72.0 |
| Actuated g/C Ratio | 0.11 | 0.11 | | 0.11 | 0.11 | | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 141 | 191 | | 133 | 163 | | 464 | 1469 | | 314 | 1433 | 1130 |
| v/s Ratio Prot | | 0.01 | | | 0.02 | | | c0.53 | | | 0.43 | |
| v/s Ratio Perm | c0.04 | | | 0.02 | | | 0.03 | | | 0.17 | | 0.03 |
| v/c Ratio | 0.34 | 0.10 | | 0.19 | 0.15 | | 0.04 | 0.67 | | 0.21 | 0.54 | 0.04 |
| Uniform Delay, d1 | 37.0 | 36.0 | | 36.3 | 36.1 | | 1.9 | 3.9 | | 2.2 | 3.2 | 1.9 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.4 | 0.2 | | 0.7 | 0.4 | | 0.1 | 2.4 | | 1.5 | 1.5 | 0.1 |
| Delay (s) | 38.4 | 36.2 | | 37.0 | 36.6 | | 2.0 | 6.3 | | 3.7 | 4.6 | 1.9 |
| Level of Service | D | D | | D | D | | A | A | | A | A | A |
| Approach Delay (s) | | 37.5 | | | 36.7 | | | 6.2 | | | 4.4 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | | | | |
|---|---|---|---|---|---|---|
| HCM 2000 Control Delay | 8.2 | HCM 2000 Level of Service | A | | | |
| HCM 2000 Volume to Capacity ratio | 0.63 | | | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | | | |
| Intersection Capacity Utilization | 72.0% | ICU Level of Service | C | | | |
| Analysis Period (min) | 15 | | | | | |
| c Critical Lane Group | | | | | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 40 | 81 | 837 | 65 | 38 | 714 |
| Future Volume (vph) | 40 | 81 | 837 | 65 | 38 | 714 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.909 | | 0.990 | | | |
| Flt Protected | 0.984 | | | | 0.950 | |
| Satd. Flow (prot) | 1699 | 0 | 1864 | 0 | 1745 | 1863 |
| Flt Permitted | 0.984 | | | | 0.950 | |
| Satd. Flow (perm) | 1699 | 0 | 1864 | 0 | 1745 | 1863 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 168.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 12.1 | | | 13.7 |
| Confl. Peds. (#/hr) | 1 | | | 13 | 13 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 43 | 88 | 910 | 71 | 41 | 776 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 131 | 0 | 981 | 0 | 41 | 776 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 62.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 40 | 81 | 837 | 65 | 38 | 714 |
| Future Volume (Veh/h) | 40 | 81 | 837 | 65 | 38 | 714 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 43 | 88 | 910 | 71 | 41 | 776 |
| Pedestrians | 13 | | 1 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 1 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.74 | 0.66 | | | 0.66 | |
| vC, conflicting volume | 1818 | 958 | | | 994 | |
| vC1, stage 1 conf vol | 958 | | | | | |
| vC2, stage 2 conf vol | 859 | | | | | |
| vCu, unblocked vol | 1415 | 677 | | | 731 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 84 | 70 | | | 93 | |
| cM capacity (veh/h) | 261 | 297 | | | 574 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 131 | 981 | 41 | 776 |
| Volume Left | 43 | 0 | 41 | 0 |
| Volume Right | 88 | 71 | 0 | 0 |
| cSH | 284 | 1700 | 574 | 1700 |
| Volume to Capacity | 0.46 | 0.58 | 0.07 | 0.46 |
| Queue Length 95th (m) | 17.4 | 0.0 | 1.7 | 0.0 |
| Control Delay (s) | 28.1 | 0.0 | 11.8 | 0.0 |
| Lane LOS | D | | B | |
| Approach Delay (s) | 28.1 | 0.0 | 0.6 | |
| Approach LOS | D | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.2 | | |
| Intersection Capacity Utilization | 62.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 179 | 109 | 15 | 72 | 194 | 250 | 24 | 473 | 23 | 145 | 552 | 57 |
| Future Volume (vph) | 179 | 109 | 15 | 72 | 194 | 250 | 24 | 473 | 23 | 145 | 552 | 57 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | | | 0.91 | 0.94 | 0.96 | | 0.98 | 0.99 | | 0.98 | 0.99 | |
| Frt | | | 0.850 | | 0.916 | | | 0.993 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1631 | 1776 | 1479 | 1678 | 1544 | 0 | 1662 | 1737 | 0 | 1616 | 1782 | 0 |
| Flt Permitted | 0.165 | | | 0.681 | | | 0.245 | | | 0.143 | | |
| Satd. Flow (perm) | 283 | 1776 | 1343 | 1128 | 1544 | 0 | 421 | 1737 | 0 | 238 | 1782 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 81 | | | 3 | | | 9 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 168.5 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 12.1 | |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Adj. Flow (vph) | 195 | 118 | 16 | 78 | 211 | 272 | 26 | 514 | 25 | 158 | 600 | 62 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 195 | 118 | 16 | 78 | 483 | 0 | 26 | 539 | 0 | 158 | 662 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |

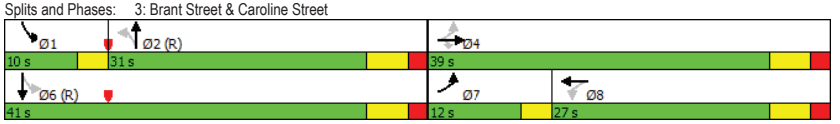




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.2 | 23.2 | | 27.0 | 27.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.34 | 0.34 | | 0.48 | 0.46 | |
| v/c Ratio | 0.71 | 0.15 | 0.03 | 0.24 | 0.96 | | 0.18 | 0.92 | | 0.68 | 0.80 | |
| Control Delay | 29.9 | 14.3 | 0.1 | 24.3 | 56.5 | | 22.8 | 48.8 | | 29.2 | 27.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 29.9 | 14.3 | 0.1 | 24.3 | 56.5 | | 22.8 | 48.8 | | 29.2 | 27.2 | |
| LOS | C | B | A | C | E | | C | D | | C | C | |
| Approach Delay | | 22.9 | | | 52.1 | | | 47.6 | | | 27.5 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 57 (71%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 80 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.96 | | |
| Intersection Signal Delay: 37.9 | | Intersection LOS: D |
| Intersection Capacity Utilization 89.3% | | ICU Level of Service E |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 195 | 118 | 16 | 78 | 483 | 26 | 539 | 158 | 662 |
| v/c Ratio | 0.71 | 0.15 | 0.03 | 0.24 | 0.96 | 0.18 | 0.92 | 0.68 | 0.80 |
| Control Delay | 29.9 | 14.3 | 0.1 | 24.3 | 56.5 | 22.8 | 48.8 | 29.2 | 27.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 29.9 | 14.3 | 0.1 | 24.3 | 56.5 | 22.8 | 48.8 | 29.2 | 27.2 |
| Queue Length 50th (m) | 17.8 | 10.4 | 0.0 | 9.0 | 61.5 | 2.8 | 77.1 | 13.3 | 81.0 |
| Queue Length 95th (m) | #40.2 | 20.0 | 0.0 | 19.8 | #120.7 | 8.9 | #136.2 | #32.9 | #139.5 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 144.5 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 279 | 777 | 633 | 327 | 505 | 142 | 588 | 233 | 829 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.15 | 0.03 | 0.24 | 0.96 | 0.18 | 0.92 | 0.68 | 0.80 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 179 | 109 | 15 | 72 | 194 | 250 | 24 | 473 | 23 | 145 | 552 | 57 |
| Future Volume (vph) | 179 | 109 | 15 | 72 | 194 | 250 | 24 | 473 | 23 | 145 | 552 | 57 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.91 | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1631 | 1776 | 1343 | 1573 | 1543 | | 1634 | 1737 | | 1612 | 1782 | |
| Flt Permitted | 0.17 | 1.00 | 1.00 | 0.68 | 1.00 | | 0.24 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 284 | 1776 | 1343 | 1128 | 1543 | | 421 | 1737 | | 242 | 1782 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 195 | 118 | 16 | 78 | 211 | 272 | 26 | 514 | 25 | 158 | 600 | 62 |
| RTOR Reduction (vph) | 0 | 0 | 9 | 0 | 58 | 0 | 0 | 2 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 195 | 118 | 7 | 78 | 425 | 0 | 26 | 537 | 0 | 158 | 657 | 0 |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.2 | 21.2 | | 25.0 | 25.0 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.2 | 23.2 | | 27.0 | 27.0 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.34 | 0.34 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 265 | 777 | 587 | 327 | 447 | | 142 | 586 | | 225 | 824 | |
| v/s Ratio Prot | c0.08 | 0.07 | | | c0.28 | | | c0.31 | | 0.06 | c0.37 | |
| v/s Ratio Perm | 0.22 | | 0.01 | 0.07 | | | 0.06 | | | 0.24 | | |
| v/c Ratio | 0.74 | 0.15 | 0.01 | 0.24 | 0.95 | | 0.18 | 0.92 | | 0.70 | 0.80 | |
| Uniform Delay, d1 | 18.5 | 13.6 | 12.7 | 21.7 | 27.9 | | 18.7 | 25.4 | | 17.5 | 18.3 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 10.1 | 0.4 | 0.0 | 1.7 | 32.1 | | 2.8 | 21.4 | | 9.5 | 7.9 | |
| Delay (s) | 28.6 | 14.0 | 12.8 | 23.4 | 59.9 | | 21.5 | 46.9 | | 27.0 | 26.2 | |
| Level of Service | C | B | B | C | E | | C | D | | C | C | |
| Approach Delay (s) | | 22.6 | | | 54.9 | | | 45.7 | | | 26.4 | |
| Approach LOS | | C | | | D | | | D | | | C | |

Intersection Summary

| | | | | | |
|---|---|---|---|---|---|
| HCM 2000 Control Delay | 37.7 | HCM 2000 Level of Service | | D | |
| HCM 2000 Volume to Capacity ratio | 0.90 | | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | | 14.0 | |
| Intersection Capacity Utilization | 89.3% | ICU Level of Service | | E | |
| Analysis Period (min) | 15 | | | | |

c Critical Lane Group

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 21 | 186 | 70 | 33 | 362 | 77 | 98 | 19 | 36 | 63 | 25 | 56 |
| Future Volume (vph) | 21 | 186 | 70 | 33 | 362 | 77 | 98 | 19 | 36 | 63 | 25 | 56 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 15.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.966 | | | | 0.850 | | 0.902 | | | | 0.850 |
| Flt Protected | | 0.996 | | | 0.996 | | 0.950 | | | | 0.965 | |
| Satd. Flow (prot) | 0 | 1801 | 0 | 0 | 1892 | 1615 | 1745 | 1714 | 0 | 0 | 1834 | 1597 |
| Flt Permitted | | 0.996 | | | 0.996 | | 0.950 | | | | 0.965 | |
| Satd. Flow (perm) | 0 | 1801 | 0 | 0 | 1892 | 1615 | 1745 | 1714 | 0 | 0 | 1834 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 166.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 12.0 | |
| Confl. Peds. (#/hr) | 23 | | 4 | 4 | | 23 | 5 | | 11 | 11 | | 5 |
| 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 (%) | 0% | 0% | 6% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 23 | 202 | 76 | 36 | 393 | 84 | 107 | 21 | 39 | 68 | 27 | 61 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 301 | 0 | 0 | 429 | 84 | 107 | 60 | 0 | 0 | 95 | 61 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 51.3% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 21 | 186 | 70 | 33 | 362 | 77 | 98 | 19 | 36 | 63 | 25 | 56 |
| Future Volume (vph) | 21 | 186 | 70 | 33 | 362 | 77 | 98 | 19 | 36 | 63 | 25 | 56 |
| 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) | 23 | 202 | 76 | 36 | 393 | 84 | 107 | 21 | 39 | 68 | 27 | 61 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total (vph) | 301 | 429 | 84 | 107 | 60 | 95 | 61 |
| Volume Left (vph) | 23 | 36 | 0 | 107 | 0 | 68 | 0 |
| Volume Right (vph) | 76 | 0 | 84 | 0 | 39 | 0 | 61 |
| Hadj (s) | -0.11 | 0.04 | -0.70 | 0.50 | -0.45 | 0.36 | -0.70 |
| Departure Headway (s) | 6.2 | 6.1 | 5.3 | 7.6 | 6.7 | 7.5 | 6.4 |
| Degree Utilization, x | 0.52 | 0.73 | 0.12 | 0.23 | 0.11 | 0.20 | 0.11 |
| Capacity (veh/h) | 553 | 577 | 648 | 423 | 485 | 431 | 497 |
| Control Delay (s) | 15.7 | 22.3 | 7.9 | 11.7 | 9.3 | 11.2 | 9.0 |
| Approach Delay (s) | 15.7 | 19.9 | | 10.8 | | 10.3 | |
| Approach LOS | C | C | | B | | B | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Delay | 16.2 | | | | |
| Level of Service | C | | | | |
| Intersection Capacity Utilization | 51.3% | 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) | 46 | 1 | 38 | 0 | 0 | 0 | 44 | 65 | 0 | 0 | 61 | 14 |
| Future Volume (vph) | 46 | 1 | 38 | 0 | 0 | 0 | 44 | 65 | 0 | 0 | 61 | 14 |
| 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 | | 0.940 | | | | | | | | | 0.975 | |
| Flt Protected | | 0.974 | | | | | | 0.980 | | | | |
| Satd. Flow (prot) | 0 | 1672 | 0 | 0 | 1900 | 0 | 0 | 1840 | 0 | 0 | 1852 | 0 |
| Flt Permitted | | 0.974 | | | | | | 0.980 | | | | |
| Satd. Flow (perm) | 0 | 1672 | 0 | 0 | 1900 | 0 | 0 | 1840 | 0 | 0 | 1852 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 166.3 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 12.0 | | | 4.2 | |
| Confl. Peds. (#/hr) | 141 | | 2 | 2 | | 141 | 16 | | 38 | 38 | | 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 (%) | 5% | 0% | 3% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 50 | 1 | 41 | 0 | 0 | 0 | 48 | 71 | 0 | 0 | 66 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 119 | 0 | 0 | 81 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 33.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 46 | 1 | 38 | 0 | 0 | 0 | 44 | 65 | 0 | 0 | 61 | 14 |
| Future Volume (vph) | 46 | 1 | 38 | 0 | 0 | 0 | 44 | 65 | 0 | 0 | 61 | 14 |
| 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) | 50 | 1 | 41 | 0 | 0 | 0 | 48 | 71 | 0 | 0 | 66 | 15 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 92 | 0 | 119 | 81 |
| Volume Left (vph) | 50 | 0 | 48 | 0 |
| Volume Right (vph) | 41 | 0 | 0 | 15 |
| Hadj (s) | -0.09 | 0.00 | 0.10 | -0.11 |
| Departure Headway (s) | 4.3 | 4.4 | 4.3 | 4.1 |
| Degree Utilization, x | 0.11 | 0.00 | 0.14 | 0.09 |
| Capacity (veh/h) | 808 | 777 | 811 | 846 |
| Control Delay (s) | 7.8 | 7.4 | 8.0 | 7.5 |
| Approach Delay (s) | 7.8 | 0.0 | 8.0 | 7.5 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 33.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# Appendix G

## 2025 Total Traffic Operations Reports

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Future Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.88 | 0.93 | | 0.86 | 0.95 | | 0.98 | 1.00 | | 0.98 | | 0.91 |
| Frt | | 0.938 | | | 0.951 | | | 0.994 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1659 | 0 | 1601 | 1648 | 0 | 1631 | 1775 | 0 | 1572 | 1759 | 1493 |
| Flt Permitted | 0.704 | | | 0.715 | | | 0.341 | | | 0.357 | | |
| Satd. Flow (perm) | 1133 | 1659 | 0 | 1040 | 1648 | 0 | 573 | 1775 | 0 | 581 | 1759 | 1354 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 27 | | | 27 | | | 4 | | | | 149 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| 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 (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Adj. Flow (vph) | 110 | 38 | 27 | 13 | 55 | 27 | 33 | 623 | 25 | 32 | 677 | 149 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 110 | 65 | 0 | 13 | 82 | 0 | 33 | 648 | 0 | 32 | 677 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |

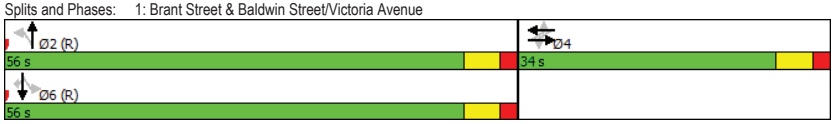




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 65.7 | 65.7 | | 65.7 | 65.7 | 65.7 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| v/c Ratio | 0.54 | 0.20 | | 0.07 | 0.26 | | 0.08 | 0.50 | | 0.08 | 0.53 | 0.14 |
| Control Delay | 41.9 | 20.3 | | 28.2 | 22.6 | | 5.3 | 7.6 | | 5.3 | 8.1 | 1.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 20.3 | | 28.2 | 22.6 | | 5.3 | 7.6 | | 5.3 | 8.1 | 1.3 |
| LOS | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay | | 33.9 | | | 23.4 | | | 7.5 | | | 6.8 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.54 | | | |
| Intersection Signal Delay: 10.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 64.7% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 110 | 65 | 13 | 82 | 33 | 648 | 32 | 677 | 149 |
| v/c Ratio | 0.54 | 0.20 | 0.07 | 0.26 | 0.08 | 0.50 | 0.08 | 0.53 | 0.14 |
| Control Delay | 41.9 | 20.3 | 28.2 | 22.6 | 5.3 | 7.6 | 5.3 | 8.1 | 1.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 20.3 | 28.2 | 22.6 | 5.3 | 7.6 | 5.3 | 8.1 | 1.3 |
| Queue Length 50th (m) | 17.5 | 5.6 | 1.9 | 8.2 | 1.4 | 38.7 | 1.3 | 42.1 | 0.0 |
| Queue Length 95th (m) | 30.5 | 14.6 | 6.2 | 18.2 | 5.3 | 82.1 | 5.2 | 89.2 | 5.8 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 377 | 571 | 346 | 567 | 418 | 1295 | 423 | 1283 | 1028 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.11 | 0.04 | 0.14 | 0.08 | 0.50 | 0.08 | 0.53 | 0.14 |

Intersection Summary





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Future Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.93 | | 1.00 | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.91 |
| Flpb, ped/bikes | 0.88 | 1.00 | | 0.86 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | 1.00 |
| Frt | 1.00 | 0.94 | | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1529 | 1658 | | 1382 | 1648 | | 1591 | 1775 | | 1541 | 1759 | 1354 |
| Flt Permitted | 0.70 | 1.00 | | 0.71 | 1.00 | | 0.34 | 1.00 | | 0.36 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1133 | 1658 | | 1040 | 1648 | | 572 | 1775 | | 579 | 1759 | 1354 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 110 | 38 | 27 | 13 | 55 | 27 | 33 | 623 | 25 | 32 | 677 | 149 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 40 |
| Lane Group Flow (vph) | 110 | 43 | 0 | 13 | 60 | 0 | 33 | 647 | 0 | 32 | 677 | 109 |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 14.3 | 14.3 | | 14.3 | 14.3 | | 63.7 | 63.7 | | 63.7 | 63.7 | 63.7 |
| Effective Green, g (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 65.7 | 65.7 | | 65.7 | 65.7 | 65.7 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 205 | 300 | | 188 | 298 | | 417 | 1295 | | 422 | 1284 | 988 |
| v/s Ratio Prot | | 0.03 | | | 0.04 | | | 0.36 | | | c0.38 | |
| v/s Ratio Perm | c0.10 | | | 0.01 | | | 0.06 | | | 0.06 | | 0.08 |
| v/c Ratio | 0.54 | 0.14 | | 0.07 | 0.20 | | 0.08 | 0.50 | | 0.08 | 0.53 | 0.11 |
| Uniform Delay, d1 | 33.4 | 31.0 | | 30.6 | 31.3 | | 3.5 | 5.2 | | 3.5 | 5.3 | 3.6 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.7 | 0.2 | | 0.2 | 0.3 | | 0.4 | 1.4 | | 0.3 | 1.6 | 0.2 |
| Delay (s) | 36.1 | 31.2 | | 30.7 | 31.6 | | 3.9 | 6.5 | | 3.8 | 6.9 | 3.8 |
| Level of Service | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay (s) | | 34.3 | | | 31.5 | | | 6.4 | | | 6.2 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 10.3 | HCM 2000 Level of Service | B | |
| HCM 2000 Volume to Capacity ratio | 0.53 | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 64.7% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 13 | 30 | 596 | 38 | 50 | 610 |
| Future Volume (vph) | 13 | 30 | 596 | 38 | 50 | 610 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.905 | | 0.992 | | | |
| Flt Protected | 0.985 | | | | 0.950 | |
| Satd. Flow (prot) | 1572 | 0 | 1794 | 0 | 1678 | 1810 |
| Flt Permitted | 0.985 | | | | 0.950 | |
| Satd. Flow (perm) | 1572 | 0 | 1794 | 0 | 1678 | 1810 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 46.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 3.3 | | | 13.7 |
| Confl. Peds. (#/hr) | 4 | | | 19 | 19 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 11% | 5% | 6% | 4% | 5% |
| Adj. Flow (vph) | 14 | 33 | 648 | 41 | 54 | 663 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 47 | 0 | 689 | 0 | 54 | 663 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 50.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 13 | 30 | 596 | 38 | 50 | 610 |
| Future Volume (Veh/h) | 13 | 30 | 596 | 38 | 50 | 610 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 14 | 33 | 648 | 41 | 54 | 663 |
| Pedestrians | 19 | | 4 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 2 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.86 | 0.78 | | | 0.78 | |
| vC, conflicting volume | 1462 | 688 | | | 708 | |
| vC1, stage 1 conf vol | 688 | | | | | |
| vC2, stage 2 conf vol | 775 | | | | | |
| vCu, unblocked vol | 1018 | 454 | | | 481 | |
| tC, single (s) | 6.4 | 6.3 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.4 | | | 2.2 | |
| p0 queue free % | 96 | 93 | | | 93 | |
| cM capacity (veh/h) | 358 | 449 | | | 818 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 47 | 689 | 54 | 663 |
| Volume Left | 14 | 0 | 54 | 0 |
| Volume Right | 33 | 41 | 0 | 0 |
| cSH | 417 | 1700 | 818 | 1700 |
| Volume to Capacity | 0.11 | 0.41 | 0.07 | 0.39 |
| Queue Length 95th (m) | 2.9 | 0.0 | 1.6 | 0.0 |
| Control Delay (s) | 14.7 | 0.0 | 9.7 | 0.0 |
| Lane LOS | B | | A | |
| Approach Delay (s) | 14.7 | 0.0 | 0.7 | |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.8 | | |
| Intersection Capacity Utilization | 50.4% | 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) | 139 | 113 | 20 | 26 | 62 | 129 | 11 | 355 | 37 | 172 | 414 | 61 |
| Future Volume (vph) | 139 | 113 | 20 | 26 | 62 | 129 | 11 | 355 | 37 | 172 | 414 | 61 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | 1.00 | | 0.95 | 0.97 | 0.99 | | 0.99 | 0.99 | | 0.97 | 0.99 | |
| Frt | | | 0.850 | | 0.899 | | | 0.986 | | | 0.981 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1646 | 1792 | 1439 | 1479 | 1450 | 0 | 1572 | 1631 | 0 | 1601 | 1652 | 0 |
| Flt Permitted | 0.467 | | | 0.678 | | | 0.416 | | | 0.231 | | |
| Satd. Flow (perm) | 808 | 1792 | 1363 | 1026 | 1450 | 0 | 679 | 1631 | 0 | 377 | 1652 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 132 | | | 7 | | | 12 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 122.0 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 8.8 | |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| 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% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Adj. Flow (vph) | 151 | 123 | 22 | 28 | 67 | 140 | 12 | 386 | 40 | 187 | 450 | 66 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 151 | 123 | 22 | 28 | 207 | 0 | 12 | 426 | 0 | 187 | 516 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |

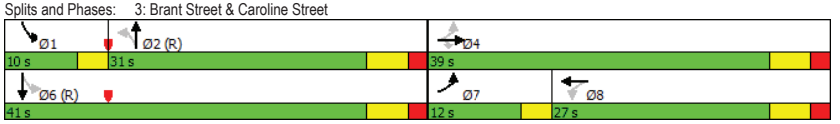




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 27.0 | 27.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.34 | 0.34 | | 0.48 | 0.46 | |
| v/c Ratio | 0.33 | 0.16 | 0.03 | 0.09 | 0.40 | | 0.05 | 0.77 | | 0.65 | 0.67 | |
| Control Delay | 15.6 | 14.3 | 0.1 | 22.0 | 11.6 | | 18.8 | 34.4 | | 25.3 | 21.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 15.6 | 14.3 | 0.1 | 22.0 | 11.6 | | 18.8 | 34.4 | | 25.3 | 21.6 | |
| LOS | B | B | A | C | B | | B | C | | C | C | |
| Approach Delay | | 13.9 | | | 12.9 | | | 34.0 | | | 22.6 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 54 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 75 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.77 | | |
| Intersection Signal Delay: 22.7 | | Intersection LOS: C |
| Intersection Capacity Utilization 68.4% | | ICU Level of Service C |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 151 | 123 | 22 | 28 | 207 | 12 | 426 | 187 | 516 |
| v/c Ratio | 0.33 | 0.16 | 0.03 | 0.09 | 0.40 | 0.05 | 0.77 | 0.65 | 0.67 |
| Control Delay | 15.6 | 14.3 | 0.1 | 22.0 | 11.6 | 18.8 | 34.4 | 25.3 | 21.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 15.6 | 14.3 | 0.1 | 22.0 | 11.6 | 18.8 | 34.4 | 25.3 | 21.6 |
| Queue Length 50th (m) | 13.4 | 10.9 | 0.0 | 3.1 | 8.5 | 1.2 | 56.2 | 16.1 | 57.0 |
| Queue Length 95th (m) | 24.6 | 20.8 | 0.0 | 9.0 | 25.4 | 4.8 | #99.5 | #31.8 | 90.8 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 98.0 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 457 | 784 | 642 | 301 | 519 | 229 | 555 | 286 | 770 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.16 | 0.03 | 0.09 | 0.40 | 0.05 | 0.77 | 0.65 | 0.67 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 139 | 113 | 20 | 26 | 62 | 129 | 11 | 355 | 37 | 172 | 414 | 61 |
| Future Volume (vph) | 139 | 113 | 20 | 26 | 62 | 129 | 11 | 355 | 37 | 172 | 414 | 61 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.95 | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.90 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1645 | 1792 | 1363 | 1437 | 1449 | | 1550 | 1631 | | 1591 | 1651 | |
| Flt Permitted | 0.47 | 1.00 | 1.00 | 0.68 | 1.00 | | 0.42 | 1.00 | | 0.23 | 1.00 | |
| Satd. Flow (perm) | 808 | 1792 | 1363 | 1026 | 1449 | | 678 | 1631 | | 386 | 1651 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 151 | 123 | 22 | 28 | 67 | 140 | 12 | 386 | 40 | 187 | 450 | 66 |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 93 | 0 | 0 | 5 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 151 | 123 | 10 | 28 | 114 | 0 | 12 | 421 | 0 | 187 | 510 | 0 |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| Heavy Vehicles (%) | 6% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.6 | 21.6 | | 25.0 | 25.0 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 27.0 | 27.0 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.34 | 0.34 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 421 | 784 | 596 | 302 | 427 | | 228 | 550 | | 274 | 763 | |
| v/s Ratio Prot | c0.04 | 0.07 | | | 0.08 | | | c0.26 | | 0.06 | c0.31 | |
| v/s Ratio Perm | c0.11 | | 0.01 | 0.03 | | | 0.02 | | | 0.24 | | |
| v/c Ratio | 0.36 | 0.16 | 0.02 | 0.09 | 0.27 | | 0.05 | 0.77 | | 0.68 | 0.67 | |
| Uniform Delay, d1 | 15.5 | 13.6 | 12.7 | 20.4 | 21.6 | | 17.9 | 23.7 | | 16.2 | 16.7 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.4 | 0.0 | 0.6 | 1.5 | | 0.4 | 9.8 | | 6.8 | 4.6 | |
| Delay (s) | 16.0 | 14.0 | 12.8 | 21.0 | 23.1 | | 18.3 | 33.5 | | 23.1 | 21.3 | |
| Level of Service | B | B | B | C | C | | B | C | | C | C | |
| Approach Delay (s) | | 14.9 | | | 22.9 | | | 33.1 | | | 21.8 | |
| Approach LOS | | B | | | C | | | C | | | C | |

Intersection Summary

| | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 68.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 24 | 217 | 81 | 20 | 165 | 49 | 35 | 8 | 14 | 17 | 13 | 17 |
| Future Volume (vph) | 24 | 217 | 81 | 20 | 165 | 49 | 35 | 8 | 14 | 17 | 13 | 17 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 15.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.966 | | | | 0.850 | | 0.906 | | | | 0.850 |
| Flt Protected | | 0.996 | | | 0.995 | | 0.950 | | | | 0.973 | |
| Satd. Flow (prot) | 0 | 1728 | 0 | 0 | 1857 | 1615 | 1745 | 1721 | 0 | 0 | 1782 | 1597 |
| Flt Permitted | | 0.996 | | | 0.995 | | 0.950 | | | | 0.973 | |
| Satd. Flow (perm) | 0 | 1728 | 0 | 0 | 1857 | 1615 | 1745 | 1721 | 0 | 0 | 1782 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 166.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 12.0 | |
| Confl. Peds. (#/hr) | 14 | | 7 | 7 | | 14 | 8 | | 15 | 15 | | 8 |
| 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 (%) | 0% | 3% | 15% | 0% | 2% | 0% | 0% | 0% | 0% | 2% | 6% | 0% |
| Adj. Flow (vph) | 26 | 236 | 88 | 22 | 179 | 53 | 38 | 9 | 15 | 18 | 14 | 18 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 350 | 0 | 0 | 201 | 53 | 38 | 24 | 0 | 0 | 32 | 18 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 49.4% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 24 | 217 | 81 | 20 | 165 | 49 | 35 | 8 | 14 | 17 | 13 | 17 |
| Future Volume (vph) | 24 | 217 | 81 | 20 | 165 | 49 | 35 | 8 | 14 | 17 | 13 | 17 |
| 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) | 26 | 236 | 88 | 22 | 179 | 53 | 38 | 9 | 15 | 18 | 14 | 18 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total (vph) | 350 | 201 | 53 | 38 | 24 | 32 | 18 |
| Volume Left (vph) | 26 | 22 | 0 | 38 | 0 | 18 | 0 |
| Volume Right (vph) | 88 | 0 | 53 | 0 | 15 | 0 | 18 |
| Hadj (s) | -0.04 | 0.09 | -0.70 | 0.50 | -0.44 | 0.34 | -0.70 |
| Departure Headway (s) | 5.1 | 5.2 | 4.5 | 6.6 | 5.6 | 6.4 | 5.4 |
| Degree Utilization, x | 0.49 | 0.29 | 0.07 | 0.07 | 0.04 | 0.06 | 0.03 |
| Capacity (veh/h) | 685 | 663 | 775 | 501 | 577 | 506 | 598 |
| Control Delay (s) | 13.0 | 9.2 | 6.6 | 8.9 | 7.6 | 8.6 | 7.3 |
| Approach Delay (s) | 13.0 | 8.7 | | 8.4 | | 8.2 | |
| Approach LOS | B | A | | A | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | 10.7 | | | |
| Level of Service | B | | | |
| Intersection Capacity Utilization | 49.4% | 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) | 18 | 0 | 43 | 0 | 0 | 0 | 28 | 34 | 1 | 1 | 46 | 7 |
| Future Volume (vph) | 18 | 0 | 43 | 0 | 0 | 0 | 28 | 34 | 1 | 1 | 46 | 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 | | 0.905 | | | | | | 0.998 | | | 0.982 | |
| Flt Protected | | 0.985 | | | | | | 0.978 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1664 | 0 | 0 | 1900 | 0 | 0 | 1825 | 0 | 0 | 1833 | 0 |
| Flt Permitted | | 0.985 | | | | | | 0.978 | | | 0.999 | |
| Satd. Flow (perm) | 0 | 1664 | 0 | 0 | 1900 | 0 | 0 | 1825 | 0 | 0 | 1833 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 166.3 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 12.0 | | | 4.2 | |
| Confl. Peds. (#/hr) | 55 | | 3 | 3 | | 55 | 22 | | 7 | 7 | | 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% | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 2% | 0% |
| Adj. Flow (vph) | 20 | 0 | 47 | 0 | 0 | 0 | 30 | 37 | 1 | 1 | 50 | 8 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 67 | 0 | 0 | 0 | 0 | 0 | 68 | 0 | 0 | 59 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 29.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 18 | 0 | 43 | 0 | 0 | 0 | 28 | 34 | 1 | 1 | 46 | 7 |
| Future Volume (vph) | 18 | 0 | 43 | 0 | 0 | 0 | 28 | 34 | 1 | 1 | 46 | 7 |
| 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) | 20 | 0 | 47 | 0 | 0 | 0 | 30 | 37 | 1 | 1 | 50 | 8 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 67 | 0 | 68 | 59 |
| Volume Left (vph) | 20 | 0 | 30 | 1 |
| Volume Right (vph) | 47 | 0 | 1 | 8 |
| Hadj (s) | -0.33 | 0.00 | 0.11 | -0.05 |
| Departure Headway (s) | 3.8 | 4.2 | 4.2 | 4.1 |
| Degree Utilization, x | 0.07 | 0.00 | 0.08 | 0.07 |
| Capacity (veh/h) | 904 | 825 | 831 | 866 |
| Control Delay (s) | 7.1 | 7.2 | 7.6 | 7.3 |
| Approach Delay (s) | 7.1 | 0.0 | 7.6 | 7.3 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.4 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 29.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 20 | 614 | 9 | 6 | 617 |
| Future Volume (vph) | 30 | 20 | 614 | 9 | 6 | 617 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 25.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.946 | | 0.998 | | | |
| Flt Protected | 0.971 | | | | 0.950 | |
| Satd. Flow (prot) | 1745 | 0 | 1807 | 0 | 1745 | 1810 |
| Flt Permitted | 0.971 | | | | 0.950 | |
| Satd. Flow (perm) | 1745 | 0 | 1807 | 0 | 1745 | 1810 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 35.9 | | 122.0 | | | 46.5 |
| Travel Time (s) | 2.6 | | 8.8 | | | 3.3 |
| Confl. Peds. (#/hr) | | | | 19 | 19 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 5% | 0% | 0% | 5% |
| Adj. Flow (vph) | 33 | 22 | 667 | 10 | 7 | 671 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 55 | 0 | 677 | 0 | 7 | 671 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 42.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 20 | 614 | 9 | 6 | 617 |
| Future Volume (Veh/h) | 30 | 20 | 614 | 9 | 6 | 617 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 33 | 22 | 667 | 10 | 7 | 671 |
| Pedestrians | 19 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.1 | | | | | |
| Percent Blockage | 2 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 122 | | | 237 |
| pX, platoon unblocked | 0.83 | 0.75 | | | 0.75 | |
| vC, conflicting volume | 1376 | 691 | | | 696 | |
| vC1, stage 1 conf vol | 691 | | | | | |
| vC2, stage 2 conf vol | 685 | | | | | |
| vCu, unblocked vol | 912 | 422 | | | 429 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 92 | 95 | | | 99 | |
| cM capacity (veh/h) | 402 | 469 | | | 842 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 55 | 677 | 7 | 671 |
| Volume Left | 33 | 0 | 7 | 0 |
| Volume Right | 22 | 10 | 0 | 0 |
| cSH | 426 | 1700 | 842 | 1700 |
| Volume to Capacity | 0.13 | 0.40 | 0.01 | 0.39 |
| Queue Length 95th (m) | 3.3 | 0.0 | 0.2 | 0.0 |
| Control Delay (s) | 14.7 | 0.0 | 9.3 | 0.0 |
| Lane LOS | B | | A | |
| Approach Delay (s) | 14.7 | 0.0 | 0.1 | |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.6 | | |
| Intersection Capacity Utilization | 42.9% | 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) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Future Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.98 | 0.97 | | 0.97 | 0.97 | | 0.99 | 1.00 | | | | 0.92 |
| Frt | | 0.929 | | | 0.882 | | | 0.997 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1721 | 0 | 1601 | 1470 | 0 | 1745 | 1837 | 0 | 1631 | 1792 | 1536 |
| Flt Permitted | 0.706 | | | 0.735 | | | 0.311 | | | 0.225 | | |
| Satd. Flow (perm) | 1269 | 1721 | 0 | 1198 | 1470 | 0 | 564 | 1837 | 0 | 386 | 1792 | 1413 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 16 | | | 62 | | | 2 | | | | 53 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| 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 (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Adj. Flow (vph) | 48 | 18 | 16 | 25 | 17 | 62 | 17 | 977 | 20 | 66 | 800 | 59 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 48 | 34 | 0 | 25 | 79 | 0 | 17 | 997 | 0 | 66 | 800 | 59 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |

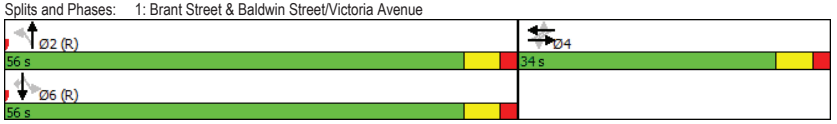




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 11.6 | 11.6 | | 11.6 | 11.6 | | 74.0 | 74.0 | | 74.0 | 74.0 | 74.0 |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.82 | 0.82 | | 0.82 | 0.82 | 0.82 |
| v/c Ratio | 0.29 | 0.14 | | 0.16 | 0.33 | | 0.04 | 0.66 | | 0.21 | 0.54 | 0.05 |
| Control Delay | 39.7 | 23.3 | | 36.5 | 16.8 | | 2.8 | 7.3 | | 4.8 | 5.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.7 | 23.3 | | 36.5 | 16.8 | | 2.8 | 7.3 | | 4.8 | 5.4 | 1.1 |
| LOS | D | C | | D | B | | A | A | | A | A | A |
| Approach Delay | | 32.9 | | | 21.5 | | | 7.2 | | | 5.1 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.66 | | | |
| Intersection Signal Delay: 8.0 | | Intersection LOS: A | |
| Intersection Capacity Utilization 72.0% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 48 | 34 | 25 | 79 | 17 | 997 | 66 | 800 | 59 |
| v/c Ratio | 0.29 | 0.14 | 0.16 | 0.33 | 0.04 | 0.66 | 0.21 | 0.54 | 0.05 |
| Control Delay | 39.7 | 23.3 | 36.5 | 16.8 | 2.8 | 7.3 | 4.8 | 5.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.7 | 23.3 | 36.5 | 16.8 | 2.8 | 7.3 | 4.8 | 5.4 | 1.1 |
| Queue Length 50th (m) | 7.7 | 2.8 | 3.9 | 2.7 | 0.5 | 58.8 | 2.2 | 39.1 | 0.2 |
| Queue Length 95th (m) | 17.3 | 10.7 | 10.7 | 14.4 | 2.1 | 119.9 | 7.4 | 77.3 | 2.7 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 423 | 584 | 399 | 531 | 464 | 1511 | 317 | 1473 | 1171 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.06 | 0.06 | 0.15 | 0.04 | 0.66 | 0.21 | 0.54 | 0.05 |

Intersection Summary





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Future Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.92 |
| Flpb, ped/bikes | 0.98 | 1.00 | | 0.97 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | 1.00 |
| Frt | 1.00 | 0.93 | | 1.00 | 0.88 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1708 | 1721 | | 1549 | 1471 | | 1715 | 1837 | | 1613 | 1792 | 1413 |
| Flt Permitted | 0.71 | 1.00 | | 0.73 | 1.00 | | 0.31 | 1.00 | | 0.23 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1269 | 1721 | | 1198 | 1471 | | 561 | 1837 | | 382 | 1792 | 1413 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 48 | 18 | 16 | 25 | 17 | 62 | 17 | 977 | 20 | 66 | 800 | 59 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Lane Group Flow (vph) | 48 | 20 | 0 | 25 | 24 | 0 | 17 | 997 | 0 | 66 | 800 | 48 |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 70.0 | 70.0 | | 70.0 | 70.0 | 70.0 |
| Effective Green, g (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 72.0 | 72.0 | | 72.0 | 72.0 | 72.0 |
| Actuated g/C Ratio | 0.11 | 0.11 | | 0.11 | 0.11 | | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 141 | 191 | | 133 | 163 | | 448 | 1469 | | 305 | 1433 | 1130 |
| v/s Ratio Prot | | 0.01 | | | 0.02 | | | c0.54 | | | 0.45 | |
| v/s Ratio Perm | c0.04 | | | 0.02 | | | 0.03 | | | 0.17 | | 0.03 |
| v/c Ratio | 0.34 | 0.10 | | 0.19 | 0.15 | | 0.04 | 0.68 | | 0.22 | 0.56 | 0.04 |
| Uniform Delay, d1 | 37.0 | 36.0 | | 36.3 | 36.1 | | 1.9 | 3.9 | | 2.2 | 3.3 | 1.9 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.4 | 0.2 | | 0.7 | 0.4 | | 0.2 | 2.5 | | 1.6 | 1.6 | 0.1 |
| Delay (s) | 38.4 | 36.2 | | 37.0 | 36.6 | | 2.0 | 6.5 | | 3.8 | 4.8 | 1.9 |
| Level of Service | D | D | | D | D | | A | A | | A | A | A |
| Approach Delay (s) | | 37.5 | | | 36.7 | | | 6.4 | | | 4.6 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | | | | |
|---|---|---|---|---|---|---|
| HCM 2000 Control Delay | 8.3 | HCM 2000 Level of Service | A | | | |
| HCM 2000 Volume to Capacity ratio | 0.64 | | | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | | | |
| Intersection Capacity Utilization | 72.0% | ICU Level of Service | C | | | |
| Analysis Period (min) | 15 | | | | | |
| c Critical Lane Group | | | | | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 45 | 87 | 846 | 70 | 46 | 728 |
| Future Volume (vph) | 45 | 87 | 846 | 70 | 46 | 728 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.911 | | 0.990 | | | |
| Flt Protected | 0.983 | | | | 0.950 | |
| Satd. Flow (prot) | 1701 | 0 | 1864 | 0 | 1745 | 1863 |
| Flt Permitted | 0.983 | | | | 0.950 | |
| Satd. Flow (perm) | 1701 | 0 | 1864 | 0 | 1745 | 1863 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 46.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 3.3 | | | 13.7 |
| Confl. Peds. (#/hr) | 1 | | | 13 | 13 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 49 | 95 | 920 | 76 | 50 | 791 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 144 | 0 | 996 | 0 | 50 | 791 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 63.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 45 | 87 | 846 | 70 | 46 | 728 |
| Future Volume (Veh/h) | 45 | 87 | 846 | 70 | 46 | 728 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 49 | 95 | 920 | 76 | 50 | 791 |
| Pedestrians | 13 | | 1 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 1 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.74 | 0.65 | | | 0.65 | |
| vC, conflicting volume | 1863 | 971 | | | 1009 | |
| vC1, stage 1 conf vol | 971 | | | | | |
| vC2, stage 2 conf vol | 892 | | | | | |
| vCu, unblocked vol | 1447 | 691 | | | 749 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 80 | 67 | | | 91 | |
| cM capacity (veh/h) | 250 | 289 | | | 561 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 144 | 996 | 50 | 791 |
| Volume Left | 49 | 0 | 50 | 0 |
| Volume Right | 95 | 76 | 0 | 0 |
| cSH | 275 | 1700 | 561 | 1700 |
| Volume to Capacity | 0.52 | 0.59 | 0.09 | 0.47 |
| Queue Length 95th (m) | 21.4 | 0.0 | 2.2 | 0.0 |
| Control Delay (s) | 31.7 | 0.0 | 12.0 | 0.0 |
| Lane LOS | D | | B | |
| Approach Delay (s) | 31.7 | 0.0 | 0.7 | |
| Approach LOS | D | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.6 | | |
| Intersection Capacity Utilization | 63.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Future Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | | | 0.91 | 0.94 | 0.96 | | 0.98 | 1.00 | | | 0.99 | |
| Frt | | | 0.850 | | 0.915 | | | 0.993 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1631 | 1776 | 1479 | 1678 | 1542 | 0 | 1662 | 1740 | 0 | 1616 | 1782 | 0 |
| Flt Permitted | 0.165 | | | 0.680 | | | 0.226 | | | 0.143 | | |
| Satd. Flow (perm) | 283 | 1776 | 1343 | 1126 | 1542 | 0 | 389 | 1740 | 0 | 243 | 1782 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 83 | | | 3 | | | 9 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 122.0 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 8.8 | |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Adj. Flow (vph) | 197 | 120 | 16 | 79 | 212 | 279 | 26 | 535 | 27 | 162 | 615 | 63 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 197 | 120 | 16 | 79 | 491 | 0 | 26 | 562 | 0 | 162 | 678 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |

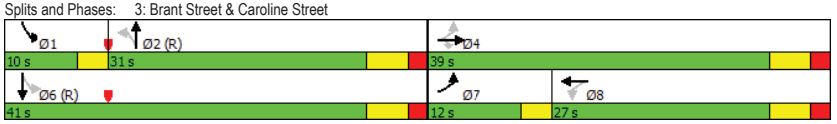


Lanes, Volumes, Timings
3: Brant Street & Caroline Street
Total PM
190080: 535-551 Brant Street, Burlington

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.2 | 23.2 | | 27.0 | 27.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.34 | 0.34 | | 0.48 | 0.46 | |
| v/c Ratio | 0.71 | 0.15 | 0.03 | 0.24 | 0.97 | | 0.20 | 0.95 | | 0.69 | 0.82 | |
| Control Delay | 30.5 | 14.3 | 0.1 | 24.3 | 59.7 | | 23.6 | 55.4 | | 29.9 | 28.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 30.5 | 14.3 | 0.1 | 24.3 | 59.7 | | 23.6 | 55.4 | | 29.9 | 28.4 | |
| LOS | C | B | A | C | E | | C | E | | C | C | |
| Approach Delay | | 23.2 | | | 54.8 | | | 54.0 | | | 28.7 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 57 (71%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 80 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.97 | | |
| Intersection Signal Delay: 40.7 | | Intersection LOS: D |
| Intersection Capacity Utilization 90.7% | | ICU Level of Service E |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 120 | 16 | 79 | 491 | 26 | 562 | 162 | 678 |
| v/c Ratio | 0.71 | 0.15 | 0.03 | 0.24 | 0.97 | 0.20 | 0.95 | 0.69 | 0.82 |
| Control Delay | 30.5 | 14.3 | 0.1 | 24.3 | 59.7 | 23.6 | 55.4 | 29.9 | 28.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 30.5 | 14.3 | 0.1 | 24.3 | 59.7 | 23.6 | 55.4 | 29.9 | 28.4 |
| Queue Length 50th (m) | 18.0 | 10.6 | 0.0 | 9.2 | 62.9 | 2.8 | 82.0 | 13.7 | 84.3 |
| Queue Length 95th (m) | #41.2 | 20.4 | 0.0 | 19.9 | #123.3 | 9.1 | #144.6 | #33.9 | #145.5 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 98.0 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 279 | 777 | 633 | 326 | 505 | 131 | 589 | 235 | 829 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.71 | 0.15 | 0.03 | 0.24 | 0.97 | 0.20 | 0.95 | 0.69 | 0.82 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Future Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.91 | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1631 | 1776 | 1343 | 1574 | 1541 | | 1635 | 1736 | | 1616 | 1783 | |
| Flt Permitted | 0.17 | 1.00 | 1.00 | 0.68 | 1.00 | | 0.23 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 284 | 1776 | 1343 | 1126 | 1541 | | 390 | 1736 | | 243 | 1783 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 120 | 16 | 79 | 212 | 279 | 26 | 535 | 27 | 162 | 615 | 63 |
| RTOR Reduction (vph) | 0 | 0 | 9 | 0 | 59 | 0 | 0 | 2 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 197 | 120 | 7 | 79 | 432 | 0 | 26 | 560 | 0 | 162 | 673 | 0 |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.2 | 21.2 | | 25.0 | 25.0 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.2 | 23.2 | | 27.0 | 27.0 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.34 | 0.34 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 265 | 777 | 587 | 326 | 446 | | 131 | 585 | | 226 | 824 | |
| v/s Ratio Prot | c0.08 | 0.07 | | | c0.28 | | | c0.32 | | 0.06 | c0.38 | |
| v/s Ratio Perm | 0.22 | | 0.01 | 0.07 | | | 0.07 | | | 0.25 | | |
| v/c Ratio | 0.74 | 0.15 | 0.01 | 0.24 | 0.97 | | 0.20 | 0.96 | | 0.72 | 0.82 | |
| Uniform Delay, d1 | 18.6 | 13.6 | 12.7 | 21.7 | 28.0 | | 18.8 | 25.9 | | 17.8 | 18.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 10.7 | 0.4 | 0.0 | 1.8 | 35.5 | | 3.4 | 28.0 | | 10.3 | 8.8 | |
| Delay (s) | 29.3 | 14.0 | 12.8 | 23.4 | 63.5 | | 22.2 | 54.0 | | 28.2 | 27.4 | |
| Level of Service | C | B | B | C | E | | C | D | | C | C | |
| Approach Delay (s) | | 23.0 | | | 58.0 | | | 52.6 | | | 27.5 | |
| Approach LOS | | C | | | E | | | D | | | C | |

Intersection Summary

| | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 40.6 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.92 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 90.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 25 | 189 | 70 | 33 | 368 | 79 | 98 | 19 | 36 | 66 | 25 | 59 |
| Future Volume (vph) | 25 | 189 | 70 | 33 | 368 | 79 | 98 | 19 | 36 | 66 | 25 | 59 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 15.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.967 | | | | 0.850 | | 0.902 | | | | 0.850 |
| Flt Protected | | 0.996 | | | 0.996 | | 0.950 | | | | 0.965 | |
| Satd. Flow (prot) | 0 | 1803 | 0 | 0 | 1892 | 1615 | 1745 | 1714 | 0 | 0 | 1834 | 1597 |
| Flt Permitted | | 0.996 | | | 0.996 | | 0.950 | | | | 0.965 | |
| Satd. Flow (perm) | 0 | 1803 | 0 | 0 | 1892 | 1615 | 1745 | 1714 | 0 | 0 | 1834 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 166.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 12.0 | |
| Confl. Peds. (#/hr) | 23 | | 4 | 4 | | 23 | 5 | | 11 | 11 | | 5 |
| 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 (%) | 0% | 0% | 6% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 27 | 205 | 76 | 36 | 400 | 86 | 107 | 21 | 39 | 72 | 27 | 64 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 308 | 0 | 0 | 436 | 86 | 107 | 60 | 0 | 0 | 99 | 64 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 55.0% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 25 | 189 | 70 | 33 | 368 | 79 | 98 | 19 | 36 | 66 | 25 | 59 |
| Future Volume (vph) | 25 | 189 | 70 | 33 | 368 | 79 | 98 | 19 | 36 | 66 | 25 | 59 |
| 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) | 27 | 205 | 76 | 36 | 400 | 86 | 107 | 21 | 39 | 72 | 27 | 64 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total (vph) | 308 | 436 | 86 | 107 | 60 | 99 | 64 |
| Volume Left (vph) | 27 | 36 | 0 | 107 | 0 | 72 | 0 |
| Volume Right (vph) | 76 | 0 | 86 | 0 | 39 | 0 | 64 |
| Hadj (s) | -0.11 | 0.04 | -0.70 | 0.50 | -0.45 | 0.36 | -0.70 |
| Departure Headway (s) | 6.3 | 6.1 | 5.4 | 7.7 | 6.7 | 7.6 | 6.5 |
| Degree Utilization, x | 0.54 | 0.74 | 0.13 | 0.23 | 0.11 | 0.21 | 0.12 |
| Capacity (veh/h) | 548 | 572 | 642 | 418 | 478 | 428 | 492 |
| Control Delay (s) | 16.3 | 23.6 | 8.0 | 11.8 | 9.4 | 11.4 | 9.2 |
| Approach Delay (s) | 16.3 | 21.0 | | 10.9 | | 10.5 | |
| Approach LOS | C | C | | B | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 16.8 | | |
| Level of Service | C | | |
| Intersection Capacity Utilization | 55.0% | 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) | 46 | 1 | 51 | 0 | 0 | 0 | 55 | 65 | 0 | 0 | 61 | 14 |
| Future Volume (vph) | 46 | 1 | 51 | 0 | 0 | 0 | 55 | 65 | 0 | 0 | 61 | 14 |
| 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 | | 0.930 | | | | | | | | | 0.975 | |
| Flt Protected | | 0.977 | | | | | | 0.978 | | | | |
| Satd. Flow (prot) | 0 | 1661 | 0 | 0 | 1900 | 0 | 0 | 1838 | 0 | 0 | 1852 | 0 |
| Flt Permitted | | 0.977 | | | | | | 0.978 | | | | |
| Satd. Flow (perm) | 0 | 1661 | 0 | 0 | 1900 | 0 | 0 | 1838 | 0 | 0 | 1852 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 166.3 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 12.0 | | | 4.2 | |
| Confl. Peds. (#/hr) | 141 | | 2 | 2 | | 141 | 16 | | 38 | 38 | | 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 (%) | 5% | 0% | 3% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 50 | 1 | 55 | 0 | 0 | 0 | 60 | 71 | 0 | 0 | 66 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 106 | 0 | 0 | 0 | 0 | 0 | 131 | 0 | 0 | 81 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 33.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 46 | 1 | 51 | 0 | 0 | 0 | 55 | 65 | 0 | 0 | 61 | 14 |
| Future Volume (vph) | 46 | 1 | 51 | 0 | 0 | 0 | 55 | 65 | 0 | 0 | 61 | 14 |
| 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) | 50 | 1 | 55 | 0 | 0 | 0 | 60 | 71 | 0 | 0 | 66 | 15 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 106 | 0 | 131 | 81 |
| Volume Left (vph) | 50 | 0 | 60 | 0 |
| Volume Right (vph) | 55 | 0 | 0 | 15 |
| Hadj (s) | -0.15 | 0.00 | 0.11 | -0.11 |
| Departure Headway (s) | 4.2 | 4.5 | 4.3 | 4.2 |
| Degree Utilization, x | 0.12 | 0.00 | 0.16 | 0.09 |
| Capacity (veh/h) | 812 | 767 | 802 | 834 |
| Control Delay (s) | 7.8 | 7.5 | 8.1 | 7.6 |
| Approach Delay (s) | 7.8 | 0.0 | 8.1 | 7.6 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.9 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 33.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 16 | 11 | 905 | 25 | 16 | 757 |
| Future Volume (vph) | 16 | 11 | 905 | 25 | 16 | 757 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 25.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.944 | | 0.996 | | | |
| Flt Protected | 0.972 | | | | 0.950 | |
| Satd. Flow (prot) | 1743 | 0 | 1874 | 0 | 1745 | 1863 |
| Flt Permitted | 0.972 | | | | 0.950 | |
| Satd. Flow (perm) | 1743 | 0 | 1874 | 0 | 1745 | 1863 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 35.9 | | 122.0 | | | 46.5 |
| Travel Time (s) | 2.6 | | 8.8 | | | 3.3 |
| Confl. Peds. (#/hr) | | | | 13 | 13 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 17 | 12 | 984 | 27 | 17 | 823 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 29 | 0 | 1011 | 0 | 17 | 823 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 59.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 16 | 11 | 905 | 25 | 16 | 757 |
| Future Volume (Veh/h) | 16 | 11 | 905 | 25 | 16 | 757 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 17 | 12 | 984 | 27 | 17 | 823 |
| Pedestrians | 13 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.1 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 122 | | | 237 |
| pX, platoon unblocked | 0.72 | 0.63 | | | 0.63 | |
| vC, conflicting volume | 1868 | 1010 | | | 1024 | |
| vC1, stage 1 conf vol | 1010 | | | | | |
| vC2, stage 2 conf vol | 857 | | | | | |
| vCu, unblocked vol | 1471 | 723 | | | 744 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 93 | 96 | | | 97 | |
| cM capacity (veh/h) | 249 | 267 | | | 543 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 29 | 1011 | 17 | 823 |
| Volume Left | 17 | 0 | 17 | 0 |
| Volume Right | 12 | 27 | 0 | 0 |
| cSH | 257 | 1700 | 543 | 1700 |
| Volume to Capacity | 0.11 | 0.59 | 0.03 | 0.48 |
| Queue Length 95th (m) | 2.9 | 0.0 | 0.7 | 0.0 |
| Control Delay (s) | 20.8 | 0.0 | 11.8 | 0.0 |
| Lane LOS | C | | B | |
| Approach Delay (s) | 20.8 | 0.0 | 0.2 | |
| Approach LOS | C | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.4 | | |
| Intersection Capacity Utilization | | 59.2% | ICU Level of Service | B |
| Analysis Period (min) | | 15 | | |

# Appendix H

## SimTraffic Simulation Results

## Intersection: 3: Brant Street & Caroline Street

| Movement | EB | EB | EB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | L | TR | L | TR | L | TR |
| Maximum Queue (m) | 40.3 | 40.0 | 17.6 | 26.5 | 43.1 | 26.5 | 132.9 | 34.9 | 106.3 |
| Average Queue (m) | 18.5 | 15.8 | 5.9 | 6.9 | 26.1 | 4.0 | 62.0 | 28.9 | 78.0 |
| 95th Queue (m) | 33.7 | 32.2 | 17.4 | 21.2 | 43.3 | 17.2 | 109.8 | 42.4 | 122.3 |
| Link Distance (m) | | 95.7 | | | 41.0 | | 161.8 | | 102.1 |
| Upstream Blk Time (%) | | | | | 2 | | 0 | | 6 |
| Queuing Penalty (veh) | | | | | 4 | | 0 | | 39 |
| Storage Bay Dist (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Storage Blk Time (%) | 0 | 24 | 4 | 1 | 15 | 0 | 37 | 28 | 35 |
| Queuing Penalty (veh) | 1 | 38 | 10 | 2 | 4 | 0 | 4 | 134 | 60 |

## Intersection: 6: Brant Street & Site Driveway

| Movement | WB | NB | SB | SB |
|---|---|---|---|---|
| Directions Served | LR | TR | L | T |
| Maximum Queue (m) | 25.8 | 1.8 | 9.0 | 30.7 |
| Average Queue (m) | 11.4 | 0.1 | 1.0 | 7.8 |
| 95th Queue (m) | 23.5 | 1.4 | 5.5 | 27.7 |
| Link Distance (m) | 25.8 | 102.1 | | 28.8 |
| Upstream Blk Time (%) | 4 | | | 3 |
| Queuing Penalty (veh) | 0 | | | 21 |
| Storage Bay Dist (m) | | | 25.0 | |
| Storage Blk Time (%) | | | | 4 |
| Queuing Penalty (veh) | | | | 0 |

## Zone Summary

Zone wide Queuing Penalty: 317





## Intersection: 3: Brant Street & Caroline Street

| Movement | EB | EB | EB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | L | TR | L | TR | L | TR |
| Maximum Queue (m) | 47.1 | 72.3 | 18.1 | 27.3 | 47.1 | 29.9 | 173.0 | 34.9 | 106.5 |
| Average Queue (m) | 25.6 | 29.0 | 3.7 | 15.0 | 38.4 | 8.0 | 119.2 | 28.8 | 101.4 |
| 95th Queue (m) | 48.1 | 78.1 | 13.9 | 34.2 | 56.2 | 24.7 | 195.0 | 41.5 | 118.2 |
| Link Distance (m) | | 95.7 | | | 41.0 | | 161.8 | | 102.1 |
| Upstream Blk Time (%) | | 12 | | | 36 | | 25 | | 32 |
| Queuing Penalty (veh) | | 0 | | | 188 | | 0 | | 249 |
| Storage Bay Dist (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Storage Blk Time (%) | 6 | 33 | 3 | 2 | 57 | 0 | 63 | 34 | 45 |
| Queuing Penalty (veh) | 8 | 65 | 8 | 11 | 41 | 2 | 15 | 213 | 68 |

## Intersection: 6: Brant Street & Site Driveway

| Movement | WB | NB | SB | SB |
|---|---|---|---|---|
| Directions Served | LR | TR | L | T |
| Maximum Queue (m) | 28.0 | 3.6 | 20.3 | 32.4 |
| Average Queue (m) | 15.3 | 0.1 | 3.6 | 23.9 |
| 95th Queue (m) | 31.4 | 2.5 | 13.2 | 40.8 |
| Link Distance (m) | 25.8 | 102.1 | | 28.8 |
| Upstream Blk Time (%) | 32 | | 0 | 26 |
| Queuing Penalty (veh) | 0 | | 0 | 203 |
| Storage Bay Dist (m) | | | 25.0 | |
| Storage Blk Time (%) | | | 0 | 29 |
| Queuing Penalty (veh) | | | 0 | 5 |

## Zone Summary

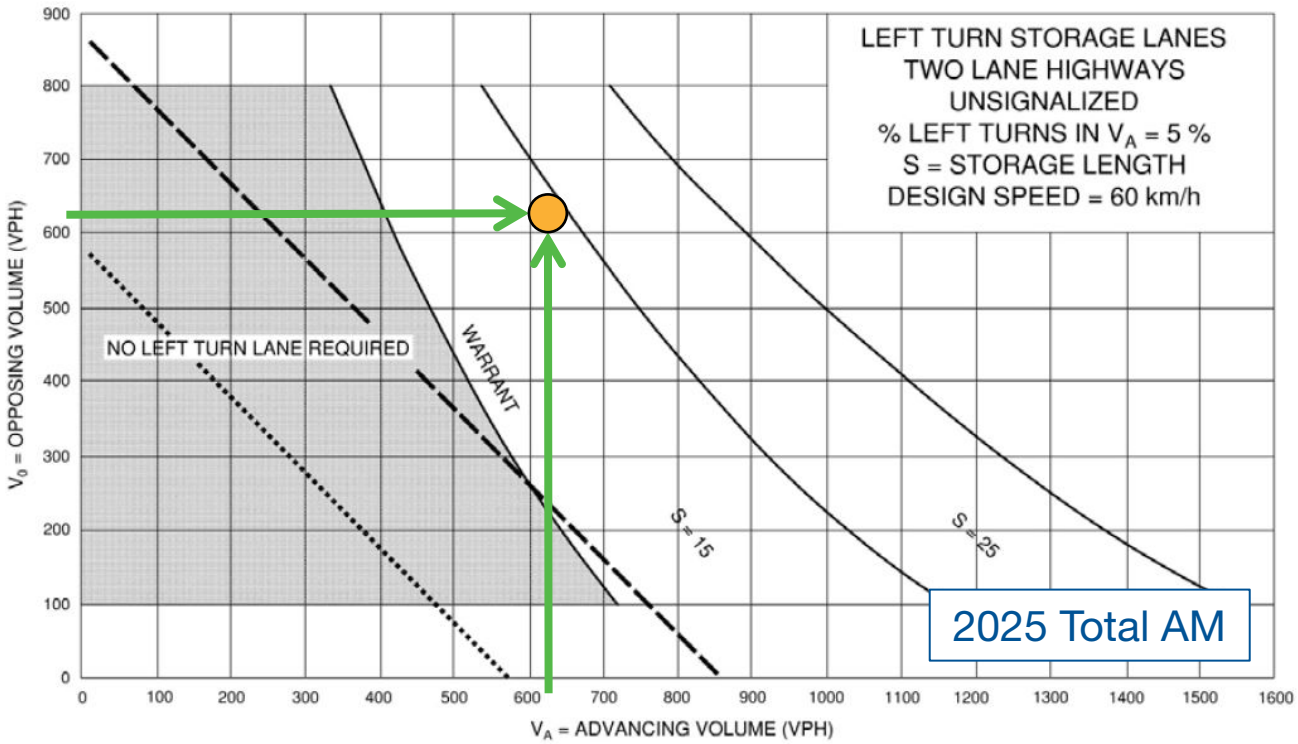
Zone wide Queuing Penalty: 1075

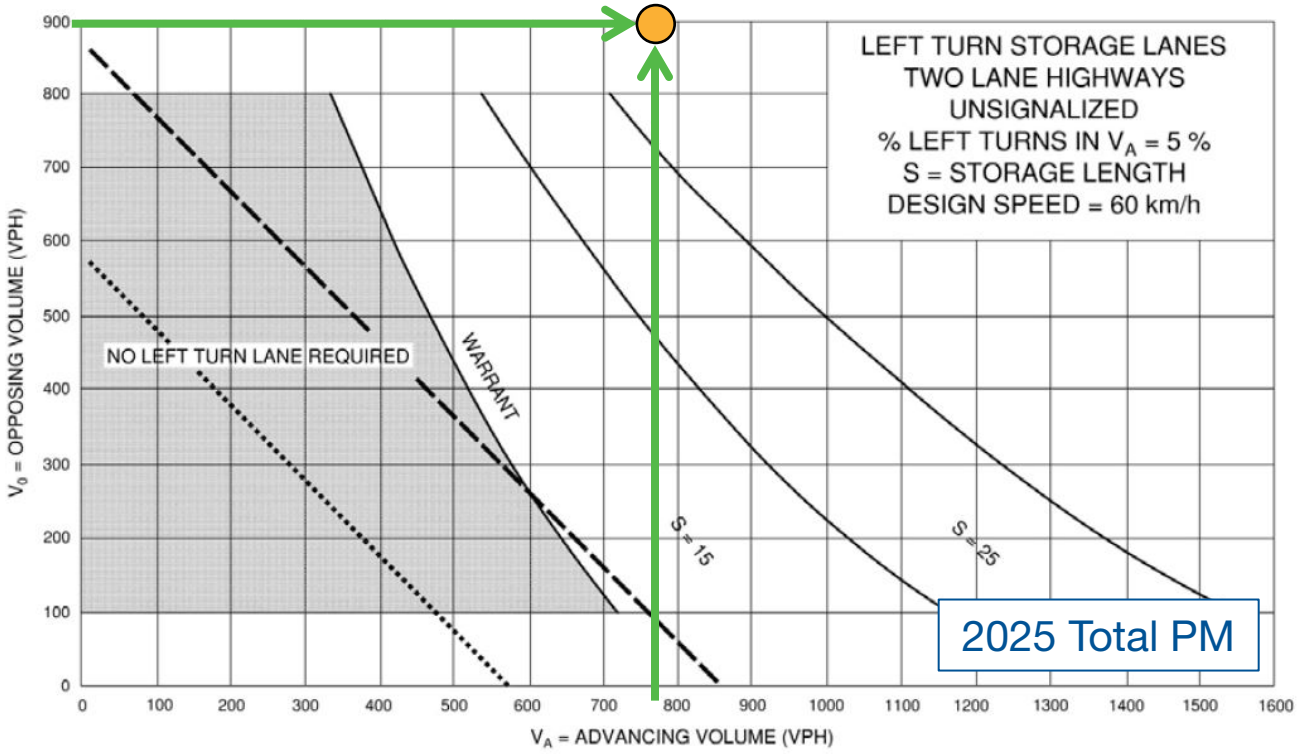
# Appendix I

## Left-Turn Lane Warrants






LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN $V_A$ = 5 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
S = 15
S = 25
2025 Total AM
$V_O$ = OPPOSING VOLUME (VPH)
$V_A$ = ADVANCING VOLUME (VPH)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600


LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN $V_A$ = 5 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
S = 15
S = 25
2025 Total PM
$V_O$ = OPPOSING VOLUME (VPH)
$V_A$ = ADVANCING VOLUME (VPH)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

# Appendix J

## 2025 Total Traffic Operations Reports - Signal Optimization

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Future Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | | | 0.87 | 0.91 | 0.95 | | 0.98 | 0.99 | | | 0.99 | |
| Frt | | | 0.850 | | 0.915 | | | 0.993 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1631 | 1776 | 1479 | 1678 | 1522 | 0 | 1662 | 1732 | 0 | 1616 | 1778 | 0 |
| Flt Permitted | 0.177 | | | 0.680 | | | 0.213 | | | 0.150 | | |
| Satd. Flow (perm) | 304 | 1776 | 1290 | 1089 | 1522 | 0 | 366 | 1732 | 0 | 255 | 1778 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 55 | | 62 | | | 2 | | | 6 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 122.0 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 8.8 | |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Adj. Flow (vph) | 197 | 120 | 16 | 79 | 212 | 279 | 26 | 535 | 27 | 162 | 615 | 63 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 197 | 120 | 16 | 79 | 491 | 0 | 26 | 562 | 0 | 162 | 678 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |



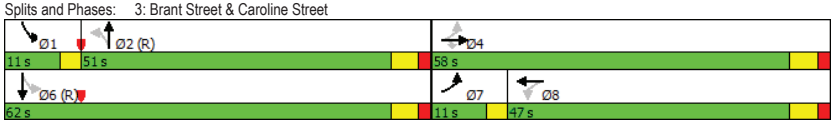
Lanes, Volumes, Timings
3: Brant Street & Caroline Street

Total PM - Improvements
190080: 535-551 Brant Street, Burlington

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 11.0 | 58.0 | 58.0 | 47.0 | 47.0 | | 51.0 | 51.0 | | 11.0 | 62.0 | |
| Total Split (%) | 9.2% | 48.3% | 48.3% | 39.2% | 39.2% | | 42.5% | 42.5% | | 9.2% | 51.7% | |
| Maximum Green (s) | 8.0 | 52.0 | 52.0 | 41.0 | 41.0 | | 45.0 | 45.0 | | 8.0 | 56.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 55.0 | 54.0 | 54.0 | 43.0 | 43.0 | | 47.0 | 47.0 | | 59.0 | 58.0 | |
| Actuated g/C Ratio | 0.46 | 0.45 | 0.45 | 0.36 | 0.36 | | 0.39 | 0.39 | | 0.49 | 0.48 | |
| v/c Ratio | 0.87 | 0.15 | 0.03 | 0.20 | 0.84 | | 0.18 | 0.83 | | 0.75 | 0.79 | |
| Control Delay | 57.9 | 20.1 | 0.1 | 28.5 | 45.1 | | 28.2 | 44.8 | | 40.8 | 33.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 57.9 | 20.1 | 0.1 | 28.5 | 45.1 | | 28.2 | 44.8 | | 40.8 | 33.6 | |
| LOS | E | C | A | C | D | | C | D | | D | C | |
| Approach Delay | | 41.5 | | | 42.8 | | | 44.0 | | | 35.0 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 120 | | |
| Actuated Cycle Length: 120 | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 80 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.87 | | |
| Intersection Signal Delay: 40.1 | Intersection LOS: D | |
| Intersection Capacity Utilization 90.7% | ICU Level of Service E | |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 197 | 120 | 16 | 79 | 491 | 26 | 562 | 162 | 678 |
| v/c Ratio | 0.87 | 0.15 | 0.03 | 0.20 | 0.84 | 0.18 | 0.83 | 0.75 | 0.79 |
| Control Delay | 57.9 | 20.1 | 0.1 | 28.5 | 45.1 | 28.2 | 44.8 | 40.8 | 33.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 57.9 | 20.1 | 0.1 | 28.5 | 45.1 | 28.2 | 44.8 | 40.8 | 33.6 |
| Queue Length 50th (m) | 27.9 | 16.3 | 0.0 | 12.8 | 93.8 | 4.0 | 117.2 | 20.9 | 128.3 |
| Queue Length 95th (m) | #61.8 | 28.1 | 0.0 | 24.7 | #151.7 | 11.2 | #175.4 | #43.1 | 179.4 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 98.0 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 227 | 799 | 610 | 390 | 585 | 143 | 679 | 216 | 862 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.87 | 0.15 | 0.03 | 0.20 | 0.84 | 0.18 | 0.83 | 0.75 | 0.79 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Future Volume (vph) | 181 | 110 | 15 | 73 | 195 | 257 | 24 | 492 | 25 | 149 | 566 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.87 | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.91 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1631 | 1776 | 1290 | 1522 | 1521 | | 1634 | 1732 | | 1616 | 1778 | |
| Flt Permitted | 0.18 | 1.00 | 1.00 | 0.68 | 1.00 | | 0.21 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 304 | 1776 | 1290 | 1089 | 1521 | | 366 | 1732 | | 255 | 1778 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 197 | 120 | 16 | 79 | 212 | 279 | 26 | 535 | 27 | 162 | 615 | 63 |
| RTOR Reduction (vph) | 0 | 0 | 9 | 0 | 40 | 0 | 0 | 1 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 197 | 120 | 7 | 79 | 451 | 0 | 26 | 561 | 0 | 162 | 675 | 0 |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 52.0 | 52.0 | 52.0 | 41.0 | 41.0 | | 45.0 | 45.0 | | 56.0 | 56.0 | |
| Effective Green, g (s) | 52.0 | 54.0 | 54.0 | 43.0 | 43.0 | | 47.0 | 47.0 | | 56.0 | 58.0 | |
| Actuated g/C Ratio | 0.43 | 0.45 | 0.45 | 0.36 | 0.36 | | 0.39 | 0.39 | | 0.47 | 0.48 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 220 | 799 | 580 | 390 | 545 | | 143 | 678 | | 209 | 859 | |
| v/s Ratio Prot | c0.06 | 0.07 | | | 0.30 | | | 0.32 | | 0.05 | c0.38 | |
| v/s Ratio Perm | c0.33 | | 0.01 | 0.07 | | | 0.07 | | | 0.31 | | |
| v/c Ratio | 0.90 | 0.15 | 0.01 | 0.20 | 0.83 | | 0.18 | 0.83 | | 0.78 | 0.79 | |
| Uniform Delay, d1 | 29.2 | 19.5 | 18.3 | 26.6 | 35.1 | | 23.9 | 32.8 | | 24.4 | 25.8 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 33.7 | 0.4 | 0.0 | 1.2 | 13.5 | | 2.8 | 11.1 | | 16.3 | 7.2 | |
| Delay (s) | 62.9 | 19.9 | 18.3 | 27.8 | 48.7 | | 26.7 | 44.0 | | 40.7 | 33.0 | |
| Level of Service | E | B | B | C | D | | C | D | | D | C | |
| Approach Delay (s) | | 45.2 | | | 45.8 | | | 43.2 | | | 34.5 | |
| Approach LOS | | D | | | D | | | D | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 41.0 | HCM 2000 Level of Service | D | |
| HCM 2000 Volume to Capacity ratio | 0.87 | | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 14.0 | |
| Intersection Capacity Utilization | 90.7% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

# Appendix K

## Off-Peak Hour Analysis





| Time | 187 Park Street South<br>138 Units<br>February 20, 2020 |
|---|---|
| 12:00:00 AM | 7 |
| 12:30:00 AM | 7 |
| 1:00:00 AM | 1 |
| 1:30:00 AM | 0 |
| 2:00:00 AM | 0 |
| 2:30:00 AM | 0 |
| 3:00:00 AM | 1 |
| 3:30:00 AM | 0 |
| 4:00:00 AM | 0 |
| 4:30:00 AM | 0 |
| 5:00:00 AM | 2 |
| 5:30:00 AM | 0 |
| 6:00:00 AM | 3 |
| 6:30:00 AM | 6 |
| 7:00:00 AM | 6 |
| 7:30:00 AM | 8 |
| 8:00:00 AM | 2 |
| 8:30:00 AM | 5 |
| 9:00:00 AM | 9 |
| 9:30:00 AM | 1 |
| 10:00:00 AM | 2 |
| 10:30:00 AM | 12 |
| 11:00:00 AM | 3 |
| 11:30:00 AM | 5 |
| 12:00:00 PM | 8 |
| 12:30:00 PM | 9 |
| 1:00:00 PM | 3 |
| 1:30:00 PM | 0 |
| 2:00:00 PM | 7 |
| 2:30:00 PM | 5 |
| 3:00:00 PM | 12 |
| 3:30:00 PM | 7 |
| 4:00:00 PM | 7 |
| 4:30:00 PM | 7 |
| 5:00:00 PM | 15 |
| 5:30:00 PM | 13 |
| 6:00:00 PM | 5 |
| 6:30:00 PM | 7 |
| 7:00:00 PM | 5 |
| 7:30:00 PM | 2 |
| 8:00:00 PM | 9 |
| 8:30:00 PM | 9 |
| 9:00:00 PM | 11 |
| 9:30:00 PM | 10 |
| 10:00:00 PM | 4 |
| 10:30:00 PM | 6 |
| 11:00:00 PM | 6 |
| 11:30:00 PM | 0 |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 8 | 6 | 425 | 13 | 9 | 322 |
| Future Volume (vph) | 8 | 6 | 425 | 13 | 9 | 322 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 25.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.941 | | 0.996 | | | |
| Flt Protected | 0.973 | | | | 0.950 | |
| Satd. Flow (prot) | 1740 | 0 | 1839 | 0 | 1745 | 1792 |
| Flt Permitted | 0.973 | | | | 0.950 | |
| Satd. Flow (perm) | 1740 | 0 | 1839 | 0 | 1745 | 1792 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 35.9 | | 122.0 | | | 46.5 |
| Travel Time (s) | 2.6 | | 8.8 | | | 3.3 |
| Confl. Peds. (#/hr) | | | | 9 | 9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 3% | 0% | 0% | 6% |
| Adj. Flow (vph) | 9 | 7 | 462 | 14 | 10 | 350 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 16 | 0 | 476 | 0 | 10 | 350 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 33.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 8 | 6 | 425 | 13 | 9 | 322 |
| Future Volume (Veh/h) | 8 | 6 | 425 | 13 | 9 | 322 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 9 | 7 | 462 | 14 | 10 | 350 |
| Pedestrians | 9 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.1 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 122 | | | 237 |
| pX, platoon unblocked | 0.92 | 0.92 | | | 0.92 | |
| vC, conflicting volume | 848 | 478 | | | 485 | |
| vC1, stage 1 conf vol | 478 | | | | | |
| vC2, stage 2 conf vol | 370 | | | | | |
| vCu, unblocked vol | 788 | 384 | | | 391 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 99 | | | 99 | |
| cM capacity (veh/h) | 535 | 607 | | | 1070 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 16 | 476 | 10 | 350 |
| Volume Left | 9 | 0 | 10 | 0 |
| Volume Right | 7 | 14 | 0 | 0 |
| cSH | 564 | 1700 | 1070 | 1700 |
| Volume to Capacity | 0.03 | 0.28 | 0.01 | 0.21 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.2 | 0.0 |
| Control Delay (s) | 11.6 | 0.0 | 8.4 | 0.0 |
| Lane LOS | B | | A | |
| Approach Delay (s) | 11.6 | 0.0 | 0.2 | |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 33.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## Intersection: 3: Brant Street & Caroline Street

| Movement | EB | EB | EB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | L | TR | L | TR | L | TR |
| Maximum Queue (m) | 33.1 | 22.0 | 16.8 | 25.8 | 42.6 | 10.7 | 61.5 | 34.8 | 84.7 |
| Average Queue (m) | 16.1 | 6.6 | 3.7 | 7.5 | 21.3 | 1.1 | 24.7 | 14.4 | 33.4 |
| 95th Queue (m) | 29.2 | 17.2 | 13.5 | 20.8 | 38.4 | 6.2 | 47.7 | 31.1 | 64.5 |
| Link Distance (m) | | 95.7 | | | 41.0 | | 161.8 | | 102.1 |
| Upstream Blk Time (%) | | | | | 1 | | | | 0 |
| Queuing Penalty (veh) | | | | | 2 | | | | 0 |
| Storage Bay Dist (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Storage Blk Time (%) | 0 | 10 | 2 | 1 | 9 | | 8 | 2 | 16 |
| Queuing Penalty (veh) | 0 | 13 | 3 | 2 | 3 | | 0 | 6 | 13 |

## Intersection: 6: Brant Street & Site Driveway

| Movement | WB | SB | SB |
|---|---|---|---|
| Directions Served | LR | L | T |
| Maximum Queue (m) | 10.4 | 9.0 | 2.2 |
| Average Queue (m) | 3.1 | 0.7 | 0.1 |
| 95th Queue (m) | 10.2 | 4.7 | 2.2 |
| Link Distance (m) | 25.8 | | 28.8 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (m) | | 25.0 | |
| Storage Blk Time (%) | | | 0 |
| Queuing Penalty (veh) | | | 0 |

## Zone Summary

Zone wide Queuing Penalty: 41

# Appendix L

## Sensitivity Analysis

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Future Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.88 | 0.93 | | 0.86 | 0.95 | | 0.98 | 1.00 | | 0.98 | | 0.91 |
| Frt | | 0.938 | | | 0.951 | | | 0.994 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1659 | 0 | 1601 | 1648 | 0 | 1631 | 1775 | 0 | 1572 | 1759 | 1493 |
| Flt Permitted | 0.704 | | | 0.715 | | | 0.341 | | | 0.357 | | |
| Satd. Flow (perm) | 1133 | 1659 | 0 | 1040 | 1648 | 0 | 573 | 1775 | 0 | 581 | 1759 | 1354 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 27 | | | 27 | | | 4 | | | | 149 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| 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 (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Adj. Flow (vph) | 110 | 38 | 27 | 13 | 55 | 27 | 33 | 623 | 25 | 32 | 677 | 149 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 110 | 65 | 0 | 13 | 82 | 0 | 33 | 648 | 0 | 32 | 677 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |



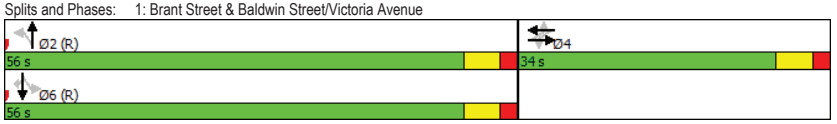
Lanes, Volumes, Timings
1: Brant Street & Baldwin Street/Victoria Avenue

Total AM - Sensitivity Analysis
190080: 535-551 Brant Street, Burlington

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 65.7 | 65.7 | | 65.7 | 65.7 | 65.7 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| v/c Ratio | 0.54 | 0.20 | | 0.07 | 0.26 | | 0.08 | 0.50 | | 0.08 | 0.53 | 0.14 |
| Control Delay | 41.9 | 20.3 | | 28.2 | 22.6 | | 5.3 | 7.6 | | 5.3 | 8.1 | 1.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 20.3 | | 28.2 | 22.6 | | 5.3 | 7.6 | | 5.3 | 8.1 | 1.3 |
| LOS | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay | | 33.9 | | | 23.4 | | | 7.5 | | | 6.8 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.54 | | | |
| Intersection Signal Delay: 10.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 64.7% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue




Paradigm Transportation Solutions Limited

Synchro 9 Report

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 110 | 65 | 13 | 82 | 33 | 648 | 32 | 677 | 149 |
| v/c Ratio | 0.54 | 0.20 | 0.07 | 0.26 | 0.08 | 0.50 | 0.08 | 0.53 | 0.14 |
| Control Delay | 41.9 | 20.3 | 28.2 | 22.6 | 5.3 | 7.6 | 5.3 | 8.1 | 1.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 20.3 | 28.2 | 22.6 | 5.3 | 7.6 | 5.3 | 8.1 | 1.3 |
| Queue Length 50th (m) | 17.5 | 5.6 | 1.9 | 8.2 | 1.4 | 38.7 | 1.3 | 42.1 | 0.0 |
| Queue Length 95th (m) | 30.5 | 14.6 | 6.2 | 18.2 | 5.3 | 82.1 | 5.2 | 89.2 | 5.8 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 377 | 571 | 346 | 567 | 418 | 1295 | 423 | 1283 | 1028 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.11 | 0.04 | 0.14 | 0.08 | 0.50 | 0.08 | 0.53 | 0.14 |

Intersection Summary





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Future Volume (vph) | 101 | 35 | 25 | 12 | 51 | 25 | 30 | 573 | 23 | 29 | 623 | 137 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.93 | | 1.00 | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.91 |
| Flpb, ped/bikes | 0.88 | 1.00 | | 0.86 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | 1.00 |
| Frt | 1.00 | 0.94 | | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1529 | 1658 | | 1382 | 1648 | | 1591 | 1775 | | 1541 | 1759 | 1354 |
| Flt Permitted | 0.70 | 1.00 | | 0.71 | 1.00 | | 0.34 | 1.00 | | 0.36 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1133 | 1658 | | 1040 | 1648 | | 572 | 1775 | | 579 | 1759 | 1354 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 110 | 38 | 27 | 13 | 55 | 27 | 33 | 623 | 25 | 32 | 677 | 149 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 40 |
| Lane Group Flow (vph) | 110 | 43 | 0 | 13 | 60 | 0 | 33 | 647 | 0 | 32 | 677 | 109 |
| Confl. Peds. (#/hr) | 77 | | 83 | 83 | | 77 | 56 | | 42 | 42 | | 56 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 4% | 4% | 7% | 6% | 9% | 11% | 8% | 7% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 14.3 | 14.3 | | 14.3 | 14.3 | | 63.7 | 63.7 | | 63.7 | 63.7 | 63.7 |
| Effective Green, g (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 65.7 | 65.7 | | 65.7 | 65.7 | 65.7 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 205 | 300 | | 188 | 298 | | 417 | 1295 | | 422 | 1284 | 988 |
| v/s Ratio Prot | | 0.03 | | | 0.04 | | | 0.36 | | | c0.38 | |
| v/s Ratio Perm | c0.10 | | | 0.01 | | | 0.06 | | | 0.06 | | 0.08 |
| v/c Ratio | 0.54 | 0.14 | | 0.07 | 0.20 | | 0.08 | 0.50 | | 0.08 | 0.53 | 0.11 |
| Uniform Delay, d1 | 33.4 | 31.0 | | 30.6 | 31.3 | | 3.5 | 5.2 | | 3.5 | 5.3 | 3.6 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.7 | 0.2 | | 0.2 | 0.3 | | 0.4 | 1.4 | | 0.3 | 1.6 | 0.2 |
| Delay (s) | 36.1 | 31.2 | | 30.7 | 31.6 | | 3.9 | 6.5 | | 3.8 | 6.9 | 3.8 |
| Level of Service | D | C | | C | C | | A | A | | A | A | A |
| Approach Delay (s) | | 34.3 | | | 31.5 | | | 6.4 | | | 6.2 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 10.3 | HCM 2000 Level of Service | B | |
| HCM 2000 Volume to Capacity ratio | 0.53 | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 64.7% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 13 | 50 | 576 | 37 | 56 | 604 |
| Future Volume (vph) | 13 | 50 | 576 | 37 | 56 | 604 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.893 | | 0.992 | | | |
| Flt Protected | 0.990 | | | | 0.950 | |
| Satd. Flow (prot) | 1545 | 0 | 1794 | 0 | 1678 | 1810 |
| Flt Permitted | 0.990 | | | | 0.950 | |
| Satd. Flow (perm) | 1545 | 0 | 1794 | 0 | 1678 | 1810 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 168.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 12.1 | | | 13.7 |
| Confl. Peds. (#/hr) | 4 | | | 19 | 19 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 11% | 5% | 6% | 4% | 5% |
| Adj. Flow (vph) | 14 | 54 | 626 | 40 | 61 | 657 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 68 | 0 | 666 | 0 | 61 | 657 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 49.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 13 | 50 | 576 | 37 | 56 | 604 |
| Future Volume (Veh/h) | 13 | 50 | 576 | 37 | 56 | 604 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 14 | 54 | 626 | 40 | 61 | 657 |
| Pedestrians | 19 | | 4 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 2 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.86 | 0.78 | | | 0.78 | |
| vC, conflicting volume | 1448 | 665 | | | 685 | |
| vC1, stage 1 conf vol | 665 | | | | | |
| vC2, stage 2 conf vol | 783 | | | | | |
| vCu, unblocked vol | 1007 | 428 | | | 454 | |
| tC, single (s) | 6.4 | 6.3 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.4 | | | 2.2 | |
| p0 queue free % | 96 | 88 | | | 93 | |
| cM capacity (veh/h) | 357 | 465 | | | 839 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 68 | 666 | 61 | 657 |
| Volume Left | 14 | 0 | 61 | 0 |
| Volume Right | 54 | 40 | 0 | 0 |
| cSH | 438 | 1700 | 839 | 1700 |
| Volume to Capacity | 0.16 | 0.39 | 0.07 | 0.39 |
| Queue Length 95th (m) | 4.1 | 0.0 | 1.8 | 0.0 |
| Control Delay (s) | 14.7 | 0.0 | 9.6 | 0.0 |
| Lane LOS | B | | A | |
| Approach Delay (s) | 14.7 | 0.0 | 0.8 | |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 49.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 114 | 20 | 29 | 65 | 127 | 11 | 348 | 38 | 165 | 394 | 58 |
| Future Volume (vph) | 138 | 114 | 20 | 29 | 65 | 127 | 11 | 348 | 38 | 165 | 394 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | 1.00 | | 0.95 | 0.97 | 0.99 | | 0.98 | 0.99 | | 0.97 | 0.99 | |
| Frt | | | 0.850 | | 0.901 | | | 0.985 | | | 0.981 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1646 | 1792 | 1439 | 1479 | 1455 | 0 | 1572 | 1629 | 0 | 1601 | 1651 | 0 |
| Flt Permitted | 0.464 | | | 0.677 | | | 0.446 | | | 0.239 | | |
| Satd. Flow (perm) | 803 | 1792 | 1363 | 1024 | 1455 | 0 | 727 | 1629 | 0 | 390 | 1651 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 123 | | | 7 | | | 12 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 168.5 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 12.1 | |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| 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% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Adj. Flow (vph) | 150 | 124 | 22 | 32 | 71 | 138 | 12 | 378 | 41 | 179 | 428 | 63 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 150 | 124 | 22 | 32 | 209 | 0 | 12 | 419 | 0 | 179 | 491 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |

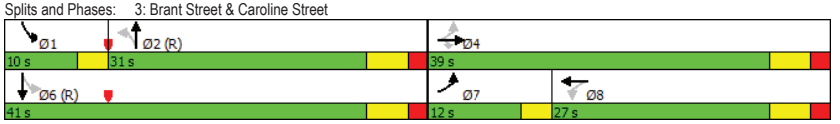




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 27.0 | 27.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.34 | 0.34 | | 0.48 | 0.46 | |
| v/c Ratio | 0.33 | 0.16 | 0.03 | 0.11 | 0.41 | | 0.05 | 0.76 | | 0.62 | 0.64 | |
| Control Delay | 15.6 | 14.3 | 0.1 | 22.2 | 12.6 | | 18.7 | 33.7 | | 22.9 | 20.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 15.6 | 14.3 | 0.1 | 22.2 | 12.6 | | 18.7 | 33.7 | | 22.9 | 20.6 | |
| LOS | B | B | A | C | B | | B | C | | C | C | |
| Approach Delay | | 13.9 | | | 13.9 | | | 33.3 | | | 21.2 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 54 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 75 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.76 | | |
| Intersection Signal Delay: 22.0 | | Intersection LOS: C |
| Intersection Capacity Utilization 67.1% | | ICU Level of Service C |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 150 | 124 | 22 | 32 | 209 | 12 | 419 | 179 | 491 |
| v/c Ratio | 0.33 | 0.16 | 0.03 | 0.11 | 0.41 | 0.05 | 0.76 | 0.62 | 0.64 |
| Control Delay | 15.6 | 14.3 | 0.1 | 22.2 | 12.6 | 18.7 | 33.7 | 22.9 | 20.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 15.6 | 14.3 | 0.1 | 22.2 | 12.6 | 18.7 | 33.7 | 22.9 | 20.6 |
| Queue Length 50th (m) | 13.3 | 11.0 | 0.0 | 3.6 | 9.9 | 1.2 | 54.9 | 15.3 | 53.1 |
| Queue Length 95th (m) | 24.4 | 20.9 | 0.0 | 10.0 | 27.2 | 4.8 | #97.0 | #27.9 | 84.5 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 144.5 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 456 | 784 | 642 | 301 | 515 | 245 | 554 | 291 | 770 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.16 | 0.03 | 0.11 | 0.41 | 0.05 | 0.76 | 0.62 | 0.64 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 114 | 20 | 29 | 65 | 127 | 11 | 348 | 38 | 165 | 394 | 58 |
| Future Volume (vph) | 138 | 114 | 20 | 29 | 65 | 127 | 11 | 348 | 38 | 165 | 394 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.95 | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.90 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1645 | 1792 | 1363 | 1437 | 1455 | | 1548 | 1630 | | 1591 | 1651 | |
| Flt Permitted | 0.46 | 1.00 | 1.00 | 0.68 | 1.00 | | 0.45 | 1.00 | | 0.24 | 1.00 | |
| Satd. Flow (perm) | 803 | 1792 | 1363 | 1025 | 1455 | | 727 | 1630 | | 400 | 1651 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 150 | 124 | 22 | 32 | 71 | 138 | 12 | 378 | 41 | 179 | 428 | 63 |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 87 | 0 | 0 | 5 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 150 | 124 | 10 | 32 | 122 | 0 | 12 | 414 | 0 | 179 | 485 | 0 |
| Confl. Peds. (#/hr) | 1 | | 15 | 15 | | 1 | 18 | | 49 | 49 | | 18 |
| Heavy Vehicles (%) | 6% | 6% | 11% | 18% | 12% | 18% | 11% | 14% | 11% | 9% | 12% | 13% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.6 | 21.6 | | 25.0 | 25.0 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.6 | 23.6 | | 27.0 | 27.0 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.30 | 0.30 | | 0.34 | 0.34 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 419 | 784 | 596 | 302 | 429 | | 245 | 550 | | 279 | 763 | |
| v/s Ratio Prot | c0.04 | 0.07 | | | 0.08 | | | c0.25 | | 0.06 | c0.29 | |
| v/s Ratio Perm | c0.11 | | 0.01 | 0.03 | | | 0.02 | | | 0.22 | | |
| v/c Ratio | 0.36 | 0.16 | 0.02 | 0.11 | 0.29 | | 0.05 | 0.75 | | 0.64 | 0.64 | |
| Uniform Delay, d1 | 15.5 | 13.6 | 12.7 | 20.5 | 21.7 | | 17.9 | 23.5 | | 16.1 | 16.4 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.4 | 0.0 | 0.7 | 1.7 | | 0.4 | 9.2 | | 5.0 | 4.0 | |
| Delay (s) | 16.0 | 14.0 | 12.8 | 21.2 | 23.4 | | 18.2 | 32.8 | | 21.0 | 20.4 | |
| Level of Service | B | B | B | C | C | | B | C | | C | C | |
| Approach Delay (s) | | 14.9 | | | 23.1 | | | 32.4 | | | 20.5 | |
| Approach LOS | | B | | | C | | | C | | | C | |

Intersection Summary

| | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.56 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 67.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 26 | 210 | 81 | 20 | 163 | 51 | 35 | 14 | 14 | 24 | 30 | 23 |
| Future Volume (vph) | 26 | 210 | 81 | 20 | 163 | 51 | 35 | 14 | 14 | 24 | 30 | 23 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 15.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.965 | | | | 0.850 | | 0.925 | | | | 0.850 |
| Flt Protected | | 0.996 | | | 0.995 | | 0.950 | | | | 0.978 | |
| Satd. Flow (prot) | 0 | 1726 | 0 | 0 | 1857 | 1615 | 1745 | 1758 | 0 | 0 | 1783 | 1597 |
| Flt Permitted | | 0.996 | | | 0.995 | | 0.950 | | | | 0.978 | |
| Satd. Flow (perm) | 0 | 1726 | 0 | 0 | 1857 | 1615 | 1745 | 1758 | 0 | 0 | 1783 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 128.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 9.2 | |
| Confl. Peds. (#/hr) | 14 | | 7 | 7 | | 14 | 8 | | 15 | 15 | | 8 |
| 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 (%) | 0% | 3% | 15% | 0% | 2% | 0% | 0% | 0% | 0% | 2% | 6% | 0% |
| Adj. Flow (vph) | 28 | 228 | 88 | 22 | 177 | 55 | 38 | 15 | 15 | 26 | 33 | 25 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 344 | 0 | 0 | 199 | 55 | 38 | 30 | 0 | 0 | 59 | 25 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 49.1% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 26 | 210 | 81 | 20 | 163 | 51 | 35 | 14 | 14 | 24 | 30 | 23 |
| Future Volume (vph) | 26 | 210 | 81 | 20 | 163 | 51 | 35 | 14 | 14 | 24 | 30 | 23 |
| 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) | 28 | 228 | 88 | 22 | 177 | 55 | 38 | 15 | 15 | 26 | 33 | 25 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total (vph) | 344 | 199 | 55 | 38 | 30 | 59 | 25 |
| Volume Left (vph) | 28 | 22 | 0 | 38 | 0 | 26 | 0 |
| Volume Right (vph) | 88 | 0 | 55 | 0 | 15 | 0 | 25 |
| Hadj (s) | -0.04 | 0.09 | -0.70 | 0.50 | -0.35 | 0.29 | -0.70 |
| Departure Headway (s) | 5.2 | 5.4 | 4.6 | 6.7 | 5.8 | 6.4 | 5.4 |
| Degree Utilization, x | 0.50 | 0.30 | 0.07 | 0.07 | 0.05 | 0.11 | 0.04 |
| Capacity (veh/h) | 666 | 643 | 747 | 494 | 559 | 510 | 598 |
| Control Delay (s) | 13.3 | 9.5 | 6.7 | 9.0 | 7.9 | 9.0 | 7.4 |
| Approach Delay (s) | 13.3 | 8.9 | | 8.5 | | 8.5 | |
| Approach LOS | B | A | | A | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | 10.8 | | | |
| Level of Service | B | | | |
| Intersection Capacity Utilization | 49.1% | 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) | 18 | 0 | 48 | 0 | 0 | 0 | 48 | 34 | 1 | 1 | 46 | 7 |
| Future Volume (vph) | 18 | 0 | 48 | 0 | 0 | 0 | 48 | 34 | 1 | 1 | 46 | 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 | | 0.902 | | | | | | 0.998 | | | 0.982 | |
| Flt Protected | | 0.986 | | | | | | 0.972 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1662 | 0 | 0 | 1900 | 0 | 0 | 1821 | 0 | 0 | 1833 | 0 |
| Flt Permitted | | 0.986 | | | | | | 0.972 | | | 0.999 | |
| Satd. Flow (perm) | 0 | 1662 | 0 | 0 | 1900 | 0 | 0 | 1821 | 0 | 0 | 1833 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 38.0 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 2.7 | | | 4.2 | |
| Confl. Peds. (#/hr) | 55 | | 3 | 3 | | 55 | 22 | | 7 | 7 | | 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% | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 2% | 0% |
| Adj. Flow (vph) | 20 | 0 | 52 | 0 | 0 | 0 | 52 | 37 | 1 | 1 | 50 | 8 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 72 | 0 | 0 | 0 | 0 | 0 | 90 | 0 | 0 | 59 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 30.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 18 | 0 | 48 | 0 | 0 | 0 | 48 | 34 | 1 | 1 | 46 | 7 |
| Future Volume (vph) | 18 | 0 | 48 | 0 | 0 | 0 | 48 | 34 | 1 | 1 | 46 | 7 |
| 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) | 20 | 0 | 52 | 0 | 0 | 0 | 52 | 37 | 1 | 1 | 50 | 8 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 72 | 0 | 90 | 59 |
| Volume Left (vph) | 20 | 0 | 52 | 1 |
| Volume Right (vph) | 52 | 0 | 1 | 8 |
| Hadj (s) | -0.35 | 0.00 | 0.13 | -0.05 |
| Departure Headway (s) | 3.9 | 4.3 | 4.2 | 4.1 |
| Degree Utilization, x | 0.08 | 0.00 | 0.11 | 0.07 |
| Capacity (veh/h) | 891 | 811 | 824 | 857 |
| Control Delay (s) | 7.2 | 7.3 | 7.7 | 7.4 |
| Approach Delay (s) | 7.2 | 0.0 | 7.7 | 7.4 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.5 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 30.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 20 | 30 | 9 | 63 | 88 | 6 |
| Future Volume (vph) | 20 | 30 | 9 | 63 | 88 | 6 |
| 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 | 0.919 | | | | 0.991 | |
| Flt Protected | 0.980 | | | 0.994 | | |
| Satd. Flow (prot) | 1711 | 0 | 0 | 1856 | 1866 | 0 |
| Flt Permitted | 0.980 | | | 0.994 | | |
| Satd. Flow (perm) | 1711 | 0 | 0 | 1856 | 1866 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 34.4 | | | 128.3 | 38.0 | |
| Travel Time (s) | 2.5 | | | 9.2 | 2.7 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 1% | 0% |
| Adj. Flow (vph) | 22 | 33 | 10 | 68 | 96 | 7 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 55 | 0 | 0 | 78 | 103 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Sign Control | Stop | | | Free | Free | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization 20.5% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 30 | 9 | 63 | 88 | 6 |
| Future Volume (Veh/h) | 20 | 30 | 9 | 63 | 88 | 6 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 22 | 33 | 10 | 68 | 96 | 7 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 188 | 100 | 103 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 188 | 100 | 103 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 97 | 99 | | | |
| cM capacity (veh/h) | 801 | 962 | 1502 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 55 | 78 | 103 |
| Volume Left | 22 | 10 | 0 |
| Volume Right | 33 | 0 | 7 |
| cSH | 890 | 1502 | 1700 |
| Volume to Capacity | 0.06 | 0.01 | 0.06 |
| Queue Length 95th (m) | 1.5 | 0.2 | 0.0 |
| Control Delay (s) | 9.3 | 1.0 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 9.3 | 1.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.5 | | |
| Intersection Capacity Utilization | 20.5% | 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) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Future Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Storage Length (m) | 20.0 | | 0.0 | 25.0 | | 0.0 | 15.0 | | 0.0 | 45.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | 0.98 | 0.97 | | 0.97 | 0.97 | | 0.99 | 1.00 | | | | 0.92 |
| Frt | | 0.929 | | | 0.882 | | | 0.997 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1745 | 1721 | 0 | 1601 | 1470 | 0 | 1745 | 1837 | 0 | 1631 | 1792 | 1536 |
| Flt Permitted | 0.706 | | | 0.735 | | | 0.311 | | | 0.225 | | |
| Satd. Flow (perm) | 1269 | 1721 | 0 | 1198 | 1470 | 0 | 564 | 1837 | 0 | 386 | 1792 | 1413 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 16 | | | 62 | | | 2 | | | | 53 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.4 | | | 111.4 | | | 189.9 | | | 113.4 | |
| Travel Time (s) | | 10.0 | | | 10.0 | | | 13.7 | | | 8.2 | |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| 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 (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Adj. Flow (vph) | 48 | 18 | 16 | 25 | 17 | 62 | 17 | 977 | 20 | 66 | 800 | 59 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 48 | 34 | 0 | 25 | 79 | 0 | 17 | 997 | 0 | 66 | 800 | 59 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | Yes | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.01 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |



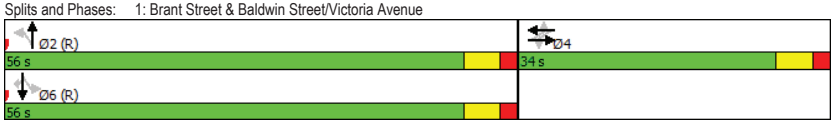
Lanes, Volumes, Timings
1: Brant Street & Baldwin Street/Victoria Avenue

Total PM - Sensitivity Analysis
190080: 535-551 Brant Street, Burlington

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Detector Phase | 4 | 4 | | 4 | 4 | | 2 | 2 | | 6 | 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) | 32.0 | 32.0 | | 32.0 | 32.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 |
| Total Split (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 37.8% | 37.8% | | 37.8% | 37.8% | | 62.2% | 62.2% | | 62.2% | 62.2% | 62.2% |
| Maximum Green (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | | -2.0 | -2.0 | -2.0 |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| 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 | | C-Max | C-Max | | C-Max | C-Max | C-Max |
| Walk Time (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Flash Dont Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Act Effct Green (s) | 11.6 | 11.6 | | 11.6 | 11.6 | | 74.0 | 74.0 | | 74.0 | 74.0 | 74.0 |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.82 | 0.82 | | 0.82 | 0.82 | 0.82 |
| v/c Ratio | 0.29 | 0.14 | | 0.16 | 0.33 | | 0.04 | 0.66 | | 0.21 | 0.54 | 0.05 |
| Control Delay | 39.7 | 23.3 | | 36.5 | 16.8 | | 2.8 | 7.3 | | 4.8 | 5.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.7 | 23.3 | | 36.5 | 16.8 | | 2.8 | 7.3 | | 4.8 | 5.4 | 1.1 |
| LOS | D | C | | D | B | | A | A | | A | A | A |
| Approach Delay | | 32.9 | | | 21.5 | | | 7.2 | | | 5.1 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.66 | | | |
| Intersection Signal Delay: 8.0 | | Intersection LOS: A | |
| Intersection Capacity Utilization 72.0% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Brant Street & Baldwin Street/Victoria Avenue




Paradigm Transportation Solutions Limited

Synchro 9 Report

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 48 | 34 | 25 | 79 | 17 | 997 | 66 | 800 | 59 |
| v/c Ratio | 0.29 | 0.14 | 0.16 | 0.33 | 0.04 | 0.66 | 0.21 | 0.54 | 0.05 |
| Control Delay | 39.7 | 23.3 | 36.5 | 16.8 | 2.8 | 7.3 | 4.8 | 5.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.7 | 23.3 | 36.5 | 16.8 | 2.8 | 7.3 | 4.8 | 5.4 | 1.1 |
| Queue Length 50th (m) | 7.7 | 2.8 | 3.9 | 2.7 | 0.5 | 58.8 | 2.2 | 39.1 | 0.2 |
| Queue Length 95th (m) | 17.3 | 10.7 | 10.7 | 14.4 | 2.1 | 119.9 | 7.4 | 77.3 | 2.7 |
| Internal Link Dist (m) | | 87.4 | | 87.4 | | 165.9 | | 89.4 | |
| Turn Bay Length (m) | 20.0 | | 25.0 | | 15.0 | | 45.0 | | 50.0 |
| Base Capacity (vph) | 423 | 584 | 399 | 531 | 464 | 1511 | 317 | 1473 | 1171 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.06 | 0.06 | 0.15 | 0.04 | 0.66 | 0.21 | 0.54 | 0.05 |

Intersection Summary





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Future Volume (vph) | 44 | 17 | 15 | 23 | 16 | 57 | 16 | 899 | 18 | 61 | 736 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.5 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.92 |
| Flpb, ped/bikes | 0.98 | 1.00 | | 0.97 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | 1.00 |
| Frt | 1.00 | 0.93 | | 1.00 | 0.88 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1708 | 1721 | | 1549 | 1471 | | 1715 | 1837 | | 1613 | 1792 | 1413 |
| Flt Permitted | 0.71 | 1.00 | | 0.73 | 1.00 | | 0.31 | 1.00 | | 0.23 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1269 | 1721 | | 1198 | 1471 | | 561 | 1837 | | 382 | 1792 | 1413 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 48 | 18 | 16 | 25 | 17 | 62 | 17 | 977 | 20 | 66 | 800 | 59 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Lane Group Flow (vph) | 48 | 20 | 0 | 25 | 24 | 0 | 17 | 997 | 0 | 66 | 800 | 48 |
| Confl. Peds. (#/hr) | 13 | | 19 | 19 | | 13 | 46 | | 45 | 45 | | 46 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 9% | 7% | 11% | 0% | 3% | 0% | 7% | 6% | 4% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 4 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 4 | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 70.0 | 70.0 | | 70.0 | 70.0 | 70.0 |
| Effective Green, g (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 72.0 | 72.0 | | 72.0 | 72.0 | 72.0 |
| Actuated g/C Ratio | 0.11 | 0.11 | | 0.11 | 0.11 | | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 141 | 191 | | 133 | 163 | | 448 | 1469 | | 305 | 1433 | 1130 |
| v/s Ratio Prot | | 0.01 | | | 0.02 | | | c0.54 | | | 0.45 | |
| v/s Ratio Perm | c0.04 | | | 0.02 | | | 0.03 | | | 0.17 | | 0.03 |
| v/c Ratio | 0.34 | 0.10 | | 0.19 | 0.15 | | 0.04 | 0.68 | | 0.22 | 0.56 | 0.04 |
| Uniform Delay, d1 | 37.0 | 36.0 | | 36.3 | 36.1 | | 1.9 | 3.9 | | 2.2 | 3.3 | 1.9 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.4 | 0.2 | | 0.7 | 0.4 | | 0.2 | 2.5 | | 1.6 | 1.6 | 0.1 |
| Delay (s) | 38.4 | 36.2 | | 37.0 | 36.6 | | 2.0 | 6.5 | | 3.8 | 4.8 | 1.9 |
| Level of Service | D | D | | D | D | | A | A | | A | A | A |
| Approach Delay (s) | | 37.5 | | | 36.7 | | | 6.4 | | | 4.6 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | | | | |
|---|---|---|---|---|---|---|
| HCM 2000 Control Delay | 8.3 | HCM 2000 Level of Service | A | | | |
| HCM 2000 Volume to Capacity ratio | 0.64 | | | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 8.0 | | | |
| Intersection Capacity Utilization | 72.0% | ICU Level of Service | C | | | |
| Analysis Period (min) | 15 | | | | | |
| c Critical Lane Group | | | | | | |



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 42 | 98 | 835 | 67 | 62 | 712 |
| Future Volume (vph) | 42 | 98 | 835 | 67 | 62 | 712 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.3 | 3.6 |
| Storage Length (m) | 0.0 | 0.0 | | 0.0 | 20.0 | |
| Storage Lanes | 1 | 0 | | 0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.906 | | 0.990 | | | |
| Flt Protected | 0.985 | | | | 0.950 | |
| Satd. Flow (prot) | 1696 | 0 | 1864 | 0 | 1745 | 1863 |
| Flt Permitted | 0.985 | | | | 0.950 | |
| Satd. Flow (perm) | 1696 | 0 | 1864 | 0 | 1745 | 1863 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 58.7 | | 168.5 | | | 189.9 |
| Travel Time (s) | 4.2 | | 12.1 | | | 13.7 |
| Confl. Peds. (#/hr) | 1 | | | 13 | 13 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 46 | 107 | 908 | 73 | 67 | 774 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 153 | 0 | 981 | 0 | 67 | 774 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.6 | | 3.3 | | | 3.3 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | Yes | | | Yes |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 | 1.00 |
| Sign Control | Stop | | Free | | | Free |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 66.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |







| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 42 | 98 | 835 | 67 | 62 | 712 |
| Future Volume (Veh/h) | 42 | 98 | 835 | 67 | 62 | 712 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 46 | 107 | 908 | 73 | 67 | 774 |
| Pedestrians | 13 | | 1 | | | |
| Lane Width (m) | 3.6 | | 3.6 | | | |
| Walking Speed (m/s) | 1.1 | | 1.1 | | | |
| Percent Blockage | 1 | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | TWLTL | | | TWLTL |
| Median storage veh) | | | 2 | | | 2 |
| Upstream signal (m) | | | 169 | | | 190 |
| pX, platoon unblocked | 0.74 | 0.66 | | | 0.66 | |
| vC, conflicting volume | 1866 | 958 | | | 994 | |
| vC1, stage 1 conf vol | 958 | | | | | |
| vC2, stage 2 conf vol | 909 | | | | | |
| vCu, unblocked vol | 1469 | 674 | | | 730 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 81 | 64 | | | 88 | |
| cM capacity (veh/h) | 245 | 297 | | | 573 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 153 | 981 | 67 | 774 |
| Volume Left | 46 | 0 | 67 | 0 |
| Volume Right | 107 | 73 | 0 | 0 |
| cSH | 279 | 1700 | 573 | 1700 |
| Volume to Capacity | 0.55 | 0.58 | 0.12 | 0.46 |
| Queue Length 95th (m) | 23.1 | 0.0 | 3.0 | 0.0 |
| Control Delay (s) | 32.4 | 0.0 | 12.1 | 0.0 |
| Lane LOS | D | | B | |
| Approach Delay (s) | 32.4 | 0.0 | 1.0 | |
| Approach LOS | D | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.9 | | |
| Intersection Capacity Utilization | 66.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 179 | 112 | 15 | 76 | 196 | 250 | 24 | 473 | 28 | 145 | 552 | 57 |
| Future Volume (vph) | 179 | 112 | 15 | 76 | 196 | 250 | 24 | 473 | 28 | 145 | 552 | 57 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Storage Length (m) | 40.0 | | 10.0 | 20.0 | | 0.0 | 25.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 15.0 | | |
| 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 | | | 0.91 | 0.94 | 0.96 | | 0.98 | 1.00 | | 0.99 | 0.99 | |
| Frt | | | 0.850 | | 0.916 | | | 0.992 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1631 | 1776 | 1479 | 1678 | 1544 | 0 | 1662 | 1737 | 0 | 1616 | 1782 | 0 |
| Flt Permitted | 0.165 | | | 0.679 | | | 0.245 | | | 0.143 | | |
| Satd. Flow (perm) | 283 | 1776 | 1343 | 1125 | 1544 | 0 | 421 | 1737 | 0 | 240 | 1782 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 81 | | | 4 | | | 9 | |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 107.3 | | | 65.5 | | | 176.5 | | | 168.5 | |
| Travel Time (s) | | 9.7 | | | 5.9 | | | 12.7 | | | 12.1 | |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Adj. Flow (vph) | 195 | 122 | 16 | 83 | 213 | 272 | 26 | 514 | 30 | 158 | 600 | 62 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 195 | 122 | 16 | 83 | 485 | 0 | 26 | 544 | 0 | 158 | 662 | 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | Yes | |
| Headway Factor | 1.04 | 1.00 | 1.01 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 |
| 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 | |



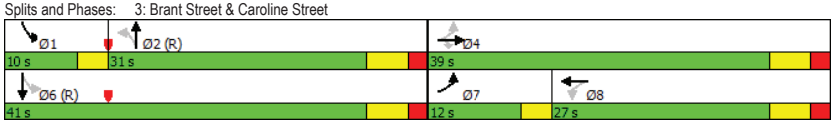
Lanes, Volumes, Timings
3: Brant Street & Caroline Street

Total PM - Sensitivity Analysis
190080: 535-551 Brant Street, Burlington

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 8 | 8 | | 2 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | 6.0 | 8.0 | |
| Minimum Split (s) | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | | 30.0 | 30.0 | | 10.0 | 30.0 | |
| Total Split (s) | 12.0 | 39.0 | 39.0 | 27.0 | 27.0 | | 31.0 | 31.0 | | 10.0 | 41.0 | |
| Total Split (%) | 15.0% | 48.8% | 48.8% | 33.8% | 33.8% | | 38.8% | 38.8% | | 12.5% | 51.3% | |
| Maximum Green (s) | 9.0 | 33.0 | 33.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 7.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | -2.0 | -2.0 | -2.0 | -2.0 | | -2.0 | -2.0 | | 0.0 | -2.0 | |
| Total Lost Time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lead/Lag | Lead | | | Lag | Lag | | Lag | Lag | | Lead | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | Max | Max | Max | | C-Max | C-Max | | None | C-Max | |
| Walk Time (s) | | 10.0 | 10.0 | 10.0 | 10.0 | | 15.0 | 15.0 | | | 15.0 | |
| Flash Dont Walk (s) | | 8.0 | 8.0 | 8.0 | 8.0 | | 8.0 | 8.0 | | | 8.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| Act Effct Green (s) | 36.0 | 35.0 | 35.0 | 23.2 | 23.2 | | 27.0 | 27.0 | | 38.0 | 37.0 | |
| Actuated g/C Ratio | 0.45 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.34 | 0.34 | | 0.48 | 0.46 | |
| v/c Ratio | 0.71 | 0.16 | 0.03 | 0.25 | 0.96 | | 0.18 | 0.93 | | 0.68 | 0.80 | |
| Control Delay | 29.9 | 14.3 | 0.1 | 24.6 | 57.4 | | 22.8 | 50.1 | | 28.9 | 27.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 29.9 | 14.3 | 0.1 | 24.6 | 57.4 | | 22.8 | 50.1 | | 28.9 | 27.2 | |
| LOS | C | B | A | C | E | | C | D | | C | C | |
| Approach Delay | | 22.8 | | | 52.6 | | | 48.8 | | | 27.5 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Cycle Length: 80 | | |
| Actuated Cycle Length: 80 | | |
| Offset: 57 (71%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 80 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.96 | | |
| Intersection Signal Delay: 38.3 | | Intersection LOS: D |
| Intersection Capacity Utilization 89.4% | | ICU Level of Service E |
| Analysis Period (min) 15 | | |

Splits and Phases: 3: Brant Street & Caroline Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 195 | 122 | 16 | 83 | 485 | 26 | 544 | 158 | 662 |
| v/c Ratio | 0.71 | 0.16 | 0.03 | 0.25 | 0.96 | 0.18 | 0.93 | 0.68 | 0.80 |
| Control Delay | 29.9 | 14.3 | 0.1 | 24.6 | 57.4 | 22.8 | 50.1 | 28.9 | 27.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 29.9 | 14.3 | 0.1 | 24.6 | 57.4 | 22.8 | 50.1 | 28.9 | 27.2 |
| Queue Length 50th (m) | 17.8 | 10.8 | 0.0 | 9.7 | 62.0 | 2.8 | 77.9 | 13.3 | 81.0 |
| Queue Length 95th (m) | #40.2 | 20.7 | 0.0 | 21.0 | #121.3 | 8.9 | #137.6 | #32.7 | #139.5 |
| Internal Link Dist (m) | | 83.3 | | | 41.5 | | 152.5 | | 144.5 |
| Turn Bay Length (m) | 40.0 | | 10.0 | 20.0 | | 25.0 | | 20.0 | |
| Base Capacity (vph) | 279 | 777 | 633 | 326 | 505 | 142 | 588 | 234 | 829 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.16 | 0.03 | 0.25 | 0.96 | 0.18 | 0.93 | 0.68 | 0.80 |

Intersection Summary

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





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 179 | 112 | 15 | 76 | 196 | 250 | 24 | 473 | 28 | 145 | 552 | 57 |
| Future Volume (vph) | 179 | 112 | 15 | 76 | 196 | 250 | 24 | 473 | 28 | 145 | 552 | 57 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.3 | 3.6 | 3.5 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 |
| Total Lost time (s) | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 0.91 | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1631 | 1776 | 1343 | 1574 | 1544 | | 1634 | 1732 | | 1612 | 1782 | |
| Flt Permitted | 0.17 | 1.00 | 1.00 | 0.68 | 1.00 | | 0.24 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 284 | 1776 | 1343 | 1124 | 1544 | | 421 | 1732 | | 242 | 1782 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 195 | 122 | 16 | 83 | 213 | 272 | 26 | 514 | 30 | 158 | 600 | 62 |
| RTOR Reduction (vph) | 0 | 0 | 9 | 0 | 58 | 0 | 0 | 3 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 195 | 122 | 7 | 83 | 427 | 0 | 26 | 541 | 0 | 158 | 657 | 0 |
| Confl. Peds. (#/hr) | 20 | | 33 | 33 | | 20 | 32 | | 53 | 53 | | 32 |
| Heavy Vehicles (%) | 7% | 7% | 8% | 4% | 7% | 10% | 5% | 8% | 10% | 8% | 4% | 8% |
| Turn Type | pm+pt | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.0 | 33.0 | 33.0 | 21.2 | 21.2 | | 25.0 | 25.0 | | 35.0 | 35.0 | |
| Effective Green, g (s) | 33.0 | 35.0 | 35.0 | 23.2 | 23.2 | | 27.0 | 27.0 | | 35.0 | 37.0 | |
| Actuated g/C Ratio | 0.41 | 0.44 | 0.44 | 0.29 | 0.29 | | 0.34 | 0.34 | | 0.44 | 0.46 | |
| Clearance Time (s) | 3.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 265 | 777 | 587 | 325 | 447 | | 142 | 584 | | 225 | 824 | |
| v/s Ratio Prot | c0.08 | 0.07 | | | c0.28 | | | c0.31 | | 0.06 | c0.37 | |
| v/s Ratio Perm | 0.22 | | 0.01 | 0.07 | | | 0.06 | | | 0.24 | | |
| v/c Ratio | 0.74 | 0.16 | 0.01 | 0.26 | 0.96 | | 0.18 | 0.93 | | 0.70 | 0.80 | |
| Uniform Delay, d1 | 18.5 | 13.6 | 12.7 | 21.8 | 27.9 | | 18.7 | 25.5 | | 17.5 | 18.3 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 10.1 | 0.4 | 0.0 | 1.9 | 33.0 | | 2.8 | 23.0 | | 9.5 | 7.9 | |
| Delay (s) | 28.7 | 14.0 | 12.8 | 23.7 | 60.9 | | 21.5 | 48.6 | | 27.0 | 26.2 | |
| Level of Service | C | B | B | C | E | | C | D | | C | C | |
| Approach Delay (s) | | 22.5 | | | 55.4 | | | 47.3 | | | 26.4 | |
| Approach LOS | | C | | | E | | | D | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 38.2 | HCM 2000 Level of Service | D | |
| HCM 2000 Volume to Capacity ratio | 0.90 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 14.0 | |
| Intersection Capacity Utilization | 89.4% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 30 | 185 | 70 | 33 | 361 | 86 | 98 | 35 | 36 | 70 | 36 | 63 |
| Future Volume (vph) | 30 | 185 | 70 | 33 | 361 | 86 | 98 | 35 | 36 | 70 | 36 | 63 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.3 | 3.6 | 3.6 | 3.6 | 3.6 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 15.0 | 25.0 | | 0.0 | 0.0 | | 30.0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 1 | | 0 | 0 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 | | 0.967 | | | | 0.850 | | 0.924 | | | | 0.850 |
| Flt Protected | | 0.995 | | | 0.996 | | 0.950 | | | | 0.968 | |
| Satd. Flow (prot) | 0 | 1802 | 0 | 0 | 1892 | 1615 | 1745 | 1756 | 0 | 0 | 1839 | 1597 |
| Flt Permitted | | 0.995 | | | 0.996 | | 0.950 | | | | 0.968 | |
| Satd. Flow (perm) | 0 | 1802 | 0 | 0 | 1892 | 1615 | 1745 | 1756 | 0 | 0 | 1839 | 1597 |
| Link Speed (k/h) | | 40 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 65.5 | | | 62.3 | | | 126.2 | | | 128.3 | |
| Travel Time (s) | | 5.9 | | | 5.6 | | | 9.1 | | | 9.2 | |
| Confl. Peds. (#/hr) | 23 | | 4 | 4 | | 23 | 5 | | 11 | 11 | | 5 |
| 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 (%) | 0% | 0% | 6% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 33 | 201 | 76 | 36 | 392 | 93 | 107 | 38 | 39 | 76 | 39 | 68 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 310 | 0 | 0 | 428 | 93 | 107 | 77 | 0 | 0 | 115 | 68 |
| 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) | | 3.3 | | | 3.3 | | | 3.3 | | | 3.3 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 59.2% | ICU Level of Service B | |
| Analysis Period (min) | 15 | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 30 | 185 | 70 | 33 | 361 | 86 | 98 | 35 | 36 | 70 | 36 | 63 |
| Future Volume (vph) | 30 | 185 | 70 | 33 | 361 | 86 | 98 | 35 | 36 | 70 | 36 | 63 |
| 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) | 33 | 201 | 76 | 36 | 392 | 93 | 107 | 38 | 39 | 76 | 39 | 68 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total (vph) | 310 | 428 | 93 | 107 | 77 | 115 | 68 |
| Volume Left (vph) | 33 | 36 | 0 | 107 | 0 | 76 | 0 |
| Volume Right (vph) | 76 | 0 | 93 | 0 | 39 | 0 | 68 |
| Hadj (s) | -0.10 | 0.04 | -0.70 | 0.50 | -0.35 | 0.33 | -0.70 |
| Departure Headway (s) | 6.4 | 6.3 | 5.6 | 7.8 | 7.0 | 7.7 | 6.6 |
| Degree Utilization, x | 0.55 | 0.75 | 0.14 | 0.23 | 0.15 | 0.25 | 0.13 |
| Capacity (veh/h) | 535 | 547 | 623 | 413 | 466 | 426 | 487 |
| Control Delay (s) | 17.2 | 24.8 | 8.3 | 12.0 | 10.0 | 12.0 | 9.4 |
| Approach Delay (s) | 17.2 | 21.9 | | 11.2 | | 11.0 | |
| Approach LOS | C | C | | B | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 17.3 | | |
| Level of Service | C | | |
| Intersection Capacity Utilization | 59.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 46 | 1 | 64 | 0 | 0 | 0 | 63 | 65 | 0 | 0 | 61 | 14 |
| Future Volume (vph) | 46 | 1 | 64 | 0 | 0 | 0 | 63 | 65 | 0 | 0 | 61 | 14 |
| 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 | | 0.922 | | | | | | | | | 0.975 | |
| Flt Protected | | 0.980 | | | | | | 0.976 | | | | |
| Satd. Flow (prot) | 0 | 1654 | 0 | 0 | 1900 | 0 | 0 | 1836 | 0 | 0 | 1852 | 0 |
| Flt Permitted | | 0.980 | | | | | | 0.976 | | | | |
| Satd. Flow (perm) | 0 | 1654 | 0 | 0 | 1900 | 0 | 0 | 1836 | 0 | 0 | 1852 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 58.7 | | | 38.3 | | | 38.0 | | | 58.4 | |
| Travel Time (s) | | 4.2 | | | 2.8 | | | 2.7 | | | 4.2 | |
| Confl. Peds. (#/hr) | 141 | | 2 | 2 | | 141 | 16 | | 38 | 38 | | 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 (%) | 5% | 0% | 3% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 50 | 1 | 70 | 0 | 0 | 0 | 68 | 71 | 0 | 0 | 66 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 121 | 0 | 0 | 0 | 0 | 0 | 139 | 0 | 0 | 81 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 33.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Yield | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 46 | 1 | 64 | 0 | 0 | 0 | 63 | 65 | 0 | 0 | 61 | 14 |
| Future Volume (vph) | 46 | 1 | 64 | 0 | 0 | 0 | 63 | 65 | 0 | 0 | 61 | 14 |
| 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) | 50 | 1 | 70 | 0 | 0 | 0 | 68 | 71 | 0 | 0 | 66 | 15 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 121 | 0 | 139 | 81 |
| Volume Left (vph) | 50 | 0 | 68 | 0 |
| Volume Right (vph) | 70 | 0 | 0 | 15 |
| Hadj (s) | -0.20 | 0.00 | 0.12 | -0.11 |
| Departure Headway (s) | 4.2 | 4.5 | 4.4 | 4.2 |
| Degree Utilization, x | 0.14 | 0.00 | 0.17 | 0.09 |
| Capacity (veh/h) | 817 | 760 | 793 | 822 |
| Control Delay (s) | 7.9 | 7.5 | 8.3 | 7.7 |
| Approach Delay (s) | 7.9 | 0.0 | 8.3 | 7.7 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.0 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 33.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

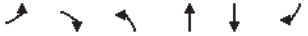


| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 16 | 25 | 117 | 109 | 16 |
| Future Volume (vph) | 11 | 16 | 25 | 117 | 109 | 16 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.921 | | | | 0.983 | |
| Flt Protected | 0.980 | | | 0.991 | | |
| Satd. Flow (prot) | 1715 | 0 | 0 | 1867 | 1852 | 0 |
| Flt Permitted | 0.980 | | | 0.991 | | |
| Satd. Flow (perm) | 1715 | 0 | 0 | 1867 | 1852 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 34.4 | | | 128.3 | 38.0 | |
| Travel Time (s) | 2.5 | | | 9.2 | 2.7 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 1% | 1% | 0% |
| Adj. Flow (vph) | 12 | 17 | 27 | 127 | 118 | 17 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 29 | 0 | 0 | 154 | 135 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Sign Control | Stop | | | Free | Free | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 27.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 11 | 16 | 25 | 117 | 109 | 16 |
| Future Volume (Veh/h) | 11 | 16 | 25 | 117 | 109 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 12 | 17 | 27 | 127 | 118 | 17 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 308 | 126 | 135 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 308 | 126 | 135 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 98 | 98 | | | |
| cM capacity (veh/h) | 676 | 929 | 1462 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 29 | 154 | 135 |
| Volume Left | 12 | 27 | 0 |
| Volume Right | 17 | 0 | 17 |
| cSH | 805 | 1462 | 1700 |
| Volume to Capacity | 0.04 | 0.02 | 0.08 |
| Queue Length 95th (m) | 0.9 | 0.4 | 0.0 |
| Control Delay (s) | 9.6 | 1.4 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 9.6 | 1.4 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.6 | | |
| Intersection Capacity Utilization | 27.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## Intersection: 4: John Street & Caroline Street

| Movement | EB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|
| Directions Served | LTR | LT | R | L | TR | LT | R |
| Maximum Queue (m) | 36.9 | 29.5 | 15.2 | 11.2 | 11.4 | 17.9 | 9.5 |
| Average Queue (m) | 18.8 | 14.2 | 7.3 | 6.0 | 5.2 | 7.5 | 4.1 |
| 95th Queue (m) | 30.2 | 24.1 | 14.2 | 12.9 | 12.0 | 14.4 | 10.2 |
| Link Distance (m) | 40.9 | 52.7 | | | 115.8 | 108.2 | |
| Upstream Blk Time (%) | 0 | 0 | | | | | |
| Queuing Penalty (veh) | 0 | 0 | | | | | |
| Storage Bay Dist (m) | | | 15.0 | 25.0 | | | 30.0 |
| Storage Blk Time (%) | | 3 | 0 | 0 | | | |
| Queuing Penalty (veh) | | 2 | 0 | 0 | | | |

## Intersection: 5: John Street & Access Road

| Movement | EB | NB | SB |
|---|---|---|---|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (m) | 10.3 | 15.6 | 17.4 |
| Average Queue (m) | 0.9 | 8.5 | 8.0 |
| 95th Queue (m) | 5.6 | 13.7 | 14.6 |
| Link Distance (m) | 39.8 | 18.2 | 50.0 |
| Upstream Blk Time (%) | | 0 | |
| Queuing Penalty (veh) | | 0 | |
| Storage Bay Dist (m) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 6: John Street & Site Driveway

| Movement | EB | NB |
|---|---|---|
| Directions Served | LR | LT |
| Maximum Queue (m) | 18.2 | 3.6 |
| Average Queue (m) | 7.7 | 0.2 |
| 95th Queue (m) | 15.2 | 2.3 |
| Link Distance (m) | 25.7 | 108.2 |
| Upstream Blk Time (%) | 0 | |
| Queuing Penalty (veh) | 0 | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 2





## Intersection: 4: John Street & Caroline Street

| Movement | EB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|
| Directions Served | LTR | LT | R | L | TR | LT | R |
| Maximum Queue (m) | 38.2 | 57.3 | 22.5 | 29.5 | 22.6 | 28.5 | 24.8 |
| Average Queue (m) | 19.4 | 57.0 | 19.2 | 14.5 | 9.0 | 10.4 | 10.2 |
| 95th Queue (m) | 31.5 | 61.9 | 32.1 | 25.3 | 17.2 | 21.8 | 20.9 |
| Link Distance (m) | 40.9 | 52.7 | | | 115.8 | 108.2 | |
| Upstream Blk Time (%) | 0 | 96 | | | | | |
| Queuing Penalty (veh) | 0 | 0 | | | | | |
| Storage Bay Dist (m) | | | 15.0 | 25.0 | | | 30.0 |
| Storage Blk Time (%) | | 97 | 1 | 2 | 0 | 0 | 1 |
| Queuing Penalty (veh) | | 83 | 5 | 2 | 0 | 0 | 2 |

## Intersection: 5: John Street & Access Road

| Movement | EB | NB | SB |
|---|---|---|---|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (m) | 17.1 | 21.7 | 28.9 |
| Average Queue (m) | 4.2 | 12.0 | 11.6 |
| 95th Queue (m) | 13.4 | 20.4 | 26.3 |
| Link Distance (m) | 39.8 | 18.2 | 50.0 |
| Upstream Blk Time (%) | | 13 | 2 |
| Queuing Penalty (veh) | | 16 | 0 |
| Storage Bay Dist (m) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 6: John Street & Site Driveway

| Movement | EB | NB |
|---|---|---|
| Directions Served | LR | LT |
| Maximum Queue (m) | 13.9 | 46.3 |
| Average Queue (m) | 6.3 | 7.5 |
| 95th Queue (m) | 15.9 | 38.4 |
| Link Distance (m) | 25.7 | 108.2 |
| Upstream Blk Time (%) | 2 | 0 |
| Queuing Penalty (veh) | 0 | 0 |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 109

# Appendix M

## Zoning By-law 2020

(c) A decorative finish shall be applied to all exterior walls facing a street or residential zone.

(d) Overhead doors are not permitted in a building elevation facing Brant Street and Lakeshore Road.

## 4.6 LANDSCAPE AREA AND BUFFER

**Landscape Area:**

| | |
|---|---|
| Abutting a creek block or O3 zone: | 3 m |
| For a parking lot as a principal use: | 3 m abutting a street |
| Abutting a PC or P zone: | 3 m |

**Landscape Buffer:**

| | |
|---|---|
| Abutting a residential or DRL zone: | 3 m |

## 4.7 PARKING

(a) Parking shall be provided in accordance with Part 1, Subsection 2.25 “Off-Street Parking and Loading Requirements”, except as amended by the following:

Apartment Dwelling Units: 1.25 spaces per unit

(b) Parking is not permitted in a front yard between the street line and the building elevation facing the street.

(c) Surface parking is not permitted in a DC, DW, DL-A, or DL-B zone; temporary parking for drop-off or delivery excepted.

(d) Parking of trucks and trailers is prohibited except:
- when the truck or trailer is being loaded or unloaded
- when the truck or trailer is for customer use
- when the truck or trailer belongs to a property owner or tenant
- when the truck or trailer is being used for charitable purposes

## 4.8 OUTSIDE STORAGE

(a) Only merchandise displayed for retail sale may be stored outside, provided the merchandise is not stored in a truck, trailer, or other vehicle.

(b) Perishable waste must be kept in refrigerated storage within a building. Alternatively, perishable waste may be stored outside if a deep collection waste disposal system, comprised of a sealed container with a lockable lid located primarily below grade, is used.

# Appendix N

## New Direction Policy

# Transportation Plan – Policy Directions

| Title | Description | Subject Site |
|---|---|---|
| 1. Align Land Use & Transportation | Land-use decisions including density, mix of uses and quality of urban design contribute to a fabric that supports walking, biking and public transit. Fully integrate land-use and transportation decision-making at every level including policy-making and budgeting to ensure that future decisions facilitate a transportation network that supports intensification. | ▶ Quality urban design<br>▶ Opportunities for high quality landscaping around site and in central park<br>▶ Direct connections between existing bicycle/transit network<br>▶ Reduced minimum parking requirements |
| 2. Rethink Streets | Abandon the “old” way of thinking, replace the term “road” with “street” and recognize that streets do more than just move automobiles, they are “people-places” and have the potential to be key assets in the civic life of our city. | ▶ Internal streets designed to minimum width – 6.0 metres with sidewalks<br>▶ Raised drop-off/pick-up area at Condo entry<br>▶ Short-term bicycle parking in close proximity to building entrances<br>▶ Reduced minimum parking requirements |
| 3. Reprioritize Mobility Choices | Reprioritize decision-making in order to support intensification and allow active & sustainable mobility choices to “catch-up” to the auto and reach an ambitious level of attractiveness in order to realize a true multi-modal city. | ▶ Sustainable mobility choices are encouraged by reducing on-site parking supply<br>▶ Provisions of short-term and long-term bicycle parking areas.<br>▶ Adjacent to existing Burlington Transit routes<br>▶ Direct connections between existing bicycle/transit network<br>▶ Raised drop-off/pick-up area at Condo entry |

# Transportation Plan – Policy Directions

| | | |
|---|---|---|
| 4. No New Car Capacity | Intensification with further car-oriented design will only result in continued auto-dependency, expensive infrastructure and an overall failure. Confirm that through the intensification strategy, mobility will be facilitated not through increased auto capacity, but by allocating existing space and budget for walking, biking and public transit. Strategic reallocation of existing car capacity for active and sustainable mobility choices. | ▶ Limited on-site parking due to proximity to transit.<br>▶ Provisions of short-term and long-term bicycle parking areas<br>▶ Direct connections between existing bicycle/transit network. |
| 5. Make Walking Delightful | Change the culture, decision-making, policy and budget to make the city rapidly more walkable – achieve the strategic goal of becoming a leader in walkability. | ▶ Urban design focus on sustainability mobility choices<br>▶ Opportunities for high quality landscaping around site and in central park<br>▶ Supports walking biking and public transit – connectivity between adjacent bicycle/transit network and connects directly to existing sidewalk facilities |
| 6. Make Biking Delightful | Move in a timely way to create a minimum network of safe, connected bike infrastructure with continued network expansion over time. Emphasis on initiatives to build an urban biking culture and achieve the “Gold Standard” for cycling. | ▶ Connectivity to adjacent bicycle network.<br>▶ Cycling supportive design enhanced through short-term and long-term bicycle parking areas. |
| 7. Make Transit Delightful | Support significant and strategic improvement of transit coverage, service and experience in order improve the branding of public transit as an attractive mobility option. Develop policy to support levels of density that will translate to increased ridership. | ▶ Adjacent to existing Burlington Transit routes |
| 8. “Walk the Talk” | Dedicate energy and attention to ensuring that the plan is followed-through. Strategically position the city for successful implementation of the Plan and align budget allocations to the new mode hierarchy. | ▶ Site plan details to be finalized during site plan approval |

# Appendix O

## Off-Site – Parking Survey Data

| Time | # Stalls | 9:00 | | 9:20 | | 9:40 | | 10:00 | | 10:20 | | 10:40 | | 11:00 | | 11:20 | | 11:40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lot 5**<br>Brant St Lot | 60 | 10 | 17% | 16 | 27% | 22 | 37% | 29 | 48% | 29 | 48% | 27 | 45% | 29 | 48% | 37 | 62% | 34 | 57% |
| **John St**<br>west side between Pine & Lot 5 | 3 | 0 | 0% | 2 | 67% | 0 | 0% | 1 | 33% | 1 | 33% | 0 | 0% | 0 | 0% | 1 | 33% | 2 | 67% |
| **John St**<br>west side between Lakeshore & Pine | 5 | 0 | 0% | 0 | 0% | 1 | 20% | 2 | 40% | 3 | 60% | 2 | 40% | 4 | 80% | 4 | 80% | 4 | 80% |
| **John St**<br>east side between Lakehsore & Pine | 6 | 0 | 0% | 0 | 0% | 1 | 17% | 3 | 50% | 3 | 50% | 3 | 50% | 5 | 83% | 4 | 67% | 4 | 67% |
| **Brant St**<br>east side between Lakeshore & Pine | 2 | 1 | 50% | 1 | 50% | 0 | 0% | 2 | 100% | 3 | 150% | 2 | 100% | 3 | 150% | 3 | 150% | 3 | 150% |
| **Brant St**<br>west side between Lakeshore & Elgin | 8 | 7 | 88% | 8 | 100% | 6 | 75% | 6 | 75% | 8 | 100% | 8 | 100% | 9 | 113% | 6 | 75% | 10 | 125% |
| **Pine St**<br>north side between Brant & John | 3 | 2 | 67% | 1 | 33% | 1 | 33% | 1 | 33% | 1 | 33% | 2 | 67% | 2 | 67% | 2 | 67% | 1 | 33% |
| **Brant St**<br>east side between Pine & Elgin/Lot 5 | 8 | 3 | 38% | 3 | 38% | 3 | 38% | 6 | 75% | 7 | 88% | 6 | 75% | 8 | 100% | 8 | 100% | 6 | 75% |
| **Lakeshore Rd**<br>south side between Elizabeth & Pearl | 7 | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 2 | 29% | 2 | 29% | 2 | 29% |
| **Elizabeth St**<br>west side between Pine & Lot 4 | 6 | 0 | 0% | 3 | 50% | 3 | 50% | 4 | 67% | 4 | 67% | 3 | 50% | 5 | 83% | 5 | 83% | 7 | 117% |
| **Lot 4**<br>Elizabeth St Lot | 97 | 42 | 43% | 46 | 47% | 59 | 61% | 74 | 76% | 75 | 77% | 73 | 75% | 72 | 74% | 75 | 77% | 75 | 77% |
| **Lot 1**<br>Pearl St Lot | 39 | 19 | 49% | 14 | 36% | 17 | 44% | 22 | 56% | 26 | 67% | 27 | 69% | 30 | 77% | 31 | 79% | 29 | 74% |
| **Pearl St**<br>west side between Pine & Lot 1 | 8 | 3 | 38% | 3 | 38% | 3 | 38% | 4 | 50% | 6 | 75% | 6 | 75% | 4 | 50% | 7 | 88% | 5 | 63% |
| **Pine St**<br>north side between Elizabeth & Pearl | 9 | 9 | 100% | 9 | 100% | 9 | 100% | 7 | 78% | 8 | 89% | 6 | 67% | 4 | 44% | 4 | 44% | 8 | 89% |
| **Pine St**<br>north side between Pearl & Martha | 4 | 2 | 50% | 3 | 75% | 3 | 75% | 6 | 150% | 6 | 150% | 6 | 150% | 6 | 150% | 4 | 100% | 5 | 125% |
| **Lot 4**<br>Martha St Lot | 11 | 0 | 0% | 2 | 18% | 3 | 27% | 4 | 36% | 4 | 36% | 5 | 45% | 5 | 45% | 5 | 45% | 5 | 45% |
| **Martha St**<br>west side between Lakeshore & Pine | 6 | 0 | 0% | 0 | 0% | 1 | 17% | 4 | 67% | 3 | 50% | 2 | 33% | 3 | 50% | 2 | 33% | 2 | 33% |
| **Old Lakeshore Rd**<br>south side between Lakeshore & Lakeshore | 12 | 1 | 8% | 3 | 25% | 4 | 33% | 4 | 33% | 3 | 25% | 3 | 25% | 3 | 25% | 2 | 17% | 2 | 17% |
| **Pearl St**<br>east side between Lakeshore & Pine | 7 | 1 | 14% | 3 | 43% | 7 | 100% | 7 | 100% | 7 | 100% | 2 | 29% | 5 | 71% | 3 | 43% | 4 | 57% |

| Time | # Stalls | 12:00 | | 12:20 | | 12:40 | | 13:00 | | 13:20 | | 13:40 | | 14:00 | | 14:20 | | 14:40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lot 5**<br>Brant St Lot | 60 | 37 | 62% | 35 | 58% | 39 | 65% | 47 | 78% | 56 | 93% | 50 | 83% | 51 | 85% | 43 | 72% | 34 | 57% |
| **John St**<br>west side between Pine & Lot 5 | 3 | 3 | 100% | 3 | 100% | 3 | 100% | 3 | 100% | 0 | 0% | 2 | 67% | 2 | 67% | 3 | 100% | 3 | 100% |
| **John St**<br>west side between Lakeshore & Pine | 5 | 5 | 100% | 5 | 100% | 5 | 100% | 5 | 100% | 4 | 80% | 4 | 80% | 5 | 100% | 5 | 100% | 5 | 100% |
| **John St**<br>east side between Lakehsore & Pine | 6 | 5 | 83% | 5 | 83% | 6 | 100% | 6 | 100% | 6 | 100% | 5 | 83% | 6 | 100% | 5 | 83% | 2 | 33% |
| **Brant St**<br>east side between Lakeshore & Pine | 2 | 3 | 150% | 2 | 100% | 2 | 100% | 3 | 150% | 1 | 50% | 1 | 50% | 2 | 100% | 1 | 50% | 1 | 50% |
| **Brant St**<br>west side between Lakeshore & Elgin | 8 | 10 | 125% | 8 | 100% | 10 | 125% | 8 | 100% | 7 | 88% | 7 | 88% | 7 | 88% | 8 | 100% | 8 | 100% |
| **Pine St**<br>north side between Brant & John | 3 | 3 | 100% | 3 | 100% | 3 | 100% | 3 | 100% | 2 | 67% | 3 | 100% | 3 | 100% | 3 | 100% | 2 | 67% |
| **Brant St**<br>east side between Pine & Elgin/Lot 5 | 8 | 7 | 88% | 7 | 88% | 8 | 100% | 7 | 88% | 8 | 100% | 8 | 100% | 6 | 75% | 7 | 88% | 6 | 75% |
| **Lakeshore Rd**<br>south side between Elizabeth & Pearl | 7 | 2 | 29% | 2 | 29% | 2 | 29% | 5 | 71% | 3 | 43% | 4 | 57% | 3 | 43% | 3 | 43% | 1 | 14% |
| **Elizabeth St**<br>west side between Pine & Lot 4 | 6 | 7 | 117% | 5 | 83% | 5 | 83% | 6 | 100% | 5 | 83% | 6 | 100% | 6 | 100% | 5 | 83% | 4 | 67% |
| **Lot 4**<br>Elizabeth St Lot | 97 | 79 | 81% | 81 | 84% | 80 | 82% | 83 | 86% | 72 | 74% | 73 | 75% | 70 | 72% | 67 | 69% | 64 | 66% |
| **Lot 1**<br>Pearl St Lot | 39 | 33 | 85% | 31 | 79% | 33 | 85% | 30 | 77% | 29 | 74% | 31 | 79% | 30 | 77% | 29 | 74% | 31 | 79% |
| **Pearl St**<br>west side between Pine & Lot 1 | 8 | 7 | 88% | 7 | 88% | 6 | 75% | 7 | 88% | 7 | 88% | 6 | 75% | 7 | 88% | 8 | 100% | 8 | 100% |
| **Pine St**<br>north side between Elizabeth & Pearl | 9 | 9 | 100% | 9 | 100% | 7 | 78% | 7 | 78% | 9 | 100% | 8 | 89% | 9 | 100% | 9 | 100% | 9 | 100% |
| **Pine St**<br>north side between Pearl & Martha | 4 | 5 | 125% | 3 | 75% | 4 | 100% | 2 | 50% | 2 | 50% | 3 | 75% | 4 | 100% | 5 | 125% | 5 | 125% |
| **Lot 4**<br>Martha St Lot | 11 | 5 | 45% | 5 | 45% | 7 | 64% | 5 | 45% | 4 | 36% | 4 | 36% | 4 | 36% | 4 | 36% | 5 | 45% |
| **Martha St**<br>west side between Lakeshore & Pine | 6 | 4 | 67% | 4 | 67% | 1 | 17% | 2 | 33% | 2 | 33% | 3 | 50% | 1 | 17% | 1 | 17% | 2 | 33% |
| **Old Lakeshore Rd**<br>south side between Lakeshore & Lakeshore | 12 | 2 | 17% | 1 | 8% | 1 | 8% | 1 | 8% | 2 | 17% | 2 | 17% | 2 | 17% | 1 | 8% | 2 | 17% |
| **Pearl St**<br>east side between Lakeshore & Pine | 7 | 5 | 71% | 4 | 57% | 7 | 100% | 7 | 100% | 5 | 71% | 7 | 100% | 6 | 86% | 7 | 100% | 8 | 114% |

| Time | # Stalls | 15:00 | | 15:20 | | 15:40 | | 16:00 | | 16:20 | | 16:40 | | 17:00 | | 17:20 | | 17:40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lot 5**<br>Brant St Lot | 60 | 36 | 60% | 35 | 58% | 32 | 53% | 32 | 53% | 34 | 57% | 31 | 52% | 31 | 52% | 22 | 37% | 26 | 43% |
| **John St**<br>west side between Pine & Lot 5 | 3 | 3 | 100% | 2 | 67% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 33% | 3 | 100% | 0 | 0% |
| **John St**<br>west side between Lakeshore & Pine | 5 | 2 | 40% | 3 | 60% | 3 | 60% | 5 | 100% | 3 | 60% | 3 | 60% | 4 | 80% | 5 | 100% | 5 | 100% |
| **John St**<br>east side between Lakehsore & Pine | 6 | 2 | 33% | 0 | 0% | 1 | 17% | 2 | 33% | 3 | 50% | 5 | 83% | 5 | 83% | 6 | 100% | 6 | 100% |
| **Brant St**<br>east side between Lakeshore & Pine | 2 | 3 | 150% | 3 | 150% | 3 | 150% | 3 | 150% | 3 | 150% | 2 | 100% | 3 | 150% | 3 | 150% | 3 | 150% |
| **Brant St**<br>west side between Lakeshore & Elgin | 8 | 6 | 75% | 9 | 113% | 5 | 63% | 8 | 100% | 5 | 63% | 6 | 75% | 7 | 88% | 8 | 100% | 8 | 100% |
| **Pine St**<br>north side between Brant & John | 3 | 1 | 33% | 2 | 67% | 1 | 33% | 2 | 67% | 3 | 100% | 1 | 33% | 3 | 100% | 3 | 100% | 3 | 100% |
| **Brant St**<br>east side between Pine & Elgin/Lot 5 | 8 | 5 | 63% | 6 | 75% | 6 | 75% | 3 | 38% | 4 | 50% | 7 | 88% | 7 | 88% | 8 | 100% | 8 | 100% |
| **Lakeshore Rd**<br>south side between Elizabeth & Pearl | 7 | 1 | 14% | 1 | 14% | 1 | 14% | 2 | 29% | 1 | 14% | 1 | 14% | 2 | 29% | 2 | 29% | 2 | 29% |
| **Elizabeth St**<br>west side between Pine & Lot 4 | 6 | 4 | 67% | 3 | 50% | 5 | 83% | 3 | 50% | 3 | 50% | 5 | 83% | 6 | 100% | 14 | 233% | 6 | 100% |
| **Lot 4**<br>Elizabeth St Lot | 97 | 63 | 65% | 57 | 59% | 58 | 60% | 58 | 60% | 53 | 55% | 53 | 55% | 52 | 54% | 57 | 59% | 59 | 61% |
| **Lot 1**<br>Pearl St Lot | 39 | 32 | 82% | 31 | 79% | 33 | 85% | 38 | 97% | 36 | 92% | 37 | 95% | 37 | 95% | 26 | 67% | 36 | 92% |
| **Pearl St**<br>west side between Pine & Lot 1 | 8 | 8 | 100% | 7 | 88% | 6 | 75% | 7 | 88% | 6 | 75% | 8 | 100% | 8 | 100% | 7 | 88% | 7 | 88% |
| **Pine St**<br>north side between Elizabeth & Pearl | 9 | 6 | 67% | 8 | 89% | 9 | 100% | 6 | 67% | 6 | 67% | 7 | 78% | 9 | 100% | 9 | 100% | 9 | 100% |
| **Pine St**<br>north side between Pearl & Martha | 4 | 6 | 150% | 6 | 150% | 6 | 150% | 4 | 100% | 6 | 150% | 6 | 150% | 5 | 125% | 5 | 125% | 5 | 125% |
| **Lot 4**<br>Martha St Lot | 11 | 5 | 45% | 5 | 45% | 5 | 45% | 5 | 45% | 5 | 45% | 5 | 45% | 5 | 45% | 5 | 45% | 5 | 45% |
| **Martha St**<br>west side between Lakeshore & Pine | 6 | 2 | 33% | 2 | 33% | 2 | 33% | 1 | 17% | 2 | 33% | 1 | 17% | 0 | 0% | 0 | 0% | 0 | 0% |
| **Old Lakeshore Rd**<br>south side between Lakeshore & Lakeshore | 12 | 3 | 25% | 4 | 33% | 4 | 33% | 5 | 42% | 4 | 33% | 4 | 33% | 5 | 42% | 7 | 58% | 10 | 83% |
| **Pearl St**<br>east side between Lakeshore & Pine | 7 | 7 | 100% | 7 | 100% | 6 | 86% | 6 | 86% | 5 | 71% | 4 | 57% | 4 | 57% | 7 | 100% | 7 | 100% |

| Time | # Stalls | 18:00 | | 18:20 | | 18:40 | | 19:00 | | 19:20 | | 19:40 | | 20:00 | | 20:20 | | 20:40 | | Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lot 5**<br>Brant St Lot | 60 | 28 | 47% | 40 | 67% | 41 | 68% | 42 | 70% | 41 | 68% | 38 | 63% | 34 | 57% | 35 | 58% | 33 | 55% | **93%** |
| **John St**<br>west side between Pine & Lot 5 | 3 | 2 | 67% | 2 | 67% | 3 | 100% | 3 | 100% | 3 | 100% | 1 | 33% | 1 | 33% | 0 | 0% | 1 | 33% | **100%** |
| **John St**<br>west side between Lakeshore & Pine | 5 | 5 | 100% | 5 | 100% | 5 | 100% | 5 | 100% | 5 | 100% | 4 | 80% | 3 | 60% | 3 | 60% | 1 | 20% | **100%** |
| **John St**<br>east side between Lakehsore & Pine | 6 | 6 | 100% | 6 | 100% | 6 | 100% | 6 | 100% | 3 | 50% | 3 | 50% | 2 | 33% | 1 | 17% | 1 | 17% | **100%** |
| **Brant St**<br>east side between Lakeshore & Pine | 2 | 3 | 150% | 3 | 150% | 3 | 150% | 3 | 150% | 2 | 100% | 2 | 100% | 2 | 100% | 2 | 100% | 2 | 100% | **150%** |
| **Brant St**<br>west side between Lakeshore & Elgin | 8 | 8 | 100% | 8 | 100% | 9 | 113% | 10 | 125% | 10 | 125% | 10 | 125% | 9 | 113% | 9 | 113% | 5 | 63% | **125%** |
| **Pine St**<br>north side between Brant & John | 3 | 3 | 100% | 2 | 67% | 3 | 100% | 3 | 100% | 3 | 100% | 3 | 100% | 4 | 133% | 4 | 133% | 3 | 100% | **133%** |
| **Brant St**<br>east side between Pine & Elgin/Lot 5 | 8 | 9 | 113% | 9 | 113% | 9 | 113% | 9 | 113% | 7 | 88% | 8 | 100% | 8 | 100% | 7 | 88% | 6 | 75% | **113%** |
| **Lakeshore Rd**<br>south side between Elizabeth & Pearl | 7 | 1 | 14% | 2 | 29% | 4 | 57% | 3 | 43% | 5 | 71% | 4 | 57% | 4 | 57% | 3 | 43% | 2 | 29% | **71%** |
| **Elizabeth St**<br>west side between Pine & Lot 4 | 6 | 6 | 100% | 5 | 83% | 6 | 100% | 6 | 100% | 6 | 100% | 6 | 100% | 6 | 100% | 5 | 83% | 6 | 100% | **233%** |
| **Lot 4**<br>Elizabeth St Lot | 97 | 71 | 73% | 73 | 75% | 74 | 76% | 73 | 75% | 70 | 72% | 69 | 71% | 57 | 59% | 58 | 60% | 54 | 56% | **86%** |
| **Lot 1**<br>Pearl St Lot | 39 | 38 | 97% | 39 | 100% | 38 | 97% | 39 | 100% | 37 | 95% | 34 | 87% | 35 | 90% | 34 | 87% | 36 | 92% | **100%** |
| **Pearl St**<br>west side between Pine & Lot 1 | 8 | 8 | 100% | 8 | 100% | 7 | 88% | 8 | 100% | 8 | 100% | 7 | 88% | 5 | 63% | 3 | 38% | 3 | 38% | **100%** |
| **Pine St**<br>north side between Elizabeth & Pearl | 9 | 9 | 100% | 9 | 100% | 9 | 100% | 9 | 100% | 9 | 100% | 7 | 78% | 9 | 100% | 7 | 78% | 9 | 100% | **100%** |
| **Pine St**<br>north side between Pearl & Martha | 4 | 6 | 150% | 6 | 150% | 6 | 150% | 6 | 150% | 4 | 100% | 4 | 100% | 4 | 100% | 3 | 75% | 2 | 50% | **150%** |
| **Lot 4**<br>Martha St Lot | 11 | 5 | 45% | 4 | 36% | 4 | 36% | 4 | 36% | 4 | 36% | 4 | 36% | 4 | 36% | 3 | 27% | 3 | 27% | **64%** |
| **Martha St**<br>west side between Lakeshore & Pine | 6 | 0 | 0% | 0 | 0% | 0 | 0% | 2 | 33% | 2 | 33% | 1 | 17% | 2 | 33% | 1 | 17% | 0 | 0% | **67%** |
| **Old Lakeshore Rd**<br>south side between Lakeshore & Lakeshore | 12 | 11 | 92% | 11 | 92% | 12 | 100% | 12 | 100% | 12 | 100% | 11 | 92% | 11 | 92% | 12 | 100% | 10 | 83% | **100%** |
| **Pearl St**<br>east side between Lakeshore & Pine | 7 | 7 | 100% | 6 | 86% | 8 | 114% | 8 | 114% | 8 | 114% | 8 | 114% | 4 | 57% | 3 | 43% | 1 | 14% | **114%** |

| Time | # Stalls | Avg |
|---|---|---|
| **Lot 5**<br>Brant St Lot | 60 | 57% |
| **John St**<br>west side between Pine & Lot 5 | 3 | 50% |
| **John St**<br>west side between Lakeshore & Pine | 5 | 73% |
| **John St**<br>east side between Lakehsore & Pine | 6 | 62% |
| **Brant St**<br>east side between Lakeshore & Pine | 2 | 114% |
| **Brant St**<br>west side between Lakeshore & Elgin | 8 | 98% |
| **Pine St**<br>north side between Brant & John | 3 | 79% |
| **Brant St**<br>east side between Pine & Elgin/Lot 5 | 8 | 83% |
| **Lakeshore Rd**<br>south side between Elizabeth & Pearl | 7 | 29% |
| **Elizabeth St**<br>west side between Pine & Lot 4 | 6 | 85% |
| **Lot 4**<br>Elizabeth St Lot | 97 | 68% |
| **Lot 1**<br>Pearl St Lot | 39 | 80% |
| **Pearl St**<br>west side between Pine & Lot 1 | 8 | 78% |
| **Pine St**<br>north side between Elizabeth & Pearl | 9 | 88% |
| **Pine St**<br>north side between Pearl & Martha | 4 | 114% |
| **Lot 4**<br>Martha St Lot | 11 | 39% |
| **Martha St**<br>west side between Lakeshore & Pine | 6 | 25% |
| **Old Lakeshore Rd**<br>south side between Lakeshore & Lakeshore | 12 | 43% |
| **Pearl St**<br>east side between Lakeshore & Pine | 7 | 80% |

# Appendix P

## Comparable Sites – Parking Survey Data

## 551 Maple Avenue - Residential Parking Utilization Survey (186 Units)

| Time Ending | Thursday November 1, 2016 | | | Wednesday November 2, 2016 | | | Tuesday November 8, 2016 | | | Wednesday November 9, 2016 | | | Four Day Average | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate |
| 4:15 | 60 | 181 | 0.32 | 43 | 198 | 0.23 | 52 | 189 | 0.28 | 58 | 183 | 0.31 | 57 | 184 | 0.30 |
| 4:30 | 56 | 185 | 0.30 | 39 | 202 | 0.21 | 53 | 188 | 0.28 | 60 | 181 | 0.32 | 56 | 185 | 0.30 |
| 4:45 | 57 | 184 | 0.31 | 47 | 194 | 0.25 | 60 | 181 | 0.32 | 60 | 181 | 0.32 | 59 | 182 | 0.32 |
| 5:00 | 60 | 181 | 0.32 | 52 | 189 | 0.28 | 61 | 180 | 0.33 | 63 | 178 | 0.34 | 61 | 180 | 0.33 |
| 5:15 | 68 | 173 | 0.37 | 56 | 185 | 0.30 | 60 | 181 | 0.32 | 65 | 176 | 0.35 | 64 | 177 | 0.35 |
| 5:30 | 80 | 161 | 0.43 | 60 | 181 | 0.32 | 76 | 165 | 0.41 | 68 | 173 | 0.37 | 75 | 166 | 0.40 |
| 5:45 | 82 | 159 | 0.44 | 78 | 163 | 0.42 | 84 | 157 | 0.45 | 69 | 172 | 0.37 | 78 | 163 | 0.42 |
| 6:00 | 84 | 157 | 0.45 | 89 | 152 | 0.48 | 84 | 157 | 0.45 | 72 | 169 | 0.39 | 80 | 161 | 0.43 |
| 6:15 | 93 | 148 | 0.50 | 90 | 151 | 0.48 | 88 | 153 | 0.47 | 88 | 153 | 0.47 | 90 | 151 | 0.48 |
| 6:30 | 96 | 145 | 0.52 | 101 | 140 | 0.54 | 93 | 148 | 0.50 | 95 | 146 | 0.51 | 95 | 146 | 0.51 |
| 6:45 | 93 | 148 | 0.50 | 102 | 139 | 0.55 | 96 | 145 | 0.52 | 103 | 138 | 0.55 | 97 | 144 | 0.52 |
| 7:00 | 103 | 138 | 0.55 | 110 | 131 | 0.59 | 98 | 143 | 0.53 | 108 | 133 | 0.58 | 103 | 138 | 0.55 |
| 7:15 | 112 | 129 | 0.60 | 118 | 123 | 0.63 | 104 | 137 | 0.56 | 111 | 130 | 0.60 | 109 | 132 | 0.59 |
| 7:30 | 110 | 131 | 0.59 | 130 | 111 | 0.70 | 110 | 131 | 0.59 | 115 | 126 | 0.62 | 112 | 129 | 0.60 |
| 7:45 | 120 | 121 | 0.65 | 129 | 112 | 0.69 | 118 | 123 | 0.63 | 122 | 119 | 0.66 | 120 | 121 | 0.65 |
| 8:00 | 132 | 109 | 0.71 | 133 | 108 | 0.72 | 125 | 116 | 0.67 | 128 | 113 | 0.69 | 128 | 113 | 0.69 |
| 8:15 | 134 | 107 | 0.72 | 131 | 110 | 0.70 | 132 | 109 | 0.71 | 130 | 111 | 0.70 | 132 | 109 | 0.71 |
| 8:30 | 133 | 108 | 0.72 | 146 | 95 | 0.78 | 138 | 103 | 0.74 | 138 | 103 | 0.74 | 136 | 105 | 0.73 |
| 8:45 | 134 | 107 | 0.72 | 149 | 92 | 0.80 | 142 | 99 | 0.76 | 135 | 106 | 0.73 | 137 | 104 | 0.74 |
| 9:00 | 140 | 101 | 0.75 | 155 | 86 | 0.83 | 147 | 94 | 0.79 | 132 | 109 | 0.71 | 140 | 101 | 0.75 |
| 9:15 | 141 | 100 | 0.76 | 154 | 87 | 0.83 | 145 | 96 | 0.78 | 132 | 109 | 0.71 | 139 | 102 | 0.75 |
| 9:30 | 143 | 98 | 0.77 | 154 | 87 | 0.83 | 150 | 91 | 0.81 | 145 | 96 | 0.78 | 146 | 95 | 0.78 |
| 9:45 | 146 | 95 | 0.78 | 153 | 88 | 0.82 | 151 | 90 | 0.81 | 148 | 93 | 0.80 | 148 | 93 | 0.80 |
| 10:00 | 146 | 95 | 0.78 | 153 | 88 | 0.82 | 154 | 87 | 0.83 | 148 | 93 | 0.80 | 149 | 92 | 0.80 |
| **Maximum Observed** | **146** | **185** | **0.78** | **155** | **202** | **0.83** | **154** | **189** | **0.83** | **148** | **183** | **0.80** | **149** | **185** | **0.80** |
| **Minimum Observed** | **56** | **95** | **0.30** | **39** | **86** | **0.21** | **52** | **87** | **0.28** | **58** | **93** | **0.31** | **56** | **92** | **0.30** |
| **Average Observed** | **105** | **136** | **0.57** | **107** | **134** | **0.58** | **105** | **136** | **0.56** | **104** | **137** | **0.56** | **105** | **136** | **0.56** |

## 551 Maple Avenue - Visitor Parking Utilization Survey (186 Units)

| Time Ending | Thursday November 1, 2016 | | | Wednesday November 2, 2016 | | | Tuesday November 8, 2016 | | | Wednesday November 9, 2016 | | | Four Day Average | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate |
| 4:15 | 12 | 35 | 0.06 | 9 | 38 | 0.05 | 15 | 32 | 0.08 | 12 | 35 | 0.06 | 13 | 34 | 0.07 |
| 4:30 | 8 | 39 | 0.04 | 7 | 40 | 0.04 | 15 | 32 | 0.08 | 9 | 38 | 0.05 | 11 | 36 | 0.06 |
| 4:45 | 12 | 35 | 0.06 | 11 | 36 | 0.06 | 15 | 32 | 0.08 | 13 | 34 | 0.07 | 13 | 34 | 0.07 |
| 5:00 | 13 | 34 | 0.07 | 13 | 34 | 0.07 | 12 | 35 | 0.06 | 13 | 34 | 0.07 | 13 | 34 | 0.07 |
| 5:15 | 13 | 34 | 0.07 | 13 | 34 | 0.07 | 15 | 32 | 0.08 | 13 | 34 | 0.07 | 14 | 33 | 0.07 |
| 5:30 | 15 | 32 | 0.08 | 13 | 34 | 0.07 | 11 | 36 | 0.06 | 12 | 35 | 0.06 | 13 | 34 | 0.07 |
| 5:45 | 12 | 35 | 0.06 | 15 | 32 | 0.08 | 12 | 35 | 0.06 | 12 | 35 | 0.06 | 12 | 35 | 0.06 |
| 6:00 | 19 | 28 | 0.10 | 13 | 34 | 0.07 | 11 | 36 | 0.06 | 13 | 34 | 0.07 | 14 | 33 | 0.08 |
| 6:15 | 17 | 30 | 0.09 | 15 | 32 | 0.08 | 15 | 32 | 0.08 | 16 | 31 | 0.09 | 16 | 31 | 0.09 |
| 6:30 | 15 | 32 | 0.08 | 15 | 32 | 0.08 | 12 | 35 | 0.06 | 15 | 32 | 0.08 | 14 | 33 | 0.08 |
| 6:45 | 13 | 34 | 0.07 | 16 | 31 | 0.09 | 13 | 34 | 0.07 | 15 | 32 | 0.08 | 14 | 33 | 0.07 |
| 7:00 | 15 | 32 | 0.08 | 20 | 27 | 0.11 | 15 | 32 | 0.08 | 16 | 31 | 0.09 | 15 | 32 | 0.08 |
| 7:15 | 15 | 32 | 0.08 | 21 | 26 | 0.11 | 19 | 28 | 0.10 | 19 | 28 | 0.10 | 18 | 29 | 0.09 |
| 7:30 | 15 | 32 | 0.08 | 22 | 25 | 0.12 | 22 | 25 | 0.12 | 19 | 28 | 0.10 | 19 | 28 | 0.10 |
| 7:45 | 15 | 32 | 0.08 | 24 | 23 | 0.13 | 17 | 30 | 0.09 | 19 | 28 | 0.10 | 17 | 30 | 0.09 |
| 8:00 | 15 | 32 | 0.08 | 25 | 22 | 0.13 | 15 | 32 | 0.08 | 19 | 28 | 0.10 | 16 | 31 | 0.09 |
| 8:15 | 16 | 31 | 0.09 | 23 | 24 | 0.12 | 17 | 30 | 0.09 | 19 | 28 | 0.10 | 17 | 30 | 0.09 |
| 8:30 | 16 | 31 | 0.09 | 20 | 27 | 0.11 | 15 | 32 | 0.08 | 17 | 30 | 0.09 | 16 | 31 | 0.09 |
| 8:45 | 15 | 32 | 0.08 | 23 | 24 | 0.12 | 13 | 34 | 0.07 | 16 | 31 | 0.09 | 15 | 32 | 0.08 |
| 9:00 | 15 | 32 | 0.08 | 23 | 24 | 0.12 | 13 | 34 | 0.07 | 17 | 30 | 0.09 | 15 | 32 | 0.08 |
| 9:15 | 16 | 31 | 0.09 | 20 | 27 | 0.11 | 15 | 32 | 0.08 | 17 | 30 | 0.09 | 16 | 31 | 0.09 |
| 9:30 | 16 | 31 | 0.09 | 16 | 31 | 0.09 | 13 | 34 | 0.07 | 15 | 32 | 0.08 | 15 | 32 | 0.08 |
| 9:45 | 16 | 31 | 0.09 | 16 | 31 | 0.09 | 16 | 31 | 0.09 | 16 | 31 | 0.09 | 16 | 31 | 0.09 |
| 10:00 | 15 | 32 | 0.08 | 16 | 31 | 0.09 | 16 | 31 | 0.09 | 16 | 31 | 0.09 | 16 | 31 | 0.08 |
| **Maximum Observed** | **19** | **39** | **0.10** | **25** | **40** | **0.13** | **22** | **36** | **0.12** | **19** | **38** | **0.10** | **19** | **36** | **0.10** |
| **Minimum Observed** | **8** | **28** | **0.04** | **7** | **22** | **0.04** | **11** | **25** | **0.06** | **9** | **28** | **0.05** | **11** | **28** | **0.06** |
| **Average Observed** | **15** | **32** | **0.08** | **17** | **30** | **0.09** | **15** | **32** | **0.08** | **15** | **32** | **0.08** | **15** | **32** | **0.08** |

## 360 Pearl Street - Residential Parking Utilization Survey (75 Units)

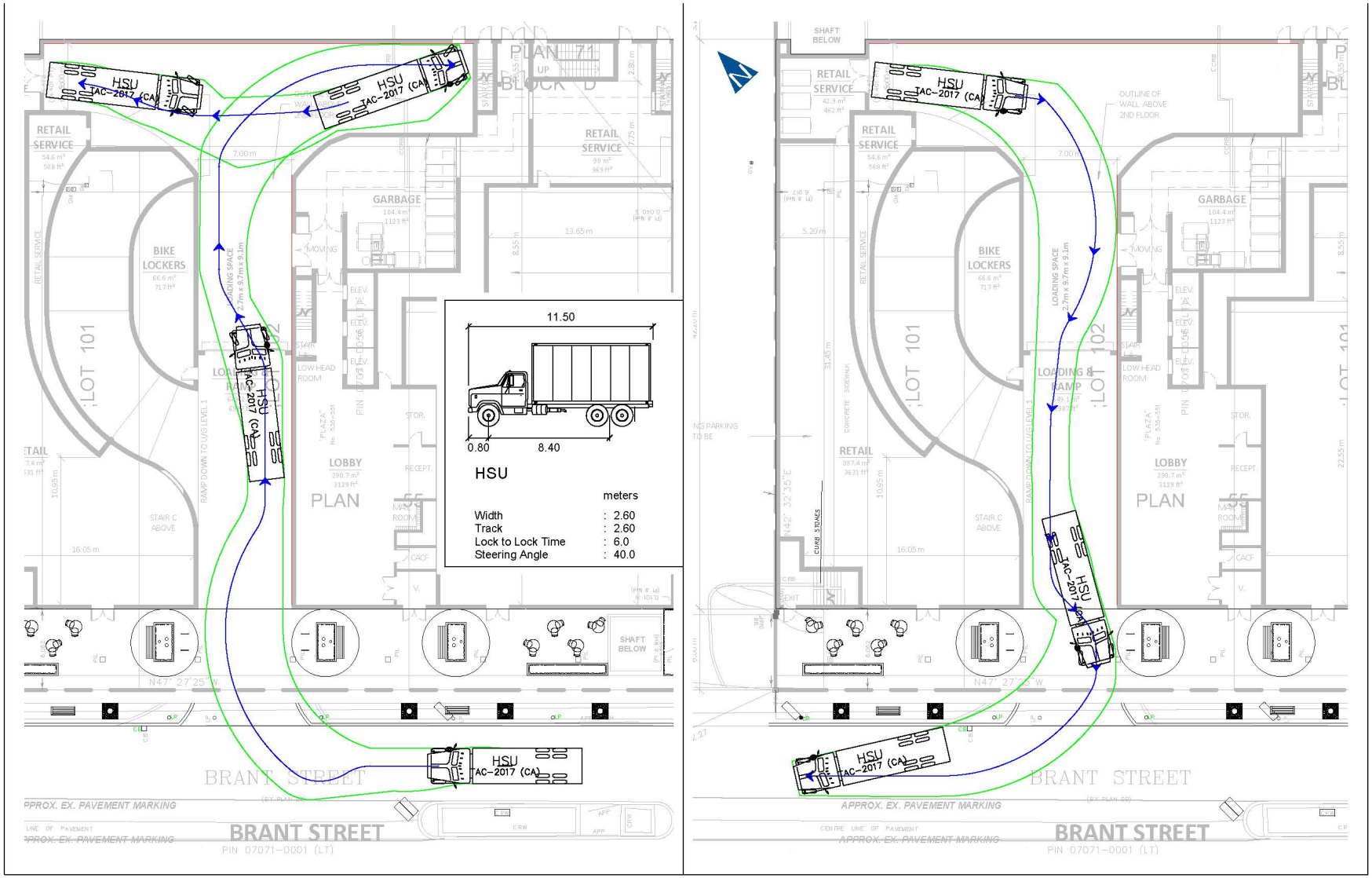
| Time Ending | Thursday November 1, 2016 | | | Wednesday November 2, 2016 | | | Tuesday November 8, 2016 | | | Wednesday November 9, 2016 | | | Four Day Average | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate |
| 4:15 | 13 | 101 | 0.17 | 21 | 93 | 0.28 | 18 | 96 | 0.24 | 18 | 96 | 0.24 | 16 | 225 | 0.22 |
| 4:30 | 12 | 102 | 0.16 | 20 | 94 | 0.27 | 17 | 97 | 0.23 | 18 | 96 | 0.24 | 16 | 225 | 0.21 |
| 4:45 | 15 | 99 | 0.20 | 20 | 94 | 0.27 | 19 | 95 | 0.25 | 21 | 93 | 0.28 | 18 | 223 | 0.24 |
| 5:00 | 17 | 97 | 0.23 | 21 | 93 | 0.28 | 20 | 94 | 0.27 | 22 | 92 | 0.29 | 20 | 221 | 0.26 |
| 5:15 | 19 | 95 | 0.25 | 24 | 90 | 0.32 | 22 | 92 | 0.29 | 21 | 93 | 0.28 | 21 | 220 | 0.28 |
| 5:30 | 20 | 94 | 0.27 | 29 | 85 | 0.39 | 26 | 88 | 0.35 | 28 | 86 | 0.37 | 25 | 216 | 0.33 |
| 5:45 | 28 | 86 | 0.37 | 30 | 84 | 0.40 | 30 | 84 | 0.40 | 31 | 83 | 0.41 | 30 | 211 | 0.40 |
| 6:00 | 32 | 82 | 0.43 | 31 | 83 | 0.41 | 31 | 83 | 0.41 | 31 | 83 | 0.41 | 31 | 210 | 0.42 |
| 6:15 | 33 | 81 | 0.44 | 35 | 79 | 0.47 | 33 | 81 | 0.44 | 32 | 82 | 0.43 | 33 | 208 | 0.44 |
| 6:30 | 37 | 77 | 0.49 | 36 | 78 | 0.48 | 36 | 78 | 0.48 | 35 | 79 | 0.47 | 36 | 205 | 0.48 |
| 6:45 | 38 | 76 | 0.51 | 36 | 78 | 0.48 | 37 | 77 | 0.49 | 36 | 78 | 0.48 | 37 | 204 | 0.49 |
| 7:00 | 41 | 73 | 0.55 | 40 | 74 | 0.53 | 39 | 75 | 0.52 | 37 | 77 | 0.49 | 39 | 202 | 0.52 |
| 7:15 | 44 | 70 | 0.59 | 42 | 72 | 0.56 | 42 | 72 | 0.56 | 39 | 75 | 0.52 | 42 | 199 | 0.56 |
| 7:30 | 49 | 65 | 0.65 | 41 | 73 | 0.55 | 44 | 70 | 0.59 | 41 | 73 | 0.55 | 45 | 196 | 0.60 |
| 7:45 | 48 | 66 | 0.64 | 45 | 69 | 0.60 | 46 | 68 | 0.61 | 45 | 69 | 0.60 | 46 | 195 | 0.62 |
| 8:00 | 50 | 64 | 0.67 | 50 | 64 | 0.67 | 50 | 64 | 0.67 | 47 | 67 | 0.63 | 49 | 192 | 0.65 |
| 8:15 | 53 | 61 | 0.71 | 51 | 63 | 0.68 | 52 | 62 | 0.69 | 50 | 64 | 0.67 | 52 | 189 | 0.69 |
| 8:30 | 55 | 59 | 0.73 | 51 | 63 | 0.68 | 53 | 61 | 0.71 | 53 | 61 | 0.71 | 54 | 187 | 0.72 |
| 8:45 | 56 | 58 | 0.75 | 51 | 63 | 0.68 | 54 | 60 | 0.72 | 54 | 60 | 0.72 | 55 | 186 | 0.73 |
| 9:00 | 56 | 58 | 0.75 | 53 | 61 | 0.71 | 56 | 58 | 0.75 | 56 | 58 | 0.75 | 56 | 185 | 0.75 |
| 9:15 | 58 | 56 | 0.77 | 54 | 60 | 0.72 | 56 | 58 | 0.75 | 55 | 59 | 0.73 | 56 | 185 | 0.75 |
| 9:30 | 58 | 56 | 0.77 | 55 | 59 | 0.73 | 57 | 57 | 0.76 | 55 | 59 | 0.73 | 57 | 184 | 0.76 |
| 9:45 | 58 | 56 | 0.77 | 56 | 58 | 0.75 | 57 | 57 | 0.76 | 55 | 59 | 0.73 | 57 | 184 | 0.76 |
| 10:00 | 58 | 56 | 0.77 | 58 | 56 | 0.77 | 57 | 57 | 0.76 | 55 | 59 | 0.73 | 57 | 184 | 0.76 |
| **Maximum Observed** | **58** | **102** | **0.77** | **58** | **94** | **0.77** | **57** | **97** | **0.76** | **56** | **96** | **0.75** | **57** | **225** | **0.76** |
| **Minimum Observed** | **12** | **56** | **0.16** | **20** | **56** | **0.27** | **17** | **57** | **0.23** | **18** | **58** | **0.24** | **16** | **184** | **0.21** |
| **Average Observed** | **40** | **75** | **0.53** | **40** | **74** | **0.53** | **40** | **74** | **0.53** | **39** | **75** | **0.52** | **39** | **202** | **0.53** |

## 360 Pearl Street - Visitor Parking Utilization Survey (75 Units)

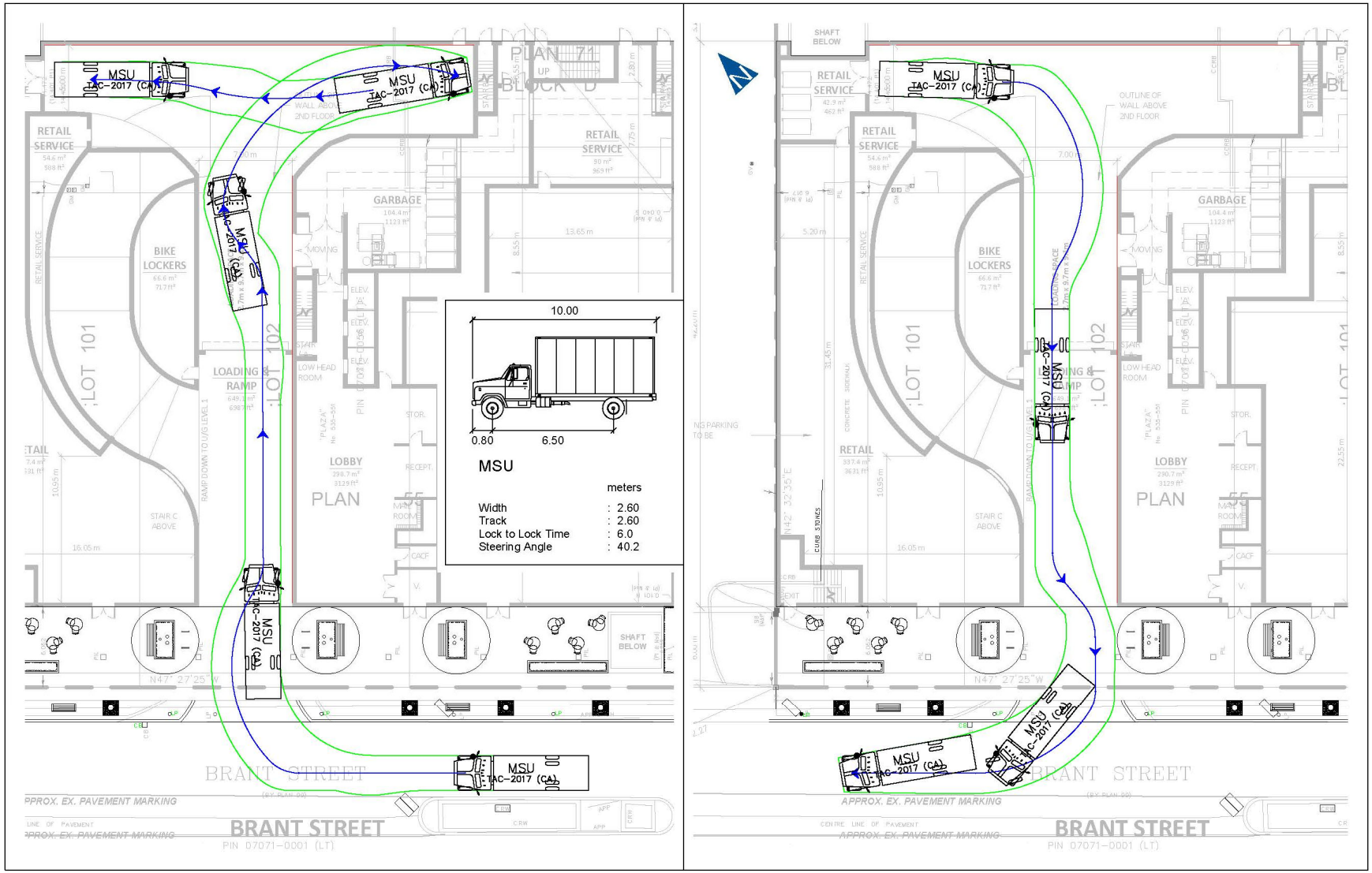
| Time Ending | Thursday November 1, 2016 | | | Wednesday November 2, 2016 | | | Tuesday November 8, 2016 | | | Wednesday November 9, 2016 | | | Four Day Average | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate | Occupied | Unoccupied | Rate |
| 4:15 | 7 | 5 | 0.09 | 7 | 5 | 0.09 | 9 | 3 | 0.12 | 5 | 7 | 0.07 | 7 | 40 | 0.09 |
| 4:30 | 6 | 6 | 0.08 | 7 | 5 | 0.09 | 10 | 2 | 0.13 | 5 | 7 | 0.07 | 7 | 40 | 0.09 |
| 4:45 | 6 | 6 | 0.08 | 7 | 5 | 0.09 | 8 | 4 | 0.11 | 4 | 8 | 0.05 | 6 | 41 | 0.08 |
| 5:00 | 7 | 5 | 0.09 | 6 | 6 | 0.08 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 7 | 40 | 0.09 |
| 5:15 | 7 | 5 | 0.09 | 7 | 5 | 0.09 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 7 | 40 | 0.09 |
| 5:30 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 7 | 40 | 0.10 |
| 5:45 | 6 | 6 | 0.08 | 8 | 4 | 0.11 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 7 | 40 | 0.09 |
| 6:00 | 5 | 7 | 0.07 | 7 | 5 | 0.09 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 6 | 41 | 0.08 |
| 6:15 | 6 | 6 | 0.08 | 6 | 6 | 0.08 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 7 | 40 | 0.09 |
| 6:30 | 7 | 5 | 0.09 | 7 | 5 | 0.09 | 7 | 5 | 0.09 | 5 | 7 | 0.07 | 6 | 41 | 0.08 |
| 6:45 | 7 | 5 | 0.09 | 7 | 5 | 0.09 | 7 | 5 | 0.09 | 6 | 6 | 0.08 | 7 | 40 | 0.09 |
| 7:00 | 7 | 5 | 0.09 | 7 | 5 | 0.09 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 7 | 40 | 0.09 |
| 7:15 | 5 | 7 | 0.07 | 8 | 4 | 0.11 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 6 | 41 | 0.08 |
| 7:30 | 5 | 7 | 0.07 | 8 | 4 | 0.11 | 7 | 5 | 0.09 | 5 | 7 | 0.07 | 6 | 41 | 0.08 |
| 7:45 | 5 | 7 | 0.07 | 7 | 5 | 0.09 | 6 | 6 | 0.08 | 5 | 7 | 0.07 | 5 | 42 | 0.07 |
| 8:00 | 6 | 6 | 0.08 | 8 | 4 | 0.11 | 6 | 6 | 0.08 | 4 | 8 | 0.05 | 5 | 42 | 0.07 |
| 8:15 | 6 | 6 | 0.08 | 7 | 5 | 0.09 | 5 | 7 | 0.07 | 4 | 8 | 0.05 | 5 | 42 | 0.07 |
| 8:30 | 6 | 6 | 0.08 | 7 | 5 | 0.09 | 5 | 7 | 0.07 | 4 | 8 | 0.05 | 5 | 42 | 0.07 |
| 8:45 | 5 | 7 | 0.07 | 6 | 6 | 0.08 | 4 | 8 | 0.05 | 3 | 9 | 0.04 | 4 | 43 | 0.05 |
| 9:00 | 5 | 7 | 0.07 | 5 | 7 | 0.07 | 4 | 8 | 0.05 | 3 | 9 | 0.04 | 4 | 43 | 0.05 |
| 9:15 | 5 | 7 | 0.07 | 5 | 7 | 0.07 | 3 | 9 | 0.04 | 2 | 10 | 0.03 | 3 | 44 | 0.04 |
| 9:30 | 4 | 8 | 0.05 | 5 | 7 | 0.07 | 3 | 9 | 0.04 | 3 | 9 | 0.04 | 3 | 44 | 0.04 |
| 9:45 | 4 | 8 | 0.05 | 5 | 7 | 0.07 | 3 | 9 | 0.04 | 4 | 8 | 0.05 | 4 | 43 | 0.05 |
| 10:00 | 4 | 8 | 0.05 | 2 | 10 | 0.03 | 3 | 9 | 0.04 | 4 | 8 | 0.05 | 4 | 43 | 0.05 |
| **Maximum Observed** | **8** | **8** | **0.11** | **8** | **10** | **0.11** | **10** | **9** | **0.13** | **6** | **10** | **0.08** | **7** | **44** | **0.10** |
| **Minimum Observed** | **4** | **4** | **0.05** | **2** | **4** | **0.03** | **3** | **2** | **0.04** | **2** | **6** | **0.03** | **3** | **40** | **0.04** |
| **Average Observed** | **6** | **6** | **0.08** | **6** | **6** | **0.09** | **6** | **6** | **0.09** | **5** | **7** | **0.06** | **6** | **41** | **0.08** |

# Appendix Q

## AutoTURN Plots

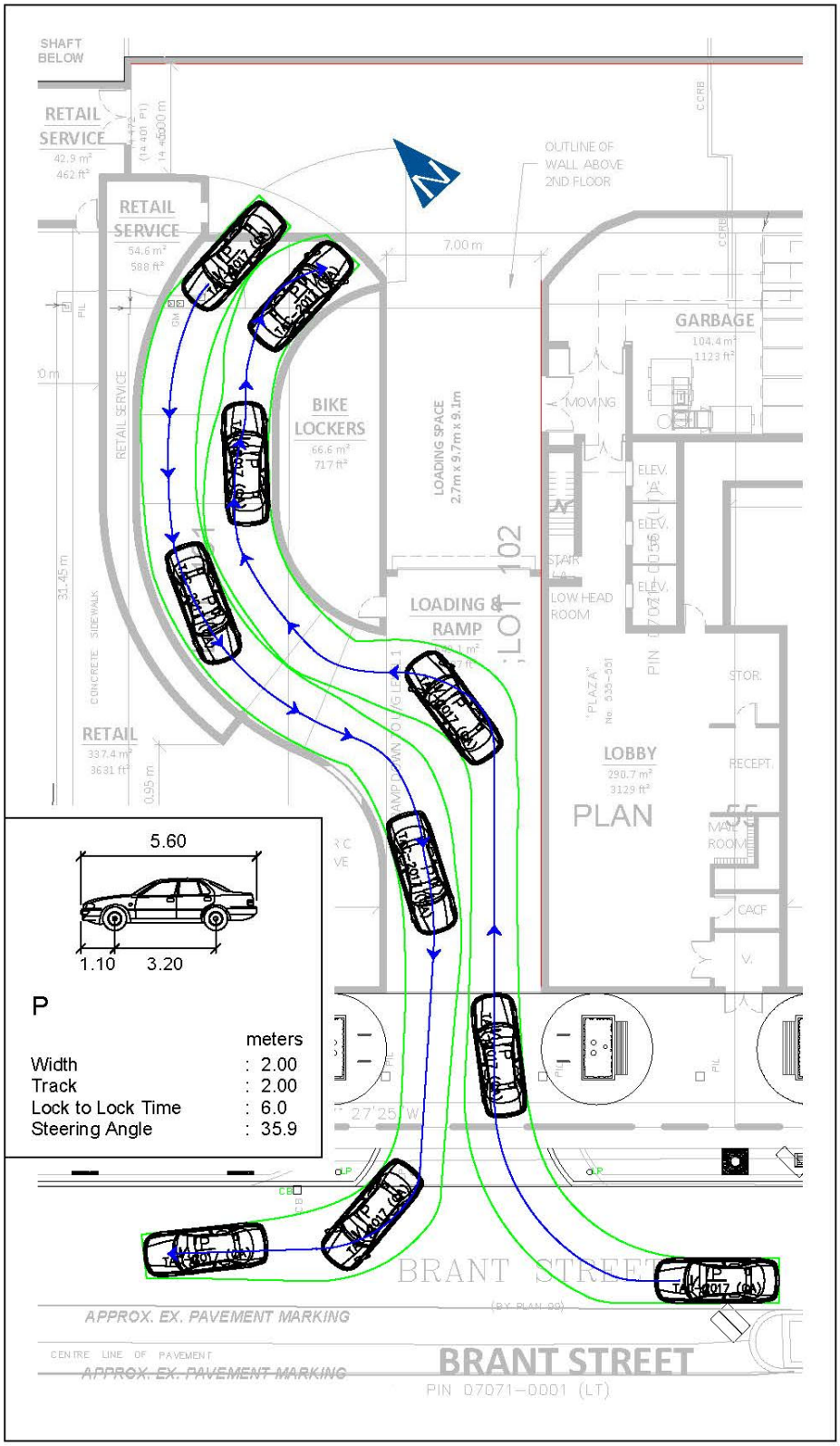



# AutoTURN Plots
# TAC HSU

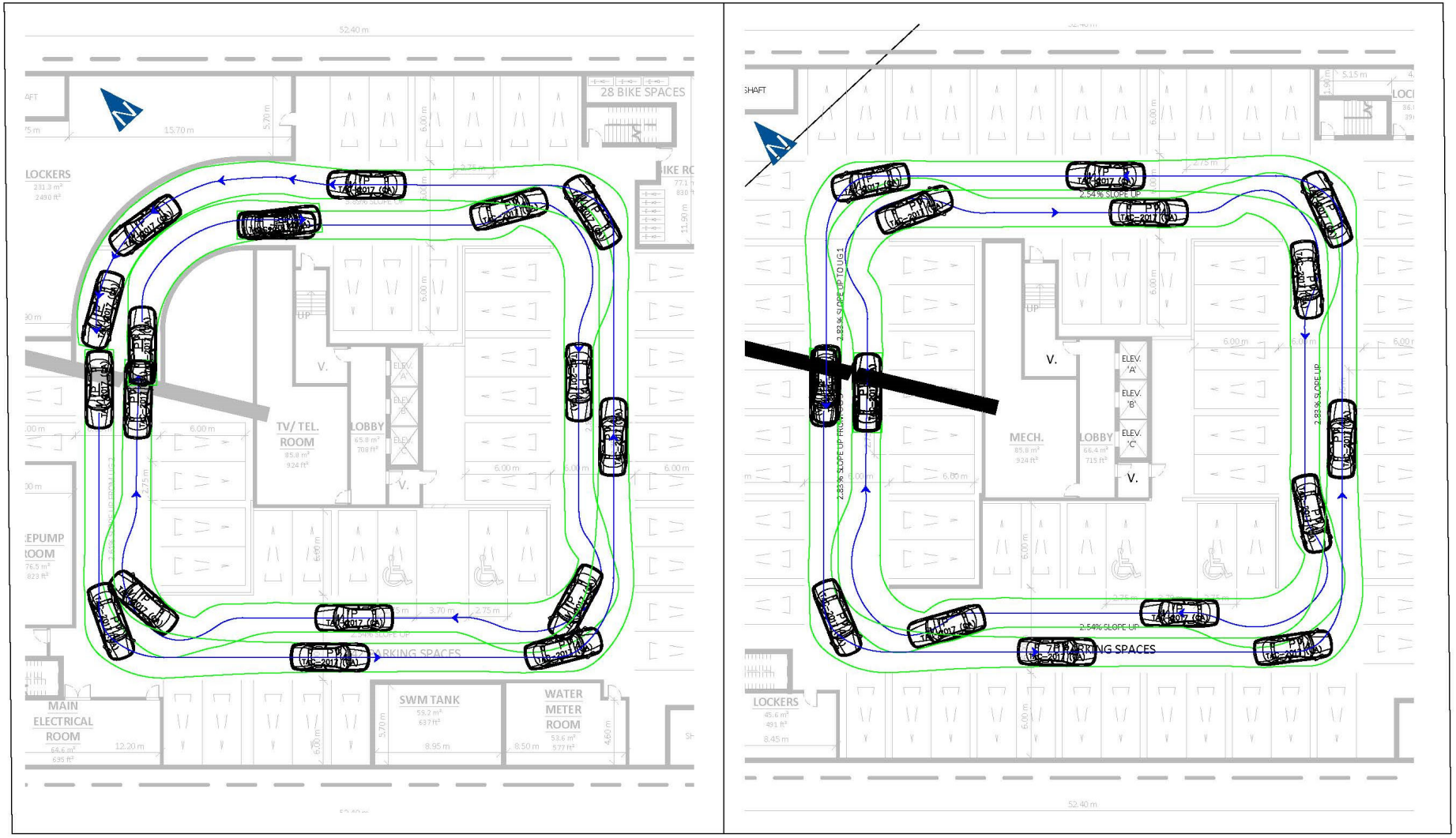



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# AutoTURN Plots
# TAC MSU




# AutoTURN Plots
# TAC Passenger Car (P)
# Site Driveway




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# AutoTURN Plots
# TAC Passenger Car (P)
# Parking Garage Ramp