951 Gladstone Avenue and 145 Loretta Avenue North

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report (revision #5)

Prepared for:

TIP Gladstone Limited Partnership
200-485 Bank Street
Ottawa, ON K2P 1Z2

Prepared by:

CGH TRANSPORTATION
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Ottawa, ON K2H 7W1

April 2024

PN: 2020-25

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1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, prior to the June 2023 updates. A TIA report was submitted and approved for the zoning bylaw amendment in 2019. This report provides an update on the existing conditions, forecasting and network impact component and the submission of the design review component. Accordingly, the Step 1 Screening Form has been revised and is included as Appendix A, along with the Certification Form for TIA Study PM. This TIA will support the site plan application.

2 Existing and Planned Conditions

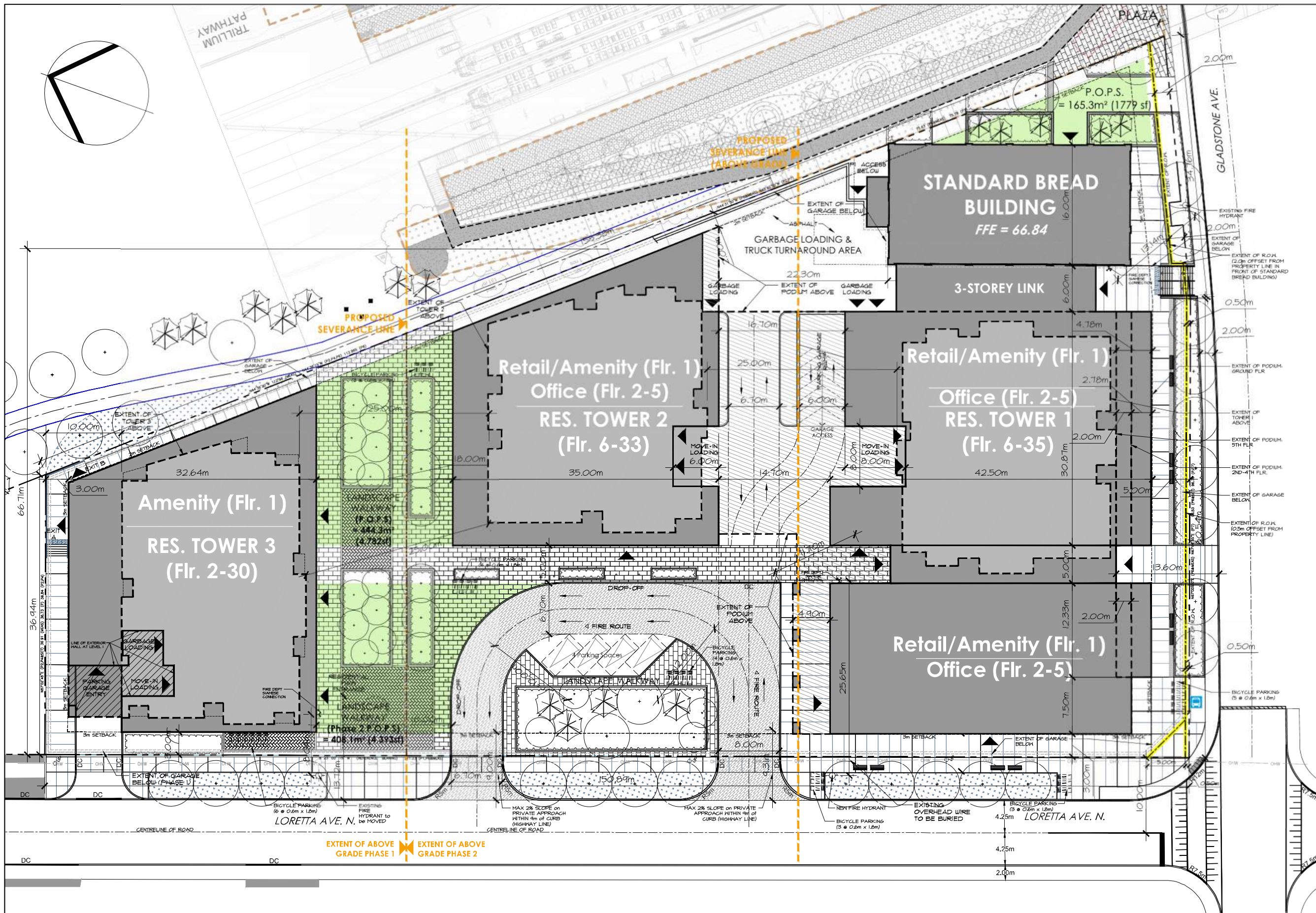
2.1 Proposed Development

The proposed development is located at 951 Gladstone Avenue and 145 Loretta Avenue North and has undergone an Official Plan and Zoning amendment to rezone the site from general industry (IG) zoning to mixed-use centre (MC). The existing land uses have been closed and previously included a brewery, jujitsu club, cross-fit gym, glass blowing, art studio, beer and wine supply, bread bakery, and other assorted industrial uses. The proposed site plan application consists of approximately 872 residential units, 198,524 sq. ft of office space (including the existing Standard Bread building, live-work space) and 17,611 sq. ft of retail space. A total of 526 parking spaces will be provided (including visitor spaces), with four at ground level and the remaining 522 in the three levels of underground parking. Parking spaces for bikes are provided in the underground parking levels totalling 516 spaces. Four existing accesses and street edge parking will be removed and replaced with a new two-way general access between Towers 1 and 2, with a one-way loop extending past Tower 2 to Loretta Avenue North and a two-way access for Tower 3. A loading/move-in areas will be provided adjacent to the underground parking ramps. The frontage along Loretta Avenue North would formalize the curb edge and remove the paved shoulder and open access along the building frontage. The anticipated full build-out and occupancy horizon is 2026. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan

Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 21, 2021

Figure 2: Concept Plan



LOCATION PLAN

SURVEY INFORMATION TAKEN FROM:

SURVEYOR'S REAL PROPERTY REPORT
PART I - PLAN OF

PART OF LOT 1 & LOTS 2 & 3
(WEST CHAMPAGNE AVENUE)
BLOCK C AND
LOTS 1, 2 & 3 (EAST LORETTA AVENUE)
BLOCK C AND
LOTS 4, 5, 6, 7 & 8
BLOCK C AND
PART OF BLOCK C AND
PART OF CHAMPAGNE STREET
(CLOSED BY BY-LAW 4863)

REGISTERED PLAN 73
CITY OF OTTAWA

STANTEC GEOMATICS LTD. 2017

LEGEND

BUS STOP	
EXISTING OVERHEAD WIRES (TO BE BURIED)	
FIRE HYDRANT (EXISTING & NEW - as noted)	
EXISTING UTILITY POLE (TO BE REMOVED)	
PROPERTY LINE	
SETBACK LINE	
FIRE ROUTE	
PRIVATELY OWNED PUBLIC SPACE (P.O.P.S.)	
EXTENT OF GARAGE BELOW	
ROAD WIDENING LINE	

SITE STATISTICS

SITE AREA: 10,012m² / 2.47 ac

RESIDENTIAL UNIT COUNT:

TOWER 1	= 279
TOWER 2	= 271
TOWER 3	= 322
TOTAL	= 872

GFA

PHASE 1	= 26,249m²
PHASE 2	= 68,840m²
TOTAL	= 95,089m²

Gladstone and Loretta Mixed-Use Hub Draft Zoning Table

MC[XXXX] SYYY-h		Requirement	Proposed
Minimum Lot Width (m)		No minimum	Complies
Minimum Lot Area (m²)		No minimum	Complies
Minimum Front Yard Setback (m)		5 metres; aside from Standard Bread Building (See S.YYY)	5m
Minimum Rear Yard Setback (m)		3 metres (See S.YYY)	3m
Interior Side Yard Setback (m)		2 metres, aside from Standard Bread Building (See S.YYY)	2m
Corner Side Yard Setback (m)		3 metres, (See S.YYY)	3m
Minimum Building Height (m)		6.7m (See S. YYY)	Complies
Maximum Building Height (m)		0m to 132m (See S. YYY)	Complies
Maximum Floor Space Index		No maximum	N/A
Minimum Width of Landscaped Area		No minimum, except that where a yard is provided and not used for required driveways, aisles, parking, loading spaces or outdoor commercial patio, the whole yard must be landscaped	Complies
Minimum Tower Separation Distance		23 metres	Complies
Minimum Tower Podium Stepback Distance		2 metres	2m at Gladstone frontage only
Parking Requirements (Sec. 101, 102, 106, 111)		**Requirement**	**Proposed**
Area Z of Schedule 1A 0 spaces/unit (resident) 0.1 spaces/unit, less first 12 units (visitor), but no more than 30		Resident: 0 Visitor: 30	Surface: 4 P1: 218 P2: 251 P3: 53 Total: 526
Vehicle Space Dimensions		- Must be 2.6m-3.1m by 5.2m - Up to 40% of required parking aside from visitor's spaces may be 2.4m x 4.6m	Complies
		0.5 x 872 units = 436 bicycles 80.3 bicycles Total Bicycle Spaces: 516	516 spaces proposed
Bicycle Space Dimensions		Horizontal: 0.6m x 1.8m Vertical: 0.5m x 1.5m (max 50% of required spaces) Stacked: 0.37m x 1.5m	Complies
Drive Aisle Width (Double Traffic Lane)	Parking Lot	Minimum: 6.7m	Complies
	Parking Garage	Minimum: 6m Maximum: 6.7m	6m
Amenity Space Requirements (Sec. 137)		**Requirement**	**Proposed**
Total: 6m² per unit **Communal: 50% of total required** **POPS [Privately Owned Public Space**		Total: 5,232 m² Communal: 2,616 m²	Rooftop Terrace (Communal):1,441.9m² Indoor Amenity (Communal): 2,022.7 m² Balconies: ~3,548.2m² POPS: 1,017.7 m²

0 m 10 m 25 m 50 m

PBCGROUP

CLV GROUP

no.	date	revision
09	APR, 17 2024	SITE PLAN COMMENTS
08	DEC, 18 2023	COORDINATION
07	AUG, 16 2023	SITE PLAN COMMENTS
06	NOV, 04 2022	REVISED PHASE LINE
05	OCT, 10 2022	SITE PLAN COMMENTS
04	MAR 02, 2022	SITE PLAN COMMENTS
03	APR 09, 2021	SITE PLAN
02	FEB 12, 2020	ZONING & OPA

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

Do not scale drawings.

This drawing may not be used for construction until signed.

ONTARIO ASSOCIATION OF ARCHITECTS
BARRY J. HOBIN
LICENCE
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HOBIN ARCHITECTURE

PROJECT/LOCATION:
951 GLADSTONE AVE.
& 145 LORETTA AVE. NORTH

DRAWING TITLE:
SITE PLAN

DRAWN BY:	DATE:	SCALE:
TD	19/04/17	1:300

north arrow

PROJECT: 1726

DRAWING NO.: S1

REVISION NO.:

18526

D07-12-21-0053

PROJECT CONSULTANTS:

Owner / Applicant

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Ottawa, ON K2G 3Z1

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Perth, ON, K7H 1T5

Contact:
John Stewart
phone: (613) 267-7040 email: jjs@chrml.com

None

2.2 Existing Conditions

2.2.1 Area Road Network

Preston Street: Preston Street is a City of Ottawa arterial road with a two-lane urban cross-section, including parking lanes and auxiliary lanes at major intersections. The unposted speed limit is 50 km/h, and the Ottawa Official Plan reserves a 23.0 metre right-of-way.

Somerset Street West: Somerset Street West is a City of Ottawa arterial road with a two-lane cross-section, including sidewalks and on street parking. The unposted speed limit is 50 km/h, and the right-of-way is 20.0 metres. East of Breezehill Avenue, bike lanes are provided.

Gladstone Avenue: Gladstone Avenue is a City of Ottawa major collector road with a two-lane urban cross-section including sidewalks and a posted speed limit of 40 km/h. The current right-of-way is 20.0 metres, with additional width provided in proximity to the rail corridor.

Bayswater Avenue: Bayswater Avenue is a City of Ottawa collector road with a two-lane urban cross-section, including sidewalks and on-street parking. The posted speed limit is 30 km/h, and the right-of-way is 25.0 metres.

Loretta Avenue North/Laurel Street: Loretta Avenue N is a City of Ottawa local road with a two-lane urban cross-section including paved shoulders on the east side and a sidewalk on the west side. The posted speed is 40 km/h, and the right-of-way is 20.0 metres.

Breezehill Avenue: Breezehill Avenue is a City of Ottawa local road with a two-lane urban cross-section, including sidewalks, and parking on the east side of the road. The posted speed limit is 40 km/h, and the right-of-way is 20.0 metres.

2.2.2 Existing Intersections

The existing signalized area intersections within one kilometre of the site have been summarized below:

Gladstone Avenue & Bayswater Avenue	The intersection of Gladstone Avenue and Bayswater Avenue is a signalized intersection with shared all movement lanes on each approach. No turn restrictions were noted.
Gladstone Avenue & Preston Street	The intersection of Gladstone Avenue and Preston Street is a signalized intersection with auxiliary left-turn lanes on the northbound, westbound, and southbound approaches. Eastbound and southbound right turns on red are prohibited.
Somerset Street West & Breezehill Avenue	The intersection of Somerset Street West and Breezehill Avenue is a minor stop-controlled intersection with shared movement lanes on all approaches. Bike lanes along Somerset Street West start/end on the east side of the intersection. No turn restrictions were noted.
Gladstone Avenue & Loretta Avenue North	The intersection of Gladstone Avenue and Loretta Avenue N is a minor stop-controlled intersection with shared movement lanes on all approaches. No turn restrictions were noted.

Laurel Street & Breezehill Avenue	The intersection of Laurel Street and Breezehill Avenue is an all-way stop-controlled intersection with shared movement lanes on all approaches. No turn restrictions were noted.

2.2.3 Existing Driveways

Along Gladstone Avenue, a driveway to the City of Ottawa yard (175 Loretta Avenue North) is located opposite the existing Standard Bread access adjacent to the Trillium Rail Corridor, and an access to 950 Gladstone Avenue within 5.0 metres of the Loretta Avenue North intersection. Between Loretta Avenue North and Breezehill Avenue, an access loop is located on the north side of Gladstone Avenue to the Canadian Bank Note Limited, and five driveways are located on the south side.

Along Loretta Avenue North, two accesses are provided on the west side of the road for the Canadian Bank Note Limited site, and a single access is located north of the proposed site for 131 Loretta Avenue North. The paved shoulder is used for perpendicular parking along Loretta Avenue North as well.

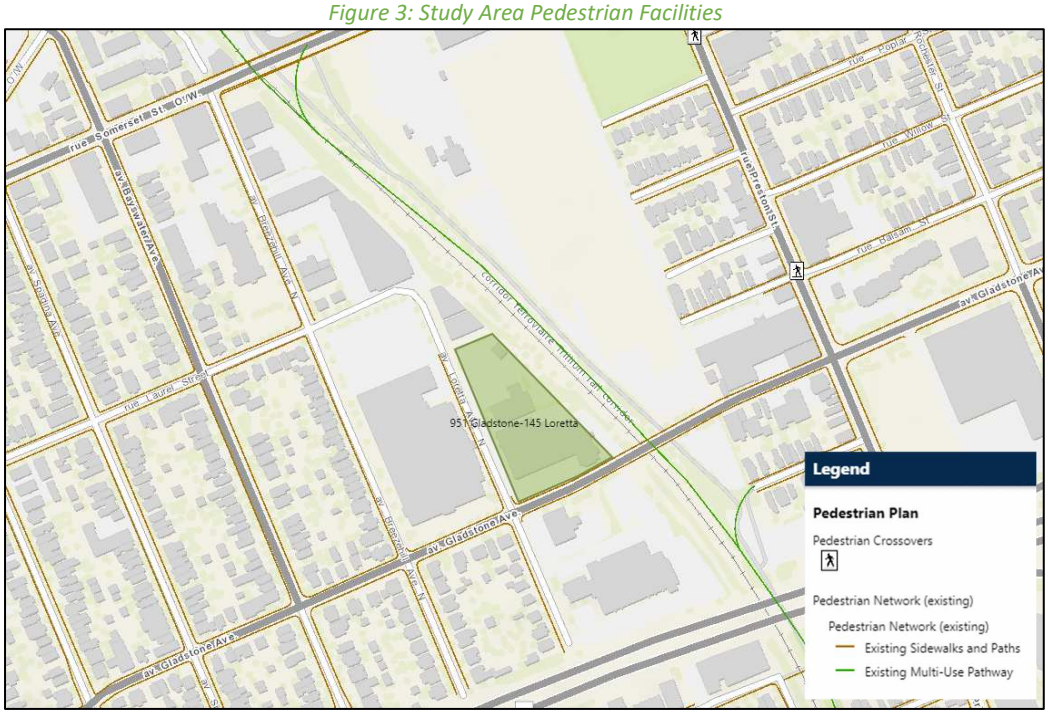
2.2.4 Cycling and Pedestrian Facilities

Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities. Figure 5 and Figure 6 illustrate the existing pedestrian and cycling volumes within the study area.

Sidewalks are provided along both sides of the roadways in the study area with the exception of the east side of Breezehill Avenue between Gladstone Avenue and Laurel Street, on both sides of Laurel Street, and the east side of Loretta Avenue North. The Trillium Pathway is a multi-use pathway along the east side of the Trillium Rail Corridor.

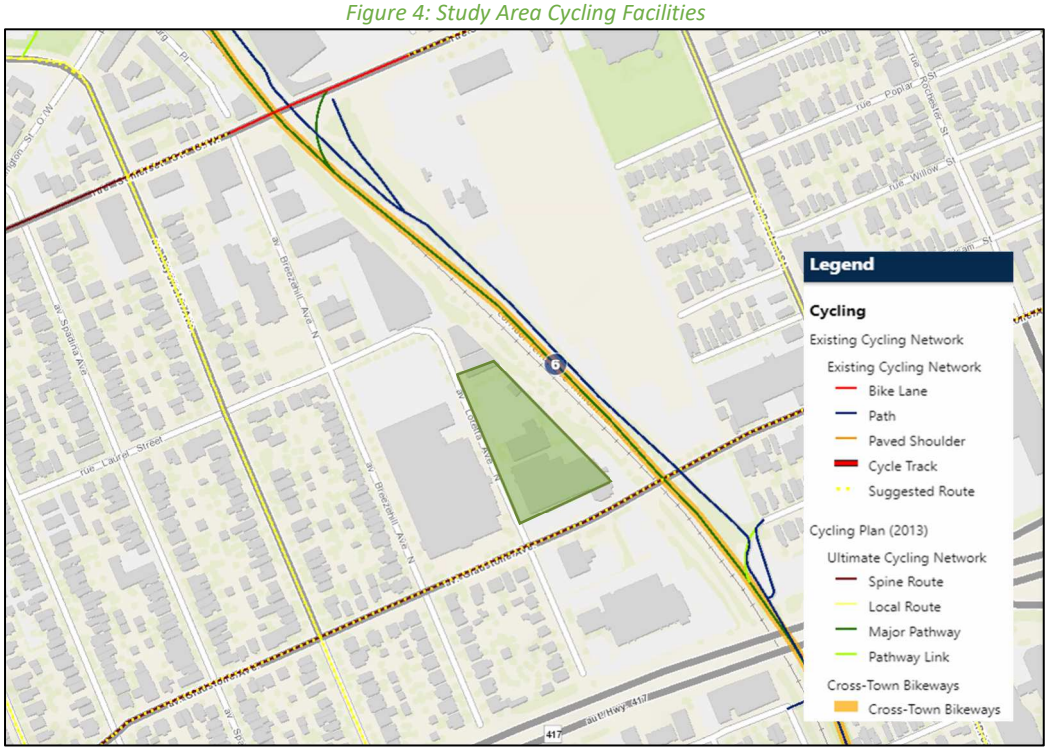
The Ottawa Cycling Plan (2013) consists of the Trillium Pathway as a cross-town bikeway, suggested biking routes along Gladstone Avenue, Bayswater Avenue and Somerset Street W, including bike lanes on the bridge over the Trillium Rail Corridor.

Figure 3: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 31, 2021

Figure 4: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: September 27, 2022

Figure 5: Existing Pedestrian Volumes

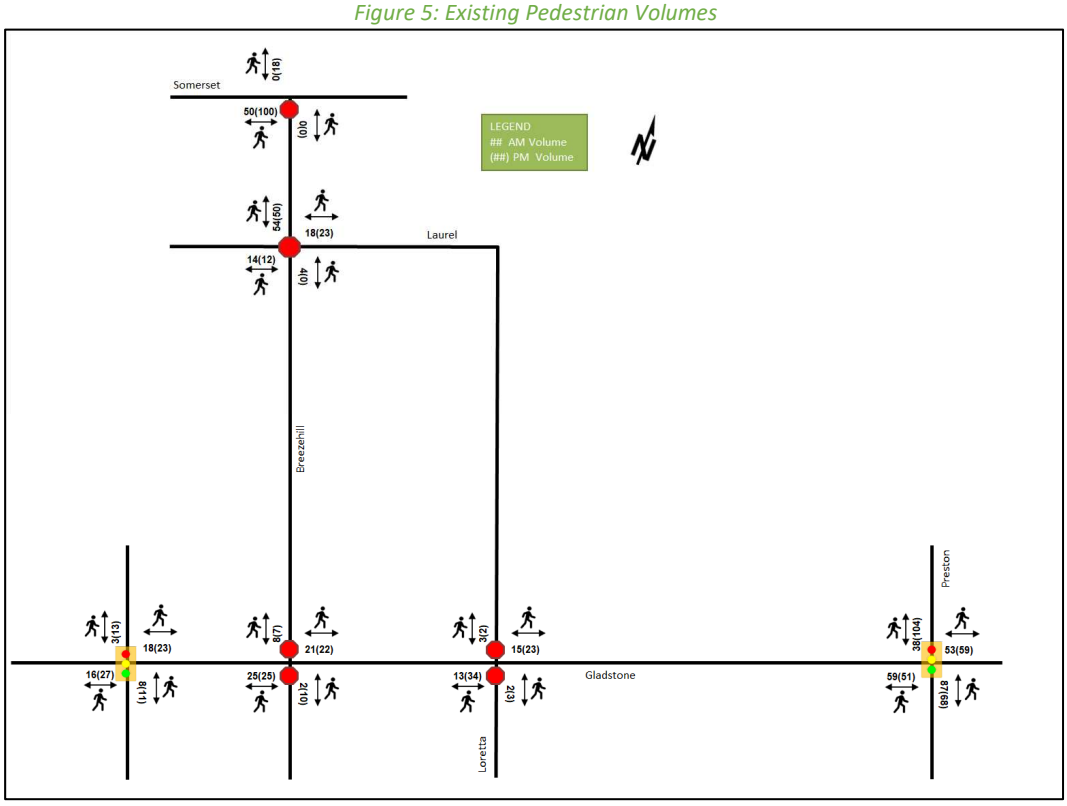
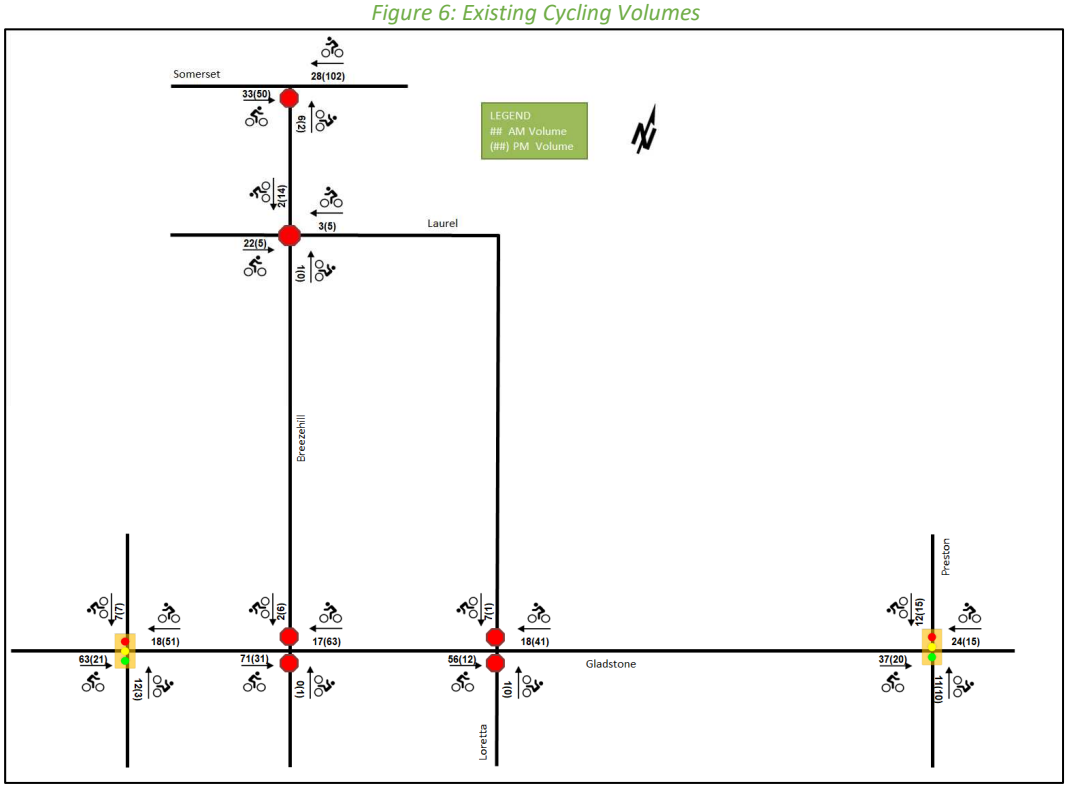


Figure 6: Existing Cycling Volumes



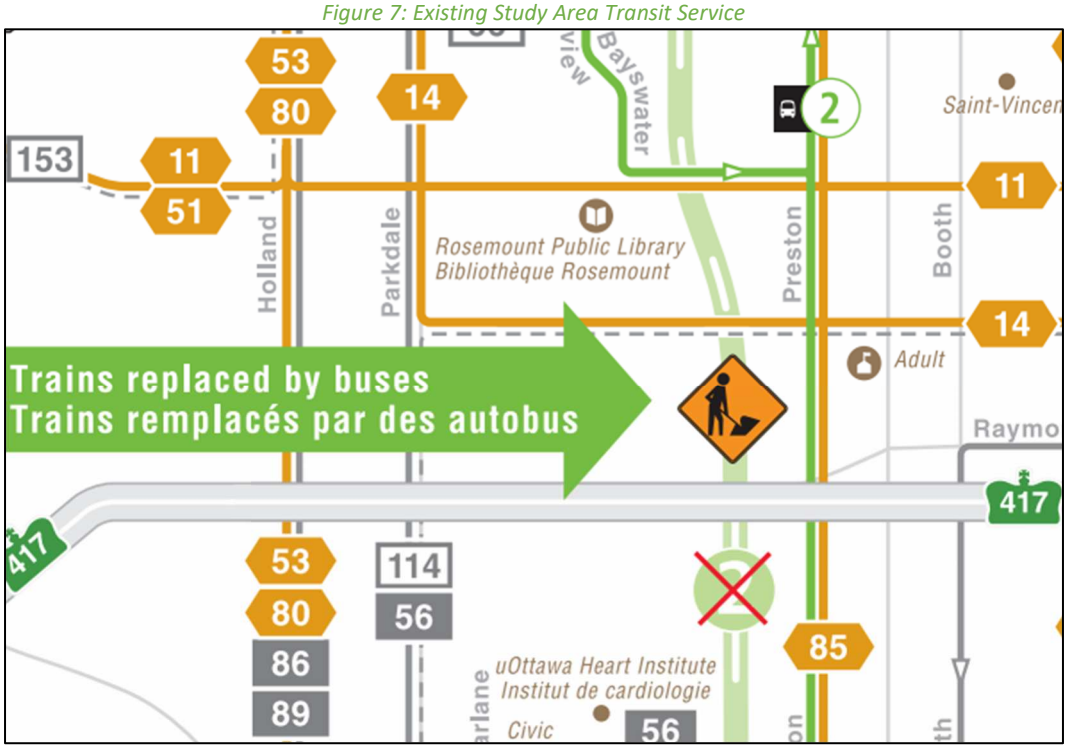
2.2.5 Existing Transit

Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates nearby transit stops. All transit information is from September 27, 2022, and is included for general information purposes and context to the surrounding area.

Within the study area, the routes #11, #14 and #114 run along Gladstone Avenue, Somerset Street and Preston Street. The frequency of these routes within proximity of the proposed site based on September 27, 2022, service levels are:

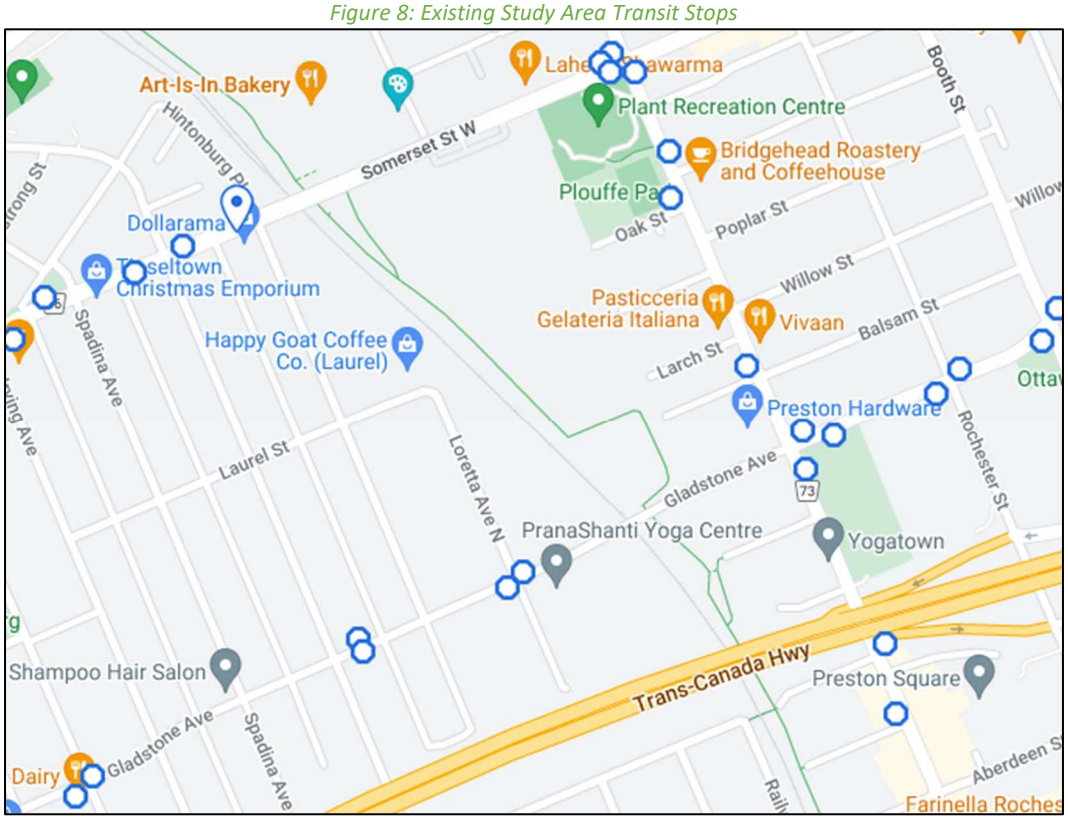
- Route #11 – every 10-15 minutes during the day and 20-30 minutes during the evening
- Route # 14 – every 15-20 minutes during the day and 20-30 minutes during the evening
- Route #85 – every 10-20 minutes during the day and 20-30 minutes during the evening
- Route # 114 – two trips during the AM peak to Rideau and two trips during the PM peak to Caldwell/Merivale

Figure 7: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: September 27, 2022

Figure 8: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: September 27, 2022

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa and new traffic count surveys for the existing Study Area intersection. Table 1 summarizes the intersection count dates and sources.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Gladstone Avenue and Bayswater Avenue	Wednesday July 27, 2016	City of Ottawa
Gladstone Avenue and Breezehill Avenue	Wednesday, July 18, 2018	City of Ottawa
Gladstone Avenue and Loretta Avenue	Tuesday, April 23, 2019	The Traffic Specialist
Gladstone Avenue and Preston Street	Tuesday June 20,2017	City of Ottawa
Laurel Street and Breezehill Avenue	Tuesday, April 23, 2019	The Traffic Specialist
Somerset Street West and Breezehill Avenue	Thursday August 12, 2015	City of Ottawa

Figure 9 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. The volumes have been balanced through the network. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 9: Existing Traffic Counts

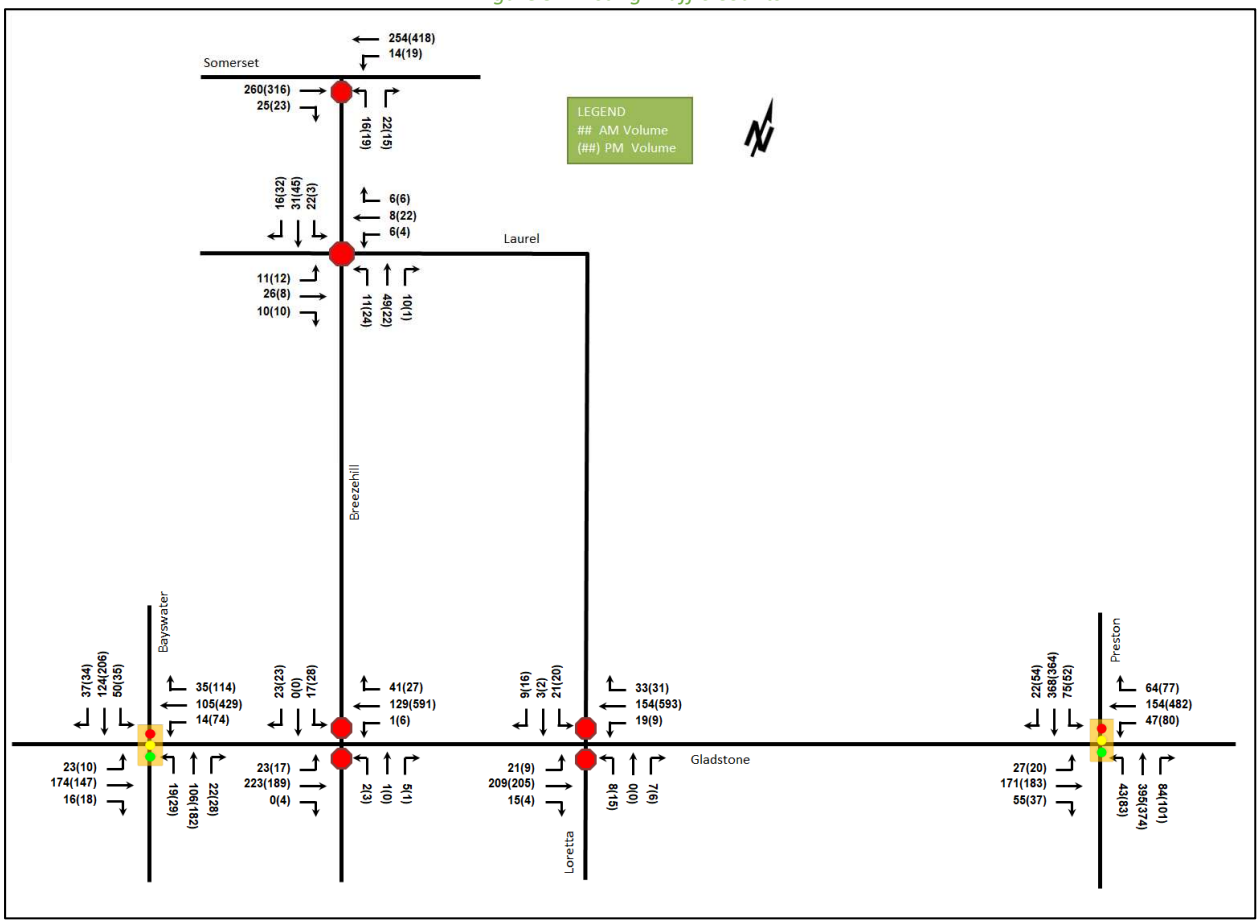


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Gladstone Avenue & Preston Street ***Signalized***	EB	C	0.76	37.8	**#57.3**	A	0.50	20.0	47.8
	WBL	A	0.27	23.8	13.6	A	0.23	16.0	17.5
	WBT/R	A	0.59	25.9	43.1	E	0.91	40.2	**#140.8**
	NBL	A	0.11	8.5	7.6	A	0.39	19.7	19.0
	NBT/R	A	0.55	12.2	68.1	C	0.76	24.4	85.2
	SBL	A	0.23	10.3	12.8	A	0.29	17.7	12.7
	SBT/R	A	0.43	10.7	52.0	B	0.67	21.8	73.0
	Overall	**B**	**0.61**	**18.3**	-	**D**	**0.83**	**27.2**	-
Gladstone Avenue & Loretta Avenue North ***Unsignalized***	EB	A	0.02	7.8	0.8	A	0.01	9.2	0.0
	WB	A	0.02	7.8	0.8	A	0.01	7.9	0.0
	NB	B	0.03	11.9	0.8	C	0.09	20.3	2.3
	SB	B	0.08	12.9	1.5	C	0.15	20.3	3.8
	Overall	**A**	-	**1.8**	-	**A**	-	**1.5**	-
Gladstone Avenue & Breezehill Avenue ***Unsignalized***	EB	A	0.02	7.7	0.8	A	0.02	9.2	0.8
	WB	A	0.00	7.8	0.0	A	0.01	7.8	0.0
	NB	B	0.02	11.2	0.0	C	0.02	19.6	0.8
	SB	B	0.07	11.3	1.5	C	0.20	20.9	5.3
	Overall	**A**	-	**1.5**	-	**A**	-	**1.5**	-
Gladstone Avenue & Bayswater Avenue ***Signalized***	EB	A	0.31	11.3	27.8	A	0.23	8.5	19.8
	WB	A	0.23	8.9	18.4	D	0.85	25.5	**#121.1**
	NB	A	0.28	13.8	22.9	A	0.52	20.7	41.7
	SB	A	0.42	16.0	33.3	B	0.61	23.0	49.3
	Overall	**A**	**0.35**	**12.7**	-	**C**	**0.75**	**21.8**	-
Somerset Street W & Breezehill Avenue ***Unsignalized***	EB	-	-	-	-	-	-	-	-
	WB	A	0.01	8.2	0.0	A	0.02	8.7	0.8
	NB	B	0.08	12.5	2.3	C	0.12	17.7	3.0
	Overall	**A**	-	**1.0**	-	**A**	-	**1.0**	-
Laurel Street & Breezehill Avenue ***Unsignalized***	EB	A	0.06	7.5	1.5	A	0.04	7.3	0.8
	WB	A	0.03	7.3	0.8	A	0.04	7.4	0.8
	NB	A	0.09	7.5	2.3	A	0.06	7.5	1.5
	SB	A	0.09	7.5	2.3	A	0.10	7.3	2.3
	Overall	**A**	-	**7.5**	-	**A**	-	**7.4**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90
Delay = average vehicle delay in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersection operates well. No capacity issues are noted. The eastbound movements at the intersection of Gladstone Avenue and Preston Street may exhibit extended queues during AM peak. During the PM peak, the westbound queues at the Gladstone Avenue and Preston Street intersection may extend beyond the mid-block and to Rochester Street, and at the Gladstone Avenue and Bayswater Avenue intersection may extend beyond the Breezehill Avenue intersection.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for the recent five years for the surrounding study area road network. Table 3 summarizes the collision types and conditions in the study area, Figure 10 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2016-2020

		Number	%
Total Collisions		**63**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	25	40%
	Property Damage Only	38	60%
Initial Impact Type	**Approaching**	1	2%
	Angled	17	27%
	Rear end	12	19%
	Sideswipe	6	10%
	Turning Movement	13	21%
	SMV Unattended	4	6%
	SMV Other	8	13%
	Other	2	3%
Road Surface Condition	**Dry**	38	60%
	Wet	11	17%
	Loose Snow	4	6%
	Slush	6	10%
	Packed Snow	1	2%
	Ice	3	5%
Pedestrian Involved		7	11%
Cyclists Involved		7	11%

Figure 10: Study Area Collision Records – Representation of 2016-2020

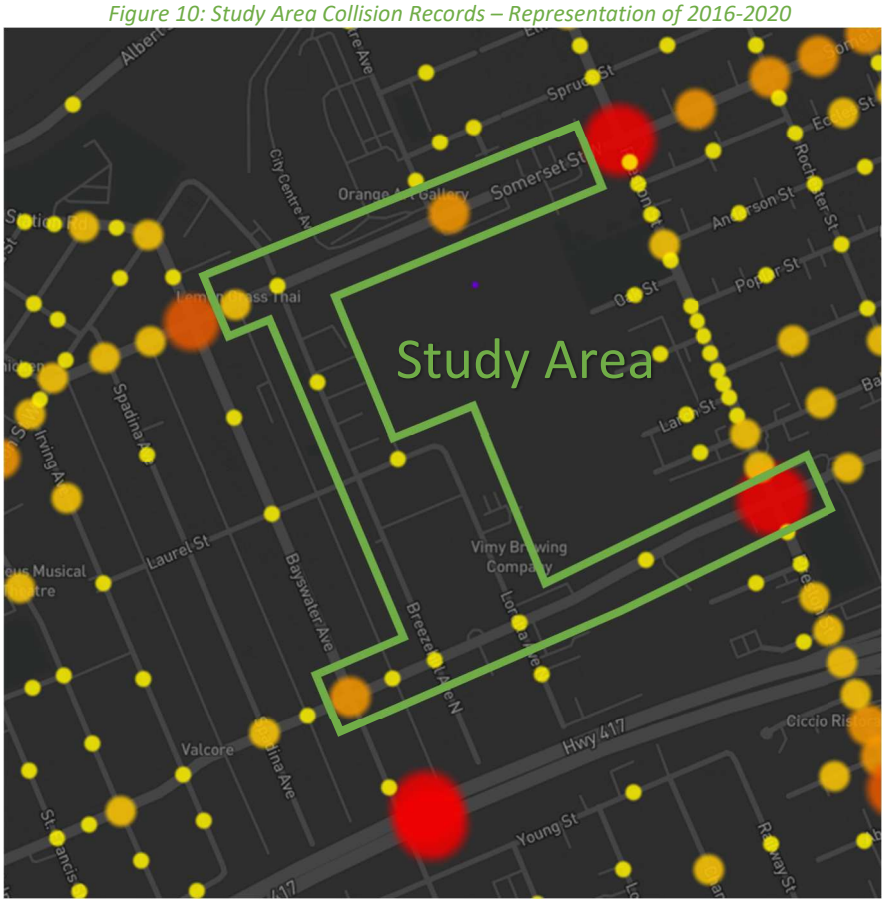


Table 4: Summary of Collision Locations, 2016-2020

	Number	%
Intersections / Segments	**63**	**100%**
Gladstone Avenue @ Bayswater Avenue	14	22%
Gladstone Avenue @ Breezehill Avenue	3	5%
Gladstone Avenue @ Loretta Avenue	1	2%
Gladstone Avenue @ Preston Street	19	30%
Gladstone Avenue btwn Bayswater Avenue & Breezehill Avenue N	2	3%
Gladstone Avenue btwn Loretta Avenue N & Preston Street	3	5%
Gladstone Avenue btwn Breezehill Avenue & Loretta Avenue	1	2%
Somerset Street W btwn Bayswater Avenue & Breezehill Avenue N	7	11%
Somerset Street W btwn Breezehill Avenue N & Preston Street	11	17%
Breezehill Avenue N btwn Somerset Street W & Laurel Street	1	2%
Laurel Street btwn Breezehill Avenue N & Loretta Avenue N	1	2%

Within the study area, the intersection of Gladstone Avenue at Bayswater Avenue and Gladstone Avenue at Preston Street, and the segment of Somerset Street W between Breezehill Avenue and Preston Street are noted to have experienced higher collisions than other intersections. Table 5, Table 6 and Table 7 summarize the collision types and conditions for each of these locations.

Table 5: Gladstone Avenue and Bayswater Avenue Collision Summary

		Number	%
Total Collisions		**14**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	5	36%
	Property Damage Only	9	64%
Initial Impact Type	**Angle**	5	35%
	Rear end	4	29%
	Turning Movement	3	21%
	SMV Other	2	14%
Road Surface Condition	**Dry**	9	64%
	Wet	2	14%
	Loose Snow	2	14%
	Packed Snow	1	7%
Pedestrian Involved		2	14%
Cyclists Involved		0	0%

The Gladstone Avenue and Bayswater Avenue intersection had a total of 14 collisions during the 2016-2020 time period, with nine involving property damage only and the remaining five having non-fatal injuries. The collision types are most represented by angled (five collisions) and rear-end (four collisions) and the remaining split between turning movement and single motor vehicle. The angled collisions may be subject to weather conditions as two are loose snow and one was wet weather conditions. Weather conditions do not affect collisions at this location. No other patterns are noted within the collision data and no mitigation is recommended.

Table 6: Gladstone Avenue and Preston Street Collision Summary

		Number	%
Total Collisions		**19**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	9	47%
	Property Damage Only	10	53%
Initial Impact Type	**Angle**	2	10%

		Number	%
Total Collisions		**19**	**100%**
	Rear end	6	32%
	Sideswipe	2	10%
	Turning Movement	4	21%
	SMV Other	5	26%
Road Surface Condition	**Dry**	9	47%
	Wet	4	21%
	Loose Snow	1	4%
	Slush	3	16%
	Ice	2	10%
Pedestrian Involved		4	21%
Cyclists Involved		2	10%

The Gladstone Avenue and Preston Street intersection had a total of 19 collisions during the 2016-2020 time period, with 10 involving property damage only and the remaining nine having non-fatal injuries. The collision types are most represented by rear-end (six collisions), SMV other (five collisions), and sideswipe, turning movement and angled with four or less each. Pedestrian and bicycles were involved in 31% of the collisions at the intersection and this aligns with the safety review completed by the City in 2020 for this intersection. Intersection improvements were recommended to include buffered/protected cycling approaches to the intersection, thermoplast bike crossing markings, truck aprons to reduce turn radii and reducing all approaches to single shared movement lanes. Weather conditions do not affect collisions at this location. No further review is required as part of this study.

Table 7: Somerset Street W between Breezehill Avenue and Preston Street Collision Summary

		Number	%
Total Collisions		**11**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	6	45%
	Property Damage Only	5	55%
Initial Impact Type	**Angle**	3	27%
	Sideswipe	3	27%
	Turning Movement	4	36%
	SMV Unattended	1	9%
Road Surface Condition	**Dry**	9	79%
	Wet	2	21%
Pedestrian Involved		0	0%
Cyclists Involved		5	55%

The Somerset Street W segment between Breezehill Avenue and Preston Street had a total of 11 collisions during the 2016-2020 time period, with five involving property damage only and six having non-fatal injuries. The collision types are evenly distributed with turning movements with four each, sideswipe and angled with three each and a single unattended vehicle. The collisions are assumed to be a result of the on-street parking and commercial/retail access located on the east side of the Trillium Line overpass, through a combination of parked cars, dooring, loading vehicles, infrequent access traffic and the Plant Recreation Centre access. This area also has shared road cycling facilities, where as the overpass has bike lanes west to Breezehill Avenue, and likely contributes to the cycling collision frequency of approximately one per year. Weather conditions do not affect collisions at this location. No further review is required as part of this study although the City should initiate a review for potential

mitigation along Somerset Street, similar to the intersection study done for Somerset Street and Bayswater Avenue.

2.3 Planned Conditions

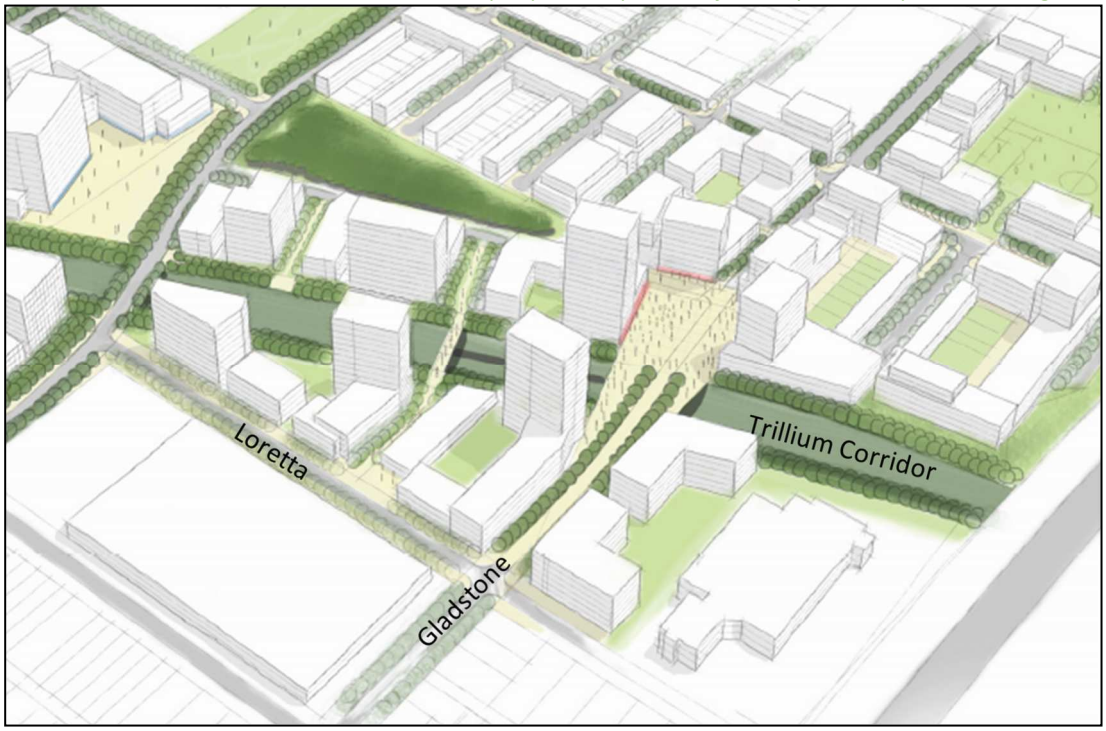
2.3.1 Changes to the Area Transportation Network

The subject development is within the Gladstone Station District CDP (2014) and as such, is subject to the development and planning vision outlined with the CDP. The CDP visioning option for the transit-oriented development node, illustrated in Figure 11, has the following new transportation infrastructure elements:

- Trillium LRT station plaza identified as a node/landmark/gateway for the community (estimated 2023)
- a multi-use crossing is proposed over the rail line between Gladstone Avenue and Laurel Street W
- a new road connection across the rail line between Laurel Street W and Oak Street

Beyond the station plaza, these improvements are not identified in the City's affordable network and no time frame is available for their construction.

Figure 11: Gladstone Station District CDP Vision & Concept Options Report – Preferred Option: Perspective Looking North-East



The Loretta Avenue N reconstruction will be undertaken by the City in 2023 to replace aging infrastructure. As part of this reconstruction, raised crossings will be included on Gladstone Avenue for the north side and south side crossings at Loretta Avenue N.

2.3.2 Other Study Area Developments

The following developments were available on Ottawa's devapps service at the time of this study. Files added subsequently should include this site within their background conditions.

1040 and 1050 Somerset Street

The combined site would include a 32-storey residential building between the Trillium Rail corridor and Breezehill Avenue, and a 23-storey residential building on the west side of Breezehill Avenue. Both sites would include

ground floor commercial/retail and provide underground parking. Access to the 1040 site was proposed along Breezehill Avenue and a laneway access on Somerset Street West was proposed for the 1050 site. This application file has not advanced since 2013.

989 Somerset Street

The proposed development consists of a mixed-use building with ground floor retail and 127 residential units above. The transportation impact of this site will be primarily on Somerset Street West and Preston Street. In addition, this file has not advanced since 2014.

975 Gladstone Avenue

An addition to the existing Canada Bank Note building is proposed on the rear of the building, consisting of 947m^2 warehousing space and a 177m^2 secure interior loading bay. The planning rationale states that the addition supports the existing light industrial business and not generate any increase of vehicular trips.

139-143 Balsam Street and 20 Larch Street

The proposed demolish control applications was submitted to remove the existing buildings on site. The properties would remain in an interim condition until such time redevelopment occurs in accordance with the Gladstone Station CDP.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Gladstone Avenue at:
  - Bayswater Avenue
  - Breezehill Avenue
  - Loretta Avenue
  - Preston Street
- Breezehill Avenue at:
  - Laurel Street
  - Somerset Street
- Loretta Avenue at:
  - Site Access #1
  - Site Access #2 (outbound)
  - Site Access #3

The boundary roads will be Gladstone Avenue and Loretta Avenue. The TRANS screenline SL-29 was reviewed during the zoning bylaw amendment application and no issues were noted. No additional screenline analysis will be provided within this TIA.

3.2 Time Periods

As the proposed development is composed predominantly by residential and office, the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2026. As a result, the full build-out plus five years horizon year is 2031.

4 Exemption Review

Table 8 summarizes the exemptions for this TIA.

Table 8: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.2.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Required
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt (site plan matches new zoning)

5 Development-Generated Travel Demand

5.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Ottawa West have been summarized in Table 9.

Table 9: TRANS Trip Generation Manual Recommended Mode Shares – Ottawa West

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator		Employment Generator
	AM	PM	AM	PM	AM and PM
Auto Driver	28%	33%	55%	50%	54%
Auto Passenger	11%	11%	11%	16%	8%
Transit	41%	26%	11%	11%	28%
Cycling	3%	7%	0%	5%	5%
Walking	16%	23%	23%	18%	5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Since the site is being within the TOD area, a higher transit mode is considered achievable at this location. A 24% shift to transit mode from the auto driver mode and six percent shift from the auto passenger mode is proposed for both residential and non-residential land uses. The modified mode share targets are proposed for the development and are summarized in Table 10.

Table 10: Proposed Development Mode Shares

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator		Employment Generator
	AM	PM	AM	PM	AM and PM
Auto Driver	10%	15%	37%	32%	36%
Auto Passenger	5%	5%	5%	10%	2%
Transit	65%	50%	35%	35%	52%
Cycling	3%	7%	0%	5%	5%
Walking	16%	23%	23%	18%	5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

5.2 Trip Generation

This TIA has been prepared using the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020) and the vehicle trip rates and derived person trip rates for commercial component from the ITE Trip Generation Manual 11th Edition (2021) using the City-prescribed conversion factor of 1.28. Table 11 summarizes the person trip rates for the proposed residential land uses for each peak period and the person trip rates for the non-residential land uses by peak hour.

Table 11: Trip Generation Person Trip Rates

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	Person Trip Rates	Note
Multi-Unit High-Rise	221 & 222 (TRANS)	AM	-	0.80	-
		PM	-	0.90	
Land Use	**Land Use Code**	**Peak Hour**	**Vehicle Trip Rate**	**Person Trip Rates**	**Note**
General Office	710 (ITE)	AM	1.02	1.31	Fitted Curve
		PM	1.48	1.89	
Strip Retail Plaza (<40k)	822 (ITE)	AM	2.36	3.02	Average Rate
		PM	6.59	8.44	

Using the above person trip rates, the total person trip generation has been estimated. Table 12 summarizes the total person trip generation for the residential land uses and for the non-residential land uses.

Table 12: Total Development Person Trip Generation

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (High-Rise)	872	216	482	698	455	330	785
Land Use	**GFA**	**AM Peak Hour**			**PM Peak Hour**		
		In	**Out**	**Total**	**In**	**Out**	**Total**
General Office	198,524	229	31	260	64	311	375
Strip Retail Plaza (<40k)	17,611	32	21	53	75	75	149

Internal capture rates from the ITE Trip Generation Handbook 3rd Edition have been assigned to the development's retail component for mixed-use developments. The rates summarized in Table 13 represent the percentage of trips to/from the office and retail use based on the residential component.

Table 13: Internal Capture Rates

Land Use	AM		PM	
	In	Out	In	Out
Residential to/from General Office	3%	1%	57%	2%
Residential to/from Shopping Centre	17%	14%	10%	26%

Using the above mode share targets for a TOD area, the internal capture, and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 14 summarizes the residential trip generation and the non-residential trip generation by mode and peak hour.

Table 14: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (High-Rise)	Auto Driver	**10%**	10	24	34	**15%**	29	23	52
	Auto Passenger	**5%**	5	12	17	**5%**	10	7	17
	Transit	**65%**	75	175	250	**50%**	104	81	185
	Cycling	**3%**	4	8	12	**7%**	15	11	26
	Walking	**16%**	20	46	65	**23%**	53	41	94
	Total	**100%**	**114**	**265**	**378**	**100%**	**211**	**163**	**374**
General Office	Auto Driver	**36%**	80	11	91	**36%**	10	110	120
	Auto Passenger	**2%**	4	1	5	**2%**	1	6	7
	Transit	**52%**	115	16	132	**52%**	15	159	173
	Cycling	**5%**	11	2	13	**5%**	1	15	17
	Walking	**5%**	11	2	13	**5%**	1	15	17
	Internal Capture	*varies*	*-7*	*0*	*-7*	*varies*	*-36*	*-6*	*-42*
	Total	**100%**	**221**	**32**	**254**	**100%**	**28**	**305**	**334**
Strip Retail Plaza (<40k)	Auto Driver	**37%**	10	7	17	**32%**	21	18	39
	Auto Passenger	**5%**	1	1	2	**10%**	7	6	12
	Transit	**35%**	9	6	16	**35%**	23	19	42
	Cycling	**0%**	0	0	0	**5%**	3	3	6
	Walking	**23%**	6	4	10	**18%**	12	10	22
	Internal Capture	*varies*	*-5*	*-3*	*-8*	*varies*	*-8*	*-20*	*-28*
	Total	**100%**	**26**	**18**	**45**	**100%**	**66**	**56**	**121**
Total	Auto Driver	-	100	42	142	-	60	151	211
	Auto Passenger	-	10	14	24	-	18	19	36
	Transit	-	199	197	398	-	142	259	400
	Cycling	-	15	10	25	-	19	29	49
	Walking	-	37	52	88	-	66	66	133
	Total	-	**361**	**315**	**677**	-	**305**	**524**	**829**

As shown above, a total of 142 AM and 211 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.3 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the travel patterns for the Ottawa West area. Table 15 below summarizes the distributions.

Table 15: OD Survey Distribution

To/From	Ottawa West	Routing
North	5%	via Somerset (2.5% east and west)
South	30%	via Gladstone (15% west), Preston (15% south)
East	30%	via Gladstone (15% east), Preston (5% south), Preston (5% north), Gladstone (5% west to Hwy 417)

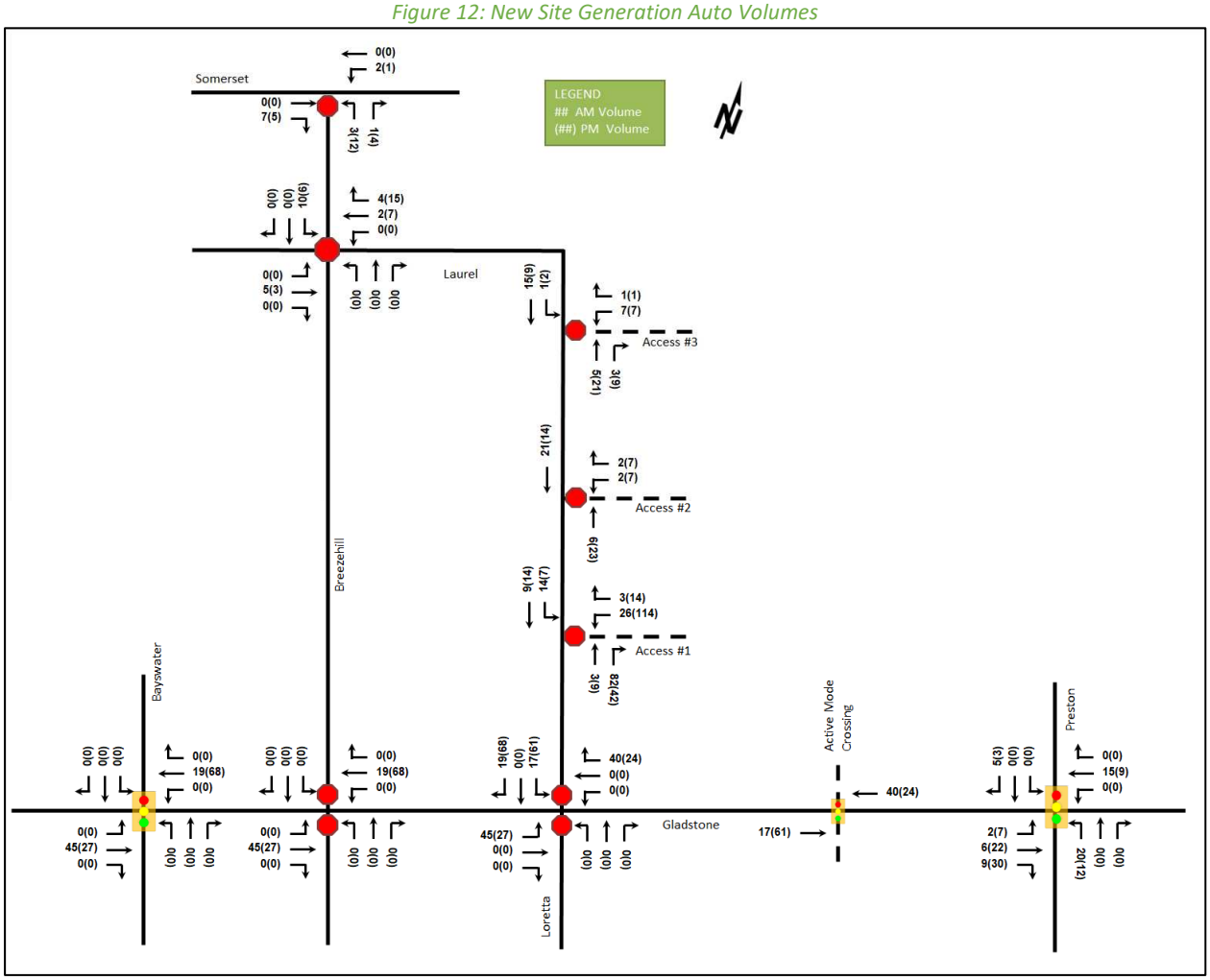
To/From	Ottawa West	Routing
West	35%	via Laurel (5%) west, Somerset (5% west), Gladstone (25% west)
Total	100%	

Note: internal trips applied to west direction

5.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Figure 12 illustrates the new site generated volumes.

Figure 12: New Site Generation Auto Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3.1. Beyond the opening of the Trillium LRT Corso Italia, no addition network changes have been included the preparation of this TIA.

6.2 Background Growth

The auto demand within the inner area of Ottawa has been documented as decreasing over the past 10 years, resulting in reduced demand on many roadways. As such, no growth has been applied to the study area intersections. This is consistent with the zoning bylaw amendment TIA.

6.3 Other Developments

No background developments were explicitly considered as part of this TIA as no active files were documented within the area at the time. The future background traffic volumes are anticipated to remain the same as the existing conditions and no improvements are recommended.

7 Demand Rationalization

7.1 Modal Share Sensitivity

No capacity constraints have been noted at the study area intersections. As this development is targeted for a transit focus and meets the planned context of this area, rationalization for adjusted demand is not required for this TIA.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a mixed-use development, with four surface parking spaces and 516 underground parking spaces. It is anticipated that 436 bicycle parking spaces will be provided for the residential component and 80 bicycle spaces shared for the office, retail, and live-work components. A total of eleven surface bicycle parking spaces are provided on the east and south side of the retail/office building southeast of the parcel, four spaces are located next to the surface parking, and six spaces are located on the south side of Tower3, with the remainder located underground in the bike storage rooms.

As part of the site plan, the plaza located between Towers 2 and 3 will provide access to the MUP on the west side of the Trillium LRT line, and the area between the Standard Bread and Trillium LRT line will be reconstructed as a pedestrian plaza for active mode connectivity to Corso Italia.

The infrastructure TDM checklist is provided in Appendix E.

8.2 Circulation and Access

Vehicle access is provided via a two-way access on Loretta Avenue to the Towers 1 and 2 loading and underground garage and a one-way loop to the north that exits onto Loretta Avenue. The two-way access is 8.0m wide and the one-way loop is 6.7m wide. An additional access is provided to Tower 3 from Loretta, and this access is 6.0m wide. The one-way loop is designated as the fire route within the site. These accesses meet the Private Approach Bylaw widths.

According to the Private Approach By-law, a maximum of one two-way private approach and two one-way private approaches or two two-way private approaches are permitted along the 150-metre frontage of Loretta Avenue. Although not meeting the by-law requirements, the additional one-way access (Access #2) is expected to generate four auto trips during the AM peak hour and 14 trips during the PM peak hour. The additional one-way access (Access #2) is considered to have a negligible impact. With respect to the existing condition, this will be a reduction from four two-way accesses and uncontrolled perpendicular parking along the street edge that will result in a

more structured operation in line with driver expectation along a local roadway. It is recommended that the access be approved by the City.

The pedestrian and active mode access is provided along Gladstone Avenue for the Standard Bread building, retail components, and through connection into the site. Along Loretta Avenue, the lobby accesses are all located on the one-way loop.

The garbage truck, move in truck and fire truck turning movements can be accommodated on site.

9 Parking

9.1 Parking Supply

The site provides a total of 526 vehicle parking spaces, which include 436 spaces for residential use, 46 spaces for office and existing buildings, 14 spaces for retail, and 30 visitor parking spaces. There are four surface vehicle parking spaces and 522 underground vehicle parking spaces in total. According to the zoning by-law, the maximum vehicle parking for the site is 1,991 parking spaces, with no minimum required for a TOD zone. The minimum requirement for visitor parking on the site is 30 spaces. The proposed vehicle parking spaces meet the bylaw requirements of maximum vehicle parking and minimum visitor parking.

The site provides a total of 516 bicycle parking spaces, including 436 spaces for the residential use and 80 spaces for the office/retail. According to the zoning by-law, the minimum bicycle parking for the site is 436 residential bicycle parking spaces and 80 office/retail parking spaces. The proposed bicycle parking meets the bylaw requirements.

10 Boundary Street Design

Table 16 summarizes the MMLOS analysis for the boundary streets of Gladstone Avenue and Loretta Avenue N. The Gladstone Avenue existing and future conditions will be the same and are considered in one row and the Loretta Avenue N will be split between existing and future conditions. The boundary street analysis is based on the policy area of "within 600m of a rapid transit station". The MMLOS worksheets has been provided in Appendix F.

Table 16: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Gladstone Avenue	**C**	A	**D**	B	D	D	-	-
Loretta Avenue North (existing)	**F**	A	B	D	-	-	-	-
Loretta Avenue North (future)	A	A	B	D	-	-	-	-

Gladstone Avenue and the existing Loretta Avenue N segments do not meet the pedestrian MMLOS target. Gladstone Avenue would require reduced traffic and a boulevard of 0.5m or greater to meet the PLOS A target. The addition of a sidewalk and landscaping along the Loretta Avenue N frontage will meet the PLOS target.

Gladstone Avenue segment does not meet the bicycle MMLOS target. To meet the target, operating speed has to be reduced to less or equal to 40 km/h.

11 Access Intersections Design

11.1 Location and Design of Access

The vehicle access will be located along Loretta Avenue N on a two-way driveway to the underground ramp, and a one-way loop will extend north to exit onto Loretta Avenue N. A two-way driveway to the underground ramp for Tower 3 located at the north of the site. Access #1 is located approximately 55 metres north of Gladstone Avenue and will be 8.0 metres wide to accommodate all turning movements, and the Access #2 is located approximately 105 metres north of Gladstone Avenue and will be 6.7 metres wide, permitting left and right turn lanes. Access #3 is located approximately 4 metres south of the northern property limit and is 6.0 metres wide.

The access is located approximately 55 metres from Gladstone Avenue, and it is five metres less than the Private Approach Bylaw Section 25(m)(ii) requirement of 60 metres. It is noted that the TAC Geometric Design Guidelines minimum clearance for a private driveway on local road is 15 metres, therefore, the 57 metres offset is considered sufficient. It is recommended that that access location meets TAC standards and can be approved by the City.

Access #1 throat length is approximately 7.4 metres to the turn of the one-way loop radius and 20.7 metres to the first parking stall. Access #2 throat length is approximately 7.3 metre from the property line to the end the turn of the one-way loop radius and 26.2 metres to the first parking space. The Access #3 provides approximately 11.2 metres from the property line to the loading door.

11.2 Intersection Control

All accesses will include stop sign controls and one-way signage will be provided at the Access #2 location.

11.3 Access Intersection Design

11.3.1 Future Total Access Intersection Operations

The future total intersection volumes are illustrated in Figure 13 and the access intersection operations are summarized below in Table 17. Synchro 11 has been used to model the unsignalized intersections and the HCM 2010 methodology was used for unsignalized intersection operations. The synchro worksheets have been provided in Appendix G.

Figure 13: Future Total Volumes

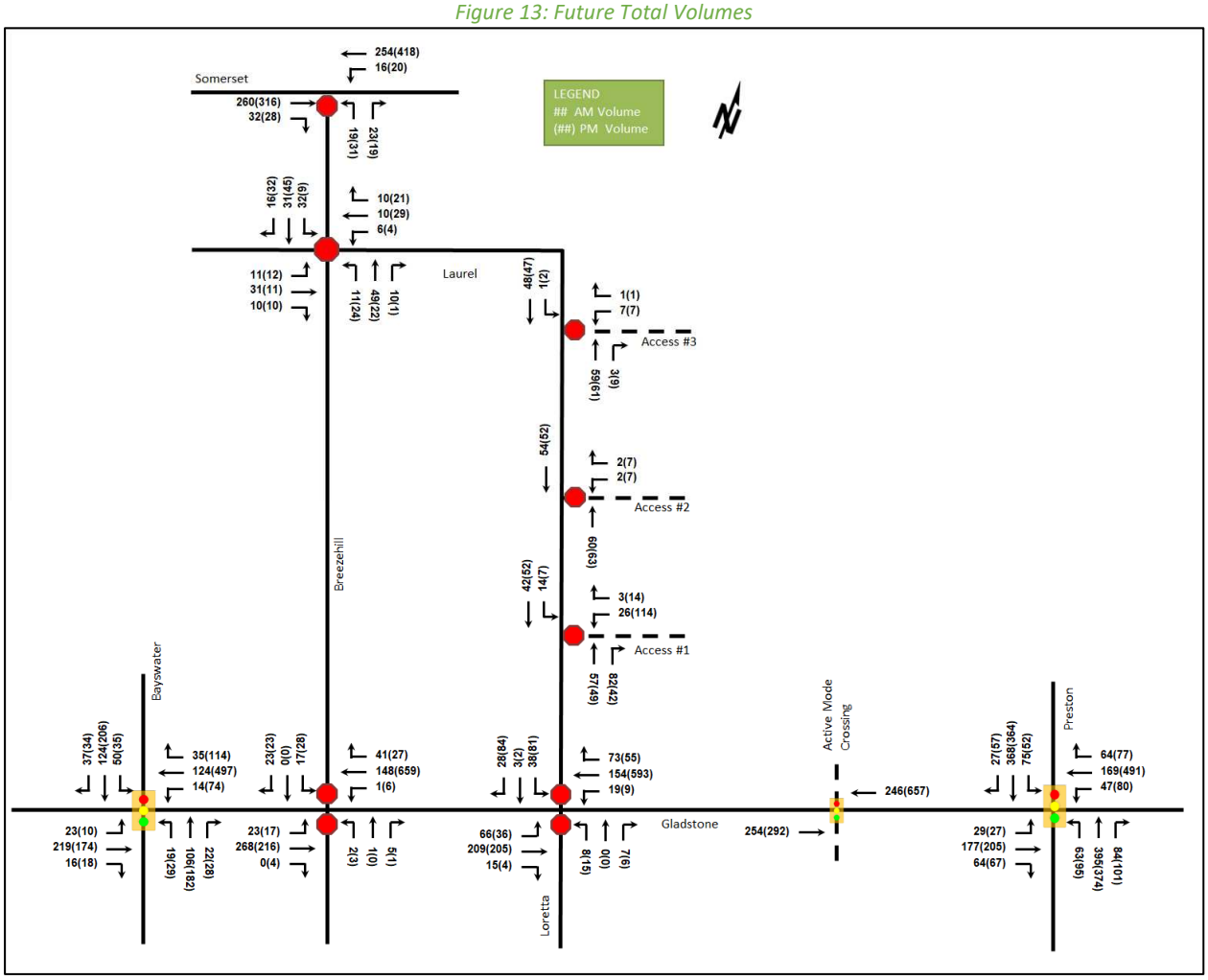


Table 17: Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Access #1 & Loretta Avenue N *Unsignalized*	WBL/R	A	0.04	9.5	0.8	A	0.15	9.9	3.8
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	0.01	7.5	0.0	A	0.01	7.4	0.0
	Overall	**A**	**-**	**1.7**	**-**	**A**	**-**	**4.7**	**-**
Access #2 & Loretta Avenue N *Unsignalized*	WBL/R	A	0.00	8.9	0.0	A	0.02	8.9	0.0
	NBT	-	-	-	-	-	-	-	-
	SBT	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**0.3**	**-**	**A**	**-**	**1.0**	**-**
Access #3 & Loretta Avenue N *Unsignalized*	WBL/R	A	0.01	9.0	0.0	A	0.01	9.1	0.0
	NBT/R	-	-	-	-	-	-	-	-
	SBL/T	A	0.00	7.3	0.0	A	0.00	7.4	0.0
	Overall	**A**	**-**	**0.6**	**-**	**A**	**-**	**0.7**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The access intersection operations for the future total horizon operate well.

11.3.2 Access Intersection MMLOS

No signalized intersections are used to access the proposed site.

11.3.3 Recommended Design Elements

The recommended access design elements remain consistent with City of Ottawa standards for access design for depressed curbs through the access locations and depressed sidewalks crossing the accesses.

12 Transportation Demand Management

12.1 Context for TDM

The mode shares used within the TIA represent the planning level targets for a transit-oriented design (TOD) s the site is located within the Gladstone Station TOD design priority area.

For the residential land use, total bedrooms are estimated to be 1,209 and no age restrictions are noted. The retail and office land uses will be determined by lease options and are entirely dependant on tenants to determine the number and occupation of employees, and clients/customers travelling from the Ottawa-Gatineau area and within 2.0km of the site. It is noted that the existing tenants of the site may continue to stay and rent the provided retail/office space.

12.2 Need and Opportunity

The subject site has been assumed to rely predominantly on transit due to the proximity to the future Gladstone LRT Station. The development is planned to coincide with the Corso Italia construction. The convenience of the transit station should provide the opportunity to reach the forecast transit mode share, although incentives for new residential tenants exists within the TDM framework. Hard measures, such as reduced parking provisions, would limit the risk of higher auto mode shares being produced from the site.

12.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists for both the residential and non-residential land uses. The checklist is provided in Appendix E.

The key TDM measures recommended include:

- Enhanced connectivity of pedestrians and cyclists to the adjacent network and adjacent Gladstone LRT station
- Engagement with local bike share programs (e.g., VeloGO) to include onsite space for bike rack/storage
- Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits
- Unbundle parking cost from purchase or rental costs
- Inclusion of a 1-year Presto card for first time new residential tenants, along with a set time frame for this offer (e.g., 6-months) from the ‘opening’ of the building/tower

The City and the proponent may engage beyond the scope of the TIA process to confirm the elements and conditions required as part of the site plan approvals.

13 Neighbourhood Traffic Management

Gladstone Avenue is a major collector road and has a 600-vehicle threshold for two-way traffic volumes per the City’s TIA Guidelines. The existing Gladstone Avenue volumes exceed this threshold in both segments to the east and west of Loretta Avenue N by at least 140 percent. The site traffic will increase the two-way vehicles by 57- 85 to the east of the site and 64-95 vehicles to the west of the site. The overall increase is not considered significant

within the context of the existing Gladstone Avenue traffic. If a reduction is required to meet the TIA thresholds, the City will be required to explore options to reduce Gladstone Avenue volumes by 250-300 vehicles during the peak hours.

Along Loretta Avenue N, the existing volumes are below the local road thresholds of 120 two-way vehicles. The segment of Loretta Avenue N from Gladstone Avenue to the outbound site access will exceed the local road threshold with the addition of the site traffic and the segment north of the site will remain below the threshold. As the segment between Gladstone Avenue and the site accesses will not have any accesses or adjacent land uses that would be negatively affected by the volumes and no mitigation is recommended. It is noted that the MMLOS analysis meets the area targets for Loretta Avenue N.

14 Transit

14.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 18 summarizes the transit trip generation.

Table 18: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	Varies	197	192	391	139	257	395

The proposed development is anticipated to generate an additional 339 AM peak hour transit trips and 289 PM peak hour transit trips. From the trip distribution found in Section 5.3, these values can further be broken down, and Table 12 summarized the transit ridership by direction and equivalent bus loads.

Table 19: Forecasted Site-Generated Transit Ridership

Direction	AM Peak Hour		PM Peak Hour		Service Type	Approximate Equivalent Peak Hour/Direction Bus Loads
	In	Out	In	Out		
North	10	9	6	13	LRT	-
South	59	58	42	77	LRT	-
East	59	58	42	77	Bus, LRT	A standard bus
West	69	67	49	90	Bus, LRT	A standard bus

The City has indicated that the Trillium line can accommodate the additional ridership demand. If a maximum of 10% of the transit mode share utilizes the existing route #14, this may see the need for an additional single bus (55-person capacity) during the peak hours to accommodate the additional demand.

14.2 Transit Priority

No transit priority is required explicitly for this study.

15 Network Intersection Design

15.1 Network Intersection Control

No change to the existing signalized control is recommended for the network intersections. A signal warrant was completed for the Gladstone Avenue and Loretta Avenue N intersection and is provided in Appendix H.

15.2 Network Intersection Design

15.2.1 Future Total Network Intersection Operations

The future total network intersection operations are summarized below in Table 20. The level of service for signalized intersections is based on the v/c calculation for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix G.

Table 20: Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Gladstone Avenue & Preston Street *Signalized*	EB	C	0.72	36.6	27.1	B	0.63	21.6	56.9
	WBL	A	0.23	21.8	11.5	A	0.23	16.2	16.2
	WBT/R	A	0.56	24.5	38.5	D	0.88	37.4	**#123.9**
	NBL	A	0.13	9.4	10.6	A	0.33	17.5	18.4
	NBT/R	A	0.50	11.8	66.0	B	0.64	19.7	72.9
	SBL	A	0.19	10.4	12.8	A	0.20	15.0	10.7
	SBT/R	A	0.40	10.9	52.5	A	0.57	18.9	64.5
	Overall	**A**	**0.56**	**17.9**	-	**C**	**0.75**	**24.5**	-
Gladstone Avenue & Active Mode Crossing *Signalized*	EB	A	0.18	3.5	17.5	A	0.21	3.6	20.3
	WB	A	0.17	2.1	13.8	A	0.46	3.1	m28.9
	Overall	**A**	**0.17**	**2.8**	-	**A**	**0.43**	**3.3**	-
Gladstone Avenue & Loretta Avenue North *Unsignalized*	EB	A	0.05	7.9	1.5	A	0.04	9.2	0.8
	WB	A	0.01	7.8	0.0	A	0.01	7.8	0.0
	NB	B	0.03	12.6	0.8	C	0.10	23.5	2.3
	SB	B	0.15	13.9	3.8	D	0.57	32.4	24.8
	Overall	**A**	-	**2.9**	-	**A**	-	**5.8**	-
Gladstone Avenue & Breezehill Avenue *Unsignalized*	EB	A	0.02	7.8	0.8	A	0.02	9.2	0.8
	WB	A	0.00	7.9	0.0	A	0.01	7.8	0.0
	NB	B	0.01	11.4	0.0	C	0.02	19.5	0.0
	SB	B	0.07	11.4	1.5	C	0.18	20.7	5.3
	Overall	**A**	-	**1.4**	-	**A**	-	**1.4**	-
Gladstone Avenue & Bayswater Avenue *Signalized*	EB	A	0.34	11.7	30.6	A	0.24	8.7	20.7
	WB	A	0.23	9.2	18.9	D	0.84	24.8	**#120.0**
	NB	A	0.25	13.2	20.6	A	0.47	19.6	37.4
	SB	A	0.37	15.1	29.6	A	0.55	21.3	43.5
	Overall	**A**	**0.35**	**12.3**	-	**C**	**0.73**	**20.9**	-
Somerset Street W & Breezehill Avenue *Unsignalized*	EB	-	-	-	-	-	-	-	-
	WB	A	0.02	8.1	0.0	A	0.02	8.6	0.8
	NB	B	0.08	12.2	2.3	C	0.15	17.4	3.8
	Overall	**A**	-	**1.1**	-	**A**	-	**1.2**	-
Laurel Street & Breezehill Avenue *Unsignalized*	EB	A	0.06	7.5	1.5	A	0.04	7.3	0.8
	WB	A	0.03	7.3	0.8	A	0.06	7.3	1.5
	NB	A	0.08	7.5	2.3	A	0.06	7.5	1.5
	SB	A	0.09	7.5	2.3	A	0.10	7.4	2.3
	Overall	**A**	-	**7.5**	-	**A**	-	**7.4**	-

Notes:
Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The network intersection operations for the future total conditions operate similarly to the existing conditions. A slight increase in operations is noted due to the peak hour factor of 1.00 applied when compared to the existing conditions.

15.2.2 Network Intersection MMLOS

Table 21 summarizes the MMLOS analysis for the signalized network intersections and the existing and future conditions for are assumed to be the same and are considered in one row. The intersection analysis is based on the policy area of "within 600m of a rapid transit station", which has the same targets as "within 330m of a school". The MMLOS worksheets has been provided in Appendix F.

Table 21: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Gladstone Avenue & Preston Street	**E**	A	**D**	B	**E**	D	**E**	D	C	E
Gladstone Avenue & Bayswater Avenue	**D**	A	B	B	D	D	-	-	C	E

The MMLOS targets will not be met for the pedestrian at both intersections and bicycle LOS, transit LOS, and truck LOS at the Gladstone Avenue and Preston Street intersection.

To meet the PLOS targets, the intersection of Gladstone Avenue and Bayswater Avenue could meet the area targets on the east and west sides of the intersection with a signage change to prohibit right-turns on red, and on the north and south sides of the intersection through protected left-turns on Gladstone Avenue or a combination of zebra hi-vis crossing markings and the prohibition of right-turns on red. These are considered City improvements and can be reviewed internally for potential implementation.

At the intersection of Gladstone Avenue and Preston Street, the PLOS cannot be met due to arterial road intersection limitations. It would require reconstruction of the intersection to reduce all pedestrian crossing distances to approximately 7.0 metres and include the additional implementation of on of the following items: protected left-turns, right-turn on red prohibition or raised pedestrian crossings. The bicycle LOS would require operating speed to be reduced to less than 40 km/h, the transit LOS would require delay to be reduced to below 30 seconds on all transit approach movements, and the truck LOS would require additional receiving lanes or corner radii to be increased to greater than 15 metres to meet the targets. No improvements are recommended for this intersection to meet the MMLOS targets.

15.2.3 Recommended Design Elements

No study area intersection design elements are proposed as part of this study.

16 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed site plan application consists of approximately 872 residential units, 198,524 sq. ft of office space (including the existing Standard Bread building, live-work space) and 17,611 sq. ft of retail space
- Four existing accesses and street edge parking will be removed and replaced with a new two-way general access between Towers 1 and 2, with a one-way loop extending past Tower 2 to Loretta Avenue North and a two-way access for Tower 3

- A pedestrian plaza is proposed at the corner of the development adjacent to Gladstone Avenue and the Trillium LRT corridor
- The development is proposed to be completed by 2026
- The trip generation and location triggers were met for the TIA Screening

Existing Conditions

- Preston Street and Somerset Street W are arterial roads, Gladstone Avenue is a major collector road, and Bayswater Avenue is a collector road in the study area
- Sidewalks are generally provided on both sides of the study area roadways, with the exception of limited facilities along Loretta Avenue, no sidewalks on Laurel Street to the east of Breezehill Avenue and on the east side of Breezehill Avenue between Laurel Street and Gladstone Avenue
- Bike lanes are provided on Somerset Street W over the Trillium LRT corridor and Gladstone Avenue, Bayswater Avenue and Somerset Street W are suggested bike routes
- The Trillium Pathway runs along the east side of the Trillium LRT corridor
- The existing transit route #14 travels along Gladstone Avenue, route #11 along Somerset Street W and #85 along Preston Street
- No operational issues are noted for the study area intersections
- The study area intersections with higher collisions were reviewed and no specific mitigation recommendations are noted for the Gladstone Avenue and Bayswater Avenue intersection or Gladstone Avenue and Preston Street intersection, but additional review may be required by the City for Somerset Street W between Breezehill Avenue and Preston Street for cycling collisions

Development Generated Travel Demand

- The proposed development is forecasted produce 677 two-way people trips during the AM peak hour and 829 two-way people trips during the PM peak hour
- Of the forecasted people trips, 142 two-way trips will be vehicle trips during the AM peak hour and 211 two-way trips will be vehicle trips during the PM peak hour
- Of the forecasted people trips, 398 two-way trips will be transit trips during the AM peak hour and 400 two-way trips will be transit trips during the PM peak hour
- Of the forecasted trips, 35% are anticipated to travel west, 30% to the east and south, and 5% to the north

Background Conditions

- Adjacent developments have either been on hold for extended periods of time with an unknown horizon, or are too small to have a noticeable impact on the adjacent road network
- Additionally, the background growth in the Ottawa core has been decreasing and a 0% growth was assumed for the area
- The future background intersection operations are the same as the existing intersections

Development Design

- Bicycle parking is provided on the east and south side of the retail/office building southeast of the parcel, on the south side of Tower3, with the remainder located underground in the bike storage rooms
- Pedestrian connections will be made along Gladstone Avenue and Loretta Avenue N, and a connection to the Trillium LRT corridor MUP will be made between Towers 2 and 3 and at the Gladstone Avenue pedestrian plaza to the LRT station

- Despite not meeting the maximum number of accesses specified in the Private Approach By-law, the one-way access (Access #2) is projected to have a negligible impact, and the proposed accesses will result in a more structured operation in line with driver expectations along a local roadway compared to the existing condition. Therefore, it is recommended that the access be approved by the City

Parking

- The site provides a total of 526 vehicle parking spaces, which include 436 spaces for residential use, 46 spaces for office and existing buildings, 14 spaces for retail, and 30 visitor parking spaces
- The site provides a total of 516 bicycle parking spaces, including 436 spaces for the residential use and 80 spaces for the office/retail
- The proposed parking spaces meet the bylaw requirements of maximum vehicle parking, minimum visitor parking, and minimum bicycle parking

Boundary Street Design

- The boundary streets will not meet pedestrian MMLOS targets along Gladstone Avenue and the existing Loretta Avenue N, due to auto volumes and lack of boulevard space along Gladstone Avenue and no sidewalk currently provided along the frontage of Loretta Avenue N
- The addition of the sidewalk and boulevard on Loretta Avenue N will meet the pedestrian targets once the site is developed
- Gladstone Avenue segment does not meet the bicycle MMLOS target, which requires reduction of operating speed to be less or equal to 40 km/h

Access Intersections Design

- The accesses will require depressed curbs through the access locations and depressed sidewalks crossing the accesses
- All accesses will include stop sign controls and one-way signage will be provided at the Access #2 location
- The access is located beyond the TAC requirements for a private driveway on a local road and it is recommended the City approve the location

TDM

- Supportive TDM measures to be included within the proposed development should include:
  - Enhanced connectivity of pedestrians and cyclists to the adjacent network and adjacent Gladstone LRT station
  - Engagement with local bike share programs (e.g., VeloGO) to include onsite space for bike rack/storage
  - Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits
  - Unbundle parking cost from purchase or rental costs
  - Inclusion of a 1-year Presto card for first time new residential tenants, along with a set time frame for this offer (e.g., 6-months) from the ‘opening’ of the building/tower
- The City and the proponent may engage beyond the scope of the TIA process to confirm the elements and conditions required as part of the site plan approvals

Neighbourhood Traffic Management

- Gladstone Avenue currently exceeds the City's TIA Guideline thresholds for a major collector road, and the City would be required to reduce the two-way traffic along Gladstone Avenue by 250-300 vehicles during the peak hours to achieve the prescribed thresholds
- Loretta Avenue N is currently under the City's TIA Guideline thresholds for a local road and is projected to remain under the threshold to the north upon the site build-out
- Between Gladstone Avenue and the outbound access of the one-way loop is forecasted to exceed the City's TIA Guideline thresholds for a local road, and due to limited impacts along the segment, no mitigation is recommended

Transit

- The City has confirmed the forecasted transit use/ridership can be accommodated on the Trillium LRT line
- An additional bus in each direction may be needed along Gladstone Avenue may be required during the peak hours for local routes
- No specific transit priority measures were considered as part of this development

Network Intersection Design

- Generally, the network intersections will operate similarly to the existing conditions
- The MMLOS targets will not be met for the pedestrian LOS at the Gladstone Avenue intersections at Bayswater Avenue and at Preston Street, the transit LOS and truck LOS at Preston Street
- At the intersection of Gladstone Avenue and Bayswater Avenue, the prohibition of right-turns on read for all approaches and the addition of zebra hi-vis crossing markings on the north and south sides of the intersection would be required to meet the pedestrian LOS, and are considered the responsibility of the City to implement should they require
- The bicycle LOS would require operating speed to be reduced to less than 40 km/h at the intersection of Gladstone Avenue and Preston Street
- The transit LOS would require delay to be reduced to below 30 seconds on all transit approach movements, and the truck LOS would require additional receiving lanes or corner radii to be increased to greater than 15 metres at the intersection of Gladstone Avenue and Preston Street
- No mitigation is recommended for the Gladstone Avenue and Preston Street intersection as reconstruction would be required to meet the pedestrian LOS targets and the truck LOS targets directly conflict with achieving the pedestrian LOS targets

17 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:

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Reviewed By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

6 Plaza Court
Ottawa ON K2H 7W1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 08-Apr-21
Project Number: 2020-25
Project Reference: 951 Gladstone & 145 Loretta

1.1 Description of Proposed Development	
Municipal Address	951 Gladstone Ave, 145 Loretta Ave N
Description of Location	Existing general indutrial or retail/commercial uses, including the Standard Bread Building
Land Use Classification	Pending rezoning to Mixed-Use Centre
Development Size	Apartments: 843 units, Office: 198,165 sq. ft, Retail: 17,611 sq.ft (includes Standard Bread Building)
Accesses	One-way loop and garbage/move-in access on Loretta
Phase of Development	Single Phase
Buildout Year	2026
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	843	Units
Trip Generation Trigger	Yes	

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, Rapid Transit or Spine Bicycle Networks?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	Yes
Location Trigger	Yes

1.4. Safety Triggers	
Are posted speed limits on a boundary street 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
Is the proposed driveway 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)?	No
Is the proposed driveway 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	No

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering √ or transportation planning □.

[1,2] **License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.**

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Dated at ___Ottawa_____ this __20__ day of _____September_____, 2018.
(City)

Name: _____Andrew Harte_____
(Please Print)

Professional Title: _____Professional Engineer_____

_____
Signature of Individual certifier that s/he meets the above four criteria

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Appendix B

Turning Movement Count Data

Transportation Services - Traffic Services

W.O. 36100

Turning Movement Count - 15 Minute Summary Report

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

		BAYSWATER 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	13	3	**16**	11	31	6	**48**	**64**	5	22	3	**30**	2	11	6	**19**	**49**	**113**
07:15	07:30	2	21	2	**25**	3	23	3	**29**	**54**	5	21	3	**29**	2	18	5	**25**	**54**	**108**
07:30	07:45	1	19	2	**22**	10	32	2	**44**	**66**	9	24	3	**36**	3	21	8	**32**	**68**	**134**
07:45	08:00	2	25	7	**34**	8	35	5	**48**	**82**	5	28	3	**36**	4	14	4	**22**	**58**	**140**
08:00	08:15	3	20	5	**28**	18	30	11	**59**	**87**	5	36	1	**42**	3	19	7	**29**	**71**	**158**
08:15	08:30	5	32	3	**40**	8	29	7	**44**	**84**	7	28	4	**39**	1	22	9	**32**	**71**	**155**
08:30	08:45	3	24	7	**34**	10	32	15	**57**	**91**	5	23	8	**36**	5	26	10	**41**	**77**	**168**
08:45	09:00	8	30	7	**45**	14	33	4	**51**	**96**	6	25	3	**34**	5	38	9	**52**	**86**	**182**
09:00	09:15	3	27	8	**38**	9	24	7	**40**	**78**	7	28	3	**38**	5	19	8	**32**	**70**	**148**
09:15	09:30	4	18	10	**32**	10	28	9	**47**	**79**	3	29	2	**34**	2	20	8	**30**	**64**	**143**
09:30	09:45	7	13	8	**28**	10	14	5	**29**	**57**	6	23	5	**34**	3	21	7	**31**	**65**	**122**
09:45	10:00	4	12	5	**21**	9	19	2	**30**	**51**	5	24	3	**32**	1	25	6	**32**	**64**	**115**
11:30	11:45	4	28	5	**37**	2	21	5	**28**	**65**	2	27	2	**31**	12	24	10	**46**	**77**	**142**
11:45	12:00	5	15	14	**34**	10	23	6	**39**	**73**	1	30	3	**34**	5	46	14	**65**	**99**	**172**
12:00	12:15	6	25	9	**40**	8	28	8	**44**	**84**	5	28	0	**33**	7	35	8	**50**	**83**	**167**
12:15	12:30	6	17	5	**28**	8	23	13	**44**	**72**	4	26	4	**34**	6	38	15	**59**	**93**	**165**
12:30	12:45	7	28	10	**45**	5	18	3	**26**	**71**	8	29	4	**41**	3	27	6	**36**	**77**	**148**
12:45	13:00	7	27	13	**47**	10	15	4	**29**	**76**	3	26	5	**34**	7	28	10	**45**	**79**	**155**
13:00	13:15	3	14	3	**20**	7	24	4	**35**	**55**	4	30	3	**37**	4	32	16	**52**	**89**	**144**
13:15	13:30	5	20	8	**33**	10	17	4	**31**	**64**	9	33	4	**46**	2	38	10	**50**	**96**	**160**
15:00	15:15	4	48	5	**57**	10	30	9	**49**	**106**	6	32	3	**41**	7	27	11	**45**	**86**	**192**
15:15	15:30	2	53	3	**58**	6	42	8	**56**	**114**	8	20	8	**36**	9	35	26	**70**	**106**	**220**
15:30	15:45	1	52	7	**60**	4	38	2	**44**	**104**	7	28	2	**37**	11	60	35	**106**	**143**	**247**
15:45	16:00	4	46	5	**55**	8	25	6	**39**	**94**	5	25	5	**35**	9	46	23	**78**	**113**	**207**
16:00	16:15	6	57	7	**70**	12	35	10	**57**	**127**	11	30	6	**47**	13	69	33	**115**	**162**	**289**
16:15	16:30	7	44	3	**54**	9	47	9	**65**	**119**	8	26	1	**35**	24	66	27	**117**	**152**	**271**
16:30	16:45	8	44	8	**60**	5	69	9	**83**	**143**	7	26	8	**41**	11	66	32	**109**	**150**	**293**
16:45	17:00	8	37	10	**55**	9	55	6	**70**	**125**	4	18	3	**25**	26	66	22	**114**	**139**	**264**
17:00	17:15	9	40	2	**51**	6	58	15	**79**	**130**	9	26	6	**41**	22	57	27	**106**	**147**	**277**
17:15	17:30	5	36	10	**51**	9	37	12	**58**	**109**	9	23	6	**38**	16	73	26	**115**	**153**	**262**
17:30	17:45	3	28	5	**36**	6	35	8	**49**	**85**	11	29	5	**45**	11	50	13	**74**	**119**	**204**
17:45	18:00	6	26	9	**41**	10	28	10	**48**	**89**	6	21	2	**29**	5	38	11	**54**	**83**	**172**
TOTAL:		148	939	208	**1295**	274	998	227	**1499**	**2794**	195	844	121	**1160**	246	1175	462	**1883**	**3043**	**5837**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36100

BAYSWATER AVE @ GLADSTONE AVE

Count Date: Wednesday, July 27, 2016 **Start Time:** 07:00

	BAYSWATER AVE			GLADSTONE AVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	6	2	**8**	29	14	**43**	**51**
08:00 09:00	12	7	**19**	63	18	**81**	**100**
09:00 10:00	5	0	**5**	19	15	**34**	**39**
11:30 12:30	2	0	**2**	11	14	**25**	**27**
12:30 13:30	2	0	**2**	10	0	**10**	**12**
15:00 16:00	3	4	**7**	10	9	**19**	**26**
16:00 17:00	3	7	**10**	21	51	**72**	**82**
17:00 18:00	11	11	**22**	35	40	**75**	**97**
Total	44	31	**75**	198	161	**359**	**434**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

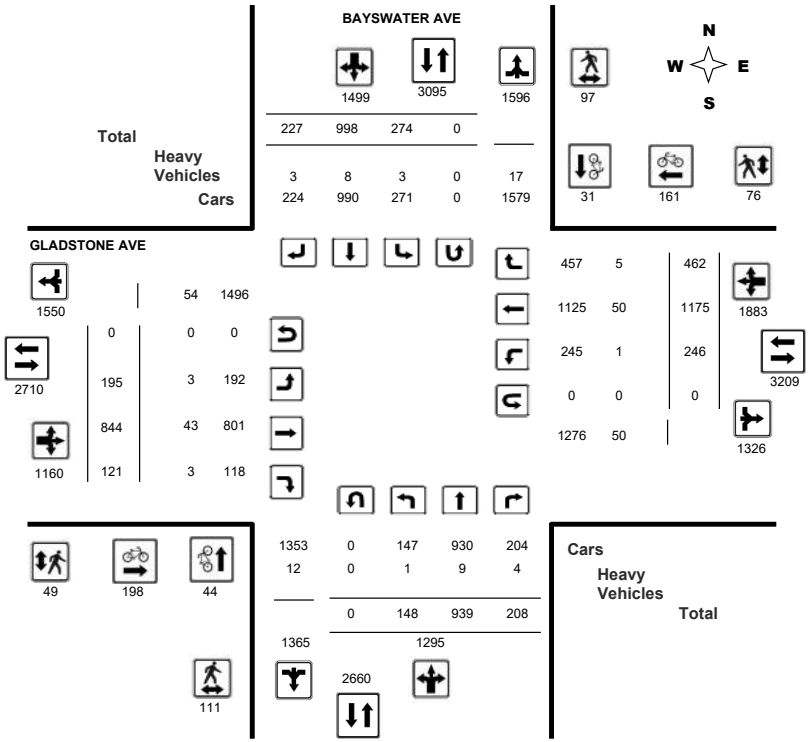
Turning Movement Count - Full Study Diagram

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

WO#: 36100

Device: Miovision



Comments

Transportation Services - Traffic Services

W.O. 36100

Turning Movement Count - Heavy Vehicle Report

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

		BAYSWATER 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	08:00	0	0	1	**1**	1	1	0	**2**	**3**	2	2	0	**4**	1	8	0	**9**	**13**	**16**
08:00	09:00	0	2	0	**2**	0	3	1	**4**	**6**	0	4	2	**6**	0	7	1	**8**	**14**	**20**
09:00	10:00	0	1	0	**1**	0	1	0	**1**	**2**	0	4	0	**4**	0	5	0	**5**	**9**	**11**
11:30	12:30	0	1	3	**4**	1	0	1	**2**	**6**	0	6	0	**6**	0	8	2	**10**	**16**	**22**
12:30	13:30	1	5	0	**6**	1	2	0	**3**	**9**	0	9	1	**10**	0	9	0	**9**	**19**	**28**
15:00	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	9	0	**9**	0	3	2	**5**	**14**	**14**
16:00	17:00	0	0	0	**0**	0	0	1	**1**	**1**	1	6	0	**7**	0	6	0	**6**	**13**	**14**
17:00	18:00	0	0	0	**0**	0	1	0	**1**	**1**	0	3	0	**3**	0	4	0	**4**	**7**	**8**
Sub Total		1	9	4	**14**	3	8	3	**14**	**28**	3	43	3	**49**	1	50	5	**56**	**105**	**133**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		1	9	4	**0**	3	8	3	**14**	**28**	3	43	3	**49**	1	50	5	**56**	**105**	**133**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 36100

Turning Movement Count - Pedestrian Volume Report

BAYSWATER AVE @ GLADSTONE AVE

Count Date: Wednesday, July 27, 2016 **Start Time:** 07:00

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	1	1	**2**	0	1	**1**	**3**
07:15 07:30	3	0	**3**	1	0	**1**	**4**
07:30 07:45	4	5	**9**	2	1	**3**	**12**
07:45 08:00	3	3	**6**	1	6	**7**	**13**
07:00 08:00	11	9	**20**	4	8	**12**	**32**
08:00 08:15	2	5	**7**	1	3	**4**	**11**
08:15 08:30	5	6	**11**	1	4	**5**	**16**
08:30 08:45	8	2	**10**	0	0	**0**	**10**
08:45 09:00	1	5	**6**	1	1	**2**	**8**
08:00 09:00	16	18	**34**	3	8	**11**	**45**
09:00 09:15	3	5	**8**	2	0	**2**	**10**
09:15 09:30	2	2	**4**	1	2	**3**	**7**
09:30 09:45	4	3	**7**	2	2	**4**	**11**
09:45 10:00	2	1	**3**	0	3	**3**	**6**
09:00 10:00	11	11	**22**	5	7	**12**	**34**
11:30 11:45	1	4	**5**	0	1	**1**	**6**
11:45 12:00	3	0	**3**	0	4	**4**	**7**
12:00 12:15	3	0	**3**	0	9	**9**	**12**
12:15 12:30	4	1	**5**	2	1	**3**	**8**
11:30 12:30	11	5	**16**	2	15	**17**	**33**
12:30 12:45	3	0	**3**	2	1	**3**	**6**
12:45 13:00	5	1	**6**	0	0	**0**	**6**
13:00 13:15	4	1	**5**	0	2	**2**	**7**
13:15 13:30	5	2	**7**	1	3	**4**	**11**
12:30 13:30	17	4	**21**	3	6	**9**	**30**
15:00 15:15	0	1	**1**	0	1	**1**	**2**
15:15 15:30	3	1	**4**	4	2	**6**	**10**
15:30 15:45	4	2	**6**	1	2	**3**	**9**
15:45 16:00	2	2	**4**	0	3	**3**	**7**
15:00 16:00	9	6	**15**	5	8	**13**	**28**
16:00 16:15	6	9	**15**	3	4	**7**	**22**
16:15 16:30	2	1	**3**	4	0	**4**	**7**
16:30 16:45	8	7	**15**	5	5	**10**	**25**
16:45 17:00	11	6	**17**	1	2	**3**	**20**
16:00 17:00	27	23	**50**	13	11	**24**	**74**
17:00 17:15	3	8	**11**	3	1	**4**	**15**
17:15 17:30	1	7	**8**	3	7	**10**	**18**
17:30 17:45	2	3	**5**	2	5	**7**	**12**
17:45 18:00	3	3	**6**	6	0	**6**	**12**
17:00 18:00	9	21	**30**	14	13	**27**	**57**
Total	111	97	**208**	49	76	**125**	**333**

Comment:

Transportation Services - Traffic Services

Work Order 36100

Turning Movement Count - Full Study Summary Report

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	BAYSWATER 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	5	78	14	**97**	32	121	16	**169**	**266**	24	95	12	**131**	11	64	23	**98**	**229**	**495**
08:00 09:00	19	106	22	**147**	50	124	37	**211**	**358**	23	112	16	**151**	14	105	35	**154**	**305**	**663**
09:00 10:00	18	70	31	**119**	38	85	23	**146**	**265**	21	104	13	**138**	11	85	29	**125**	**263**	**528**
11:30 12:30	21	85	33	**139**	28	95	32	**155**	**294**	12	111	9	**132**	30	143	47	**220**	**352**	**646**
12:30 13:30	22	89	34	**145**	32	74	15	**121**	**266**	24	118	16	**158**	16	125	42	**183**	**341**	**607**
15:00 16:00	11	199	20	**230**	28	135	25	**188**	**418**	26	105	18	**149**	36	168	95	**299**	**448**	**866**
16:00 17:00	29	182	28	**239**	35	206	34	**275**	**514**	30	100	18	**148**	74	267	114	**455**	**603**	**1117**
17:00 18:00	23	130	26	**179**	31	158	45	**234**	**413**	35	99	19	**153**	54	218	77	**349**	**502**	**915**
Sub Total	148	939	208	**1295**	274	998	227	**1499**	**2794**	195	844	121	**1160**	246	1175	462	**1883**	**3043**	**5837**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	148	939	208	**1295**	274	998	227	**1499**	**2794**	195	844	121	**1160**	246	1175	462	**1883**	**3043**	**5837**
EQ 12Hr	206	1305	289	**1800**	381	1387	316	**2084**	**3884**	271	1173	168	**1612**	342	1633	642	**2617**	**4229**	**8113**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**																			
AVG 12Hr	185	1175	260	**1620**	343	1248	284	**1875**	**3495**	244	1056	151	**1451**	308	1470	578	**2356**	**3807**	**7302**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**																			
AVG 24Hr	243	1539	341	**2122**	449	1636	372	**2457**	**4579**	320	1383	198	**1901**	403	1926	757	**3086**	**4987**	**9566**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**																			

Comments:

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

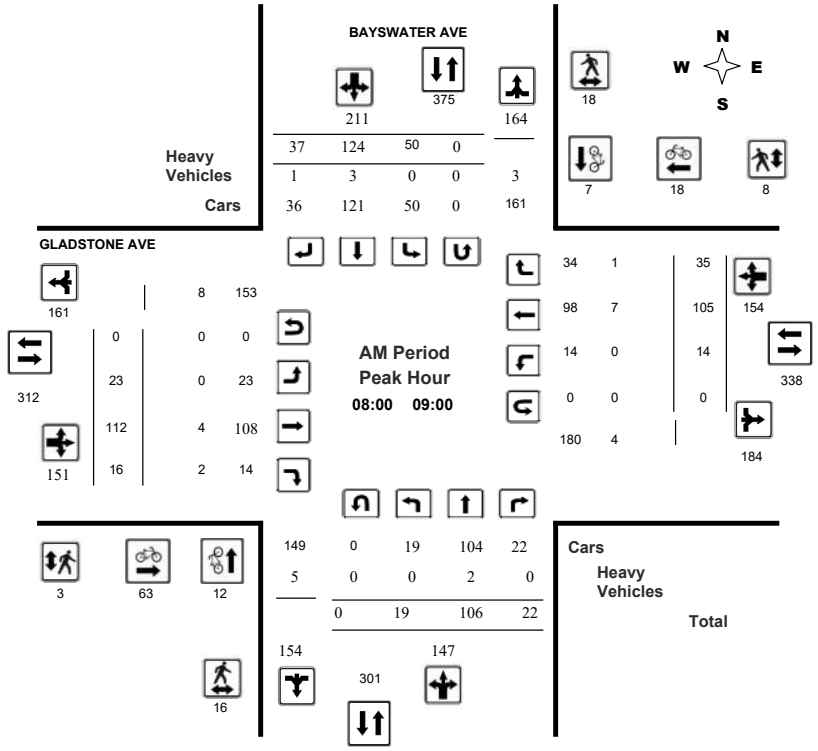
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36100

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



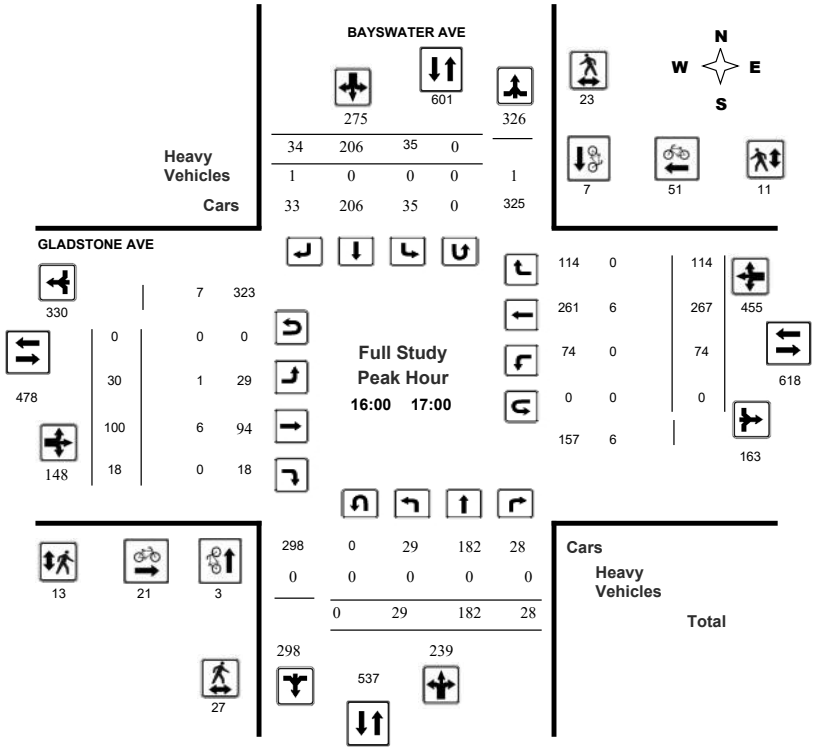
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36100

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



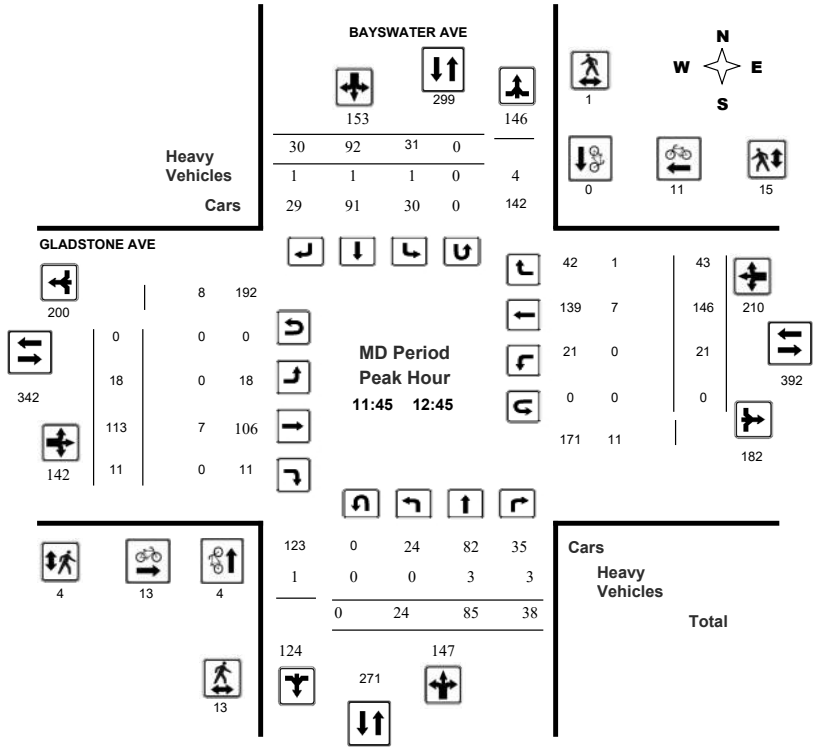
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36100

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



Comments

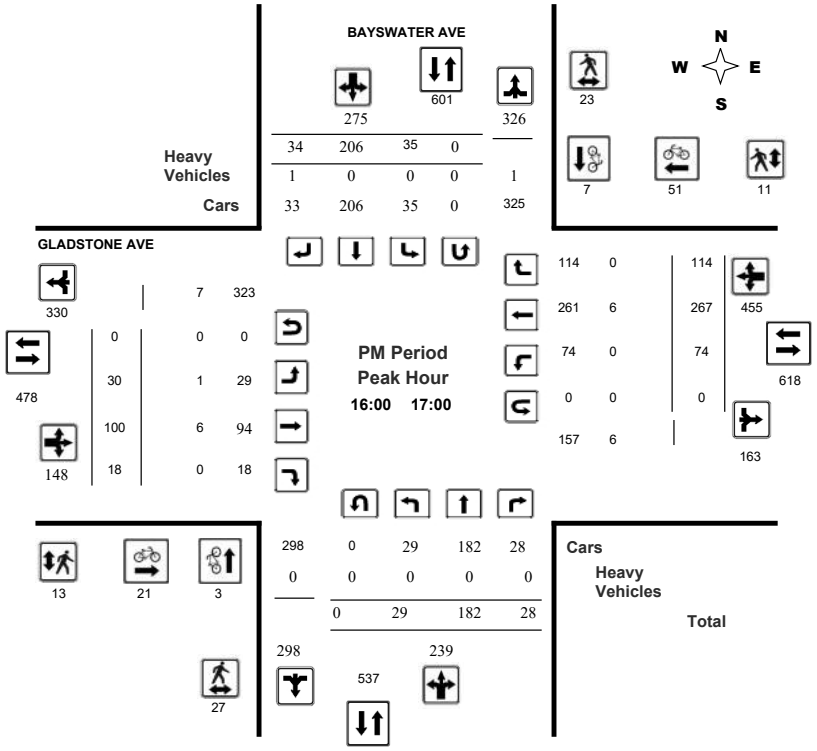
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016 **WO No:** 36100

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



Comments

Transportation Services - Traffic Services

Work Order 36100

Turning Movement Count - 15 Min U-Turn Total Report

BAYSWATER AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 27, 2016

Time Period		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

W.O. 37971

Turning Movement Count - 15 Minute Summary Report

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

		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**	**3660**	**3994**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
37971

BREEZEHILL AVE @ GLADSTONE AVE

Count Date: Wednesday, July 18, 2018 **Start Time:** 07:00

	BREEZEHILL AVE			GLADSTONE AVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	4	1	**5**	39	23	**62**	**67**
08:00 09:00	2	2	**4**	98	15	**113**	**117**
09:00 10:00	0	1	**1**	29	24	**53**	**54**
11:30 12:30	0	0	**0**	17	11	**28**	**28**
12:30 13:30	0	2	**2**	7	10	**17**	**19**
15:00 16:00	1	3	**4**	26	33	**59**	**63**
16:00 17:00	1	3	**4**	28	49	**77**	**81**
17:00 18:00	2	6	**8**	36	71	**107**	**115**
Total	10	18	**28**	280	236	**516**	**544**

Comment:

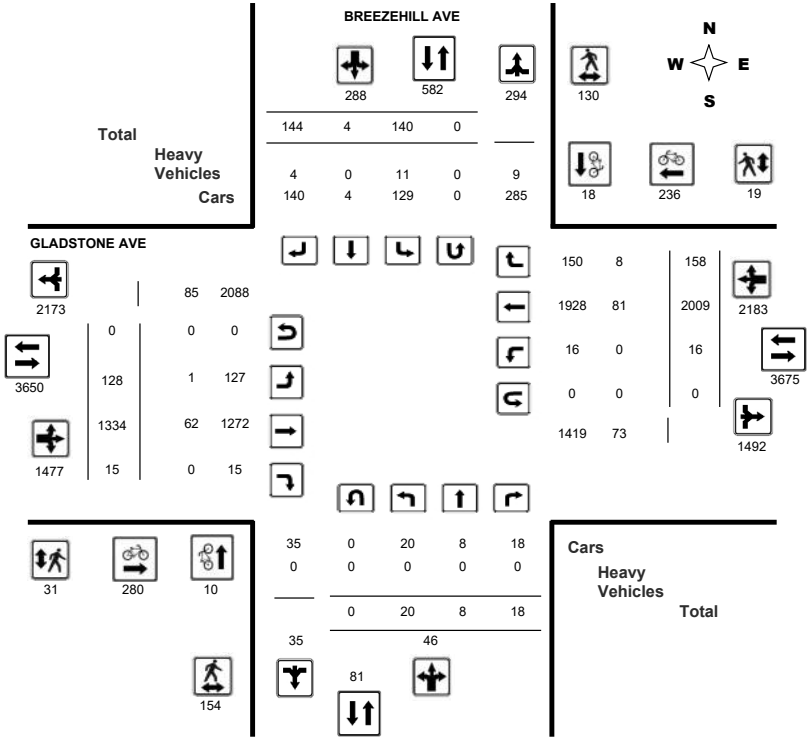
Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018 **WO#:** 37971 **Device:** Miovision



Comments

Transportation Services - Traffic Services

W.O. 37971

Turning Movement Count - Heavy Vehicle Report

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018

		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	08:00	0	0	0	**0**	0	0	1	**1**	**1**	0	11	0	**11**	0	12	1	**13**	**24**	**25**
08:00	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	11	0	**11**	0	11	0	**11**	**22**	**22**
09:00	10:00	0	0	0	**0**	1	0	0	**1**	**1**	0	10	0	**10**	0	12	1	**13**	**23**	**24**
11:30	12:30	0	0	0	**0**	4	0	2	**6**	**6**	1	9	0	**10**	0	10	3	**13**	**23**	**29**
12:30	13:30	0	0	0	**0**	1	0	1	**2**	**2**	0	7	0	**7**	0	9	0	**9**	**16**	**18**
15:00	16:00	0	0	0	**0**	1	0	0	**1**	**1**	0	5	0	**5**	0	6	0	**6**	**11**	**12**
16:00	17:00	0	0	0	**0**	3	0	0	**3**	**3**	0	7	0	**7**	0	15	3	**18**	**25**	**28**
17:00	18:00	0	0	0	**0**	1	0	0	**1**	**1**	0	2	0	**2**	0	6	0	**6**	**8**	**9**
Sub Total		0	0	0	**0**	11	0	4	**15**	**15**	1	62	0	**63**	0	81	8	**89**	**152**	**167**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		0	0	0	**0**	11	0	4	**15**	**15**	1	62	0	**63**	0	81	8	**89**	**152**	**167**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 37971

Turning Movement Count - Pedestrian Volume Report

BREEZEHILL AVE @ GLADSTONE AVE

Count Date: Wednesday, July 18, 2018 **Start Time:** 07:00

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**
07:00	08:00	20	14	**34**	2	5	**7**	**41**
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**
08:00	09:00	29	21	**50**	9	1	**10**	**60**
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**
09:00	10:00	16	11	**27**	4	1	**5**	**32**
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**
11:30	12:30	21	14	**35**	2	0	**2**	**37**
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**
12:30	13:30	10	13	**23**	3	0	**3**	**26**
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**
15:00	16:00	22	14	**36**	1	0	**1**	**37**
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**
16:00	17:00	17	23	**40**	5	9	**14**	**54**
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**
17:00	18:00	19	20	**39**	5	3	**8**	**47**
Total	.....	154	130	**284**	31	19	**50**	**334**

Comment:

Transportation Services - Traffic Services

Work Order 37971

Turning Movement Count - Full Study Summary Report

BREEZEHILL AVE @ GLADSTONE AVE

Survey Date: Wednesday, July 18, 2018

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	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**
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	**400**	**464**	178	1854	21	**2053**	22	2793	220	**3034**	**5087**	**5551**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**																			
AVG 12Hr	25	10	23	**58**	175	5	180	**360**	**418**	160	1669	19	**1848**	20	2513	198	**2731**	**4579**	**4997**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**																			
AVG 24Hr	33	13	29	**75**	229	7	236	**472**	**547**	210	2186	25	**2421**	26	3292	259	**3578**	**5999**	**6546**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**																			

Comments:

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

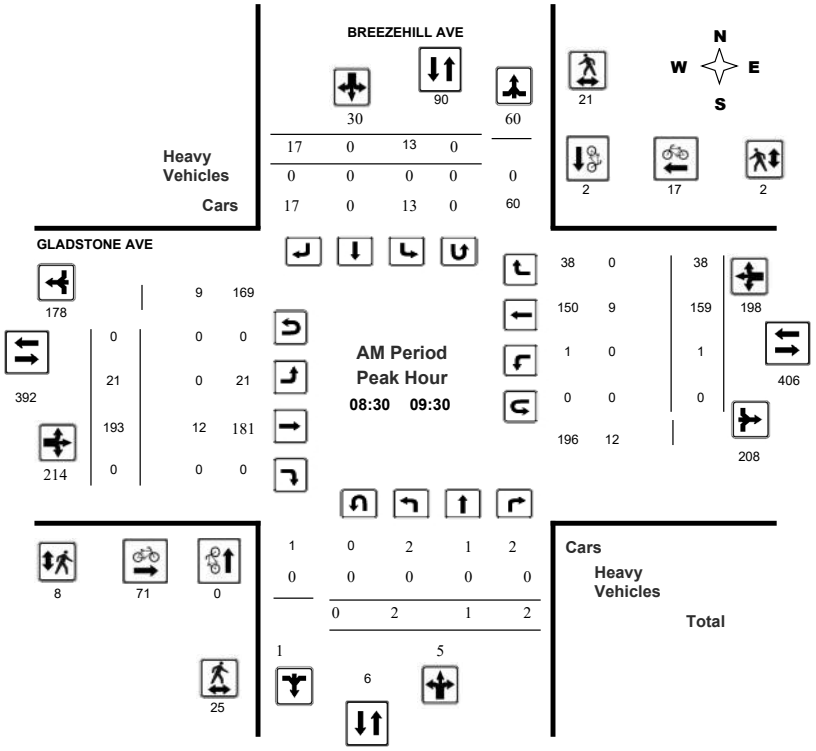
Transportation Services - Traffic Services

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

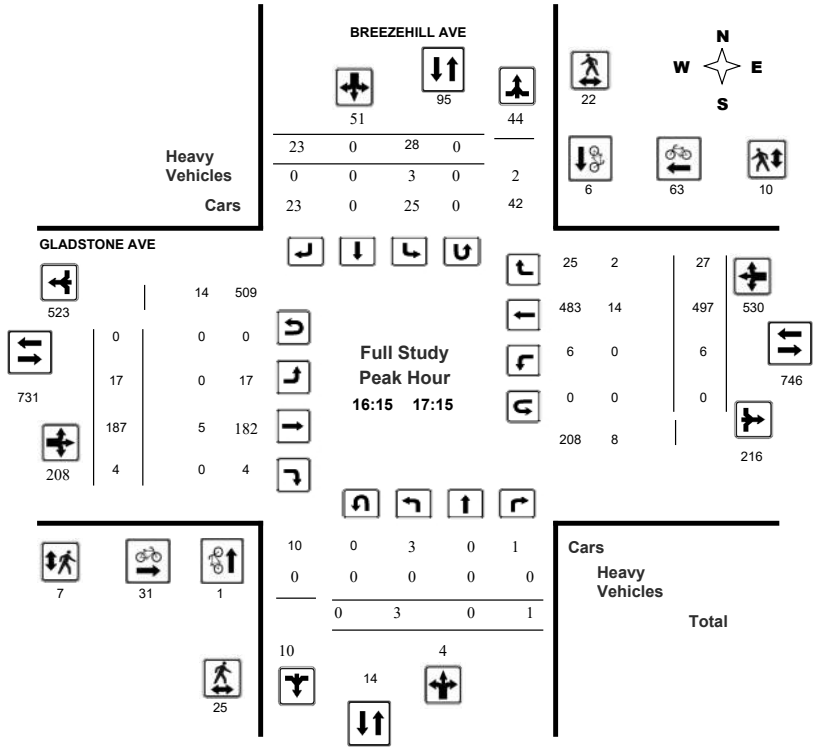
Transportation Services - Traffic Services

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

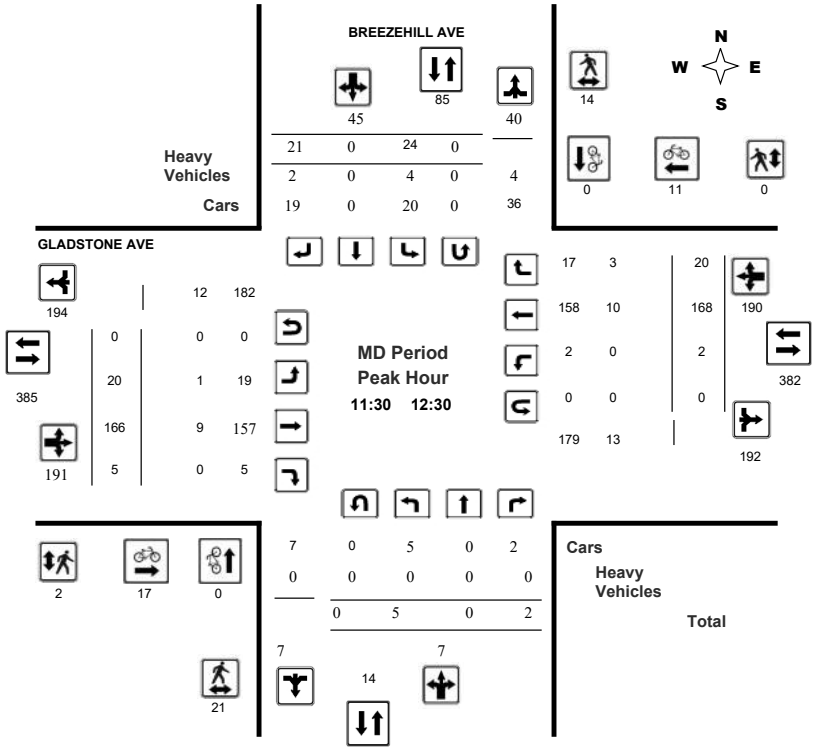
Transportation Services - Traffic Services

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

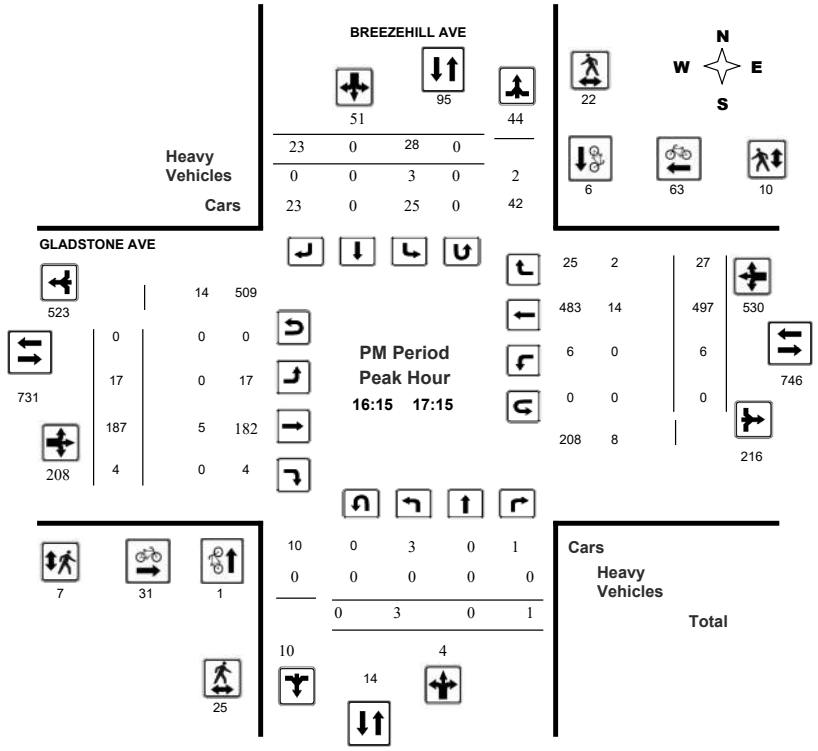
Transportation Services - Traffic Services

Turning Movement Count - 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

Work Order 37971

Turning Movement Count - 15 Min U-Turn Total Report

BREEZEHILL AVE @ GLADSTONE AVE

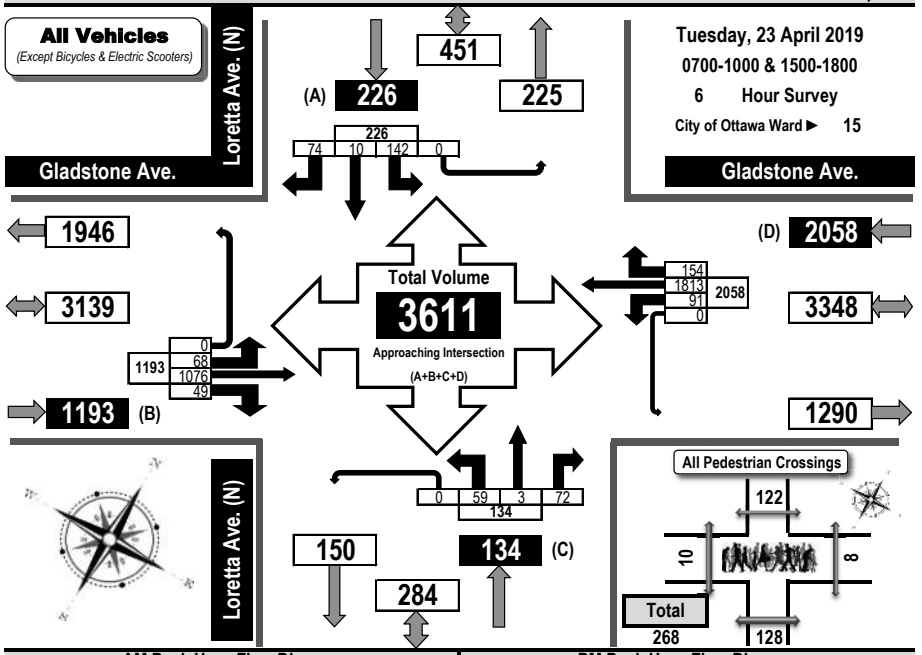
Survey Date: Wednesday, July 18, 2018

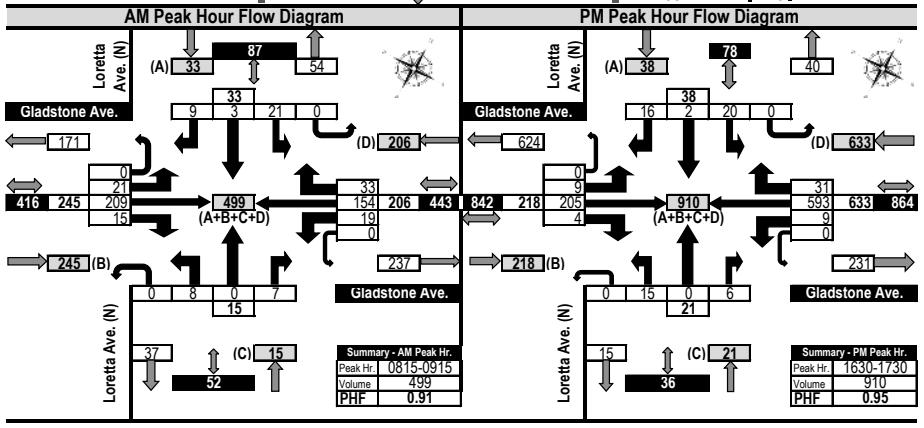
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	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

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Gladstone Avenue & Loretta Avenue North — Ottawa, ON





Printed on: 4/24/2019 | Prepared by: thetrafficspecialist@gmail.com | Flow Diagrams: AM PM Peak

Turning Movement Count
Summary Report
AADT and Expansion Factors

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Gladstone Avenue & Loretta Avenue North — Ottawa, ON

Survey Date: Tuesday, 23 April 2019 | **Start Time:** 0700 | **AADT Factor:** 0.7
Weather AM: Partly Cloudy +10ºC | **Survey Duration:** 6 Hrs. | **Survey Hours:** 0700-1000 & 1500-1800
Weather PM: Overcast +17ºC | **Surveyor(s):** 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
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	68	1076	49	0	1193	91	1813	154	0	2058	3251	59	3	72	0	134	142	10	74	0	226	360	3611

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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.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

PM Peak Hour Factor ➔ 0.95 — Highest Hourly Vehicle Volume Between 1500h & 1800h

PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.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.

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.

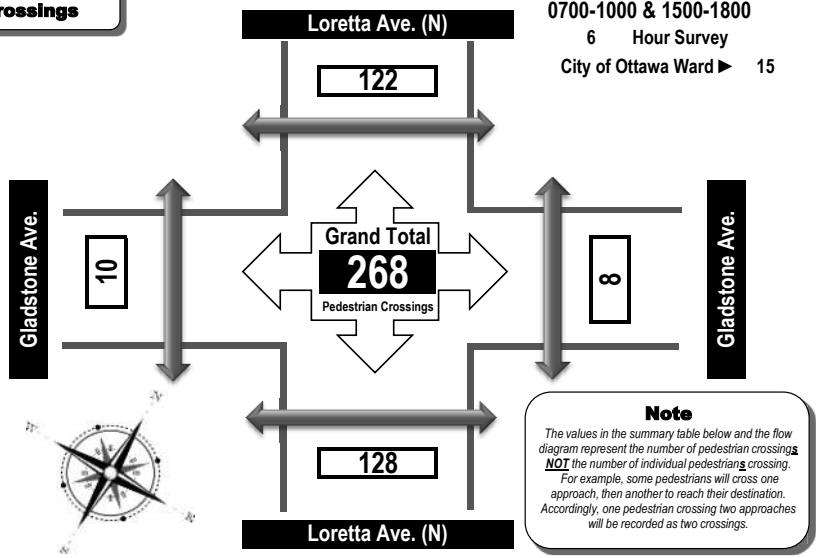
Printed on: 4/24/2019 | Prepared by: thetrafficspecialist@gmail.com | Summary: All Vehicles

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Gladstone Avenue & Loretta Avenue North — Ottawa, ON

Pedestrian Crossings

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



Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** 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
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	10	8	18	128	122	250	268

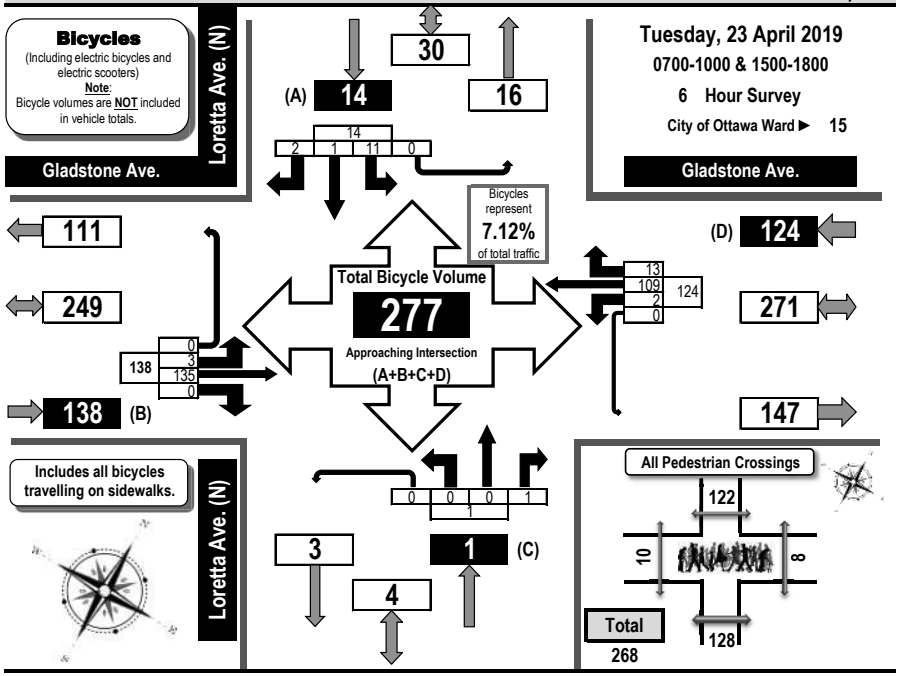
Comments:
No traffic issues noted during survey.

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, 23 April 2019
0700-1000 & 1500-1800
6 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	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.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
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	135	0	0	138	2	109	13	0	124	0	0	1	0	1	11	1	2	0	14	277

Comments:
No traffic issues noted during survey.

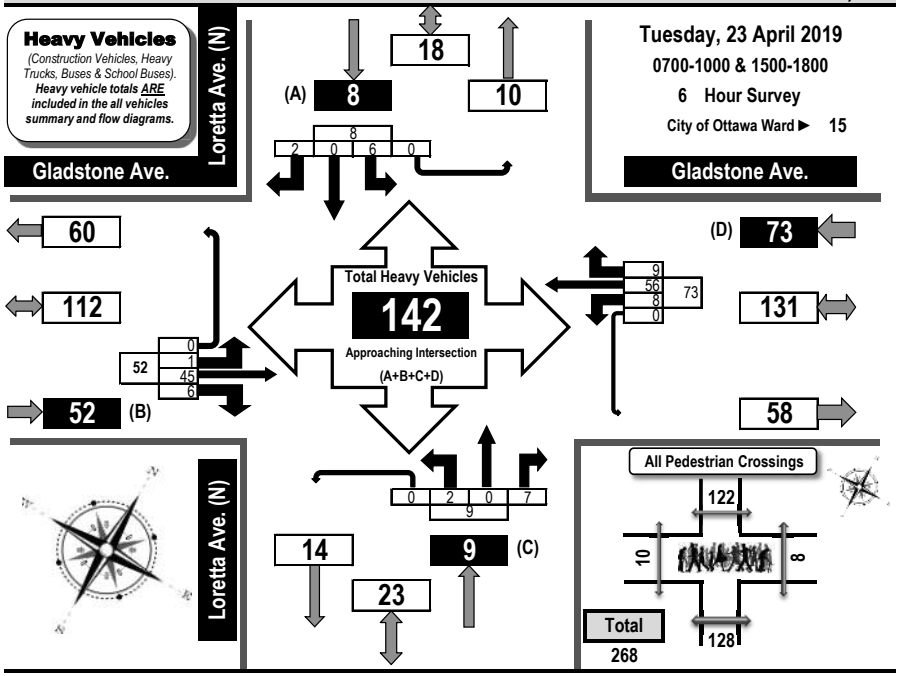
Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Heavy Trucks, Buses, and School Buses

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, 23 April 2019
0700-1000 & 1500-1800
6 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	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.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
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	45	6	0	52	8	56	9	0	73	2	0	7	0	9	6	0	2	0	8	142

Comments:
No traffic issues noted during survey.

Printed on: 4/24/2019 Prepared by: thetrafficspecialist@gmail.com Summary: Heavy Vehicles

Transportation Services - Traffic Services
W.O. 37132

Turning Movement Count - 15 Minute Summary Report

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 1 Westbound: 0

		PRESTON ST Northbound				PRESTON ST Southbound					GLADSTONE AVE Eastbound					GLADSTONE AVE 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	12	66	16	**94**	12	82	2	**96**	**190**	4	25	10	**39**		10	27	19	**56**	**95**	**285**
07:15	07:30	3	78	19	**100**	14	104	3	**121**	**221**	2	24	8	**34**		10	23	12	**45**	**79**	**300**
07:30	07:45	13	85	15	**113**	10	70	4	**84**	**197**	3	29	13	**45**		8	25	12	**45**	**90**	**287**
07:45	08:00	13	95	15	**123**	17	90	7	**114**	**237**	11	32	10	**53**		13	24	14	**51**	**104**	**341**
08:00	08:15	12	99	17	**128**	19	85	3	**107**	**235**	7	39	16	**62**		13	28	21	**62**	**124**	**359**
08:15	08:30	14	100	27	**141**	18	91	10	**119**	**260**	9	56	19	**84**		17	40	17	**74**	**158**	**418**
08:30	08:45	9	120	21	**150**	20	91	3	**114**	**264**	5	52	14	**71**		6	49	14	**69**	**140**	**404**
08:45	09:00	10	94	16	**120**	16	78	0	**94**	**214**	10	50	13	**73**		12	41	16	**69**	**142**	**356**
09:00	09:15	13	81	20	**114**	21	108	10	**139**	**253**	5	27	13	**45**		12	35	17	**64**	**109**	**362**
09:15	09:30	19	61	18	**98**	23	94	8	**125**	**223**	8	27	12	**47**		12	40	21	**73**	**120**	**343**
09:30	09:45	14	79	17	**110**	24	84	11	**119**	**229**	9	25	10	**45**		21	26	15	**62**	**107**	**336**
09:45	10:00	9	73	19	**101**	16	75	3	**94**	**195**	4	30	11	**45**		11	38	17	**66**	**111**	**306**
11:30	11:45	8	70	20	**98**	20	63	4	**87**	**185**	5	24	14	**43**		29	22	20	**71**	**114**	**299**
11:45	12:00	9	67	23	**99**	15	89	13	**117**	**216**	2	38	12	**52**		27	53	27	**107**	**159**	**375**
12:00	12:15	13	79	21	**113**	11	84	11	**106**	**219**	5	35	13	**53**		30	41	28	**99**	**152**	**371**
12:15	12:30	11	89	25	**125**	16	67	5	**88**	**213**	5	35	14	**54**		22	44	29	**95**	**149**	**362**
12:30	12:45	7	53	19	**79**	18	97	11	**126**	**205**	6	33	13	**52**		21	34	27	**82**	**134**	**339**
12:45	13:00	16	63	27	**106**	21	77	4	**102**	**208**	8	32	19	**59**		22	44	25	**91**	**150**	**358**
13:00	13:15	13	89	19	**121**	14	83	9	**106**	**227**	9	40	19	**68**		24	44	21	**89**	**157**	**384**
13:15	13:30	12	73	22	**107**	29	75	8	**112**	**219**	10	35	11	**56**		21	41	21	**83**	**139**	**358**
15:00	15:15	15	84	29	**128**	8	95	8	**111**	**239**	5	39	26	**70**		24	62	27	**113**	**183**	**422**
15:15	15:30	21	118	24	**163**	17	97	9	**123**	**286**	6	40	11	**57**		16	64	15	**95**	**152**	**438**
15:30	15:45	12	98	16	**126**	13	73	10	**96**	**222**	5	39	14	**58**		26	92	20	**138**	**196**	**418**
15:45	16:00	13	108	16	**137**	12	86	6	**104**	**241**	10	48	14	**72**		19	96	15	**130**	**202**	**443**
16:00	16:15	27	118	19	**164**	15	83	9	**107**	**271**	4	40	8	**52**		22	97	14	**133**	**185**	**456**
16:15	16:30	14	104	22	**140**	12	95	10	**117**	**257**	3	48	11	**62**		18	107	20	**145**	**207**	**464**
16:30	16:45	16	83	29	**128**	9	86	8	**103**	**231**	6	51	13	**70**		24	101	20	**145**	**215**	**446**
16:45	17:00	22	92	23	**137**	15	103	10	**128**	**265**	3	43	6	**52**		18	114	24	**156**	**208**	**473**
17:00	17:15	24	95	27	**146**	16	80	21	**117**	**263**	8	45	8	**61**		20	117	13	**150**	**211**	**474**
17:15	17:30	12	79	24	**115**	7	85	8	**100**	**215**	1	40	9	**50**		24	100	20	**144**	**194**	**409**
17:30	17:45	13	86	31	**130**	15	71	7	**93**	**223**	8	48	8	**64**		26	85	25	**136**	**200**	**423**
17:45	18:00	13	84	12	**109**	6	94	11	**111**	**220**	8	45	12	**65**		27	78	20	**125**	**190**	**410**
TOTAL:		432	2763	668	**3863**	499	2735	246	**3480**	**7343**	194	1214	404	**1813**		605	1832	626	**3063**	**4876**	**12219**

Note: U-Turns are included in Totals.

Comment:

2018-Oct-04

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 37132

GLADSTONE AVE @ PRESTON ST

Count Date: Tuesday, June 20, 2017 **Start Time:** 07:00

	PRESTON ST			GLADSTONE AVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	8	**8**	19	14	**33**	**41**
08:00 09:00	10	14	**24**	47	25	**72**	**96**
09:00 10:00	7	8	**15**	15	21	**36**	**51**
11:30 12:30	5	9	**14**	10	8	**18**	**32**
12:30 13:30	8	10	**18**	4	14	**18**	**36**
15:00 16:00	8	8	**16**	17	15	**32**	**48**
16:00 17:00	11	13	**24**	20	42	**62**	**86**
17:00 18:00	7	8	**15**	27	38	**65**	**80**
Total	56	78	**134**	159	177	**336**	**470**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

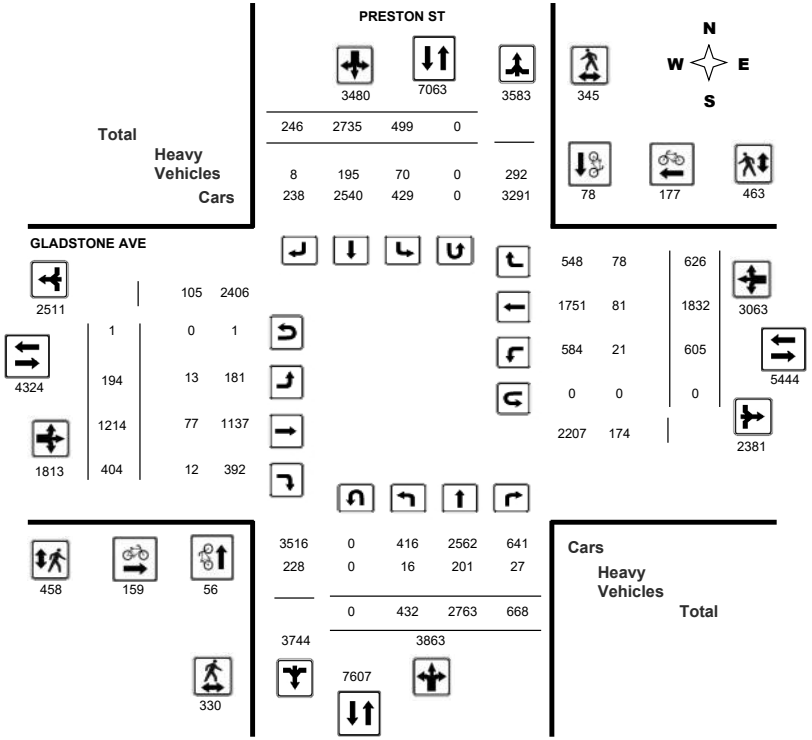
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017 **WO#:** 37132

Device: Miovision



Comments

Transportation Services - Traffic Services

W.O. 37132

Turning Movement Count - Heavy Vehicle Report

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017

		PRESTON ST									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	08:00	1	26	5	**32**	13	22	1	**36**	**68**	2	12	1	**15**	0	9	5	**14**	**29**	**97**
08:00	09:00	1	28	5	**34**	11	26	0	**37**	**71**	4	10	3	**17**	4	12	10	**26**	**43**	**114**
09:00	10:00	4	33	5	**42**	12	40	0	**52**	**94**	2	12	4	**18**	3	13	12	**28**	**46**	**140**
11:30	12:30	1	25	2	**28**	6	29	4	**39**	**67**	1	9	1	**11**	3	9	14	**26**	**37**	**104**
12:30	13:30	5	27	2	**34**	15	22	0	**37**	**71**	1	10	2	**13**	7	11	11	**29**	**42**	**113**
15:00	16:00	3	27	4	**34**	3	24	3	**30**	**64**	3	6	1	**10**	3	12	8	**23**	**33**	**97**
16:00	17:00	1	21	3	**25**	7	18	0	**25**	**50**	0	11	0	**11**	0	9	11	**20**	**31**	**81**
17:00	18:00	0	14	1	**15**	3	14	0	**17**	**32**	0	7	0	**7**	1	6	7	**14**	**21**	**53**
Sub Total		16	201	27	**244**	70	195	8	**273**	**517**	13	77	12	**102**	21	81	78	**180**	**282**	**799**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		16	201	27	**0**	70	195	8	**273**	**517**	13	77	12	**102**	21	81	78	**180**	**282**	**799**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 37132

Turning Movement Count - Pedestrian Volume Report

GLADSTONE AVE @ PRESTON ST

Count Date: Tuesday, June 20, 2017 **Start Time:** 07:00

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	1	3	**4**	1	3	**4**	**8**
07:15	07:30	7	5	**12**	3	4	**7**	**19**
07:30	07:45	7	10	**17**	8	12	**20**	**37**
07:45	08:00	19	6	**25**	12	14	**26**	**51**
07:00	08:00	34	24	**58**	24	33	**57**	**115**
08:00	08:15	10	7	**17**	9	16	**25**	**42**
08:15	08:30	8	9	**17**	4	15	**19**	**36**
08:30	08:45	26	22	**48**	21	40	**61**	**109**
08:45	09:00	13	16	**29**	10	23	**33**	**62**
08:00	09:00	57	54	**111**	44	94	**138**	**249**
09:00	09:15	12	6	**18**	3	9	**12**	**30**
09:15	09:30	8	6	**14**	5	14	**19**	**33**
09:30	09:45	4	9	**13**	9	3	**12**	**25**
09:45	10:00	9	10	**19**	10	12	**22**	**41**
09:00	10:00	33	31	**64**	27	38	**65**	**129**
11:30	11:45	9	4	**13**	8	14	**22**	**35**
11:45	12:00	8	9	**17**	11	9	**20**	**37**
12:00	12:15	14	13	**27**	18	13	**31**	**58**
12:15	12:30	14	9	**23**	27	8	**35**	**58**
11:30	12:30	45	35	**80**	64	44	**108**	**188**
12:30	12:45	10	9	**19**	16	20	**36**	**55**
12:45	13:00	8	8	**16**	13	16	**29**	**45**
13:00	13:15	6	11	**17**	20	14	**34**	**51**
13:15	13:30	4	6	**10**	12	12	**24**	**34**
12:30	13:30	28	34	**62**	61	62	**123**	**185**
15:00	15:15	6	7	**13**	16	14	**30**	**43**
15:15	15:30	9	11	**20**	10	19	**29**	**49**
15:30	15:45	10	5	**15**	17	11	**28**	**43**
15:45	16:00	21	11	**32**	11	13	**24**	**56**
15:00	16:00	46	34	**80**	54	57	**111**	**191**
16:00	16:15	8	14	**22**	22	14	**36**	**58**
16:15	16:30	10	15	**25**	20	16	**36**	**61**
16:30	16:45	10	16	**26**	33	22	**55**	**81**
16:45	17:00	16	12	**28**	28	12	**40**	**68**
16:00	17:00	44	57	**101**	103	64	**167**	**268**
17:00	17:15	15	16	**31**	23	18	**41**	**72**
17:15	17:30	13	17	**30**	18	22	**40**	**70**
17:30	17:45	9	18	**27**	13	8	**21**	**48**
17:45	18:00	6	25	**31**	27	23	**50**	**81**
17:00	18:00	43	76	**119**	81	71	**152**	**271**
Total	.....	330	345	**675**	458	463	**921**	**1596**

Comment:

Transportation Services - Traffic Services

Work Order 37132

Turning Movement Count - Full Study Summary Report

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 1 Westbound: 0

AADT Factor .90

Full Study

	PRESTON ST									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	41	324	65	**430**	53	346	16	**415**	**845**	20	110	41	**171**	41	99	57	**197**	**368**	**1213**
08:00 09:00	45	413	81	**539**	73	345	16	**434**	**973**	31	197	62	**290**	48	158	68	**274**	**564**	**1537**
09:00 10:00	55	294	74	**423**	84	361	32	**477**	**900**	26	109	46	**181**	56	139	70	**265**	**446**	**1346**
11:30 12:30	41	305	89	**435**	62	303	33	**398**	**833**	17	132	53	**202**	108	160	104	**372**	**574**	**1407**
12:30 13:30	48	278	87	**413**	82	332	32	**446**	**859**	33	140	62	**235**	88	163	94	**345**	**580**	**1439**
15:00 16:00	61	408	85	**554**	50	351	33	**434**	**988**	26	166	65	**257**	85	314	77	**476**	**733**	**1721**
16:00 17:00	79	397	93	**569**	51	367	37	**455**	**1024**	16	182	38	**236**	82	419	78	**579**	**815**	**1839**
17:00 18:00	62	344	94	**500**	44	330	47	**421**	**921**	25	178	37	**240**	97	380	78	**555**	**795**	**1716**
Sub Total	432	2763	668	**3863**	499	2735	246	**3480**	**7343**	194	1214	404	**1812**	605	1832	626	**3063**	**4875**	**12218**
U Turns				**0**				**0**	**0**				**1**				**0**	**1**	**1**
Total	432	2763	668	**3863**	499	2735	246	**3480**	**7343**	194	1214	404	**1813**	605	1832	626	**3063**	**4876**	**12219**
EQ 12Hr	600	3841	929	**5370**	694	3802	342	**4837**	**10207**	270	1687	562	**2520**	841	2546	870	**4258**	**6778**	**16985**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	540	3457	836	**4833**	624	3421	308	**4353**	**9186**	243	1519	505	**2268**	757	2292	783	**3832**	**6100**	**15286**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	708	4528	1095	**6331**	818	4482	403	**5703**	**12034**	318	1990	662	**2971**	991	3002	1026	**5020**	**7991**	**20025**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

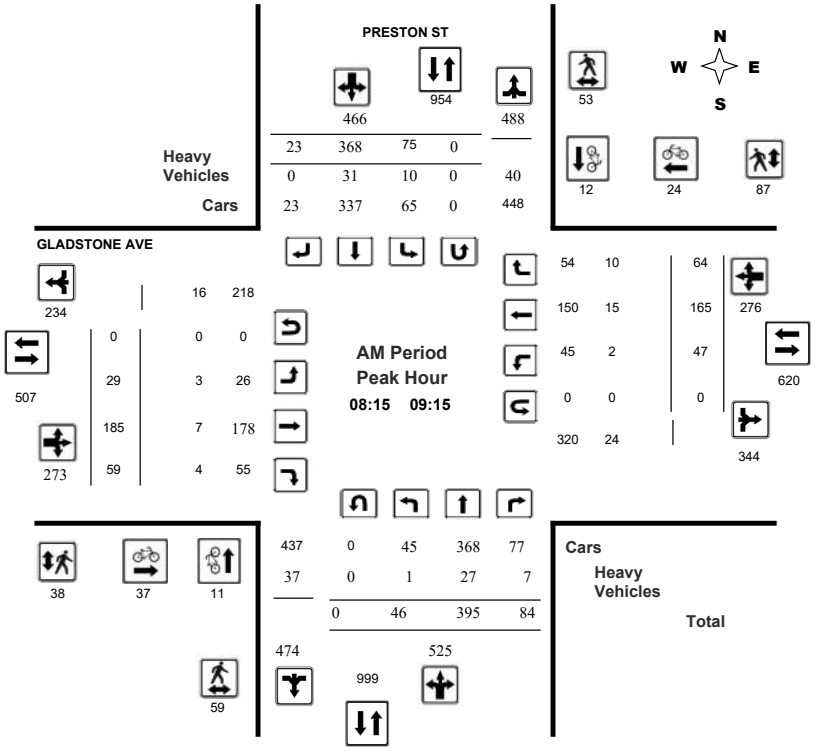
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017 **WO No:** 37132

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



Comments

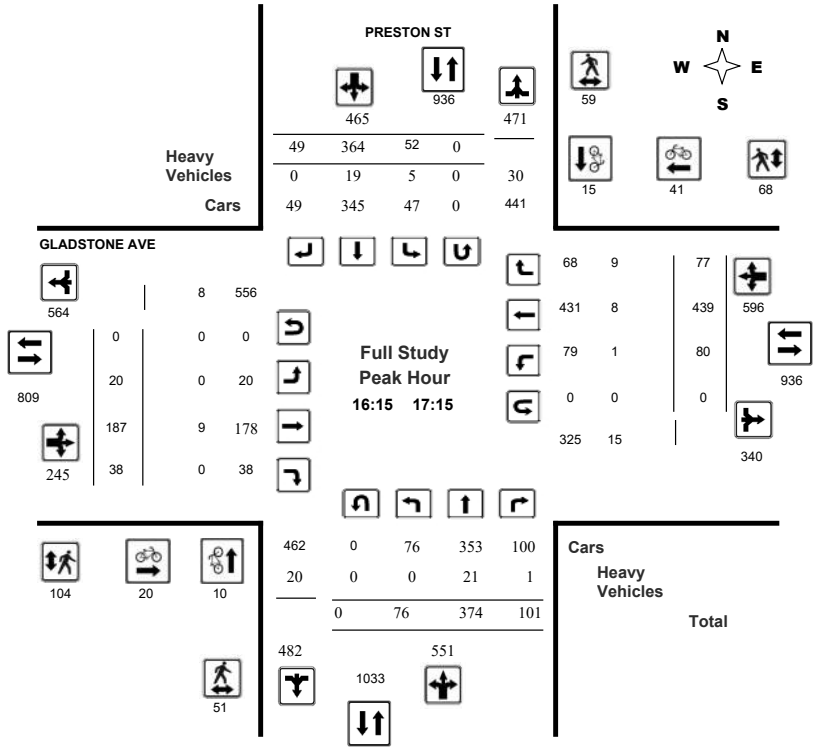
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017 **WO No:** 37132

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



Comments

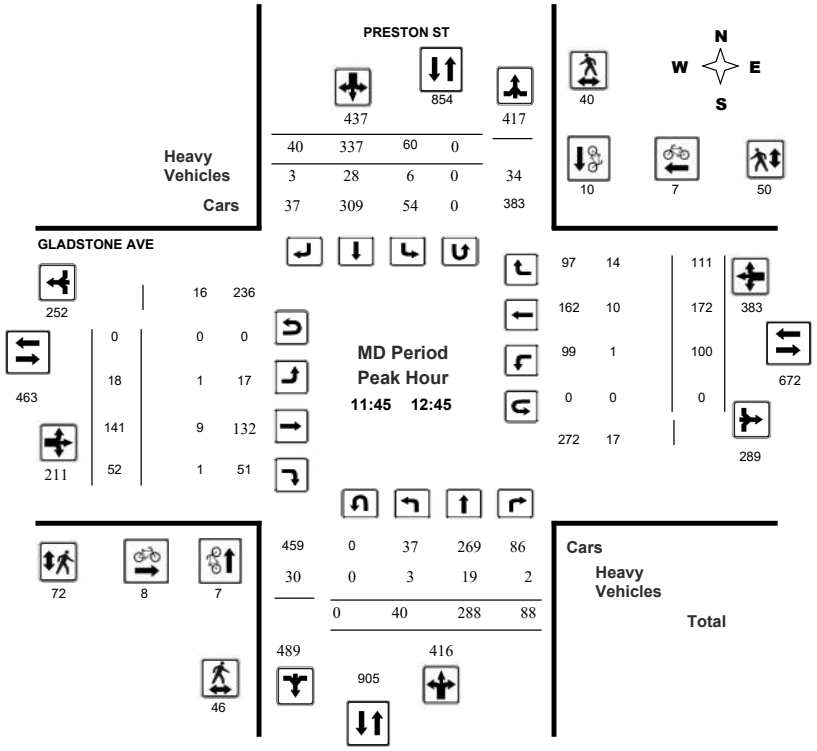
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017 **WO No:** 37132

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



Comments

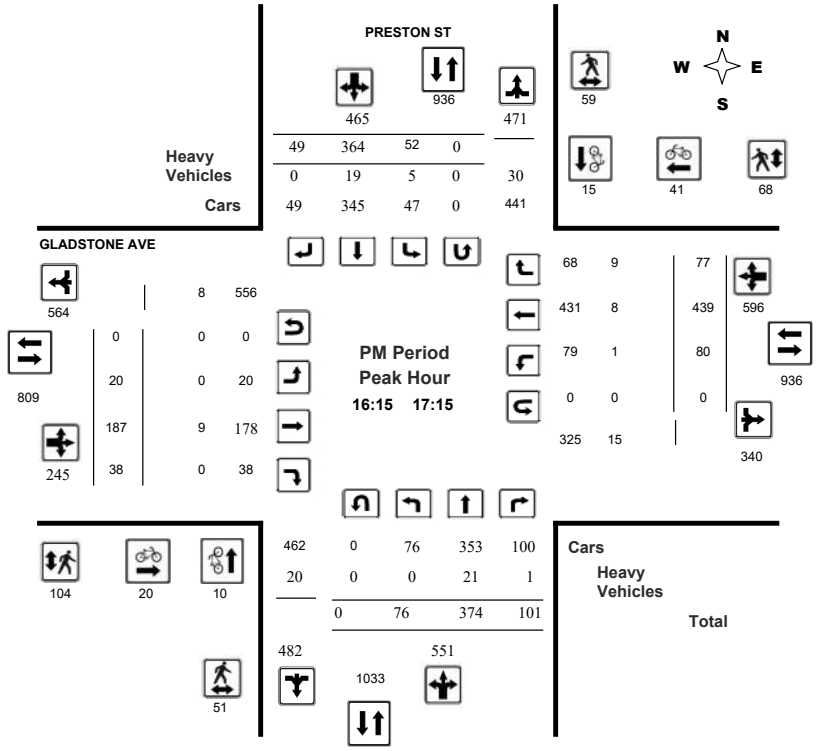
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLADSTONE AVE @ PRESTON ST

Survey Date: Tuesday, June 20, 2017 **WO No:** 37132

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



Transportation Services - Traffic Services

Work Order 37132

Turning Movement Count - 15 Min U-Turn Total Report

GLADSTONE AVE @ PRESTON ST

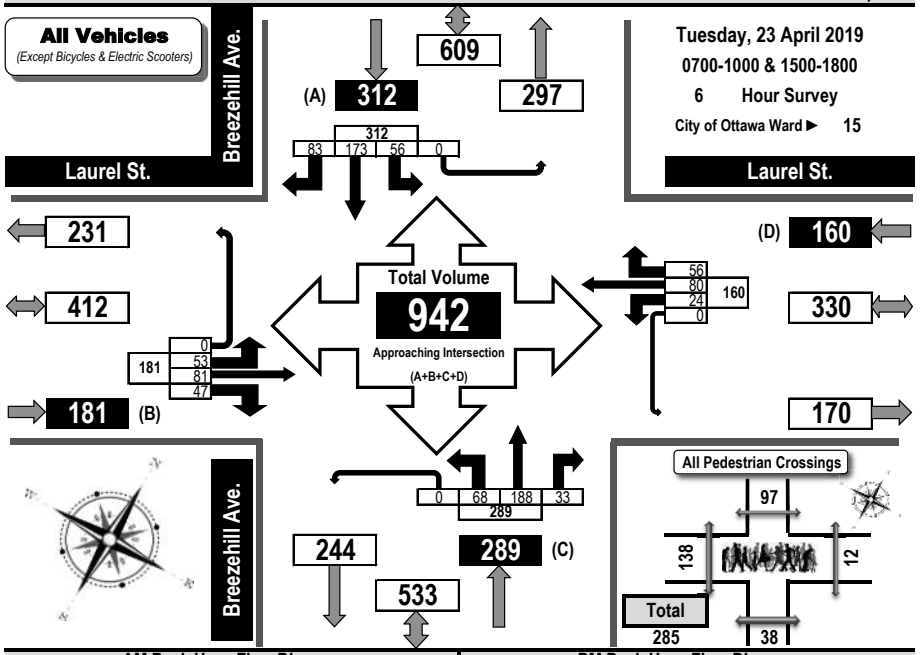
Survey Date: Tuesday, June 20, 2017

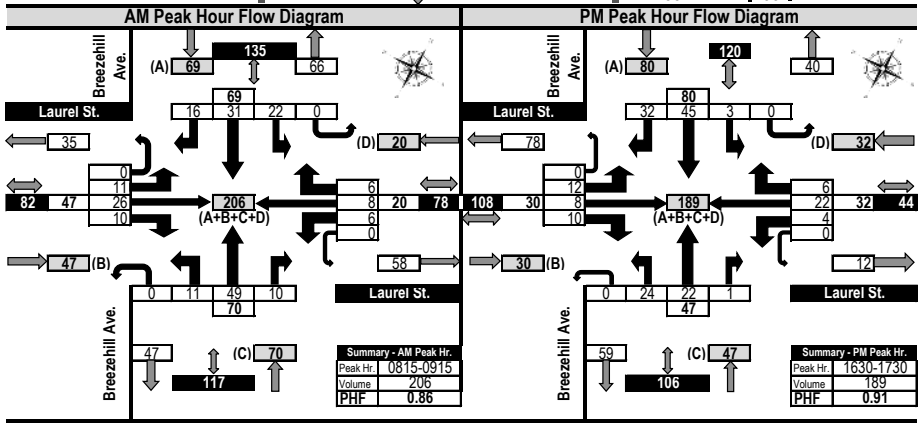
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	1	0	1
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	1	0	1

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Breezehill Avenue & Laurel Street — Ottawa, ON





Printed on: 4/25/2019 | Prepared by: thetrafficspecialist@gmail.com | Flow Diagrams: AM PM Peak

Turning Movement Count
Summary Report
AADT and Expansion Factors

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Breezehill Avenue & Laurel Street — Ottawa, ON

Survey Date: Tuesday, 23 April 2019 | **Start Time:** 0700 | **AADT Factor:** 0.7
Weather AM: Partly Cloudy +10ºC | **Survey Duration:** 6 Hrs. | **Survey Hours:** 0700-1000 & 1500-1800
Weather PM: Overcast +17ºC | **Surveyor(s):** Carmody

	Laurel St. Eastbound					Laurel St. Westbound						Breezehill Ave. Northbound					Breezehill Ave. 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	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
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	53	81	47	0	181	24	80	56	0	160	341	68	188	33	0	289	56	173	83	0	312	601	942

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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.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

PM Peak Hour Factor ➔ 0.91 — Highest Hourly Vehicle Volume Between 1500h & 1800h

PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.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.

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.

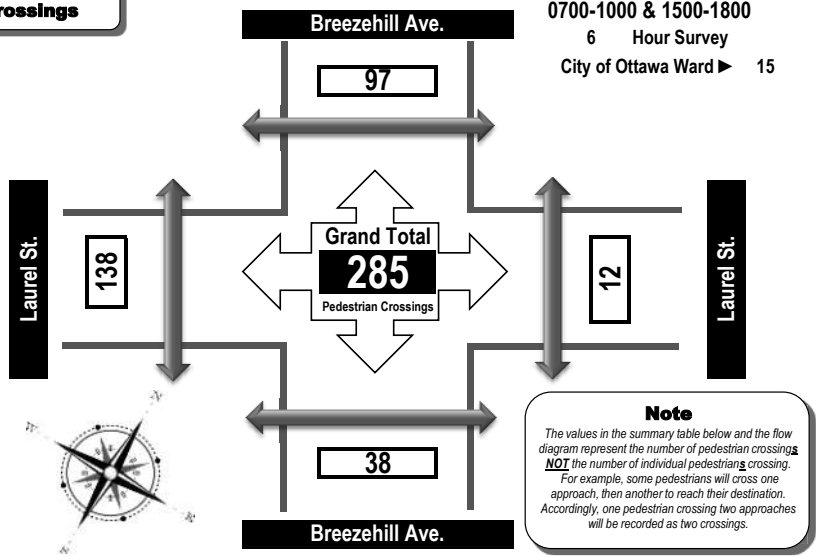
Printed on: 4/25/2019 | Prepared by: thetrafficspecialist@gmail.com | Summary: All Vehicles

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

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

Pedestrian Crossings

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



Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** 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
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	138	12	150	38	97	135	285

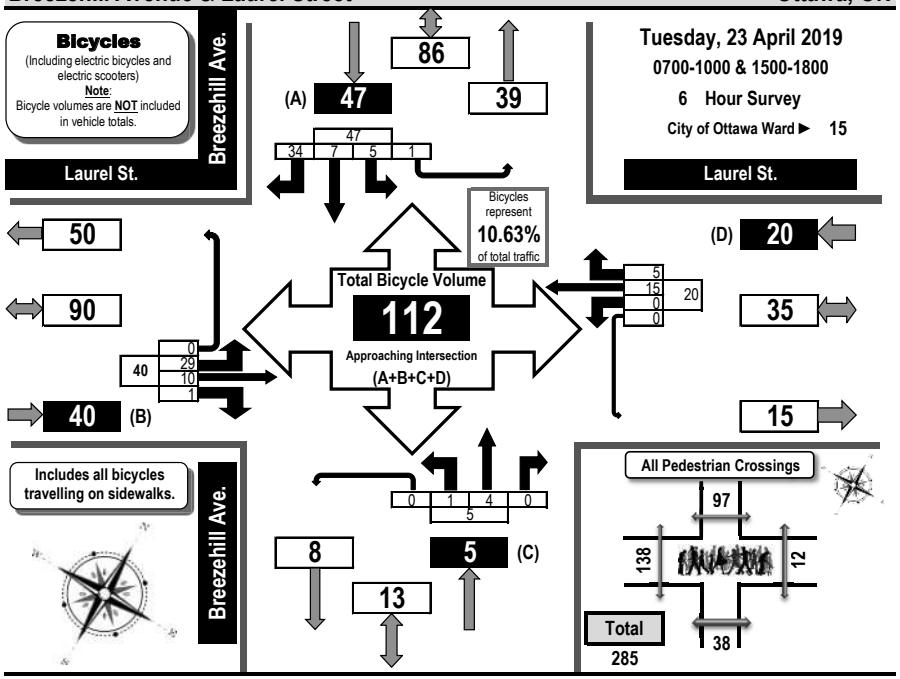
Comments:
A cedar hedge growing along the property frontage on the southwest quadrant is creating a serious sightline problem. The majority of the cyclists as well as some drivers ignore the all-way stop control. Vehicles parked too close to the intersection on both Laurel Street, east of Breezehill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

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, 23 April 2019
0700-1000 & 1500-1800
6 Hour Survey
City of Ottawa Ward ► 15



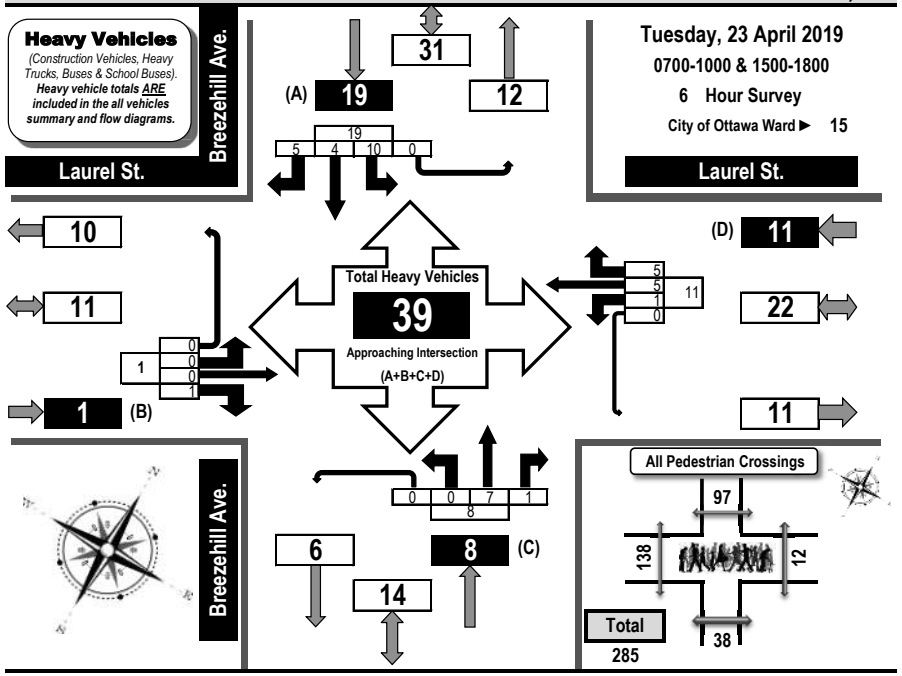
	Laurel St. Eastbound					Laurel St. Westbound					Breezehill Ave. Northbound					Breezehill Ave. Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0700-0800	6	1	0	0	7	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	10
0800-0900	15	6	1	0	22	0	2	1	0	3	0	1	0	0	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
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	29	10	1	0	40	0	15	5	0	20	1	4	0	0	5	5	7	34	1	47	112

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.

Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Heavy Trucks, Buses, and School Buses

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



	Laurel St. Eastbound					Laurel St. Westbound					Breezehill Ave. Northbound					Breezehill Ave. Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.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**
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**	**5**	**0**	**11**	**0**	**7**	**1**	**0**	**8**	**10**	**4**	**5**	**0**	**19**	**39**

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.

Printed on: 4/25/2019 Prepared by: thetrafficspecialist@gmail.com Summary: Heavy Vehicles

Transportation Services - Traffic Services

W.O. 35301

Turning Movement Count - 15 Minute Summary Report

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 4 Westbound: 2

BREEZEHILL AVE (Northbound / Southbound) **SOMERSET ST** (Eastbound / Westbound)

Time Period	Northbound LT	ST	RT	N TOT	Southbound LT	ST	RT	S TOT	STR TOT	Eastbound LT	ST	RT	E TOT	Westbound 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**	0	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**	0	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**	0	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**	4	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**	7	113	0	**121**	**202**	**209**
17:30 17:45	4	0	5	**9**	0	0	0	**0**	**9**	0	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**	0	2137	147	**2288**	136	2329	0	**2467**	**4755**	**5042**

Note: U-Turns are included in Totals.

Comment:

2018-Sep-27

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 35301

BREEZEHILL AVE @ SOMERSET ST

Count Date: Thursday, August 13, 2015 **Start Time:** 07:00

	BREEZEHILL AVE			SOMERSET ST			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	6	0	**6**	38	24	**62**	**68**
08:00 09:00	17	0	**17**	99	39	**138**	**155**
09:00 10:00	6	0	**6**	33	28	**61**	**67**
11:30 12:30	4	0	**4**	28	25	**53**	**57**
12:30 13:30	2	0	**2**	21	30	**51**	**53**
15:00 16:00	3	0	**3**	41	34	**75**	**78**
16:00 17:00	3	0	**3**	50	79	**129**	**132**
17:00 18:00	4	0	**4**	59	101	**160**	**164**
Total	45	0	**45**	369	360	**729**	**774**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

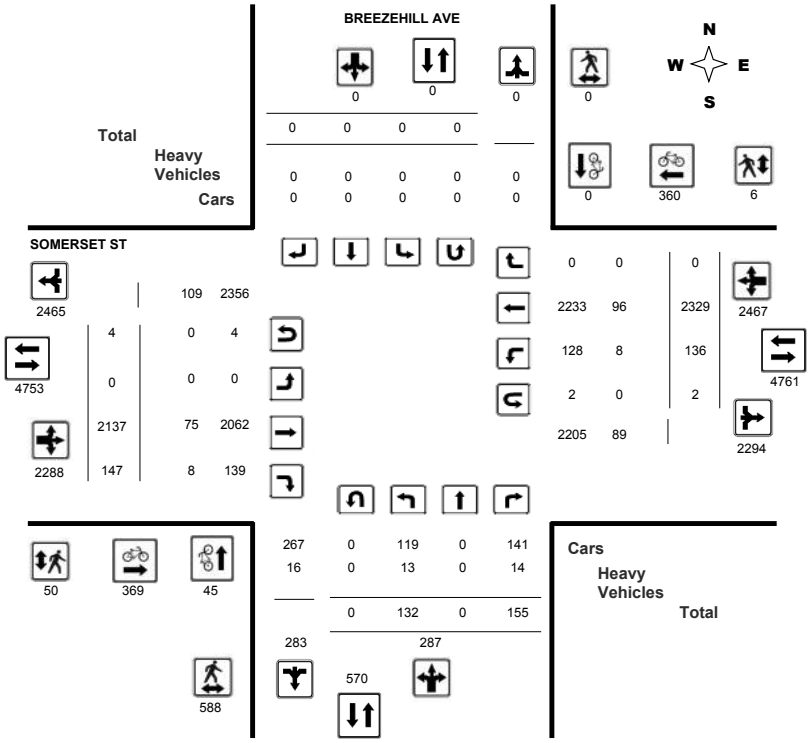
Transportation Services - Traffic Services

Turning Movement Count - Full Study Diagram

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015 **WO#:** 35301

Device: Miovision



Comments

Transportation Services - Traffic Services

W.O. 35301

Turning Movement Count - Heavy Vehicle Report

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015

		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	08:00	2	0	1	**3**	0	0	0	**0**	**3**	0	7	1	**8**	2	12	0	**14**	**22**	**25**
08:00	09:00	1	0	2	**3**	0	0	0	**0**	**3**	0	12	0	**12**	1	15	0	**16**	**28**	**31**
09:00	10:00	4	0	6	**10**	0	0	0	**0**	**10**	0	11	2	**13**	0	15	0	**15**	**28**	**38**
11:30	12:30	4	0	2	**6**	0	0	0	**0**	**6**	0	10	0	**10**	4	11	0	**15**	**25**	**31**
12:30	13:30	1	0	0	**1**	0	0	0	**0**	**1**	0	7	3	**10**	1	13	0	**14**	**24**	**25**
15:00	16:00	1	0	3	**4**	0	0	0	**0**	**4**	0	11	0	**11**	0	15	0	**15**	**26**	**30**
16:00	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	7	1	**8**	0	7	0	**7**	**15**	**15**
17:00	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	10	1	**11**	0	8	0	**8**	**19**	**19**
Sub Total		13	0	14	**27**	0	0	0	**0**	**27**	0	75	8	**83**	8	96	0	**104**	**187**	**214**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		13	0	14	**0**	0	0	0	**0**	**27**	0	75	8	**83**	8	96	0	**104**	**187**	**214**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 35301

Turning Movement Count - Pedestrian Volume Report

BREEZEHILL AVE @ SOMERSET ST

Count Date: Thursday, August 13, 2015 **Start Time:** 07:00

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**
07:00	08:00	45	0	**45**	3	2	**5**	**50**
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**
08:00	09:00	59	0	**59**	4	1	**5**	**64**
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**
09:00	10:00	50	0	**50**	0	0	**0**	**50**
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**
11:30	12:30	66	0	**66**	7	1	**8**	**74**
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**
12:30	13:30	71	0	**71**	0	1	**1**	**72**
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**
15:00	16:00	87	0	**87**	4	0	**4**	**91**
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**
16:00	17:00	87	0	**87**	17	0	**17**	**104**
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**
17:00	18:00	123	0	**123**	15	1	**16**	**139**
Total	.....	588	0	**588**	50	6	**56**	**644**

Comment:

Transportation Services - Traffic Services

Work Order 35301

Turning Movement Count - Full Study Summary Report

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 4 Westbound: 2

AADT Factor .90

Full Study

	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**				**4**				**2**	**6**	**6**
Total	132	0	155	**287**	0	0	0	**0**	**287**	0	2137	147	**2288**	136	2329	0	**2467**	**4755**	**5042**
EQ 12Hr	183	0	215	**399**	0	0	0	**0**	**399**	0	2970	204	**3180**	189	3237	0	**3429**	**6609**	**7008**
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**	0	2673	184	**2862**	170	2914	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**	0	3502	241	**3750**	223	3817	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**						

Comments:

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

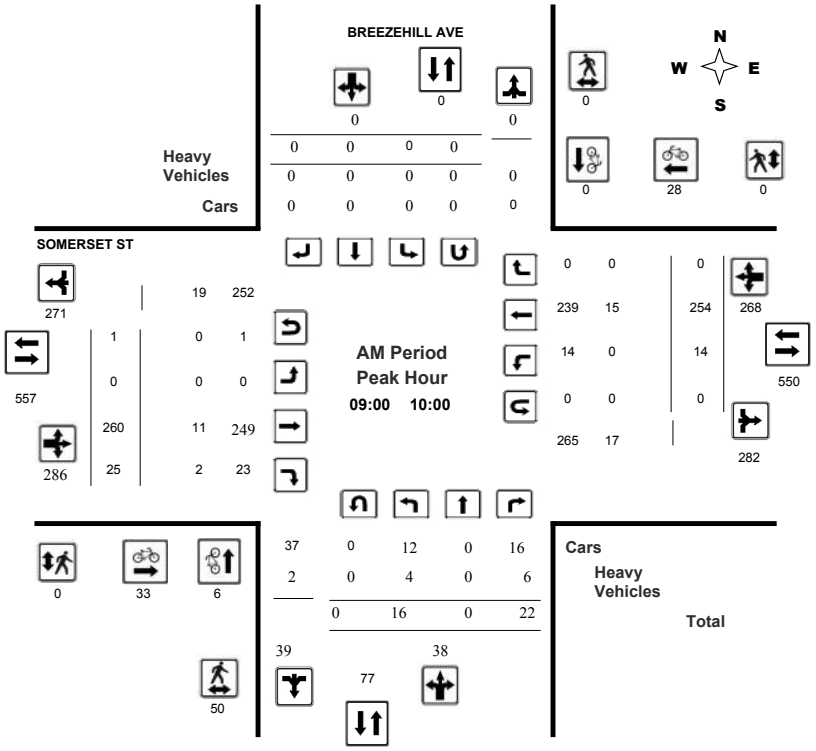
Transportation Services - Traffic Services

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

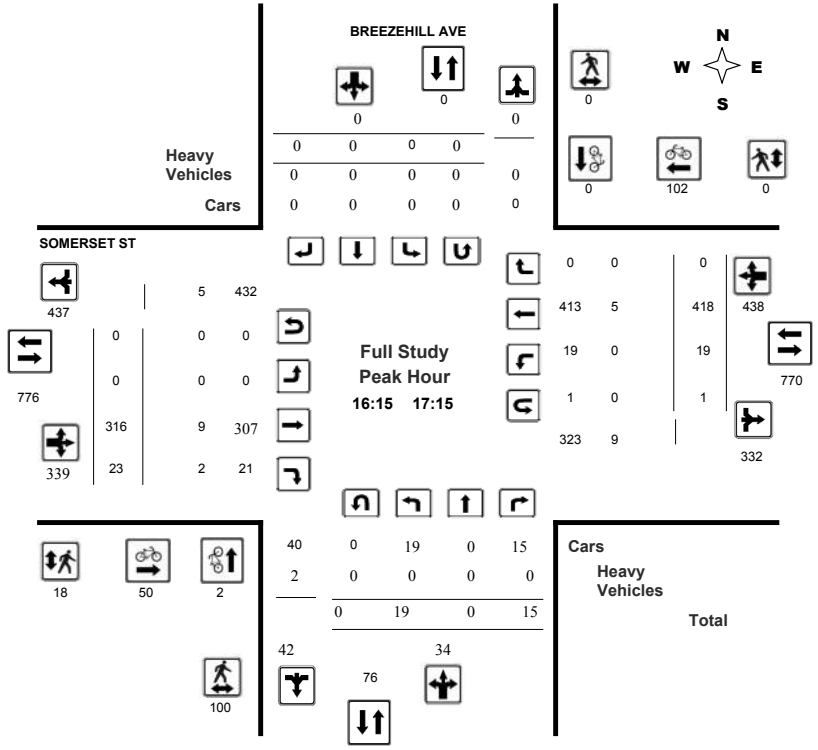
Transportation Services - Traffic Services

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

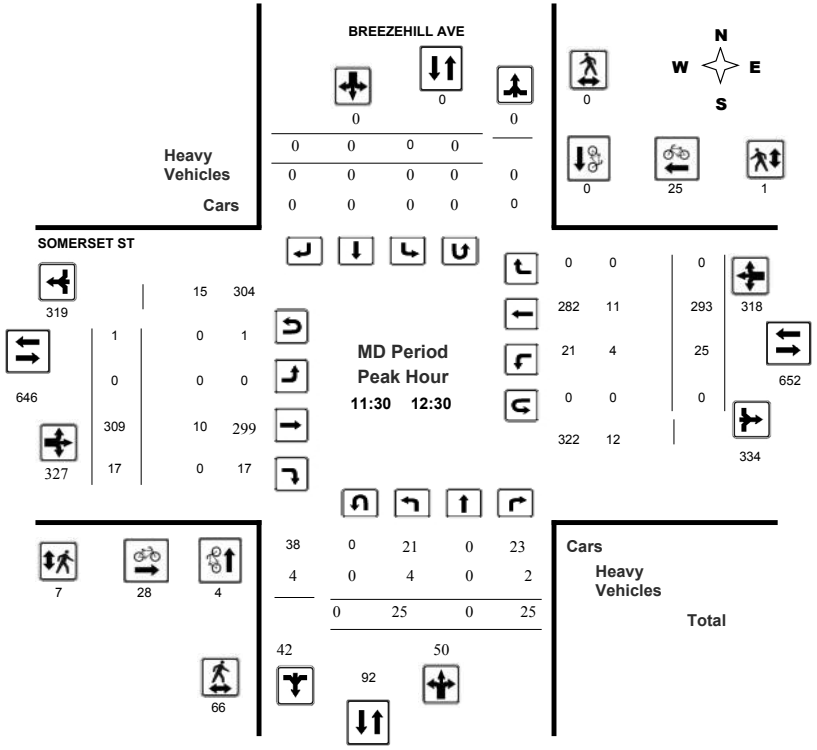
Transportation Services - Traffic Services

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

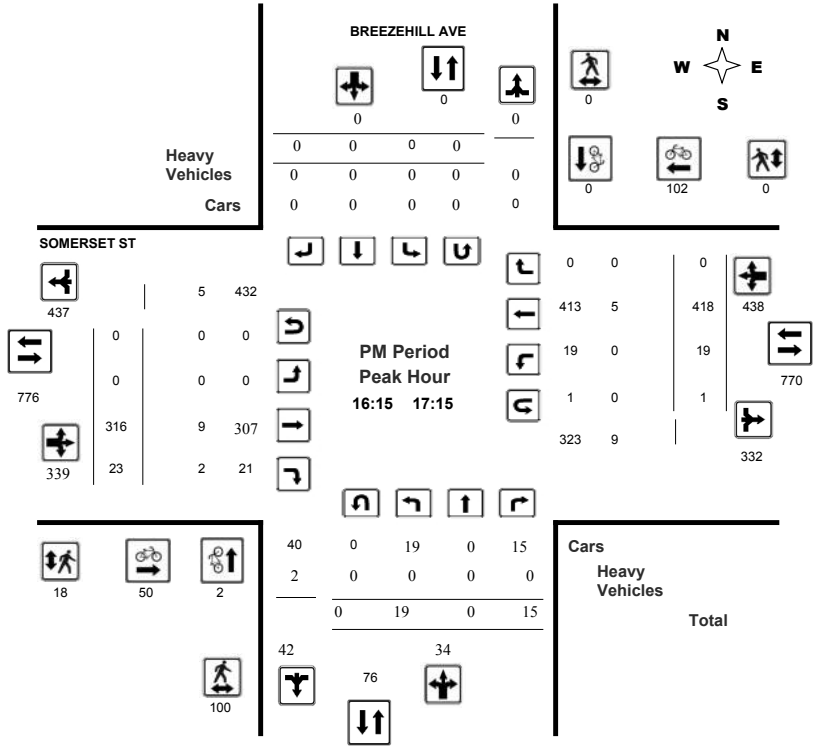
Transportation Services - Traffic Services

Turning Movement Count - 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

Work Order 35301

Turning Movement Count - 15 Min U-Turn Total Report

BREEZEHILL AVE @ SOMERSET ST

Survey Date: Thursday, August 13, 2015

Time Period		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	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

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	223	0	1	129	41	2	1	5	17	0	23
Future Vol, veh/h	23	223	0	1	129	41	2	1	5	17	0	23
Conflicting Peds, #/hr	21	0	25	25	0	21	8	0	2	2	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	248	0	1	143	46	2	1	6	19	0	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	210	0	0	273	0	0	514	537	275	495	514	195
Stage 1	-	-	-	-	-	-	325	325	-	189	189	-
Stage 2	-	-	-	-	-	-	189	212	-	306	325	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1361	-	-	1290	-	-	471	450	764	485	464	846
Stage 1	-	-	-	-	-	-	687	649	-	813	744	-
Stage 2	-	-	-	-	-	-	813	727	-	704	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1339	-	-	1265	-	-	437	424	748	463	437	827
Mov Cap-2 Maneuver	-	-	-	-	-	-	437	424	-	463	437	-
Stage 1	-	-	-	-	-	-	658	622	-	781	731	-
Stage 2	-	-	-	-	-	-	782	715	-	680	622	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	11.2	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	587	1339	-	-	1265	-	-	620
HCM Lane V/C Ratio	0.015	0.019	-	-	0.001	-	-	0.072
HCM Control Delay (s)	11.2	7.7	0	-	7.8	0	-	11.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	27	171	55	47	154	64	43	395	84	75	368	22
Future Volume (vph)	27	171	55	47	154	64	43	395	84	75	368	22
Satd. Flow (prot)	0	1616	0	1658	1588	0	1658	1643	0	1658	1722	0
Flt Permitted		0.936		0.487			0.465			0.389		
Satd. Flow (perm)	0	1507	0	791	1588	0	782	1643	0	635	1722	0
Satd. Flow (RTOR)					29			25				
Lane Group Flow (vph)	0	281	0	52	242	0	48	532	0	83	433	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.5	24.5		24.5	24.5		23.7	23.7		23.7	23.7	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.5	3.5		3.5	3.5		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.5		6.5	6.5		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		17.3		17.3	17.3		40.5	40.5		40.5	40.5	
Actuated g/C Ratio		0.25		0.25	0.25		0.58	0.58		0.58	0.58	
v/c Ratio		0.76		0.27	0.59		0.11	0.55		0.23	0.43	
Control Delay		37.8		23.8	25.9		8.5	12.2		10.3	10.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		37.8		23.8	25.9		8.5	12.2		10.3	10.7	
LOS		D		C	C		A	B		B	B	
Approach Delay		37.8			25.5			11.9			10.7	
Approach LOS		D			C			B			B	
Queue Length 50th (m)		33.3		5.4	23.8		2.7	38.4		5.0	30.0	
Queue Length 95th (m)		#57.3		13.6	43.1		7.6	68.1		12.8	52.0	
Internal Link Dist (m)		300.5			149.8			122.5			139.6	
Turn Bay Length (m)				37.5			24.0			28.0		
Base Capacity (vph)		414		217	457		461	979		374	1015	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.68		0.24	0.53		0.10	0.54		0.22	0.43	

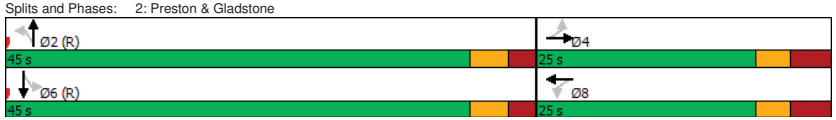
Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 37 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 18.3	Intersection LOS: B
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 2: Preston & Gladstone



Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	260	25	14	254	16	22
Future Vol, veh/h	260	25	14	254	16	22
Conflicting Peds, #/hr	0	50	50	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	289	28	16	282	18	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	367	0	667	353
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	314	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1192	-	424	691
Stage 1	-	-	-	-	711	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1146	-	401	664
Mov Cap-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	728	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	520	-	-	1146	-
HCM Lane V/C Ratio	0.081	-	-	0.014	-
HCM Control Delay (s)	12.5	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	21	209	15	19	154	33	8	0	7	21	3	9
Future Vol, veh/h	21	209	15	19	154	33	8	0	7	21	3	9
Conflicting Peds, #/hr	15	0	13	13	0	15	3	0	2	2	0	3
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	232	17	21	171	37	9	0	8	23	3	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	223	0	0	262	0	0	541	565	256	540	555	208
Stage 1	-	-	-	-	-	-	300	300	-	247	247	-
Stage 2	-	-	-	-	-	-	241	265	-	293	308	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1346	-	-	1302	-	-	452	434	783	453	440	832
Stage 1	-	-	-	-	-	-	709	666	-	757	702	-
Stage 2	-	-	-	-	-	-	762	689	-	715	660	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1330	-	-	1289	-	-	425	408	774	429	414	820
Mov Cap-2 Maneuver	-	-	-	-	-	-	425	408	-	429	414	-
Stage 1	-	-	-	-	-	-	688	646	-	734	680	-
Stage 2	-	-	-	-	-	-	733	668	-	693	640	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.7	11.9	12.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	538	1330	-	-	1289	-	-	491
HCM Lane V/C Ratio	0.031	0.018	-	-	0.016	-	-	0.075
HCM Control Delay (s)	11.9	7.8	0	-	7.8	0	-	12.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1	-	-	0.2

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	26	10	6	8	6	11	49	10	22	31	16
Future Vol, veh/h	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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	29	11	7	9	7	12	54	11	24	34	18
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.3	7.5	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	23%	30%	32%
Vol Thru, %	70%	55%	40%	45%
Vol Right, %	14%	21%	30%	23%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	47	20	69
LT Vol	11	11	6	22
Through Vol	49	26	8	31
RT Vol	10	10	6	16
Lane Flow Rate	78	52	22	77
Geometry Grp	1	1	1	1
Degree of Util (X)	0.088	0.06	0.025	0.086
Departure Headway (Hd)	4.067	4.136	4.12	4.047
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	875	855	857	879
Service Time	2.12	2.212	2.204	2.101
HCM Lane V/C Ratio	0.089	0.061	0.026	0.088
HCM Control Delay	7.5	7.5	7.3	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.1	0.3

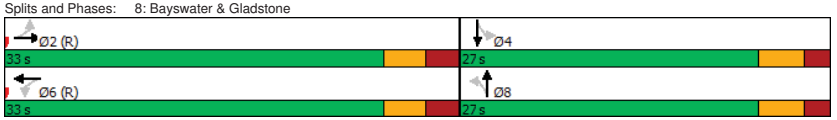
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	23	174	16	14	105	35	19	106	22	50	124	37
Future Volume (vph)	23	174	16	14	105	35	19	106	22	50	124	37
Satd. Flow (prot)	0	1706	0	0	1657	0	0	1688	0	0	1673	0
Flt Permitted		0.960			0.966			0.946			0.894	
Satd. Flow (perm)	0	1641	0	0	1606	0	0	1606	0	0	1510	0
Satd. Flow (RTOR)		9			32			16			20	
Lane Group Flow (vph)	0	237	0	0	172	0	0	163	0	0	235	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		27.5			27.5			21.7			21.7	
Actuated g/C Ratio		0.46			0.46			0.36			0.36	
v/c Ratio		0.31			0.23			0.28			0.42	
Control Delay		11.3			8.9			13.8			16.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.3			8.9			13.8			16.0	
LOS		B			A			B			B	
Approach Delay		11.3			8.9			13.8			16.0	
Approach LOS		B			A			B			B	
Queue Length 50th (m)		14.8			8.6			11.1			17.1	
Queue Length 95th (m)		27.8			18.4			22.9			33.3	
Internal Link Dist (m)		95.1			81.5			119.0			98.4	
Turn Bay Length (m)												
Base Capacity (vph)		757			753			591			558	
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		0.31			0.23			0.28			0.42	

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 46.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Bayswater & Gladstone



Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	189	4	6	591	27	3	0	1	28	0	23
Future Vol, veh/h	17	189	4	6	591	27	3	0	1	28	0	23
Conflicting Peds, #/hr	22	0	25	25	0	22	7	0	10	10	0	7
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	19	210	4	7	657	30	3	0	1	31	0	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	709	0	0	239	0	0	981	998	247	969	985	701
Stage 1	-	-	-	-	-	-	275	275	-	708	708	-
Stage 2	-	-	-	-	-	-	706	723	-	261	277	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	890	-	-	1328	-	-	229	244	792	233	248	439
Stage 1	-	-	-	-	-	-	731	683	-	426	438	-
Stage 2	-	-	-	-	-	-	427	431	-	744	681	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	875	-	-	1302	-	-	205	227	771	221	231	429
Mov Cap-2 Maneuver	-	-	-	-	-	-	205	227	-	221	231	-
Stage 1	-	-	-	-	-	-	699	653	-	408	427	-
Stage 2	-	-	-	-	-	-	396	420	-	719	651	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	19.6	20.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	251	875	-	-	1302	-	-	283
HCM Lane V/C Ratio	0.018	0.022	-	-	0.005	-	-	0.2
HCM Control Delay (s)	19.6	9.2	0	-	7.8	0	-	20.9
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	20	183	37	80	482	77	83	374	101	52	364	54
Future Volume (vph)	20	183	37	80	482	77	83	374	101	52	364	54
Satd. Flow (prot)	0	1663	0	1658	1671	0	1658	1633	0	1658	1661	0
Flt Permitted		0.778		0.595			0.355			0.290		
Satd. Flow (perm)	0	1299	0	968	1671	0	568	1633	0	483	1661	0
Satd. Flow (RTOR)					13			25				
Lane Group Flow (vph)	0	266	0	89	622	0	92	528	0	58	464	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.5	24.5		24.5	24.5		23.7	23.7		23.7	23.7	
Total Split (s)	33.0	33.0		33.0	33.0		37.0	37.0		37.0	37.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%		52.9%	52.9%		52.9%	52.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.5	3.5		3.5	3.5		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.5		6.5	6.5		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		28.4		28.4	28.4		29.4	29.4		29.4	29.4	
Actuated g/C Ratio		0.41		0.41	0.41		0.42	0.42		0.42	0.42	
v/c Ratio		0.50		0.23	0.91		0.39	0.76		0.29	0.67	
Control Delay		20.0		16.0	40.2		19.7	24.4		17.7	21.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		20.0		16.0	40.2		19.7	24.4		17.7	21.8	
LOS		C		B	D		B	C		B	C	
Approach Delay		20.0			37.2			23.7			21.4	
Approach LOS		C			D			C			C	
Queue Length 50th (m)		23.7		7.0	68.6		8.5	57.0		5.1	49.8	
Queue Length 95th (m)		47.8		17.5	#140.8		19.0	85.2		12.7	73.0	
Internal Link Dist (m)		300.5			149.8			122.5			139.6	
Turn Bay Length (m)				37.5			24.0			28.0		
Base Capacity (vph)		527		392	686		253	744		215	742	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.50		0.23	0.91		0.36	0.71		0.27	0.63	

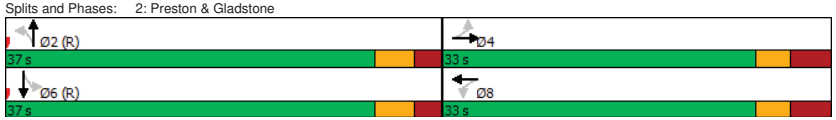
Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 40 (57%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 2: Preston & Gladstone



Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	316	23	19	418	19	15
Future Vol, veh/h	316	23	19	418	19	15
Conflicting Peds, #/hr	0	100	100	0	19	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	351	26	21	464	21	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	477	0	989	464
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	525	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1085	-	274	598
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1001	-	242	552
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	322	-	-	1001	-
HCM Lane V/C Ratio	0.117	-	-	0.021	-
HCM Control Delay (s)	17.7	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	205	4	9	593	31	15	0	6	20	2	16
Future Vol, veh/h	9	205	4	9	593	31	15	0	6	20	2	16
Conflicting Peds, #/hr	23	0	34	34	0	23	2	0	3	3	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	228	4	10	659	34	17	0	7	22	2	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	716	0	0	266	0	0	992	1020	267	976	1005	701
Stage 1	-	-	-	-	-	-	284	284	-	719	719	-
Stage 2	-	-	-	-	-	-	708	736	-	257	286	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	885	-	-	1298	-	-	225	237	772	230	241	439
Stage 1	-	-	-	-	-	-	723	676	-	420	433	-
Stage 2	-	-	-	-	-	-	426	425	-	748	675	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	869	-	-	1264	-	-	204	221	750	219	225	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	204	221	-	219	225	-
Stage 1	-	-	-	-	-	-	695	650	-	407	420	-
Stage 2	-	-	-	-	-	-	400	412	-	730	649	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	20.3	20.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	258	869	-	-	1264	-	-	277
HCM Lane V/C Ratio	0.09	0.012	-	-	0.008	-	-	0.152
HCM Control Delay (s)	20.3	9.2	0	-	7.9	0	-	20.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.5

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	8	10	4	22	6	24	22	1	3	45	32
Future Vol, veh/h	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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	9	11	4	24	7	27	24	1	3	50	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.4	7.5	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	40%	12%	4%
Vol Thru, %	47%	27%	69%	56%
Vol Right, %	2%	33%	19%	40%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	30	32	80
LT Vol	24	12	4	3
Through Vol	22	8	22	45
RT Vol	1	10	6	32
Lane Flow Rate	52	33	36	89
Geometry Grp	1	1	1	1
Degree of Util (X)	0.061	0.038	0.041	0.095
Departure Headway (Hd)	4.212	4.085	4.116	3.862
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	846	867	861	923
Service Time	2.26	2.153	2.183	1.908
HCM Lane V/C Ratio	0.061	0.038	0.042	0.096
HCM Control Delay	7.5	7.3	7.4	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	10	147	18	74	429	114	29	182	28	35	206	34
Future Volume (vph)	10	147	18	74	429	114	29	182	28	35	206	34
Satd. Flow (prot)	0	1701	0	0	1661	0	0	1698	0	0	1694	0
Flt Permitted		0.960			0.937			0.938			0.934	
Satd. Flow (perm)	0	1636	0	0	1558	0	0	1600	0	0	1589	0
Satd. Flow (RTOR)		14			28			12			12	
Lane Group Flow (vph)	0	194	0	0	686	0	0	265	0	0	306	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	36.0	36.0		36.0	36.0		24.0	24.0		24.0	24.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		30.5			30.5			18.7			18.7	
Actuated g/C Ratio		0.51			0.51			0.31			0.31	
v/c Ratio		0.23			0.85			0.52			0.61	
Control Delay		8.5			25.5			20.7			23.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.5			25.5			20.7			23.0	
LOS		A			C			C			C	
Approach Delay		8.5			25.5			20.7			23.0	
Approach LOS		A			C			C			C	
Queue Length 50th (m)		10.1			57.9			22.4			27.0	
Queue Length 95th (m)		19.8			#121.1			41.7			49.3	
Internal Link Dist (m)		95.1			81.5			119.0			98.4	
Turn Bay Length (m)												
Base Capacity (vph)		838			805			506			503	
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		0.23			0.85			0.52			0.61	

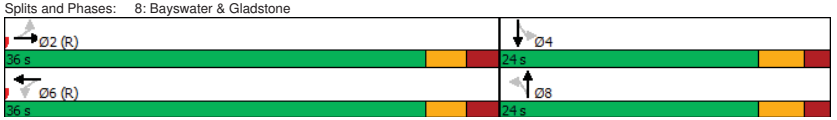
Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 53 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 84.1%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 8: Bayswater & Gladstone



Appendix D

Collision Data

CGH TRANSPORTATION

Anom_ID	Accident_Date	Accident_Ti	Location	Geo_ID	Accident_Location	Classification_of_Accident	Initial_Impact_Type	Environment_Cond	Light	Road_Surface_Condit	Traffic_Control	Traffic_Control_Cond	No_of_Vehicles	No_of_Bicycles	No_of_Motorcyc	No_of_Pedestrians	Max_Injur	No_of_Injur	No_of	No_of	No_of	X	Y	Latitude	Longitude	ObjectId
16-10248	2016-10-02	1:33 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	02 - Intersection related	02 - Non-fatal injury	03 - Rear end	02 - Rain	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	2	0	0	0	02 - Minor	1		1		366001.5	5029477	45.40256	-75.7182205	389
16-11753	2016-11-12	6:01 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	02 - Intersection related	03 - P.D. only	03 - Rear end	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366002.4	5029481	45.40259	-75.7182095	1764
16-6478	2016-06-14	5:42 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	02 - Intersection related	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366001.8	5029479	45.402576	-75.7182165	10663
17-10464	2017-10-14	12:20 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366001.7	5029478	45.402568	-75.7182189	271
17-12510	2017-11-28	7:06 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	02 - Non-fatal injury	03 - Rear end	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning		3	0	0	0	01 - Minim	1	1			366001.7	5029480	45.402584	-75.7182179	2606
17-1798	2017-02-12	1:39 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	03 - P.D. only	02 - Angle	03 - Snow	01 - Daylight	03 - Loose snow	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366002.2	5029479	45.402575	-75.7182117	5525
17-8459	2017-08-21	1:29 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366000.3	5029480	45.402578	-75.7182362	12411
18-5291	2018-05-16	6:10 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366000.7	5029480	45.402578	-75.7182308	9109
19-12278	2019-10-10	8:47 AM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366000.7	5029480	45.40258	-75.7182312	2433
19-12867	2019-10-24	4:42 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	02 - Non-fatal injury	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	1	0	0	0	01 - Minim	1	1			366000.5	5029480	45.402579	-75.7182333	3853
19-2759	2019-02-14	7:19 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	02 - Non-fatal injury	07 - SMV other	01 - Clear	07 - Dark	05 - Packed snow	01 - Traffic signal	01 - Functioning	1	0	0	0	02 - Minor	1		1		366000.6	5029480	45.402579	-75.7182322	8818
19-938	2019-01-18	9:50 AM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	03 - P.D. only	02 - Angle	03 - Snow	01 - Daylight	03 - Loose snow	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366000.7	5029480	45.402578	-75.7182304	15137
20-332	2020-01-09	1:06 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366000.7	5029480	45.402578	-75.718231	2034
20-8308	2020-11-03	1:37 PM	BAYSWATER AVE @ GLADSTONE AVE (0006164)	6164	03 - At intersection	02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0	02 - Minor	1		1		366000.7	5029480	45.402578	-75.7182309	8791
16-10156	2016-09-29	Unknown	BREEZEHILL AVE N btwn SOMERSET ST W & LAUREL ST (__3ZAAIA)	3ZAAIA	01 - Non intersection	03 - P.D. only	06 - SMV unattended vel	01 - Clear	00 - Unknown	01 - Dry	10 - No control		1	0	0	0		0				366002.1	5029740	45.404921	-75.7181808	887
16-12776	2016-12-07	3:25 PM	BREEZEHILL AVE @ GLADSTONE AVE (0006286)	6286	03 - At intersection	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	02 - Wet	02 - Stop sign	01 - Functioning	2	0	0	0	01 - Minim	1	1			366099	5029524	45.402968	-75.7169704	3902
18-6897	2018-06-28	4:27 PM	BREEZEHILL AVE @ GLADSTONE AVE (0006286)	6286	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	2	0	0	0		0				366098.7	5029524	45.402966	-75.7169739	11793
19-7449	2019-06-14	11:13 PM	BREEZEHILL AVE @ GLADSTONE AVE (0006286)	6286	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	01 - Dry	02 - Stop sign	01 - Functioning	2	0	0	0		0				366098.6	5029524	45.402966	-75.7169749	13624
18-6394	2018-06-15	10:14 PM	GLADSTONE AVE @ LORETTA AVE (0005092)	5092	03 - At intersection	02 - Non-fatal injury	07 - SMV other	01 - Clear	07 - Dark	01 - Dry	02 - Stop sign	01 - Functioning	1	0	0	1	01 - Minim	1	1			366196.7	5029568	45.403353	-75.7157165	10928
16-1852	2016-02-12	5:40 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	03 - P.D. only	03 - Rear end	03 - Snow	05 - Dusk	03 - Loose snow	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366489.5	5029713	45.404634	-75.7119586	4507
16-3967	2016-04-01	6:23 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	02 - Non-fatal injury	07 - SMV other	01 - Clear	03 - Dawn	02 - Wet	01 - Traffic signal	01 - Functioning	1	0	0	0	02 - Minor	1		1		366489.1	5029712	45.404631	-75.7119633	7133
16-7075	2016-06-29	9:45 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	03 - P.D. only	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	1	0	0	0		0				366490.2	5029713	45.404634	-75.7119499	10192
16-7984	2016-07-26	3:25 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	02 - Non-fatal injury	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	1	0	0	1	03 - Major	1			1	366489.5	5029713	45.404636	-75.7119587	11863
16-8456	2016-08-10	9:45 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	02 - Non-fatal injury	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0	01 - Minim	1	1			366489.5	5029713	45.404632	-75.7119587	12352
16-8418	2016-08-09	6:13 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	1	0	0	02 - Minor	1		1		366489.5	5029713	45.404632	-75.7119587	12812
17-10763	2017-10-23	2:18 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	00 - Unknown	2	0	0	0		0				366489.7	5029712	45.40463	-75.7119559	606
17-14172	2017-12-27	9:15 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	03 - P.D. only	05 - Turning movement	03 - Snow	01 - Daylight	06 - Ice	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366489.9	5029713	45.404634	-75.7119528	4504
18-11703	2018-11-05	5:14 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	02 - Non-fatal injury	07 - SMV other	02 - Rain	07 - Dark	02 - Wet	01 - Traffic signal	01 - Functioning	1	0	0	1	01 - Minim	1	1			366489.7	5029713	45.404632	-75.7119558	1310
18-3956	2018-04-04	2:25 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	02 - Non-fatal injury	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	1	0	0	1	01 - Minim	1	1			366489.4	5029712	45.404626	-75.7119604	7022
18-596	2018-01-10	2:37 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	04 - Slush	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366489.7	5029713	45.404632	-75.7119558	10256
18-6961	2018-06-29	7:26 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0	01 - Minim	1	1			366489.7	5029713	45.404632	-75.7119563	11461
19-13168	2019-10-31	2:38 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	03 - P.D. only	04 - Sideswipe	02 - Rain	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366489.7	5029713	45.404632	-75.7119556	3397
19-1537	2019-01-25	8:27 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	04 - Slush	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366489.7	5029713	45.404631	-75.7119565	5615
19-1581	2019-01-26	5:34 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	03 - P.D. only	03 - Rear end	03 - Snow	05 - Dusk	06 - Ice	01 - Traffic signal	00 - Unknown	2	0	0	0		0				366489.6	5029713	45.404632	-75.719569	6290
19-7012	2019-06-03	9:04 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366489.8	5029712	45.40463	-75.7119548	13830
20-16	2020-01-01	6:00 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	02 - Wet	01 - Traffic signal	01 - Functioning	2	0	0	0		0				366489.7	5029713	45.404632	-75.7119558	424
20-3408	2020-03-06	7:32 AM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	02 - Intersection related	02 - Non-fatal injury	03 - Rear end	03 - Snow	01 - Daylight	04 - Slush	01 - Traffic signal	01 - Functioning	2	0	0	0	01 - Minim	1	1			366489.7	5029713	45.404632	-75.7119558	2843
20-5581	2020-07-15	9:01 PM	GLADSTONE AVE @ PRESTON ST (0002212)	2212	03 - At intersection	02 - Non-fatal injury	05 - Turning movement	01 - Clear	05 - Dusk	01 - Dry	01 - Traffic signal	01 - Functioning	2	1	0	0	03 - Major	1			1	366489.7	5029713	45.404632	-75.7119558	5753
19-9701	2019-08-10	4:41 PM	GLADSTONE AVE btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA329)	3ZA329	01 - Non intersection	03 - P.D. only	99 - Other	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0		0				366088.5	5029519	45.402926	-75.7171049	16207
20-5307	2020-07-03	3:35 PM	GLADSTONE AVE btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA329)	3ZA329	01 - Non intersection	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0		0				366074	5029513	45.402869	-75.7172899	4474
20-2736	2020-02-22	10:21 AM	GLADSTONE AVE btwn BREEZEHILL AVE N & LORETTA AVE N (__3ZA3ZD)	3ZA3ZD	01 - Non intersection	03 - P.D. only	99 - Other	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0		0				366189.8	5029565	45.403328	-75.7158054	1704
18-12366	2018-11-17	6:30 PM	GLADSTONE AVE btwn LORETTA AVE N & PRESTON ST (__3ZA31H)	3ZA31H	01 - Non intersection	03 - P.D. only	04 - Sideswipe	01 - Clear	07 - Dark	02 - Wet	10 - No control		2	0	0	0		0				366413	5029680	45.404347	-75.7129392	2751
18-2157	2018-02-10	7:11 PM	GLADSTONE AVE btwn LORETTA AVE N & PRESTON ST (__3ZA31H)	3ZA31H	01 - Non intersection	03 - P.D. only	01 - Approaching	03 - Snow	07 - Dark	03 - Loose snow	10 - No control		2	0	0	0		0				366434.2	5029688	45.404413	-75.7126684	5026
19-2702	2019-02-14	11:00 AM	GLADSTONE AVE btwn LORETTA AVE N & PRESTON ST (__3ZA31H)	3ZA31H	01 - Non intersection	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	04 - Slush	10 - No control		2	0	0	0		0				366422.7	5029683	45.404374	-75.7128148	8207
19-2298	2019-02-05	Unknown	LAUREL St btwn BREEZEHILL AVE N & LORETTA AVE N (__3ZA15S)	3ZA15S	01 - Non intersection	03 - P.D. only	06 - SMV unattended vel	03 - Snow	00 - Unknown	06 - Ice	10 - No control		1	0	0	0		0				366078.3	5029767	45.405156	-75.7172034	7314
17-12890	2017-12-07	3:38 PM	SOMERSET ST W btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA31E)	3ZA31E	04 - At/near private drive	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0		0				365845.4	5029927	45.406619	-75.7201074	3922
17-4984	2017-05-09	2:42 PM	SOMERSET ST W btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA31E)	3ZA31E	04 - At/near private drive	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0		0				365872.8	5029937	45.406702	-75.719808	8669
17-60	2017-01-03	12:46 AM	SOMERSET ST W btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA31E)	3ZA31E	04 - At/near private drive	02 - Non-fatal injury	05 - Turning movement	01 - Clear	07 - Dark	02 - Wet	10 - No control		2	0	0	0	03 - Major	1			1	365858.7	5029931	45.40665	-75.7199884	9159
18-14072	2018-12-19	12:34 AM	SOMERSET ST W btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA31E)	3ZA31E	01 - Non intersection	03 - P.D. only	06 - SMV unattended vel	01 - Clear	07 - Dark	01 - Dry	10 - No control		1	0	0	0		0				365834.3	5029921	45.406566	-75.7203017	4561
18-469	2018-01-08	2:15 PM	SOMERSET ST W btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA31E)	3ZA31E	04 - At/near private drive	02 - Non-fatal injury	02 - Angle	03 - Snow	01 - Daylight	04 - Slush	10 - No control		2	0	0	0	01 - Minim	1	1			365898.8	5029949	45.406815	-75.7194746	8136
19-299	2019-01-08	11:36 AM	SOMERSET ST W btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA31E)	3ZA31E	04 - At/near private drive	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	04 - Slush	10 - No control		2	0	0	0		0				365862.5	5029933	45.406675	-75.7199393	8251
20-2702	2020-02-21	2:08 PM	SOMERSET ST W btwn BAYSWATER AVE & BREEZEHILL AVE N (__3ZA31E)	3ZA31E	04 - At/near private drive	02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0	02 - Minor	1		1		365870	5029937	45.406703	-75.7198439	1667
16-5138	2016-05-08	1:37 PM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	01 - Non intersection	02 - Non-fatal injury	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	1	0	0	01 - Minim	1	1			366282.2	5030117	45.408285	-75.7145557	8933
16-7475	2016-07-11	6:43 PM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	04 - At/near private drive	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	1	0	0	03 - Major	1			1	366294.5	5030122	45.408333	-75.7143978	11453
16-8258	2016-08-03	9:12 AM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	01 - Non intersection	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0		0				365914.8	5029955	45.406868	-75.7192695	12648
17-12584	2017-11-30	11:17 AM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	01 - Non intersection	03 - P.D. only	06 - SMV unattended vel	01 - Clear	01 - Daylight	01 - Dry	10 - No control		1	0	0	0		0				366232.9	5030096	45.408103	-75.7151879	2796
17-6052	2017-06-08	4:42 PM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	01 - Non intersection	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	1	0	0	02 - Minor	1		1		366170.2	5030069	45.407871	-75.715992	10122
17-833	2017-01-20	1:01 PM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	04 - At/near private drive	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	02 - Wet	10 - No control		2	0	0	0		0				366208.9	5030085	45.408007	-75.715496	12558
18-6971	2018-06-30	10:02 AM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	01 - Non intersection	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0	01 - Minim	2	2			365924.5	5029960	45.406905	-75.7191443	11472
18-8698	2018-08-22	2:20 PM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	01 - Non intersection	02 - Non-fatal injury	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	1	0	0	03 - Major	1			1	366123.9	5030048	45.407678	-75.7165872	13186
18-968	2018-01-17	6:10 PM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	04 - At/near private drive	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	02 - Wet	10 - No control		2	0	0	0		0				366247.4	5030098	45.408124	-75.7150025	14386
19-11004	2019-09-12	11:15 AM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	04 - At/near private drive	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	0	0	0		0				366220.4	5030089	45.408046	-75.7153493	1029
19-9075	2019-07-24	5:28 PM	SOMERSET ST W btwn BREEZEHILL AVE N & PRESTON ST (__3ZA32I)	3ZA32I	04 - At/near private drive	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	10 - No control		2	1	0	0	02 - Minor	1		1		366212.3	5030086	45.408016	-75.7154525	15727

Appendix E

TDM Checklist

CGH TRANSPORTATION

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

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: *Non-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	☑
		2.2 Bicycle skills training	
		Commuter travel	
BETTER	★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3 Valet bike parking	
		Visitor travel	
BETTER		2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-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	☑
BASIC		3.1.2 Provide online links to OC Transpo and STO information	☑
BETTER		3.1.3 Provide real-time arrival information display at entrances	☐
		3.2 Transit fare incentives	
		Commuter travel	
BETTER		3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit	☑
BETTER	★	3.2.2 Subsidize or reimburse monthly transit pass purchases by employees	☐
		Visitor travel	
BETTER		3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3 Enhanced public transit service	
		Commuter travel	
BETTER		3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER		3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4 Private transit service	
		Commuter travel	
BETTER		3.4.1 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER		3.4.2 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☑
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☑
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☐
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☑
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☑

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

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	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

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: *Non-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: *Non-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: *Non-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 commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office 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 the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	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)	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	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	☑
	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	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(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	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	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	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

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)	☐

Appendix F

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Intersections Form

Consultant	**CGH Transportation Inc**	**Project**	**2020-25**
Scenario	**Existing and Future**	**Date**	**12/20/2021**
Comments			

	INTERSECTIONS	**Gladstone @ Bayswater**				**Gladstone @ Preston**			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	4	3	3	3	4	4	5	0 - 2
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	no	no	no	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	5-10m	5-10m	5-10m	5-10m	5-10m	5-10m	10-15m	5-10m
	Crosswalk Type	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement
	PETSI Score	**54**	**71**	**74**	**74**	**57**	**60**	**43**	**89**
	Ped. Exposure to Traffic LoS	**D**	**C**	**C**	**C**	**D**	**C**	**E**	**B**
	Cycle Length	60	60	60	60	70	70	70	70
	Effective Walk Time	22	22	11	11	28	28	11	11
	Average Pedestrian Delay	**12**	**12**	**20**	**20**	**13**	**13**	**25**	**25**
	Pedestrian Delay LoS	**B**	**B**	**C**	**C**	**B**	**B**	**C**	**C**
	Level of Service	**D**	**C**	**C**	**C**	**D**	**C**	**E**	**C**
		D				**E**			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Right Turn Lane Configuration								
	Right Turning Speed								
	Cyclist relative to RT motorists	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	No lane crossed	No lane crossed	No lane crossed	No lane crossed	One lane crossed	One lane crossed	One lane crossed	No lane crossed
	Operating Speed	≤ 40 km/h	≤ 40 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h
	Left Turning Cyclist	**B**	**B**	**B**	**B**	**D**	**D**	**D**	**B**
	Level of Service	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**
		#N/A				**#N/A**			
Transit	Average Signal Delay			≤ 30 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 40 sec	≤ 40 sec
	Level of Service	**-**	**-**	**D**	**C**	**C**	**C**	**E**	**E**
		D				**E**			
Truck	Effective Corner Radius					10 - 15 m	10 - 15 m	10 - 15 m	
	Number of Receiving Lanes on Departure from Intersection					1	1	1	
	Level of Service	**-**	**-**	**-**	**-**	**E**	**E**	**E**	**-**
		-				**E**			
Auto	Volume to Capacity Ratio	0.71 - 0.80				0.71 - 0.80			
	Level of Service	**C**				**C**			

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc**	**Project**	**2020-25**
Scenario	**Existing and Future**	**Date**	**4/7/2021**
Comments			

SEGMENTS			Gladstone	Loretta (frontage)	Loretta (frontage)
			1	2	3
Pedestrian	Sidewalk Width Boulevard Width	**C**	≥ 2 m < 0.5	no sidewalk n/a	≥ 2 m 0.5 - 2 m
	Avg Daily Curb Lane Traffic Volume		> 3000	≤ 3000	≤ 3000
	Operating Speed On-Street Parking		> 30 to 50 km/h no	> 30 to 50 km/h yes	> 30 to 50 km/h no
	Exposure to Traffic PLoS		**C**	**F**	**A**
	Effective Sidewalk Width		2.0 m		
	Pedestrian Volume		500 ped /hr		
	Crowding PLoS		**B**	-	-
	Level of Service		**C**	**-**	**-**
Bicycle	Type of Cycling Facility	**D**	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Number of Travel Lanes		2-3 lanes total	≤ 2 (no centreline)	≤ 2 (no centreline)
	Operating Speed		>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h
	# of Lanes & Operating Speed LoS		**D**	**B**	**B**
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS		-	-	-
	Bike Lane Blockages				
	Blockage LoS		-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		>40 to 50 km/h	≤ 40 km/h	≤ 40 km/h
	Unsignalized Crossing - Lowest LoS		**B**	**A**	**A**
	Level of Service		**D**	**B**	**B**
Transit	Facility Type	**D**	Mixed Traffic		
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8		
	Level of Service		**D**	**-**	**-**
Truck	Truck Lane Width	**-**			
	Travel Lanes per Direction				
	Level of Service		**-**	**-**	**-**
Auto	**Level of Service**	**Not Applicable**			

Appendix G

Synchro Intersection Worksheets – Future Total Conditions

CGH TRANSPORTATION

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	268	0	1	148	41	2	1	5	17	0	23
Future Vol, veh/h	23	268	0	1	148	41	2	1	5	17	0	23
Conflicting Peds, #/hr	25	0	25	25	0	25	8	0	2	2	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	268	0	1	148	41	2	1	5	17	0	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	214	0	0	293	0	0	529	555	295	515	535	202
Stage 1	-	-	-	-	-	-	339	339	-	196	196	-
Stage 2	-	-	-	-	-	-	190	216	-	319	339	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1356	-	-	1269	-	-	460	440	744	470	452	839
Stage 1	-	-	-	-	-	-	676	640	-	806	739	-
Stage 2	-	-	-	-	-	-	812	724	-	693	640	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1330	-	-	1244	-	-	429	414	728	449	426	818
Mov Cap-2 Maneuver	-	-	-	-	-	-	429	414	-	449	426	-
Stage 1	-	-	-	-	-	-	650	615	-	775	724	-
Stage 2	-	-	-	-	-	-	783	710	-	672	615	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0	11.4	11.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	574	1330	-	-	1244	-	-	606
HCM Lane V/C Ratio	0.014	0.017	-	-	0.001	-	-	0.066
HCM Control Delay (s)	11.4	7.8	0	-	7.9	0	-	11.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.2

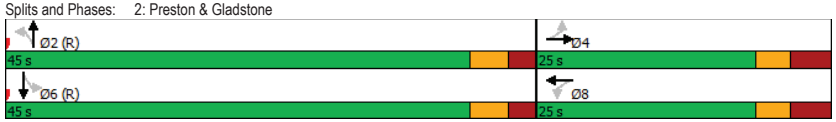
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	29	177	64	47	169	64	63	395	84	75	368	27
Future Volume (vph)	29	177	64	47	169	64	63	395	84	75	368	27
Satd. Flow (prot)	0	1596	0	1658	1590	0	1658	1643	0	1658	1715	0
Flt Permitted		0.938		0.507			0.494			0.427		
Satd. Flow (perm)	0	1490	0	815	1590	0	826	1643	0	690	1715	0
Satd. Flow (RTOR)					26			25				
Lane Group Flow (vph)	0	270	0	47	233	0	63	479	0	75	395	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.5	24.5		24.5	24.5		23.7	23.7		23.7	23.7	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.5	3.5		3.5	3.5		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.5		6.5	6.5		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		17.6		17.6	17.6		40.2	40.2		40.2	40.2	
Actuated g/C Ratio		0.25		0.25	0.25		0.57	0.57		0.57	0.57	
v/c Ratio		0.72		0.23	0.56		0.13	0.50		0.19	0.40	
Control Delay		36.6		21.8	24.5		9.4	11.8		10.4	10.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		36.6		21.8	24.5		9.4	11.8		10.4	10.9	
LOS		D		C	C		A	B		B	B	
Approach Delay		36.6			24.1			11.5			10.8	
Approach LOS		D			C			B			B	
Queue Length 50th (m)		39.7		4.9	23.3		3.5	32.3		4.3	26.1	
Queue Length 95th (m)		27.1		11.5	38.5		10.6	66.0		12.8	52.5	
Internal Link Dist (m)		140.4			149.8			122.5			139.6	
Turn Bay Length (m)				37.5			24.0			28.0		
Base Capacity (vph)		422		231	469		489	985		409	1017	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.64		0.20	0.50		0.13	0.49		0.18	0.39	

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 37 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 88.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Preston & Gladstone



Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	260	32	16	254	19	23
Future Vol, veh/h	260	32	16	254	19	23
Conflicting Peds, #/hr	0	50	50	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	260	32	16	254	19	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	342	0	612	326
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	286	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1217	-	456	715
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1170	-	431	687
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	751	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	541	-	-	1170	-
HCM Lane V/C Ratio	0.078	-	-	0.014	-
HCM Control Delay (s)	12.2	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	66	209	15	19	154	73	8	0	7	38	3	28
Future Vol, veh/h	66	209	15	19	154	73	8	0	7	38	3	28
Conflicting Peds, #/hr	25	0	14	14	0	25	3	0	3	3	0	3
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	66	209	15	19	154	73	8	0	7	38	3	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	252	0	0	238	0	0	610	653	234	609	624	219
Stage 1	-	-	-	-	-	-	363	363	-	254	254	-
Stage 2	-	-	-	-	-	-	247	290	-	355	370	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1313	-	-	1329	-	-	407	387	805	407	402	821
Stage 1	-	-	-	-	-	-	656	625	-	750	697	-
Stage 2	-	-	-	-	-	-	757	672	-	662	620	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1288	-	-	1315	-	-	363	347	794	372	361	803
Mov Cap-2 Maneuver	-	-	-	-	-	-	363	347	-	372	361	-
Stage 1	-	-	-	-	-	-	611	582	-	692	672	-
Stage 2	-	-	-	-	-	-	713	648	-	616	577	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	0.6	12.6	13.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	486	1288	-	-	1315	-	-	475
HCM Lane V/C Ratio	0.031	0.051	-	-	0.014	-	-	0.145
HCM Control Delay (s)	12.6	7.9	0	-	7.8	0	-	13.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.5

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	31	10	6	10	10	11	49	10	32	31	16
Future Vol, veh/h	11	31	10	6	10	10	11	49	10	32	31	16
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	31	10	6	10	10	11	49	10	32	31	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.3	7.5	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	21%	23%	41%
Vol Thru, %	70%	60%	38%	39%
Vol Right, %	14%	19%	38%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	52	26	79
LT Vol	11	11	6	32
Through Vol	49	31	10	31
RT Vol	10	10	10	16
Lane Flow Rate	70	52	26	79
Geometry Grp	1	1	1	1
Degree of Util (X)	0.079	0.06	0.029	0.09
Departure Headway (Hd)	4.075	4.137	4.046	4.082
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	872	855	872	871
Service Time	2.131	2.214	2.13	2.136
HCM Lane V/C Ratio	0.08	0.061	0.03	0.091
HCM Control Delay	7.5	7.5	7.3	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.1	0.3

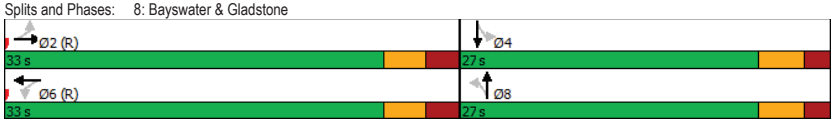
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	219	16	14	124	35	19	106	22	50	124	37
Future Volume (vph)	23	219	16	14	124	35	19	106	22	50	124	37
Satd. Flow (prot)	0	1713	0	0	1666	0	0	1687	0	0	1673	0
Flt Permitted		0.968			0.970			0.950			0.902	
Satd. Flow (perm)	0	1661	0	0	1620	0	0	1612	0	0	1522	0
Satd. Flow (RTOR)		7			28			17			20	
Lane Group Flow (vph)	0	258	0	0	173	0	0	147	0	0	211	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		27.5			27.5			21.7			21.7	
Actuated g/C Ratio		0.46			0.46			0.36			0.36	
v/c Ratio		0.34			0.23			0.25			0.37	
Control Delay		11.7			9.2			13.2			15.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.7			9.2			13.2			15.1	
LOS		B			A			B			B	
Approach Delay		11.7			9.2			13.2			15.1	
Approach LOS		B			A			B			B	
Queue Length 50th (m)		16.6			8.9			9.7			14.9	
Queue Length 95th (m)		30.6			18.9			20.6			29.6	
Internal Link Dist (m)		95.1			81.5			119.0			98.4	
Turn Bay Length (m)												
Base Capacity (vph)		765			757			593			563	
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		0.34			0.23			0.25			0.37	

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Bayswater & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	254	0	0	246	0	0	0	0	0	0	0
Future Volume (vph)	0	254	0	0	246	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1745	0	0	1745	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1745	0	0	1745	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	254	0	0	246	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		22.5			22.5							
Total Split (s)		50.0			50.0							
Total Split (%)		71.4%			71.4%							
Yellow Time (s)		3.0			3.0							
All-Red Time (s)		1.9			1.9							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		4.9			4.9							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max							
Act Effct Green (s)		56.8			56.8							
Actuated g/C Ratio		0.81			0.81							
v/c Ratio		0.18			0.17							
Control Delay		3.5			2.1							
Queue Delay		0.0			0.0							
Total Delay		3.5			2.1							
LOS		A			A							
Approach Delay		3.5			2.1							
Approach LOS		A			A							
Queue Length 50th (m)		10.1			3.8							
Queue Length 95th (m)		17.5			13.8							
Internal Link Dist (m)		136.1			140.4			3.1			12.7	
Turn Bay Length (m)												
Base Capacity (vph)		1416			1416							
Starvation Cap Reductn		0			0							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.18			0.17							

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

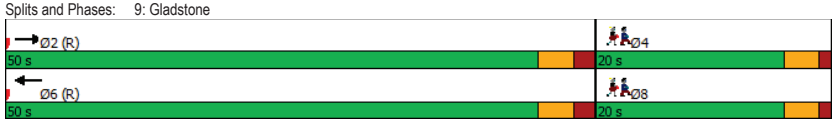
Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	18.0	18.0
Total Split (s)	20.0	20.0
Total Split (%)	29%	29%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	1.1	1.1
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.18

Intersection Signal Delay: 2.8	Intersection LOS: A
Intersection Capacity Utilization 18.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Gladstone



Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	3	57	82	14	42
Future Vol, veh/h	26	3	57	82	14	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	3	57	82	14	42

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	168	98	0	0	139	0
Stage 1	98	-	-	-	-	-
Stage 2	70	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	822	958	-	-	1445	-
Stage 1	926	-	-	-	-	-
Stage 2	953	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	814	958	-	-	1445	-
Mov Cap-2 Maneuver	814	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	943	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	1.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	827	1445	-
HCM Lane V/C Ratio	-	-	0.035	0.01	-
HCM Control Delay (s)	-	-	9.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	2	60	0	0	54
Future Vol, veh/h	2	2	60	0	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	60	0	0	54

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	114	60	0	-	-	-
Stage 1	60	-	-	-	-	-
Stage 2	54	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	882	1005	-	0	0	-
Stage 1	963	-	-	0	0	-
Stage 2	969	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	882	1005	-	-	-	-
Mov Cap-2 Maneuver	882	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	969	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	939	-
HCM Lane V/C Ratio	-	0.004	-
HCM Control Delay (s)	-	8.9	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	1	59	3	1	48
Future Vol, veh/h	7	1	59	3	1	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	1	59	3	1	48

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	111	61	0	0	62	0
Stage 1	61	-	-	-	-	-
Stage 2	50	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	886	1004	-	-	1541	-
Stage 1	962	-	-	-	-	-
Stage 2	972	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	885	1004	-	-	1541	-
Mov Cap-2 Maneuver	885	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	971	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 898	1541	-
HCM Lane V/C Ratio	-	- 0.009	0.001	-
HCM Control Delay (s)	-	- 9	7.3	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	216	4	6	659	27	3	0	1	28	0	23
Future Vol, veh/h	17	216	4	6	659	27	3	0	1	28	0	23
Conflicting Peds, #/hr	26	0	25	25	0	26	7	0	10	10	0	7
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	216	4	6	659	27	3	0	1	28	0	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	712	0	0	245	0	0	980	1001	253	974	990	706
Stage 1	-	-	-	-	-	-	277	277	-	711	711	-
Stage 2	-	-	-	-	-	-	703	724	-	263	279	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	888	-	-	1321	-	-	229	243	786	231	246	436
Stage 1	-	-	-	-	-	-	729	681	-	424	436	-
Stage 2	-	-	-	-	-	-	428	430	-	742	680	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	870	-	-	1295	-	-	206	227	765	219	230	425
Mov Cap-2 Maneuver	-	-	-	-	-	-	206	227	-	219	230	-
Stage 1	-	-	-	-	-	-	699	653	-	406	424	-
Stage 2	-	-	-	-	-	-	399	418	-	719	652	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	19.5	20.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	252	870	-	-	1295	-	-	280
HCM Lane V/C Ratio	0.016	0.02	-	-	0.005	-	-	0.182
HCM Control Delay (s)	19.5	9.2	0	-	7.8	0	-	20.7
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	27	205	67	80	491	77	95	374	101	52	364	57
Future Volume (vph)	27	205	67	80	491	77	95	374	101	52	364	57
Satd. Flow (prot)	0	1628	0	1658	1665	0	1658	1633	0	1658	1657	0
Flt Permitted		0.758		0.553			0.414			0.361		
Satd. Flow (perm)	0	1234	0	905	1665	0	654	1633	0	597	1657	0
Satd. Flow (RTOR)					13			25				
Lane Group Flow (vph)	0	299	0	80	568	0	95	475	0	52	421	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.5	24.5		24.5	24.5		23.7	23.7		23.7	23.7	
Total Split (s)	33.0	33.0		33.0	33.0		37.0	37.0		37.0	37.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%		52.9%	52.9%		52.9%	52.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.5	3.5		3.5	3.5		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.5		6.5	6.5		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		26.7		26.7	26.7		31.1	31.1		31.1	31.1	
Actuated g/C Ratio		0.38		0.38	0.38		0.44	0.44		0.44	0.44	
v/c Ratio		0.63		0.23	0.88		0.33	0.64		0.20	0.57	
Control Delay		21.6		16.2	37.4		17.5	19.7		15.0	18.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		21.6		16.2	37.4		17.5	19.7		15.0	18.9	
LOS		C		B	D		B	B		B	B	
Approach Delay		21.6			34.8			19.4			18.4	
Approach LOS		C			C			B			B	
Queue Length 50th (m)		19.1		6.3	60.4		8.5	48.0		4.3	43.1	
Queue Length 95th (m)		56.9		16.2	#123.9		18.4	72.9		10.7	64.5	
Internal Link Dist (m)		137.4			149.8			122.5			139.6	
Turn Bay Length (m)				37.5			24.0			28.0		
Base Capacity (vph)		488		357	666		301	765		274	762	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.61		0.22	0.85		0.32	0.62		0.19	0.55	

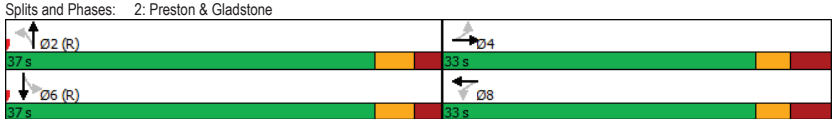
Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 40 (57%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 2: Preston & Gladstone



Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	316	28	20	418	31	19
Future Vol, veh/h	316	28	20	418	31	19
Conflicting Peds, #/hr	0	100	100	0	19	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	316	28	20	418	31	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	444	0	907	430
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	477	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1116	-	306	625
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1029	-	271	576
Mov Cap-2 Maneuver	-	-	-	-	271	-
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	600	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	339	-	-	1029	-
HCM Lane V/C Ratio	0.147	-	-	0.019	-
HCM Control Delay (s)	17.4	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	36	205	4	9	593	55	15	0	6	81	2	84
Future Vol, veh/h	36	205	4	9	593	55	15	0	6	81	2	84
Conflicting Peds, #/hr	36	0	35	35	0	36	2	0	4	4	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	205	4	9	593	55	15	0	6	81	2	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	684	0	0	244	0	0	998	1016	246	961	991	659
Stage 1	-	-	-	-	-	-	314	314	-	675	675	-
Stage 2	-	-	-	-	-	-	684	702	-	286	316	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	909	-	-	1322	-	-	223	238	793	236	246	464
Stage 1	-	-	-	-	-	-	697	656	-	444	453	-
Stage 2	-	-	-	-	-	-	439	440	-	721	655	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	884	-	-	1286	-	-	167	212	769	217	219	450
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	212	-	217	219	-
Stage 1	-	-	-	-	-	-	647	609	-	412	435	-
Stage 2	-	-	-	-	-	-	351	423	-	680	608	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.1	23.5	32.4
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	215	884	-	-	1286	-	-	293
HCM Lane V/C Ratio	0.098	0.041	-	-	0.007	-	-	0.57
HCM Control Delay (s)	23.5	9.2	0	-	7.8	0	-	32.4
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	3.3

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	11	10	4	29	21	24	22	1	9	45	32
Future Vol, veh/h	12	11	10	4	29	21	24	22	1	9	45	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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	11	10	4	29	21	24	22	1	9	45	32
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.3	7.5	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	36%	7%	10%
Vol Thru, %	47%	33%	54%	52%
Vol Right, %	2%	30%	39%	37%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	33	54	86
LT Vol	24	12	4	9
Through Vol	22	11	29	45
RT Vol	1	10	21	32
Lane Flow Rate	47	33	54	86
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.038	0.06	0.094
Departure Headway (Hd)	4.239	4.096	3.97	3.918
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	838	864	892	908
Service Time	2.297	2.167	2.038	1.97
HCM Lane V/C Ratio	0.056	0.038	0.061	0.095
HCM Control Delay	7.5	7.3	7.3	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.2	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	10	174	18	74	497	114	29	182	28	35	206	34
Future Volume (vph)	10	174	18	74	497	114	29	182	28	35	206	34
Satd. Flow (prot)	0	1707	0	0	1669	0	0	1697	0	0	1694	0
Flt Permitted		0.966			0.943			0.935			0.934	
Satd. Flow (perm)	0	1652	0	0	1575	0	0	1594	0	0	1589	0
Satd. Flow (RTOR)		12			24			12			12	
Lane Group Flow (vph)	0	202	0	0	685	0	0	239	0	0	275	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	36.0	36.0		36.0	36.0		24.0	24.0		24.0	24.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.3			5.3	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		30.5			30.5			18.7			18.7	
Actuated g/C Ratio		0.51			0.51			0.31			0.31	
v/c Ratio		0.24			0.84			0.47			0.55	
Control Delay		8.7			24.8			19.6			21.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.7			24.8			19.6			21.3	
LOS		A			C			B			C	
Approach Delay		8.7			24.8			19.6			21.3	
Approach LOS		A			C			B			C	
Queue Length 50th (m)		10.7			57.6			19.8			23.6	
Queue Length 95th (m)		20.7			#120.0			37.4			43.5	
Internal Link Dist (m)		95.1			81.5			119.0			98.4	
Turn Bay Length (m)												
Base Capacity (vph)		845			812			505			503	
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		0.24			0.84			0.47			0.55	

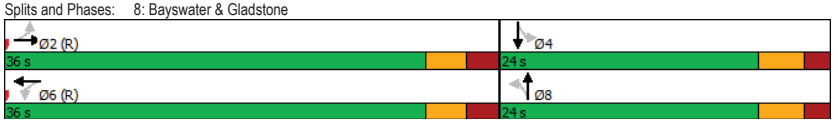
Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 53 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 20.9	Intersection LOS: C
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 8: Bayswater & Gladstone



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	292	0	0	657	0	0	0	0	0	0	0
Future Volume (vph)	0	292	0	0	657	0	0	0	0	0	0	0
Satd. Flow (prot)	0	1745	0	0	1745	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1745	0	0	1745	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	292	0	0	657	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		22.5			22.5							
Total Split (s)		50.0			50.0							
Total Split (%)		71.4%			71.4%							
Yellow Time (s)		3.0			3.0							
All-Red Time (s)		1.9			1.9							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		4.9			4.9							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max							
Act Effct Green (s)		56.8			56.8							
Actuated g/C Ratio		0.81			0.81							
v/c Ratio		0.21			0.46							
Control Delay		3.6			3.1							
Queue Delay		0.0			0.0							
Total Delay		3.6			3.1							
LOS		A			A							
Approach Delay		3.6			3.1							
Approach LOS		A			A							
Queue Length 50th (m)		11.9			19.8							
Queue Length 95th (m)		20.3			m28.9							
Internal Link Dist (m)		139.1			137.4			12.5			12.7	
Turn Bay Length (m)												
Base Capacity (vph)		1416			1416							
Starvation Cap Reductn		0			59							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.21			0.48							

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	18.0	18.0
Total Split (s)	20.0	20.0
Total Split (%)	29%	29%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	1.1	1.1
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

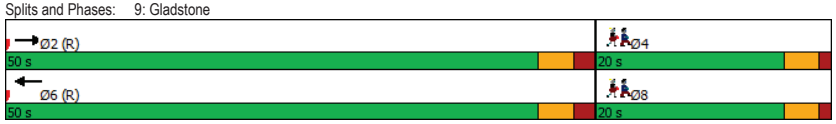
Intersection Summary

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 3.3	Intersection LOS: A
Intersection Capacity Utilization 40.6%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 9: Gladstone



Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	114	14	49	42	7	52
Future Vol, veh/h	114	14	49	42	7	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	14	49	42	7	52

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	136	70	0	0	91	0
Stage 1	70	-	-	-	-	-
Stage 2	66	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	857	993	-	-	1504	-
Stage 1	953	-	-	-	-	-
Stage 2	957	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	853	993	-	-	1504	-
Mov Cap-2 Maneuver	853	-	-	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	952	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	866	1504	-
HCM Lane V/C Ratio	-	-	0.148	0.005	-
HCM Control Delay (s)	-	-	9.9	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	7	63	0	0	52
Future Vol, veh/h	7	7	63	0	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	63	0	0	52

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	115	63	0	-	-	-
Stage 1	63	-	-	-	-	-
Stage 2	52	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	881	1002	-	0	0	-
Stage 1	960	-	-	0	0	-
Stage 2	970	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	881	1002	-	-	-	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	938	-
HCM Lane V/C Ratio	-	0.015	-
HCM Control Delay (s)	-	8.9	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	1	61	9	2	47
Future Vol, veh/h	7	1	61	9	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	1	61	9	2	47

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	117	66	0	0	70	0
Stage 1	66	-	-	-	-	-
Stage 2	51	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	879	998	-	-	1531	-
Stage 1	957	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	878	998	-	-	1531	-
Mov Cap-2 Maneuver	878	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 891	1531	-
HCM Lane V/C Ratio	-	- 0.009	0.001	-
HCM Control Delay (s)	-	- 9.1	7.4	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0	0	-

Appendix H

Signal Warrant – OTM Justification 7

CGH TRANSPORTATION

Gladstone Ave @ Loretta Ave N
Future Total

Justification #7

Justification	Description	Minimum Requirement 1 Lane Highway		Minimum Requirement 2 or More Lanes		Compliance Sectional		Compliance Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	428	59%	40%	No
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	68	40%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	360	50%	49%	No
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	37	49%		

Notes
1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, AHV = PM/2 or (AM + PM) / 4, including amplifcation factors
4. T-intersection factor corrected, applies only to 1B