75 Breezehill Avenue N

Transportation Impact Assessment (TIA) Strategy Report

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December 2024

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STRATEGY REPORT

Parsons has been retained by The Estate of Carson Unsworth to prepare a Transportation Impact Assessment (TIA) Report in support of a Zoning By-Law Amendment (ZBLA) and Official Plan Amendment (OPA) application for a residential development located at 75 Breezehill Avenue N. This document follows the TIA process, as outlined in the City Transportation Impact Assessment (TIA) Guidelines (2017). The following report represents Step 4 – Strategy Report.

1.0 SCREENING FORM

The Screening Form confirmed the need for a TIA Report based on the site meeting each of the trip generation and location triggers. The trip generation trigger is met due to the number of person trips anticipated to be generated by the development exceeding 60 person trips per hour. The location trigger is met due to the development being located within a Transit Oriented Development Zone (TOD). Note that the safety trigger was not met. The Screening Form has been provided in **Appendix A**, along with responses to City comments.

2.0 SCOPING REPORT

2.1. Existing and Planned Conditions

2.1.1. Proposed Development

The proposed development is located at the municipal address of 75 Breezehill Ave N, which is bordered by Breezehill Ave N to the west, Laurel St to the south and the Trillium Line to the east. The site is currently zoned as General Industrial IG1 H(11). **Figure 1** illustrates the local context of the proposed site, while **Figure 2** illustrates the existing land uses and accesses of the proposed site properties, which includes various commercial businesses.

The development will consist of a 27-storey and a 29-storey high-rise building with a total of 479 apartment units and 429 m^2 (4,615 ft^2) of retail space. The site will continue to use the existing Laurel St access location in the future, while the existing Breezehill Ave N access will be removed. An underground parking garage ramp is proposed to be provided along the west end of the site driveway, with 124 vehicle parking spaces proposed in the garage and 678 bicycle parking spaces proposed on the ground floor and in the garage. **Figure 3** illustrates the proposed Concept Plan, which is expected to be constructed in a single phase with an assumed buildout date of 2026 (high quality plan provided in **Appendix A**).

2.1.2. Existing Conditions

Area Road Network

Description of roads included within the study area has been provided below.

Breezehill Ave N is a north-south municipal local roadway that extends from Somerset St W in the north to approximately 130m south of Gladstone Ave. The road consists of a two-lane cross-section with a 40km/h posted speed limit, on-street parking permitted on some sections on the east side, and a protected ROW of 20m.

Laurel St is an east-west municipal local roadway that extends from Loretta Ave N in the east to Irving Ave in the west. The road consists of a two-lane cross-section with a 40km/h posted speed limit, on-street parking permitted on both sides, and a protected ROW of 20m.

Loretta Ave N is a north-south municipal local roadway that extends from Laurel St in the north to approximately 130m south of Gladstone Ave. The road consists of a two-lane cross-section with a 40km/h posted speed limit, on-street parking permitted along some sections, and a protected ROW of 20m.

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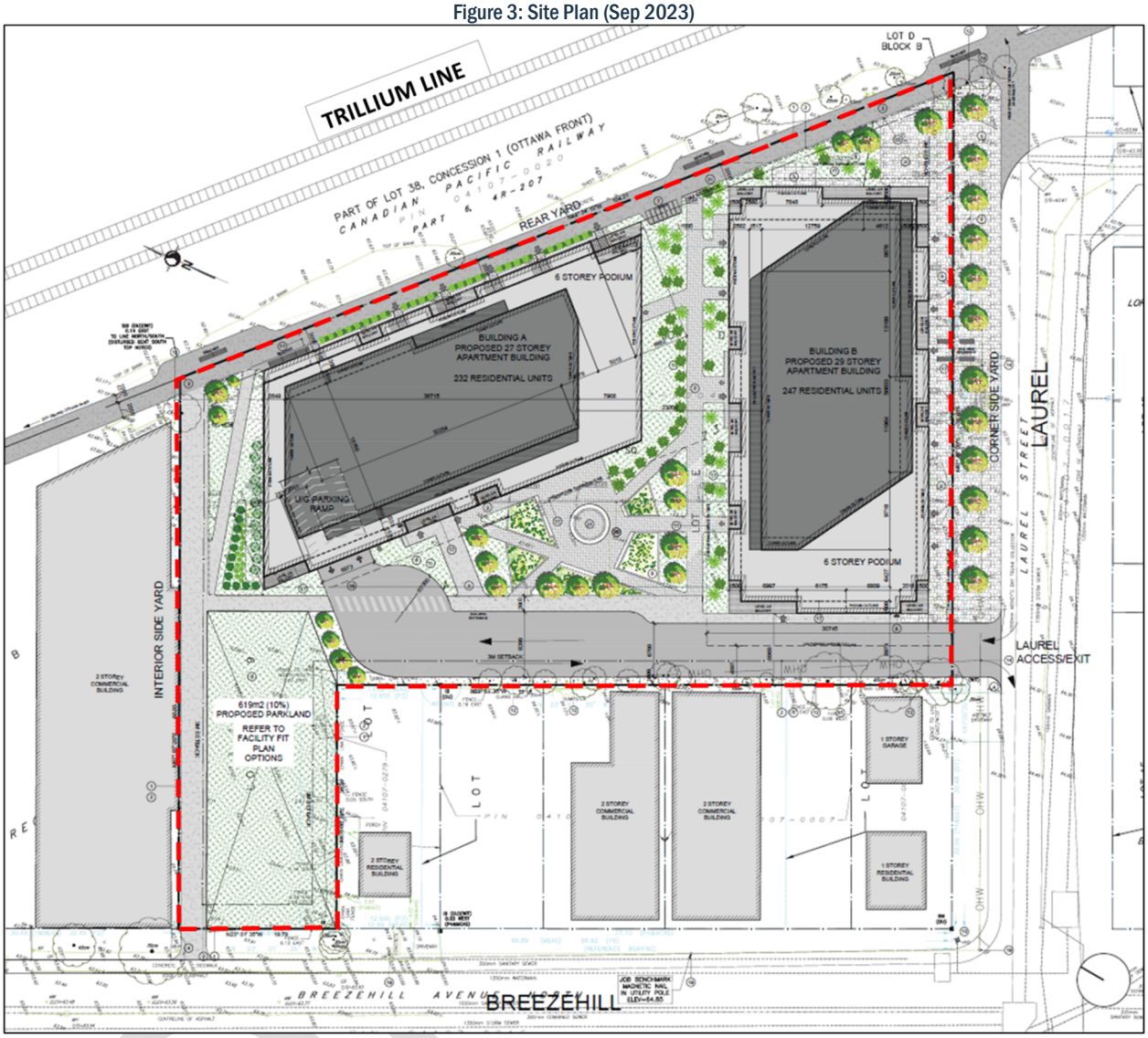
Gladstone Ave is an east-west municipal major collector roadway within the City of Ottawa, that extends from Parkdale Ave in the west to Cartier St in the east. The roadway consists of a two-lane cross-section, a posted speed limit of 40km/h, and a protected ROW of 20m west of Loretta Ave and 22m between Loretta Ave and 106m west of Preston St.

Somerset St W is an east-west municipal arterial roadway within the City of Ottawa, which extends from Queen Elizabeth Dr in the east to Garland St in the west, where it continues as Wellington St W. Within the study area, the roadway consists of a two-lane cross-section with an assumed speed limit of 50km/h and a protected ROW of 20m.

Figure 1: Local Context

Figure 2: Existing Land Uses and Accesses on Site

Figure 3: Site Plan (Sep 2023)



Existing Study Area Intersections

Somerset/Breezehill

The Somerset/Breezehill intersection is an unsignalized three-legged intersection with stop control on the south leg only. The south approach (Breezehill) consists of a shared left/right-turn lane. The west approach (Somerset) consists of a shared through/right-turn lane. The east approach (Somerset) consists of a shared through/left-turn lane. There are no restricted movements at this intersection. An east-west pedestrian crossing is provided on the south leg and bike lanes begin/end on Somerset Ave east leg.

Breezehill/Laurel

The Breezehill/Laurel intersection is an unsignalized four-legged intersection, with stop control on all legs of the intersection. All intersection approaches consist of an all-movement lane. Trucks are not permitted to enter the south leg of the intersection. Pedestrian crossings are provided on all legs of the intersection.

Note that a temporary access permit was issued in 2022 by the City of Ottawa ROW group to allow trucks to access the Canadian Bank Note Company via Breezehill Avenue during the Laurel Street and Loretta Avenue N Renewal project.

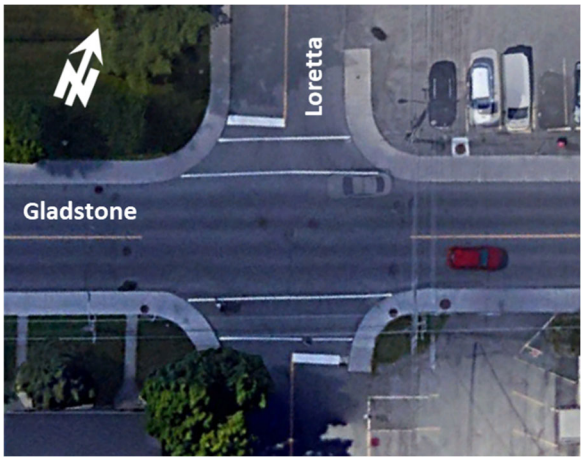
Gladstone/Breezehill

The Gladstone/Breezehill intersection is an unsignalized four-legged intersection, with stop control on the north and south legs of the intersection. All approaches of the intersection consist of an all-movement lane. Trucks are not permitted to enter the north leg of the intersection. East-west pedestrian crossings are provided on the north and south legs of the intersections.

Note that a temporary access permit was issued in 2022 by the City of Ottawa ROW group to allow trucks to access the Canadian Bank Note Company via Breezehill Avenue during the Laurel Street and Loretta Avenue N Renewal project.

Gladstone/Loretta

The Gladstone/Loretta intersection is an unsignalized four-legged intersection, with stop control on the north and south legs of the intersection. All approaches of the intersection consist of an all-movement lane. There are no restricted movements at this intersection. East-west pedestrian crossings are provided on the north and south legs of the intersections.



Existing Driveways to Adjacent Developments

Figure 4 illustrates nonresidential adjacent accesses (red lines) within 200m of the proposed future site access (blue circle) along Laurel St. It should be noted that accesses to several individual residential unit driveways are

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located on both sides of Laurel St (west of Breezehill Ave N only). As shown in **Figure 4**, driveway accesses on Laurel St and Loretta Ave not specific to individual residential units include the following:

Laurel St

- A north-south one-lane driveway that stretches from Somerset St W to Gladstone Ave is located midblock between Bayswater Ave and Breezehill Ave N. This driveway provides front and rear access to residential units, apartment buildings and commercial units.

Loretta Ave

- 6 east-west driveways that provide access to commercial buildings, 2 of which are on the west side of Loretta Ave and 4 on the east side.

Figure 4: Adjacent Driveways within 200m of Site Access

Existing Area Traffic Management Measures

Existing area traffic management measures within the study area include:

- Speed humps on Breezehill Ave N;
- On-street parking on the local roads;
- Limited access for heavy vehicles on local roads;
- Curb extensions at intersection corners on Breezehill Ave N at both Gladstone Ave and Somerset St W; and,
- Traffic calming signs on Breezehill Ave N.

Pedestrian/Cycling Network

Figure 5 illustrates active transportation facilities within the study area. Sidewalks are provided on both sides of Gladstone Ave and Somerset St W within the study area. Along Laurel St, sidewalks are provided on both sides west of Gladstone Ave, but not provided east thereof. Along Breezehill Ave N, sidewalks are provided on both sides north of Laurel St and south of Gladstone Ave, and on the west side between Laurel St and Gladstone Ave. Along Loretta Ave N, sidewalks are provided on the west side approximately 60m south of Laurel St.

The Trillium Line Multi-Use Pathway (Trillium Pathway) is located east of the development site following the LRT Trillium Line. Within the study area, the Trillium Line MUP can be accessed along both Somerset St W and Gladstone Ave.

The pathway was completed in three phases between 2012 and 2018 and is considered a key component of city's active transportation network. The pathway was constructed from the Ottawa River Pathway MUP in the north to Prince of Wales Dr in the south, however, due to the current construction of The Ottawa Hospital (TOH) parking garage, the segment between Carling Ave and Prince of Wales Dr has been rerouted to Preston St for the duration of construction. It is estimated the Trillium Pathway serves over 1500 people per day and accommodates both pedestrians and cyclists.

Bike lanes are provided along a short 200m segment on Somerset St W east of Breezehill Ave N. Bayswater Ave, Gladstone Ave and Somerset St W are also suggested cycling routes. Based on the City of Ottawa Transportation Master Plan (TMP Part 1 2023), the Trillium Pathway is classified as a Cross-Town Bikeway.

Figure 5: Existing Active Transportation Facilities within Study Area

Transit Network

The existing transit network surrounding the proposed development site is illustrated in **Figure 6**. The nearest bus stops to the site are along Somerset St W and Gladstone Ave (as shown in **Figure 7**). The O-Train Trillium Line (began operating recently) operates north-south, directly east of the development site. Bus Route #14, designated a "frequent route", and bus Route #114, designated a "local route", both operate along Gladstone Ave, with the nearest bus stop at Gladstone/Loretta. Bus Route #11, designated a "frequent route", operates along Somerset St W, with the nearest bus stop at Somerset/Bayswater. Transit route maps are provided in **Appendix B.**

Under existing conditions, the Corso Italia LRT station is accessible by walking 400m via Laurel St, Loretta Ave, and Gladstone Ave. However, as part of the Corso Italia District Secondary Plan (discussed in **Section 2.1.3.1**), a proposed north-south MUP along the west side of the rail corridor will provide direct access to the new station. Once the MUP is built, the station will be an approximate 330m walking distance away from the proposed development.

Figure 6: Area Transit Network

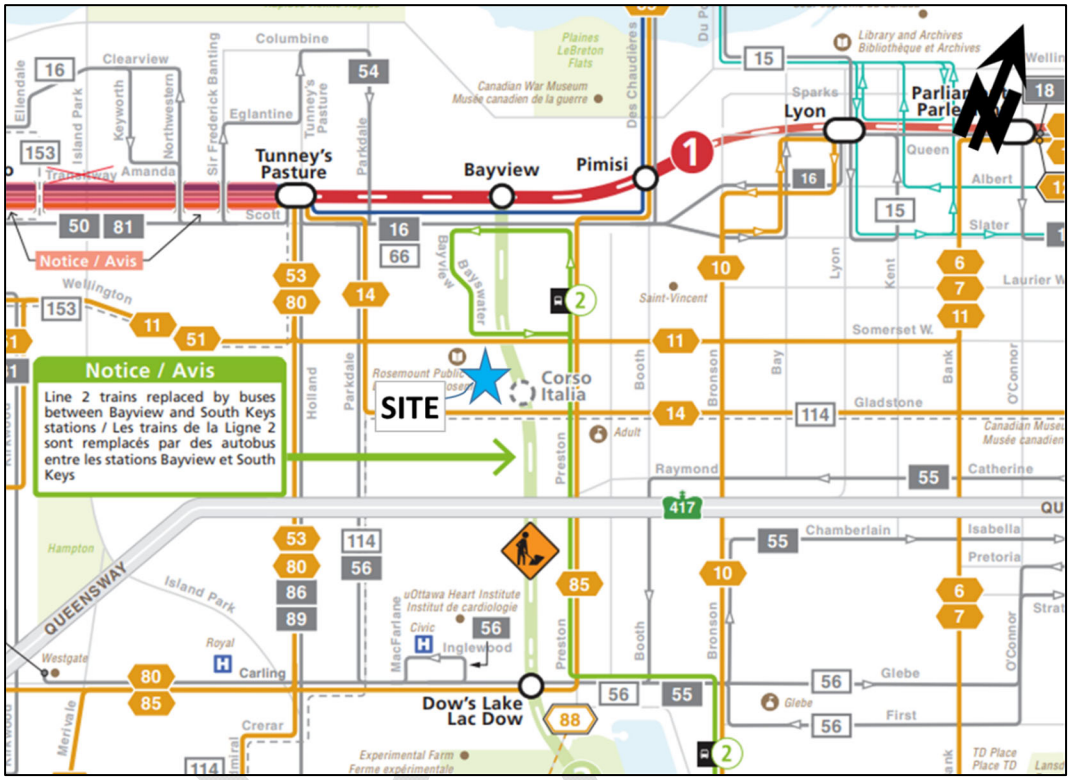
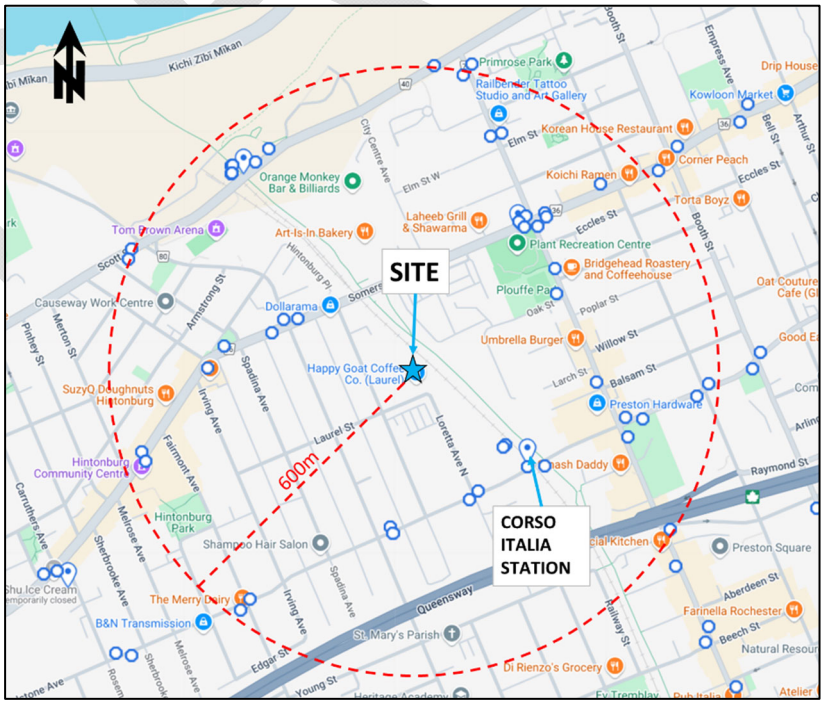


Figure 7: Adjacent Transit Stops



Peak Hour Travel Demands

The existing peak hour traffic and pedestrian volumes at the intersections within the study area were obtained from both the City of Ottawa and separately for the following intersections:

- Somerset/Breezehill – Conducted by Parsons on Thursday, June 22, 2023
- Gladstone/Breezehill – Conducted by City of Ottawa on Wednesday, July 18, 2018
- Breezehill/Laurel and Gladstone/Laurel – both were conducted on Tuesday, April 23, 2019

The traffic volumes at study area intersections are illustrated in **Figure 8**, with pedestrian and cyclist volumes illustrated in **Figure 9**. Raw traffic count data is provided in **Appendix C**. Traffic volume differences of 50 vehicles or more between intersections where balanced to the higher volume. Therefore, the westbound through movement at the intersection of Gladstone/Breezehill was increased by approximately 100 vehicles in the afternoon peak hour to balance with the westbound egress volumes at the intersection of Gladstone/Loretta. No other adjustments were made to the traffic volumes provided. Notably, the pedestrian and cyclist volumes recorded at the study area intersections are fairly high during the peak hours, which is expected given the available active transport and transit connectivity in the area.

Figure 8: Existing Peak Hour Traffic Volumes

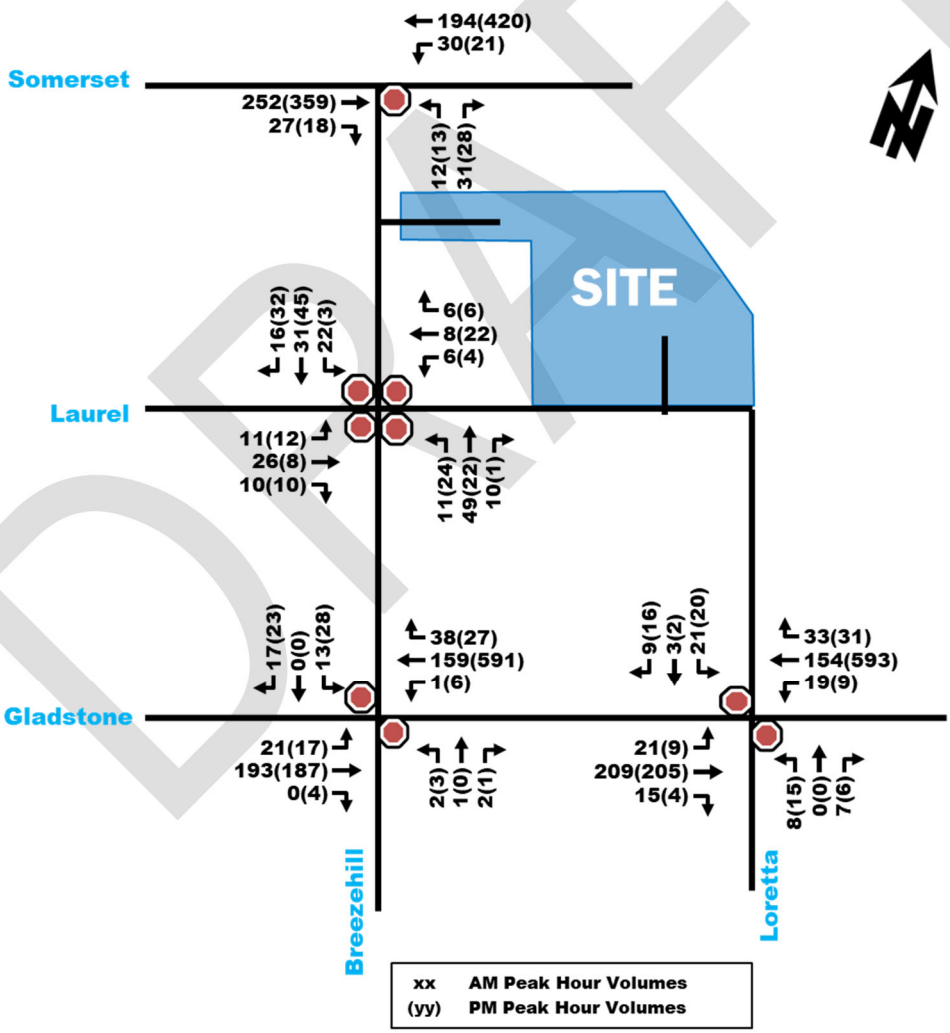


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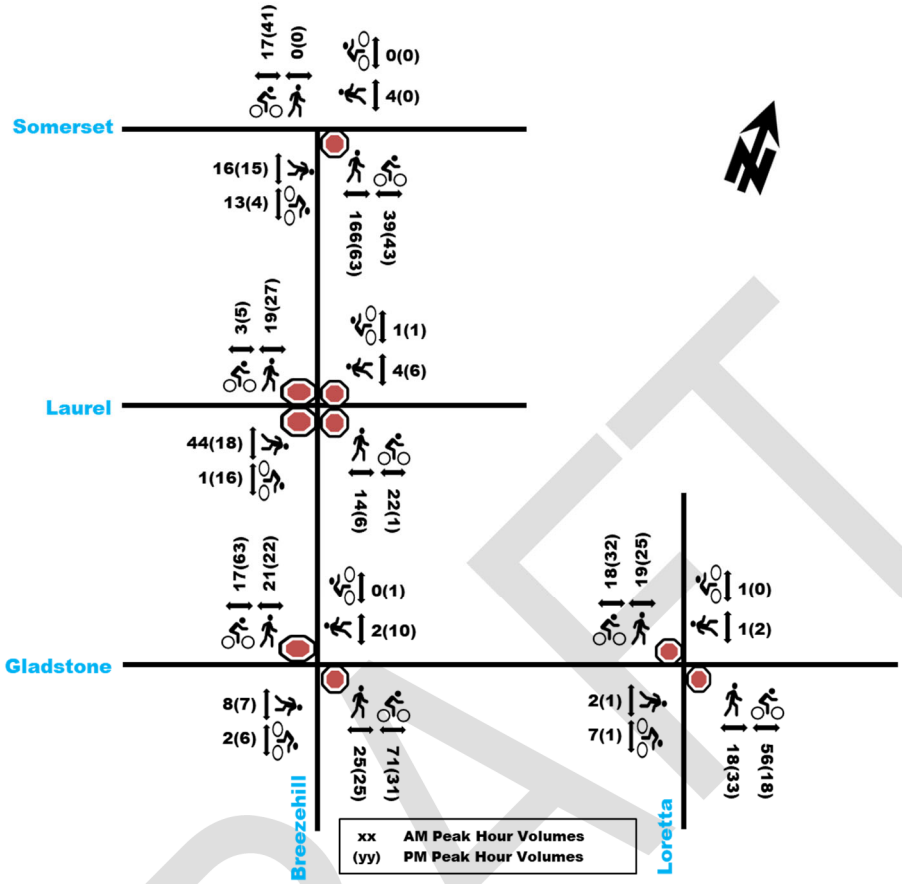
Figure 9: Existing Peak Hour Pedestrian and Cyclist Volumes



Existing Road Safety Conditions

A five-year collision history data (2015-2019, inclusive) was requested and obtained from the City of Ottawa for all intersections and road segments within the study area. Upon reviewing the collision data, the total number of collisions occurring within the study area was determined to be 9 collisions within the five-year period. Of the reported collisions, 5 resulted in property damage only and 4 resulted in non-fatal injury.

The types of impact were broken down into the following: 3 angled, 4 single motor vehicles, and 3 turning movements. None of the noted collisions involved bicycles, but one collision involved a pedestrian and resulted in a non-fatal injury. The pedestrian collision occurred at the north crosswalk of the Gladstone/Loretta intersection with an eastbound left-turning vehicle.

At study area intersections, three collisions occurred at Breezehill/Gladstone, one collision at Breezehill/Somerset, and two collisions at Gladstone/Loretta. At midblock sections of the study area, three collisions have occurred, all involving a single motor vehicle with an unattended/parked vehicle.

Using the City of Ottawa's Open Ottawa website, 2020 collision data (latest data available for collision reporting purposes) identified one additional collision, which occurred midblock on Gladstone Ave, between Loretta Ave N and Breezehill Ave N. These collisions resulted in property damage only with an impact type labeled "other".

Based on the collision data, there are no identifiable safety concerns at intersections and road segments within the study area. The source collision data provided by the City of Ottawa is attached in **Appendix D**.

2.1.3. Planned Conditions

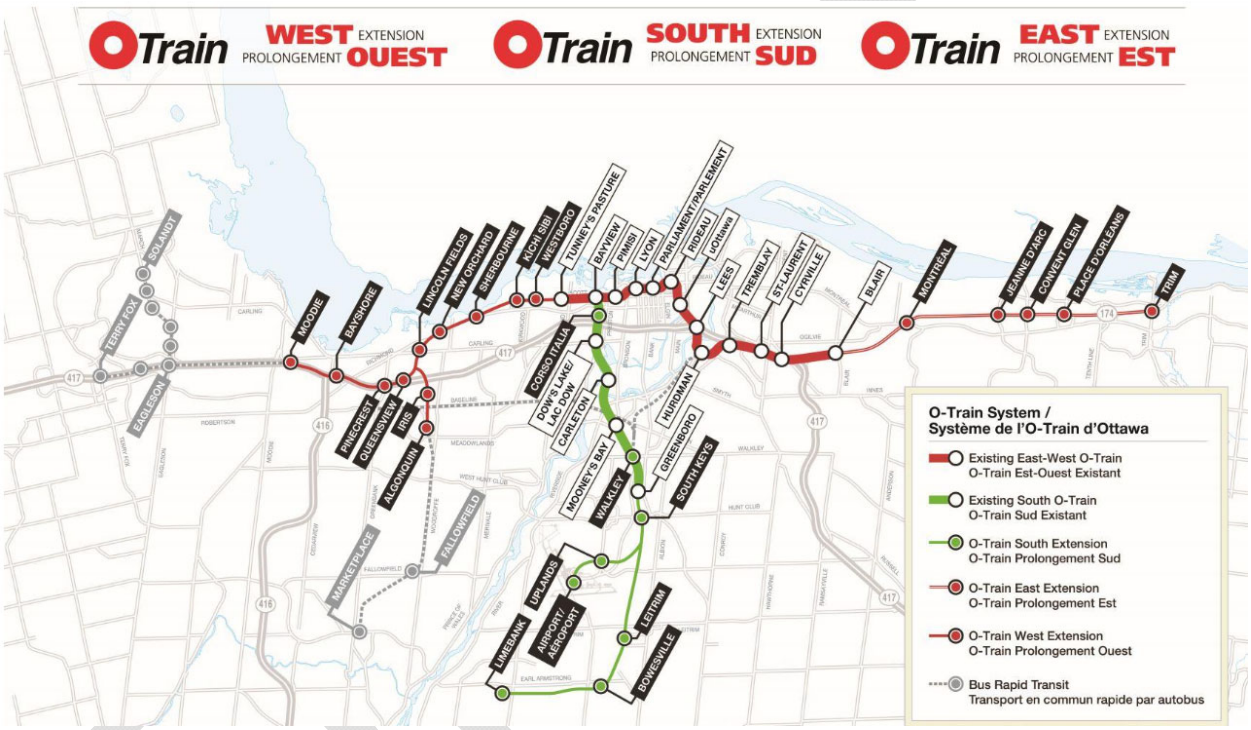
2.1.3.1. Future Transportation Network Changes

LRT Stage 2

Stage 2 of the City of Ottawa LRT system is currently under construction. Stage 2, as shown in **Figure 10**, is a combination of three extensions – south, east, and west – totaling 44 km of new rail and 24 new LRT stations. As mentioned previously, the Trillium Line is directly east of the proposed development site and has began operating recently, which includes 8 new stations with the extension of the Trillium Line south to Limebank Rd.

As part of the Trillium Line changes, the new future Corso Italia Station is located north of Gladstone Ave within an approximately 300m radius from the proposed development.

Figure 10: LRT Stage 2 Plan



Corso Italia Station District Secondary Plan

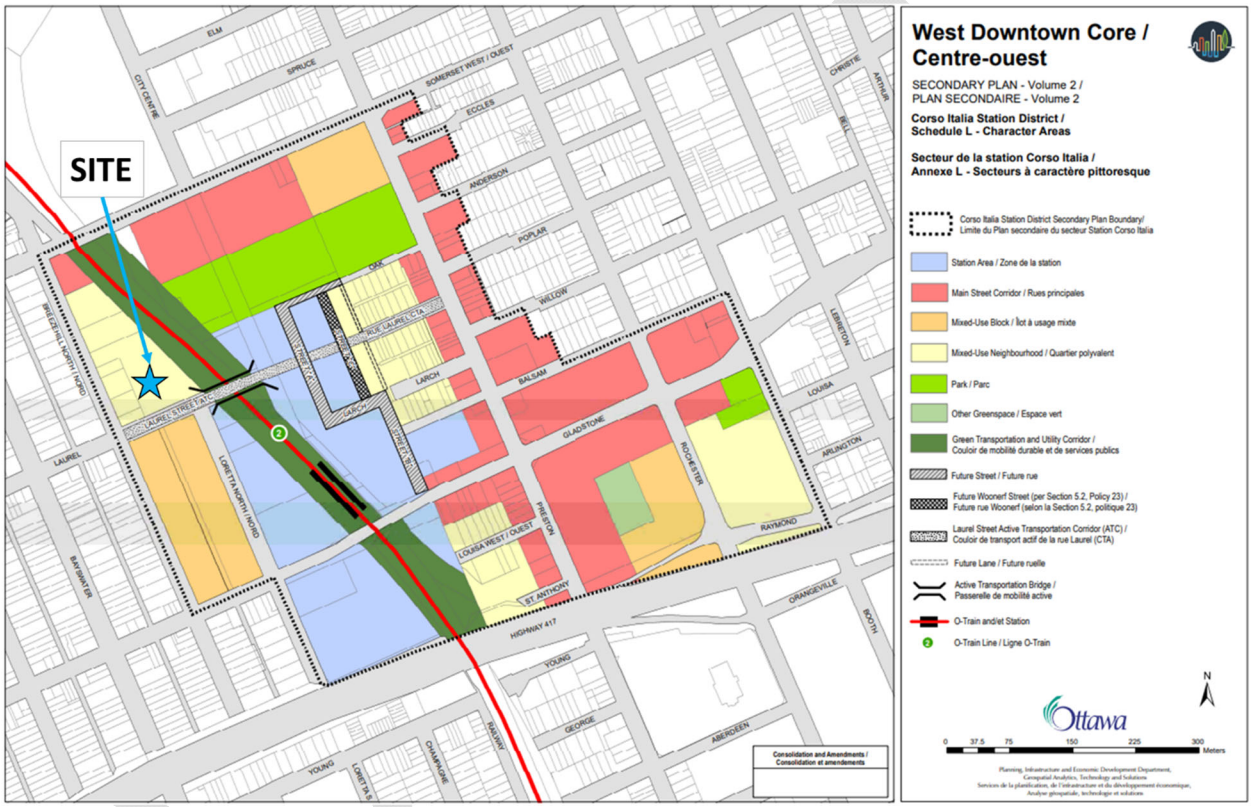
A Secondary Plan study is underway for the Corso Italia Station District. Previously, three planning studies were undertaken by the City of Ottawa around the future adjacent LRT Stations at Bayview Station, Corso Italia Station, and Dow's Lake Station. The purpose of these studies was to examine how the areas around these stations may be redeveloped. Since then, Secondary Plans have been completed for both Bayview Station and Preston-Carling Station. The Corso Italia Station study was put on hold for several years and reinitiated in May 2019. In the new City of Ottawa Official Plan, the three studies, along with Pimisi Station and Lebreton Flats District Secondary Plan, were all consolidated into the "West Downtown Core Secondary Plan". The potential land uses within the Corso Italia Station District, as provided in the Secondary Plan, are illustrated in **Figure 11**.

The purpose of the Secondary Plan is to provide a "detailed area-based policy direction to guide both public and private development and investments over the next 25 years." The following are some of the major considerations provided in the Secondary Plan with regards to transportation, that may have an impact on the proposed 75 Breezehill Ave N development:

- A new Laurel St Active Transportation Corridor (ATC) will connect from the dead-ends of Laurel St on the west and east sides of the Trillium Line and connect to a proposed future north-south MUP that will run parallel on the west side of the rail corridor.

  All development in the Breezehill Ave N area shall support active transportation along Breezehill Ave N and Laurel St and shall provide their portion of the future MUP. As of today, there is no expected date of completion for the Laurel AT bridge and the completion date of the future MUP depends on the build-out date of the redevelopment sites along the western side of the rail corridor. The City of Ottawa TMP Part 1 (2023) indicates a feasibility study will be carried out for the purpose of assessing the proposed bridge.
- Bicycle parking is to be provided at a minimum rate of 1.0 bike parking space per residential unit.

Figure 11: Corso Italia Station District Character Areas (City of Ottawa)



Laurel St and Loretta Ave N Renewal

Laurel St (between Breezehill and Loretta) and Loretta Ave N (between Laurel and Gladstone) are expected to undergo renewal to replace aging sanitary sewers and watermain. The project will include a full road reconstruction that will include the following physical design changes:

- Four new speed humps will be added: 1 on Laurel St approximately 2m west of the proposed developments site access and the other 3 located along Loretta Ave approximately 80m south of Laurel St, approximately 75m north of Gladstone Ave, and approximately 70m south of Gladstone Ave.
- Raised east-west crosswalks at Gladstone Ave/Loretta Ave.
- 2m concrete sidewalks along both sides of Laurel St and Loretta from Breezehill Ave to the end of Loretta Ave.
- Road width of 8.5m down the entirety of Loretta Ave and 9m down Laurel between Breezhill Ave and Loretta Ave N, with the exception of any bulb out curbs.

- Bulb-out curb on the south-west corner of Gladstone Ave/Loretta Ave that will narrow the south leg egress to 7m.

Construction was expected to begin early July 2023 and complete by the end of 2024.

Breezehill Ave N Renewal

Breezehill Ave N is expected to undergo renewal to replace its aging sanitary sewers and watermain between Somerset St W and Gladstone Ave. As part of the project, full road reconstruction is expected to be implemented, which will include physical design changes that promote traffic calming as part of the City's 30km/h policy. The major aspects of the design are as follows:

- 2m wide sidewalks on both sides of Breezehill Ave from Somerset St W to Laurel St and on the west side of Breezehill Ave from Laurel St to Gladstone Ave. Sidewalk on the east side of Breezehill Ave will be 1.8m from Laurel St to Gladstone Ave.
- Road narrowing to 8.5m down the entirety of Breezehill Ave between Somerset St W and Gladstone Ave except for any location with a curb extension.
- Two 1.5m wide mid-block curb extensions located between Somerset St W and Laurel St, each narrowing the road to 7m. One will be located on the east side at 53 Breezehill Ave between the property access and north property line. The other will be located 57m north of Laurel St on the west side.
- Two locations with 1.25m wide opposing mid-block curb extensions on both sides of Breezehill Ave that will narrow the road width to 6m. They will be located in front of 134 & 158 Breezehill Ave.
- Four new speed humps will be added along Breezehill Ave and will be at the following locations: in front of 134 Breezehill, 150 Breezehill Ave, 40m north of Laurel St, and 97m north of Laurel St. The existing speed hump approximately located 70m south of Somerset St W shall be maintained while the other existing speed hump approximately located 70m north of Laurel St will be removed.

Construction was expected to begin spring 2024 and be completed in fall 2024.

2.1.3.2. Other Study Area Developments

The following section outlines adjacent future developments in the study area to be considered in the TIA. The criteria for inclusion of other area developments are the proximity to the proposed development site and the potential impact to study area intersections. Developments that are either approved or have an active planning application in the City are included below and illustrated as part of the map in **Figure 12**.

1) 951 Gladstone Ave and 145 Loretta Ave N

A mixed-use development proposed by Commvesco Levinson Viner (CLV), which will consist of 849 residential units, 193,015 sq.ft. of office space and 17,611 sq.ft. of retail space. The development will be fully constructed by 2026. During the morning peak hour, the development is anticipated to generate approximately 136 vehicle trips and 645 person trips. During the afternoon peak hour, the development is anticipated to generate approximately 149 vehicle trips and 678 person trips.

3) 1010 Somerset St W

The City of Ottawa and Ottawa Community Housing is proposing a new community hub on 19 acres of land that will include facilities such as an elementary school, childcare facility, affordable housing, limited mixed-use private developments etc. The development is currently in the concept planning phase and is expected to be constructed in the long-term future. Due to there being no active development application and in the preliminary stages of planning, this development will not be considered in the analysis phase.

2) 1040 Somerset St W

Claridge Homes is proposing a 30-storey mixed-use building that will provide 268 units and 141m^2 of commercial retail space. The development will be fully constructed by the year 2025. Based on the TIA (prepared by

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Novatech), the proposed development is expected to generate a total of 24 and 26 vehicle trips for the morning and afternoon peak hours.

3) 1050 Somerset St W

Claridge Homes is proposing a 28-storey mixed-use building that will provide 271 condo units and 567 m2 of commercial space. The traffic analysis report provided on the Development Applications search tool appears to be outdated, having been prepared in 2012, and inconsistent with the proposed site statistics. As such, it is assumed that the application is on hold and this development will not be included in the future background volumes provided in this report.

4) Gladstone Village, 933 Gladstone Ave

The Ottawa Community Housing Corporation is proposing a large-scale development in the vacant lands directly east of the Trillium Line. Phase 1 is anticipated to be constructed in 2024, which will include 338 apartment unit in mid to high-rise buildings, along with first floor commercial space. Phase 1 is expected to generate approximately 21 new vehicle trips and 141 total person trips during peak hours. Full development buildout was assumed to be by 2031, where the development will generate up to 118 vehicle trips and 953 person trips during peak hours.

5) 975 Gladstone Ave

The Canada Bank Note building at 975 Gladstone Ave is proposing a 347 m^2 warehouse addition near Laurel St to the existing building, along with a 177 m^2 secured loading bay. This expansion is not expected to result in any significant increase in traffic volumes.

Figure 12: Other Area Developments

2.2. Study Area and Time Periods

Full buildout of the proposed residential development is assumed to be 2026. As such, the horizon years being analyzed in this report are 2026 and 2031 (five years after full buildout) horizon years, using the weekday morning and afternoon peak hour time periods.

Proposed study area intersections and boundary roads are outlined below and highlighted in **Figure 13**.

- Somerset/Breezehill (unsignalized)
- Gladstone/Breezehill (unsignalized)
- Gladstone/Loretta (unsignalized)
- Breezehill/Laurel (unsignalized)
- Breezehill Ave N, between Laurel St and Somerset St
- Laurel St, between Breezehill Ave N and Loretta Ave N

Figure 13: Study Area Intersections

2.3. Exemption Review

The modules/elements in **Table 1** are recommended to be exempt from the TIA Report based on the City's TIA guidelines.

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 – 4.4 Design Review Component	All elements except for 4.2.1	Not required for applications involving ZBLA. However, a brief description may be provided.
4.8 Network Concept	4.8 Network Concept	Only required if proposed development is anticipated to generate more than 200 person-trips over the permitted zoning

3.0 FORECASTING REPORT

3.1. Development Generated Travel Demand

3.1.1. Trip Generation and Mode Shares

The proposed development will consist of 479 residential units and less than 429 m² of ground floor commercial space, housed within two apartment buildings that are 27 and 29-storeys high. Due to the small size of the commercial space, it is assumed that it will be utilized mostly by the residents of the building and would generate a very negligible number of new trips. The appropriate trip generation rates for a high-rise apartment land use were obtained from the 2020 TRANS Trip Generation Manual. Table 3 in the Manual provides person-trip rates during the peak AM and PM periods (7am-9:30am and 3:30PM-6PM) and are summarized in **Table 2** below.

Table 2: Trip Generation Trip Rates

Land Use	Data Source	Trip Rates	
		AM Peak Period (7-9:30am)	PM Peak Period (3:30-6pm)
High-Rise Apartments	TRANS 2020	T = 0.8(du);	T = 0.9(du);
Notes: T = Average Vehicle Trip Ends *du = Dwelling unit*			

Using the trip rates provided in **Table 2**, the total number of person trips generated during the morning and afternoon peak periods can be found in **Table 3**.

Table 3: Residential Units Peak Period Person Trip Generation

Land Use	Dwelling Units	AM Peak Period Person Trips	PM Peak Period Person Trips
High-Rise Apartments	479	383	431

The proposed development is anticipated to generate 383 and 431 person trips during the morning and afternoon peak periods, respectively. The total peak period person trips in **Table 3** are then divided into different travel modes, as shown in **Table 4**, using mode share percentages obtained from the 2020 TRANS Manual for the "Ottawa West" district. It should be noted, some calculations presented minor rounding errors and have been adjusted accordingly throughout the trip generation analysis.

Table 4: Peak Period Trips Mode Shares Breakdown

Travel Mode	Mode Share	AM Peak Period Person Trip	Mode Share	PM Peak Period Person Trips
Auto Driver	29%	109	33%	142
Auto Passenger	11%	44	11%	49
Transit	41%	158	26%	110
Cycling	3%	13	7%	29
Walking	16%	60	23%	100
Total Person Trips	**100%**	**383**	**100%**	**431**

Standard traffic analysis is usually conducted using the morning and afternoon peak hour trips as they represent a worst-case scenario. In the 2020 TRANS Manual, Table 4 provides conversions rates from peak period to peak hours for different mode shares. The conversion rates for both AM and PM are provided in **Table 5** below.

Table 5: Peak Period to Peak Hour Conversion Factors (2020 TRANS Manual)

Travel Mode	Peak Period to Peak Hour Conversion Factors	
	AM	PM
Auto Driver & Auto Passenger	0.48	0.44
Transit	0.55	0.47
Cycling	0.58	0.48
Walking	0.58	0.52

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Using the conversion rates in **Table 5** and the peak period person trips for different travel modes in **Table 4**, the peak hour trips for different travel modes can be calculated as shown in **Table 6**.

Table 6: Peak Hour Trips, with Actual Mode Share Percentages

Travel Mode	AM Peak Hour Trips	PM Peak Hour Trips
Auto Driver	52	62
Auto Passenger	21	22
Transit	87	52
Cycling	7	14
Walking	35	52
Total Person Trips	**202**	**202**

As shown in **Table 6**, the proposed development is anticipated to generate a total of approximately 202 person trips during both the morning and afternoon peak hours. Vehicle trips are anticipated to be approximately 52 and 62 veh/h during the morning and afternoon peak hours, respectively. Active transportation mode shares (cycling and walking) generate 42 and 66 trips per hour while the transit mode share is expected to generate 87 and 52 trips.

However, considering that the development is located within a 400m walking distance of the future Corso Italia LRT station (based on existing facilities) and a 330m walking distance once the new western MUP is constructed, the transit mode share is expected to be significantly higher. As such the TRANS mode share assumptions were adjusted to reflect the opportune location of the site with respect to LRT and the Trillium Pathway more appropriately, as shown in **Table 7**. It was assumed that the same mode share distribution would occur in the morning and afternoon peak hours.

Table 7: Adjusted Mode Share Percentages and Peak Hour Trips

Travel Mode	Mode Share	AM Peak Hour Trips	PM Peak Hour Trips
Auto Driver	15%	30	30
Auto Passenger	5%	10	10
Transit	50%	102	102
Cycling	5%	10	10
Walking	25%	50	50
Total Person Trips	**100%**	**202**	**202**

Inbound and outbound percentages were obtained from Table 9 of the 2020 TRANS Manual and applied to each travel mode in **Table 7** as shown in **Table 8**.

Table 8: Inbound/Outbound Morning and Afternoon Person Trips

Travel Mode	Mode Shares	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In (31%)	Out (69%)	Total	In (58%)	Out (42%)	Total
Auto Driver	15%	9	21	30	17	13	30
Auto Passenger	5%	3	7	10	6	4	10
Transit	50%	32	70	102	59	43	102
Cycling	5%	3	7	10	6	4	10
Walking	25%	16	34	50	29	21	50
Total Person Trips	**100%**	**63**	**140**	**202**	**118**	**85**	**202**

As shown in **Table 8**, 30 new vehicular trips, 102 new transit trips and 60 new active transportation trips are forecasted to be generated in the morning and afternoon peak hours from the proposed development.

3.1.2. Trip Distribution and Assignment

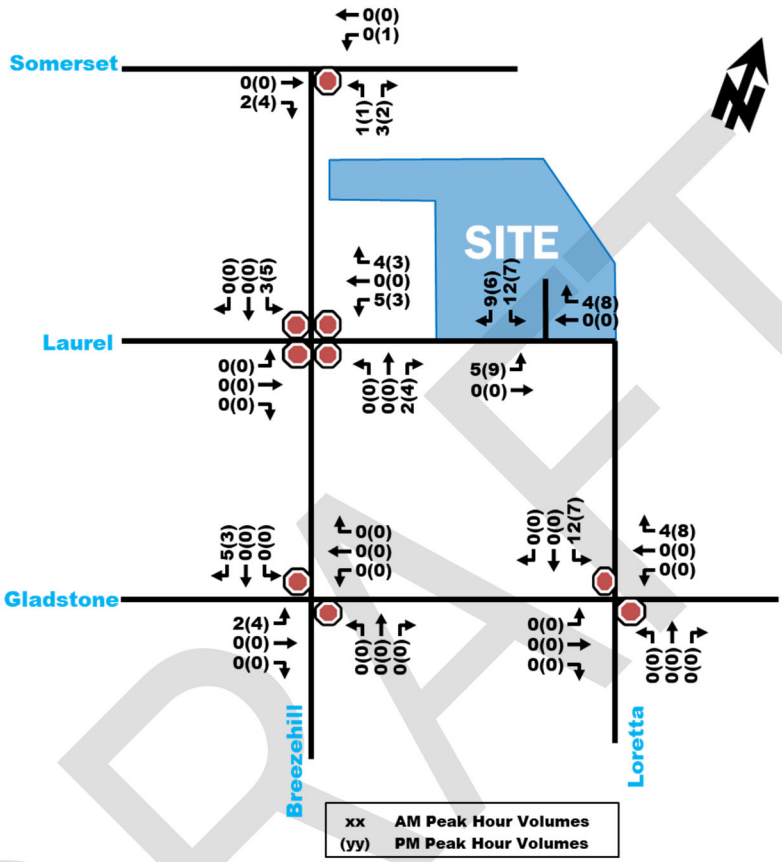
Based on the 2011 OD Survey (Ottawa West district) and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes was estimated as follows:

- 10% to/from the north via Bayview Station Rd and Somerset St W;
- 25% to/from the south via Bayswater Ave and Preston St;

- 35% to/from the east via Hwy 417, Gladstone Ave, and Somerset St W; and,
- 30% to/from the west via Hwy 417 and Scott St.

The anticipated new auto trips of the proposed development (provided in **Table 8**) were then assigned to the road network as shown in **Figure 14**.

Figure 14: Site-Generated Traffic Volumes



3.2. Background Network Traffic

3.2.1. Transportation Network Plans

Refer to **Section 2.1.3.1** for a detailed description of future transportation network changes. Major changes include the construction of the Corso Italia Station along the Trillium Line and the LRT corridor extensions which will bring 77% of all residents in the City of Ottawa within a five-kilometer radius of the rail (as cited by the City of Ottawa's LRT Stage 2 Project Overview page).

3.2.2. Background Growth

The 2021 TIA (prepared by Parsons) for the Gladstone Village Development conducted a regression analysis of historical count data that determined a 0% background growth rate to be suitable for the entirety of the study area road network including Gladstone Ave, Somerset St W, and Laurel St.

The 2018 TIA (prepared by CGH Transportation) for 951 Gladstone & 145 Loretta utilized a 0% background growth rate for all intersections based on "documented" volumes decreasing over the last 10 years.

The 2021 TIA (prepared by Novatech) for 1040 Somerset St W applied a background growth rate of 1% for Bayswater St and Somerset St; 1.5% for Gladstone Ave; and 0% for Preston St, Breezehill Ave, and Laurel Street.

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With the addition of the new Corso Italia LRT station along with measures proposed through the Corso Italia Station District plans, it is expected there will be a high transit mode share within the study area that will result in an overall reduction in vehicle trips. Based on the previously mentioned studies, the proposed development being in a well-developed area near downtown Ottawa, and the proposed development's location relative to the new LRT station, it was determined that a future background traffic growth rate of 0% is suitable for the purpose of this study.

3.2.3. Other Developments

As mentioned in **Section 2.1.3.2**, five adjacent future developments with active development applications have been identified in the study area. The anticipated traffic volumes generated by the future developments at 975 Gladstone and 1050 Somerset St W will not be included in the future background traffic due to minimal site generated volumes and lack of project progress since 2012, respectively. Traffic volumes generated by the following adjacent future developments will be considered:

- 1040 Somerset St W (Full-buildout 2025)
- 951 Gladstone Ave and 145 Lorette Ave N (Full-buildout 2026)
- Gladstone Village, 933 Gladstone Ave (Full-buildout 2031)

Figures illustrating future site-generated traffic volumes of adjacent development were obtained from their respective TIA Reports and provided in **Appendix E**. The future adjacent development traffic volumes are added to existing traffic volumes to result in future background 2026 and 2031, illustrated in **Figure 15** and **Figure 16**. Since no background growth was applied to the network, the Gladstone Village (Buildout 2031) traffic volumes are the single difference between the 2026 and 2031 horizon years. The volumes for this site are very minimal, totaling an approximate 14 trips during peak hours.

Figure 15: Future Background 2026 Traffic Volumes

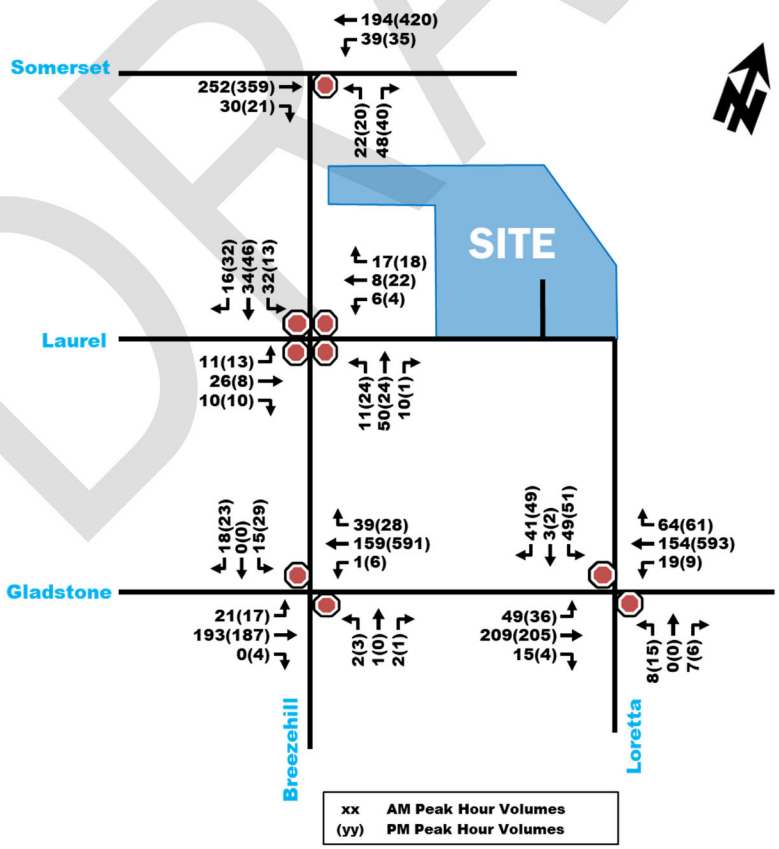

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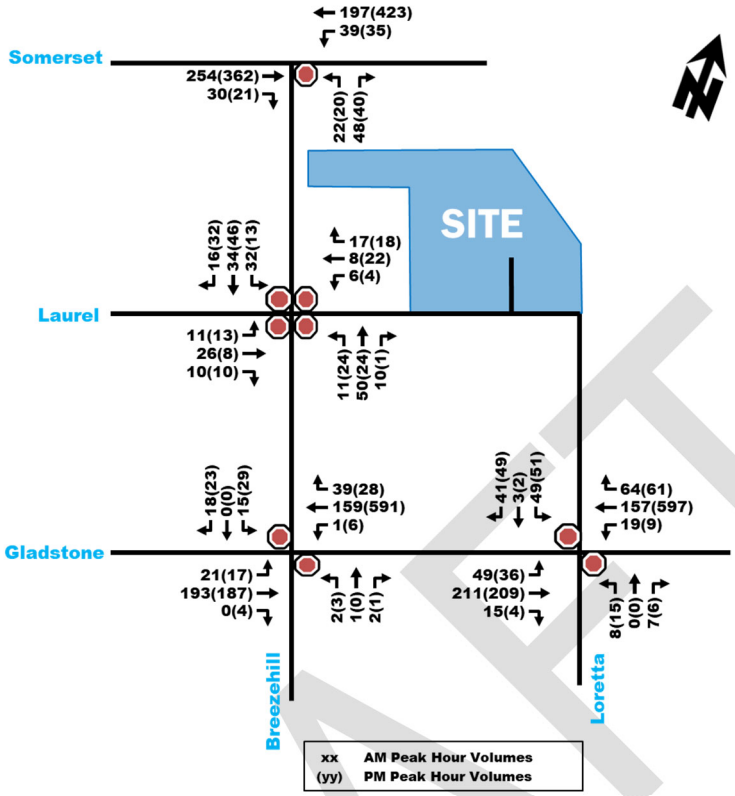
Figure 16: Future Background 2031 Traffic Volumes



3.3. Demand Rationalization

The following section indicates factors that may be used to rationalize the future travel demands in the study area and determine if there are potential capacity limitations and how they may be addressed.

The total projected 2026 and 2031 traffic volumes can be calculated by superimposing the site-generated traffic shown in **Figure 14**, onto the total future background traffic shown in **Figure 15** and **Figure 16**. As previously mentioned in **Section 3.2.3**, the total projected 2026 and 2031 traffic volumes differ by just 14 trips during peak hours and are illustrated in **Figure 17** and **Figure 18**, respectively. The approach for this study was to proceed without applying any reductions to the study area traffic volumes, reflecting a worst-case scenario. The impact of the proposed development's site-generated traffic volumes on the study area intersections and roadways will be determined in the subsequent sections of the TIA report.

<u>Site-Generated and Background Traffic Volumes</u>

The proposed development is anticipated to add approximately 30 vehicle trips during peak hours (i.e. approximately 1 vehicle every 2 minutes), which is considered to be a negligible amount of traffic. The site-generated traffic volumes are not expected to result in any notable impact to the study area intersections.

Total projected traffic volumes illustrated in **Figure 17** and **Figure 18** indicate that background traffic along Somerset St W may reach approximately 400 to 450 veh/h in the peak direction, which is considered acceptable for an arterial road. Background traffic along Gladstone Ave may reach approximately 600 to 650 veh/h in the peak direction, which exceeds the ideal two-way threshold of 600 veh/h along major collector roads, as indicated by the TIA Guidelines. These volumes will be further discussed in subsequent sections of the TIA Report.

<u>Future LRT Plans</u>

As mentioned in previous sections, the LRT is currently undergoing expansions in various directions of the city, which will see the construction of many new LRT stations. The Trillium line, which includes the future Corso Italia

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Station directly adjacent to the proposed development site recently began operations. As reflected by the mode share assumptions in **Section 3.1.1**, the LRT is expected to offset most trips generated by the development through transit, thereby limiting vehicle trips generated by the site.

Additional plans by the Corso Italia District include improvements to the active transportation facilities in the area that will naturally result in increased cycling and walking, this includes:

- Constructing a new Laurel St Active Transportation Corridor (ATC) that will connect from the dead-ends of Laurel St on the west and east sides of the Trillium Line, to be used by cyclists and pedestrians only.
- A new future north-south MUP proposed to run parallel to the rail corridor, on the west side.
- Future developments in the district are required to provide bicycle parking at a minimum rate of 1.0 bike parking space per residential unit.

Therefore, the current and anticipated future improvements to transit, cycling and walking facilities in the study area are expected to result in significant reductions in vehicle traffic for new and existing developments, which includes background traffic volumes.

<u>TDM Measures</u>

Transportation Demand Management (TDM) Measures are measures implemented by developers to encourage residents of the future development to use alternative travel modes to personal vehicles, such as transit and active transport (walking and biking). For transit, example measures include potentially subsidizing public transport passes and having high quality walking routes to transit stations. For walking and biking, measures include providing walkable routes and sufficient bicycle parking. It is expected that the proposed development and future developments in the area will have TDM measures in place that will reduce reliance on personal vehicles and increase alternative travel modes.

Figure 17: Total Projected 2026 Traffic Volumes

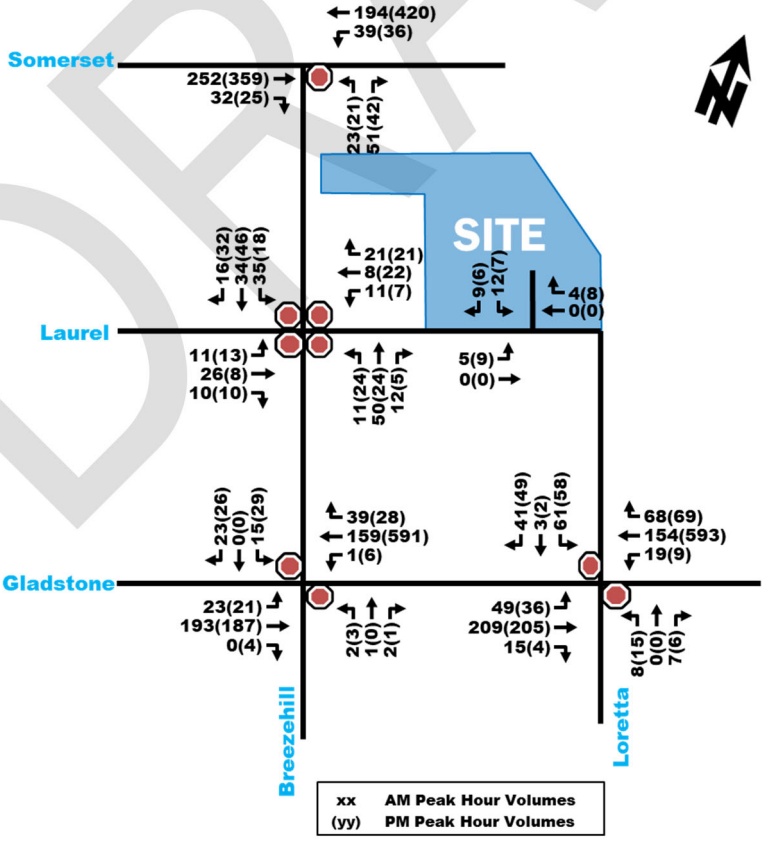

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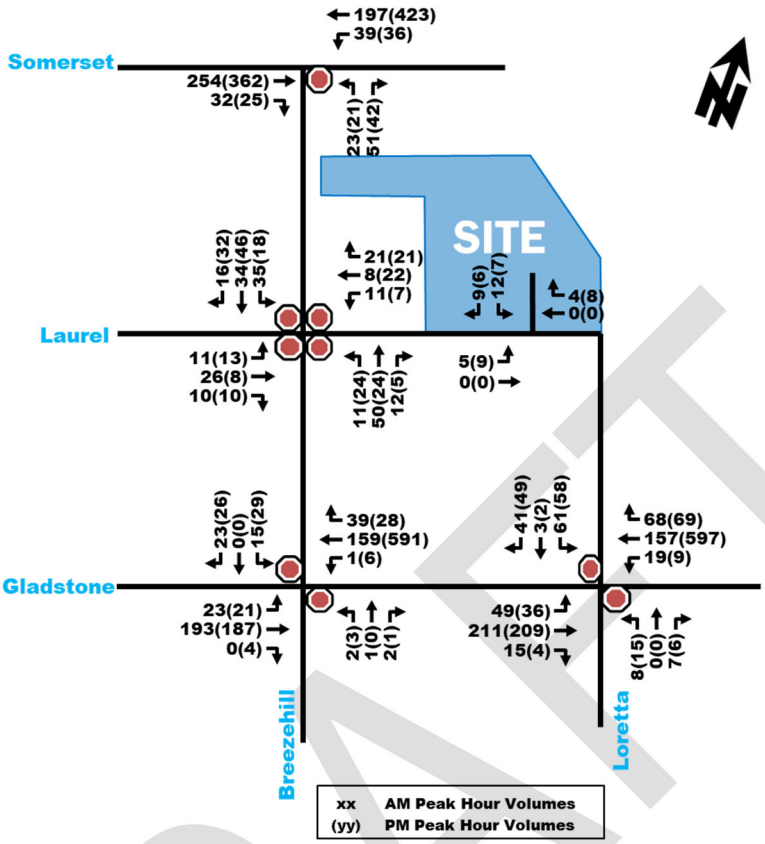
Figure 18: Total Projected 2031 Traffic Volumes



4.0 ANALYSIS

4.1. Development Design

The site access road will expand internally to form a turnaround area at the end of the internal driveway and allow circulation for vehicles entering the site. The underground parking garage ramp will be accessible at the end of the internal driveway. A finalized site plan with additional revisions is anticipated upon the Site Plan Control application and will provide further details of the specifications and geometry of the site access and circulation.

The Corso Italia Station District Secondary Planning Study proposes that a new north-south MUP be provided on the west side of the Trillium Line transit corridor, between the Queensway bridge and Somerset St W. The proposed MUP will be accessible through the site with internal sidewalks. Additionally, the development is expected to provide 2.0m wide sidewalk along Laurel St.

The TDM-supportive Design and Infrastructure Checklist is provided in Appendix F and discussed in more detail in Section 4.5.

4.2. Parking

4.2.1. Parking Supply

Based on the City of Ottawa Parking Provisions, the development site is located in “Area Z” where, according to Section 101 (2) of the Parking Provisions, the proposed development is not required to provide a minimum number of off-street motor vehicle parking spaces. For bike parking, the Corso Italia District Secondary Plan

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requires a minimum rate of 1.0 spaces per residential unit, which would equate to 479 bike spaces for the 479 proposed units.

As previously mentioned in **Section 2.1.1**, the development proposes to provide approximately 124 vehicle parking spaces in an underground parking garage and approximately 678 bicycle parking spaces — 671 of which will be located indoors throughout the ground floor and parking levels, and the remaining 7 located outdoors. Therefore, all parking requirements are expected to be met.

Considering the proposed development offers a 199-bicycle parking space surplus and is within the area of the Corso Italia Station District Secondary Plan, it exhibits the expectation of high transit and active transportation mode shares that are in line with the City's vision of promoting sustainable travel modes.

4.3. Boundary Street Design

Exempt — see **Table 1**

4.4. Access Intersection Design

The site access is located on the north side of Laurel St, approximately 40m east of Breezehill Ave N. The access is anticipated to be stop controlled on the southbound approach. Further details of the site access design, including compliance with the City of Ottawa's Private Approach By-Law, will be provided during SPC application.

4.5. Transportation Demand Management

4.5.1. Context for TDM

The proposed development is located within a Design Priority Area (DPA) and Protected Major Transit Station Areas (PMTSAs) where the future Corso Italia Station will be located. The property is owned by The Estate of Carson Unsworth.

Considering the proposed land-use of the development as a residential building, it is expected the AM peak trips will be residents leaving the site to work and returning to the site from work during the PM peak. **Sections 3.1.1** and **3.1.2** describe the anticipated site generated trips per travel mode and predicts the destinations of travelers based on the 2011 OD-Survey for Ottawa.

The development is proposing 479 apartment units within 27 and 29 storey buildings. The site plan indicates there will be 48 studio units (10%), 208 one-bedroom units (43%), 193 two-bedroom units (41%), and 30 three-bedroom units (6%).

4.5.2. Need and Opportunity

Considering the development's location in a well-developed core area of the City of Ottawa, its relative location to the nearby Corso Italia LRT station, the expected future street renewal projects, and the improvements to active transportation facilities in the area, there will be a natural increase in transit and active transportation mode shares and a decrease in auto trips.

4.5.3. TDM Program

Both the TDM Supportive Design and Infrastructure Checklist and the TDM Measures Checklist has been provided in **Appendix F**. The proposed measures are as follows:

<u>TDM Supportive Development Design and Infrastructure Checklist</u>

- All ten (10) required measures related to Walking and Cycling (facilities and bicycle parking) and Vehicle Parking have been satisfied.
- Nine (9) of the fourteen (14) basic measures related to Walking and Cycling, Parking and Ridesharing have been satisfied, namely:

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  - Locating building close to street with no parking areas between entrance and street.
  - Locating building entrances to minimize walk distance to sidewalks and transit.
  - Locating building doors and windows to ensure visibility of pedestrians.
  - Providing safe, direct, and attractive walking routes to transit.
  - Ensuring walking routes are secure, visible, and lighted.
  - Providing lighting, landscaping and benches along walking and cycling routes.
  - Provide wayfinding signage for site accesses.
  - Provide bicycle parking spaces equivalent to the expected number of residents.
  - Provide a designated area for carpool drivers.
- Four (4) of the seven (7) better measures related to Walking and Cycling: End of trip facilities and Carsharing & Bike sharing, namely:
  - Secure bicycle parking spaces equivalent to number of units
  - Provide bike repair station adjacent to main bicycle parking area.
  - Provide up to three carshare parking spaces.
  - Provide separate areas for short-term and long-term parking.

<u>TDM Measures Checklist</u>

- Four (4) of the seven (7) basic measures related to the Walking and Cycling, Transit, Parking, and TDM Marketing & Communications have been recommended and are as follows:
  - Display local area maps with walking/cycling access routes.
  - Display relevant transit schedules and route maps at entrances.
  - Unbundle parking cost from monthly rent.
  - Provide a multimodal travel option information package to new residents.

It should be noted that TDM Measures checklist is yet to be finalized and will be confirmed in full during the SPC Application.

4.6. Neighbourhood Traffic Management

This module compares the maximum two-way traffic of a local or collector road during morning and afternoon peak hours, to the respective threshold provided by the City of Ottawa TIA Guidelines.

Site-generated traffic of the proposed development are expected to use local roads; Breezehill Ave, Laurel St and Loretta Ave; and the major collector road Gladstone Ave as part of their access route to/from the proposed development. The thresholds provided in the TIA Guidelines indicate an ideal maximum two-way traffic volume of 120 veh/h for local roads and 600 veh/h for major collector roads, during peak hours. **Table 9** provides a comparison of existing and total projected traffic volumes to their respective peak hour ideal thresholds. It should be noted that much of the increase in traffic volume is the result of multiple future developments in the area.

Table 9: Existing and Projected Traffic volumes Comparison to Thresholds

Roadway	Classification	Daily Threshold	Peak Hour Threshold	Peak Hour Two-Way Volumes AM (PM)	
				Existing	2031 Projected
Breezehill Ave N	Local	1,000	120	135 (120)	167 (154)
Laurel St	Local	1,000	120	78 (44)	113 (81)
Loretta Ave	Local	1,000	120	68 (78)	167 (214)
Gladstone Ave	Major Collector	5,000	600	443 (864)	523 (948)

As shown in **Table 9**, two-way peak hour traffic volumes exceed the respective ideal threshold for the existing conditions during the AM peak hour along Breezehill Ave N and the PM peak hour along Gladstone Ave. For future conditions, ideal thresholds were exceeded along Breezehill Ave N and Loretta Ave for both morning and afternoon peak hours and along Gladstone Ave for the afternoon peak hour. The following is noted:

- **Breezehill Ave N:** Although volumes exceed the 120 veh/h recommended threshold of a local road, no major concerns are identified. The future Breezehill Ave Renewal Project is expected to provide traffic calming measures such as several new curb extensions and speed humps that will deter any potential cut-through traffic and mitigate safety concerns.

- **Laurel St:** Traffic volumes are not expected to exceed the 120 veh/h threshold for a local road during peak hours, in both existing and projected conditions.

- **Loretta Ave:** The majority of traffic volumes along Loretta Ave are the result of trips generated by the future development at 951 Gladstone Ave & 145 Loretta N, which produces a significant increase in volumes along Loretta Ave, exceeding the 120veh/h recommended threshold of a local road. The future Laurel St and Loretta Ave N Project is expected to provide traffic calming measures that will significantly reduce and traffic or safety concerns.

- **Gladstone Ave:** Traffic volumes during the afternoon peak hour significantly exceed the 600veh/h recommended threshold of a major collector road. However, these volumes are not unexpected, given the function of Gladstone Ave, its proximity to the Highway 417 and the major intersecting roadways throughout the corridor. If desired, the City may choose to reclassify the road to an arterial, although with the upcoming improvements to transit in the area and the City's constant advocacy for sustainable travel modes, these traffic volumes may stagnate or decrease in the future. As such, a reclassification is not considered necessary at this time.

It is important to note that the thresholds provided in the TIA Guidelines are ideal suggestions and not firm requirements for traffic volumes. If desired, the city may choose to reclassify roadways as needed, although the upcoming renewal projects of Breezehill Ave, Laurel St and Loretta Ave are expected to help mitigate many of the safety concerns on these roads. Additionally, the future Corso Italia LRT station is expected to increase transit usage within the area and result in reduced traffic in general. The Intersection capacity analysis is conducted in **Section 4.9**, which will confirm if any concerns are expected for traffic operations at study area intersections.

4.7. Transit

As shown in **Table 8**, the proposed development is expected to generate approximately 112 transit person trips during both peak hours. With the existing bus routes in the study area, as well as the new Corso Italia Station, the transit network is expected to have sufficient capacity that can easily accommodate the future site-generate transit trips.

4.8. Review of Network Concept

Exempt – see **Table 1**.

4.9. Intersection Design

4.9.1. Intersection Control

Stop control will be provided for vehicles exiting the site onto Laurel St; the site access will permit full movements in/out of site.

4.9.2. Intersection Design

Synchro 11 Trafficware was used to analyze intersection performance of intersections within the study area. Critical movements at each of the intersections were assessed based on either the movement with the highest volume-to-capacity ratio (for signalized intersections), or the movement experiencing the highest average delay

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(for unsignalized intersections). It should be noted that, as per the TIA Guidelines, the Peak Hour Factor (PHF) used for analysis was 0.90 in existing conditions and 1.0 in all future scenario conditions.

Based on the 1040 Somerset St W TIA, the Somerset/Breezehill intersection will be converted into a signalized intersection with the addition of a westbound left-turn lane. See detailed roadway modification design in **Appendix G**. The intersection is expected to be upgraded the same buildout year (2025) of 1040 Somerset St W. For the purposes of this analysis, Somerset/Breezehill will be modelled as a signalized intersection for future background and total projected scenarios.

As previously mentioned in **Section 3.2.3**, the Gladstone Village site generated traffic is the single difference between the 2026 and 2031 horizon years and is expected to generate a maximum of 14 vehicle trips during the peak hours. Considering the negligible increase in trips from other developments in 2031 and the 0% growth rate applied to the background traffic, only the existing conditions, 2031 background conditions, and 2031 total projected conditions will be analyzed.

All Synchro detailed reports for existing and future conditions have been provided in **Appendix H**.

Existing Conditions

Table 10 below summarizes the intersection performance of study area intersections, based on existing traffic volumes illustrated in **Figure 8**.

Table 10: Existing Conditions Intersection Performance

Intersection	Weekday AM Peak (PM Peak)				
	Critical Movement			Intersection 'As a Whole'	
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS
Somerset/Breezehill (U)	B(B)	13.2(14.5)	NB(NB)	1.6(1.0)	A(A)
Gladstone/Breezehill (U)	B(C)	11.7(19.9)	NB(SB)	1.3(1.5)	A(A)
Breezehill/Laurel (U)	A(A)	7.5(7.5)	NB(NB)	7.5(7.4)	A(A)
Gladstone/Loretta (U)	B(C)	12.8(19.8)	SB(SB)	2.0(1.5)	A(A)

Note: Analysis of signalized intersections assumes a PHF of 0.9 and a saturation flow rate of 1800 veh/h/lane.
(U) – Unsignalized intersection, movement with highest average delay identified as critical movement.

As shown in **Table 10**, the intersections 'as a whole' all operate at a LOS 'A during the morning and afternoon peak hours with critical movements operating at a LOS 'C' or better.

Future Background 2031 Conditions

Table 11 below summarizes the Synchro traffic operations at study area intersections, based on future background 2031 traffic volumes in **Figure 16**.

Table 11: Future Background 2031 Conditions Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'As a Whole'		
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
Somerset/Breezehill (S)	A(A)	0.35(0.31)	NBL(NBL)	4.9(4.2)	A(A)	0.22(0.28)
Gladstone/Breezehill (U)	B(C)	11.3(18.8)	NB(SB)	1.4(1.5)	A(A)	-
Breezehill/Laurel (U)	A(A)	7.6(7.5)	SB(NB)	7.5(7.4)	A(A)	
Gladstone/Loretta (U)	B(C)	13.7(24.7)	SB(SB)	3.4(3.4)	A(A)	-

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection, movement with highest v/c ratio identified as critical movement.
(U) – Unsignalized intersection, movement with highest average delay identified as critical movement.

As shown in **Table 11**, the future signalized intersection of Somerset/Breezehill 'as a whole' is expected to operate at LOS 'A', with critical movements also expected to operate at LOS 'A' during both peak hours. The remaining study area intersections are expected to operate similar to existing conditions.

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Total Projected 2031 Conditions

Table 12 below summarizes the Synchro traffic operations at study area intersections, based on total projected 2031 traffic volumes in **Figure 18**.

Table 12: Total Projected 2031 Conditions Traffic Volumes

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'As a Whole'		
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
Somerset/Breezehill (S)	A(A)	0.37(0.32)	NBL(NBL)	5.0(4.3)	A(A)	0.22(0.29)
Gladstone/Breezehill (U)	B(C)	11.4(17.2)	NB(SB)	1.5(1.5)	A(A)	-
Breezehill/Laurel (U)	A(A)	7.7(7.5)	SB(SB)	7.6(7.4)	A(A)	-
Gladstone/Loretta (U)	B(C)	14.5(23.4)	SB(SB)	3.7(3.4)	A(A)	-

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection, movement with highest v/c ratio identified as critical movement.
(U) – Unsignalized intersection, movement with highest average delay identified as critical movement.

As shown in **Table 12**, the total projected conditions operate very similar to 2031 background conditions with slight increases in intersection delays.

5.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Based on the results summarized herein, the following transportation related conclusions are offered:

Proposed Development

- The Estate of Carson Unsworth is proposing a development located at 75 Breezehill Ave N. The development is anticipated to be constructed in a single phase by 2026.
- The development will consist of 479 apartment units housed in 27-storey and 29-storey residential buildings, and 429 m^2 dedicated commercial space.
- Approximately 124 vehicle parking spaces are provided in an underground parking garage. Additionally, 678 bicycle parking spaces are provided on the ground floor and in the underground parking garage.
- Access to the development will be provided through an internal driveway along the north side of Laurel Street. Stop control was assumed for vehicles exiting the site.
- The development is anticipated to generate 202 person trips during peak hours, which comprise of 30 vehicle trips, 10 passenger trips, 102 transit trips and 60 active transport (walking and cycling) trips.
- The development is be located within a 400m walking distance of the new Corso Italia LRT Station based on existing conditions and a 330m walking distance once the western MUP is constructed. As a result, transit usage is expected to be very high, and active transportation modes were also expected to be high given the City's intensification policies reflected in the Corso Italia Station District Secondary Plan.
- A suite of TDM measures are anticipated to be adopted by the Estate of Carson Unsworth for the purpose of ensuring sustainable transit and active mode travel patterns are maintained. These measures will be confirmed in the future SPC application, but is currently expected to include the following:
    - Providing safe, direct and attractive walking routes to transit.
    - Designing roads for cyclist circulation.
    - Providing lighting, landscaping and benches along walking and cycling routes.
    - Providing a permanent bike repair station.

Existing and Future Background Conditions

- In existing conditions, the intersections 'as a whole' operated at a LOS 'A' or better during peak hours, while critical movements operated at a LOS 'C' or better.

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- A background traffic growth rate of 0% per year was applied to the study area intersections based on anticipated future traffic trends, where transit usage and active transport are expected to increase and offset personal vehicle usage. Traffic volumes from currently active development applications were added separately.
- Given that no background growth rate was applied to study area intersections and the minimal change in volumes due to future adjacent development volumes, future background traffic volumes between horizon years 2026 and 2031 were found to be nearly similar.
- In the future background 2031 conditions, overall study area conditions were shown to operate similar to existing conditions, with some movements continuing to experience temporary congestion. The proposed traffic signal at Somerset/Breezehill is expected to operate at LOS 'A' during both peak hours.

Projected Conditions

- With regards to neighbourhood traffic management, it was determined that the current road classification for Breezehill Ave N, Laurel St, Loretta Ave, and Gladstone Ave were appropriate for the site context. The future Breezehill Ave, Laurel St and Loretta Ave Renewal projects are expected to help mitigate safety concerns along these roads. Gladstone Ave traffic volumes may adjust in the future given the significant improvement in transit and active transport facilities and initiatives planned in the area.
- In the 2031 total projected conditions future vehicle/walking/cycling trips on the adjacent road network generated by the proposed development were incorporated in the Synchro model. The intersection analysis results have been summarized below:
    - All intersections within the study area operated 'as a whole' at a LOS 'A' during both peak hours. The future Somerset/Breezehill signalized intersection signal timings were optimized in Synchro, resulting in improved intersection operations.
    - Critical movements of all intersections, operate at a LOS 'C' or better during both peak hours.

Future Study Area Modifications

- Stage 2 LRT will include further expansions to the east and west of the city.
- A new north-south MUP is proposed on the west side of the Trillium Line, With a new active transportation corridor connecting the east and west sides of Laurel St.
- Breezehill Ave, Laurel St, and Loretta Ave are set to undergo full road reconstructions that will implement new sidewalk facilities, speed humps, and curb extensions to improve the overall accessibility and safety for all road users.
- No additional off-site roadway modifications are triggered by the proposed development.

Overall, the proposed development as outlined in this study generates minimal traffic and can be accommodated by the adjacent road network. The development plan leverages its location in close proximity to the future Corso Italia LRT Station with abundant active transportation facilities. The proposed development is recommended to proceed from a transportation perspective.

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Appendix A:

Screening Form, Site Plan **and City Comments**

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Office: +1 613.738.4160
1223 Michael Street, Suite 100|Ottawa, ON K1J 7T2

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	12-Dec-24
Project	75 Breezehill Ave N TIA Report
Project Number	477888-01000

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	Yes
Development Satisfies the Location Trigger	Yes
Development Satisfies the Safety Trigger	No

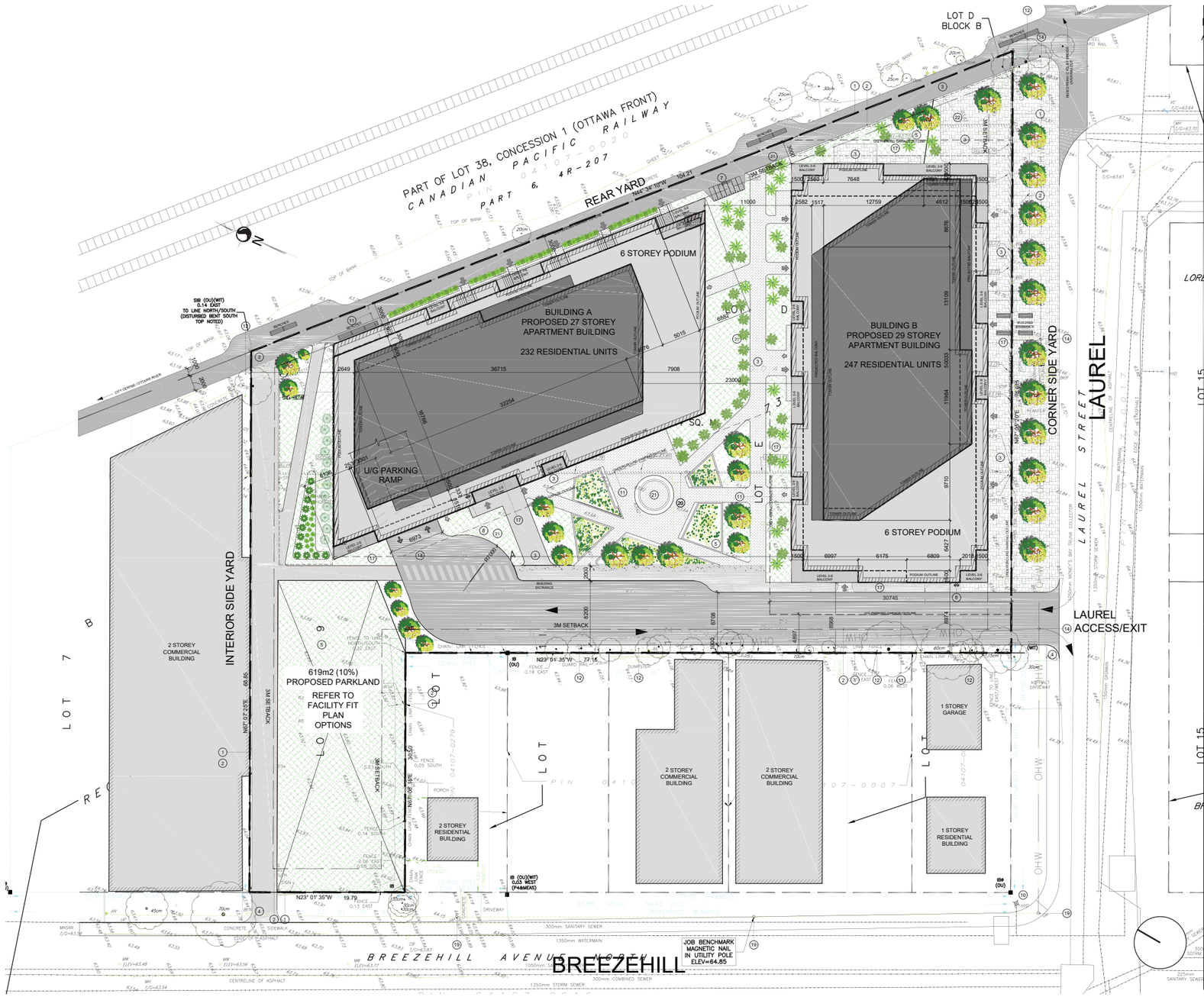
Module 1.1 - Description of Proposed Development	
Municipal Address	75 Breezehill Avenue N, Ottawa, ON K1Y 2H6
Description of location	Bounded by Larel St, Breezehill Ave and Trillium Line
Land Use	Residential apartments building
Development Size	Two high-rise buildings (27 and 29-storey), 479 units
Number of Accesses and Locations	Access along Laurel Street
Development Phasing	Single phase assumed
Buildout Year	2026
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Multi-High Rise Res (3+ Storeys)	
Development Size	479	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	No
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?	Yes
Location Trigger Met?	Yes

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	<80	km/h
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No	
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection?	No	
Does the proposed driveway make use of an existing median break that serves an existing site?	No	
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No	
Does the development include a drive-thru facility?	No	
Safety Trigger Met?	No	

SITE PLAN



DRAWING NOTES

1. PROPERTY LINE
2. EXISTING BUILDING SETBACKS
3. HARD SURFACE PAVING, SEE LANDSCAPE PLAN FOR PATTERN AND TYPE
4. DEPRESSED CURB AND SIDEWALK TO CITY OF OTTAWA STANDARD DETAIL
5. GROUND COVER IN CONCRETE PLANTERS
6. RESERVED
7. BICYCLE PARKING SPACES
8. SIAMESE CONNECTION @ GROUND FLOOR
9. RESERVED
10. EXISTING FIRE HYDRANT
11. OUTLINE OF UNDERGROUND PARKING LEVELS
12. EXISTING TREE TO BE REMOVED
13. RESERVED
14. RELOCATE EXISTING UTILITY POLE AND GUIDE CABLES
15. RESERVED
16. RESERVED
17. EXTENT OF GROUND FLOOR
18. ENTRY DRIVEWAY TO U/G PARKING GARAGE
19. EXISTING UTILITY POLE
20. EXISTING 2 STOREY BUILDING TO BE REMOVED
21. SPLASH PAD
22. P.O.P.S AREA - 150 SQ METERS/ 1,315 SQ FT

SITE PLAN SYMBOLS

- CONCRETE UNIT PAVERS SURFACE
- PROPOSED CONCRETE SURFACE
- EXISTING CONCRETE CITY SIDEWALK
- NCC MULTI-USE PATHWAY
- SOFT LANDSCAPING
- BIKE RACK
- TWO WAY VEHICLE CIRCULATION
- MAIN/COMMERCIAL ENTRANCE / BIKE ROOM/RESIDENTIAL ENTRANCE
- FIRE EXIT
- PROPERTY LINE
- ZONING SETBACKS

PROPERTY OWNER
FRED UNSWORTH
Ottawa, ON
E-Mail:fg_unsworth@rogers.com

LEGAL DESCRIPTION
SURVEYOR'S REAL PROPERTY REPORT
LOT D (BLOCK B),
PARTS of LOTS 10, 11, 12, 13 & 14
And **ALL OF LOTS D, E, AND 9 (BLOCK J)**
And **LORETTA AVE**
REGISTERED PLAN 73
CITY OF OTTAWA
Surveyed by Stantec Geomatics Ltd.

SURVEYOR
Stantec Geomatics Ltd.
Ontario Land Surveyors
1331 Clyde Avenue, Suite 400,
Ottawa, Ontario K2C 3G4
Tel.: (613) 722-4420
E-Mail: brian.webster@stantec.com

URBAN PLANNER
FoTenn Consultants Inc.
223 McLeod Street
Ottawa, ON Canada, K2P 0Z8
Tel.: (613) 730-5709
E-Mail: beed@fotenn.com

LANDSCAPE ARCHITECT

CIVIL ENGINEER
Stantec Civil Ltd.
Civil Engineering
1331 Clyde Avenue, Suite 400,
Ottawa, Ontario K2C 3G4
Tel: (780) 917-8567
E-Mail: Alyssa.Gladish@stantec.com

PROJECT INFORMATION

EXISTING ZONING	IG1 H(11)
PROPOSED ZONING Zoning By-Law 2008-250	MC
SITE AREA	6172 sq. m. (66,433) sq. ft.
OPEN AREA	41.3% 2548 sq. m.(27,426) sq. ft.
BUILDING HEIGHT - VARIES	85M, 91M

PROJECT STATISTICS

BUILDING HEIGHT	BLDG. A BLDG. B	27 STOREY - 85 M 29 STOREY - 91 M
AMENITY AREA	6 m² PER UNIT (479 UNITS)	2,874 sq. m.

GROSS BUILDING - AREAS (27 STOREY BLDG.)
(CITY OF OTTAWA'S DEFINITION)

PARKING LEVELS (2 LEVELS U/G)		N/A
GROUND FLOOR		367 sq. m. (3,950) sq. ft.
L2 FLOOR		1,138 sq. m. (12,249) sq. ft.
L3-6 FLOOR	4 x 1,085 sq. m. 4 x (11,679) sq. ft.	4,340 sq. m. (46,716) sq. ft.
L7 FLOOR		277 sq. m. (2,982) sq. ft.
L8-27 FLOOR	20 x 562 sq. m. 20 x (6,049) sq. ft.	11,240 sq. m. (120,980) sq. ft.
TOTAL AREA		17,362 sq. m. (186,877) sq. ft.

GROSS BUILDING - AREAS (29 STOREY BLDG.)
(CITY OF OTTAWA'S DEFINITION)

PARKING LEVELS (2 LEVELS U/G)		N/A
GROUND FLOOR		N/A
L2-6 FLOOR	5 x 1,070 sq. m. 5 x (11,517) sq. ft.	5,350 sq. m. (57,585) sq. ft.
L7 FLOOR		320 sq. m. (3,444) sq. ft.
L8-29 FLOOR	22 x 546 sq. m. 22 x (5,877) sq. ft.	12,012 sq. m. (129,294) sq. ft.
MECHANICAL FLOORS		N/A
TOTAL AREA		17,682 sq. m. (190,323) sq. ft.

UNIT STATISTICS

STUDIO UNIT	48	10.0%
1 BEDROOM UNIT	131	27.3%
1 BEDROOM + STUDY UNIT	77	16.1%
2 BEDROOM UNIT	193	40.3%
3 BEDROOM UNIT	30	6.3%
TOTAL	479	

COMMERCIAL RETAIL Bldg A - 27 storey	0 sq. m. (0) sq. ft.
COMMERCIAL RETAIL Bldg B - 29 storey	429 sq. m. (4,615) sq. ft.
TOTAL AREA	429 sq. m. (4,615) sq. ft.

CAR PARKING

REQUIRED by ZONING BY-LAW

RESIDENCE	- 0.5 PER UNIT (479 UNITS) (AFTER 12 UNITS -10% FOR UG)	234
VISITOR	- 0.1 PER DWELLING UNIT (AFTER 12 UNITS -MAX 30)	30
COMMERCIAL RETAIL (INSTN, FOOD, BANK & CONVENIENCE STORE)	- 0 UNDER 500 sq.m.PER UNIT	0
TOTAL		264

PROVIDED

2 LEVEL UNDER GROUND PARKING	124
SURFACE	0
TOTAL	124

BICYCLE PARKING

REQUIRED

RESIDENCE	- 0.5 PER UNIT (479 UNITS)	240
COMMERCIAL RETAIL	- 1.0 PER 250m² OF G.F.A.	2
TOTAL		242

PROVIDED

EXTERIOR	7
INDOOR ON GROUND FLOOR	132
INDOOR ON P1 & P2 PARKING LEVELS	539
TOTAL	678

AMENITY AREA

PRIVATE AT GRADE	96 sq. m.
EXTERIOR COMMUNAL AT GRADE	2205 sq. m.
1st FLOOR LOBBIES	189 sq. m.
1st FLOOR COMMUNAL AMENITY	366 sq. m.
7th FLOOR COMMUNAL AMENITY	1385 sq. m.
PRIVATE BALCONIES	4312 sq. m.
TOTAL =	8553 sq. m.
TOTAL COMMUNAL =	4145 sq. m.
REQUIRED - 6.0M² PER UNIT (479) =	2,874 sq. m.
REQUIRED COMMUNAL @ 50% =	1,437 sq. m.

1223 Michael Street North, Suite 100 | Ottawa, ON K1J 7T2
P: +1 613.738.4160 | F: +1 613.739.7105 | www.parsons.com

27 June 2023

City of Ottawa
Development Review Services
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: Wally Dubyk

Dear Wally:

Re: 75 Breezehill Ave TIA

Step 3 – Response to City Comments - DRAFT

The following response has been prepared in response to City of Ottawa TIA Forecasting Report comments received on June 20, 2023. City comments are presented in black with the corresponding responses from Parsons in Green.

Section 2.1.2 Existing Conditions:

Area Road Network: Please include the protected ROW for the study area roads per Schedule C16 of the Official Plan.

TIA Report updated.

Existing Study Area Intersections: For the Gladstone Avenue and Breezehill Avenue intersection, as well as the Breezehill Avenue and Laurel Street intersection, please note that a temporary access permit was issued in 2022 by the City of Ottawa ROW group to allow trucks to access the Canadian Bank Note Company via Breezehill Avenue during the Laurel Street and Loretta Avenue N Renewal project.

TIA Report updated.

Existing Driveways to Adjacent Developments: Document adjacent accesses on Loretta Avenue within 200m of the proposed future site access.

TIA Report updated.

Peak Hour Travel Demands: The Breezehill/Gladstone traffic count is eight (8) years old. Please provide more recent data.

New count at Breezehill/Gladstone completed on June 22, 2023.

Section 2.1.3.1 Future Transportation Network Changes:

Note that, as part of the 1040 Somerset St W development, an RMA was approved for a new signalization of the Breezehill Avenue N and Somerset Street W intersection. The new signal includes north-south pedestrian crossings of Somerset Street, a new westbound left-turn lane, and shortening of the existing bike lanes on Somerset Street (western terminus of Somerset Street bike lanes proposed to move approximately 30m to the east).

The signalization of the Breezehill/Somerset intersection has been accounted for in the TIA Report and the Synchro analysis.

Section 2.2 Study Area and Time Periods:

Justify the study area excluding the Bayswater Avenue and Somerset Street intersection and the Bayswater Avenue and Gladstone Avenue intersection. Both these signalized intersections are within 400m of the site.

The expected increases to these intersections based on the site development are very negligible, where Somerset/Bayswater and Gladstone/Bayswater are expected to increase by a maximum of 5 and 7 trips during peak hours.

3.1.1. Trip Generation

Please include the commercial component in the trip generation methodology, for completeness.

The proposed total GFA of the proposed commercial space is very small with an area of 407m². The commercial area is also divided into several commercial units. These units are expected to be utilized mainly by local residents and therefore, will have a negligible impact on the surrounding road network.

Preliminary Site Plan Comments:

Section 5.3 3) of the West Downtown Core Secondary Plan (part of Volume 2A of the Official Plan) states that, "A north-south, Multi-use Pathway shall be provided on the west side of the transit corridor, to continue the route from south of the Queensway bridge to Somerset Street West. It will be developed primarily on privately-owned land and deeded to the City as part of the development application processed. Provision of an easement may be considered in limited cases, if deemed more appropriate. Private property owners will provide a feasibility study, a design, pay for and construct that portion of the pathway that is on or adjacent to their property and deed the property to the City as part of development approval". Therefore, space for the pathway should be provided on private property, which should subsequently be deeded to the City. If the pathway is to be provided on public property on the Line 2 rail corridor, then a detailed justification for this deviation from the secondary plan must be provided, as well as proof that the pathway is feasible on public property from a grading and rail proximity perspective.

Proponent notified. This will be addressed at SPC.

A 2.0m pedestrian clearway made of concrete material should be provided on the Laurel Street frontage. Unit pavers are not the preferred material for the primary pedestrian clearway portion of the sidewalk.

Proponent notified. This will be addressed at SPC.

Depict the sidewalk crossing of the Laurel Street access per SC7.1 or SC13 (continuous concrete sidewalk across the access) in all future site plans and landscape plans.

Proponent notified. This will be addressed at SPC.

Note Section 25 (p) of the Private Approach By-Law with respect to the proximity of the proposed access to the property line.

Proponent notified. This will be addressed at SPC.

An overhead canopy is shown encroaching into the Laurel Street ROW. Please reduce the limits of this overhead canopy to only be within private property.

Proponent notified. This will be addressed at SPC.

The sidewalk on the east side of the internal drive aisle includes a sharp "S-bend". Recommend smoothing-out the internal sidewalk.

Proponent notified. This will be addressed at SPC.

Consider a dedicated access to the proposed bicycle parking areas directly from the new multi-use pathway.

Proponent notified. This will be addressed at SPC.

Traffic Signal Design
No comments for this current circulation.

Traffic Signal Design Unit reserves the right to make future comments based on subsequent submissions.

If there are any future proposed changes in the existing roadway geometry that would require the installation of a pedestrian crossover (Type B or Type C), the signalization of an intersection or modifications to an existing signalized intersection, the City of Ottawa Traffic Signal Design Unit would be required to complete a traffic signal plant design and would need to be engaged in reviews during the functional design stage.

Please contact Jon Pach: at 613-806-0142 or jon.pach@ottawa.ca and Christopher Geen: 613-227-0674 or Christopher.Geen@ottawa.ca to discuss any potential traffic control signal design requirements.

Noted

Traffic Engineering
The intersection of Somerset Street & Breezehill Avenue is proposed to be signalised in the future.

This has been accounted for in the TIA Report and the Synchro analysis.

Appendix B:

Transit Route Maps

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11 Fréquent

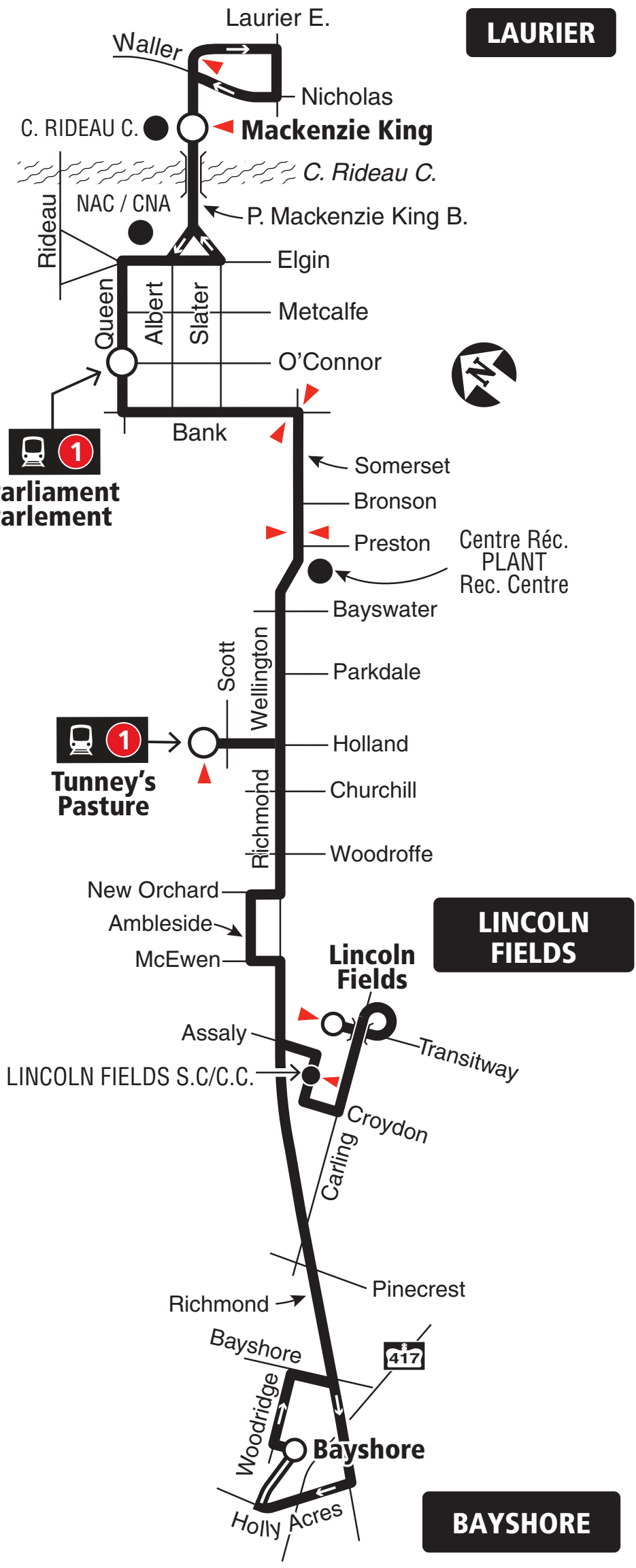
LINCOLN FIELDS BAYSHORE

LAURIER

7 days a week / 7 jours par semaine

All day service

Service toute la journée



12.2023

Transitway & Station

Timepoint / Heures de passage

12.2023

Schedule / Horaire 613-560-1000

Text / Texto* 560560

plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service
Service à la clientèle **613-560-5000**

Lost and Found / Objets perdus.....**613-563-4011**

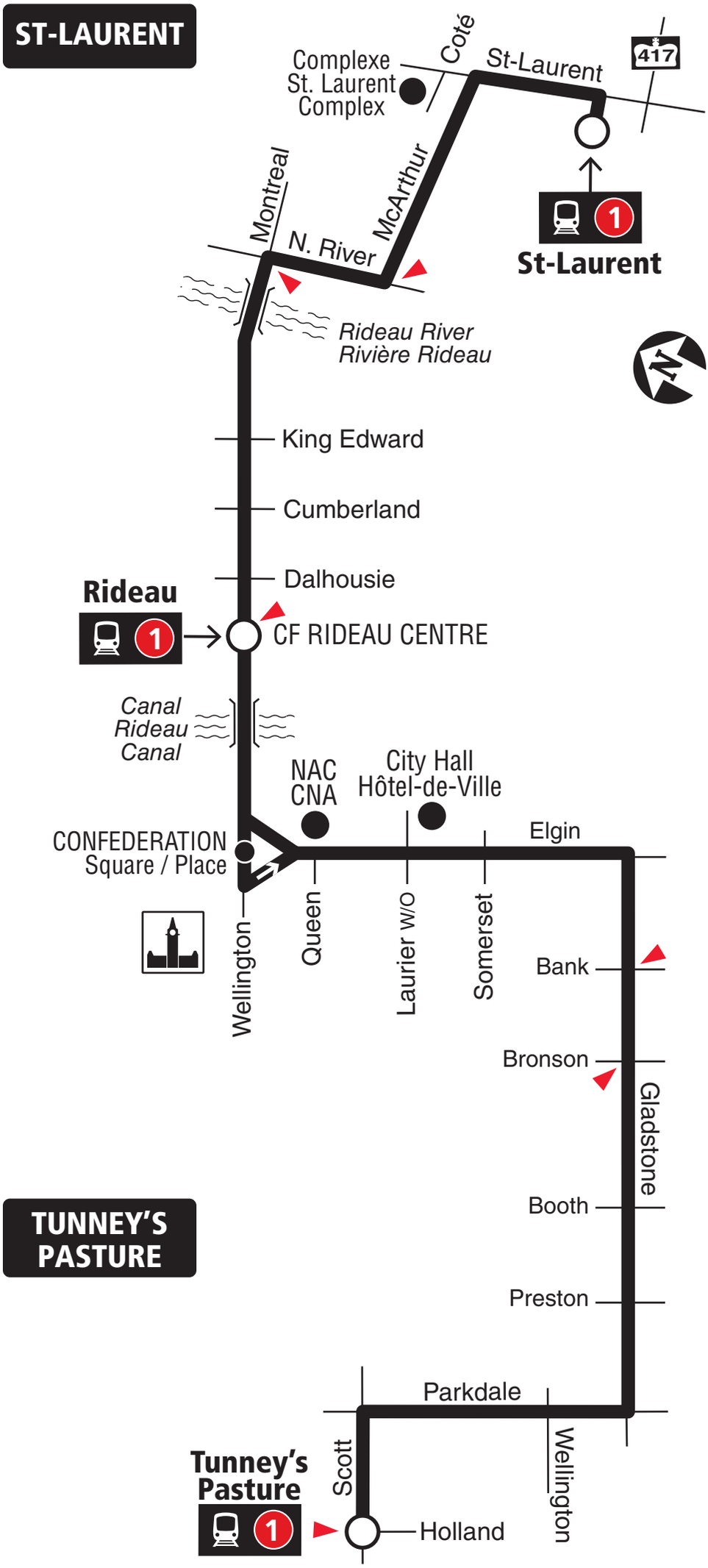
Security / Sécurité **613-741-2478**

Effective December 24, 2023

En vigueur 24 décembre 2023

OC Transpo

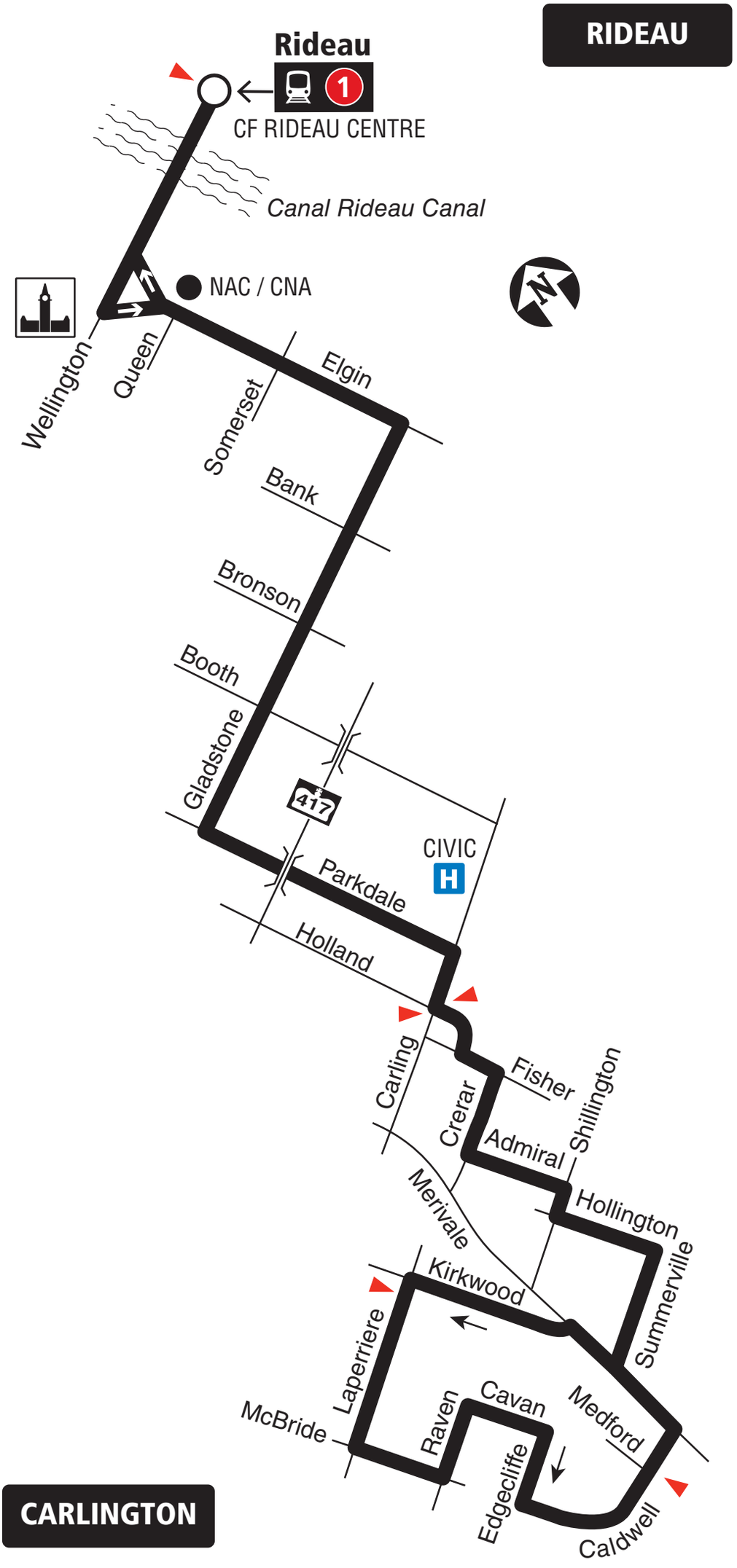
INFO 613-560-5000
octranspo.com



Station

Timepoint / Heures de passage

2020.09



Station

Timepoint / Heures de passage

2020.08

Appendix C:

Traffic Data

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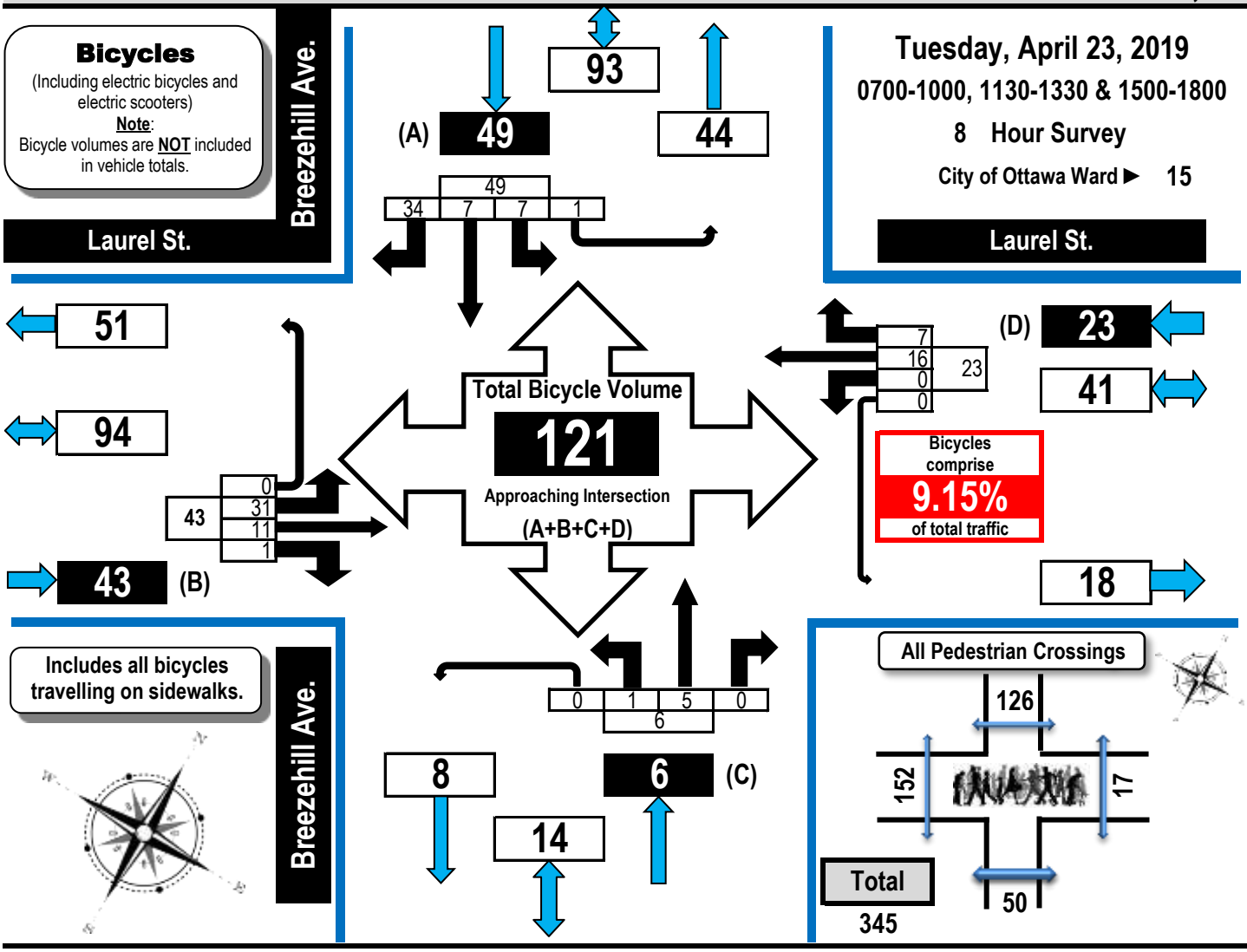
Turning Movement Count
Bicycle Summary
Flow Diagram

Breezehill Avenue & Laurel Street — Ottawa, ON

Bicycles
(Including electric bicycles and electric scooters)
Note: Bicycle volumes are NOT included in vehicle totals.

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15



	Laurel St. Eastbound					Laurel St. Westbound					Breezehill Ave. Northbound					Breezehill Ave. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	6	1	0	0	7	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	10
0800-0900	15	6	1	0	22	0	2	1	0	3	0	1	0	0	1	1	0	0	1	2	28
0900-1000	4	1	0	0	5	0	2	0	0	2	0	0	0	0	0	2	0	0	0	2	9
1130-1230	1	1	0	0	2	0	1	1	0	2	0	1	0	0	1	0	0	0	0	0	5
1230-1330	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	4
1500-1600	3	2	0	0	5	0	3	2	0	5	0	0	0	0	0	2	1	11	0	14	24
1600-1700	1	0	0	0	1	0	4	1	0	5	0	1	0	0	1	0	2	14	0	16	23
1700-1800	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	4	9	0	13	18
Totals	31	11	1	0	43	0	16	7	0	23	1	5	0	0	6	7	7	34	1	49	121

Comments:

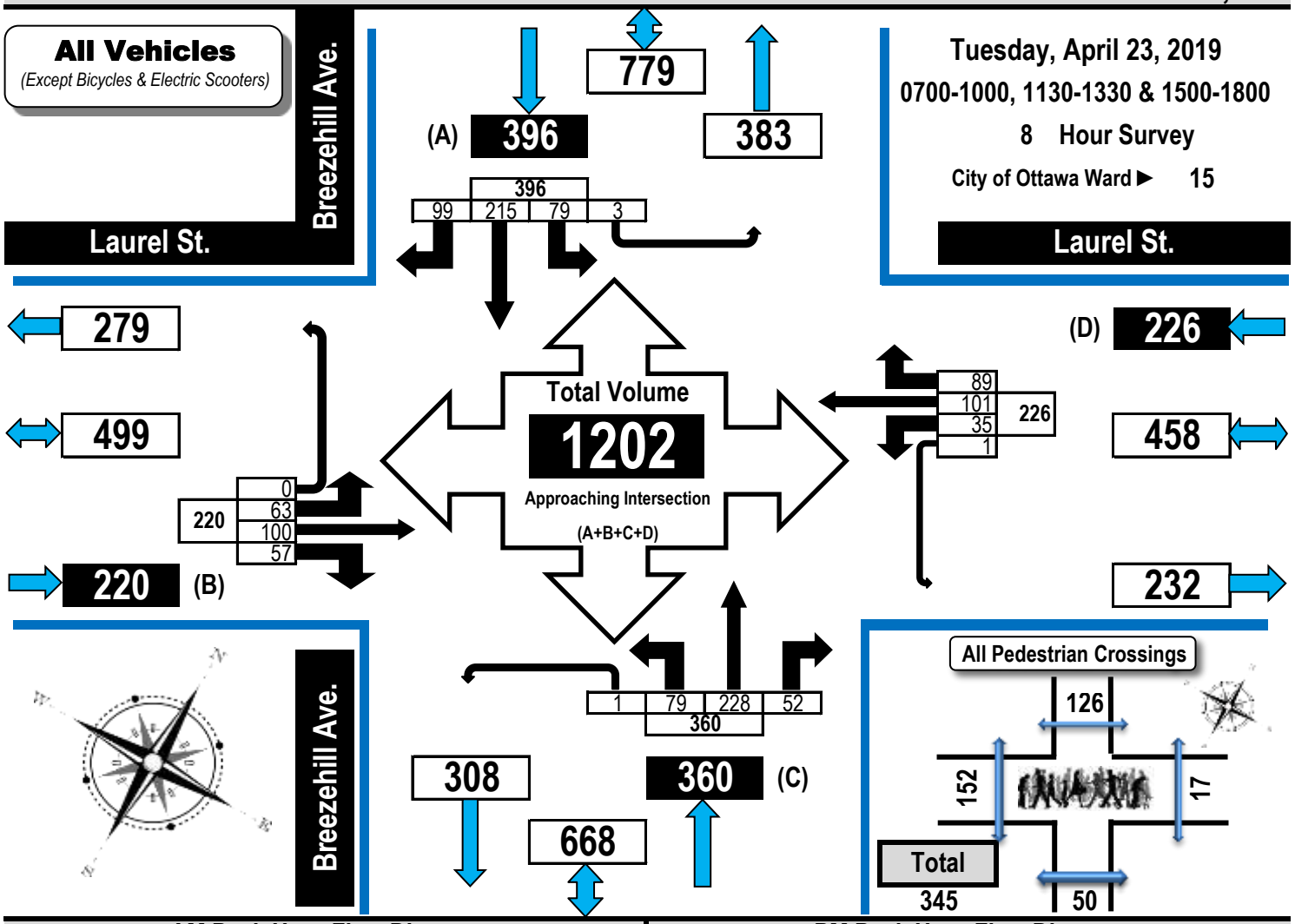
A cedar hedge growing along the property frontage on the southwest quadrant is creating a serious sightline problem. The majority of the cyclists as well as some drivers ignore the all-way stop control. Vehicles parked too close to the intersection on both Laurel Street, east of Breezehill Avenue and Breezehill Avenue, south of Laurel Street create a sightline problem. School buses comprise 8.16% of the heavy vehicle traffic.

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

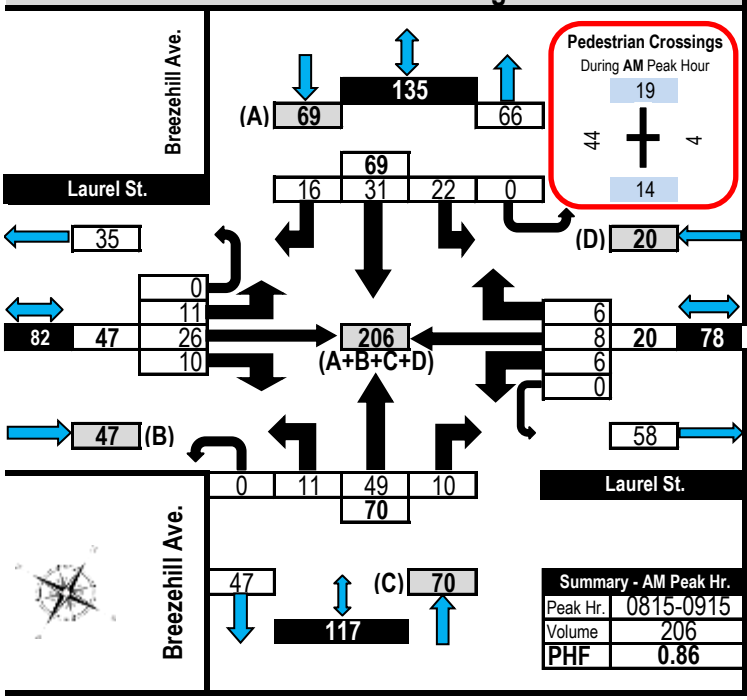
Breezehill Avenue & Laurel Street — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15

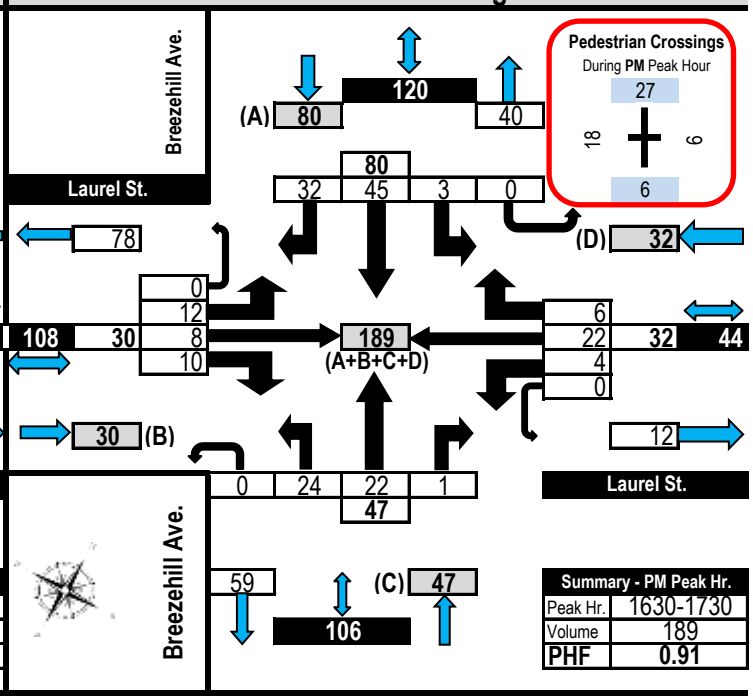


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0815-0915
Volume	206
PHF	0.86

PM Peak Hour Flow Diagram



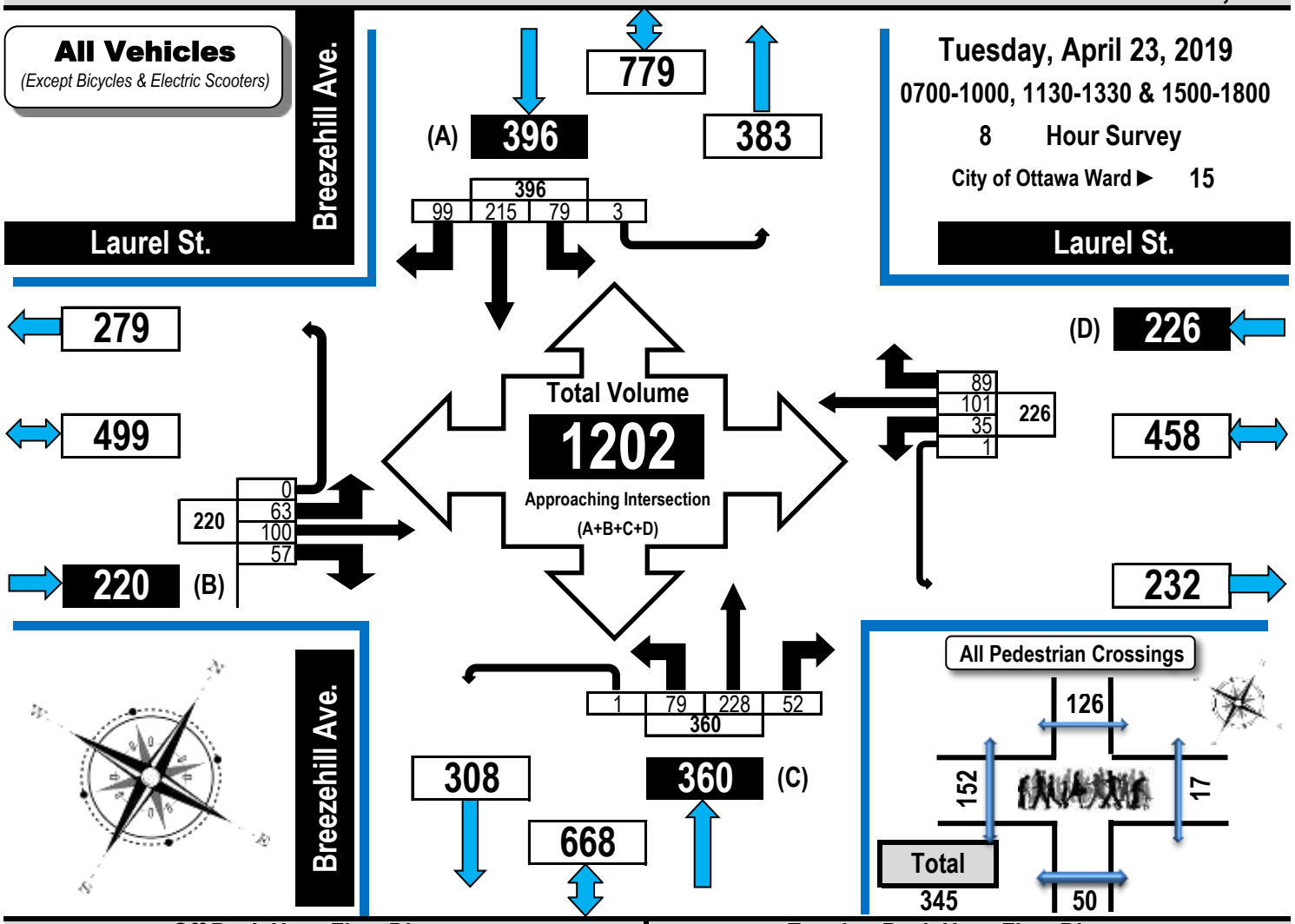
Summary - PM Peak Hr.	
Peak Hr.	1630-1730
Volume	189
PHF	0.91

Turning Movement Count
Summary, OFF and EVENING Peak Hour Flow Diagrams
All Vehicles Except Bicycles

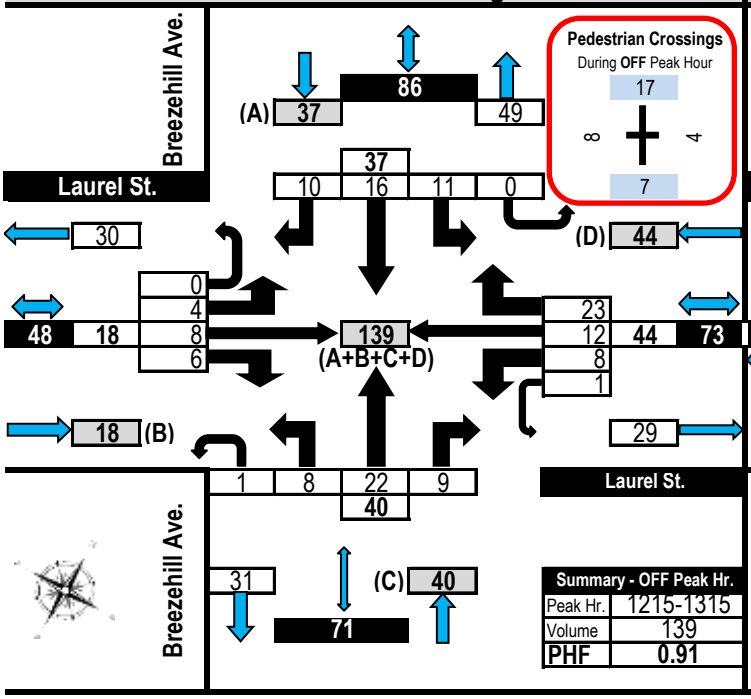
Breezehill Avenue & Laurel Street — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15

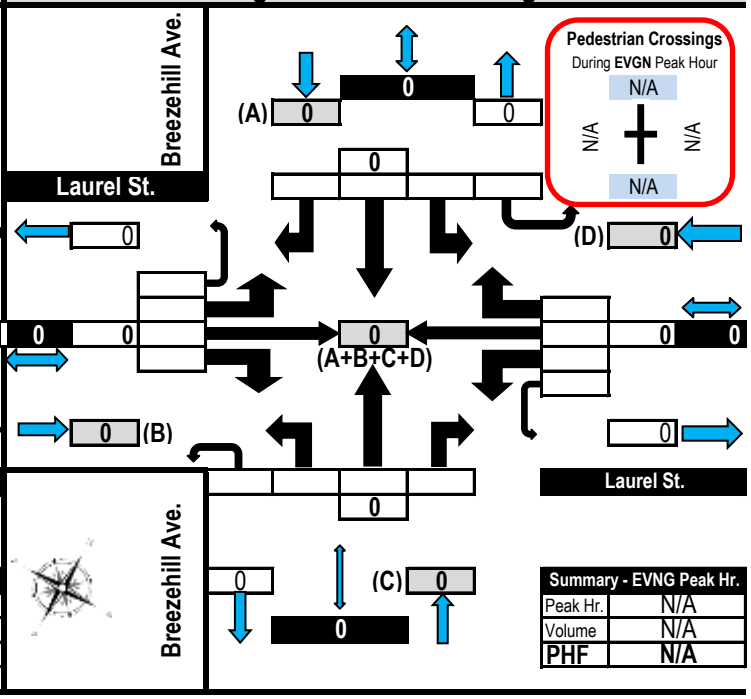


Off Peak Hour Flow Diagram



Summary - OFF Peak Hr.	
Peak Hr.	1215-1315
Volume	139
PHF	0.91

Evening Peak Hour Flow Diagram



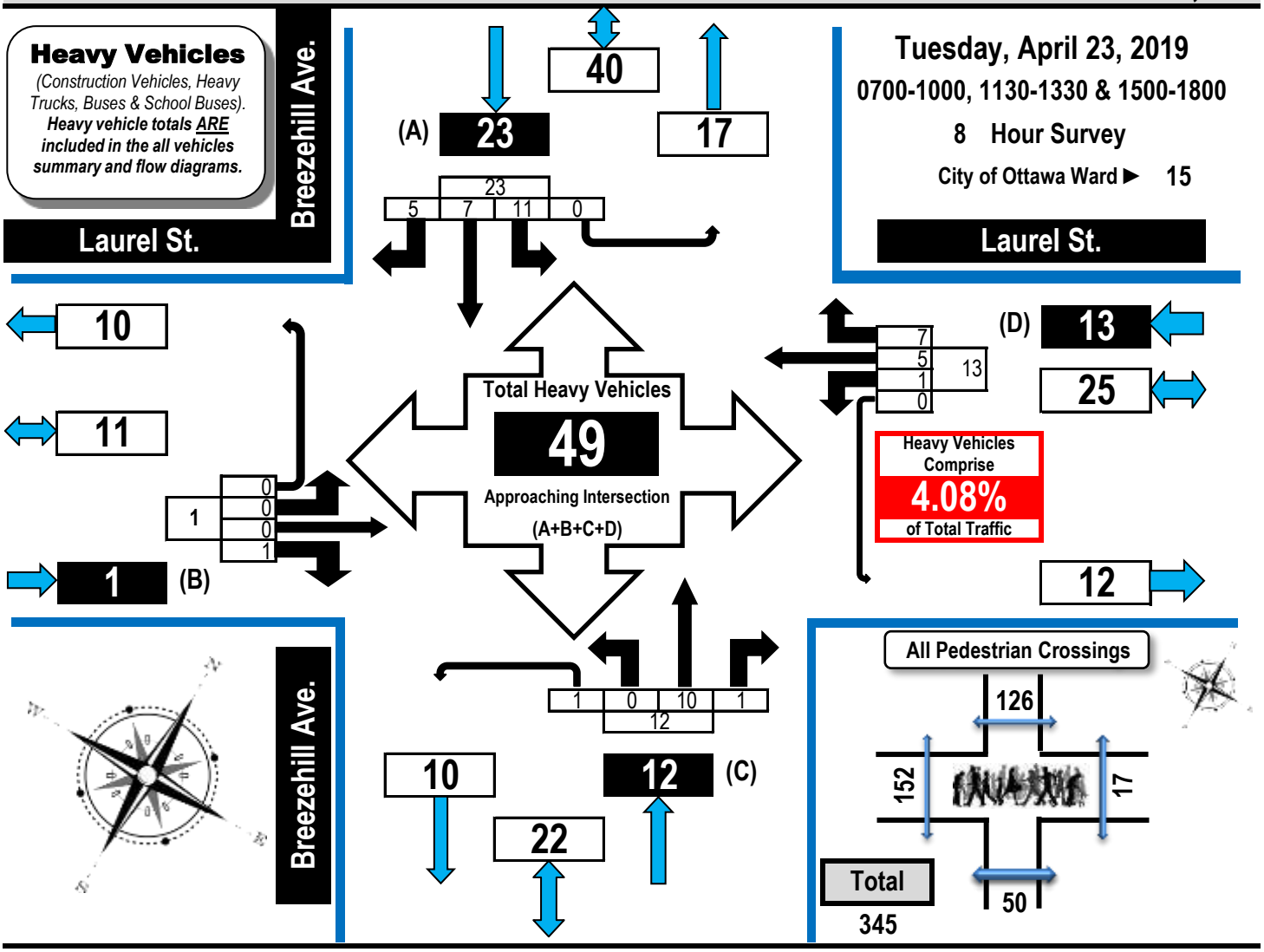
Summary - EVNG Peak Hr.	
Peak Hr.	N/A
Volume	N/A
PHF	N/A

Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Breezehill Avenue & Laurel Street — **Ottawa, ON**

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15



	Laurel St. Eastbound					Laurel St. Westbound					Breezehill Ave. Northbound					Breezehill Ave. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2	0	0	0	2	4
0800-0900	0	0	0	0	0	0	0	3	0	3	0	0	1	0	1	3	0	3	0	6	10
0900-1000	0	0	1	0	1	1	2	1	0	4	0	4	0	0	4	2	2	1	0	5	14
1130-1230	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	1	3	0	0	4	6
1230-1330	0	0	0	0	0	0	0	1	0	1	0	2	0	1	3	0	0	0	0	0	4
1500-1600	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	1	0	1	0	2	4
1600-1700	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	3
1700-1800	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	1	1	0	0	2	4
Totals	0	0	1	0	1	1	5	7	0	13	0	10	1	1	12	11	7	5	0	23	49

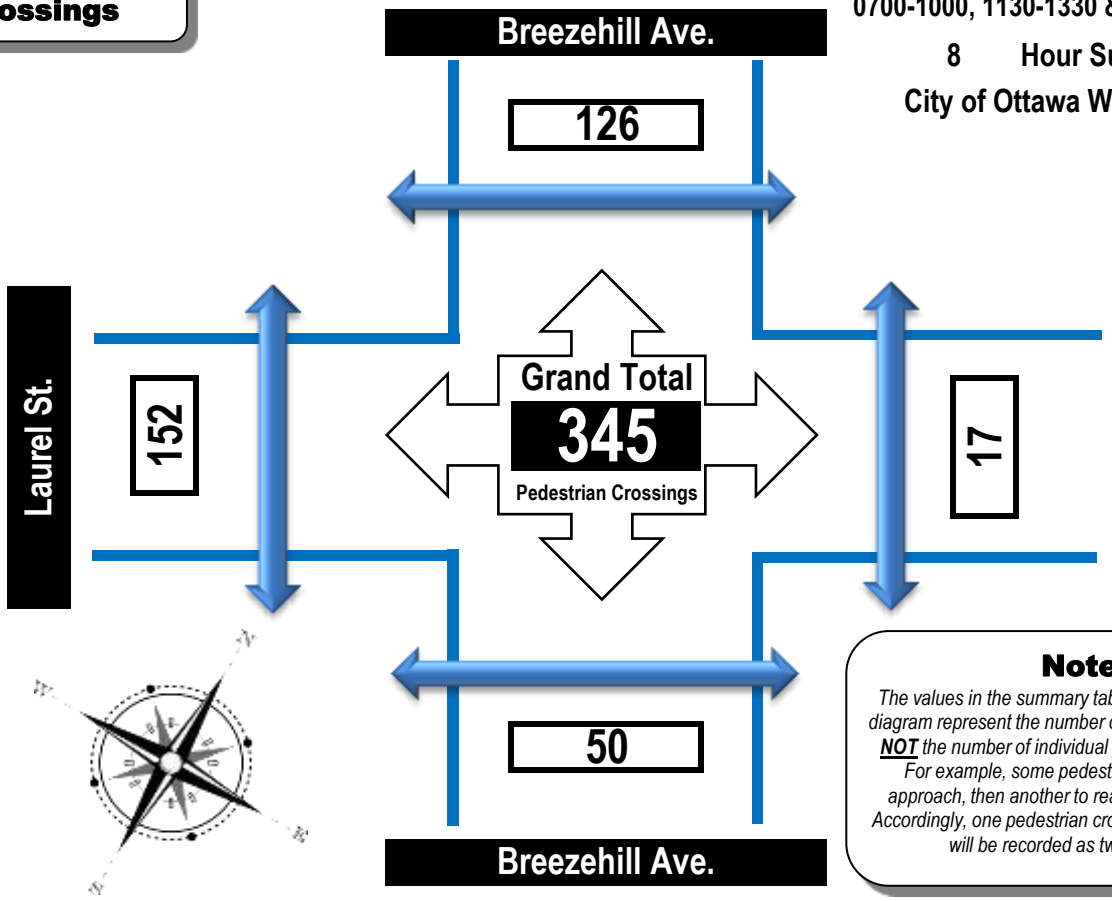
Comments:
A cedar hedge growing along the property frontage on the southwest quadrant is creating a serious sightline problem. The majority of the cyclists as well as some drivers ignore the all-way stop control. Vehicles parked too close to the intersection on both Laurel Street, east of Breezehill Avenue and Breezehill Avenue, south of Laurel Street create a sightline problem. School buses comprise 8.16% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Breezehill Avenue & Laurel Street — Ottawa, ON

Pedestrian Crossings

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15



Note
*The values in the summary table below and the flow diagram represent the number of pedestrian crossings **NOT** the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing Laurel St.	East Side Crossing Laurel St.	Street Total	South Side Crossing Breezehill Ave.	North Side Crossing Breezehill Ave.	Street Total	Grand Total
0700-0800	5	1	6	3	8	11	17
0800-0900	54	4	58	14	18	32	90
0900-1000	2	0	2	0	4	4	6
1130-1230	11	3	14	6	22	28	42
1230-1330	3	2	5	6	7	13	18
1500-1600	50	0	50	12	23	35	85
1600-1700	12	1	13	2	22	24	37
1700-1800	15	6	21	7	22	29	50
Totals	152	17	169	50	126	176	345

Comments:
A cedar hedge growing along the property frontage on the southwest quadrant is creating a serious sightline problem. The majority of the cyclists as well as some drivers ignore the all-way stop control. Vehicles parked too close to the intersection on both Laurel Street, east of Breezehill Avenue and Breezehill Avenue, south of Laurel Street create a sightline problem. School buses comprise 8.16% of the heavy vehicle traffic.

Turning Movement Count

Summary Report Including Peak Hours, AADT and Expansion Factors

All Vehicles Except Bicycles

Breezehill Avenue & Laurel Street — Ottawa, ON

Survey Date: Tuesday, April 23, 2019 **Start Time:** 0700 **AADT Factor:** 0.7

Weather AM: Partly Cloudy +10º C **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

Weather PM: Overcast + 17º C **Surveyor(s):** T. Carmody

Time Period	Laurel St. Eastbound LT	ST	RT	UT	E/B Tot	Laurel St. Westbound LT	ST	RT	UT	W/B Tot	Street Total	Breezehill Ave. Northbound LT	ST	RT	UT	N/B Tot	Breezehill Ave. Southbound LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	4	16	4	0	**24**	2	5	7	0	**14**	**38**	7	26	7	0	**40**	10	17	2	0	**29**	**69**	**107**
0800-0900	12	19	5	0	**36**	6	8	11	0	**25**	**61**	12	44	9	0	**65**	15	36	18	0	**69**	**134**	**195**
0900-1000	12	19	11	0	**42**	4	11	10	0	**25**	**67**	4	39	8	0	**51**	14	21	9	0	**44**	**95**	**162**
1130-1230	6	14	5	0	**25**	5	10	17	0	**32**	**57**	6	15	3	0	**24**	10	25	6	2	**43**	**67**	**124**
1230-1330	4	5	5	0	**14**	6	11	16	1	**34**	**48**	5	25	16	1	**47**	13	17	10	1	**41**	**88**	**136**
1500-1600	4	9	12	0	**25**	6	19	16	0	**41**	**66**	14	29	6	0	**49**	8	29	8	0	**45**	**94**	**160**
1600-1700	12	11	10	0	**33**	4	19	7	0	**30**	**63**	9	27	0	0	**36**	6	33	18	0	**57**	**93**	**156**
1700-1800	9	7	5	0	**21**	2	18	5	0	**25**	**46**	22	23	3	0	**48**	3	37	28	0	**68**	**116**	**162**
Totals	**63**	**100**	**57**	**0**	**220**	**35**	**101**	**89**	**1**	**226**	**446**	**79**	**228**	**52**	**1**	**360**	**79**	**215**	**99**	**3**	**396**	**756**	**1202**

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39																							
Equ. 12 Hr	88	139	79	0	**306**	49	140	124	1	**314**	**620**	110	317	72	1	**500**	110	299	138	4	**550**	**1051**	**1671**
Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.7																							
AADT 12-hr	61	97	55	0	**214**	34	98	87	1	**220**	**434**	77	222	51	1	**350**	77	209	96	3	**385**	**736**	**1170**
24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31																							
AADT 24 Hr	80	127	73	0	**280**	45	129	113	1	**288**	**568**	101	291	66	1	**459**	101	274	126	4	**505**	**964**	**1532**

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.86												Highest Hourly Vehicle Volume Between 0700h & 1000h											
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0815-0915	11	26	10	0	**47**	6	8	6	0	**20**	**67**	11	49	10	0	**70**	22	31	16	0	**69**	**139**	**206**
OFF Peak Hour Factor ➡ 0.91												**Highest Hourly Vehicle Volume Between 1130h & 1330h**											
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1215-1315	4	8	6	0	**18**	8	12	23	1	**44**	**62**	8	22	9	1	**40**	11	16	10	0	**37**	**77**	**139**
PM Peak Hour Factor ➡ 0.91												**Highest Hourly Vehicle Volume Between 1500h & 1800h**											
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1630-1730	12	8	10	0	**30**	4	22	6	0	**32**	**62**	24	22	1	0	**47**	3	45	32	0	**80**	**127**	**189**

Comments:

A cedar hedge growing along the property frontage on the southwest quadrant is creating a serious sightline problem. The majority of the cyclists as well as some drivers ignore the all-way stop control. Vehicles parked too close to the intersection on both Laurel Street, east of Breezehill Avenue and Breezehill Avenue, south of Laurel Street create a sightline problem. School buses comprise 8.16% of the heavy vehicle traffic.

Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Transportation Services - Traffic Services

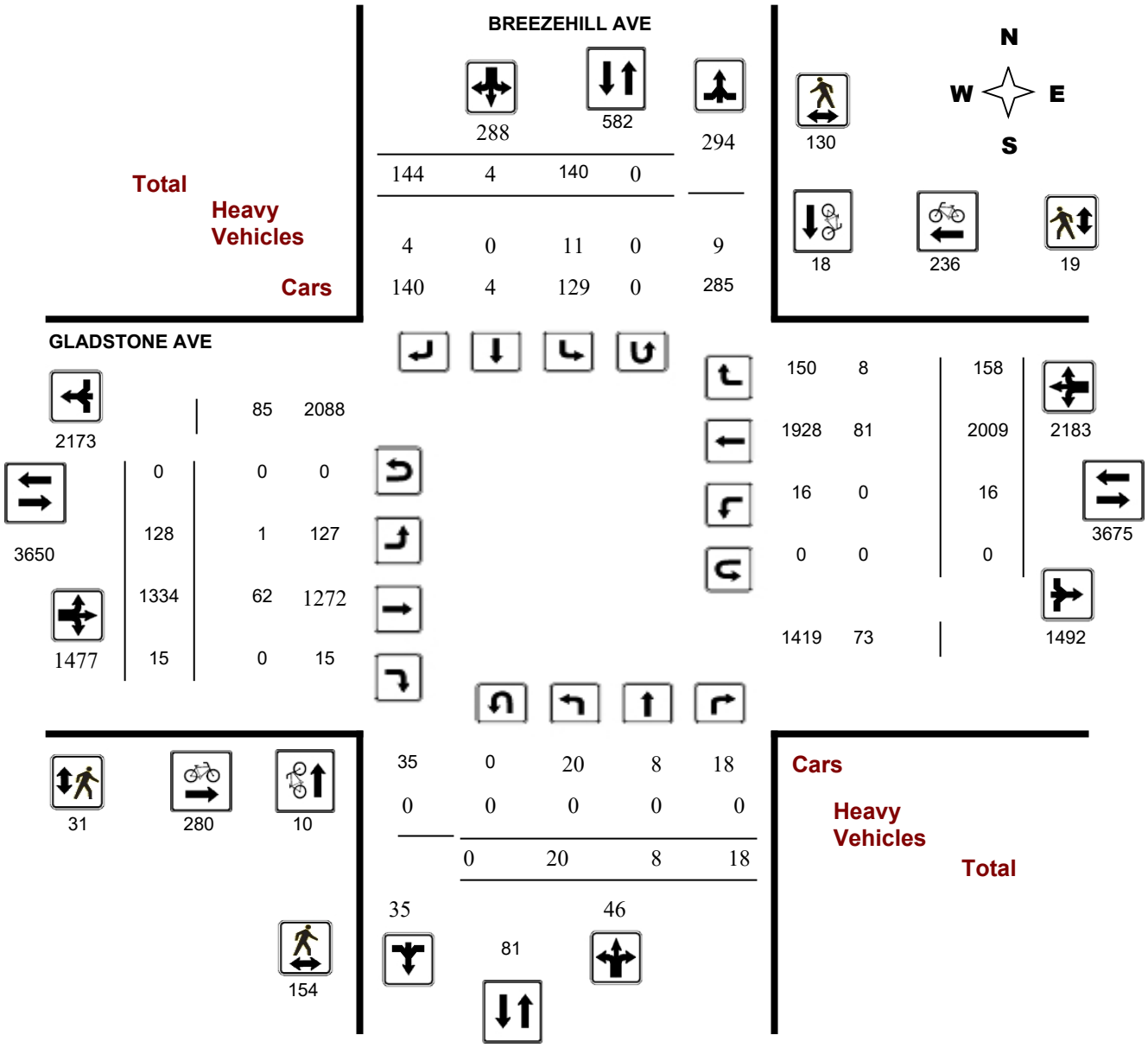
Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

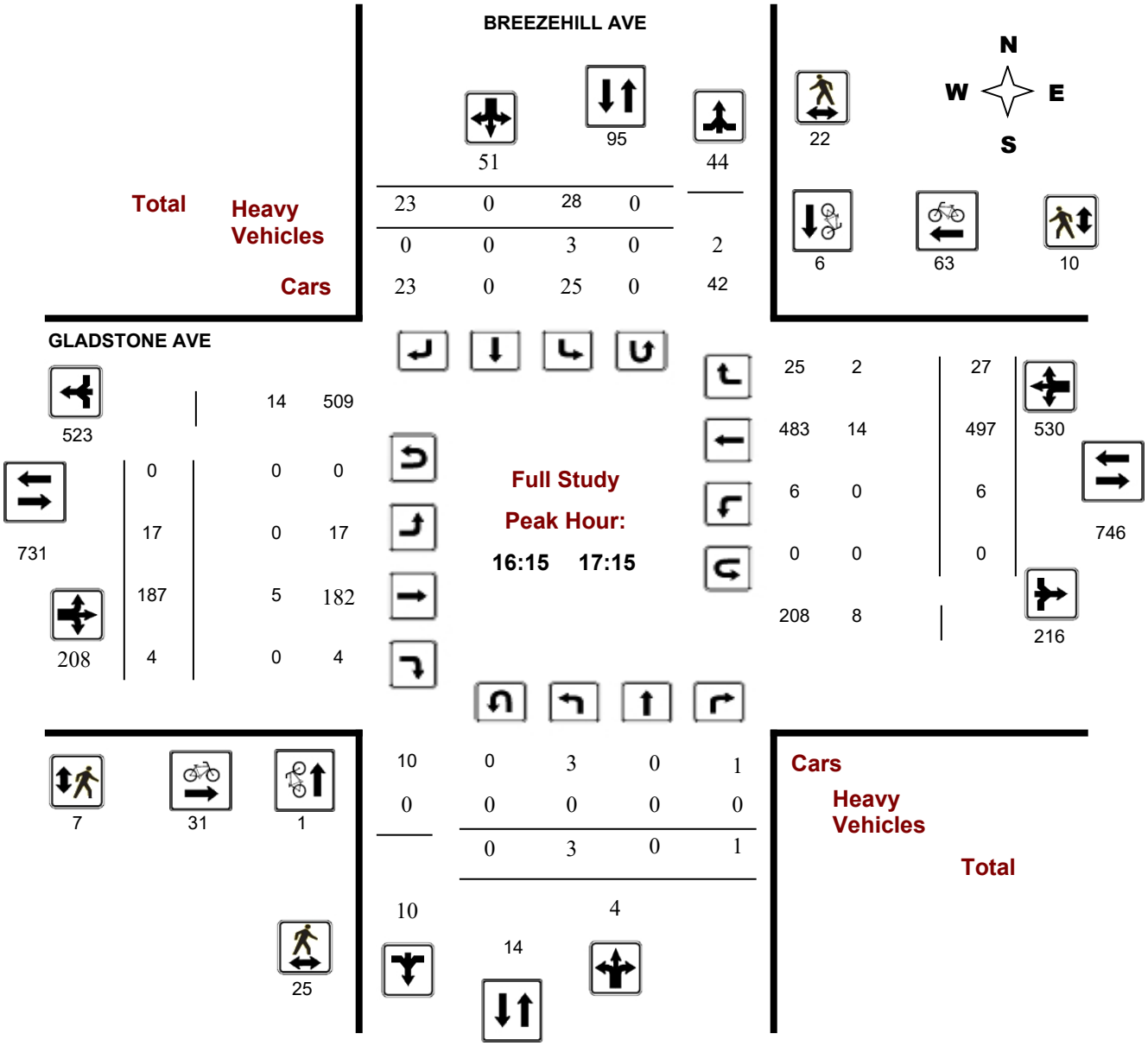
Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



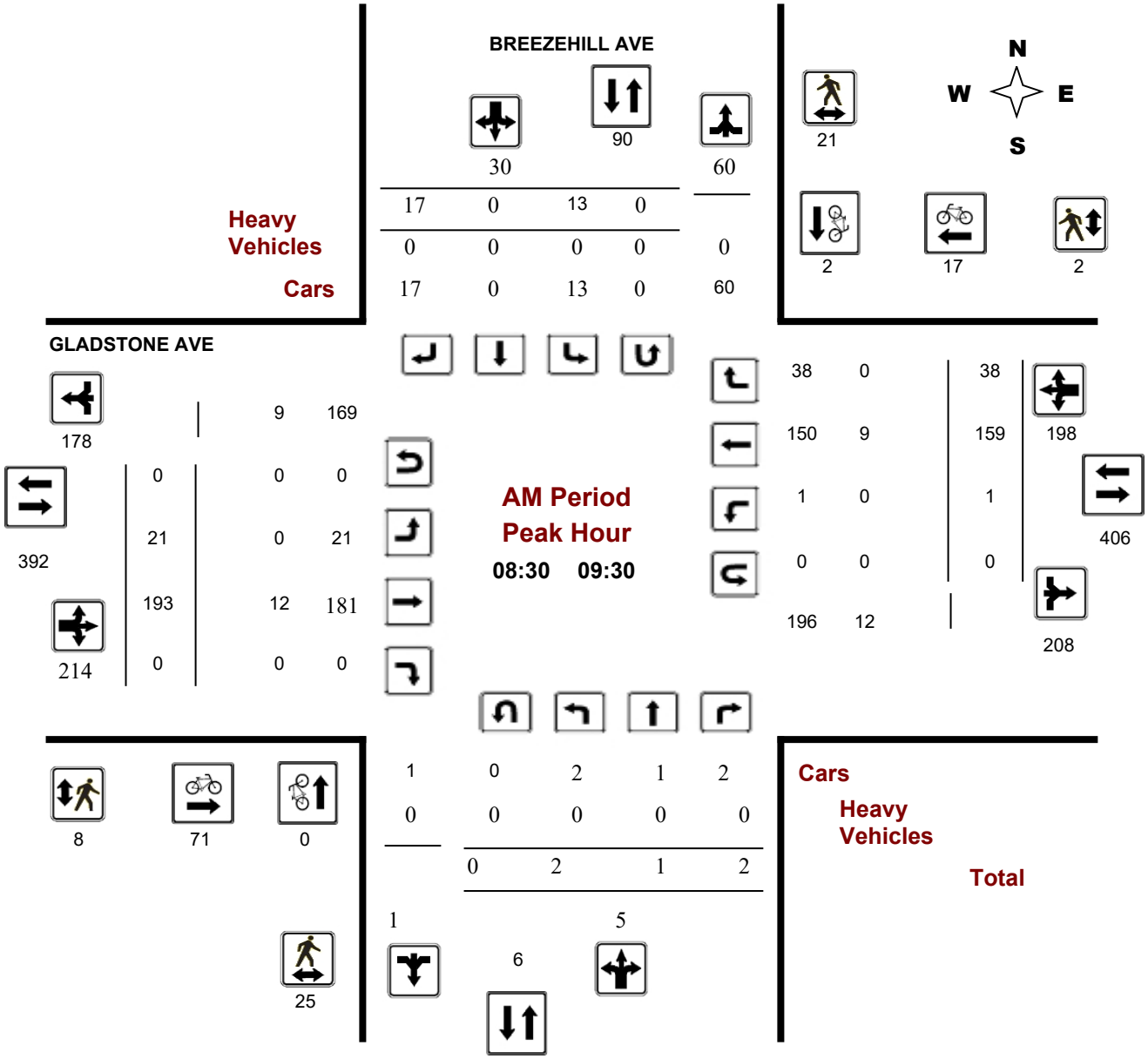
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision



Comments

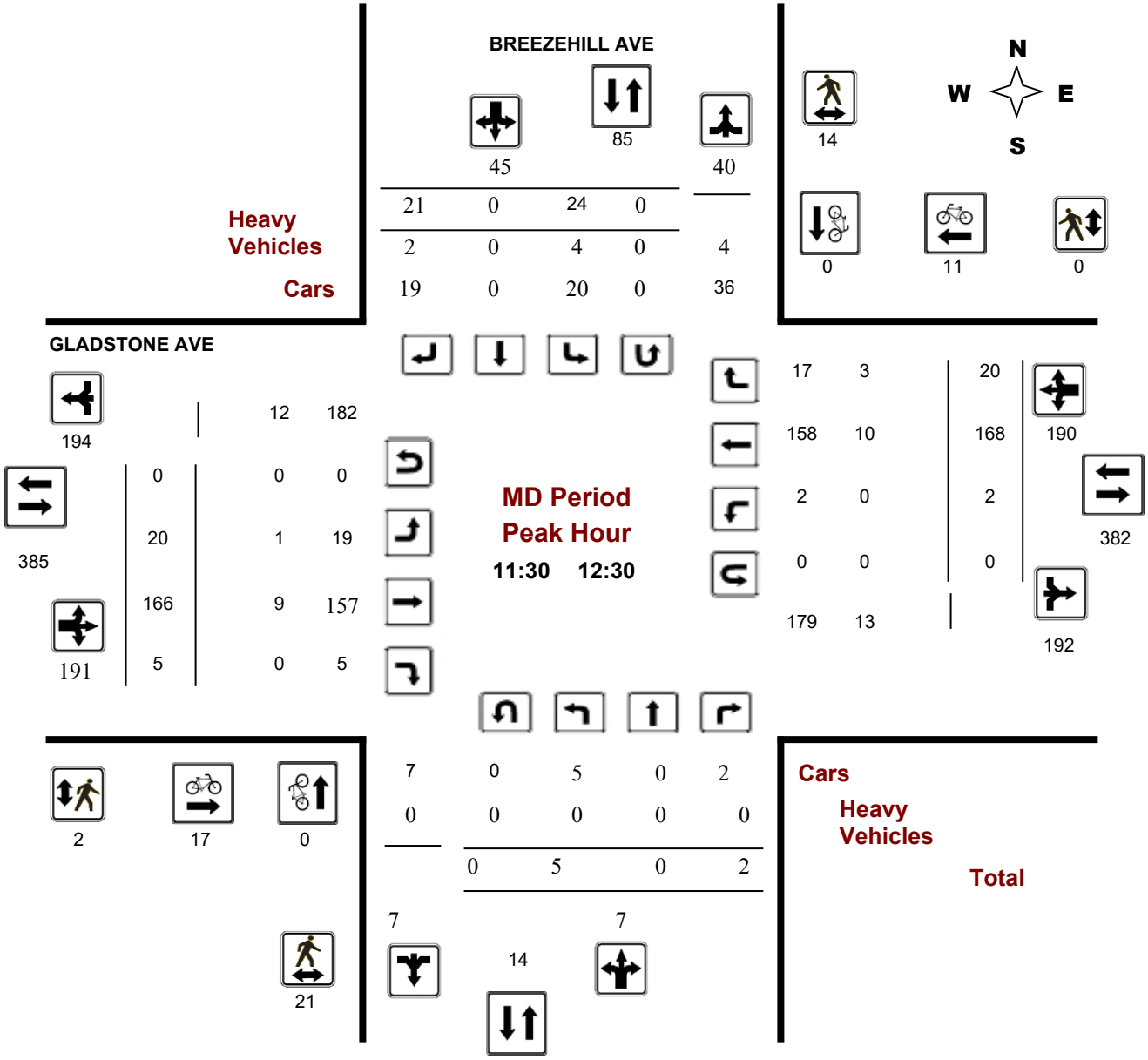
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision



Comments

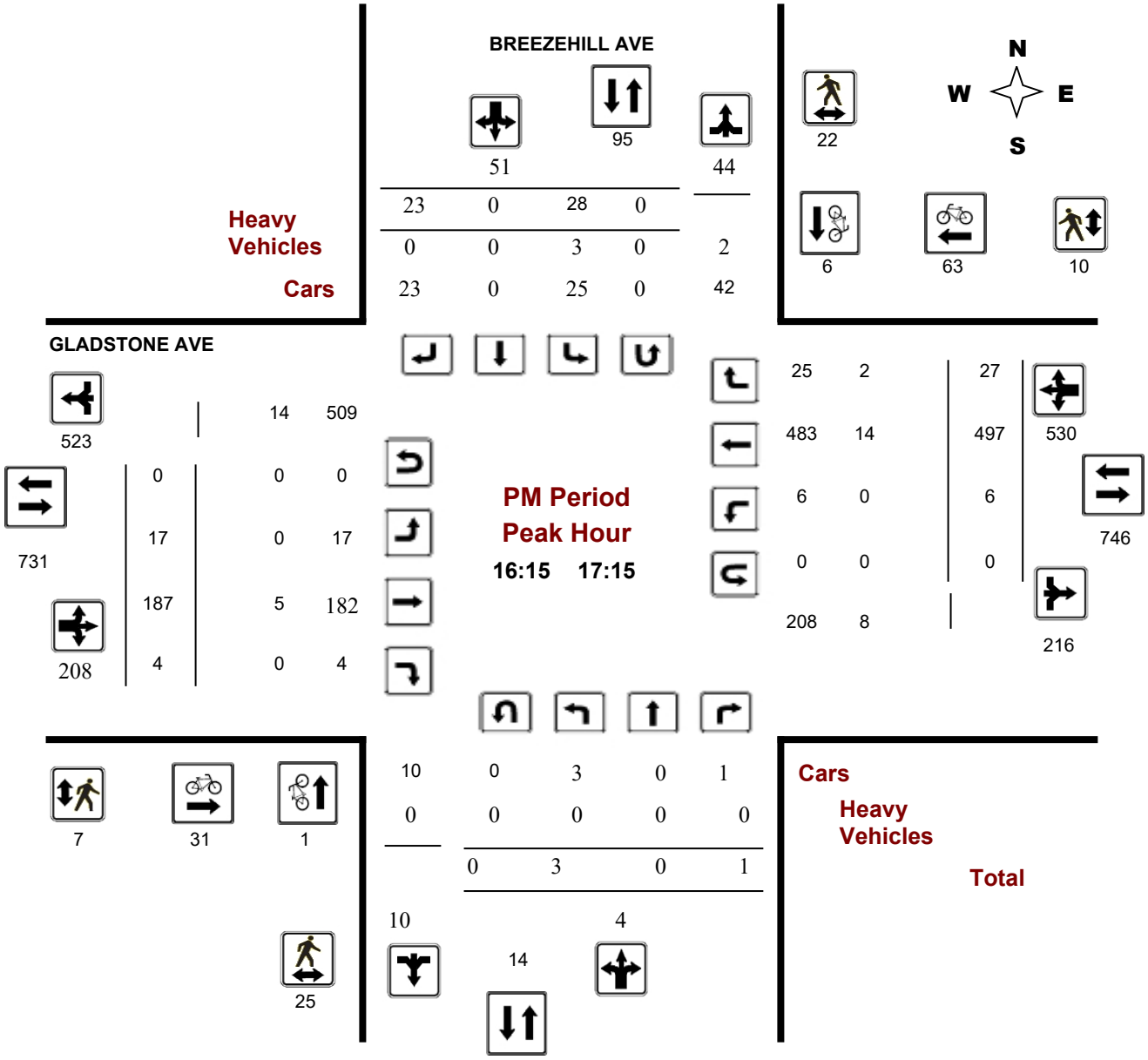
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, July 18, 2018

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

.90

	BREEZEHILL AVE									GLADSTONE AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	1	2	**3**	8	1	10	**19**	**22**	17	132	0	**149**	0	101	16	**117**	**266**	**288**
08:00 09:00	1	1	3	**5**	10	0	20	**30**	**35**	23	202	0	**225**	1	156	27	**184**	**409**	**444**
09:00 10:00	3	1	1	**5**	22	0	20	**42**	**47**	24	157	0	**181**	2	143	32	**177**	**358**	**405**
11:30 12:30	5	0	2	**7**	24	0	21	**45**	**52**	20	166	5	**191**	2	168	20	**190**	**381**	**433**
12:30 13:30	1	2	3	**6**	17	2	15	**34**	**40**	13	157	1	**171**	2	175	9	**186**	**357**	**397**
15:00 16:00	4	3	3	**10**	18	0	20	**38**	**48**	8	164	1	**173**	0	347	16	**363**	**536**	**584**
16:00 17:00	1	0	1	**2**	25	0	24	**49**	**51**	17	199	5	**221**	3	478	24	**505**	**726**	**777**
17:00 18:00	5	0	3	**8**	16	1	14	**31**	**39**	6	157	3	**166**	6	441	14	**461**	**627**	**666**
Sub Total	20	8	18	**46**	140	4	144	**288**	**334**	128	1334	15	**1477**	16	2009	158	**2183**	**3660**	**3994**
U Turns	0			**0**	0			**0**	**0**	**0**			**0**	0			**0**	**0**	**0**
Total	20	8	18	**46**	140	4	144	**288**	**334**	128	1334	15	**1477**	16	2009	158	**2183**	**3660**	**3994**
EQ 12Hr	28	11	25	**64**	195	6	200	**401**	**465**	178	1854	21	**2053**	22	2793	220	**3035**	**5088**	**5553**

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr	25	10	22	**57**	176	5	180	**361**	**418**	160	1669	19	**1848**	20	2514	198	**2732**	**4580**	**4998**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr	33	13	29	**75**	231	7	236	**474**	**549**	210	2186	25	**2421**	26	3293	259	**3578**	**5999**	**6548**

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		BREEZEHILL AVE									GLADSTONE AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	0	2	0	1	3	**3**	3	32	0	35	0	18	2	20	**55**	**58**
07:15	07:30	0	0	0	0	1	0	3	4	**4**	4	28	0	32	0	30	8	38	**70**	**74**
07:30	07:45	0	1	1	2	0	0	3	3	**5**	3	36	0	39	0	18	4	22	**61**	**66**
07:45	08:00	0	0	1	1	5	1	3	9	**10**	7	36	0	43	0	35	2	37	**80**	**90**
08:00	08:15	0	0	1	1	4	0	4	8	**9**	4	40	0	44	0	30	4	34	**78**	**87**
08:15	08:30	0	0	1	1	1	0	7	8	**9**	10	49	0	59	0	40	8	48	**107**	**116**
08:30	08:45	1	1	0	2	3	0	8	11	**13**	4	53	0	57	0	42	7	49	**106**	**119**
08:45	09:00	0	0	1	1	2	0	1	3	**4**	5	60	0	65	1	44	8	53	**118**	**122**
09:00	09:15	1	0	1	2	2	0	2	4	**6**	4	38	0	42	0	27	14	41	**83**	**89**
09:15	09:30	0	0	0	0	6	0	6	12	**12**	8	42	0	50	0	46	9	55	**105**	**117**
09:30	09:45	0	0	0	0	9	0	7	16	**16**	3	35	0	38	2	38	8	48	**86**	**102**
09:45	10:00	2	1	0	3	5	0	5	10	**13**	9	42	0	51	0	32	1	33	**84**	**97**
11:30	11:45	2	0	1	3	5	0	5	10	**13**	3	44	0	47	1	39	4	44	**91**	**104**
11:45	12:00	1	0	0	1	7	0	4	11	**12**	9	43	1	53	1	39	2	42	**95**	**107**
12:00	12:15	1	0	0	1	7	0	7	14	**15**	7	40	1	48	0	42	6	48	**96**	**111**
12:15	12:30	1	0	1	2	5	0	5	10	**12**	1	39	3	43	0	48	8	56	**99**	**111**
12:30	12:45	0	1	0	1	8	0	3	11	**12**	5	36	0	41	0	37	4	41	**82**	**94**
12:45	13:00	0	1	3	4	5	1	5	11	**15**	5	37	0	42	1	31	1	33	**75**	**90**
13:00	13:15	0	0	0	0	2	0	4	6	**6**	2	45	0	47	0	49	2	51	**98**	**104**
13:15	13:30	1	0	0	1	2	1	3	6	**7**	1	39	1	41	1	58	2	61	**102**	**109**
15:00	15:15	2	1	0	3	2	0	6	8	**11**	2	43	1	46	0	67	5	72	**118**	**129**
15:15	15:30	1	1	1	3	4	0	3	7	**10**	0	37	0	37	0	87	4	91	**128**	**138**
15:30	15:45	1	1	0	2	7	0	4	11	**13**	2	39	0	41	0	88	2	90	**131**	**144**
15:45	16:00	0	0	2	2	5	0	7	12	**14**	4	45	0	49	0	105	5	110	**159**	**173**
16:00	16:15	0	0	0	0	2	0	6	8	**8**	4	56	1	61	0	103	5	108	**169**	**177**
16:15	16:30	1	0	1	2	10	0	10	20	**22**	2	56	2	60	2	124	5	131	**191**	**213**
16:30	16:45	0	0	0	0	6	0	2	8	**8**	8	46	2	56	0	118	9	127	**183**	**191**
16:45	17:00	0	0	0	0	7	0	6	13	**13**	3	41	0	44	1	133	5	139	**183**	**196**
17:00	17:15	2	0	0	2	5	0	5	10	**12**	4	44	0	48	3	122	8	133	**181**	**193**
17:15	17:30	1	0	2	3	4	1	2	7	**10**	0	49	1	50	2	112	3	117	**167**	**177**
17:30	17:45	2	0	1	3	1	0	6	7	**10**	2	34	2	38	1	114	2	117	**155**	**165**
17:45	18:00	0	0	0	0	6	0	1	7	**7**	0	30	0	30	0	93	1	94	**124**	**131**
Total:		20	8	18	46	140	4	144	288	**334**	128	1334	15	1477	16	2009	158	2183	**334**	**3,994**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		BREEZEHILL AVE			GLADSTONE AVE			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	11	2	**13**	**13**
07:15	07:30	1	0	**1**	7	4	**11**	**12**
07:30	07:45	1	1	**2**	13	8	**21**	**23**
07:45	08:00	2	0	**2**	8	9	**17**	**19**
08:00	08:15	2	1	**3**	24	7	**31**	**34**
08:15	08:30	0	0	**0**	19	4	**23**	**23**
08:30	08:45	0	0	**0**	36	2	**38**	**38**
08:45	09:00	0	1	**1**	19	2	**21**	**22**
09:00	09:15	0	1	**1**	14	6	**20**	**21**
09:15	09:30	0	0	**0**	2	7	**9**	**9**
09:30	09:45	0	0	**0**	7	5	**12**	**12**
09:45	10:00	0	0	**0**	6	6	**12**	**12**
11:30	11:45	0	0	**0**	3	1	**4**	**4**
11:45	12:00	0	0	**0**	3	4	**7**	**7**
12:00	12:15	0	0	**0**	7	1	**8**	**8**
12:15	12:30	0	0	**0**	4	5	**9**	**9**
12:30	12:45	0	0	**0**	2	2	**4**	**4**
12:45	13:00	0	0	**0**	1	2	**3**	**3**
13:00	13:15	0	1	**1**	3	2	**5**	**6**
13:15	13:30	0	1	**1**	1	4	**5**	**6**
15:00	15:15	1	2	**3**	3	9	**12**	**15**
15:15	15:30	0	0	**0**	9	6	**15**	**15**
15:30	15:45	0	1	**1**	10	11	**21**	**22**
15:45	16:00	0	0	**0**	4	7	**11**	**11**
16:00	16:15	0	0	**0**	4	7	**11**	**11**
16:15	16:30	0	0	**0**	10	10	**20**	**20**
16:30	16:45	1	0	**1**	8	18	**26**	**27**
16:45	17:00	0	3	**3**	6	14	**20**	**23**
17:00	17:15	0	3	**3**	7	21	**28**	**31**
17:15	17:30	2	3	**5**	9	24	**33**	**38**
17:30	17:45	0	0	**0**	11	15	**26**	**26**
17:45	18:00	0	0	**0**	9	11	**20**	**20**
Total		10	18	**28**	280	236	**516**	**544**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	BREEZEHILL AVE			GLADSTONE AVE			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	6	5	**11**	1	0	**1**	**12**
07:15 07:30	5	3	**8**	1	1	**2**	**10**
07:30 07:45	7	3	**10**	0	2	**2**	**12**
07:45 08:00	2	3	**5**	0	2	**2**	**7**
08:00 08:15	5	4	**9**	0	0	**0**	**9**
08:15 08:30	8	2	**10**	3	0	**3**	**13**
08:30 08:45	11	6	**17**	2	1	**3**	**20**
08:45 09:00	5	9	**14**	4	0	**4**	**18**
09:00 09:15	6	3	**9**	2	1	**3**	**12**
09:15 09:30	3	3	**6**	0	0	**0**	**6**
09:30 09:45	1	2	**3**	2	0	**2**	**5**
09:45 10:00	6	3	**9**	0	0	**0**	**9**
11:30 11:45	7	7	**14**	0	0	**0**	**14**
11:45 12:00	5	1	**6**	1	0	**1**	**7**
12:00 12:15	3	4	**7**	1	0	**1**	**8**
12:15 12:30	6	2	**8**	0	0	**0**	**8**
12:30 12:45	2	5	**7**	2	0	**2**	**9**
12:45 13:00	2	2	**4**	1	0	**1**	**5**
13:00 13:15	4	3	**7**	0	0	**0**	**7**
13:15 13:30	2	3	**5**	0	0	**0**	**5**
15:00 15:15	9	3	**12**	0	0	**0**	**12**
15:15 15:30	3	1	**4**	1	0	**1**	**5**
15:30 15:45	6	3	**9**	0	0	**0**	**9**
15:45 16:00	4	7	**11**	0	0	**0**	**11**
16:00 16:15	2	7	**9**	0	0	**0**	**9**
16:15 16:30	3	7	**10**	1	5	**6**	**16**
16:30 16:45	5	6	**11**	4	3	**7**	**18**
16:45 17:00	7	3	**10**	0	1	**1**	**11**
17:00 17:15	10	6	**16**	2	1	**3**	**19**
17:15 17:30	5	7	**12**	0	1	**1**	**13**
17:30 17:45	0	2	**2**	0	1	**1**	**3**
17:45 18:00	4	5	**9**	3	0	**3**	**12**
Total	154	130	**284**	31	19	**50**	**334**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		BREEZEHILL AVE									GLADSTONE AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	**N TOT**	LT	ST	RT	**S TOT**	**STR TOT**	LT	ST	RT	**E TOT**	LT	ST	RT	**W TOT**	**STR TOT**	**Grand Total**
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	0	**3**	**5**	**5**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
07:30	07:45	0	0	0	**0**	0	0	1	**1**	**1**	0	1	0	**1**	0	2	1	**3**	**4**	**5**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**6**	0	5	0	**5**	**11**	**11**
08:00	08:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	4	0	**4**	**8**	**8**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	2	0	**2**	**5**	**5**
08:45	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	1	0	**1**	**4**	**4**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	4	0	**4**	**8**	**8**
09:15	09:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	2	0	**2**	**4**	**4**
09:30	09:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	1	**5**	**6**	**6**
09:45	10:00	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**3**	0	2	0	**2**	**5**	**6**
11:30	11:45	0	0	0	**0**	2	0	1	**3**	**3**	0	4	0	**4**	0	1	0	**1**	**5**	**8**
11:45	12:00	0	0	0	**0**	0	0	1	**1**	**1**	1	2	0	**3**	0	4	0	**4**	**7**	**8**
12:00	12:15	0	0	0	**0**	1	0	0	**1**	**1**	0	2	0	**2**	0	3	0	**3**	**5**	**6**
12:15	12:30	0	0	0	**0**	1	0	0	**1**	**1**	0	1	0	**1**	0	2	3	**5**	**6**	**7**
12:30	12:45	0	0	0	**0**	0	0	1	**1**	**1**	0	1	0	**1**	0	4	0	**4**	**5**	**6**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	1	0	**1**	**3**	**3**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	0	**3**	**5**	**5**
13:15	13:30	0	0	0	**0**	1	0	0	**1**	**1**	0	2	0	**2**	0	1	0	**1**	**3**	**4**
15:00	15:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	3	0	**3**	**6**	**6**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	2	0	**2**	**3**	**3**
15:30	15:45	0	0	0	**0**	1	0	0	**1**	**1**	0	1	0	**1**	0	1	0	**1**	**2**	**3**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
16:00	16:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	4	1	**5**	**7**	**7**
16:15	16:30	0	0	0	**0**	2	0	0	**2**	**2**	0	2	0	**2**	0	3	0	**3**	**5**	**7**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	2	1	**3**	**4**	**4**
16:45	17:00	0	0	0	**0**	1	0	0	**1**	**1**	0	2	0	**2**	0	6	1	**7**	**9**	**10**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	3	0	**3**	**3**	**3**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	2	0	**2**	**3**	**3**
17:45	18:00	0	0	0	**0**	1	0	0	**1**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
Total:	None	0	0	0	**0**	11	0	4	**15**	**15**	1	62	0	**63**	0	81	8	**89**	**152**	**167**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO No:** 37971

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		BREEZEHILL AVE		GLADSTONE AVE		
		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	0	0	0	**0**

Transportation Services - Traffic Services

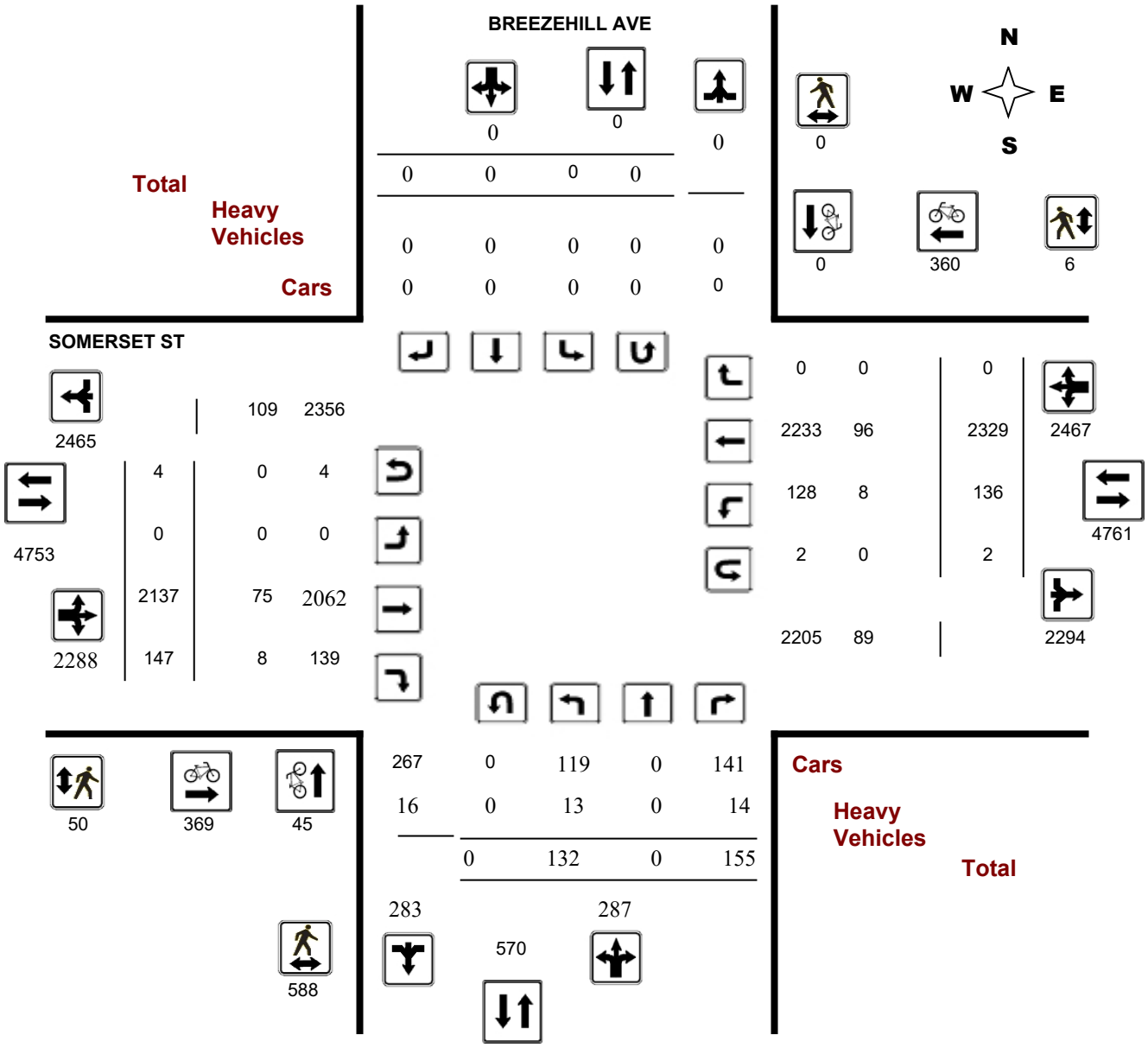
Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

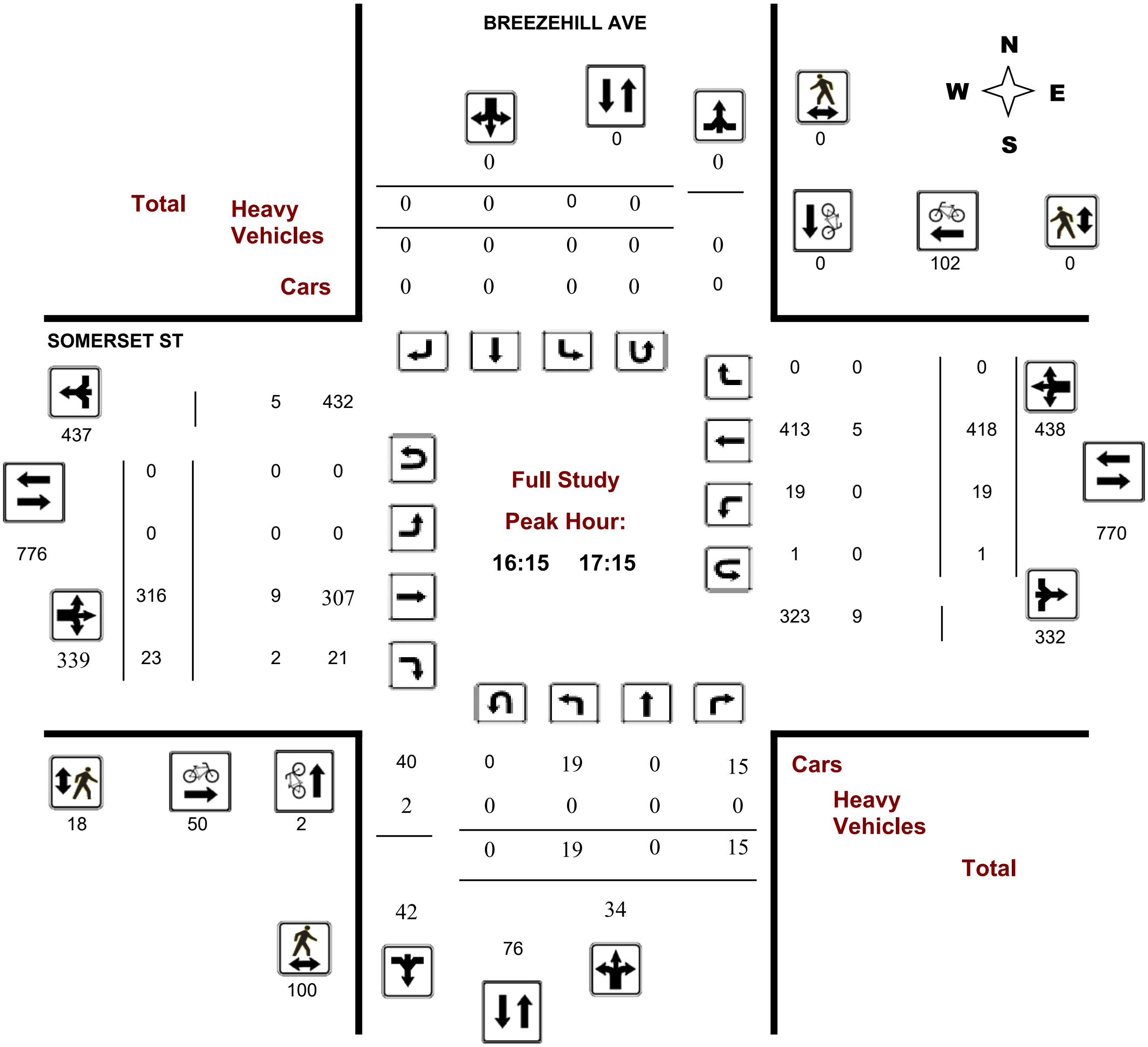
Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



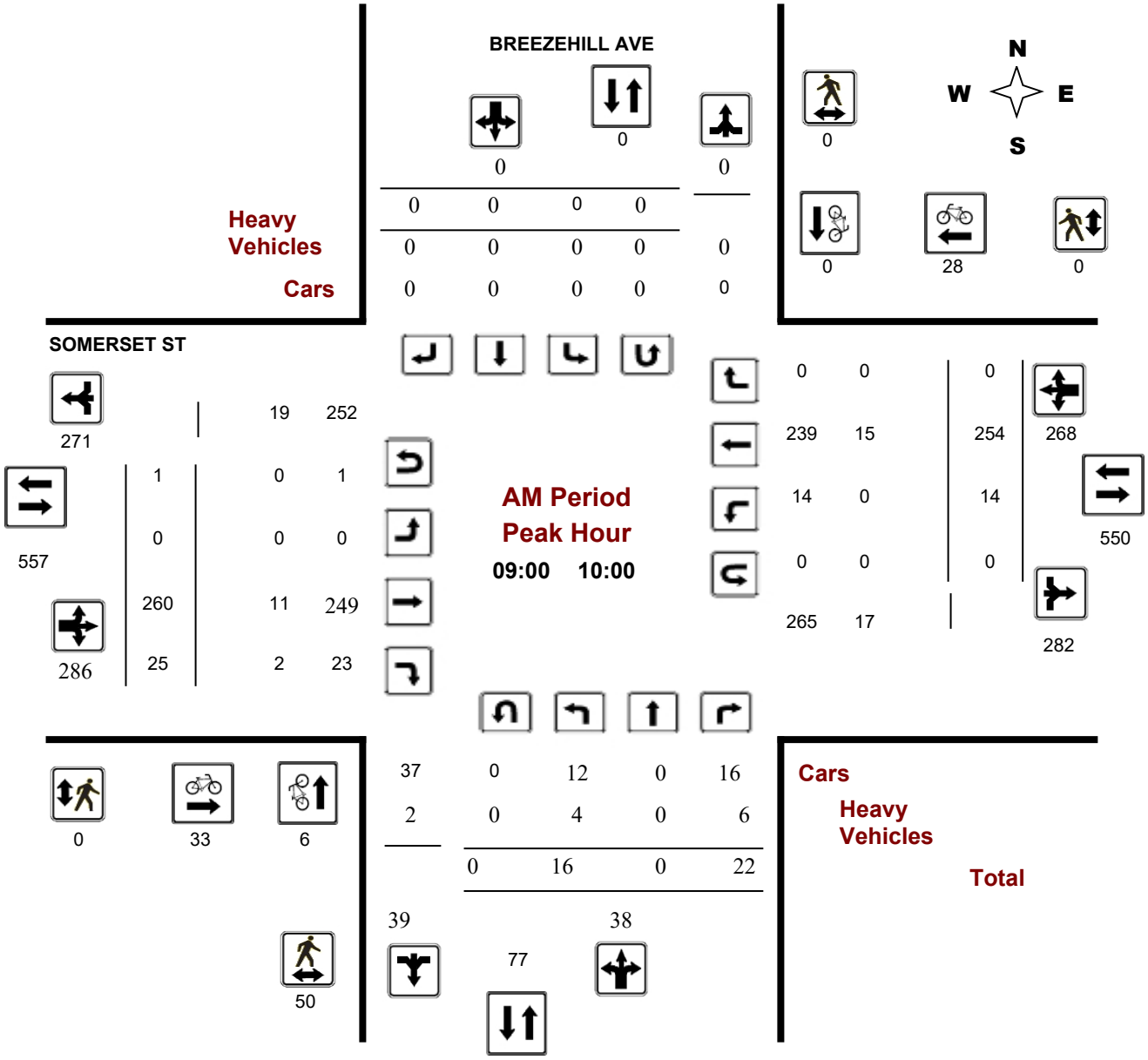
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision



Comments

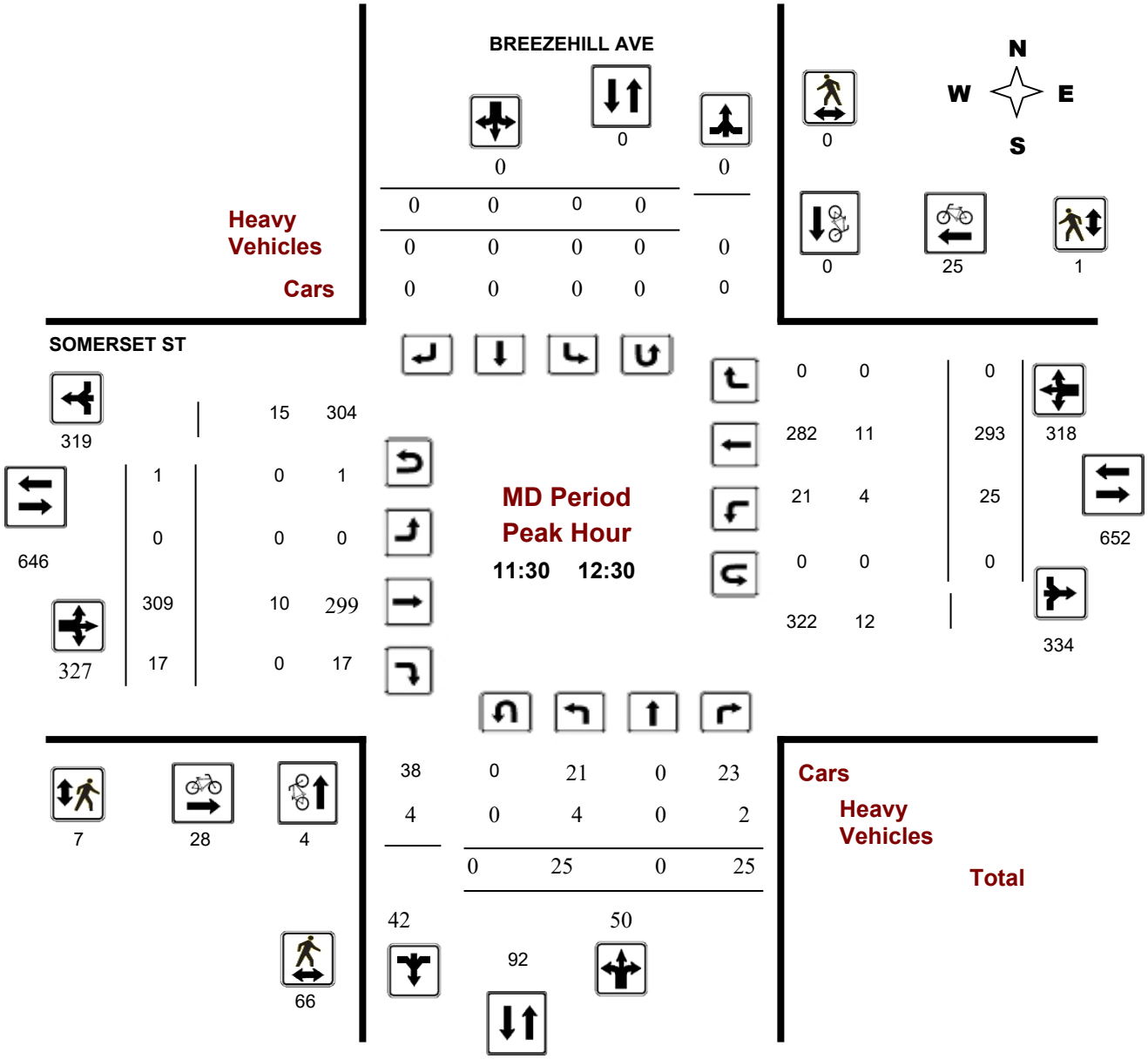
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision



Comments

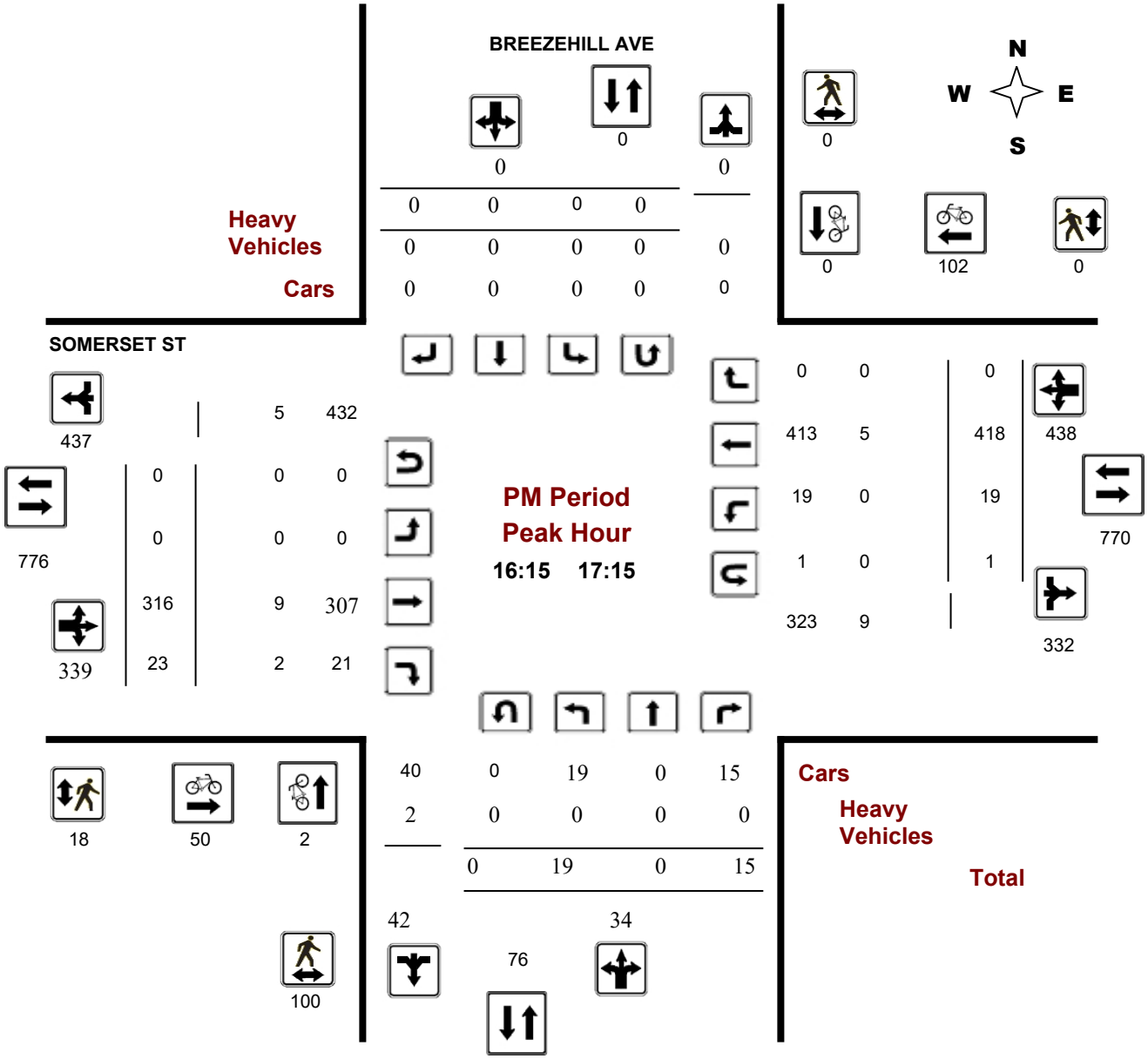
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, August 13, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 4 Westbound: 2

AADT Factor

.90

	BREEZEHILL AVE									SOMERSET ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	6	0	15	**21**	0	0	0	**0**	**21**	0	171	13	**184**	10	145	0	**155**	**339**	**360**
08:00 09:00	13	0	24	**37**	0	0	0	**0**	**37**	0	275	17	**292**	15	188	0	**203**	**495**	**532**
09:00 10:00	16	0	22	**38**	0	0	0	**0**	**38**	0	260	25	**285**	14	254	0	**268**	**553**	**591**
11:30 12:30	25	0	25	**50**	0	0	0	**0**	**50**	0	309	17	**326**	25	293	0	**318**	**644**	**694**
12:30 13:30	16	0	15	**31**	0	0	0	**0**	**31**	0	265	26	**291**	15	288	0	**303**	**594**	**625**
15:00 16:00	25	0	18	**43**	0	0	0	**0**	**43**	0	250	15	**265**	16	331	0	**347**	**612**	**655**
16:00 17:00	13	0	19	**32**	0	0	0	**0**	**32**	0	311	21	**332**	22	422	0	**444**	**776**	**808**
17:00 18:00	18	0	17	**35**	0	0	0	**0**	**35**	0	296	13	**309**	19	408	0	**427**	**736**	**771**
Sub Total	132	0	155	**287**	0	0	0	**0**	**287**	0	2137	147	**2284**	136	2329	0	**2465**	**4749**	**5036**
U Turns	0			**0**	0			**0**	**0**	**4**			**4**	2			**2**	**6**	**6**
Total	132	0	155	**287**	0	0	0	**0**	**287**	4	2137	147	**2288**	138	2329	0	**2467**	**4755**	**5042**
EQ 12Hr	183	0	215	**398**	0	0	0	**0**	**398**	6	2970	204	**3180**	192	3237	0	**3429**	**6609**	**7007**

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr	165	0	194	**359**	0	0	0	**0**	**359**	5	2673	184	**2862**	173	2913	0	**3086**	**5948**	**6307**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr	216	0	254	**470**	0	0	0	**0**	**470**	7	3502	241	**3750**	227	3816	0	**4043**	**7793**	**8263**

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		BREEZEHILL AVE									SOMERSET ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	2	0	2	4	0	0	0	0	**4**	0	27	5	32	3	21	0	24	**56**	**60**
07:15	07:30	0	0	6	6	0	0	0	0	**6**	0	29	3	32	2	35	0	37	**69**	**75**
07:30	07:45	2	0	3	5	0	0	0	0	**5**	0	53	2	55	1	35	0	36	**91**	**96**
07:45	08:00	2	0	4	6	0	0	0	0	**6**	0	62	3	65	4	54	0	58	**123**	**129**
08:00	08:15	3	0	6	9	0	0	0	0	**9**	0	65	5	70	4	56	0	60	**130**	**139**
08:15	08:30	4	0	5	9	0	0	0	0	**9**	0	92	3	95	4	42	0	46	**141**	**150**
08:30	08:45	3	0	4	7	0	0	0	0	**7**	0	54	5	59	3	40	0	43	**102**	**109**
08:45	09:00	3	0	9	12	0	0	0	0	**12**	0	64	4	68	4	50	0	54	**122**	**134**
09:00	09:15	3	0	6	9	0	0	0	0	**9**	0	63	8	71	5	68	0	73	**144**	**153**
09:15	09:30	5	0	4	9	0	0	0	0	**9**	0	62	4	66	5	53	0	58	**124**	**133**
09:30	09:45	6	0	7	13	0	0	0	0	**13**	0	76	3	79	2	66	0	68	**147**	**160**
09:45	10:00	2	0	5	7	0	0	0	0	**7**	1	59	10	70	2	67	0	69	**139**	**146**
11:30	11:45	5	0	2	7	0	0	0	0	**7**	0	81	2	83	3	74	0	77	**160**	**167**
11:45	12:00	9	0	3	12	0	0	0	0	**12**	0	81	3	84	5	69	0	74	**158**	**170**
12:00	12:15	7	0	12	19	0	0	0	0	**19**	0	78	8	86	12	80	0	92	**178**	**197**
12:15	12:30	4	0	8	12	0	0	0	0	**12**	1	69	4	74	5	70	0	75	**149**	**161**
12:30	12:45	6	0	3	9	0	0	0	0	**9**	0	71	5	76	2	64	0	66	**142**	**151**
12:45	13:00	1	0	4	5	0	0	0	0	**5**	0	80	9	89	5	72	0	77	**166**	**171**
13:00	13:15	4	0	3	7	0	0	0	0	**7**	0	65	7	72	2	66	0	68	**140**	**147**
13:15	13:30	5	0	5	10	0	0	0	0	**10**	0	49	5	54	6	86	0	92	**146**	**156**
15:00	15:15	6	0	2	8	0	0	0	0	**8**	0	65	5	70	2	74	0	76	**146**	**154**
15:15	15:30	7	0	6	13	0	0	0	0	**13**	0	66	2	68	5	89	0	94	**162**	**175**
15:30	15:45	8	0	8	16	0	0	0	0	**16**	0	58	4	62	3	93	0	96	**158**	**174**
15:45	16:00	4	0	2	6	0	0	0	0	**6**	1	61	4	66	6	75	0	81	**147**	**153**
16:00	16:15	2	0	7	9	0	0	0	0	**9**	0	73	3	76	5	96	0	101	**177**	**186**
16:15	16:30	3	0	5	8	0	0	0	0	**8**	0	87	7	94	7	108	0	115	**209**	**217**
16:30	16:45	5	0	3	8	0	0	0	0	**8**	0	65	8	73	5	104	0	109	**182**	**190**
16:45	17:00	3	0	4	7	0	0	0	0	**7**	0	86	3	89	6	114	0	120	**209**	**216**
17:00	17:15	8	0	3	11	0	0	0	0	**11**	0	78	5	83	2	92	0	94	**177**	**188**
17:15	17:30	4	0	3	7	0	0	0	0	**7**	0	78	3	81	8	113	0	121	**202**	**209**
17:30	17:45	4	0	5	9	0	0	0	0	**9**	1	64	3	68	7	110	0	117	**185**	**194**
17:45	18:00	2	0	6	8	0	0	0	0	**8**	0	76	2	78	3	93	0	96	**174**	**182**
Total:		132	0	155	287	0	0	0	0	**287**	4	2137	147	2288	138	2329	0	2467	**287**	**5,042**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		BREEZEHILL AVE			SOMERSET ST			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	3	5	**8**	**8**
07:15	07:30	1	0	**1**	9	3	**12**	**13**
07:30	07:45	0	0	**0**	15	5	**20**	**20**
07:45	08:00	5	0	**5**	11	11	**22**	**27**
08:00	08:15	4	0	**4**	19	8	**27**	**31**
08:15	08:30	4	0	**4**	25	10	**35**	**39**
08:30	08:45	4	0	**4**	37	11	**48**	**52**
08:45	09:00	5	0	**5**	18	10	**28**	**33**
09:00	09:15	4	0	**4**	11	10	**21**	**25**
09:15	09:30	1	0	**1**	12	8	**20**	**21**
09:30	09:45	1	0	**1**	3	6	**9**	**10**
09:45	10:00	0	0	**0**	7	4	**11**	**11**
11:30	11:45	1	0	**1**	9	11	**20**	**21**
11:45	12:00	2	0	**2**	4	3	**7**	**9**
12:00	12:15	1	0	**1**	8	6	**14**	**15**
12:15	12:30	0	0	**0**	7	5	**12**	**12**
12:30	12:45	0	0	**0**	3	6	**9**	**9**
12:45	13:00	1	0	**1**	5	6	**11**	**12**
13:00	13:15	1	0	**1**	7	10	**17**	**18**
13:15	13:30	0	0	**0**	6	8	**14**	**14**
15:00	15:15	1	0	**1**	12	4	**16**	**17**
15:15	15:30	0	0	**0**	12	9	**21**	**21**
15:30	15:45	0	0	**0**	10	13	**23**	**23**
15:45	16:00	2	0	**2**	7	8	**15**	**17**
16:00	16:15	1	0	**1**	11	13	**24**	**25**
16:15	16:30	0	0	**0**	13	23	**36**	**36**
16:30	16:45	2	0	**2**	15	17	**32**	**34**
16:45	17:00	0	0	**0**	11	26	**37**	**37**
17:00	17:15	0	0	**0**	11	36	**47**	**47**
17:15	17:30	0	0	**0**	18	28	**46**	**46**
17:30	17:45	3	0	**3**	15	21	**36**	**39**
17:45	18:00	1	0	**1**	15	16	**31**	**32**
Total		45	0	**45**	369	360	**729**	**774**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	BREEZEHILL AVE			SOMERSET ST			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	8	0	**8**	0	0	**0**	**8**
07:15 07:30	8	0	**8**	0	1	**1**	**9**
07:30 07:45	14	0	**14**	1	0	**1**	**15**
07:45 08:00	15	0	**15**	2	1	**3**	**18**
08:00 08:15	10	0	**10**	1	1	**2**	**12**
08:15 08:30	25	0	**25**	0	0	**0**	**25**
08:30 08:45	14	0	**14**	3	0	**3**	**17**
08:45 09:00	10	0	**10**	0	0	**0**	**10**
09:00 09:15	13	0	**13**	0	0	**0**	**13**
09:15 09:30	12	0	**12**	0	0	**0**	**12**
09:30 09:45	16	0	**16**	0	0	**0**	**16**
09:45 10:00	9	0	**9**	0	0	**0**	**9**
11:30 11:45	18	0	**18**	2	0	**2**	**20**
11:45 12:00	8	0	**8**	3	0	**3**	**11**
12:00 12:15	21	0	**21**	2	0	**2**	**23**
12:15 12:30	19	0	**19**	0	1	**1**	**20**
12:30 12:45	21	0	**21**	0	0	**0**	**21**
12:45 13:00	16	0	**16**	0	0	**0**	**16**
13:00 13:15	16	0	**16**	0	0	**0**	**16**
13:15 13:30	18	0	**18**	0	1	**1**	**19**
15:00 15:15	19	0	**19**	2	0	**2**	**21**
15:15 15:30	26	0	**26**	1	0	**1**	**27**
15:30 15:45	21	0	**21**	1	0	**1**	**22**
15:45 16:00	21	0	**21**	0	0	**0**	**21**
16:00 16:15	13	0	**13**	2	0	**2**	**15**
16:15 16:30	20	0	**20**	6	0	**6**	**26**
16:30 16:45	24	0	**24**	3	0	**3**	**27**
16:45 17:00	30	0	**30**	6	0	**6**	**36**
17:00 17:15	26	0	**26**	3	0	**3**	**29**
17:15 17:30	37	0	**37**	5	1	**6**	**43**
17:30 17:45	35	0	**35**	7	0	**7**	**42**
17:45 18:00	25	0	**25**	0	0	**0**	**25**
Total	588	0	**588**	50	6	**56**	**644**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		BREEZEHILL AVE									SOMERSET ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	**N TOT**	LT	ST	RT	**S TOT**	**STR TOT**	LT	ST	RT	**E TOT**	LT	ST	RT	**W TOT**	**STR TOT**	**Grand Total**
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	1	2	0	**3**	**4**	**4**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	1	5	0	**6**	**6**	**6**
07:30	07:45	1	0	1	**2**	0	0	0	**0**	**2**	0	1	0	**1**	0	2	0	**2**	**3**	**5**
07:45	08:00	1	0	0	**1**	0	0	0	**0**	**1**	0	5	1	**6**	0	3	0	**3**	**9**	**10**
08:00	08:15	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**1**	0	5	0	**5**	**6**	**7**
08:15	08:30	1	0	0	**1**	0	0	0	**0**	**1**	0	5	0	**5**	0	3	0	**3**	**8**	**9**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	3	0	**3**	**7**	**7**
08:45	09:00	0	0	1	**1**	0	0	0	**0**	**1**	0	2	0	**2**	1	4	0	**5**	**7**	**8**
09:00	09:15	1	0	1	**2**	0	0	0	**0**	**2**	0	2	1	**3**	0	4	0	**4**	**7**	**9**
09:15	09:30	0	0	2	**2**	0	0	0	**0**	**2**	0	4	1	**5**	0	1	0	**1**	**6**	**8**
09:30	09:45	2	0	2	**4**	0	0	0	**0**	**4**	0	2	0	**2**	0	5	0	**5**	**7**	**11**
09:45	10:00	1	0	1	**2**	0	0	0	**0**	**2**	0	3	0	**3**	0	5	0	**5**	**8**	**10**
11:30	11:45	1	0	0	**1**	0	0	0	**0**	**1**	0	4	0	**4**	0	3	0	**3**	**7**	**8**
11:45	12:00	2	0	0	**2**	0	0	0	**0**	**2**	0	4	0	**4**	1	3	0	**4**	**8**	**10**
12:00	12:15	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**1**	3	3	0	**6**	**7**	**8**
12:15	12:30	1	0	1	**2**	0	0	0	**0**	**2**	0	1	0	**1**	0	2	0	**2**	**3**	**5**
12:30	12:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	1	**3**	0	2	0	**2**	**5**	**5**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	2	**3**	0	3	0	**3**	**6**	**6**
13:00	13:15	1	0	0	**1**	0	0	0	**0**	**1**	0	3	0	**3**	1	2	0	**3**	**6**	**7**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	6	0	**6**	**7**	**7**
15:00	15:15	1	0	2	**3**	0	0	0	**0**	**3**	0	3	0	**3**	0	3	0	**3**	**6**	**9**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	4	0	**4**	**6**	**6**
15:30	15:45	0	0	1	**1**	0	0	0	**0**	**1**	0	2	0	**2**	0	4	0	**4**	**6**	**7**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	4	0	**4**	**8**	**8**
16:00	16:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	3	0	**3**	**4**	**4**
16:15	16:30	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	2	0	**2**	**5**	**5**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	0	0	**0**	**2**	**2**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	1	**2**	0	2	0	**2**	**4**	**4**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	1	**4**	0	1	0	**1**	**5**	**5**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	2	0	**2**	**3**	**3**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	1	0	**1**	**4**	**4**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	4	0	**4**	**7**	**7**
Total:	None	13	0	14	**27**	0	0	0	**0**	**27**	0	75	8	**83**	8	96	0	**104**	**187**	**214**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO No:** 35301

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

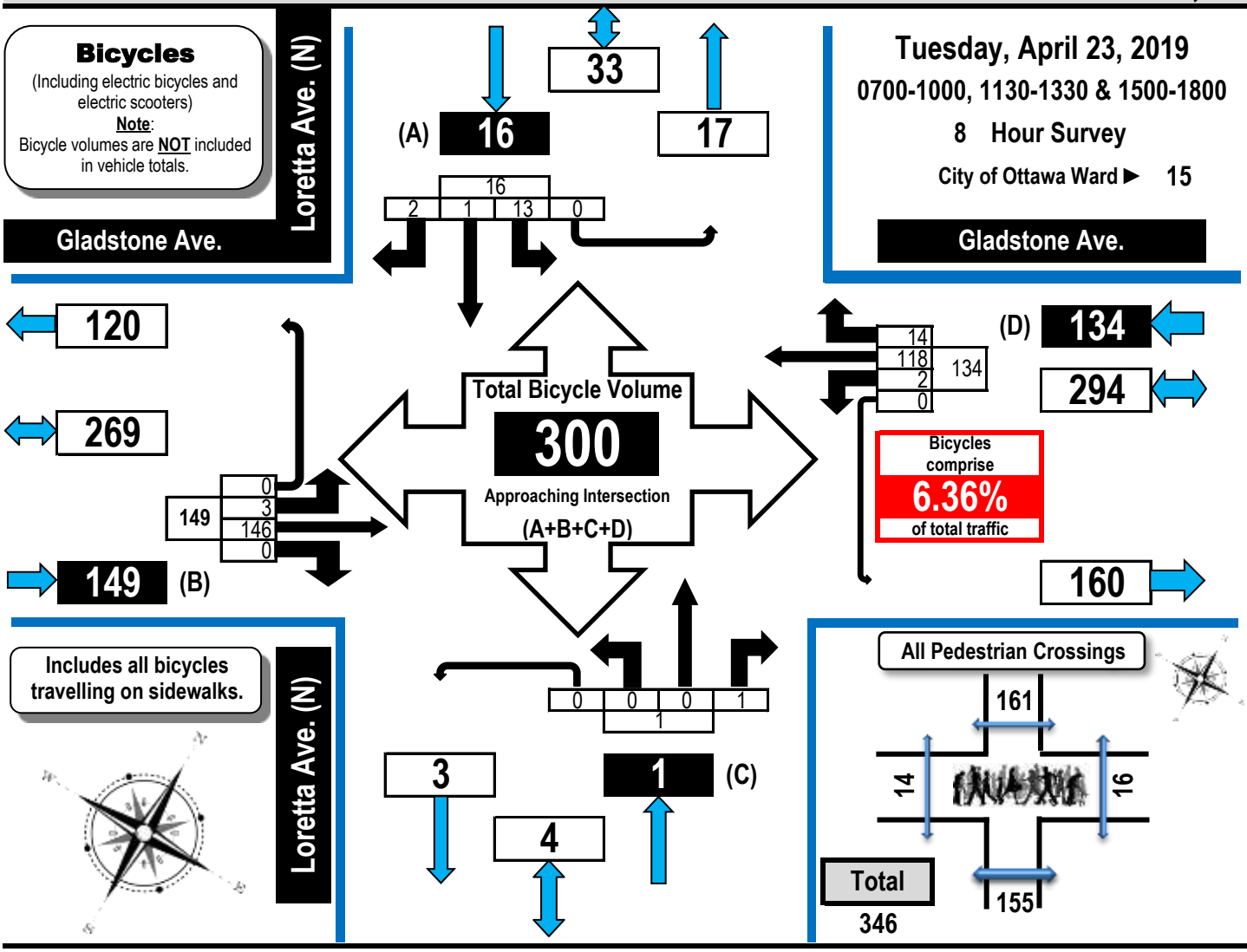
Time Period		BREEZEHILL AVE Northbound U-Turn Total	BREEZEHILL AVE Southbound U-Turn Total	SOMERSET ST Eastbound U-Turn Total	SOMERSET ST Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	1	0	**1**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	1	0	**1**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	1	0	**1**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	1	**1**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	1	**1**
17:30	17:45	0	0	1	0	**1**
17:45	18:00	0	0	0	0	**0**
Total		0	0	4	2	**6**

Turning Movement Count
Bicycle Summary
Flow Diagram

Gladstone Avenue & Loretta Avenue North — Ottawa, ON

Bicycles
(Including electric bicycles and electric scooters)
Note: Bicycle volumes are NOT included in vehicle totals.

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15



	Gladstone Ave. Eastbound					Gladstone Ave. Westbound					Loretta Ave. (N) Northbound					Loretta Ave. (N) Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	26	0	0	26	0	9	1	0	10	0	0	0	0	0	1	1	0	0	2	38
0800-0900	1	55	0	0	56	1	15	2	0	18	0	0	1	0	1	7	0	0	0	7	82
0900-1000	0	15	0	0	15	0	8	0	0	8	0	0	0	0	0	1	0	0	0	1	24
1130-1230	0	3	0	0	3	0	5	0	0	5	0	0	0	0	0	1	0	0	0	1	9
1230-1330	0	8	0	0	8	0	4	1	0	5	0	0	0	0	0	1	0	0	0	1	14
1500-1600	1	10	0	0	11	0	14	1	0	15	0	0	0	0	0	1	0	1	0	2	28
1600-1700	1	17	0	0	18	1	29	2	0	32	0	0	0	0	0	1	0	0	0	1	51
1700-1800	0	12	0	0	12	0	34	7	0	41	0	0	0	0	0	0	0	1	0	1	54
Totals	3	146	0	0	149	2	118	14	0	134	0	0	1	0	1	13	1	2	0	16	300

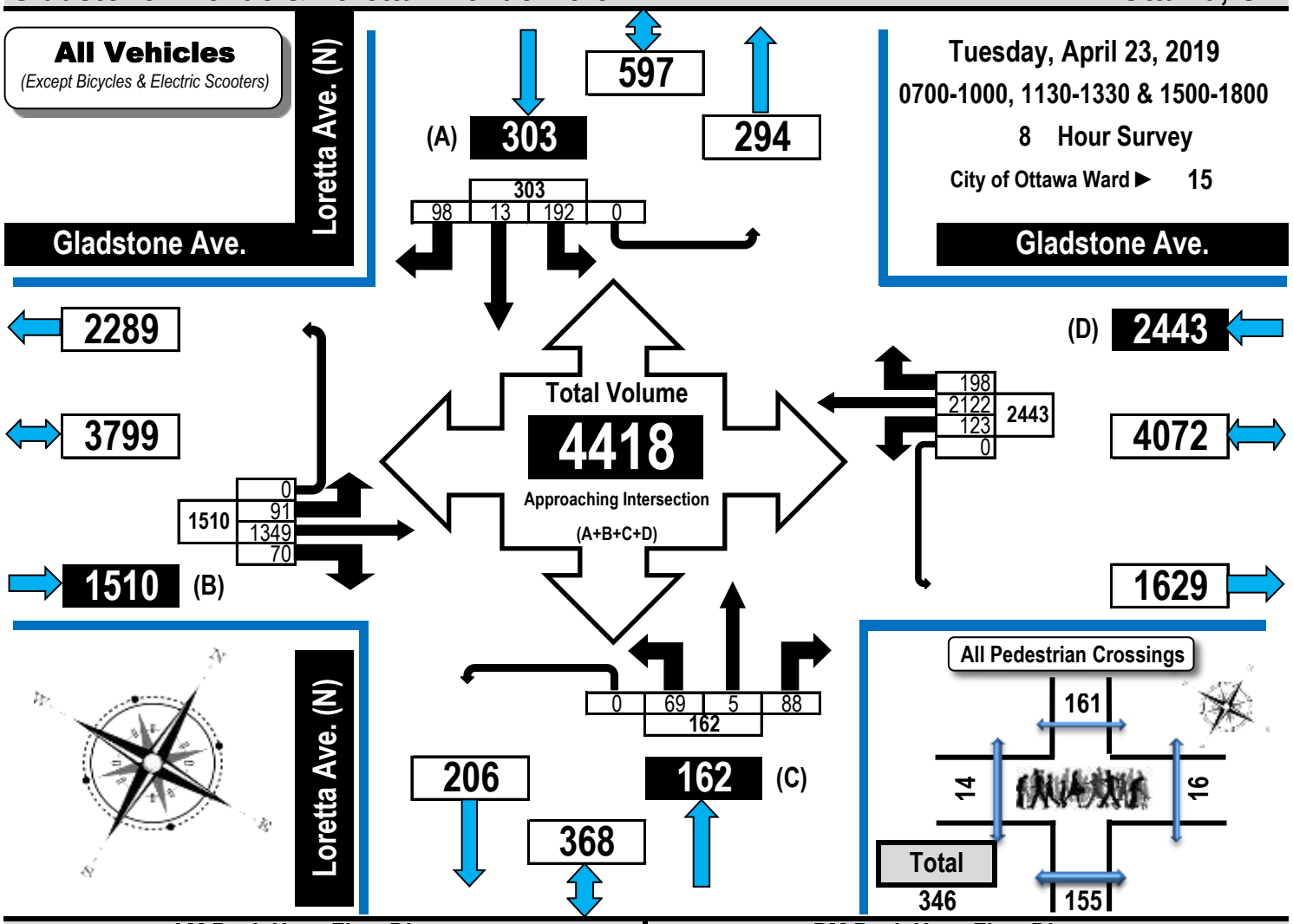
Comments:
No traffic issues noted during survey. OCTranspo and school buses comprise 41.05% of the heavy vehicle traffic.

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

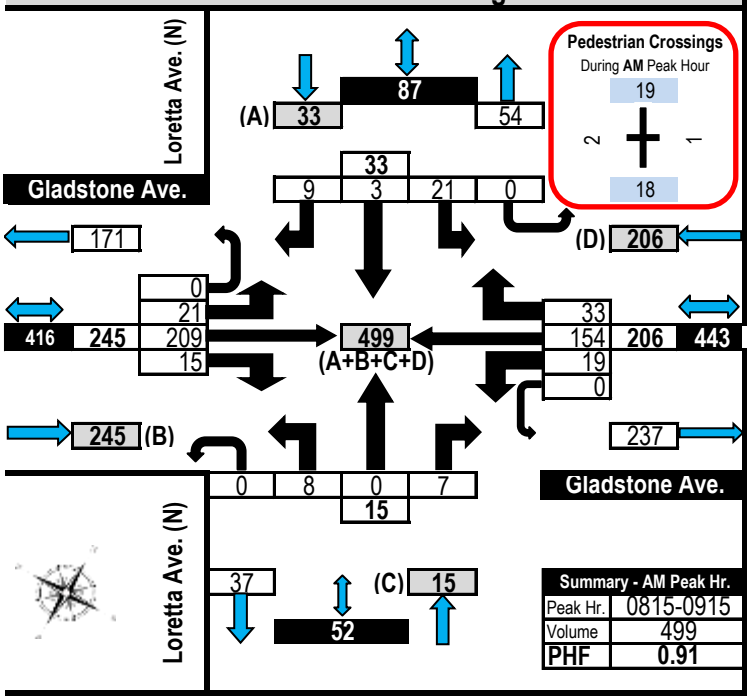
Gladstone Avenue & Loretta Avenue North — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15

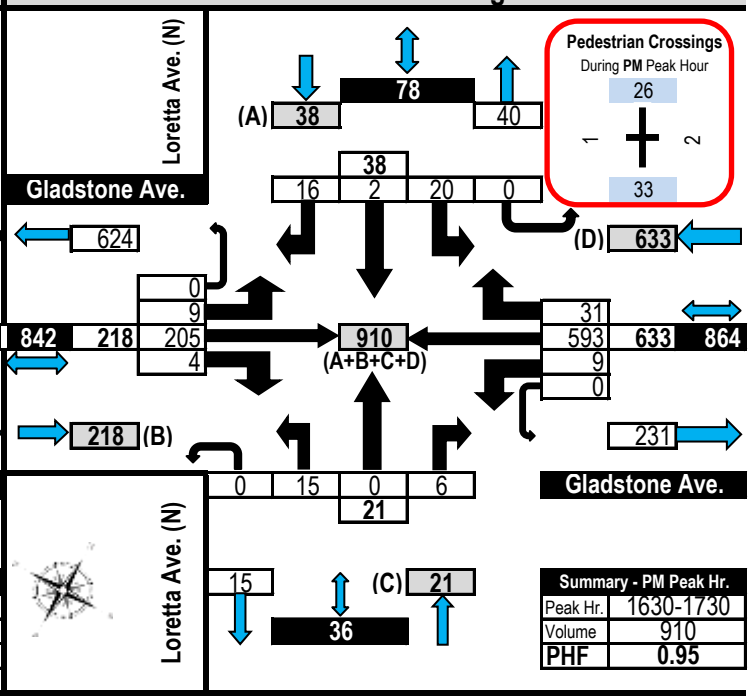


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0815-0915
Volume	499
PHF	0.91

PM Peak Hour Flow Diagram



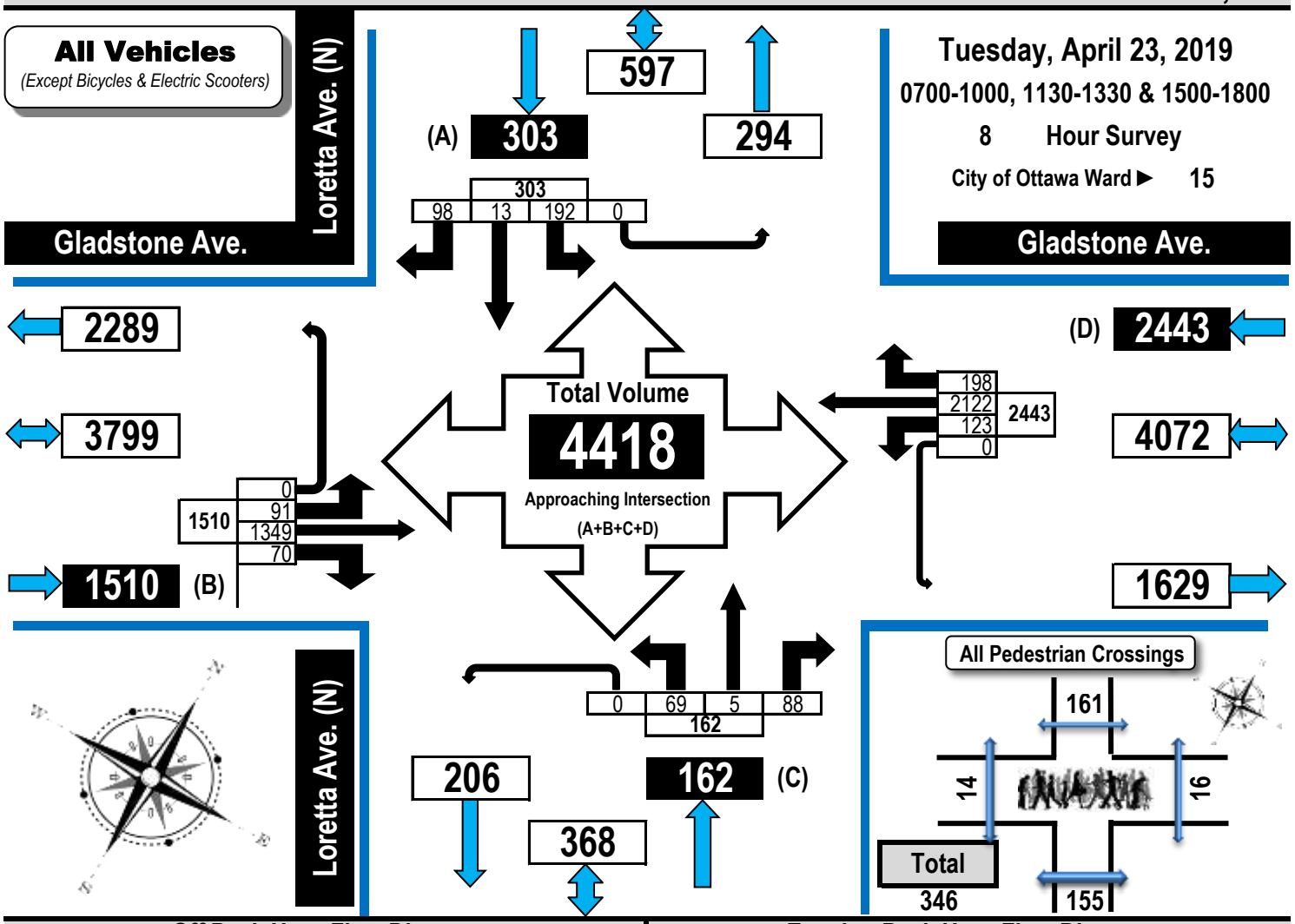
Summary - PM Peak Hr.	
Peak Hr.	1630-1730
Volume	910
PHF	0.95

Turning Movement Count
Summary, OFF and EVENING Peak Hour Flow Diagrams
All Vehicles Except Bicycles

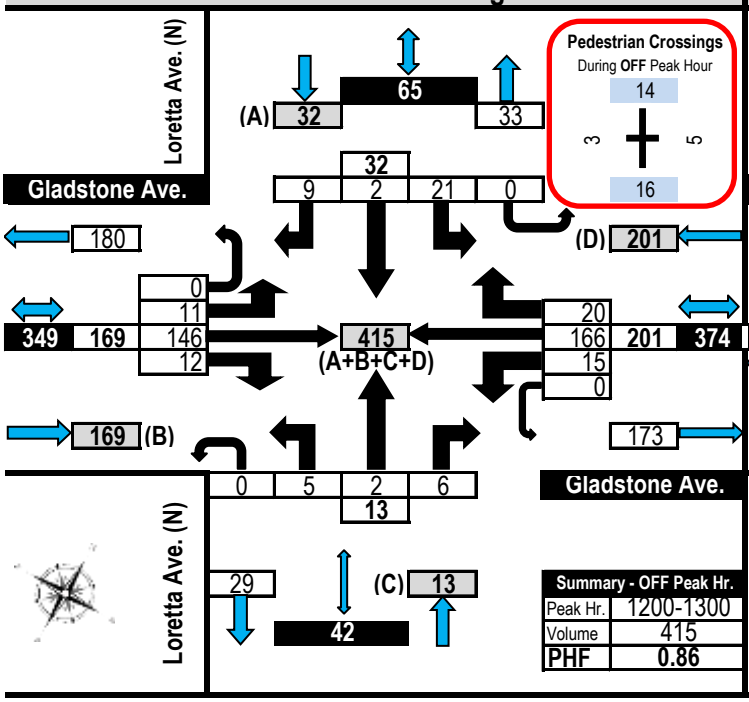
Gladstone Avenue & Loretta Avenue North — Ottawa, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15

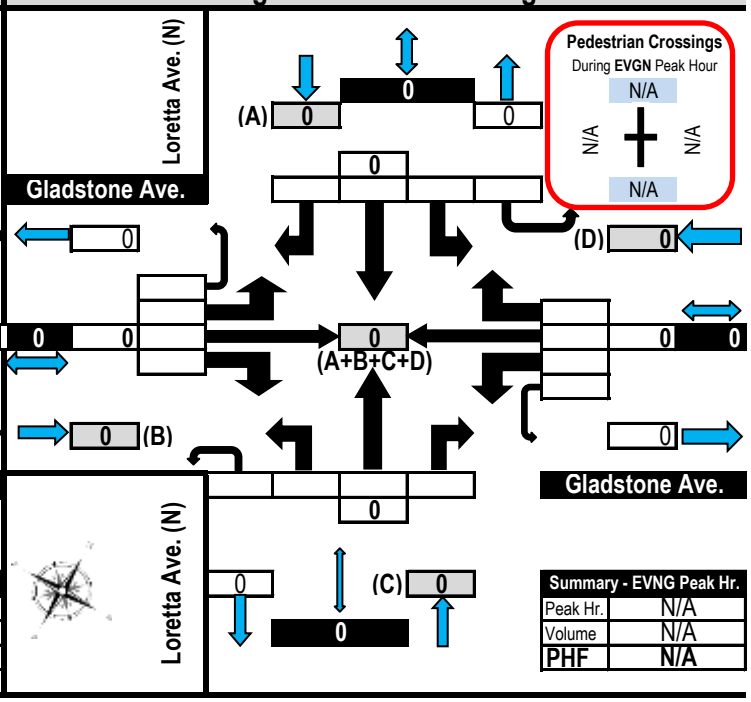


Off Peak Hour Flow Diagram



Summary - OFF Peak Hr.	
Peak Hr.	1200-1300
Volume	415
PHF	0.86

Evening Peak Hour Flow Diagram



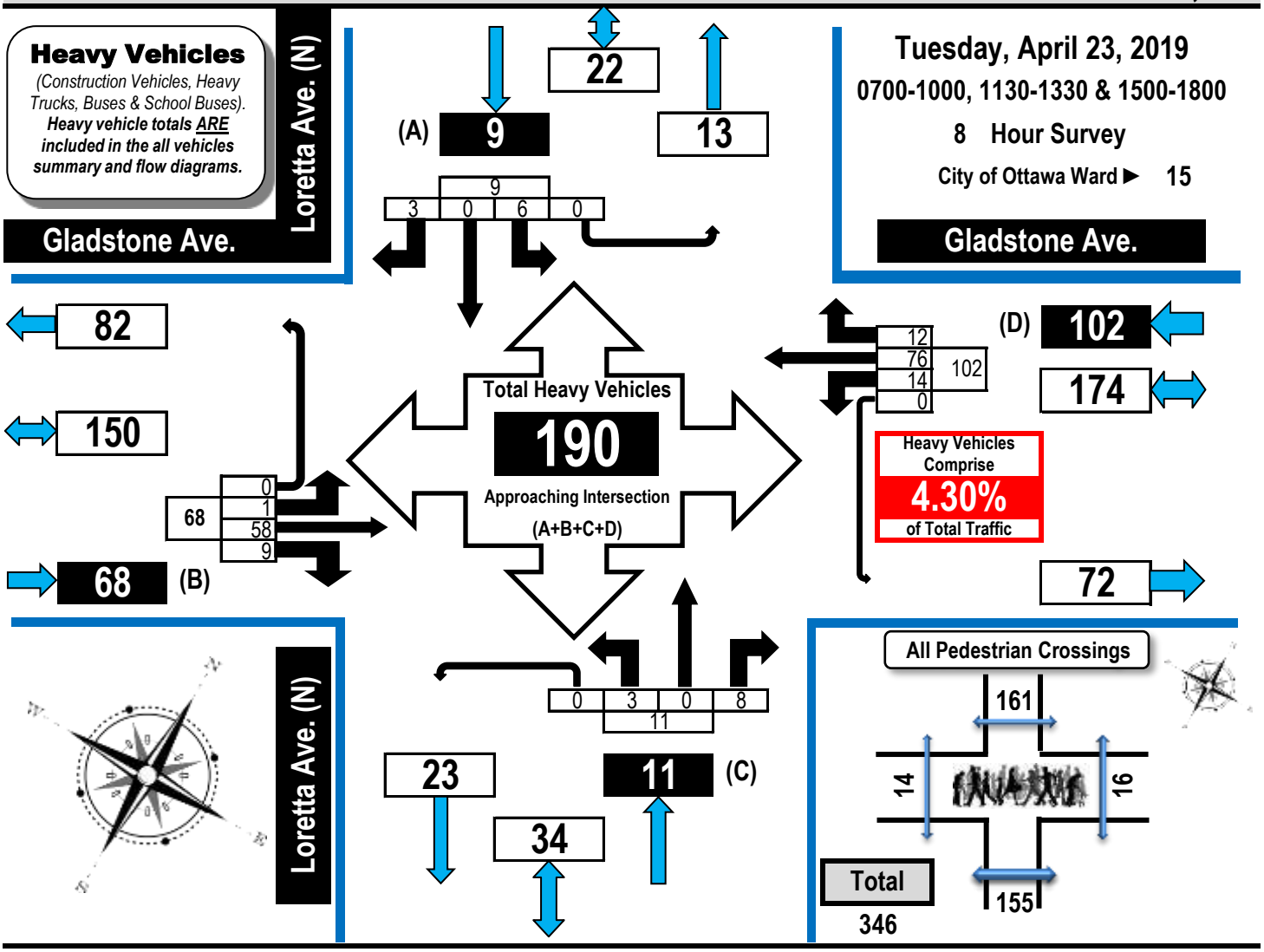
Summary - EVNG Peak Hr.	
Peak Hr.	N/A
Volume	N/A
PHF	N/A

Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Gladstone Avenue & Loretta Avenue North — Ottawa, ON

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15



	Gladstone Ave. Eastbound					Gladstone Ave. Westbound					Loretta Ave. (N) Northbound					Loretta Ave. (N) Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	6	2	0	8	1	7	1	0	9	0	0	1	0	1	0	0	0	0	0	18
0800-0900	0	8	1	0	9	0	10	3	0	13	0	0	4	0	4	2	0	0	0	2	28
0900-1000	1	14	1	0	16	2	15	3	0	20	0	0	0	0	0	1	0	2	0	3	39
1130-1230	0	9	3	0	12	1	7	1	0	9	1	0	0	0	1	0	0	1	0	1	23
1230-1330	0	4	0	0	4	5	13	2	0	20	0	0	1	0	1	0	0	0	0	0	25
1500-1600	0	6	1	0	7	3	7	1	0	11	0	0	2	0	2	1	0	0	0	1	21
1600-1700	0	5	1	0	6	1	10	0	0	11	2	0	0	0	2	1	0	0	0	1	20
1700-1800	0	6	0	0	6	1	7	1	0	9	0	0	0	0	0	1	0	0	0	1	16
Totals	1	58	9	0	68	14	76	12	0	102	3	0	8	0	11	6	0	3	0	9	190

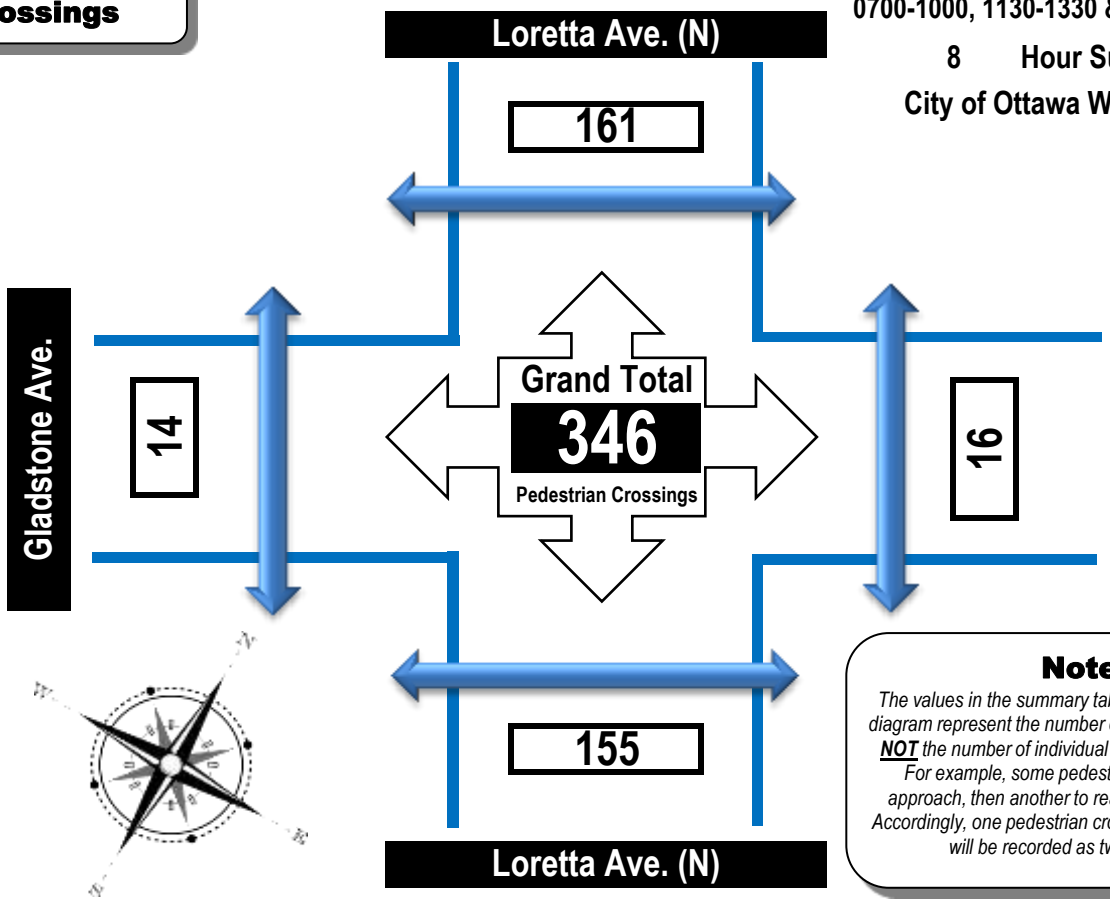
Comments:
No traffic issues noted during survey. OCTranspo and school buses comprise 41.05% of the heavy vehicle traffic.

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Gladstone Avenue & Loretta Avenue North — Ottawa, ON

Pedestrian Crossings

Tuesday, April 23, 2019
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 15



Note
*The values in the summary table below and the flow diagram represent the number of pedestrian crossings **NOT** the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing Gladstone Ave.	East Side Crossing Gladstone Ave.	Street Total	South Side Crossing Loretta Ave. (N)	North Side Crossing Loretta Ave. (N)	Street Total	Grand Total
0700-0800	6	2	8	13	15	28	36
0800-0900	2	2	4	14	16	30	34
0900-1000	0	0	0	16	17	33	33
1130-1230	2	3	5	15	20	35	40
1230-1330	2	5	7	12	19	31	38
1500-1600	0	1	1	24	23	47	48
1600-1700	0	0	0	27	28	55	55
1700-1800	2	3	5	34	23	57	62
Totals	14	16	30	155	161	316	346

Comments:
No traffic issues noted during survey. OCTranspo and school buses comprise 41.05% of the heavy vehicle traffic.

Turning Movement Count
Summary Report Including Peak Hours, AADT and Expansion Factors
All Vehicles Except Bicycles

Gladstone Avenue & Loretta Avenue North — Ottawa, ON

Survey Date: Tuesday, April 23, 2019 **Start Time:** 0700 **AADT Factor:** 0.7
Weather AM: Partly Cloudy +10º C **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800
Weather PM: Overcast +17º C **Surveyor(s):** T. Carmody

	Gladstone Ave. Eastbound					Gladstone Ave. Westbound						Loretta Ave. (N) Northbound					Loretta Ave. (N) Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	6	142	18	0	166	22	112	24	0	158	324	1	0	6	0	7	13	3	4	0	20	27	351
0800-0900	17	214	9	0	240	19	140	35	0	194	434	8	0	10	0	18	20	2	3	0	25	43	477
0900-1000	16	168	11	0	195	24	160	27	0	211	406	2	0	7	0	9	14	2	11	0	27	36	442
1130-1230	12	137	10	0	159	7	164	25	0	196	355	7	1	7	0	15	24	0	9	0	33	48	403
1230-1330	11	136	11	0	158	25	145	19	0	189	347	3	1	9	0	13	26	3	15	0	44	57	404
1500-1600	10	174	5	0	189	13	358	22	0	393	582	26	1	35	0	62	39	1	24	0	64	126	708
1600-1700	9	188	2	0	199	4	525	18	0	547	746	11	1	10	0	22	37	1	20	0	58	80	826
1700-1800	10	190	4	0	204	9	518	28	0	555	759	11	1	4	0	16	19	1	12	0	32	48	807
Totals	91	1349	70	0	1510	123	2122	198	0	2443	3953	69	5	88	0	162	192	13	98	0	303	465	4418

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	126	1875	97	0	2099	171	2950	275	0	3396	5495	96	7	122	0	225	267	18	136	0	421	646	6141

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.7

AADT 12-hr	89	1313	68	0	1469	120	2065	193	0	2377	3846	67	5	86	0	158	187	13	95	0	295	452	4299

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	116	1719	89	0	1925	157	2705	252	0	3114	5039	88	6	112	0	206	245	17	125	0	386	593	5631

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.91												Highest Hourly Vehicle Volume Between 0700h & 1000h											
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0815-0915	21	209	15	0	245	19	154	33	0	206	451	8	0	7	0	15	21	3	9	0	33	48	499
OFF Peak Hour Factor ➡ 0.86												**Highest Hourly Vehicle Volume Between 1130h & 1330h**											
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1200-1300	11	146	12	0	169	15	166	20	0	201	370	5	2	6	0	13	21	2	9	0	32	45	415
PM Peak Hour Factor ➡ 0.95												**Highest Hourly Vehicle Volume Between 1500h & 1800h**											
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1630-1730	9	205	4	0	218	9	593	31	0	633	851	15	0	6	0	21	20	2	16	0	38	59	910

Comments:
No traffic issues noted during survey. OCTranspo and school buses comprise 41.05% of the heavy vehicle traffic.

Notes:
1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Appendix D:

Collision Data

DRAFT

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: BREEZEHILL AVE N btwn SOMERSET ST W & LAUREL ST

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Sep-29, Thu,00:00	Clear	SMV unattended vehicle	P.D. only	Dry	East	Unknown	Unknown	Unattended vehicle	0

Location: BREEZEHILL AVE @ GLADSTONE AVE

Traffic Control: Stop sign **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Dec-07, Wed,15:25	Clear	Turning movement	Non-fatal injury	Wet	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Passenger van	Other motor vehicle	
2018-Jun-28, Thu,16:27	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-14, Fri,23:13	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: BREEZEHILL AVE @ SOMERSET ST

Traffic Control: Stop sign **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Dec-14, Mon,16:00	Clear	Angle	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: GLADSTONE AVE @ LORETTA AVE

Traffic Control: Stop sign **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Nov-11, Wed,19:26	Rain	Turning movement	Non-fatal injury	Wet	East	Making "U" turn	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jun-15, Fri,22:14	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Pedestrian	1

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: LAUREL ST btwn BREEZEHILL AVE N & LORETTA AVE N

Traffic Control: No control **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jun-06, Sat,20:00	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle	0
2019-Feb-05, Tue,00:00	Snow	SMV unattended vehicle	P.D. only	Ice	East	Unknown	Unknown	Unattended vehicle	0

Appendix E:

Other Developments Traffic Volumes

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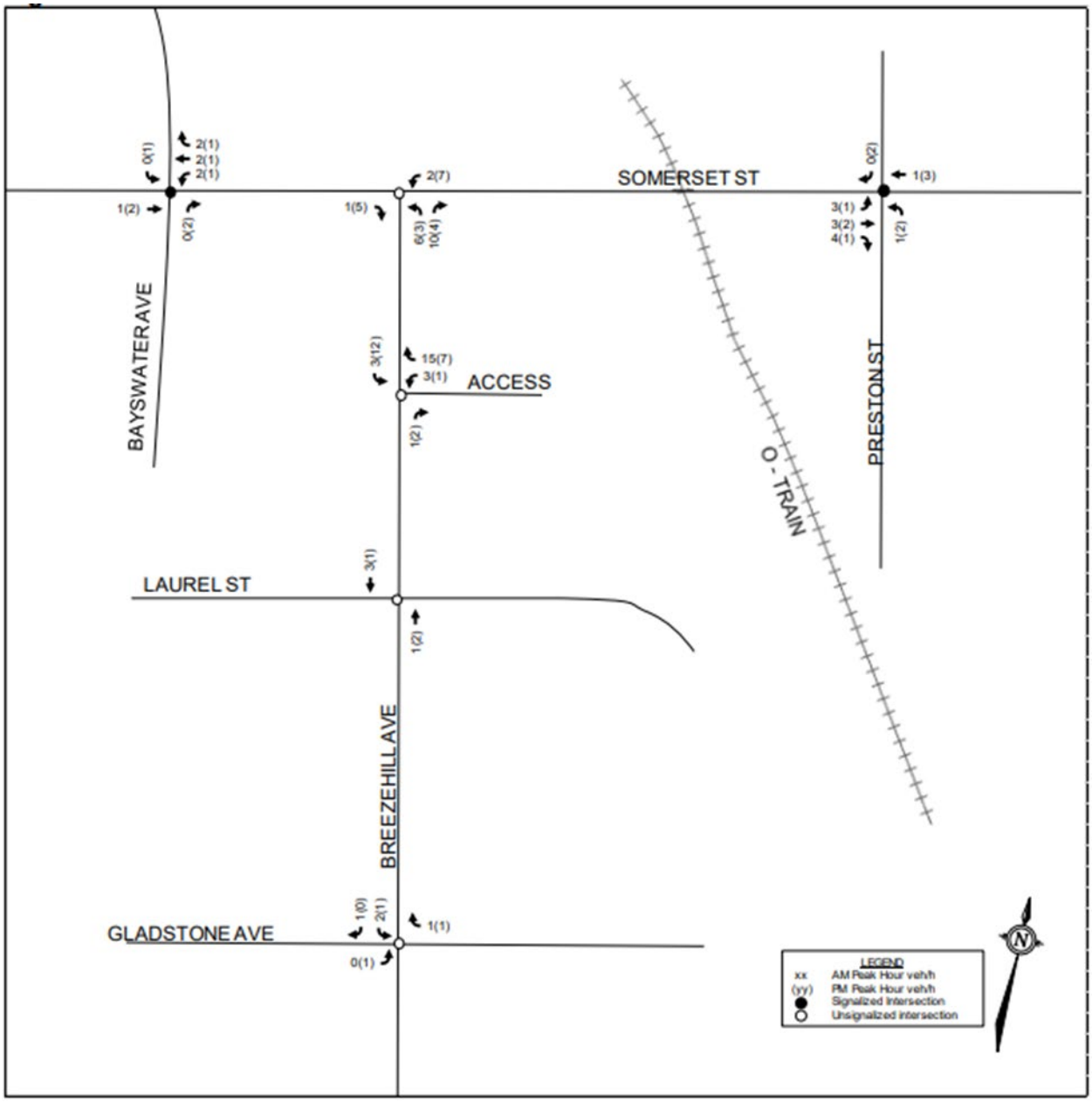
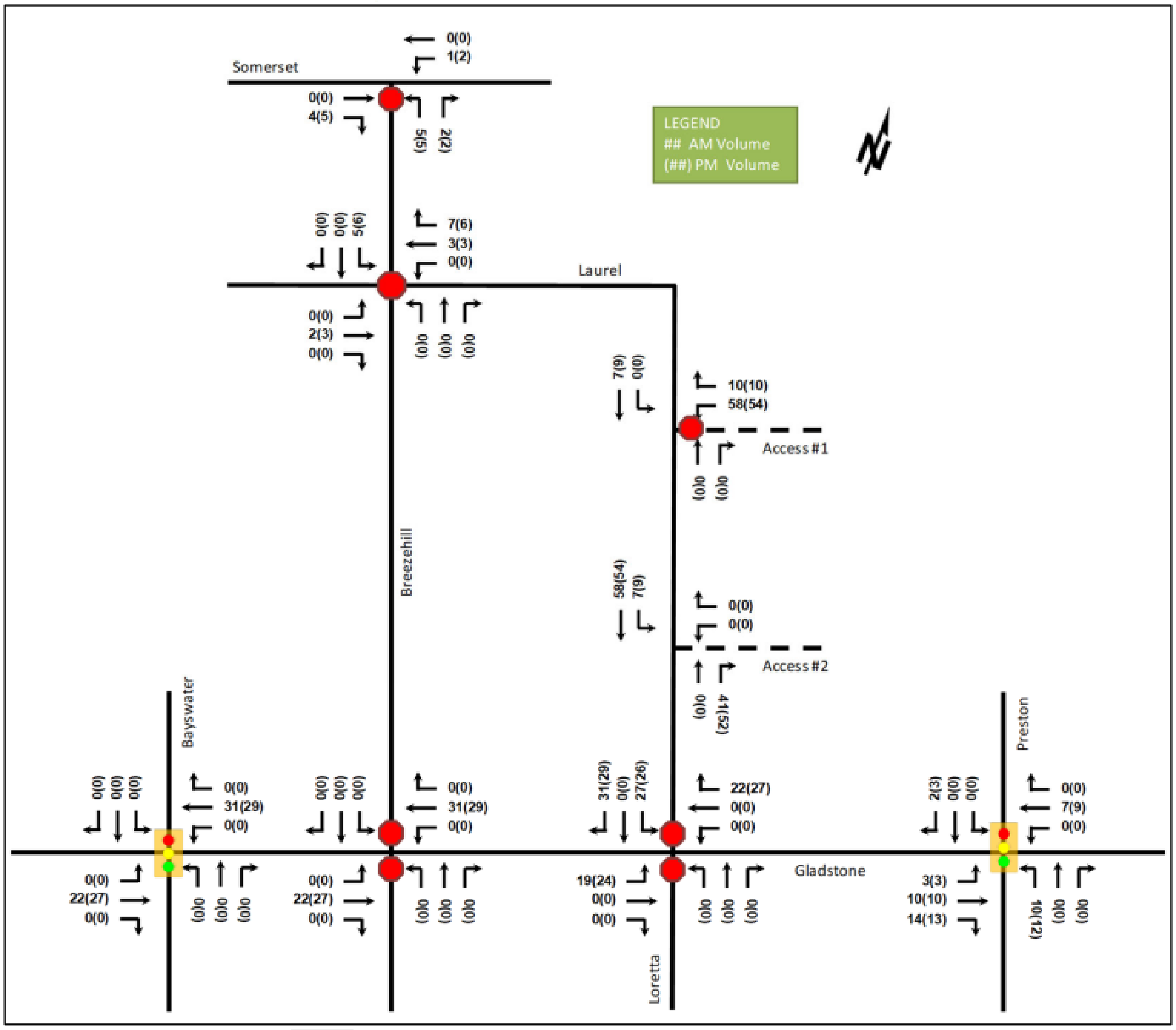
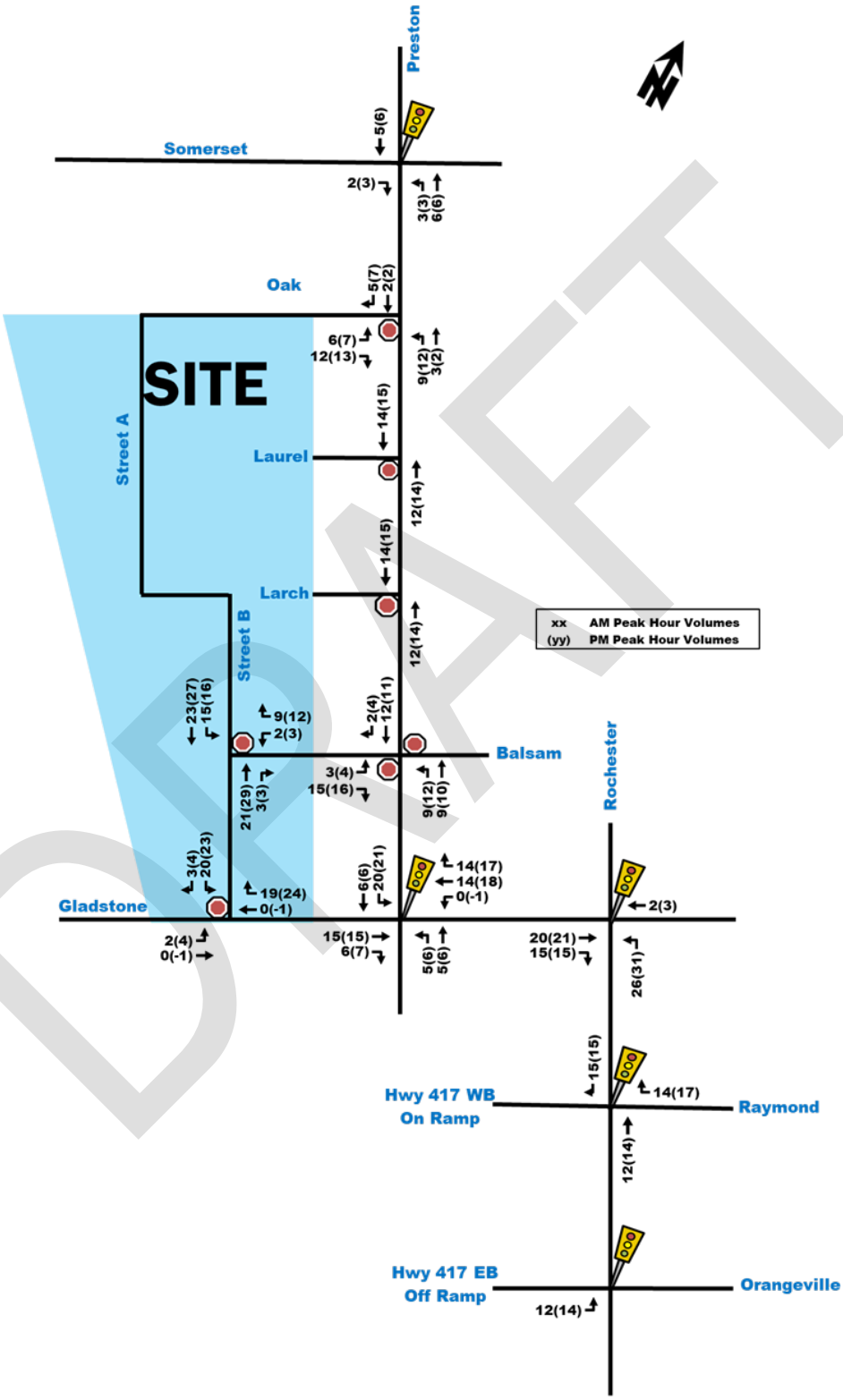
1040 Somerset St W Site Generated Traffic Volumes



951 Gladstone Ave and 145 Loretta Ave N Site Generated Traffic Volumes



Gladstone Village, 933 Gladstone Site Generated Traffic Volumes



Appendix F:

TDM Checklists

DRAFT

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

TDM-supportive design & infrastructure measures: *Residential developments*			Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☑
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☑
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☑
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☑
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☑
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☑

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
		2.2	**Bicycle skills training**	
BETTER		2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☑
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☐
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☐
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☐
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☑

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☑
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

Appendix G:

Somerset/Breezehill Roadway Modification Design

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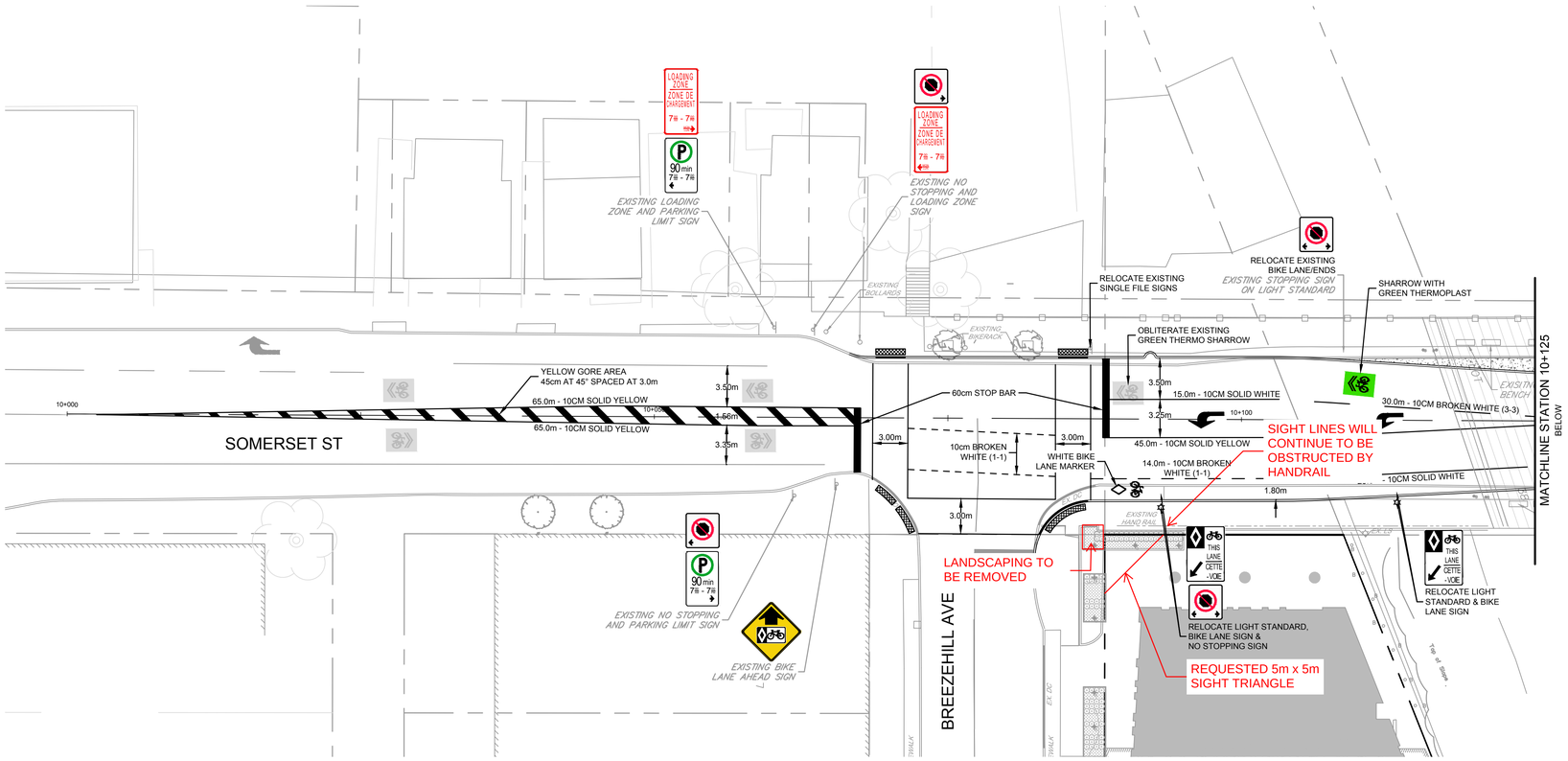

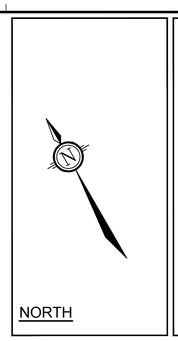

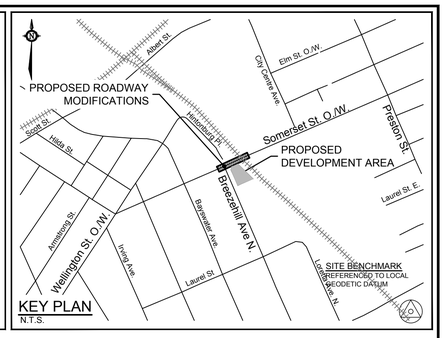

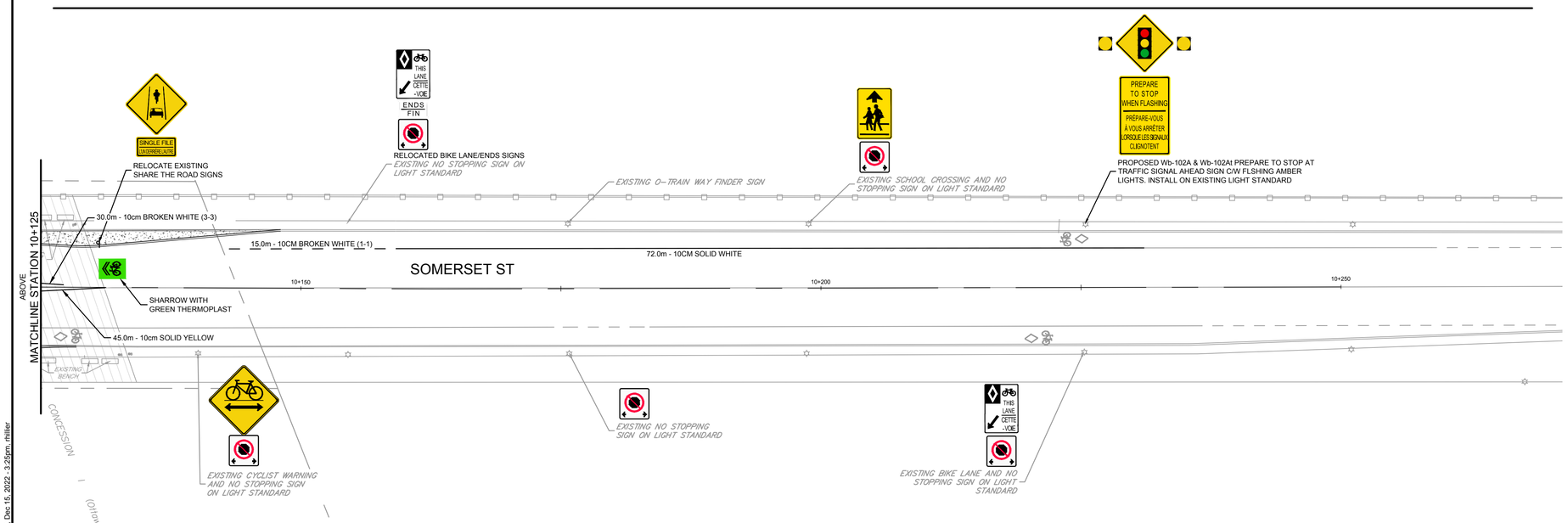

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
1.	ISSUED FOR CITY REVIEW	DEC 15/22	GJM

SCALE 1:250

1:250
0 2 4 6 8 10

DESIGN	RCH
CHECKED	BJB
DRAWN	RCH
CHECKED	BJB
APPROVED	GJM

FOR REVIEW ONLY

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LOCATION
CITY of OTTAWA
SOMERSET STREET ROADWAY MODIFICATION

DRAWING NAME
PROPOSED PAVEMENT MARKINGS & SIGNAGE

PROJECT No. 112191
REV REV # 1
DRAWING No. 112191-RM -PVMK2

D07-12-13-0124

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Appendix H:

Synchro Analysis Reports

DRAFT

Existing Conditions

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	252	194	12
Future Volume (vph)	252	194	12
Sign Control	Free	Free	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 43.5%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	252	27	30	194	12	31
Future Volume (Veh/h)	252	27	30	194	12	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	280	30	33	216	13	34
Pedestrians	16			4	166	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	3.5			3.5	3.5	
Percent Blockage	0			0	5	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			476		759	465
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			476		759	465
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		96	94
cM capacity (veh/h)			1033		343	568

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	310	249	47
Volume Left	0	33	13
Volume Right	30	0	34
cSH	1700	1033	481
Volume to Capacity	0.18	0.03	0.10
Queue Length 95th (m)	0.0	0.8	2.5
Control Delay (s)	0.0	1.4	13.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.4	13.3
Approach LOS			B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	193	159	1	0
Future Volume (vph)	193	159	1	0
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 39.3%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	193	0	1	159	38	2	1	2	13	0	17
Future Volume (Veh/h)	21	193	0	1	159	38	2	1	2	13	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	214	0	1	177	42	2	1	2	14	0	19
Pedestrians		8			2			25			21	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	240			239			512	527	241	486	506	227
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	240			239			512	527	241	486	506	227
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			100			100	100	100	97	100	98
cM capacity (veh/h)	1319			1318			446	442	792	475	454	805

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	237	220	5	33
Volume Left	23	1	2	14
Volume Right	0	42	2	19
cSH	1319	1318	539	622
Volume to Capacity	0.02	0.00	0.01	0.05
Queue Length 95th (m)	0.4	0.0	0.2	1.3
Control Delay (s)	0.9	0.0	11.7	11.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.9	0.0	11.7	11.1
Approach LOS			B	B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	26	8	49	31
Future Volume (vph)	26	8	49	31
Sign Control	Stop	Stop	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 26.8%	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)	11	26	10	6	8	6	11	49	10	22	31	16
Future Volume (vph)	11	26	10	6	8	6	11	49	10	22	31	16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	29	11	7	9	7	12	54	11	24	34	18

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	52	23	77	76
Volume Left (vph)	12	7	12	24
Volume Right (vph)	11	7	11	18
Hadj (s)	-0.05	-0.09	-0.02	-0.04
Departure Headway (s)	4.2	4.2	4.1	4.1
Degree Utilization, x	0.06	0.03	0.09	0.09
Capacity (veh/h)	822	820	846	857
Control Delay (s)	7.5	7.3	7.5	7.5
Approach Delay (s)	7.5	7.3	7.5	7.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.5		
Level of Service	A		
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	209	154	0	3
Future Volume (vph)	209	154	0	3
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 28.6%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	209	15	19	154	33	8	0	7	21	3	9
Future Volume (Veh/h)	21	209	15	19	154	33	8	0	7	21	3	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	232	17	21	171	37	9	0	8	23	3	10
Pedestrians		2			1			18			19	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	227			267			550	574	260	546	564	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			267			550	574	260	546	564	210
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			98			98	100	99	95	99	99
cM capacity (veh/h)	1334			1290			421	411	775	427	416	825

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	272	229	17	36
Volume Left	23	21	9	23
Volume Right	17	37	8	10
cSH	1334	1290	536	491
Volume to Capacity	0.02	0.02	0.03	0.07
Queue Length 95th (m)	0.4	0.4	0.7	1.8
Control Delay (s)	0.8	0.9	11.9	12.9
Lane LOS	A	A	B	B
Approach Delay (s)	0.8	0.9	11.9	12.9
Approach LOS			B	B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	359	420	13
Future Volume (vph)	359	420	13
Sign Control	Free	Free	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	359	18	21	420	13	28
Future Volume (Veh/h)	359	18	21	420	13	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	399	20	23	467	14	31
Pedestrians	15				63	
Lane Width (m)	3.7				3.7	
Walking Speed (m/s)	3.5				3.5	
Percent Blockage	0				2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			482		1000	472
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			482		1000	472
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			1061		258	581

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	419	490	45
Volume Left	0	23	14
Volume Right	20	0	31
cSH	1700	1061	418
Volume to Capacity	0.25	0.02	0.11
Queue Length 95th (m)	0.0	0.5	2.7
Control Delay (s)	0.0	0.6	14.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	14.7
Approach LOS			B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	187	591	0	0
Future Volume (vph)	187	591	0	0
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
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												
Traffic Volume (veh/h)	17	187	4	6	591	27	3	0	1	28	0	23
Future Volume (Veh/h)	17	187	4	6	591	27	3	0	1	28	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	208	4	7	657	30	3	0	1	31	0	26
Pedestrians		7			10			25			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	709			237			992	996	245	967	983	701
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	709			237			992	996	245	967	983	701
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			99	100	100	86	100	94
cM capacity (veh/h)	884			1320			203	235	786	224	239	435

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	231	694	4	57
Volume Left	19	7	3	31
Volume Right	4	30	1	26
cSH	884	1320	249	288
Volume to Capacity	0.02	0.01	0.02	0.20
Queue Length 95th (m)	0.5	0.1	0.4	5.5
Control Delay (s)	1.0	0.1	19.7	20.6
Lane LOS	A	A	C	C
Approach Delay (s)	1.0	0.1	19.7	20.6
Approach LOS			C	C

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	8	22	22	45
Future Volume (vph)	8	22	22	45
Sign Control	Stop	Stop	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 26.0%	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)	12	8	10	4	22	6	24	22	1	3	45	32
Future Volume (vph)	12	8	10	4	22	6	24	22	1	3	45	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	9	11	4	24	7	27	24	1	3	50	36

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	33	35	52	89
Volume Left (vph)	13	4	27	3
Volume Right (vph)	11	7	1	36
Hadj (s)	-0.09	-0.06	0.13	-0.20
Departure Headway (s)	4.1	4.2	4.3	3.9
Degree Utilization, x	0.04	0.04	0.06	0.10
Capacity (veh/h)	834	831	819	902
Control Delay (s)	7.3	7.3	7.5	7.3
Approach Delay (s)	7.3	7.3	7.5	7.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.4		
Level of Service	A		
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	205	593	0	2
Future Volume (vph)	205	593	0	2
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
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												
Traffic Volume (veh/h)	9	205	4	9	593	31	15	0	6	20	2	16
Future Volume (Veh/h)	9	205	4	9	593	31	15	0	6	20	2	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	228	4	10	659	34	17	0	7	22	2	18
Pedestrians		1			2			33			25	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	718			265			999	1021	265	980	1006	702
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	718			265			999	1021	265	980	1006	702
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			92	100	99	90	99	96
cM capacity (veh/h)	877			1286			204	228	766	219	233	435

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	242	703	24	42
Volume Left	10	10	17	22
Volume Right	4	34	7	18
cSH	877	1286	259	279
Volume to Capacity	0.01	0.01	0.09	0.15
Queue Length 95th (m)	0.3	0.2	2.3	4.0
Control Delay (s)	0.5	0.2	20.3	20.2
Lane LOS	A	A	C	C
Approach Delay (s)	0.5	0.2	20.3	20.2
Approach LOS			C	C

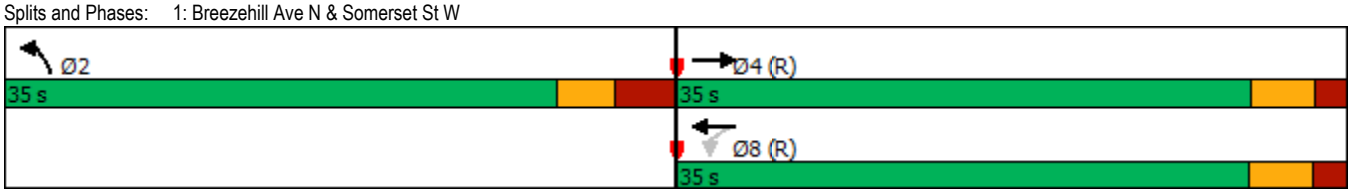
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

2031 Future Background Conditions

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Traffic Volume (vph)	254	39	197	22
Future Volume (vph)	254	39	197	22
Lane Group Flow (vph)	309	42	214	76
Turn Type	NA	Perm	NA	Prot
Protected Phases	4		8	2
Permitted Phases		8		
Detector Phase	4	8	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	23.1	23.2	23.2	24.2
Total Split (s)	35.0	35.0	35.0	35.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3	3.3	3.3	3.0
All-Red Time (s)	1.8	1.9	1.9	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.2	5.2	6.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	55.1	55.0	55.0	7.0
Actuated g/C Ratio	0.79	0.79	0.79	0.10
v/c Ratio	0.21	0.05	0.14	0.35
Control Delay	3.2	3.1	3.1	18.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.2	3.1	3.1	18.1
LOS	A	A	A	B
Approach Delay	3.2		3.1	18.1
Approach LOS	A		A	B
Queue Length 50th (m)	8.1	1.0	5.6	2.7
Queue Length 95th (m)	17.6	3.5	12.6	12.3
Internal Link Dist (m)	84.4		143.1	218.2
Turn Bay Length (m)		30.0		
Base Capacity (vph)	1463	845	1479	723
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.05	0.14	0.11

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 30 (43%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 41.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Breezehill Ave N & Somerset St W



Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	193	159	1	0
Future Volume (vph)	193	159	1	0
Lane Group Flow (vph)	233	216	5	36
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 35.4%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	193	0	1	159	39	2	1	2	15	0	18
Future Volume (Veh/h)	21	193	0	1	159	39	2	1	2	15	0	18
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)	23	210	0	1	173	42	2	1	2	16	0	20
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	215			210			472	473	210	454	452	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	215			210			472	473	210	454	452	194
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			100			100	100	100	97	100	98
cM capacity (veh/h)	1355			1361			484	481	830	507	494	847

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	233	216	5	36
Volume Left	23	1	2	16
Volume Right	0	42	2	20
cSH	1355	1361	580	653
Volume to Capacity	0.02	0.00	0.01	0.06
Queue Length 95th (m)	0.4	0.0	0.2	1.2
Control Delay (s)	0.9	0.0	11.3	10.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.9	0.0	11.3	10.8
Approach LOS			B	B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	26	8	50	34
Future Volume (vph)	26	8	50	34
Lane Group Flow (vph)	51	34	77	89
Sign Control	Stop	Stop	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 19.9%	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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	26	10	6	8	17	11	50	10	32	34	16
Future Volume (vph)	11	26	10	6	8	17	11	50	10	32	34	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
Hourly flow rate (vph)	12	28	11	7	9	18	12	54	11	35	37	17

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	51	34	77	89
Volume Left (vph)	12	7	12	35
Volume Right (vph)	11	18	11	17
Hadj (s)	-0.05	-0.24	-0.02	0.00
Departure Headway (s)	4.2	4.1	4.2	4.2
Degree Utilization, x	0.06	0.04	0.09	0.10
Capacity (veh/h)	810	842	837	842
Control Delay (s)	7.5	7.2	7.6	7.6
Approach Delay (s)	7.5	7.2	7.6	7.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.5		
Level of Service		A		
Intersection Capacity Utilization		19.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	211	157	0	3
Future Volume (vph)	211	157	0	3
Lane Group Flow (vph)	298	262	17	101
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 39.4%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	211	15	19	157	64	8	0	7	49	3	41
Future Volume (Veh/h)	49	211	15	19	157	64	8	0	7	49	3	41
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)	53	229	16	21	171	70	9	0	8	53	3	45
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	241			245			638	626	237	599	599	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	241			245			638	626	237	599	599	206
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 %	96			98			97	100	99	86	99	95
cM capacity (veh/h)	1326			1321			351	379	802	392	392	835

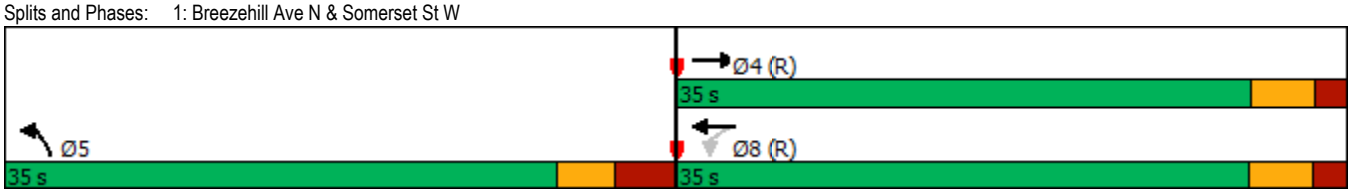
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	298	262	17	101
Volume Left	53	21	9	53
Volume Right	16	70	8	45
cSH	1326	1321	477	513
Volume to Capacity	0.04	0.02	0.04	0.20
Queue Length 95th (m)	0.9	0.3	0.8	5.1
Control Delay (s)	1.7	0.8	12.8	13.7
Lane LOS	A	A	B	B
Approach Delay (s)	1.7	0.8	12.8	13.7
Approach LOS			B	B

Intersection Summary				
Average Delay			3.4	
Intersection Capacity Utilization			39.4%	ICU Level of Service A
Analysis Period (min)			15	

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Traffic Volume (vph)	362	35	423	20
Future Volume (vph)	362	35	423	20
Lane Group Flow (vph)	383	35	423	60
Turn Type	NA	Perm	NA	Prot
Protected Phases	4		8	5
Permitted Phases		8		
Detector Phase	4	8	8	5
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	23.1	23.2	23.2	24.2
Total Split (s)	35.0	35.0	35.0	35.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3	3.3	3.3	3.0
All-Red Time (s)	1.8	1.9	1.9	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.2	5.2	6.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	58.6	58.5	58.5	6.9
Actuated g/C Ratio	0.84	0.84	0.84	0.10
v/c Ratio	0.26	0.05	0.28	0.31
Control Delay	3.1	2.9	3.3	18.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.1	2.9	3.3	18.7
LOS	A	A	A	B
Approach Delay	3.1		3.2	18.7
Approach LOS	A		A	B
Queue Length 50th (m)	10.9	0.8	12.7	2.3
Queue Length 95th (m)	22.9	3.1	26.0	10.8
Internal Link Dist (m)	84.4		143.1	218.2
Turn Bay Length (m)		30.0		
Base Capacity (vph)	1471	749	1490	681
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.05	0.28	0.09

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Breezehill Ave N & Somerset St W



Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	187	591	0	0
Future Volume (vph)	187	591	0	0
Lane Group Flow (vph)	208	625	4	52
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
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												
Traffic Volume (veh/h)	17	187	4	6	591	28	3	0	1	29	0	23
Future Volume (Veh/h)	17	187	4	6	591	28	3	0	1	29	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	17	187	4	6	591	28	3	0	1	29	0	23
Pedestrians		7			10			25			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	641			216			895	901	224	873	889	634
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	641			216			895	901	224	873	889	634
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			100			99	100	100	88	100	95
cM capacity (veh/h)	922			1319			228	259	786	248	263	465

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	208	625	4	52
Volume Left	17	6	3	29
Volume Right	4	28	1	23
cSH	922	1319	277	312
Volume to Capacity	0.02	0.00	0.01	0.17
Queue Length 95th (m)	0.4	0.1	0.3	4.1
Control Delay (s)	0.9	0.1	18.2	18.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.9	0.1	18.2	18.8
Approach LOS			C	C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	8	22	24	46
Future Volume (vph)	8	22	24	46
Lane Group Flow (vph)	31	44	49	91
Sign Control	Stop	Stop	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 25.5%	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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	8	10	4	22	18	24	24	1	13	46	32
Future Volume (vph)	13	8	10	4	22	18	24	24	1	13	46	32
Peak Hour 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
Hourly flow rate (vph)	13	8	10	4	22	18	24	24	1	13	46	32

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	31	44	49	91
Volume Left (vph)	13	4	24	13
Volume Right (vph)	10	18	1	32
Hadj (s)	-0.08	-0.19	0.12	-0.15
Departure Headway (s)	4.2	4.0	4.3	4.0
Degree Utilization, x	0.04	0.05	0.06	0.10
Capacity (veh/h)	829	857	816	886
Control Delay (s)	7.3	7.2	7.5	7.4
Approach Delay (s)	7.3	7.2	7.5	7.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.4		
Level of Service		A		
Intersection Capacity Utilization		25.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	209	597	0	2
Future Volume (vph)	209	597	0	2
Lane Group Flow (vph)	249	667	21	102
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 52.2%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	209	4	9	597	61	15	0	6	51	2	49
Future Volume (Veh/h)	36	209	4	9	597	61	15	0	6	51	2	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	36	209	4	9	597	61	15	0	6	51	2	49
Pedestrians		1			2			33			25	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		0			0			3			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	683			246			1012	1017	246	962	988	654
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	683			246			1012	1017	246	962	988	654
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 %	96			99			91	100	99	76	99	89
cM capacity (veh/h)	887			1275			171	213	764	209	221	455

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	249	667	21	102
Volume Left	36	9	15	51
Volume Right	4	61	6	49
cSH	887	1275	220	283
Volume to Capacity	0.04	0.01	0.10	0.36
Queue Length 95th (m)	0.9	0.1	2.2	11.1
Control Delay (s)	1.7	0.2	23.1	24.7
Lane LOS	A	A	C	C
Approach Delay (s)	1.7	0.2	23.1	24.7
Approach LOS			C	C

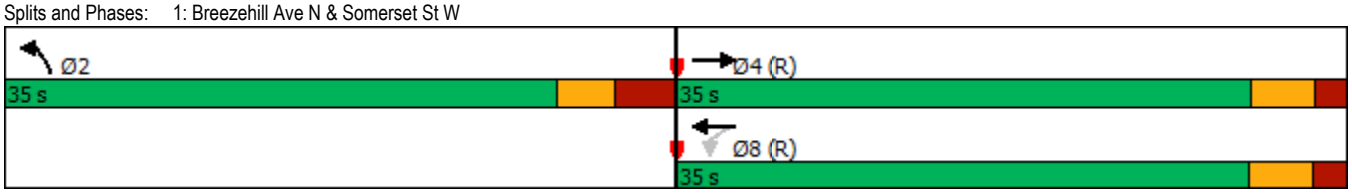
Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	52.2%	ICU Level of Service	A	
Analysis Period (min)	15			

2031 Total Projected Conditions

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Traffic Volume (vph)	254	40	197	23
Future Volume (vph)	254	40	197	23
Lane Group Flow (vph)	312	43	214	80
Turn Type	NA	Perm	NA	Prot
Protected Phases	4		8	2
Permitted Phases		8		
Detector Phase	4	8	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	23.1	23.2	23.2	24.2
Total Split (s)	35.0	35.0	35.0	35.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3	3.3	3.3	3.0
All-Red Time (s)	1.8	1.9	1.9	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.2	5.2	6.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	55.0	54.9	54.9	7.1
Actuated g/C Ratio	0.79	0.78	0.78	0.10
v/c Ratio	0.21	0.05	0.14	0.37
Control Delay	3.3	3.1	3.1	18.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.3	3.1	3.1	18.0
LOS	A	A	A	B
Approach Delay	3.3		3.1	18.0
Approach LOS	A		A	B
Queue Length 50th (m)	8.3	1.0	5.6	2.8
Queue Length 95th (m)	18.1	3.6	12.8	12.6
Internal Link Dist (m)	84.4		143.1	218.2
Turn Bay Length (m)		30.0		
Base Capacity (vph)	1458	843	1476	724
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.05	0.14	0.11

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 30 (43%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 5.0	Intersection LOS: A
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Breezehill Ave N & Somerset St W



Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	193	159	1	0
Future Volume (vph)	193	159	1	0
Lane Group Flow (vph)	236	216	5	42
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 35.6%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	193	0	1	159	39	2	1	2	15	0	24
Future Volume (Veh/h)	24	193	0	1	159	39	2	1	2	15	0	24
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)	26	210	0	1	173	42	2	1	2	16	0	26
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	215			210			484	479	210	460	458	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	215			210			484	479	210	460	458	194
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			100			100	100	100	97	100	97
cM capacity (veh/h)	1355			1361			471	476	830	501	489	847

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	236	216	5	42
Volume Left	26	1	2	16
Volume Right	0	42	2	26
cSH	1355	1361	571	671
Volume to Capacity	0.02	0.00	0.01	0.06
Queue Length 95th (m)	0.4	0.0	0.2	1.4
Control Delay (s)	1.0	0.0	11.4	10.7
Lane LOS	A	A	B	B
Approach Delay (s)	1.0	0.0	11.4	10.7
Approach LOS			B	B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	26	8	50	34
Future Volume (vph)	26	8	50	34
Lane Group Flow (vph)	51	46	80	92
Sign Control	Stop	Stop	Stop	Stop

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	26	10	12	8	22	11	50	13	35	34	16
Future Volume (vph)	11	26	10	12	8	22	11	50	13	35	34	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
Hourly flow rate (vph)	12	28	11	13	9	24	12	54	14	38	37	17

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	51	46	80	92
Volume Left (vph)	12	13	12	38
Volume Right (vph)	11	24	14	17
Hadj (s)	-0.05	-0.22	-0.04	0.01
Departure Headway (s)	4.3	4.1	4.2	4.2
Degree Utilization, x	0.06	0.05	0.09	0.11
Capacity (veh/h)	803	834	832	832
Control Delay (s)	7.5	7.3	7.6	7.7
Approach Delay (s)	7.5	7.3	7.6	7.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.6		
Level of Service		A		
Intersection Capacity Utilization		20.6%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	211	157	0	3
Future Volume (vph)	211	157	0	3
Lane Group Flow (vph)	298	267	17	115
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 40.8%	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)	49	211	15	19	157	69	8	0	7	62	3	41
Future Volume (Veh/h)	49	211	15	19	157	69	8	0	7	62	3	41
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)	53	229	16	21	171	75	9	0	8	67	3	45
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	246			245			640	631	237	602	602	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	246			245			640	631	237	602	602	208
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 %	96			98			97	100	99	83	99	95
cM capacity (veh/h)	1320			1321			350	376	802	390	391	832

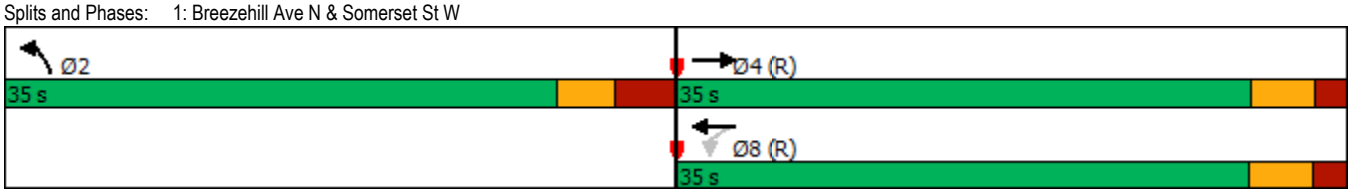
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	298	267	17	115
Volume Left	53	21	9	67
Volume Right	16	75	8	45
cSH	1320	1321	476	493
Volume to Capacity	0.04	0.02	0.04	0.23
Queue Length 95th (m)	0.9	0.3	0.8	6.3
Control Delay (s)	1.7	0.7	12.8	14.5
Lane LOS	A	A	B	B
Approach Delay (s)	1.7	0.7	12.8	14.5
Approach LOS			B	B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Traffic Volume (vph)	362	36	423	21
Future Volume (vph)	362	36	423	21
Lane Group Flow (vph)	388	36	423	63
Turn Type	NA	Perm	NA	Prot
Protected Phases	4		8	2
Permitted Phases		8		
Detector Phase	4	8	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	23.1	23.2	23.2	24.2
Total Split (s)	35.0	35.0	35.0	35.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3	3.3	3.3	3.0
All-Red Time (s)	1.8	1.9	1.9	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.2	5.2	6.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	58.5	58.4	58.4	6.9
Actuated g/C Ratio	0.84	0.83	0.83	0.10
v/c Ratio	0.26	0.05	0.28	0.32
Control Delay	3.1	2.9	3.3	18.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.1	2.9	3.3	18.7
LOS	A	A	A	B
Approach Delay	3.1		3.3	18.7
Approach LOS	A		A	B
Queue Length 50th (m)	11.1	0.9	12.8	2.4
Queue Length 95th (m)	23.4	3.1	26.4	11.2
Internal Link Dist (m)	84.4		143.1	218.2
Turn Bay Length (m)		30.0		
Base Capacity (vph)	1478	792	1489	682
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.05	0.28	0.09

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 4.3	Intersection LOS: A
Intersection Capacity Utilization 45.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Breezehill Ave N & Somerset St W



Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	187	591	0	0
Future Volume (vph)	187	591	0	0
Lane Group Flow (vph)	213	625	4	56
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 46.1%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	187	4	6	591	28	3	0	1	29	0	27
Future Volume (Veh/h)	22	187	4	6	591	28	3	0	1	29	0	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	22	187	4	6	591	28	3	0	1	29	0	27
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	619			191			877	864	189	851	852	605
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	619			191			877	864	189	851	852	605
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			100			99	100	100	89	100	95
cM capacity (veh/h)	961			1383			249	284	853	274	289	498

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	213	625	4	56
Volume Left	22	6	3	29
Volume Right	4	28	1	27
cSH	961	1383	303	350
Volume to Capacity	0.02	0.00	0.01	0.16
Queue Length 95th (m)	0.5	0.1	0.3	3.9
Control Delay (s)	1.1	0.1	17.1	17.2
Lane LOS	A	A	C	C
Approach Delay (s)	1.1	0.1	17.1	17.2
Approach LOS			C	C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	8	22	24	46
Future Volume (vph)	8	22	24	46
Lane Group Flow (vph)	31	51	54	97
Sign Control	Stop	Stop	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 17.0%	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)	13	8	10	8	22	21	24	24	6	19	46	32
Future Volume (vph)	13	8	10	8	22	21	24	24	6	19	46	32
Peak Hour 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
Hourly flow rate (vph)	13	8	10	8	22	21	24	24	6	19	46	32

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	31	51	54	97
Volume Left (vph)	13	8	24	19
Volume Right (vph)	10	21	6	32
Hadj (s)	-0.08	-0.18	0.06	-0.12
Departure Headway (s)	4.2	4.1	4.2	4.0
Degree Utilization, x	0.04	0.06	0.06	0.11
Capacity (veh/h)	820	847	822	875
Control Delay (s)	7.4	7.3	7.5	7.5
Approach Delay (s)	7.4	7.3	7.5	7.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.4		
Level of Service	A		
Intersection Capacity Utilization	17.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	209	597	0	2
Future Volume (vph)	209	597	0	2
Lane Group Flow (vph)	249	676	21	110
Sign Control	Free	Free	Stop	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 52.9%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	209	4	9	597	70	15	0	6	59	2	49
Future Volume (Veh/h)	36	209	4	9	597	70	15	0	6	59	2	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	36	209	4	9	597	70	15	0	6	59	2	49
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	667			213			983	968	211	939	935	632
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	667			213			983	968	211	939	935	632
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 %	96			99			92	100	99	75	99	90
cM capacity (veh/h)	923			1357			196	242	829	234	253	480

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	249	676	21	110
Volume Left	36	9	15	59
Volume Right	4	70	6	49
cSH	923	1357	251	304
Volume to Capacity	0.04	0.01	0.08	0.36
Queue Length 95th (m)	0.9	0.1	1.9	11.2
Control Delay (s)	1.7	0.2	20.6	23.4
Lane LOS	A	A	C	C
Approach Delay (s)	1.7	0.2	20.6	23.4
Approach LOS			C	C

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		