JLR No.: 31730-000

May 23, 2023

Transportation Impact Assessment

245-267 Rochester Street

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Value through service and commitment

Certification Form for TIA Study PM

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

- ☑ 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;
- ☑ 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;
- ☑ 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
- ☑ I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise.
  - ☑ 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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Signature of Individual certifier that she meets the above four criteria.

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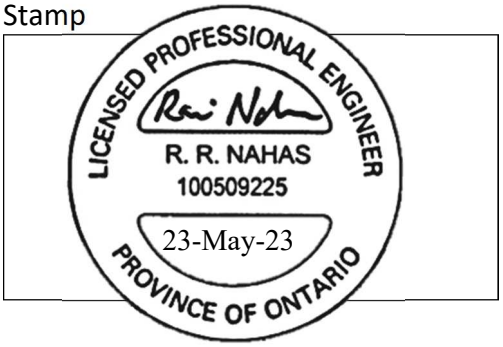

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Introduction

With respect to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, a total of five separate submissions are required for City review/approval. Each submission is a component/section of a formal TIA, which includes:

- *Step 1 – Screening*
- *Step 2 – Scoping*
- *Step 3 – Forecasting*
- *Step 4 – Analysis*
- *Step 5 – TIA Submission* (i.e., Findings and Recommendations)

This report has been structured with these above noted *Steps 1-5* as numbered sections, accordingly, as outlined in the City's TIA Guidelines.

1.0 Screening

With regard to *Step 1 – Screening*, this is a form that contains a list of triggers to determine if the proposed size, type and location of a proposed development will require a formal TIA, as part of the City's development application approval process (e.g., not all new developments require a TIA).

With respect to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, the proposed development (described below in Section 2.1) triggered the trip generation and the safety criteria outlined in the City's TIA *Step 1 – Screening* form. Given these triggers were met, a formal TIA (i.e., completed Steps 1-5) must accompany the subject development application.

2.0 Scoping

2.1 Existing and Planned Conditions

Description of Proposed Development

Based on the information provided, it is our understanding that the proponent is seeking City approval for the development of approximately 0.45 acres of land municipally known as 245-267 Rochester Street, within Ottawa's West Centretown community. The subject site is currently vacant (existing buildings were demolished in 2021) and is located within the northeast quadrant of the Rochester/Balsam intersection. The subject development will be constructed in a single phase, with an estimated build-out year of 2025.

The latest Site Plan illustrates that the proposed development will consist of a nine-storey mid-rise building, which will include approximately 118 dwelling units and ground floor commercial. Below grade parking will be provided and access/egress to approximately 30 vehicle parking spaces and 105 bicycle parking spaces will consist of a single full-movement driveway connection to Balsam Street.

The local context surrounding the subject development site is depicted in the following **Figure 1**, and the proposed Site Plan is depicted in the subsequent **Figure 2**.

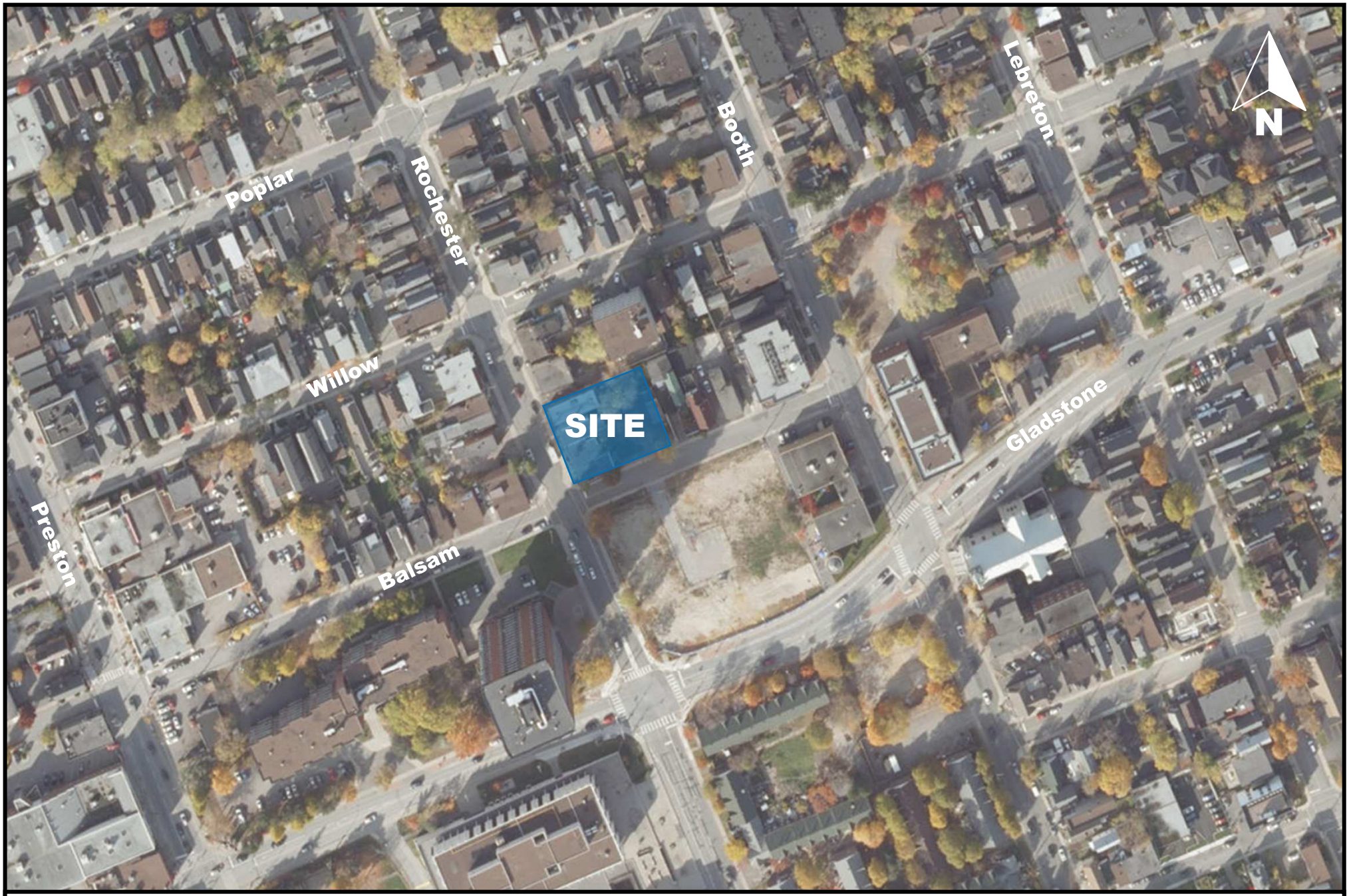

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Figure 1: Local Context

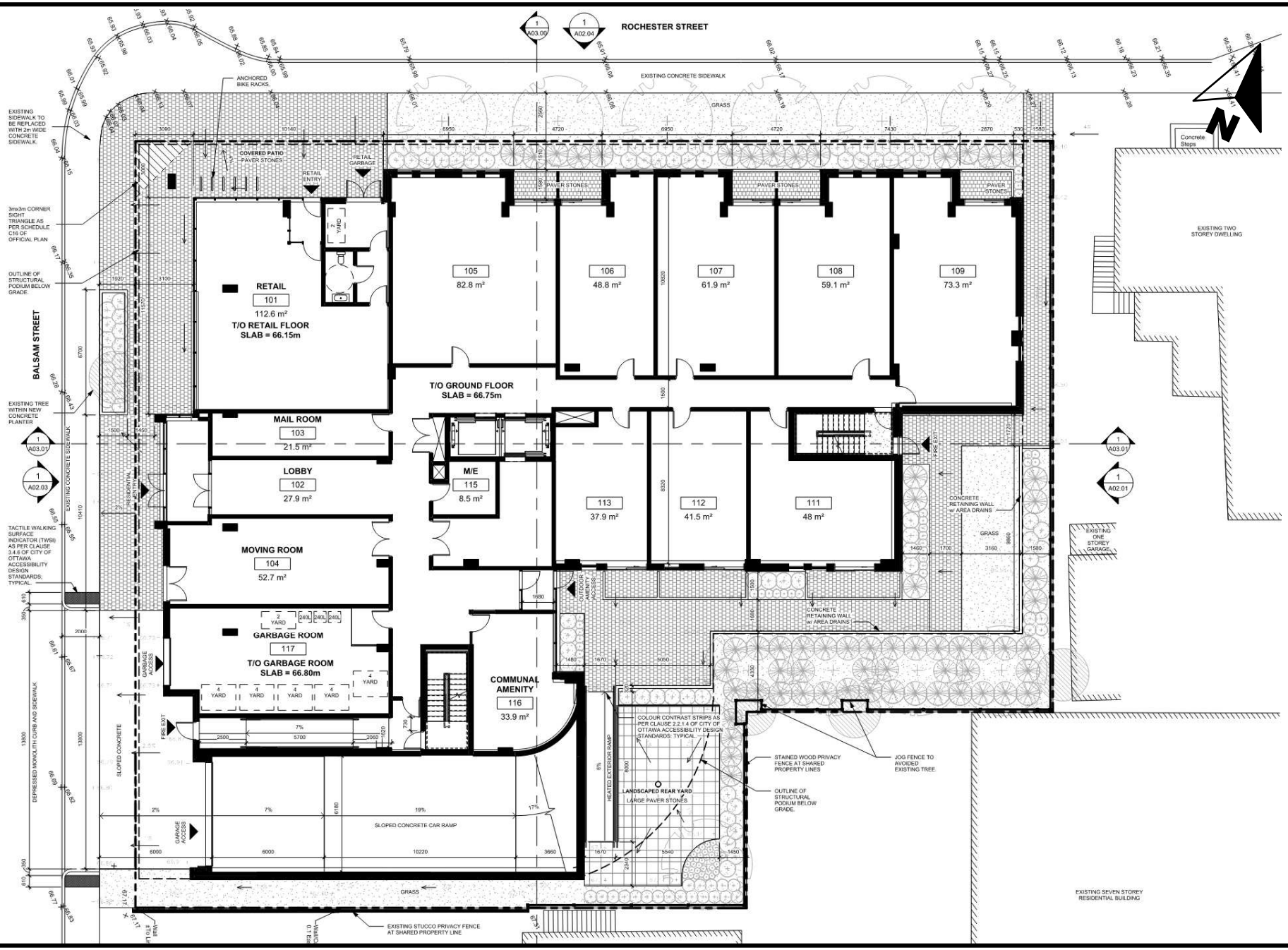

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Figure 2: Proposed Site Plan

Existing Conditions

Area Road Network

Gladstone Avenue is an east-west two-lane major collector roadway (i.e., one travel lane per direction). It extends between Parkdale Avenue in the west to Cartier Street in the east. Within the vicinity of the subject development site, the posted speed limit is 40 km/h and on-street parking is provided on the north side of the roadway.

Booth Street is a north-south two-lane arterial roadway (i.e., one travel lane per direction), which extends between Sir John A. Macdonald Parkway/Wellington Street in the north and Carling Avenue in the south. Within the vicinity of the subject development site, the posted speed limit is 40 km/h and on-street parking is permitted on the west side of the roadway only.

Rochester Street is a north-south two-lane local roadway (i.e., one travel lane per direction) within the study area. South of Gladstone Avenue, the roadway is classified as a major collector. Rochester Street extends between Primrose Avenue in the north and Carling Avenue in the south. Within the vicinity of the subject site, the posted speed limit is 30 km/h and on-street parking bays are provided on both sides of the roadway.

Balsam Street is an east-west two-lane local roadway (i.e., one travel lane per direction), which extends between Preston Street in the west and Booth Street in the east. Within the vicinity of the subject site, the posted speed limit is 30 km/h. On-street parking is permitted on the south side of the roadway for 2 hours between 7:00 am and 5:30 pm Monday to Friday.

Study Area Intersections

Rochester/Balsam
The Rochester/Balsam intersection is a four-legged intersection with STOP control on Balsam Street. All approaches consist of a single lane that accommodates all possible movements. All movements are permitted.

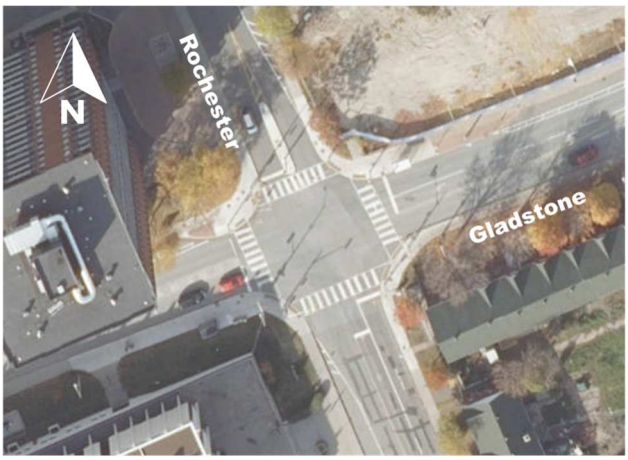
Booth/Balsam

The Booth/Balsam intersection is a 'T' intersection with STOP control on Balsam Street. All approaches consist of a single lane that accommodates all possible movements. All movements are permitted.

Rochester/Gladstone

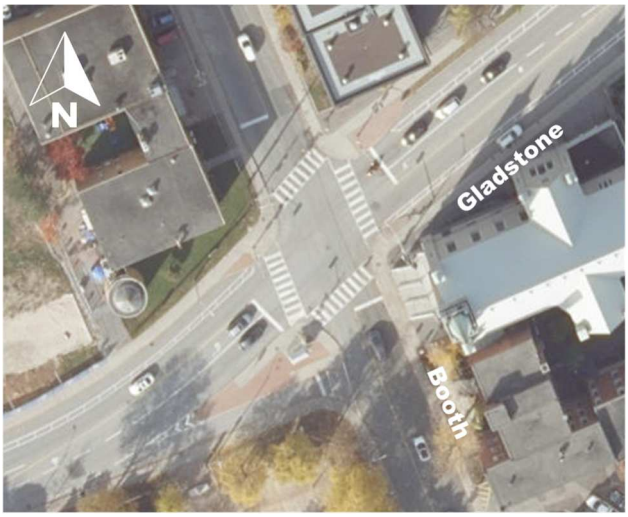
The Rochester/Gladstone intersection is a signalized, four-legged intersection. The northbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane. The southbound approach consists of a single lane that accommodates all movements. The eastbound approach consists of single through/right-turn lane. The westbound approach consists of an auxiliary left-turn lane and a shared through-right turn lane.

Heavy trucks are prohibited on Rochester Street north of Gladstone Avenue and the eastbound left-turn is prohibited. All other movements are permitted.



Booth/Gladstone

The Booth/Gladstone intersection is a signalized, four-legged intersection. The northbound and southbound approaches consist of a single lane that accommodates all-movements. The eastbound approach consists of an auxiliary left-turn lane, a through lane, and a channelized right-turn. The westbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane. Trucks are not permitted on Booth Street and the eastbound right-turn is prohibited from the eastbound through lane (i.e., the eastbound right-turn must be completed using the channel). All other movements are permitted.



Existing Driveways to Adjacent Developments

As depicted in the following **Figure 3**, there are approximately 18 driveway connections within a 200 m boundary of all site driveway connections. Approximately 14 of the driveways adjacent to the subject development (illustrated in blue) provide access/egress for private low-rise residential land uses, such as single-family homes, townhomes and apartments. The remainder of the driveways (illustrated in red) provide access/egress to commercial developments.

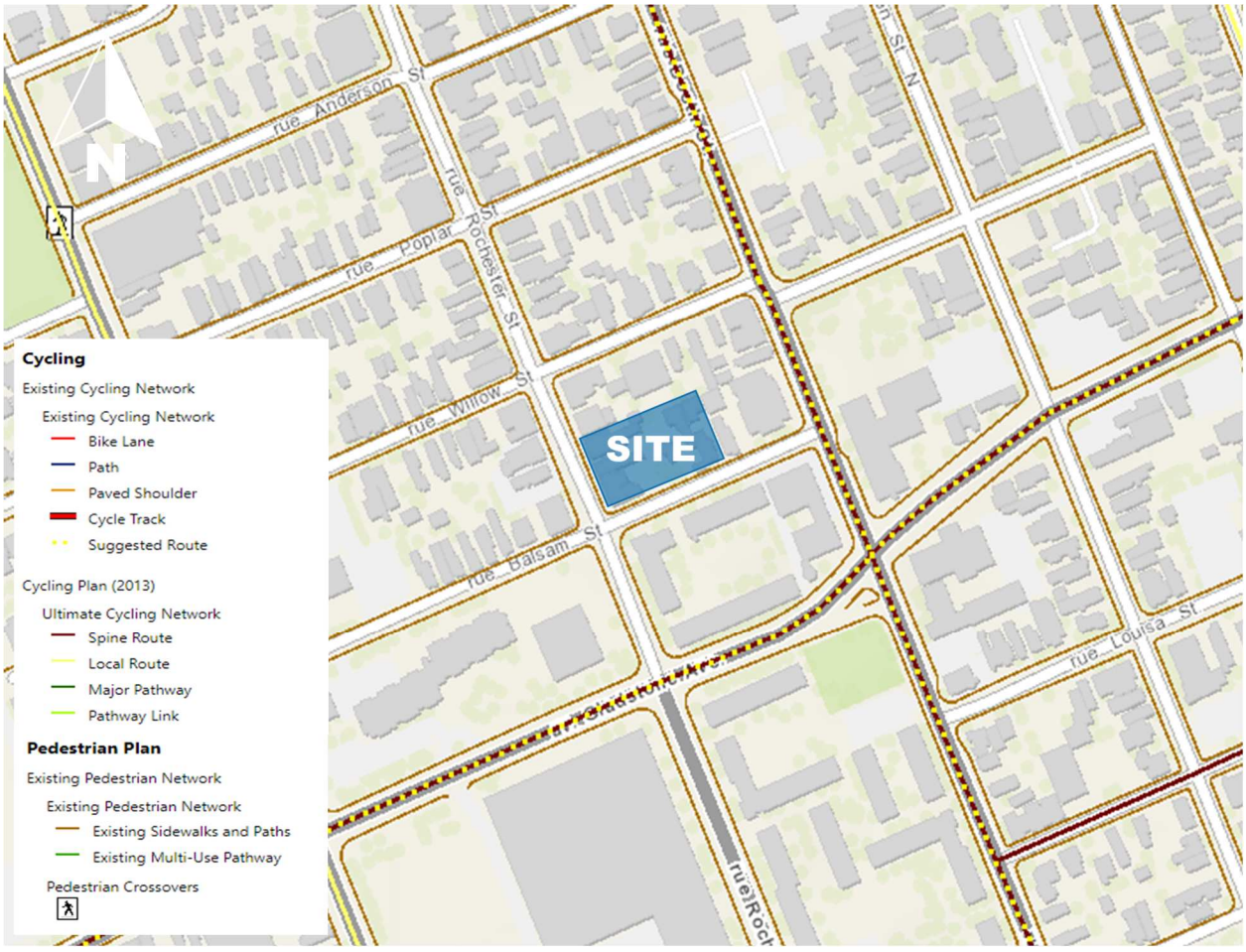
Figure 3: Existing Driveways to Adjacent Developments

Pedestrian/Cycling Network

The pedestrian network within the vicinity of the subject site is currently comprised of concrete sidewalks provided on both sides of all study area roadways. With respect to cyclists, Booth Street and Gladstone Avenue are classified as 'Spine Routes' in the 2013 *Ottawa Cycling Plan*. They are also identified as suggested cycling routes within the current existing cycling network. However, it should be noted that no facilities are provided, and cyclists travel in mixed traffic.

A detailed map of the existing study area pedestrian/cycling network, and how it connects to the greater network is depicted in the following **Figure 4**, as sourced from the City's online open data source tool.

Figure 4: Existing Pedestrian and Cycling Network



Transit Network

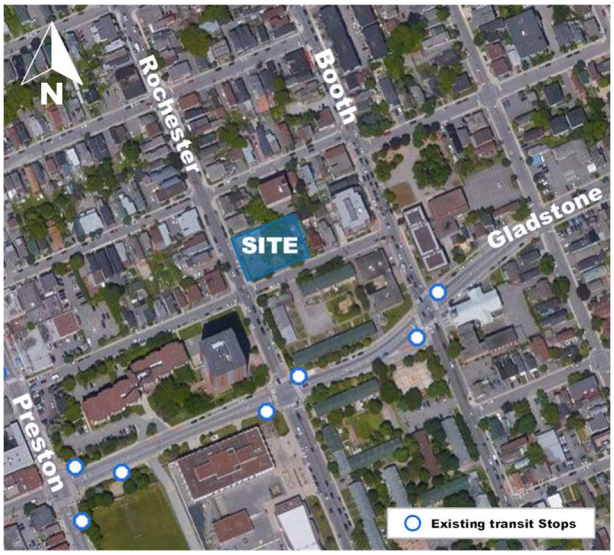
There are four OC Transpo bus routes within the vicinity of the site, summarized in **Table 1**. Bus stops for Routes #14 and #114 are located at the Booth/Gladstone and Rochester/Gladstone intersections, and bus stops for Routes #2 and #85 are located at the Preston/Gladstone intersection. All bus stops are approximately 115 m to 325 m walking distance from the site. The following **Figure 5** depicts the OC Transpo routes within the vicinity of the subject development and **Figure 6** depicts transit stop locations within the vicinity of the subject development site.

Table 1: OC Transpo Route Information

Route	Origin/Destination	Service Type	Peak Hour Headway
2	Bayview ↔ South Keys	Line 2 Bus Service	15 mins
14	Tunney's Pasture ↔ St-Laurent	Frequent	15 mins
85	Bayshore ↔ Gatineau	Frequent	15 mins
144	Carlington ↔ Rideau	Local	Twice during the peak period peak direction

Figure 5: Transit Routes Within Study Area

Figure 6: Transit Stops Within Study Area



Area Traffic Management

Traffic calming within the vicinity of the subject site is fairly abundant and includes measures such as:

- Information signage (e.g., area speed limit 30 km/h designation at Balsam Street and Rochester Street)
- Speed display devices (e.g., provided on Booth Street north of Balsam Street)
- Pavement markings (e.g., speed limit, stop approaching, school crossing, full lane transverse bars along Booth Street)
- Vertical line treatments to give drivers a lane-narrowing effect (e.g., centreline and curb line flex stakes on Booth Street)
- Vehicular directional closures (e.g., “No Trucks” along Rochester Street north of Gladstone Avenue)
- On-street parking (e.g., provided along Booth Street. Rochester Street, Balsam Street, etc.)
- Intersection narrowings (e.g., Rochester Street and Booth Street narrowed at intersecting streets)

Peak Hour Travel Demands

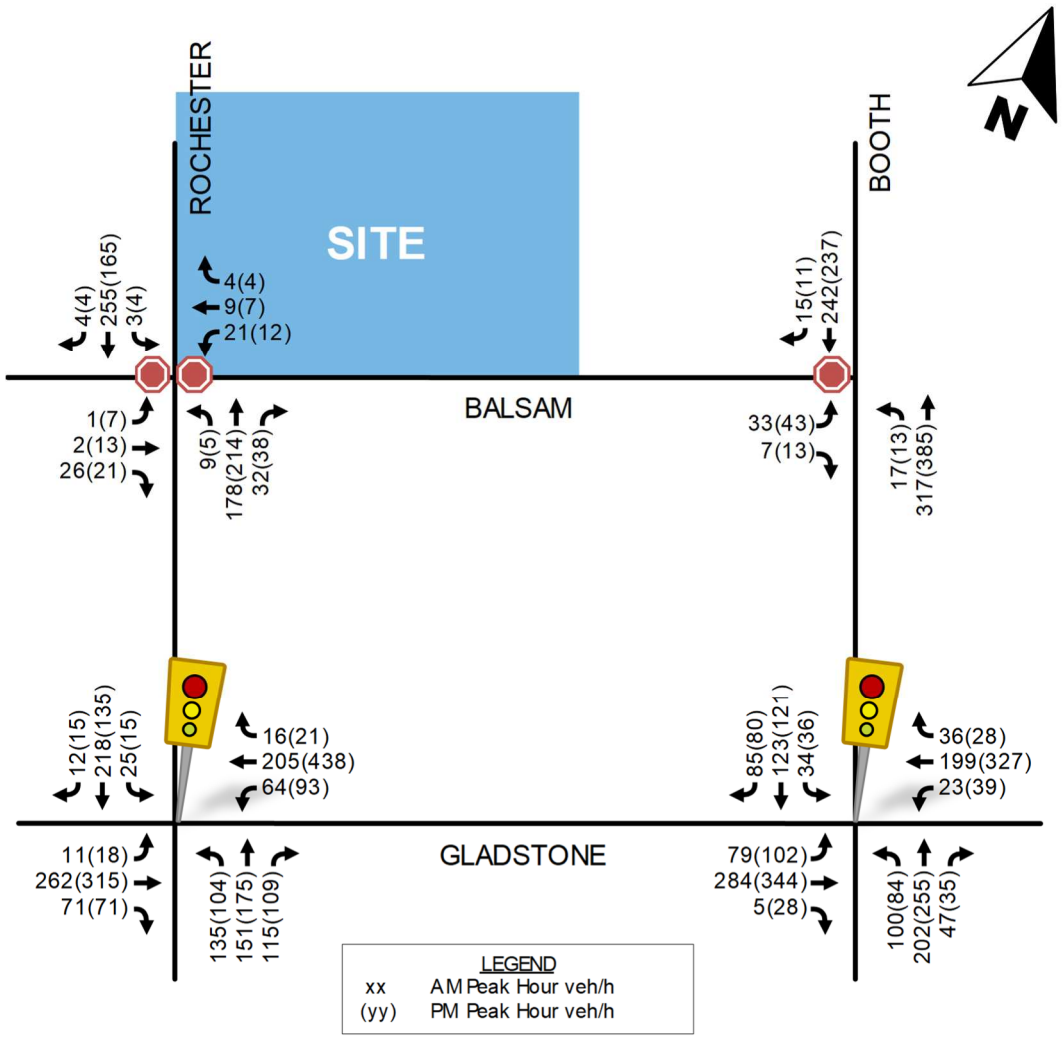
For the purpose of this assessment and based on discussions with the City staff, the following study area intersections have been identified for intersection capacity analysis:

- Rochester/Balsam
- Booth/Balsam
- Rochester/Gladstone
- Rochester/Booth

With respect to the City's TIA Guidelines, It should be noted that while the Gladstone/Preston intersection is within 400 m of the proposed development, it is not included in the subsequent analysis because the site is projected to generate a negligible amount of auto trips during peak hours at this location (e.g., less than 20 veh/h two-way trips).

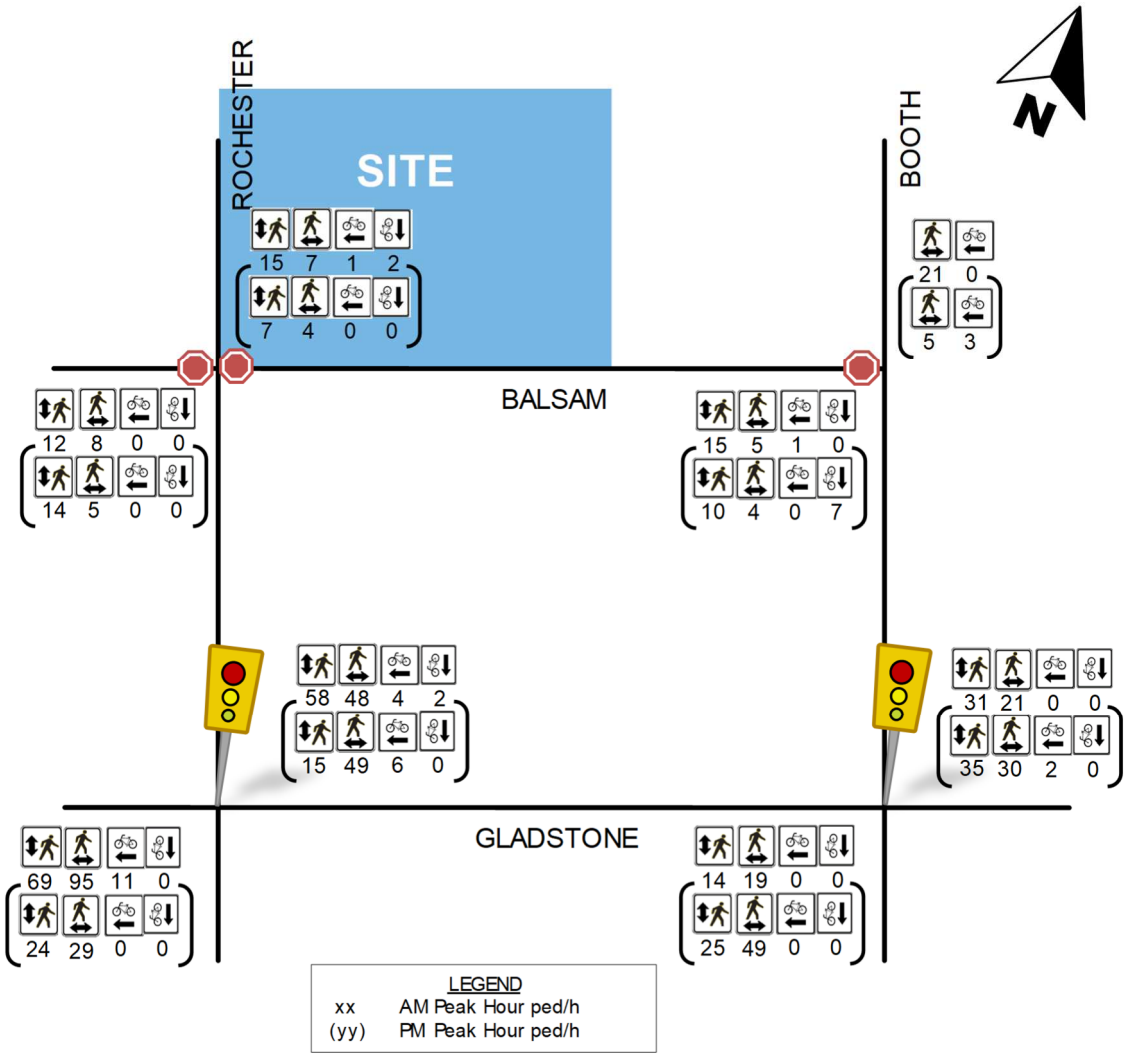
The following **Figure 7** depicts the observed weekday morning and afternoon peak hour vehicular volumes at study area intersections, and **Figure 8** depicts pedestrian and cyclist movements over the same peak hours.

Figure 7: Existing Peak Hour Traffic – Vehicles



In the following **Figure 8**, pedestrian and cycling volumes depicted in the northeast quadrants are users crossing the north and east legs of the intersection and volumes in the southwest quadrants are users crossing the south and west legs of the intersection.

Figure 8: Existing Peak Hour Counts – Active Modes



Traffic counts for the Rochester/Balsam and Booth/Balsam intersections were completed by JLR staff on September 15, 2022, and remaining study area traffic counts were provided by the City. Detailed traffic volume data is provided as **Appendix A**.

Existing Road Safety Conditions

The most recent collision history for the past five (5) years was obtained from the City (i.e., available collision data for the years of 2015 – 2019, inclusive). The collision data includes all collisions occurring at intersections and roadway segments within the study area surrounding the subject development site.

Based on the most recent available historical collision data, the five-year total number of recorded collisions within the study is 57. Most of the collisions within the study area resulted in property damage only (a total of 43 collisions, or 75%), and the remaining collisions resulted in non-fatal injuries (a total of 14 collisions, or 25%). The most frequent types of collisions, as cited by police, were angle (33%), turning movement (23%) and rear end (14%) type collisions.

It should be noted that within the five (5) years of recorded collision data, there were three (3) collisions involving pedestrians. These reported collisions involving pedestrians were non-fatal; however, personal injuries were reported and likely required hospitalization. All collisions with pedestrians occurred at the Rochester/Gladstone intersection between 2015 and 2018. In 2018 this intersection received improvements such as removal of the eastbound left-turn lane and a ban on the eastbound left-turn movement. Since these improvements, there have been no recorded collisions with pedestrians at this intersection.

The following **Figure 9** is a map that depicts the location and year of collisions within the study area. The source collision data is provided in **Appendix B**, and a more detail collision analysis is included in the subsequent *Step 4 – Analysis* section of this report.

Figure 9: Collison Frequency

Planned Conditions

Study Area Transportation Network Changes

Carling Transit Priority Measures

The *Carling Transit Priority Measures Study* was developed to provide a Recommended Functional Design of transit priority measures along Carling Avenue from Lincoln Fields Drive to Bronson Avenue. Near the study area, from Preston Street to Booth Street along Carling Avenue, identified measures include: a westbound curbside transit lane, a median eastbound transit lane,

and segregated east and westbound cycling facilities. The following **Figure 10** illustrates the proposed measures within the vicinity of the site.

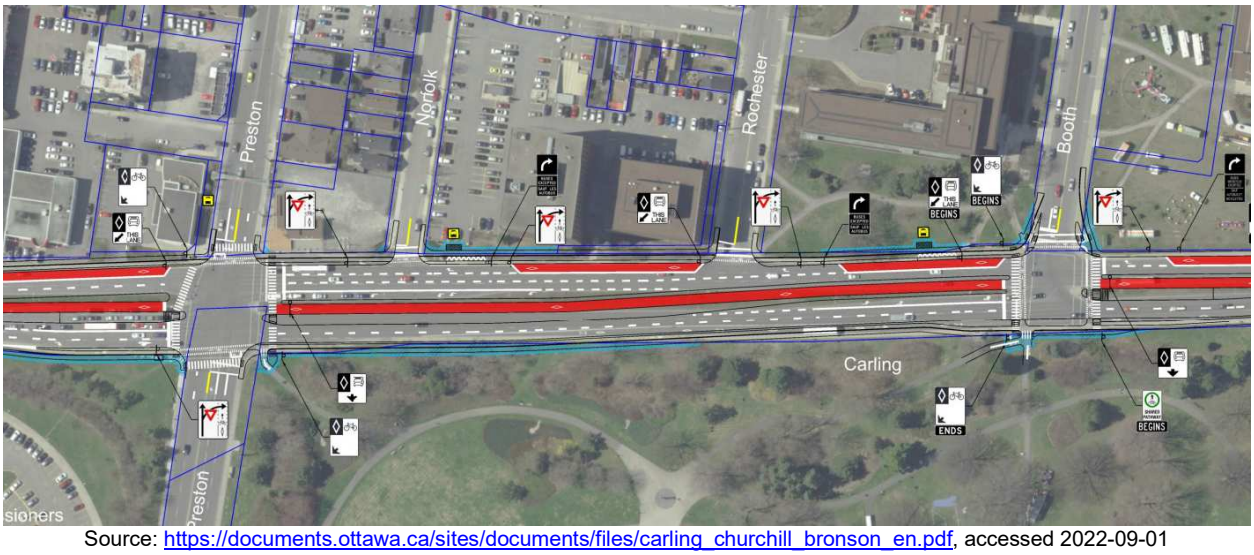
Stage 2 LRT

A notable transportation network change is the Stage 2 Trillium Line South Extension. This O-Train extension will add 16 kilometres of rail and 8 new stations to the network, with the closest new station to the proposed site being located at Gladstone Avenue (i.e., O-Train Station Corso Italia). The following **Figure 11** illustrates the future Stage 2 LRT network, where the proposed development is located approximately 500 m walking distance from the future Corso Italia LRT Station.

Corso Italia Station District Secondary Plan

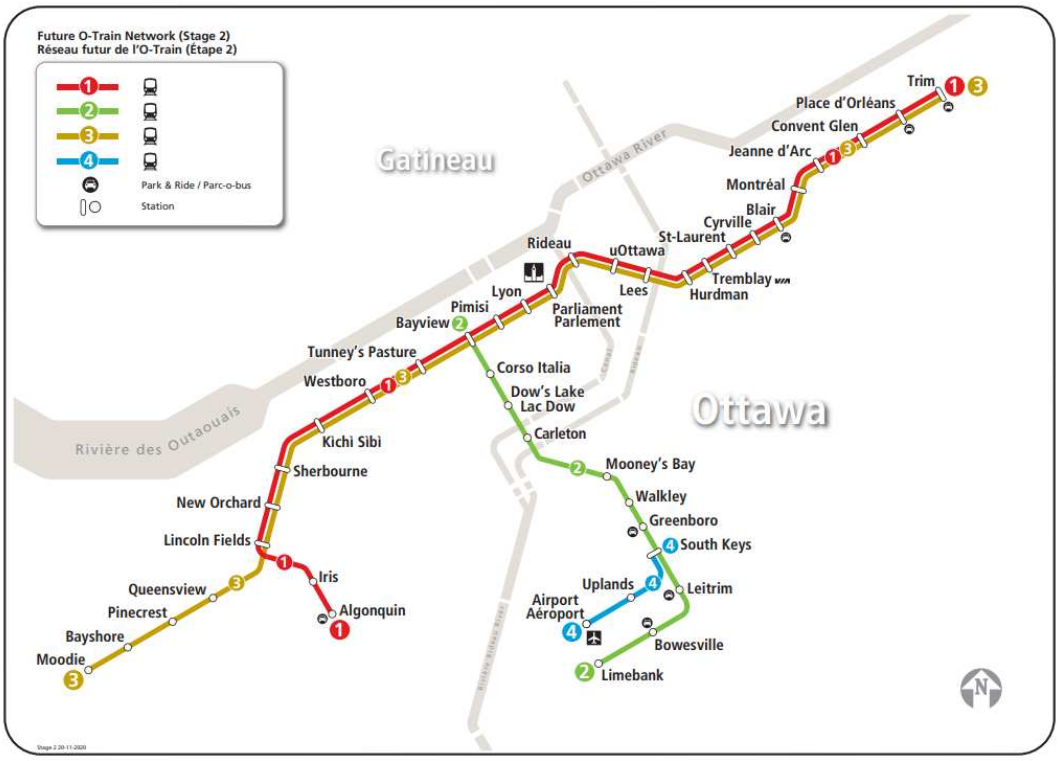
The Corso Italia Station District Secondary Plan was developed to provide policy direction and to guide the private development and investments over the next 25 years. The goal is to ensure the community is a liveable transit-oriented community that focuses on sustainable transportation throughout the area. The Plan includes the area that is generally bound by Somerset Street to the north, Highway 417 to the south, Breezehill Avenue and Loretta Avenue (south of Gladstone Avenue) to the west, and Preston Street (including properties facing Preston Street on its east side) and Booth Street (south of Balsam Street) to the east. The following **Figure 12** depicts the Plans boundary.

Figure 10: Carling Transit Priority Measures – Preston Street to Booth Street



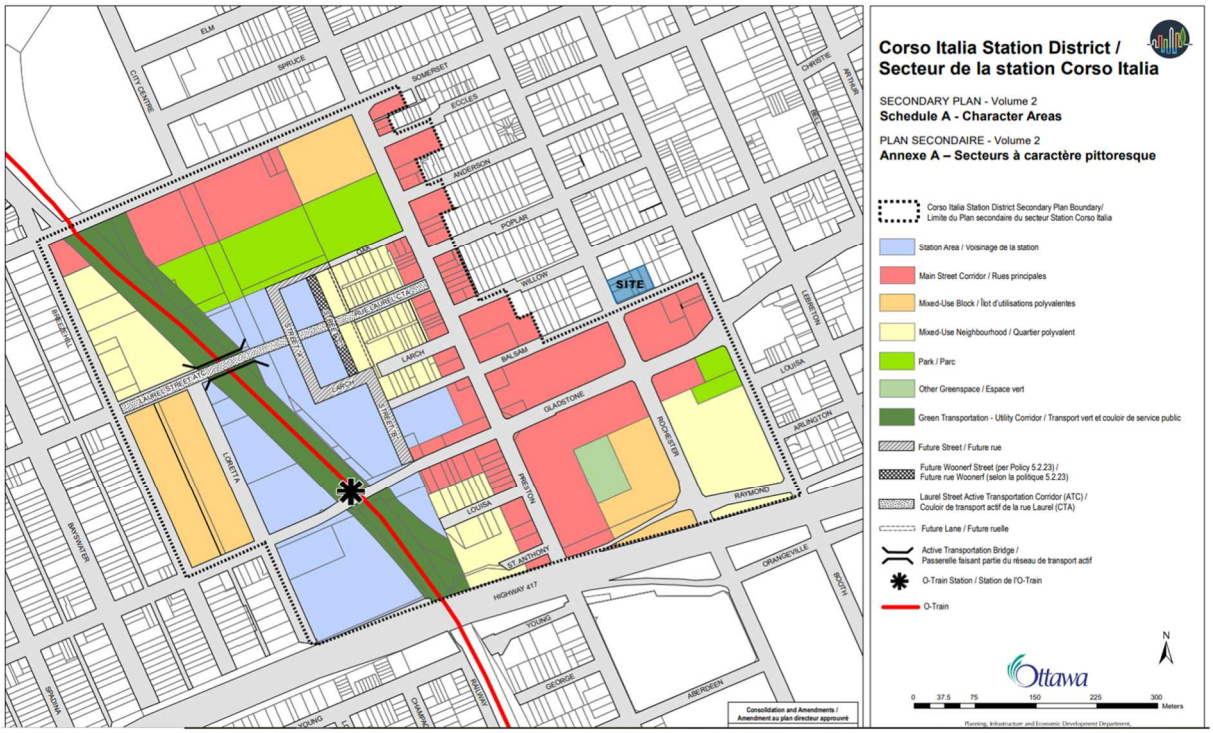
Source: https://documents.ottawa.ca/sites/documents/files/carling_churchill_bronson_en.pdf, accessed 2022-09-01

Figure 11: Stage 2 LRT Network



Source: https://www.octranspo.com/images/files/stage2/future-otrain-network-map.pdf, accessed 2022-09-01

Figure 12: Corso Italia Station District Study Area



Source: https://documents.ottawa.ca/sites/documents/files/schedulea_corsoitalia_sp_en.pdf, accessed 2022-09-01

Road Projects
Referencing the City's Construction and Infrastructure Projects website and the City's 2013 Transportation Master Plan (TMP), there are no planned roadway improvement projects within the vicinity of the site.

Other Area Development

Planned developments within the vicinity of the subject development were identified using the City's online Development Application Tool. The following **Table 2** below summarizes the registered developments within the vicinity of the subject site.

Table 2: Area Development

Location	Anticipated Build-Out Year	Proposed Land Use	Land Use
818 Gladstone Avenue	2024	270 residential units and 5,125 ft^2 of commercial space	Mixed Use
933 Gladstone Avenue	2031	1,050 residential units, 77,000 ft^2 of commercial space, and 100,000 ft^2 of office space	Mixed Use
450 Rochester	2024	540 residential units and 108,100 ft^2 of commercial space	Mixed Use

It should be noted that the projected impact of the development summarized in **Table 2** has been accounted for in the subsequent *Step 3 – Forecasting* section of this report.

2.2 Study Area and Time Periods

Study Area

As discussed previously, City staff confirmed the following study area intersections for the purpose of this assessment:

- Rochester/Balsam
- Booth/Balsam
- Rochester/Gladstone
- Rochester/Booth
- Balsam Street between Rochester Street and Booth Street.
- Rochester Street between Willow Street and Balsam Street.

Time Periods

Given the surrounding road network (Rochester Street, Booth Street, and Gladstone Avenue) typically experience the heaviest volumes during the weekday morning and afternoon peak hours, this assessment considered weekday morning and afternoon peak hours for analysis purposes only.

Horizon Years

For the purpose of this assessment and consistent with the City's TIA Guidelines, the following development timeline was assumed:

- **2025** (estimated full build-out of the subject development)
- **2030** (+5-years beyond full build-out)

2.3 Exemptions Review

Given the size and nature of the proposed subject development site, **Table 3** outlines which elements identified in the City's 2017 *Transportation Impact Assessment Guidelines* that can be exempt from this analysis.

Table 3: Module Exemption Review

Module	Element	Exemption Criteria	Exemption Status
Design Review			
4.1 Development Design	4.1.2 Circulation and Access	Required for Site Plans	***Not Exempt***
	4.1.3 New Street Network	Required for Plans of Subdivisions	Exempt
4.2 Parking	4.2.1 Parking Supply	Required for Site Plans	***Not Exempt***
	4.2.2 Spillover Parking	Required for Site Plans where parking supply will be 15% below unconstrained demand	Exempt
Network Impact			
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	***Not Exempt***
4.6 Neighborhood Traffic Management	4.6.1 Adjacent Neighborhoods	Required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	***Not Exempt***
4.8 Network Concept	All Elements	Required when development is projected to generate more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	Exempt

3.0 Forecasting

3.1 Development-Generated Travel Demand

Trip Generation

As previously described, the latest Site Plan illustrates the proposed development will consist of a single mid to high-rise building with approximately 118 residential units and mixed-use commercial/retail. As the proposed commercial space will only be 115 m^2, it is assumed this will generally serve on-site residents or pedestrians passing by (i.e., the commercial space is not anticipated to be a major trip generator). As such, it was not included in the subsequent trip generation calculations.

Consistent with the City's TIA Guidelines, projected site-generated traffic was estimated using appropriate trip generation rates from the latest TRANS Trip Generation Manual Summary Report, dated October 21, 2020. Based on the location and type of development envisioned, the following **Table 4** summarizes the appropriate trip generation rates for estimating projected site-generated traffic.

Table 4: ITE and TRANS Peak Hour Trip Generation Rates

Land Use	ITE Land Use Code	AM Peak Hour	PM Peak Hour
Multifamily Housing (High-Rise)	ITE 222 TRANS Study Table 3 & 4 Person Trips	T_P = 0.80(U) x 0.50	T_P = 0.90(U) x 0.44
Notes: *T_P = Average Person Trips* *U = Dwelling unit*			

Based on the foregoing, the projected weekday morning and afternoon peak hour person trip generation for the proposed development is summarized in **Table 5**.

Table 5: Modified Peak Hour Person Trips

Land Use	Supply	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise)	118 units	14	33	47	27	20	47

As summarized in **Table 5**, the proposed development is projected to generate an approximate two-way total of 47 person trips/h during both weekday morning and afternoon peak hours. Directional splits (i.e., inbound vs outbound trips) were obtained from the ITE Trip Generation Manual and the TRANS Trip Generation Manual Summary Report.

Travel Mode Shares

To determine the number of person trips arriving/departing by travel mode, total projected person trips were subdivided by percent mode shares. With respect to the TRANS Trip Generation Manual Summary Report, mode shares have been developed for select land uses, specific to City of Ottawa districts (e.g., Kanata-Stittsville, Orleans, Hunt Club, Ottawa Centre, etc.). Using mode

share values for the Ottawa Inner Area from the TRANS Trip Generation Manual Summary Report as a baseline, other key factors were also taken into consideration, including; proximity and quality of transit, pedestrian and cycling facilities, purpose of trips, existing traffic studies etc., which results in mode shares slightly different than the mode shares summarized in the TRANS Trip Generation Manual Summary Report. It should also be noted that the mode shares below are an average between the morning and afternoon peak hour mode shares (e.g., people who drive to work in the morning will likely drive home in the afternoon). Therefore, the mode share for individual sites should be equivalent for the morning and afternoon peaks.

Based on TRANS mode share values for specific land uses and other key factors that can affect mode choice, the projected site-generated person trips were then subdivided into separate travel modes and summarized in **Table 6** below.

Table 6: Projected Modal Site Generated Trips – Multifamily Housing (High-Rise)

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	25%	4	9	13	7	5	12
Auto Passenger	5%	1	2	3	2	1	3
Transit	25%	3	8	11	6	5	11
Non-motorized	45%	6	14	20	12	9	21
Total Person Trips	100%	14	33	47	27	20	41
Total 'New' Vehicle Trips		**4**	**9**	**13**	**7**	**5**	**12**

As shown in **Table 6**, the site is projected to generate approximate two-way vehicle volumes of 13 and 12 veh/h during weekday morning and afternoon peak hours, respectively. With regard to active modes, the proposed development is projected to generate approximately two-way person trips of 20 and 21 trips/h, during weekday morning and afternoon peak hours, respectively. With regard to transit trips during weekday morning and afternoon peak hours, the proposed development is projected to generate approximate two-way person trips of 11 trips/h during both weekday morning and afternoon peak hours, respectively.

Trip Distribution

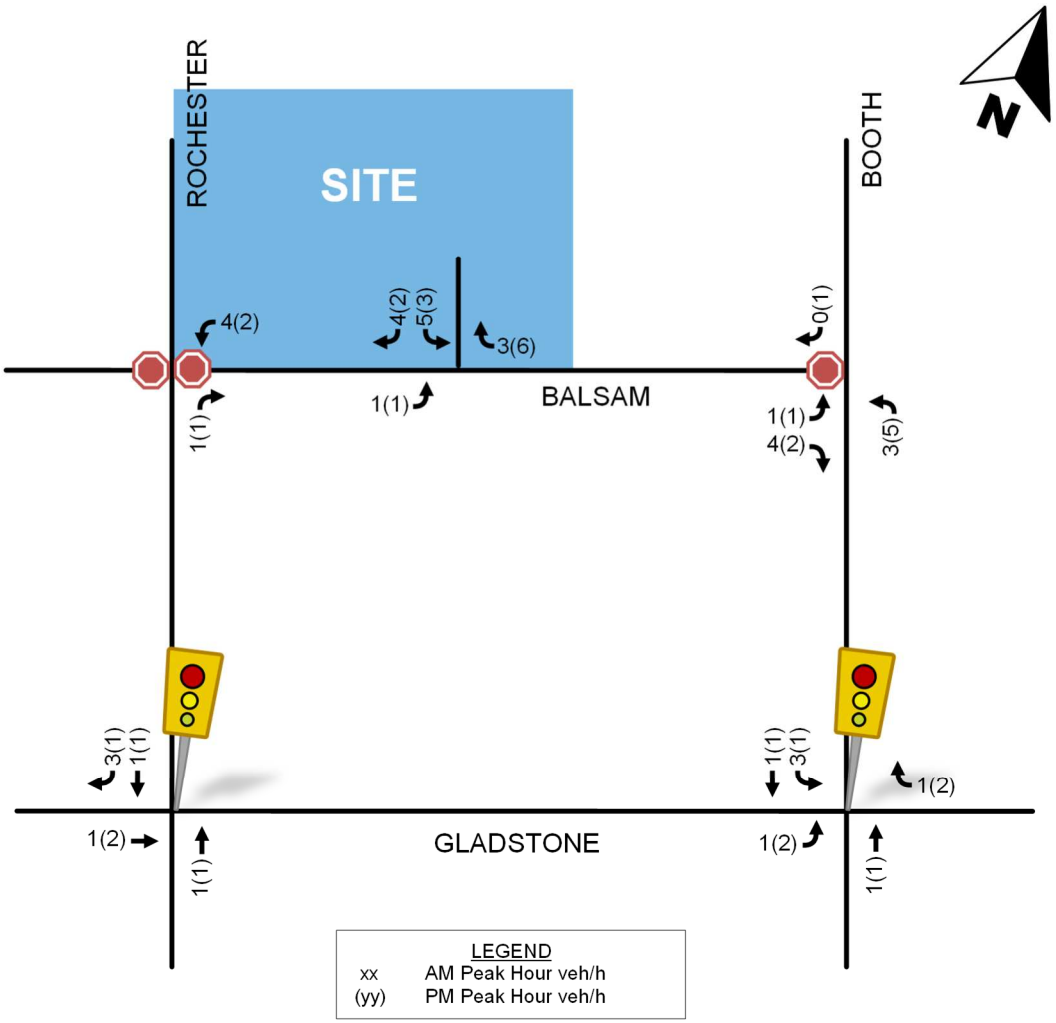
The projected distribution of site-generated traffic was derived based on the 2011 TRANS OD Survey (Ottawa Inner Area district), existing travel patterns, the site's connections to/from the surrounding road network, and our local area knowledge. Based on the foregoing, the following approximate distribution of projected site-generated traffic for the proposed development was assumed to be:

35%	to/from the east via HWY-417 and Gladstone Avenue
30%	to/from the west via HWY-417 and Gladstone Avenue
15%	to/from the north via Rochester Street and Booth Street
+ 20%	to/from the south via Rochester Street and Booth Street
100%	

Trip Assignment

Based on the above assumed distribution, projected site-generated traffic was assigned to the study area network and is depicted in the following **Figure 13**.

Figure 13: 'New' Projected Site-Generated Traffic Volumes



3.2 Background Network Travel Demands

Transportation Network Plans

As outlined in the *Study Area Transportation Network Changes* in **Section 2.1**, there are no planned roadway projects within the development's horizon years. According to Ottawa's current Transportation Master Plan (TMP), and identified in the *2031 Affordable Network Plan*, continuous transit lanes are planned on Carling Avenue from Lincoln Field Drive to Bronson Avenue. Additionally, the new Corso Italia Station is planned as a part of the Stage 2 Trillium Line South Extension. This station will be located on Gladstone Avenue, approximately 500 m walking distance to/from the proposed site.

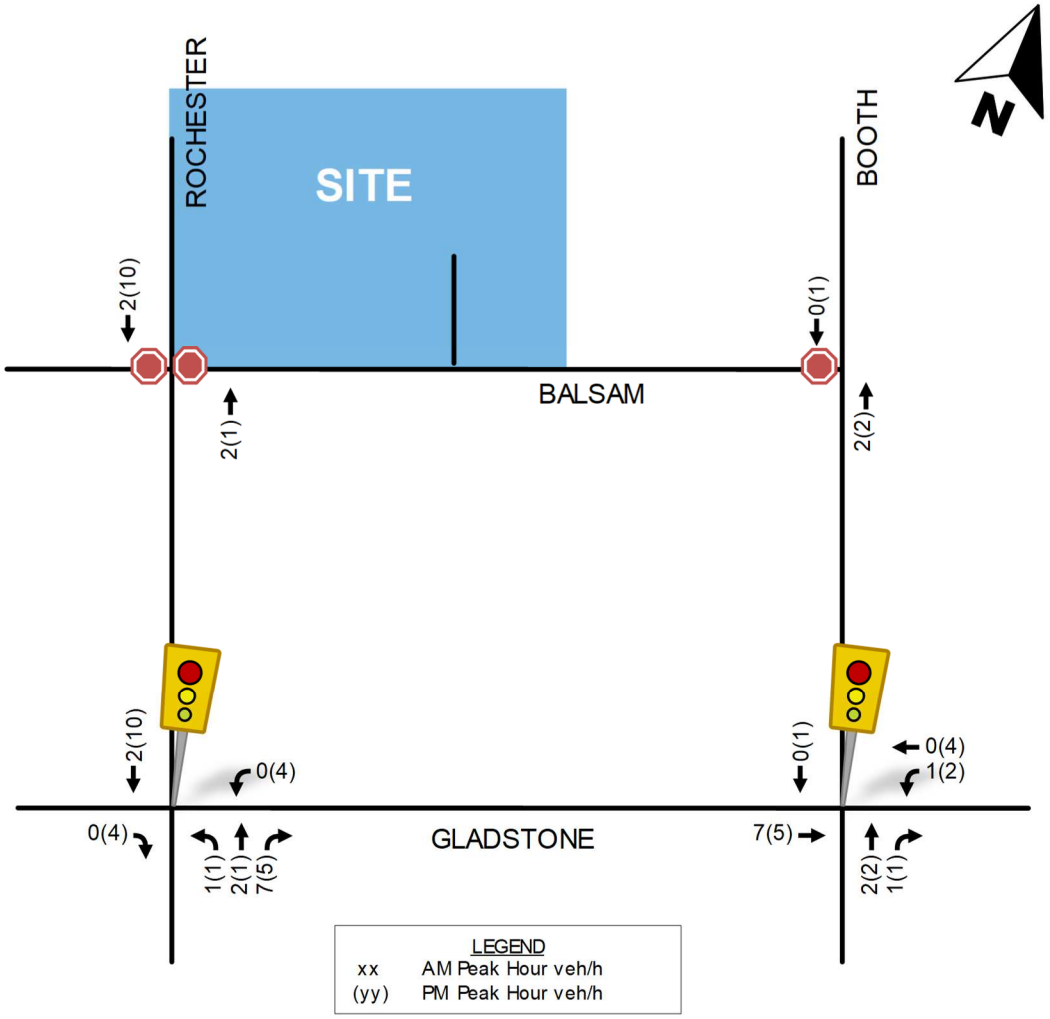
Other Area Development

Using the City's online Development Application Tool, two proposed developments were identified as having potential impacts on the study area network, namely;

- 818 Gladstone Avenue (TIA completed in 2019 by Parsons)
- 450 Rochester Street (TIA completed in 2022 by Parsons)

The projected site-generated traffic from these identified area development sites were explicitly accounted for in the subsequent analysis. Total new trips from these future developments are illustrated in **Figure 14**. Note that Gladstone Village (933 Gladstone Avenue) has not been included as its projected horizon year is 2031, outside of the 2025 and 2030 horizon years of the proposed site.

Figure 14: Other Area Development Traffic

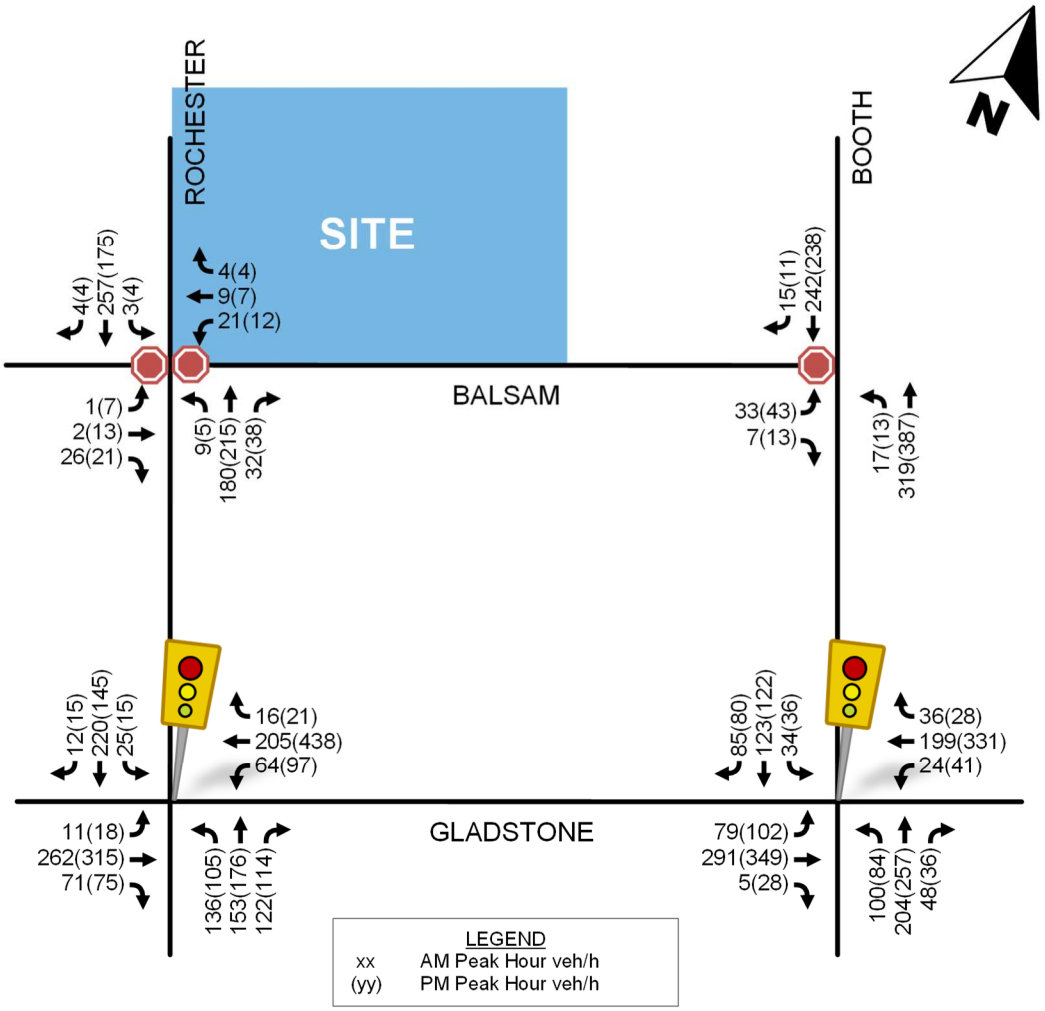


Background Growth

Following a review of the TIA studies prepared for the previously mentioned area developments (published between 2021 – 2022), a 0% per annum general background traffic growth rate was assumed for study area intersections. Therefore, to be consistent with previously completed TIA studies completed for area developments, the same 0% per annum background traffic growth rate was assumed for the subsequent analysis.

Based on a 0% growth rate for general background traffic and given all other area development is assumed to be fully built-out by the horizon year 2025, projected background traffic volumes for the horizon year 2030 will be the same as the background traffic volumes for the 2025 horizon year. Therefore, in the absence of the subject site, the following **Figure 15** depicts total projected background traffic volumes for the 2025 horizon year and beyond. This was derived by superimposing site-generated traffic from other area development (depicted in **Figure 14**) onto existing traffic volumes (depicted in **Figure 7**), resulting in total projected background traffic volumes depicted in **Figure 15**.

Figure 15: Background Traffic Volumes (2025, 2030)



3.3 Demand Rationalization

The following section summarizes the vehicular intersection capacity analysis of existing, future background and future total volume scenarios.

Using the intersection capacity analysis software Synchro (v11), study area intersections were assessed in terms of vehicle delay (seconds), 95th percentile queues (meters), a volume-to-capacity ratio (V/C ratio) and a corresponding Auto Level of Service (LOS or Auto-LOS). It should be noted that the overall performance of a signalized intersection is calculated as a weighted V/C ratio and assigned a corresponding Auto-LOS, and individual vehicular movements are assigned a LOS based on their respective V/C ratio. The overall performance of an unsignalized intersection is a ratio output from Synchro, which is based on an Intersection Capacity Utilization (ICU) method and is assigned a corresponding Auto-LOS. The Auto-LOS of individual vehicular movements at unsignalized intersections are also assigned a LOS based on their respective V/C ratio.

Existing and Background Conditions

The following **Table 7** and **Table 8** summarize existing and projected background conditions at study area intersections, in the absence of the proposed development. The objective of this analysis is to determine if network improvements are, or will be required to support background traffic, or if projected future demand should be adjusted (e.g., once an auto network becomes saturated, a modal shift can be expected). Detailed Synchro output data for existing and future background conditions are provided in **Appendix C**.

Table 7: Study Area Intersection Operations – Existing

Dir.	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Rochester/Balsam - Unsignalized									
EB	1 L/T/R	0.04	10.2	A	1	0.07	10.9	A	2
WB	1 L/T/R	0.07	13.2	A	2	0.04	11.8	A	1
NB	1 L/T/R	0.01	0.4	A	0	0.00	0.2	A	0
SB	1 L/T/R	0.00	0.1	A	0	0.00	0.2	A	0
Overall		**0.33**	**1.5**	**A**	**-**	**0.27**	**1.6**	**A**	**-**
Booth/Balsam - Unsignalized									
EB	1 L/R	0.09	13.3	A	2	0.12	13.5	A	3
NB	1 L/T	0.01	0.5	A	0	0.01	0.4	A	0
SB	1 T/R	0.16	0.0	A	0	0.15	0.0	A	0
Overall		**0.42**	**1.1**	**A**	**-**	**0.43**	**1.3**	**A**	**-**
Rochester/Gladstone - Actuated-Coordinated Signal									
EB	1 T/R	0.72	34.9	C	#82.7	0.69	32.9	B	#101.1
WBL	1 L	0.15	8.6	A	m6.0	0.19	15.2	A	m16.4
WB	1 T/R	0.29	8.7	A	m20.8	0.51	18.4	A	m72.0
NBL	1 L	0.66	42.1	B	#39.2	0.52	41.3	A	31
NB	1 T/R	0.61	26.8	B	48	0.79	46.4	C	#76.7
SB	1 L/T/R	0.63	32.2	B	52	0.55	38.2	A	43
Overall		**0.56**	**27.6**	**A**	**-**	**0.58**	**31.5**	**A**	**-**

Dir.	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Booth/Gladstone – Pretimed Signal									
EBL	1 L	0.20	12.1	A	m7.5	0.29	26.1	A	m19.3
EBT	1 T	0.43	15.1	A	m47.9	0.44	27.1	A	m62.4
EBR	1 R	0.01	0.0	A	m0.0	0.04	3.3	A	m0.0
WBL	1 L	0.07	14.7	A	6	0.11	14.6	A	9
WB	1 T/R	0.35	16.6	A	36	0.46	18.3	A	59
NB	1 L/T/R	0.89	51.6	D	#88.6	0.99	77.5	E	#114.4
SB	1 L/T/R	0.54	23.9	A	43	0.60	31.7	A	53
Overall		**0.56**	**27.4**	**A**	**-**	**0.60**	**37.8**	**A**	**-**

Notes: *# - denotes 95th percentile volume exceeding capacity*
m - denotes a queue metered by an upstream intersection
Ideal saturation flow rate assumed to be 1,800 veh/h/lane
PHF assumed to be 0.90

As shown in **Table 7**, study area intersections are currently operating well with an excellent overall Auto-LOS 'A' or better during weekday morning and afternoon peak hours. With regard to 'critical' movements at study area intersections, they are operating with an acceptable Auto-LOS 'D' or better during both peak hours, with the exception of the northbound movements at the Booth/Gladstone intersection, which is operating with an Auto-LOS 'E' during the PM peak hour.

In terms of 95th percentile queues, the northbound left-turn queue during the morning peak hour exceeds existing storage capacity at the Rochester/Gladstone intersection. A potential measure to accommodate this 95th percentile queue would be to increase the left-turn lane storage to approximately 50 m in length, which would involve simply repainting/adjusting existing pavement markings. Other 95th percentile queues within the study area do not exceed provided storage capacity.

The above suggested improvement measure is only provided for information/decision making purposes only and will not be assumed for the subsequent analysis. If a measure to improve network operations is desirable by the City, further investigation into the feasibility may be required to support the justification.

Based on field observation and our local area knowledge, the Synchro analysis results summarized in **Table 7** are reflective of existing traffic conditions.

The following **Table 8** summarizes intersection operations for future scenarios with the addition of background traffic volumes only for the 2025 horizon year and beyond. This future background scenario assumes no intersection or network improvements. Detailed Synchro output data for projected future background conditions are provided in **Appendix C**.

Table 8: Study Area Intersection Operations – Background (2025, 2030)

Dir.	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Rochester/Balsam - Unsignalized									
EB	1 L/T/R	0.04	10.2	A	1	0.07	11.0	A	2
WB	1 L/T/R	0.07	13.3	A	2	0.04	12.0	A	1
NB	1 L/T/R	0.01	0.4	A	0	0.00	0.2	A	0
SB	1 L/T/R	0.00	0.1	A	0	0.00	0.2	A	0
Overall		**0.33**	**1.5**	**A**	**-**	**0.27**	**1.6**	**A**	**-**
Booth/Balsam - Unsignalized									
EB	1 L/R	0.09	13.4	A	2	0.12	13.6	A	3
NB	1 L/T	0.01	0.5	A	0	0.01	0.4	A	0
SB	1 T/R	0.16	0.0	A	0	0.15	0.0	A	0
Overall		**0.42**	**1.1**	**A**	**-**	**0.43**	**1.3**	**A**	**-**
Rochester/Gladstone - Actuated-Coordinated Signal									
EB	1 T/R	0.72	34.9	C	#82.7	0.70	33.2	B	#102.5
WBL	1 L	0.15	8.6	A	m5.9	0.20	13.7	A	m13.4
WB	1 T/R	0.29	8.7	A	m21.0	0.51	15.1	A	m62.7
NBL	1 L	0.67	43.0	B	#39.8	0.55	43.2	A	32
NB	1 T/R	0.63	27.3	B	50	0.80	47.6	C	#78.9
SB	1 L/T/R	0.64	32.4	B	53	0.60	40.1	A	46
Overall		**0.56**	**27.9**	**A**	**-**	**0.59**	**31.2**	**A**	**-**
Booth/Gladstone – Pretimed Signal									
EBL	1 L	0.20	12.4	A	m7.6	0.29	22.7	A	m24.3
EBT	1 T	0.44	15.6	A	m51.2	0.45	24.0	A	m79.5
EBR	1 R	0.01	0.0	A	m0.0	0.04	1.4	A	m0.0
WBL	1 L	0.07	14.8	A	6	0.11	14.7	A	9
WB	1 T/R	0.35	16.6	A	36	0.46	18.4	A	60
NB	1 L/T/R	0.90	52.3	D	#89.7	1.00	80.1	F	#116.1
SB	1 L/T/R	0.54	23.9	A	43	0.60	31.8	A	53
Overall		**0.56**	**27.7**	**A**	**-**	**0.60**	**37.6**	**A**	**-**

Notes: *# - denotes 95th percentile volume exceeding capacity*
m - denotes a queue metered by an upstream intersection
Ideal saturation flow rate assumed to be 1,800 veh/h/lane
PHF assumed to be 0.90

As shown in **Table 8**, assuming no signal timing or network modifications and an increase in background traffic only (i.e., in the absence of traffic generated by the subject development), study area intersections are projected to continue operating similar to existing conditions. With the exception of the northbound movement at the Booth/Gladstone intersection which is projected to operate over capacity with an Auto-LOS 'F' during the PM peak hour.

In terms of 95th percentile queues, some individual movements are projected to approach/exceed available storage, similar to existing conditions.

Potential measures to improve individual movements that are operating near or over capacity during peak hours include:

- Implement a northbound left-turn lane at the Booth/Gladstone intersection; and/or
- Increase signal cycle length and optimize splits.

The suggested improvement measures mentioned above are only provided for information/decision making purposes and have not been assumed for the subsequent analysis. If any of these possible measures are desirable by the City, further investigation of their feasibility may be required to support their justification. It should also be noted that the above suggested measures to improve network operations are provided to mitigate impacts related to background traffic only (i.e., the above suggested measures to improve network operations are not required to support the projected traffic generated by the subject development).

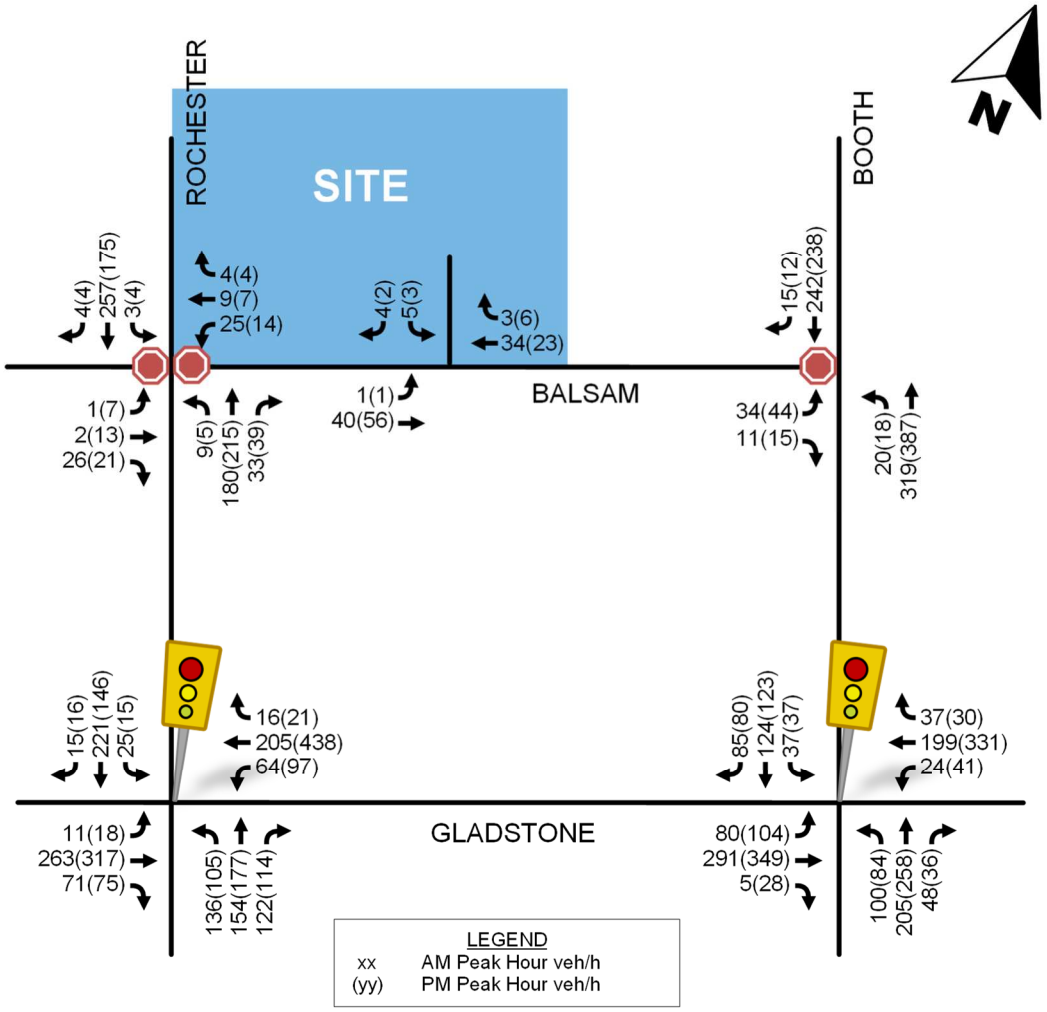
Adjustments to Background Network Demand

Given all study area intersections are projected to operate with spare capacity for future background conditions, it is not considered necessary to adjust projected background demands at this time (i.e., accounting for a modal shift from auto to transit/active mode choices should only be considered if the surrounding auto network becomes saturated).

Total Projected Conditions

The following **Figure 16** depicts 'total' projected volumes for the horizon year of 2025 and beyond, which were derived by superimposing site-generated traffic volumes (depicted in **Figure 13**) onto projected background traffic volumes (depicted in **Figure 15**).

Figure 16: Total Projected Traffic Volumes (2025, 2030)



Similar to existing and future background conditions, total projected conditions were assessed using the intersection capacity analysis software Synchro (v11). Metrics such as Auto-LOS, V/C ratio, 95th percentile queue (metres) and vehicular delay (seconds) were analyzed. Assuming no intersection or network improvements, the following **Table 9** summarizes the intersection operational analysis of the study area intersections for the total projected 2025 horizon year and beyond.

Detailed Synchro output data for future total projected conditions is provided in **Appendix D**.

Table 9: Study Area Intersection Operations – Total Projected (2025, 2030)

Dir.	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Rochester/Balsam - Unsignalized									
EB	1 L/T/R	0.04	10.2	A	1	0.07	11.0	A	2
WB	1 L/T/R	0.08	13.4	A	2	0.05	12.1	A	1
NB	1 L/T/R	0.01	0.4	A	0	0.00	0.2	A	0
SB	1 L/T/R	0.00	0.1	A	0	0.00	0.2	A	0
Overall		**0.34**	**1.6**	**A**	**-**	**0.28**	**1.6**	**A**	**-**
Booth/Balsam - Unsignalized									
EB	1 L/R	0.10	13.2	A	2	0.13	13.7	A	3
NB	1 L/T	0.02	0.6	A	0	0.01	0.5	A	0
SB	1 T/R	0.16	0.0	A	0	0.16	0.0	A	0
Overall		**0.45**	**1.3**	**A**	**-**	**0.47**	**1.4**	**A**	**-**
Rochester/Gladstone - Actuated-Coordinated Signal									
EB	1 T/R	0.73	33.9	C	#83.1	0.70	33.4	B	#103.2
WBL	1 L	0.19	10.7	A	m7.8	0.20	8.4	A	m9.2
WB	1 T/R	0.32	11.1	A	m28.2	0.51	10.2	A	m46.6
NBL	1 L	0.37	23.0	A	32	0.55	43.4	A	32
NB	1 T/R	0.43	18.3	A	49	0.81	47.8	D	#79.2
SB	1 L/T/R	0.42	21.4	A	53	0.60	40.4	A	46
Overall		**0.46**	**21.9**	**A**	**-**	**0.59**	**29.2**	**A**	**-**
Booth/Gladstone - Pretimed Signal									
EBL	1 L	0.20	16.5	A	15	0.30	11.0	A	m10.1
EBT	1 T	0.44	18.9	A	47	0.45	12.3	A	m47.2
EBR	1 R	0.01	0.0	A	0	0.04	0.1	A	m0.0
WBL	1 L	0.07	14.8	A	6	0.11	14.7	A	9
WB	1 T/R	0.36	16.6	A	36	0.47	18.5	A	61
NB	1 L/T/R	0.91	53.4	E	#90.2	1.01	81.3	F	#116.5
SB	1 L/T/R	0.56	24.6	A	45	0.61	32.1	B	54
Overall		**0.57**	**29.2**	**A**	**-**	**0.61**	**34.5**	**B**	**-**
Balsam/Site – Unsignalized									
EB	1 T/R	0.00	0.2	A	0	0.00	0.1	A	0
WB	1 L/T	0.02	0.0	A	0	0.02	0.0	A	0
SB	1 L/R	0.01	8.8	A	0	0.01	8.8	A	0
Overall		**0.13**	**0.9**	**A**	**-**	**0.14**	**0.5**	**A**	**-**

Notes: *# - denotes 95th percentile volume exceeding capacity*
m - denotes a queue metered by an upstream intersection
Ideal saturation flow rate assumed to be 1,800 veh/h/lane
PHF assumed to be 0.90

As shown in **Table 9**, study area intersections are projected to operate with an excellent overall Auto-LOS ‘B’ or better during both weekday morning and afternoon peak hours. With regard to critical movements, they are projected to operate with an Auto-LOS ‘D’ or better during weekday

morning and afternoon peaks hours. The exception is the northbound movement at the Booth/Gladstone intersection, which is projected to operate near or over capacity with an Auto-LOS 'E' during the weekday morning peak hour and an Auto-LOS 'F' during the afternoon peak hour. The eastbound movement at the Rochester/Gladstone intersection is also projected to operate near capacity with an Auto-LOS 'E' during the afternoon peak hour.

With regard to 95th percentile queues, the northbound left-turn queue during the morning peak hour is projected to exceed existing storage capacity at the Rochester/Gladstone intersection. As mentioned previously, a potential measure to accommodate this 95th percentile queue would be to increase the left-turn lane storage to approximately 50 m in length. The feasibility of this potential measure will require further investigation. All other projected queues can be accommodated with existing storage lane capacity.

As previously mentioned, potential measures to improve individual movements that are operating near or over capacity during peak hours include:

- Implement a northbound left-turn lane at the Booth/Gladstone intersection; and/or
- Increase signal cycle length and optimize splits.

The suggested improvement measures mentioned above are only provided for information/decision making purposes and have not been assumed for the subsequent analysis. If any of these possible measures are desirable by the City, further investigation of their feasibility may be required to support their justification. It should also be noted that the above suggested measures to improve network operations are provided to mitigate impacts related to background traffic only (i.e., the above suggested measures to improve network operations are not required to support the projected traffic generated by the subject development).

4.0 Analysis

With respect to the City of Ottawa TIA Guidelines, this module reviews the proposed transportation network elements within the development study area to ensure that they provide effective access for all users, while creating an environment that encourages walking, cycling, and transit use, and prioritizes safety.

4.1 Development Design

Design for Sustainable Modes

Pedestrian Facilities: The pedestrian network within the vicinity of the subject site is currently comprised of concrete sidewalks provided on both sides of all study area roadways. The Site Plan depicts connections to existing sidewalks, fully integrating pedestrians with the surrounding pedestrian network.

Cycle Facilities: Bicycle parking will be provided in accordance with the City's Zoning By-Law within the underground parking garage. Dedicated off-site cycling facilities will not be provided as part of the subject development. Cyclists will travel in mixed traffic per existing conditions.

Transit Facilities: There are seven transit stops located within the vicinity of the subject development site. Two transit stops located at both the Booth/Gladstone and Rochester/Gladstone intersections. The remaining three transit stops are located at the Preston/ Gladstone intersection. All bus stops are located within the OC Transpo service design guidelines

of 400 m walking distance to/from the subject site. As previously mentioned, the proposed development is located approximately 500 m walking distance from the future Corso Italia LRT Station, which will provide the subject site with the highest order of transit service.

Circulation and Access

The proposed development will be accessible via a two-way private approach to Balsam Street, which provides connection to/from below-grade vehicle and bicycle parking garage, as well as residential and commercial main entrances. A review of the City's Private Approach By-Law (PABL) and Part 4 - Parking, Queuing and Loading Provisions of the Zoning By-Law (Sections 100 to 113) has been conducted to evaluate the proposed access.

Section 25 (1)(a)(i) of the PABL identifies that, for properties with 35 m to 45 m of frontage, a maximum of two two-way private approaches or two one-way private approaches may be provided. With a frontage of 41 m on Balsam Street and as one two-way private approach is proposed, this requirement is satisfied.

Section 25 (p) of the PABL identifies a minimum separation requirement of 0.3 m between a private approach and any property line, as measured at the curb line or edge of the roadway. The proposed driveway connection is located approximately 2.0 m from the nearest property line and as such, meets the minimum By-Law requirements.

The distance between the underground parking garage door and the sidewalk is approximately 6.0 m, which satisfies the minimum length outlined in Section 25 (1)(t) of the PABL. However, it should be noted that according to Chapter 8 of the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, the minimum clear throat length should be 8.0 m for a collector roadway. As Balsam Street is classified as a local roadway and the driveway to the garage is not anticipated to carry high traffic volumes a 6.0 m throat length should be sufficient.

The vehicular ramp to/from the underground parking approach from Balsam is 2% for a distance of 6.0 m, then transitions to 7% for a distance of 6.0 m, then 19% for 10.2 m, and then 17% through a 90-degree bend and finally transitions to 10% slope for a distance of 3.5 m. A steep ramp may restrict two-way traffic by limiting sightlines and/or result in cars bottoming at steep transition grades. It is recommended the proponent conduct vertical vehicle turning templates to confirm appropriate design vehicles will have sufficient ground clearance. Additionally, to mitigate conflicts through the 90-degree bend, convex mirrors are recommended to increase visibility of oncoming traffic and All-Way STOP control at the bottom of the ramp is also recommended to mitigate conflicts. Given the steep ramp grades, transverse grooves, and a subsurface heating device, sufficient to melt ice and snow, is recommended to increase traction.

Given the steepness and restricted sight lines of the underground parking access ramp, it is recommended cyclists use the main entrance or stairwell to access the underground storage room. Cyclists will need to dismount and walk their bicycle to store their bicycle. For ease of taking a bicycle down a stairwell, bicycle access ramps (i.e., a u-shaped channel for bikes to be wheeled up and down the stairs) can be installed along the staircase. Signage is also suggested informing cyclists of the need to dismount.

Section 107 (1)(a)(iii) of the Zoning By-Law identifies that, in the case of a parking garage for apartment buildings, a minimum width of 6.0 m and a maximum width of 6.7 m is permitted when leading to 20 or more parking spaces. The proposed driveway leading to 30 parking spaces is proposed to be 6.2 m in width, with drive aisles noted to be 6.0 m to 7.1 m, which does not meet

By-Law requirements. This will be addressed through rezoning process with a site-specific by-law.

The dimensions of the proposed below grade parking spaces are 2.7 m wide and 5.2 m long for a standard parking space, and 2.4 m wide and 4.6 m long for designated compacting parking spaces. Both proposed dimensioning satisfies the requirements outlined Section 106 of the Zoning By-Law.

Garbage storage is internal to the building, and collection will occur along Balsam Street. For garbage collection to occur, bins will need to be wheeled onto Balsam Street for proper loading. Existing on-street parking is not expected to interfere with garbage collection as parking is prohibited along a driveway access; therefore, no issues are anticipated with respect to garbage collection. Note that with the garbage access located adjacent to the parking garage access, the width of this driveway is approximately 9.0 m which meets the maximum width for two-way traffic driveway outlined in the PABL.

New Street Networks

With respect to the City's TIA Guidelines, this module is exempt as the proposed development is a Site Plan and not subdivision.

4.2 Parking

Parking Supply

The proposed development is located in Area X (Inner Urban), as identified in Schedule 1A of the City's Zoning By-law for *"Parking, Queuing and Loading Provisions"*. The following **Table 10** and **Table 11** summarize the proposed development's minimum vehicle parking and bicycle parking supply requirements with respect to the City's Zoning By-law, *Section 101 - Minimum Parking Space Rates*, *Section 102 - Minimum Visitor Parking Space Rates* and *Section 111 - Bicycle Parking Space Rates and Provisions*.

Vehicular Parking

Given the proposed development is within 500 m walking distance of the future Corso Italia LRT Station and 400 m of a Transit Priority Network, the minimum parking requirements are to be calculated using the rates for Area X, as outlined under Section 101 of the City's Zoning By-Law (i.e., Column II of Table 101 in Section 101 of the Zoning By-Law). As outlined under Section 102 of the City's Zoning By-Law, visitor parking is to be calculated using the rates for Area X (i.e., Column II of Table 102 in Section 102 of the Zoning By-Law).

The following **Table 10** summarizes the appropriate vehicle parking rates, minimum parking requirements and proposed parking spaces for the subject development.

Table 10: Vehicular Parking Supply

Land Use	Zoning Requirement	Dwelling Units	Minimum Parking Requirement	Proposed Parking Supply
Mid-high-Rise Apartments	0.50 per dwelling unit	118	59	20
	0.10 per dwelling unit (Visitor)	118	12	10
		Total	**71**	**30**

As summarized in **Table 10**, the minimum vehicle parking space requirement for the subject development is 71 parking spots however only 30 vehicle parking spaces are provided. It should be noted that due to the proximity of the future Corso Italia LRT station, the proponent has provided less vehicular parking than required to encourage sustainable modes of travel. Additionally, the proponent is proposing measures such as providing pre-loaded PRESTO cards, unbundling parking costs from rent, and providing an on-site carshare vehicle to help promote transit and active mode usage. Additionally, the proponent will seek a site-specific by-law with a reduced parking rate of 0.25 parking spaces per unit.

Bike Parking

As outlined under Section 111 of the City's Zoning By-Law, bike parking is to be calculated using the rates found in Table 111A (i.e., Column II of Table 111A in Section 111 of the Zoning By-Law).

Table 11: Bicycle Parking Supply

Land Use	Zoning Requirement	Dwelling Units	Minimum Parking Requirement	Proposed Bike Parking Supply
Mid-high-Rise Apartments	0.50 per dwelling unit	118	59	**105**

As summarized in **Table 11**, the subject development is required to have a minimum of 59 bike parking spaces, provided in well-lit areas and close to the main entrances of buildings. Incorporating bike parking on-site will help encourage cycling as a viable travel mode. The proponent has provided 105 bicycle parking spaces in a secure room within the parking garage, exceeding minimum requirements, to promote cycling in all weather and throughout the year.

The Zoning By-law indicates that 50% of the required bicycle parking spaces must be horizontal. The proponent is providing 31 horizontal bicycle parking spaces (i.e., slightly more than half of the required 59 bicycle parking spaces) and 74 vertical bicycle parking spaces.

Spillover Parking

With respect to the City's TIA Guidelines, this module is exempt. The parking demand of the proposed development is not expected to exceed available parking supply as the site is located in an extremely well-connected neighbourhood in terms of active mode and transit system connectivity (e.g., the proximity of the future Corso Italia LRT Station, existing multi-use pathway system, etc.). **Section 4.2** and **Section 4.5** outline several measures intended to help mitigate potential parking issues by promoting other modes of travel. Should more parking be needed however, local streets within the neighbourhood allow street parking and there are paid parking lots located to the south of the site along Preston Street and Rochester Street.

Additionally, future residents of this building are choosing to live within the Ottawa Inner Area and adjacent to Preston Street's Little Italy, areas which are neighbourhoods well known for active mode and transit network connectivity. Future residents of the proposed development are making a conscious choice in living in a neighbourhood that is well linked to the existing transit and active mode network.

4.3 Boundary Street Design

With respect to the City's TIA Guidelines, this module determines design elements of boundary streets required to accommodate the proposed development, consistent with the City's complete

streets philosophy and its urban design objectives for the development area. The identified boundary streets for the subject site are Rochester Street and Balsam Street, which are all owned and maintained by the City of Ottawa.

Mobility

A Multi-Modal Level of Service (MMLOS) analysis was conducted for the subject site's boundary streets, which is a measure of risk, comfort and stress for active modes and a measure of impedance, delay and reliability for trucks/buses. With respect to the City of Ottawa's MMLOS guidelines, target MMLOS values were obtained from Exhibit 22 of the MMLOS guidelines and are identified in brackets in the following **Table 12**.

Segment MMLOS Summary

The following **Table 12** is a MMLOS analysis summary of existing conditions for non-auto modes (i.e., pedestrian, cycling, transit and trucks) along the road segments described below in **Figure 17** (road classifications from the City's GeoOttawa website). Any LOS results highlighted in red indicate that the target MMLOS was not met for that segment. It should be noted that a MMLOS segment analysis focuses on local transit provided along boundary streets only (i.e., MMLOS worksheets are not sensitive to dedicated rapid transit facilities).

Figure 17: Road Classification

Table 12: Segment MMLOS – Existing LOS (Target LOS)

No.	Road Name	Segment Between	PLOS	BLOS	TLOS	TkLOS
1	Rochester Street	Willow Street – Balsam Street	B (A)	A (D)	n/a (no target)	n/a (no target)
2	Balsam Street	Rochester Street – Booth Street	E (A)	A (D)	n/a (no target)	n/a (no target)
Notes: *'n/a' denotes insufficient input data*						

Based on the results summarized in **Table 12**, the following should be noted/considered:

Pedestrian LOS

- All study area road segments do not meet PLOS targets.
- The failing PLOS target is due to the narrow sidewalks and minimal boulevards. The PLOS could meet targets if sidewalk and boulevard widths are increased during routine infrastructure renewal.

Bike LOS

- All road segments exceed BLOS targets.

Transit LOS

- As there is no transit service provided on the boundary streets, all road segments have no TLOS targets.

Truck LOS

- As the boundary roads are not truck routes, all road segments have no TkLOS targets.

It should be noted that the suggested pedestrian improvement measure mentioned above is only provided for information/decision making purposes and were not assumed for the analysis. If increasing sidewalk and boulevard width is desirable by the City, further investigation of their feasibility may be required to support their justification. It should also be noted that the above suggested measures to improve network operations are provided to mitigate impacts related to existing conditions (i.e., the above suggested measure to improve MMLOS performance is not required to support the subject development).

Detailed segment MMLOS analysis for existing conditions is provided in **Appendix E**.

Road Safety

The TIA Guidelines require a safety review if at least six collisions of any discernable pattern, over a five-year period have occurred. As such collision records for boundary streets were examined to determine if locations exhibit any collision trends that could be mitigated by engineering intervention. If there is a collision trend that is outside the norm of what is expected, then the potential exists to reduce the future rate of collisions by addressing the overrepresented collision trend. Also, whenever changes are being made to the road environment, examining whether a safety intervention could result in a meaningful benefit should be explored.

Based on a review of the most recent five (5) years of historical collision data (collected from January 1st, 2015, to December 31st, 2019), the following **Table 13** summarizes the number and rate of collisions within the vicinity of the subject development site, along study area road segments (i.e. collisions and collisions per million vehicle kilometers).

Table 13: Historical Collision Data Summary by Road Segment

Segment	Between	Total Collisions (5-year Total)	Rate (C/MVK)	Classification		
				Property Damage	Non-fatal Injury	Fatal Injury
Rochester Street	Willow Street & Balsam Street	4	0.48	4	0	0
Balsam Street	Rochester Street & Booth Street	0	-	0	0	0
Total		4	-	4	0	0
Notes: *C/MVK = Collisions per Million Vehicle Kilometers*						

As summarized in **Table 13**, the number of collisions for all road segments adjacent to the subject development site are relatively low, and the severity of collisions along all road segments are also low, based on the available data. As such, a further safety review is not warranted for boundary streets.

Based on the same most recent five (5) years of historical collision data, **Table 14** summarizes the number and rate of collisions within the vicinity of the subject development site, at study area intersections (i.e., total collisions and collisions per million entering vehicles (C/MEV)).

Table 14: Historical Collision Data Summary by Intersection

Intersection	Total Collisions (5-year Total)	Rate (C/MEV)	Classification		
			Property Damage	Non-fatal Injury	Fatal Injury
Rochester/Gladstone	24	0.81	15	9	0
Booth/Gladstone	20	0.62	17	3	0
Rochester/Balsam	8	0.86	6	2	0
Booth/Balsam	1	0.06	1	0	0
Total	**53**	**-**	**39**	**14**	**0**
Notes: *C/MEV = Collisions per Million Entering Vehicles*					

Upon review of the collision history noted above, there is only one study area intersection with more than six collisions over a five-year period that indicates a collision pattern present, which is the Gladstone/Rochester intersection.

Of the 24 collisions reported at the Gladstone/Rochester intersection, 9 resulted in angle collisions. Of these 9 collisions, 7 occurred prior to the intersection modifications completed in 2018, as mentioned in **Section 2.1**. The modifications to this intersection included the removal of the eastbound left-turn lane and the eastbound left-turn movement is now prohibited, which is likely contributing to the decline in angle collisions at this location. If the historic angle collision pattern persists at this location, or a new pattern develops, a formal In-Service Road Safety Review should be considered.

A more detailed collision analysis for study area road segments and intersections is included as **Appendix F**. As previously mentioned, source collision data is included as **Appendix B**.

Neighbourhood Traffic Management (NTM)

This section reviews the development location to determine if the proposed development will exacerbate existing operational concerns on boundary streets, and if the subject development will rely on collector or local roads.

The proposed development is bound by Rochester Street to the west and Balsam Street to the south, which are both classified as local roadways. Balsam Street is consistent with the character of a local road whereas Rochester Street does not. Rochester Street carries traffic volumes greater than the maximum threshold of 1,000 vehicles per day, or 120 vehicles during the peak hour peak direction (as defined in the TIA Guidelines). A potential solution for Rochester Street would be to reclassify the section of it, north of Gladstone Avenue, as a "Collector" roadway. With this designation, peak hour volumes would be well within the volume threshold of 300 veh/h in the peak direction during peak hours, with respect to the City's TIA Guidelines. Note that this threshold is exceeded with existing traffic conditions and not due to the addition of site generated traffic.

4.4 Access Intersection Design

With respect to the City's TIA Guidelines, this module determines design elements of the points of access to/from the subject development site, consistent with the City's Complete Streets philosophy, MMLOS guidelines, and its urban design objectives for the development area.

Intersection Control

Given the proposed site driveway connection is projected to be low-volume and located on a relatively low-volume local roadway stop control on the minor approach to Balsam Street will be sufficient.

Intersection Design

The following is a MMLOS analysis for signalized study area intersections. As previously mentioned, MMLOS is a measure of risk, comfort and stress for active modes and a measure of impedance, delay, and reliability for trucks/buses. With respect to the City of Ottawa's MMLOS guidelines, target MMLOS values were obtained from Exhibit 22 of the MMLOS guidelines and are identified in brackets in the following **Table 15**.

Intersection MMLOS Summary

Similar to the MMLOS analysis conducted for the *4.2 – Boundary Street Design* section of this report, the following **Table 15** summarizes existing MMLOS conditions for all modes, at signalized study area intersections. The detailed intersection MMLOS analysis for existing conditions are provided in **Appendix G**.

Table 15: Intersection MMLOS – Existing LOS (Target LOS)

No.	Intersection	PLOS	BLOS	TLOS	TkLOS	AutoLOS
1	Rochester/Gladstone	C (A)	D (B)	D (D)	F (D)	A (E)
2	Booth/Gladstone	C (A)	D (C)	D (D)	F (D)	A (E)

Based on the results summarized in **Table 15**, the following should be noted/considered:

Pedestrian LOS

- All study area intersections do not meet PLOS targets.
- It should be noted that failing PLOS targets are due to many factors, such as short effective walk times (i.e., the total amount of crossing time a pedestrian receives with a "Walk" signal), the number of vehicle travel lanes crossed, and permissive left and right-turns across crosswalks.
- It should be noted that it is extremely difficult to achieve a PLOS 'A' as the effective walk time is typically the limiting factor. This target can only be reached by changing intersection geometry and the signal timing plan, which will have adverse effect on the TLOS and AutoLOS.

Bike LOS

- All study area intersections do not meet BLOS targets.
- Failing BLOS targets are primarily due to either cyclists having to share the road with mixed traffic, or the number of vehicle travel lanes that are required to cross to perform a left-turn (without a 2-stage left turn or bike boxes). Dedicated cycling facilities would be required to meet BLOS targets.

Transit LOS

- All study area intersections meet TLOS targets.

Truck LOS

- All study area intersections do not meet TkLOS targets.
- Despite Gladstone Avenue being a dedicated truck route, failing TkLOS targets are due to the combination of small corner radii and the limited number of receiving lanes (only single receiving lanes are provided).

Auto LOS

- All study area intersections meet AutoLOS targets.

4.5 Transportation Demand Management

With respect to the City's TIA Guidelines, a review of Transportation Demand Management (TDM) strategies is a requirement for the subject development. Determining which TDM strategies maybe appropriate for implementation, a formal TDM checklist is provided by the City for review by the proponent.

With respect to the City's TIA Guidelines, the Transportation Demand Management checklists, provided by the City and titled *TDM – Supportive Development Design and Infrastructure* and *TDM Measures Checklist*, have been completed and are included as **Appendix H**. The proposed

development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle, and transit systems as outlined in the **Section 4.1** of this report.

4.6 Neighbourhood Traffic Management

With respect to the City's TIA Guidelines, this module reviews significant access routes to/from the development and identifies any required neighbourhood traffic management (NTM) measures to mitigate impacts on collector and local roads.

As mentioned previously in the *4.3 – Boundary Street Design* section of this report, with the addition of the proposed development, Rochester Street is projected to operate over the vehicle threshold for a local roadway classification (i.e., 120 veh/h during peak hours). Reclassifying this road as a "Collector" roadway will satisfy the City's TIA Guidelines, and therefore, no other NTM measures would be required to support the subject development.

4.7 Transit

Transit routes within the vicinity of the site were previously mentioned in the *Step 2 – Scoping* section of this report, which included stop locations, route identifier and directional information (summarized in **Table 1**).

Route Capacity

Based on the projected modal split of site-generated traffic in the *Step 3 – Forecasting* section of this report, it was estimated that approximately 25% of trips generated by the development will be accommodated by transit. This equates to approximately 13 and 12 additional transit person trips for weekday morning and afternoon peak hours, respectively. With respect to local transit, the study area is serviced by 40 ft buses on 15-minute headways during peak hours. The buses have a person capacity of approximately 50 passengers per bus. According to passenger on/off data provided by the City, there are approximately 15 to 30 passengers per bus that arrive/depart at the bus stops within the vicinity of the site, during peak hours. As such, existing transit routes should be able to accommodate the approximate increase of an additional 12 to 13 person/hour two-way transit trips.

In addition to transit service provided along Gladstone Avenue, the subject site is also located approximately 500 m walking distance from the future Corso Italia LRT Station. It is therefore expected that existing and future transit services will be able to more than adequately accommodate development-generated transit trips.

Transit Priority

Given the proximity of the future Corso Italia LRT Station and relatively low volume of projected new transit site-generated traffic, the existing transit network is sufficient to accommodate the projected site. Therefore, there should be no impact to existing transit travel times or the need for transit priority measures. It should be noted however, as mentioned in the *Step 2 – Scoping* section of this report, transit priority measures based on the *Carling Transit Priority Measures Study* will be implemented near the study area from Preston Street to Booth Street along Carling Avenue and available for site generated transit trips to use.

4.8 Review of Network Concept

With respect to the City's TIA Guidelines, this module is exempt as the proposed development is not projected to generate more than 200 peak-hour person-trips more than the equivalent volume permitted by established zoning.

4.9 Intersection Design

With respect to the City's TIA Guidelines, this module determines the design elements of the study area intersections required to accommodate the proposed development, consistent with the City's Complete Streets philosophy and MMLOS practices.

Intersection Control

The existing intersection control will be maintained at all intersections within the study area. Based on the intersection capacity analysis in the *Step 3 – Forecasting* section, and consistent with the City's policies, goals and objectives, additional signal or intersection control will not be warranted.

Intersection Design

Based on the intersection capacity analysis in the *Step 3 – Forecasting* section, and consistent with the City's policies, goals and objectives, additional intersection or road widenings will not be warranted.

5.0 Findings and Recommendations

As with any redevelopment, the introduction of a new land use will have impacts on the surrounding transportation network. J.L. Richards and Associates Limited has completed a review of these impacts and summarized the findings within this transportation assessment, which follows the format of a Transportation Impact Assessment (TIA) Study, as requested by the City of Ottawa. At this stage, and with respect to the City's TIA Guidelines, the following findings and conclusions are offered:

- Study area intersections are currently operating overall at an acceptable level of service (LOS 'A').
- The projected background and future total conditions result in acceptable performance at all study are intersections which is projected to continue to operate overall at an LOS 'A'.
- Based on historical collision data, there are no prevailing safety concerns.
- The proposed development is projected to generate 'new' two-way vehicles volumes of 13 veh/h and 12 veh/h during weekday morning and afternoon peak hours, respectively.
- With regard to active modes, the proposed development is projected to generate approximately two-way person trips of 20 and 21 trips/h, during weekday morning and afternoon peak hours, respectively.
- With regard to transit trips during weekday morning and afternoon peak hours, the proposed development is projected to generate approximately two-way person trips of 11 trips/h during both weekday morning and afternoon peak hours, respectively.
- The proposed bicycle parking supply for the subject development significantly exceeds the minimum By-Law requirements with 222 proposed bicycle parking spaces.
- The proposed vehicle parking supply for the subject development is 30 vehicle parking spaces. The proponent is seeking a site-specific by-law with a reduced parking rate of 0.25 parking spaces per unit.

- Rochester Street north of Gladstone Avenue is projected to exceed the vehicle threshold of a local roadway during peak hours. It is recommended that the roadway designation be changed to a “Collector” roadway.
- Projected intersection MMLOS targets are not met for pedestrian mode for all study area intersections due to factors such as effective walk time, permissive left and right-turns across crosswalks and the number of vehicle lanes pedestrians have to cross. It should be noted that it is extremely difficult to meet the target for PLOS as reaching the target would involve significant changes to the intersection geometry and signal timing plan.
- Projected intersection MMLOS targets are not met for cyclist mode for all study area intersections due to cyclists travelling in mixed traffic. Dedicated cycling facilities such as curb-side bike lanes or cross-rides would be required to meet BLOS targets.

The proposed development fits well into the context of the surrounding area and it is projected to have an acceptable impact on the surrounding transportation network. The design and location of the proposed development also serves the City of Ottawa’s policies, goals, and objectives.

Based on the foregoing, the proposed development of 245-267 Rochester Street is recommended from a transportation perspective.

J.L. RICHARDS & ASSOCIATES LIMITED

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Civil Engineer, Transportation

Reviewed by:

Lee Jablonski, P.Eng.
Associate, Senior Civil Engineer

Appendix A

Existing Traffic Counts

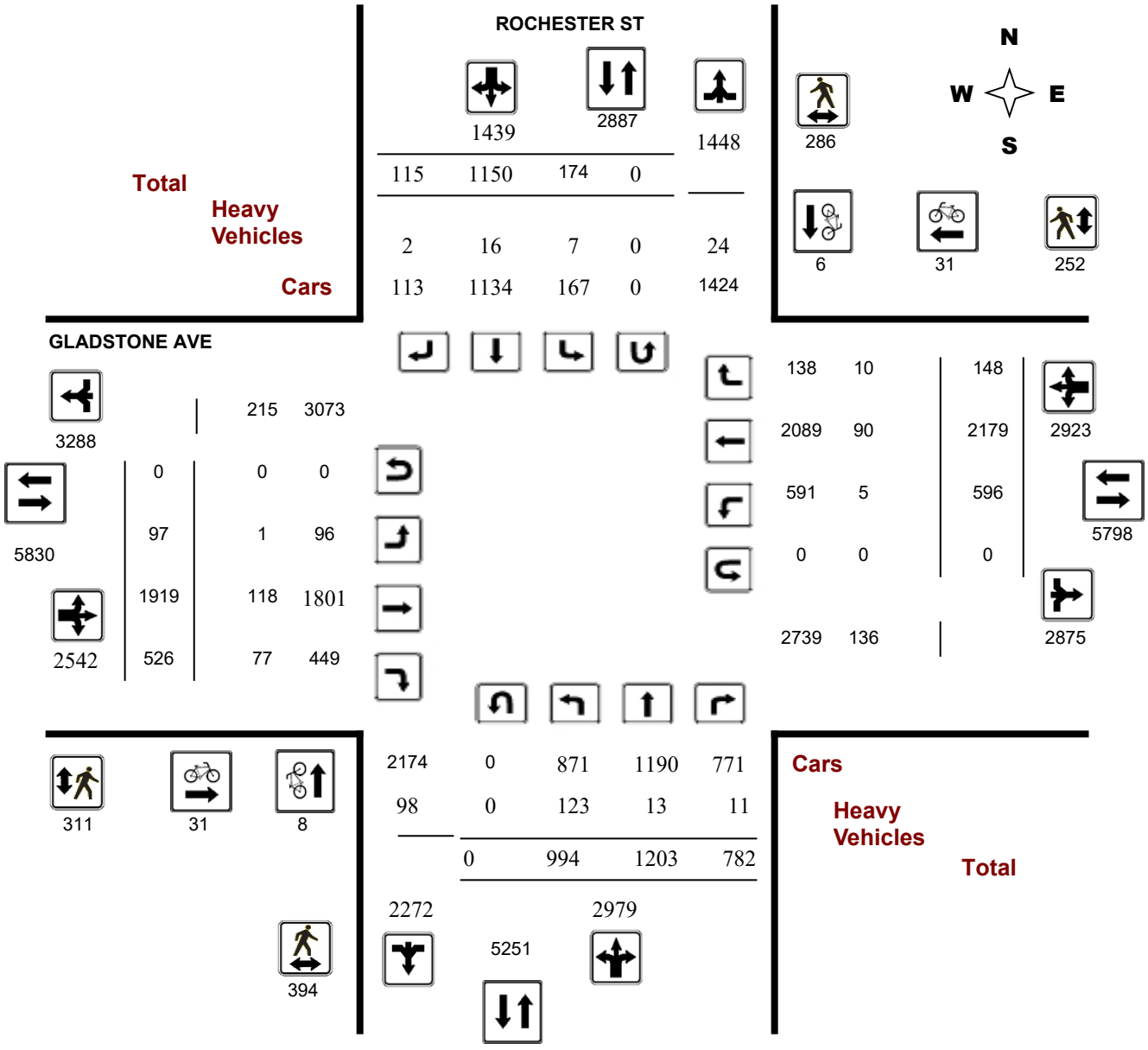
Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016
Start Time: 07:00
WO No: 36537
Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

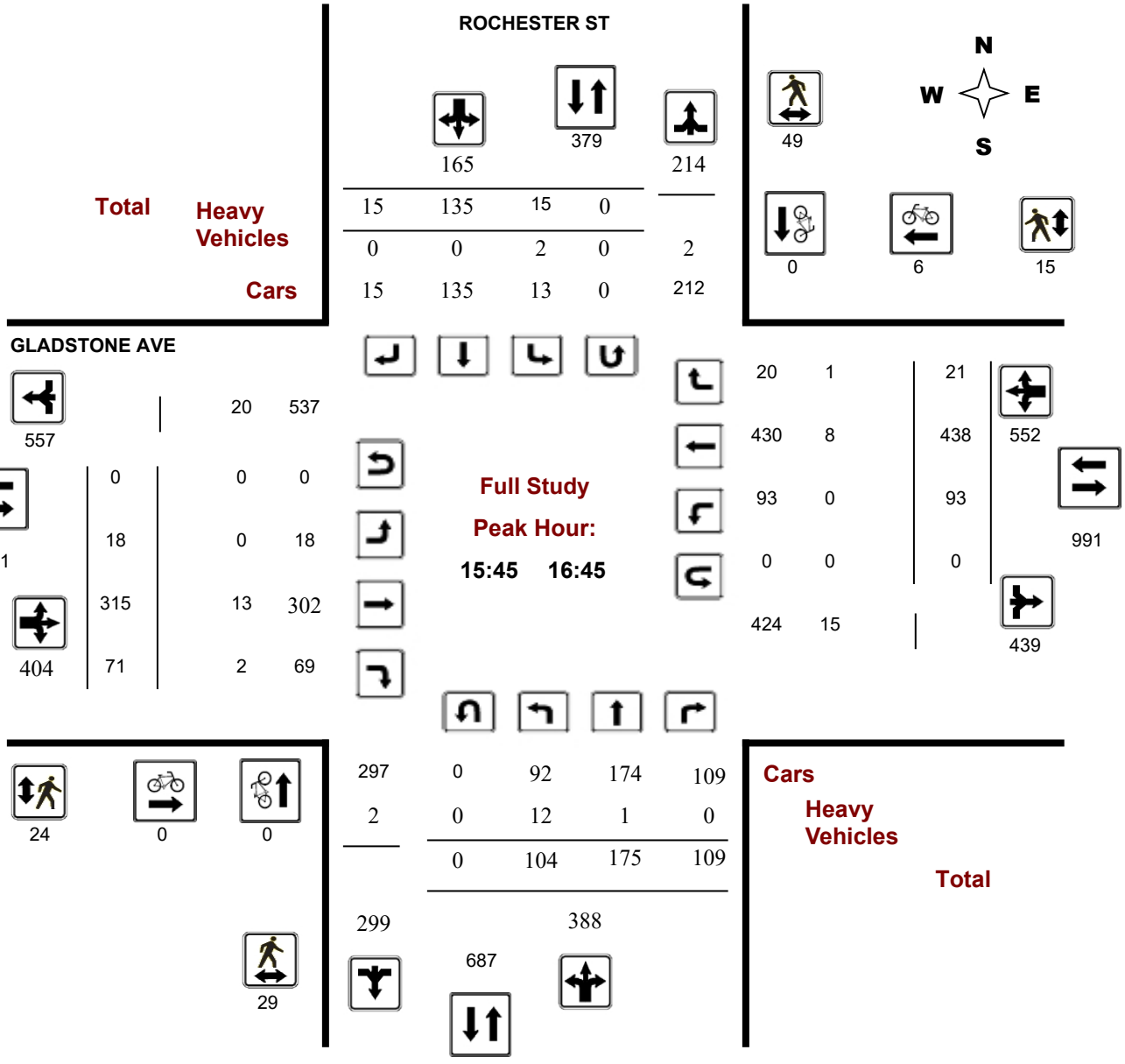
Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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

Full Study Peak Hour Diagram



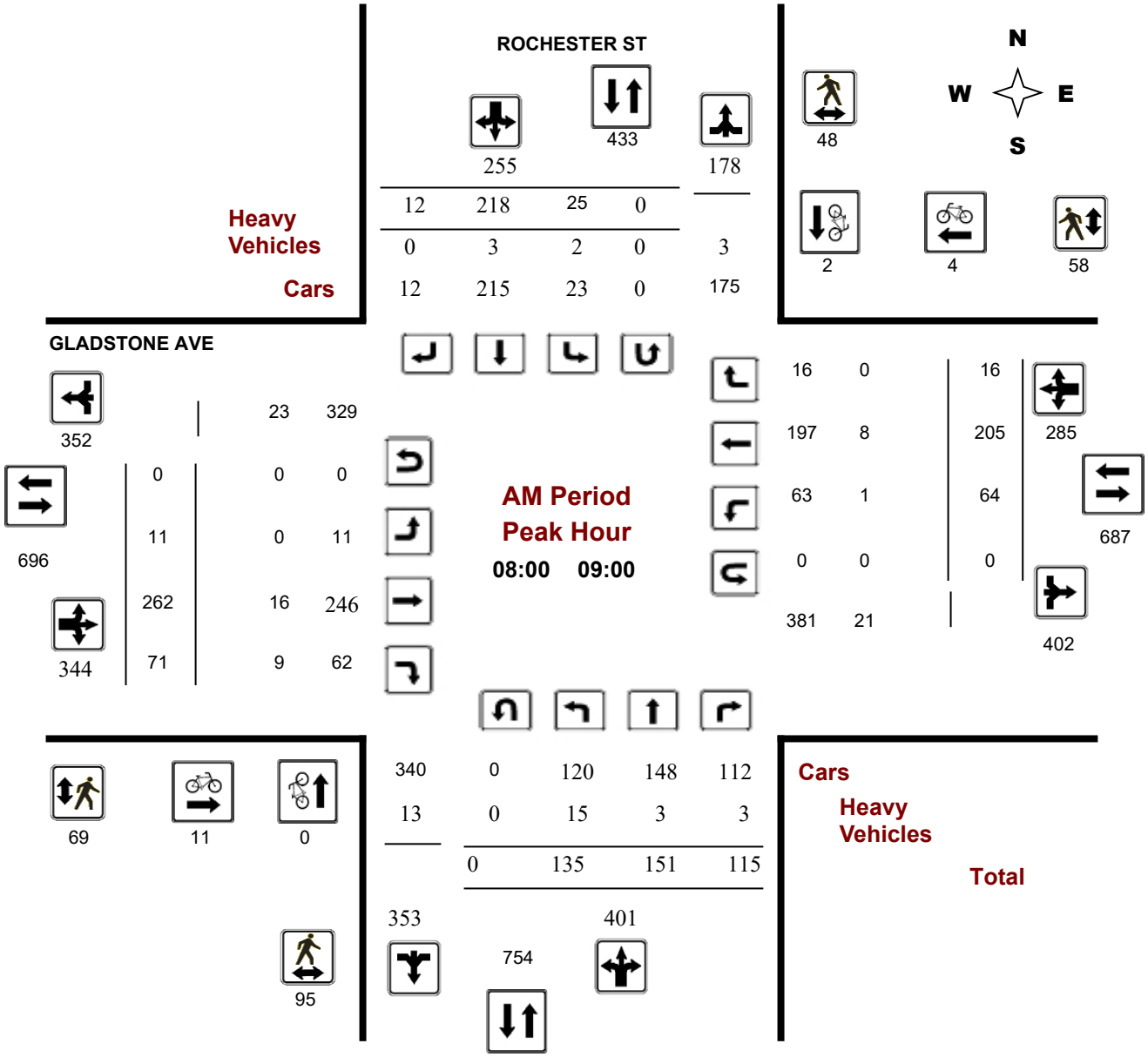
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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



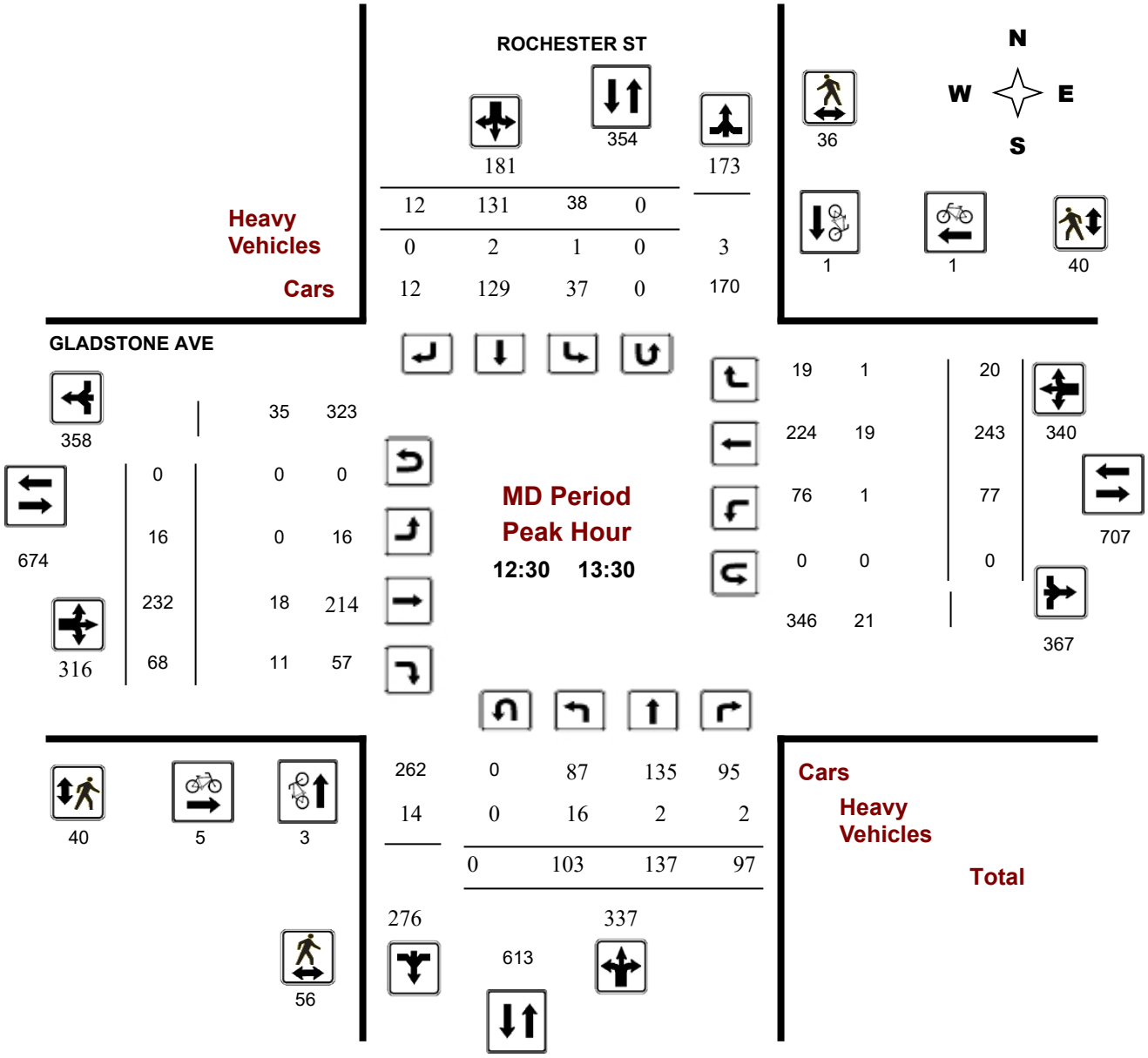
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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



Comments

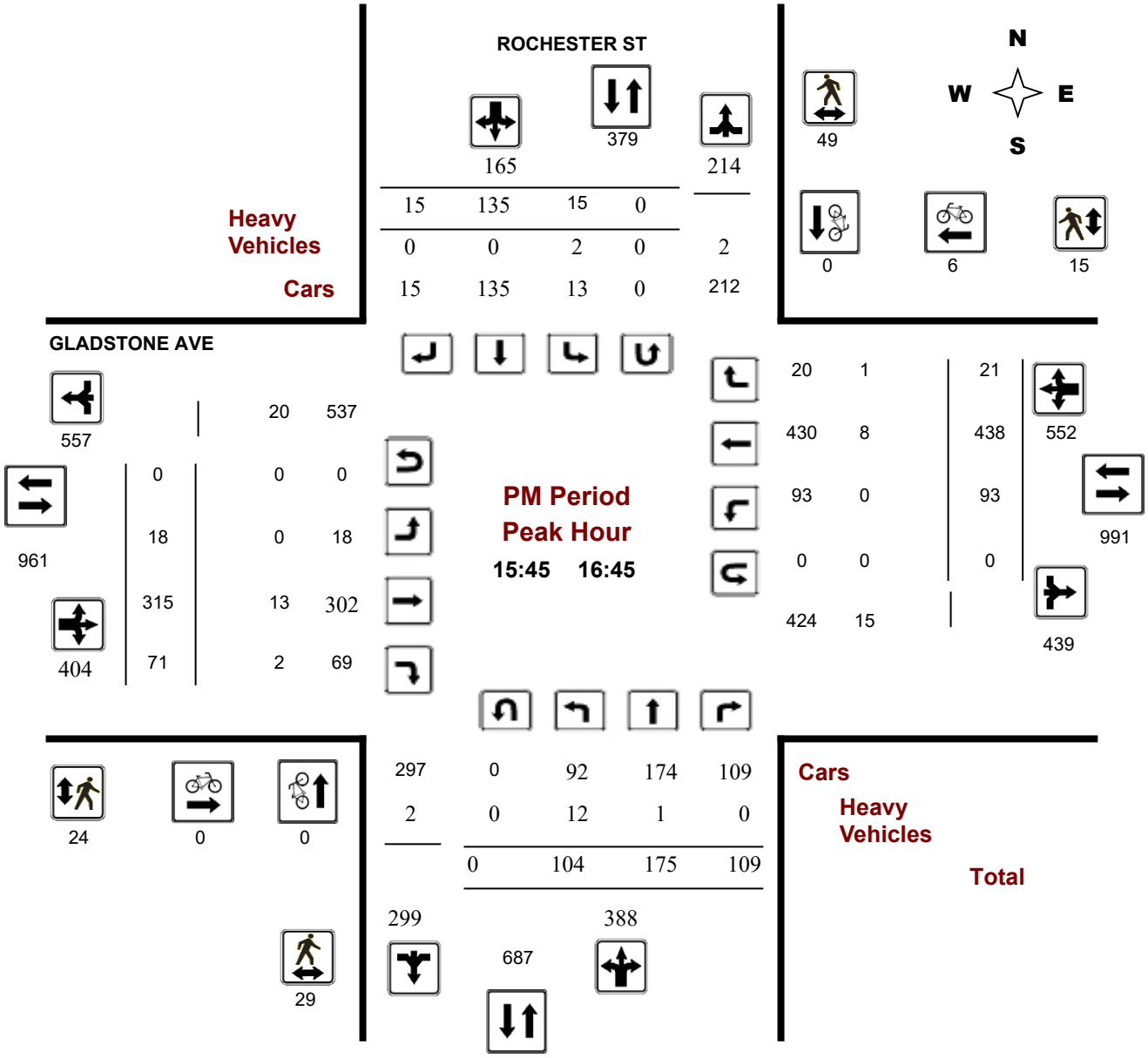
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, November 23, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

.90

	ROCHESTER 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	128	91	67	**286**	16	137	7	**160**	**446**	2	189	63	**254**	59	137	11	**207**	**461**	**907**
08:00 09:00	135	151	115	**401**	25	218	12	**255**	**656**	11	262	71	**344**	64	205	16	**285**	**629**	**1285**
09:00 10:00	121	128	78	**327**	16	117	14	**147**	**474**	20	227	59	**306**	71	186	16	**273**	**579**	**1053**
11:30 12:30	138	128	95	**361**	27	125	21	**173**	**534**	11	220	80	**311**	53	206	25	**284**	**595**	**1129**
12:30 13:30	103	137	97	**337**	38	131	12	**181**	**518**	16	232	68	**316**	77	243	20	**340**	**656**	**1174**
15:00 16:00	132	185	103	**420**	18	157	14	**189**	**609**	10	270	69	**349**	96	329	20	**445**	**794**	**1403**
16:00 17:00	108	188	111	**407**	14	145	17	**176**	**583**	17	272	74	**363**	95	435	17	**547**	**910**	**1493**
17:00 18:00	129	195	116	**440**	20	120	18	**158**	**598**	10	247	42	**299**	81	438	23	**542**	**841**	**1439**
Sub Total	994	1203	782	**2979**	174	1150	115	**1439**	**4418**	97	1919	526	**2542**	596	2179	148	**2923**	**5465**	**9883**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	994	1203	782	**2979**	174	1150	115	**1439**	**4418**	97	1919	526	**2542**	596	2179	148	**2923**	**5465**	**9883**
EQ 12Hr	1382	1672	1087	**4141**	242	1598	160	**2000**	**6141**	135	2667	731	**3533**	828	3029	206	**4063**	**7596**	**13737**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1244	1505	978	**3727**	218	1885	188	**1800**	**5527**	122	2400	658	**3180**	745	2726	185	**3657**	**6836**	**12363**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	1630	1972	1281	**4882**	286	2469	246	**2358**	**7240**	160	3144	862	**4166**	976	3571	242	**4791**	**8955**	**16196**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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

Full Study 15 Minute Increments

		ROCHESTER 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	07:15	28	21	12	61	5	38	0	43	196	0	36	17	53	11	24	5	40	196	197
07:15	07:30	26	21	13	60	2	21	2	25	159	0	47	17	64	13	41	2	56	159	205
07:30	07:45	26	19	17	62	1	41	1	43	199	1	38	14	53	17	32	2	51	199	209
11:30	11:45	31	29	27	87	4	34	10	48	250	2	55	26	83	14	55	10	79	250	297
12:15	12:30	30	29	24	83	8	34	2	44	221	2	52	14	68	10	48	5	63	221	258
12:30	12:45	28	25	22	75	6	26	1	33	201	4	52	20	76	11	76	7	94	201	278
07:45	08:00	48	30	25	103	8	37	4	49	255	1	68	15	84	18	40	2	60	255	296
09:00	09:15	42	34	21	97	4	41	2	47	260	6	57	16	79	15	46	4	65	260	288
08:00	08:15	37	30	21	88	7	46	1	54	252	1	63	12	76	20	53	1	74	252	292
08:15	08:30	31	32	24	87	11	53	4	68	267	1	72	9	82	12	49	5	66	267	303
08:30	08:45	31	45	36	112	4	66	4	74	361	5	72	30	107	23	44	6	73	361	366
11:45	12:00	41	42	25	108	2	27	8	37	254	4	54	16	74	15	49	5	69	254	288
08:45	09:00	36	44	34	114	3	53	3	59	307	4	55	20	79	9	59	4	72	307	324
09:45	10:00	21	28	25	74	4	21	4	29	195	4	52	13	69	18	48	8	74	195	246
09:15	09:30	36	38	13	87	2	23	5	30	215	3	67	12	82	22	52	0	74	215	273
09:30	09:45	22	28	19	69	6	32	3	41	215	7	51	18	76	16	40	4	60	215	246
12:00	12:15	36	28	19	83	13	30	1	44	231	3	59	24	86	14	54	5	73	231	286
12:45	13:00	24	37	21	82	13	34	4	51	247	3	60	15	78	21	46	4	71	247	282
13:00	13:15	24	38	28	90	7	44	2	53	274	4	47	15	66	26	60	4	90	274	299
15:00	15:15	30	50	29	109	5	42	3	50	299	3	67	23	93	19	68	3	90	299	342
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16:15	16:30	23	44	23	90	2	34	3	39	249	7	87	10	104	21	102	4	127	249	360
17:00	17:15	28	49	36	113	3	34	4	41	286	4	69	16	89	26	114	3	143	286	386
17:15	17:30	36	60	29	125	4	29	4	37	296	1	67	16	84	21	99	7	127	296	373
16:45	17:00	30	49	26	105	5	39	5	49	289	4	52	18	74	22	104	3	129	289	357
17:45	18:00	36	45	21	102	7	26	4	37	244	1	37	6	44	15	104	12	131	244	314
13:15	13:30	27	37	26	90	12	27	5	44	245	5	73	18	96	19	61	5	85	245	315
15:30	15:45	39	47	22	108	3	37	4	44	294	1	58	18	77	32	84	7	123	294	352
17:30	17:45	29	41	30	100	6	31	6	43	243	4	74	4	82	19	121	1	141	243	366
15:45	16:00	26	36	24	86	6	29	3	38	236	5	95	15	115	20	107	7	134	236	373
16:00	16:15	23	45	32	100	2	41	4	47	301	2	68	27	97	32	120	7	159	301	403
16:30	16:45	32	50	30	112	5	31	5	41	280	4	65	19	88	20	109	3	132	280	373
Total:		994	1203	782	2979	174	1150	115	1439	8138	97	1919	526	2542	596	2179	148	2923	8138	9,883

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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

Full Study Cyclist Volume

Time Period		ROCHESTER ST			GLADSTONE AVE			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	1	0	1	0	1	1	2
07:30	07:45	0	0	0	2	0	2	2
11:30	11:45	0	0	0	0	0	0	0
12:15	12:30	0	0	0	1	1	2	2
12:30	12:45	2	0	2	1	0	1	3
07:45	08:00	0	1	1	2	1	3	4
09:00	09:15	0	1	1	1	0	1	2
08:00	08:15	0	0	0	3	0	3	3
08:15	08:30	0	0	0	2	1	3	3
08:30	08:45	0	0	0	4	2	6	6
11:45	12:00	0	0	0	1	2	3	3
08:45	09:00	0	2	2	2	1	3	5
09:45	10:00	0	0	0	0	1	1	1
09:15	09:30	1	0	1	2	3	5	6
09:30	09:45	0	0	0	0	0	0	0
12:00	12:15	1	0	1	1	0	1	2
12:45	13:00	1	0	1	1	0	1	2
13:00	13:15	0	1	1	0	1	1	2
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	1	1	1
16:15	16:30	0	0	0	0	2	2	2
17:00	17:15	0	0	0	0	5	5	5
17:15	17:30	1	0	1	1	0	1	2
16:45	17:00	0	1	1	1	1	2	3
17:45	18:00	0	0	0	3	3	6	6
13:15	13:30	0	0	0	3	0	3	3
15:30	15:45	0	0	0	0	1	1	1
17:30	17:45	1	0	1	0	0	0	1
15:45	16:00	0	0	0	0	1	1	1
16:00	16:15	0	0	0	0	1	1	1
16:30	16:45	0	0	0	0	2	2	2
Total		8	6	**14**	31	31	62	76

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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

Full Study Pedestrian Volume

	ROCHESTER ST			GLADSTONE AVE			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	4	3	**7**	1	2	**3**	**10**
07:15 07:30	4	5	**9**	4	6	**10**	**19**
07:30 07:45	6	10	**16**	12	6	**18**	**34**
11:30 11:45	11	3	**14**	7	5	**12**	**26**
12:15 12:30	12	14	**26**	19	8	**27**	**53**
12:30 12:45	12	3	**15**	12	3	**15**	**30**
07:45 08:00	6	2	**8**	6	4	**10**	**18**
09:00 09:15	24	8	**32**	8	11	**19**	**51**
08:00 08:15	37	9	**46**	15	30	**45**	**91**
08:15 08:30	13	7	**20**	14	5	**19**	**39**
08:30 08:45	26	26	**52**	32	14	**46**	**98**
11:45 12:00	24	8	**32**	12	19	**31**	**63**
08:45 09:00	19	6	**25**	8	9	**17**	**42**
09:45 10:00	22	10	**32**	23	16	**39**	**71**
09:15 09:30	18	4	**22**	12	12	**24**	**46**
09:30 09:45	6	6	**12**	14	6	**20**	**32**
12:00 12:15	7	8	**15**	10	3	**13**	**28**
12:45 13:00	10	8	**18**	3	10	**13**	**31**
13:00 13:15	14	12	**26**	11	14	**25**	**51**
15:00 15:15	5	8	**13**	8	4	**12**	**25**
15:15 15:30	9	6	**15**	15	7	**22**	**37**
16:15 16:30	12	17	**29**	6	6	**12**	**41**
17:00 17:15	6	8	**14**	4	2	**6**	**20**
17:15 17:30	5	10	**15**	5	8	**13**	**28**
16:45 17:00	12	12	**24**	4	6	**10**	**34**
17:45 18:00	21	8	**29**	7	7	**14**	**43**
13:15 13:30	20	13	**33**	14	13	**27**	**60**
15:30 15:45	4	11	**15**	4	1	**5**	**20**
17:30 17:45	8	9	**17**	3	6	**9**	**26**
15:45 16:00	5	12	**17**	2	2	**4**	**21**
16:00 16:15	8	7	**15**	6	1	**7**	**22**
16:30 16:45	4	13	**17**	10	6	**16**	**33**
Total	394	286	**680**	311	252	**563**	**1243**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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

Full Study Heavy Vehicles

		ROCHESTER 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	07:15	2	0	0	**6**	1	1	0	**3**	**9**	0	4	3	**11**	0	2	1	**8**	**19**	**14**
07:15	07:30	2	0	0	**7**	0	1	0	**1**	**8**	0	5	4	**17**	0	6	0	**11**	**28**	**18**
07:30	07:45	1	0	1	**6**	0	2	0	**5**	**11**	1	3	2	**9**	0	2	2	**8**	**17**	**14**
11:30	11:45	6	0	0	**10**	0	1	0	**1**	**11**	0	5	3	**20**	0	6	0	**11**	**31**	**21**
12:15	12:30	3	0	0	**5**	0	0	1	**1**	**6**	0	6	2	**15**	0	3	0	**9**	**24**	**15**
12:30	12:45	4	0	0	**9**	0	0	0	**0**	**9**	0	4	5	**17**	0	4	0	**8**	**25**	**17**
07:45	08:00	6	2	0	**15**	0	1	0	**3**	**18**	0	4	6	**17**	0	1	0	**5**	**22**	**20**
09:00	09:15	7	0	0	**12**	0	0	0	**0**	**12**	0	5	5	**19**	0	2	0	**7**	**26**	**19**
08:00	08:15	1	1	0	**9**	0	3	0	**4**	**13**	0	6	3	**14**	1	4	0	**11**	**25**	**19**
08:15	08:30	4	2	2	**9**	2	0	0	**4**	**13**	0	6	1	**12**	0	1	0	**11**	**23**	**18**
08:30	08:45	6	0	0	**8**	0	0	0	**0**	**8**	0	1	2	**11**	0	2	0	**3**	**14**	**11**
11:45	12:00	3	1	1	**10**	0	1	0	**3**	**13**	0	4	3	**11**	1	1	1	**8**	**19**	**16**
08:45	09:00	4	0	1	**8**	0	0	0	**0**	**8**	0	3	3	**11**	0	1	0	**5**	**16**	**12**
09:45	10:00	1	0	0	**2**	0	0	0	**1**	**3**	0	2	1	**5**	0	1	1	**4**	**9**	**6**
09:15	09:30	7	2	1	**15**	0	0	0	**2**	**17**	0	4	5	**21**	0	5	0	**10**	**31**	**24**
09:30	09:45	4	0	0	**16**	0	0	0	**0**	**16**	0	6	10	**22**	2	2	0	**10**	**32**	**24**
12:00	12:15	5	0	1	**8**	0	1	0	**2**	**10**	0	5	1	**13**	0	2	1	**9**	**22**	**16**
12:45	13:00	1	0	0	**2**	0	0	0	**0**	**2**	0	4	1	**11**	0	5	0	**9**	**20**	**11**
13:00	13:15	4	2	2	**14**	0	1	0	**4**	**18**	0	5	5	**22**	0	8	1	**16**	**38**	**28**
15:00	15:15	7	0	0	**9**	0	0	0	**0**	**9**	0	3	2	**17**	0	5	0	**8**	**25**	**17**
15:15	15:30	6	1	1	**9**	0	0	0	**1**	**10**	0	5	1	**15**	0	3	0	**9**	**24**	**17**
16:15	16:30	3	1	0	**4**	1	0	0	**2**	**6**	0	2	0	**7**	0	2	0	**5**	**12**	**9**
17:00	17:15	3	1	0	**8**	0	0	0	**2**	**10**	0	2	4	**10**	0	1	1	**4**	**14**	**12**
17:15	17:30	3	0	0	**4**	0	0	0	**0**	**4**	0	2	1	**12**	0	6	0	**8**	**20**	**12**
16:45	17:00	4	0	1	**8**	1	2	0	**3**	**11**	0	2	1	**11**	0	4	0	**8**	**19**	**15**
17:45	18:00	2	0	0	**3**	0	1	0	**1**	**4**	0	0	0	**3**	0	1	0	**1**	**4**	**4**
13:15	13:30	7	0	0	**9**	1	1	0	**2**	**11**	0	5	0	**14**	1	2	0	**9**	**23**	**17**
15:30	15:45	8	0	0	**9**	0	0	1	**2**	**11**	0	2	1	**14**	0	2	1	**5**	**19**	**15**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	0	0	**2**	**4**	**2**
15:45	16:00	3	0	0	**5**	0	0	0	**0**	**5**	0	4	2	**12**	0	3	0	**7**	**19**	**12**
16:00	16:15	2	0	0	**2**	1	0	0	**2**	**4**	0	2	0	**5**	0	1	1	**5**	**10**	**7**
16:30	16:45	4	0	0	**4**	0	0	0	**0**	**4**	0	5	0	**11**	0	2	0	**7**	**18**	**11**
Total:	None	123	13	11	**245**	7	16	2	**49**	**294**	1	118	77	**411**	5	90	10	**241**	**652**	**473**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLADSTONE AVE @ ROCHESTER ST

Survey Date: Wednesday, November 23, 2016 **WO No:** 36537

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

Full Study 15 Minute U-Turn Total

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

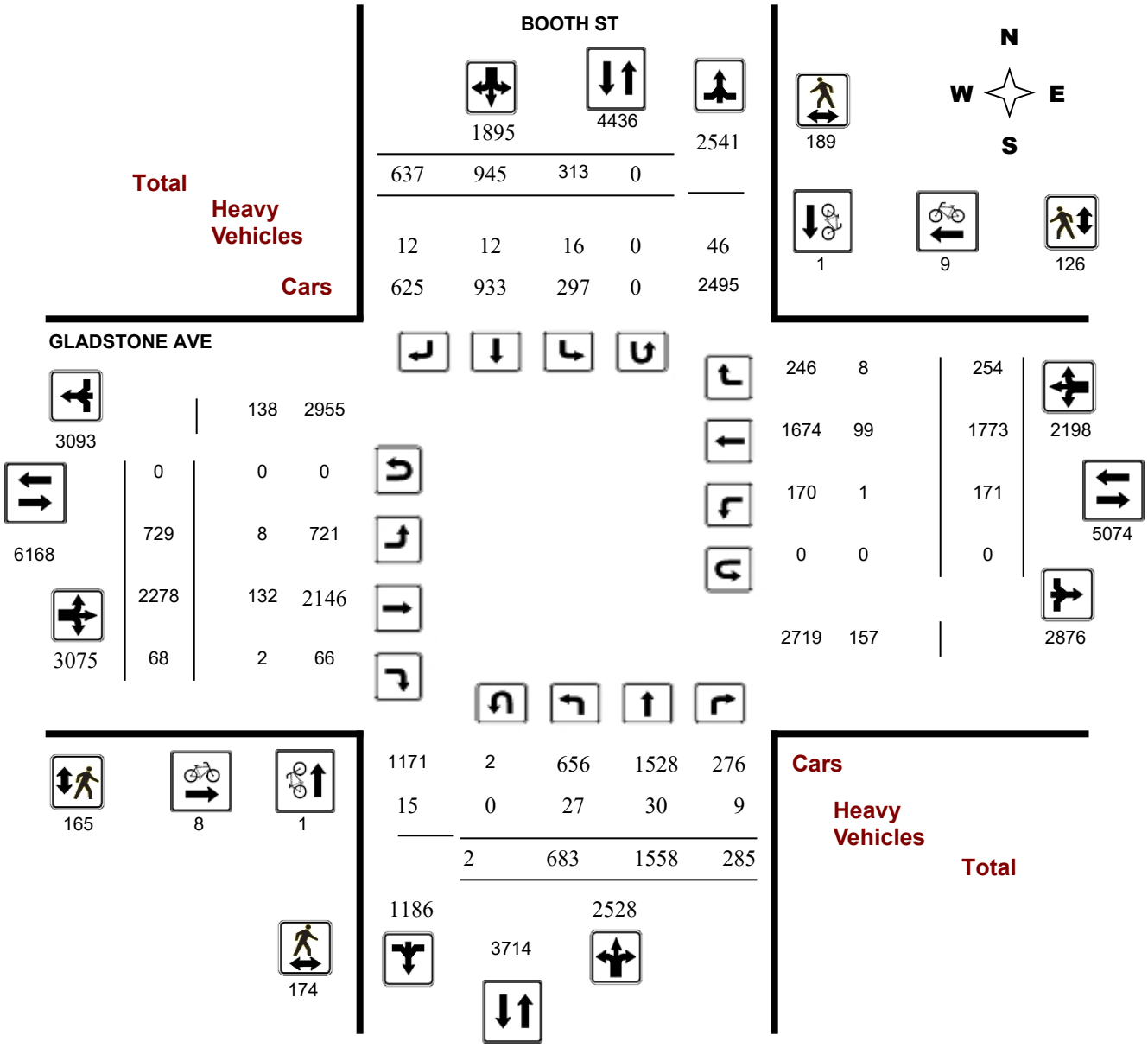
Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022
Start Time: 07:00
WO No: 40210
Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

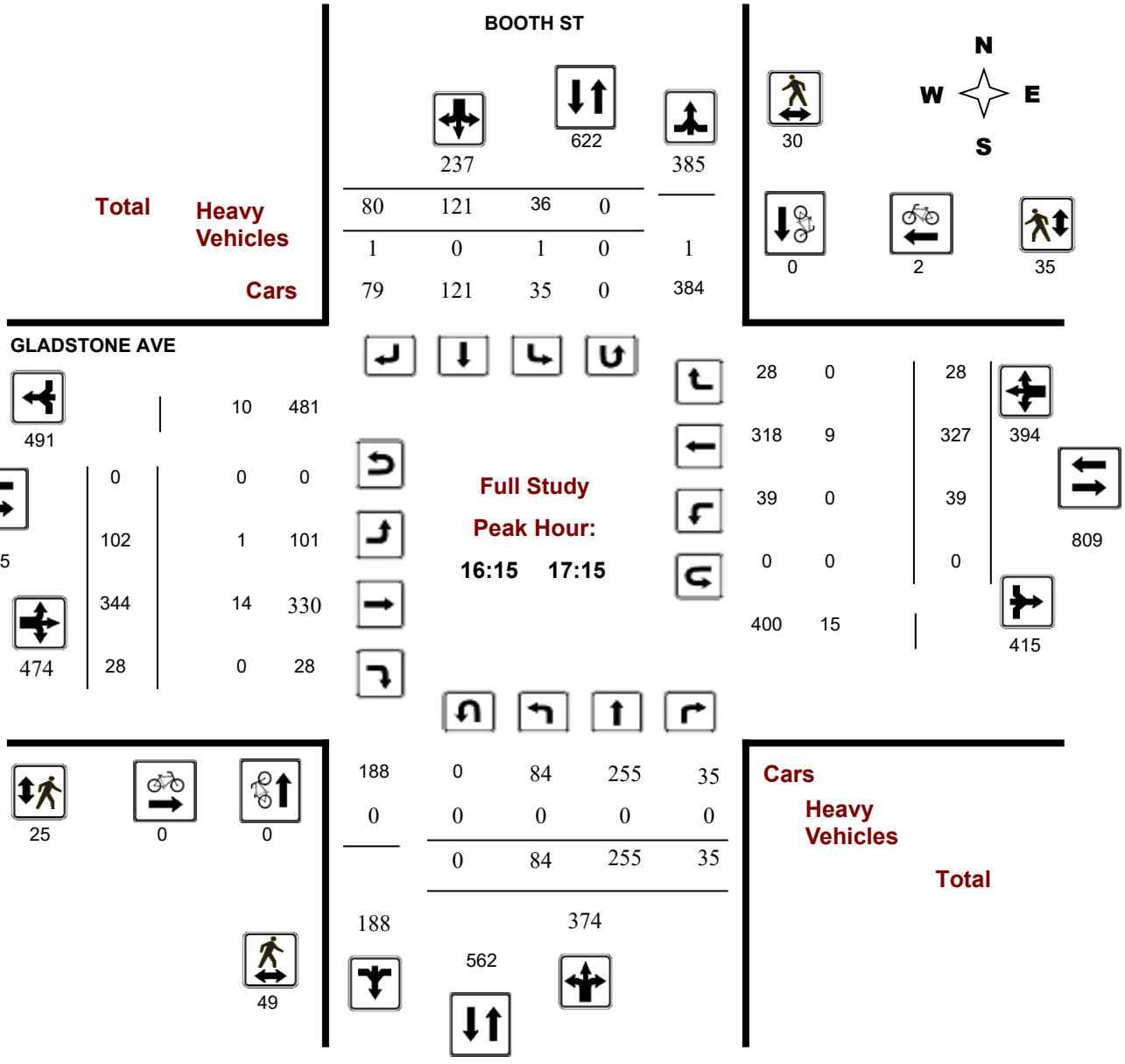
Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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

Full Study Peak Hour Diagram



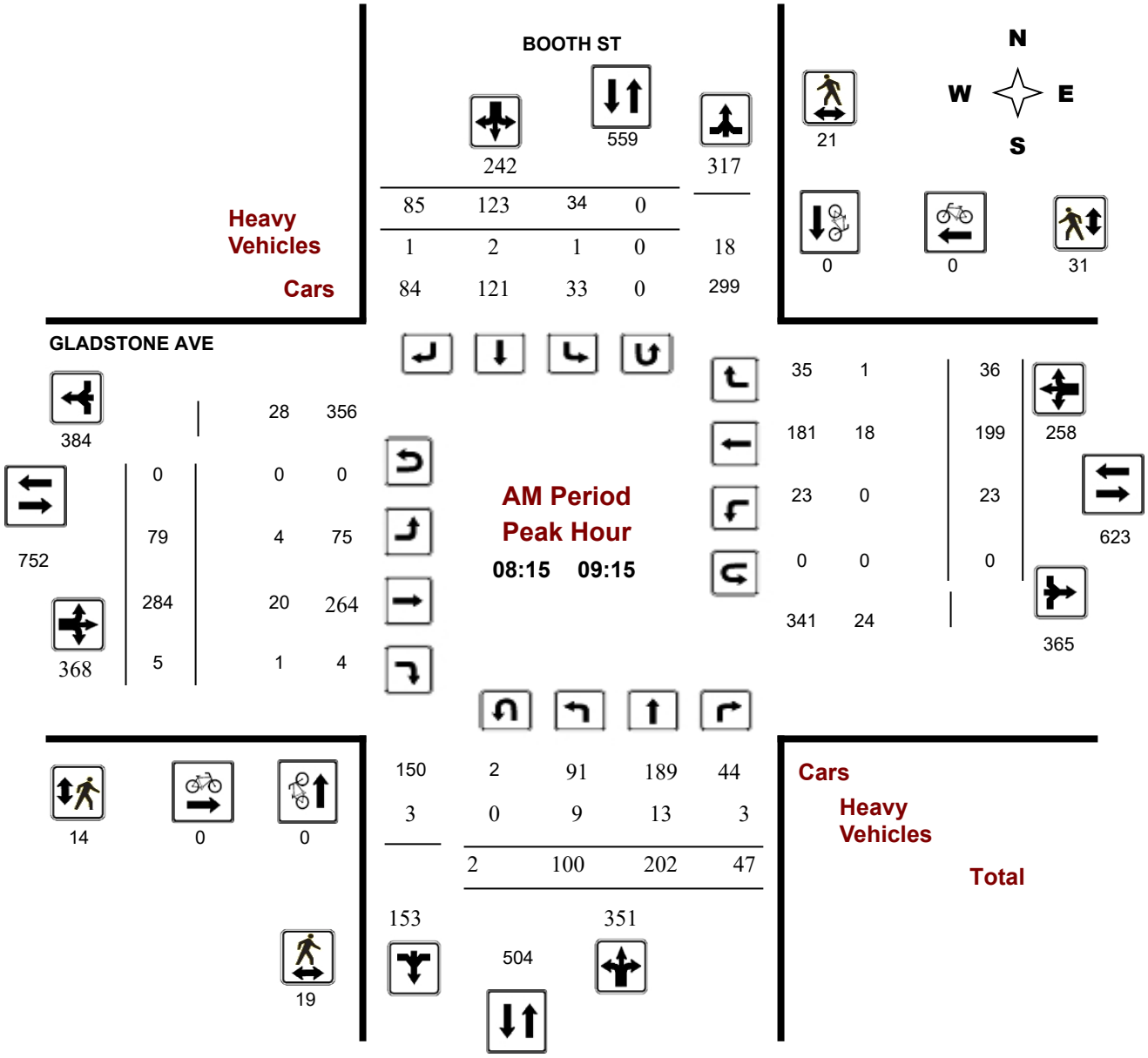
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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



Comments

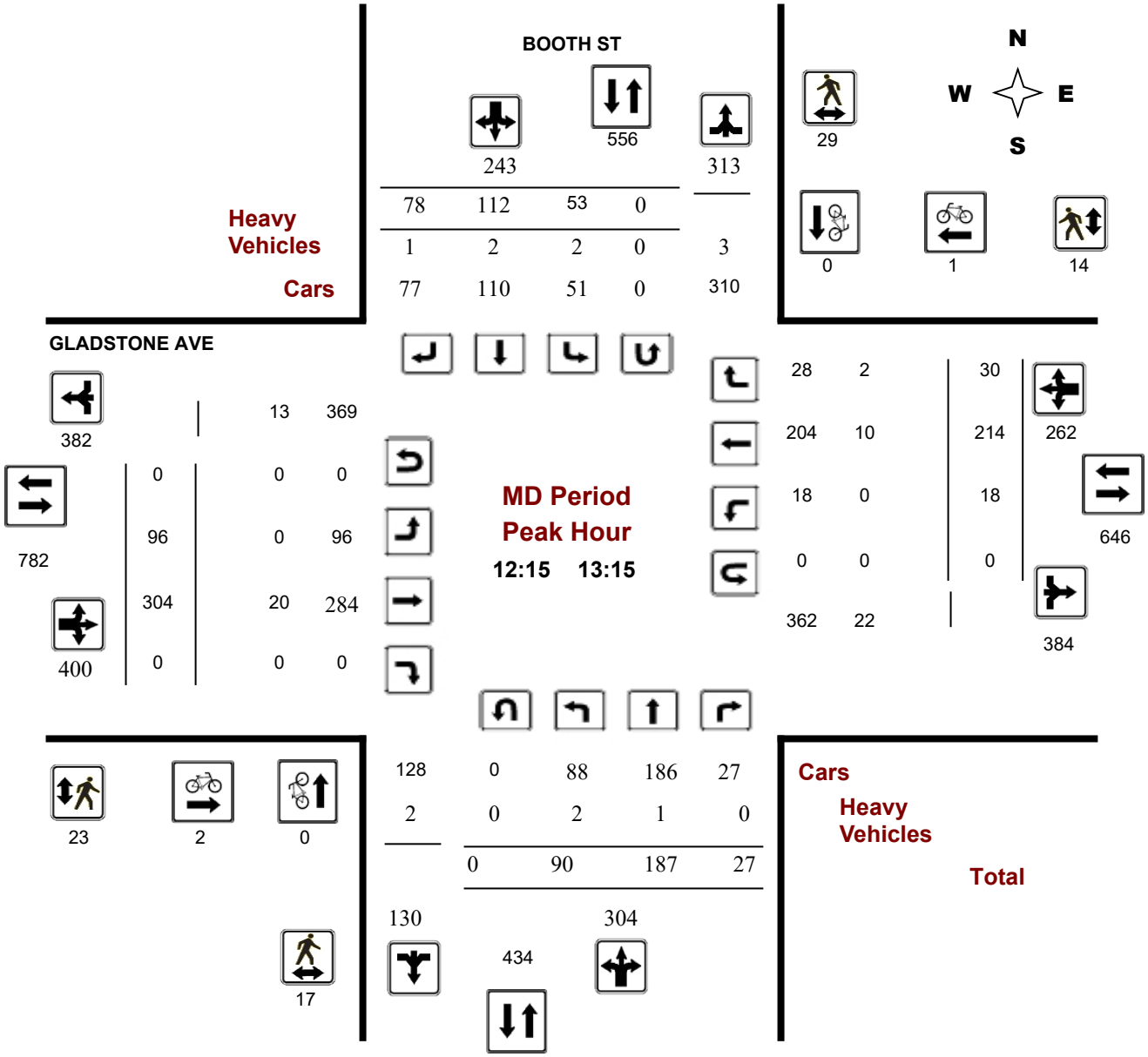
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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



Comments

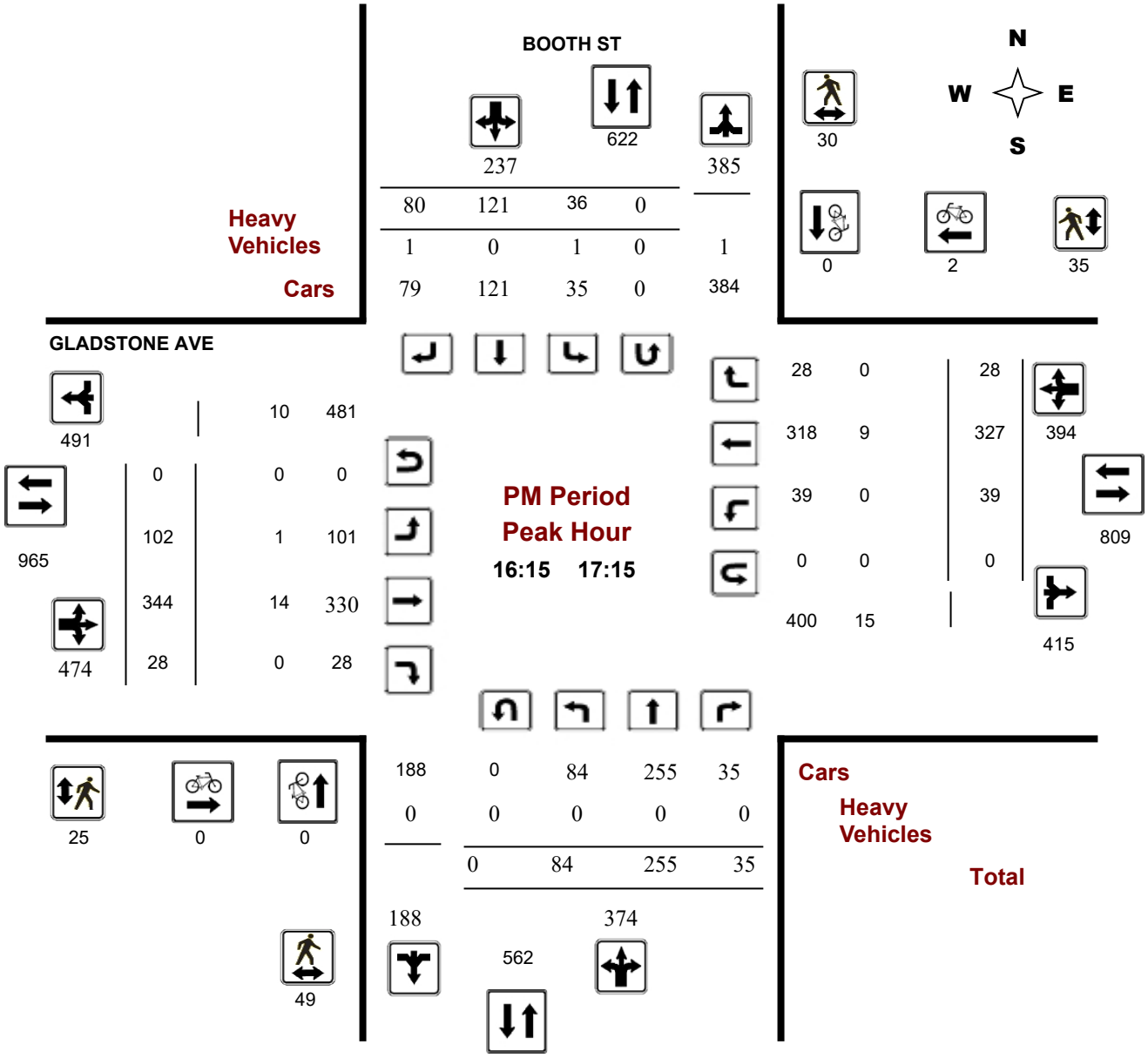
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, March 03, 2022

Total Observed U-Turns

Northbound: 2 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

1.00

	BOOTH 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	51	135	24	**210**	30	134	118	**282**	**492**	105	185	1	**291**	4	108	16	**128**	**419**	**911**
08:00 09:00	93	190	41	**324**	34	131	82	**247**	**571**	78	289	1	**368**	20	168	39	**227**	**595**	**1166**
09:00 10:00	83	176	41	**300**	38	100	71	**209**	**509**	92	254	19	**365**	14	186	19	**219**	**584**	**1093**
11:30 12:30	91	181	25	**297**	44	102	74	**220**	**517**	81	287	0	**368**	18	225	35	**278**	**646**	**1163**
12:30 13:30	88	175	30	**293**	48	107	65	**220**	**513**	87	318	0	**405**	17	203	25	**245**	**650**	**1163**
15:00 16:00	93	216	39	**348**	43	129	85	**257**	**605**	110	289	0	**399**	31	255	36	**322**	**721**	**1326**
16:00 17:00	81	236	28	**345**	39	120	86	**245**	**590**	116	346	24	**486**	38	307	31	**376**	**862**	**1452**
17:00 18:00	103	249	57	**409**	37	122	56	**215**	**624**	60	310	23	**393**	29	321	53	**403**	**796**	**1420**
Sub Total	683	1558	285	**2526**	313	945	637	**1895**	**4421**	729	2278	68	**3075**	171	1773	254	**2198**	**5273**	**9694**
U Turns				**2**				**0**	**2**				**0**				**0**	**0**	**2**
Total	683	1558	285	**2528**	313	945	637	**1895**	**4423**	729	2278	68	**3075**	171	1773	254	**2198**	**5273**	**9696**
EQ 12Hr	949	2166	396	**3514**	435	1314	885	**2634**	**6148**	1013	3166	95	**4274**	238	2464	353	**3055**	**7329**	**13477**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	949	2166	396	**3514**	435	1721	1160	**2634**	**6148**	1013	3166	95	**4274**	238	2464	353	**3055**	**7329**	**13477**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	1243	2837	519	**4603**	570	2255	1520	**3451**	**8054**	1327	4147	124	**5599**	312	3228	462	**4002**	**9601**	**17655**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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

Full Study 15 Minute Increments

		BOOTH 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	07:15	12	27	7	46	12	28	24	64	200	29	38	0	67	1	25	5	31	200	208
07:15	07:30	15	37	4	56	3	24	28	55	192	18	42	0	60	1	28	1	30	192	201
07:30	07:45	13	36	6	55	8	38	31	77	240	26	38	1	65	1	31	6	38	240	235
17:45	18:00	31	65	16	112	9	26	20	55	305	17	74	4	95	4	81	22	107	305	369
07:45	08:00	11	35	7	53	7	44	35	86	255	32	67	0	99	1	24	4	29	255	267
08:00	08:15	19	39	6	64	6	29	24	59	220	17	70	1	88	3	31	8	42	220	253
08:15	08:30	20	40	9	71	5	37	27	69	253	18	62	0	80	5	51	11	67	253	287
08:30	08:45	27	50	7	84	10	38	17	65	277	21	75	0	96	9	48	10	67	277	312
08:45	09:00	27	61	19	107	13	27	14	54	284	22	82	0	104	3	38	10	51	284	316
09:00	09:15	26	51	12	89	6	21	27	54	249	18	65	5	88	6	62	5	73	249	304
09:15	09:30	19	49	10	78	8	21	14	43	236	31	70	6	107	4	37	4	45	236	273
09:30	09:45	16	37	6	59	8	34	16	58	217	17	55	4	76	4	45	4	53	217	246
09:45	10:00	22	39	13	74	16	24	14	54	227	26	64	4	94	0	42	6	48	227	270
11:30	11:45	28	42	8	78	9	28	14	51	231	15	77	0	92	4	55	13	72	231	293
11:45	12:00	24	36	3	63	11	25	19	55	205	14	76	0	90	5	54	7	66	205	274
12:15	12:30	20	57	5	82	12	27	21	60	267	27	64	0	91	5	58	9	72	267	305
12:30	12:45	20	50	11	81	11	30	19	60	253	22	69	0	91	5	55	5	65	253	297
12:45	13:00	21	45	4	70	13	31	17	61	247	27	79	0	106	4	46	9	59	247	296
13:00	13:15	29	35	7	71	17	24	21	62	223	20	92	0	112	4	55	7	66	223	311
13:15	13:30	18	45	8	71	7	22	8	37	201	18	78	0	96	4	47	4	55	201	259
15:45	16:00	24	38	15	77	14	31	20	65	256	31	73	0	104	5	65	9	79	256	325
16:00	16:15	18	41	5	64	9	29	20	58	243	31	85	3	119	7	65	10	82	243	323
16:30	16:45	18	69	11	98	10	32	19	61	308	23	89	10	122	11	85	4	100	308	381
16:45	17:00	28	65	7	100	6	26	23	55	304	36	83	5	124	7	95	10	112	304	391
17:00	17:15	21	60	12	93	6	30	14	50	272	17	83	7	107	8	85	7	100	272	350
17:15	17:30	22	49	12	83	12	36	10	58	269	15	71	6	92	10	80	12	102	269	335
17:30	17:45	29	75	17	121	10	30	12	52	314	11	82	6	99	7	75	12	94	314	366
16:15	16:30	17	61	5	83	14	33	24	71	300	26	89	6	121	13	62	7	82	300	357
12:00	12:15	19	46	9	74	12	22	20	54	231	25	70	0	95	4	58	6	68	231	291
15:30	15:45	25	57	8	90	7	37	19	63	295	25	79	0	104	12	61	11	84	295	341
15:00	15:15	26	54	10	90	14	32	28	74	293	29	52	0	81	6	58	8	72	293	317
15:15	15:30	18	67	6	91	8	29	18	55	283	25	85	0	110	8	71	8	87	283	343
Total:		683	1558	285	2528	313	945	637	1895	8150	729	2278	68	3075	171	1773	254	2198	8150	9,696

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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

Full Study Cyclist Volume

Time Period		BOOTH ST			GLADSTONE AVE			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	1	1	1
11:30	11:45	0	0	0	2	0	2	2
11:45	12:00	0	0	0	0	1	1	1
12:15	12:30	0	0	0	1	0	1	1
12:30	12:45	0	0	0	0	1	1	1
12:45	13:00	0	0	0	1	0	1	1
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	1	0	1	1
15:45	16:00	0	0	0	1	0	1	1
16:00	16:15	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	2	2	2
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
12:00	12:15	1	0	1	0	1	1	2
15:30	15:45	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	2	2	2
15:15	15:30	0	1	1	2	1	3	4
Total		1	1	**2**	8	9	17	19

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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

Full Study Pedestrian Volume

	BOOTH ST			GLADSTONE AVE			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	1	6	**7**	6	1	**7**	**14**
07:15 07:30	4	2	**6**	3	2	**5**	**11**
07:30 07:45	3	3	**6**	3	3	**6**	**12**
17:45 18:00	10	7	**17**	4	3	**7**	**24**
07:45 08:00	5	4	**9**	8	3	**11**	**20**
08:00 08:15	0	4	**4**	3	4	**7**	**11**
08:15 08:30	6	7	**13**	5	13	**18**	**31**
08:30 08:45	6	4	**10**	4	11	**15**	**25**
08:45 09:00	6	4	**10**	3	2	**5**	**15**
09:00 09:15	1	6	**7**	2	5	**7**	**14**
09:15 09:30	6	4	**10**	6	1	**7**	**17**
09:30 09:45	3	2	**5**	7	0	**7**	**12**
09:45 10:00	2	3	**5**	11	0	**11**	**16**
11:30 11:45	6	2	**8**	6	1	**7**	**15**
11:45 12:00	1	2	**3**	1	1	**2**	**5**
12:15 12:30	6	7	**13**	7	6	**13**	**26**
12:30 12:45	6	5	**11**	7	2	**9**	**20**
12:45 13:00	2	11	**13**	3	3	**6**	**19**
13:00 13:15	3	6	**9**	6	3	**9**	**18**
13:15 13:30	3	4	**7**	2	3	**5**	**12**
15:45 16:00	5	8	**13**	3	3	**6**	**19**
16:00 16:15	7	7	**14**	6	9	**15**	**29**
16:30 16:45	14	5	**19**	8	9	**17**	**36**
16:45 17:00	14	10	**24**	1	10	**11**	**35**
17:00 17:15	6	8	**14**	8	9	**17**	**31**
17:15 17:30	8	7	**15**	12	3	**15**	**30**
17:30 17:45	4	6	**10**	2	2	**4**	**14**
16:15 16:30	15	7	**22**	8	7	**15**	**37**
12:00 12:15	2	8	**10**	2	3	**5**	**15**
15:30 15:45	6	7	**13**	5	0	**5**	**18**
15:00 15:15	3	14	**17**	4	2	**6**	**23**
15:15 15:30	10	9	**19**	9	2	**11**	**30**
Total	174	189	**363**	165	126	**291**	**654**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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

Full Study Heavy Vehicles

		BOOTH 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	07:15	1	1	0	**2**	1	0	0	**2**	**4**	0	1	0	**5**	0	3	0	**5**	**10**	**7**
07:15	07:30	2	1	1	**5**	0	1	0	**2**	**7**	0	5	0	**10**	0	3	0	**9**	**19**	**13**
07:30	07:45	0	1	0	**1**	1	0	2	**6**	**7**	0	4	0	**9**	0	3	2	**10**	**19**	**13**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
07:45	08:00	0	1	0	**1**	0	0	0	**2**	**3**	0	7	0	**9**	0	2	1	**10**	**19**	**11**
08:00	08:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	0	0	**3**	**6**	**3**
08:15	08:30	0	3	1	**5**	0	1	0	**6**	**11**	1	4	0	**12**	0	7	1	**13**	**25**	**18**
08:30	08:45	5	2	0	**7**	1	0	0	**6**	**13**	3	6	0	**16**	0	2	0	**9**	**25**	**19**
08:45	09:00	1	3	2	**6**	0	0	0	**3**	**9**	0	5	0	**9**	0	3	0	**10**	**19**	**14**
09:00	09:15	3	5	0	**10**	0	1	1	**7**	**17**	0	5	1	**16**	0	6	0	**11**	**27**	**22**
09:15	09:30	1	3	1	**7**	0	1	1	**6**	**13**	1	4	1	**10**	0	2	0	**7**	**17**	**15**
09:30	09:45	3	1	1	**5**	3	0	0	**5**	**10**	1	5	0	**12**	0	3	0	**12**	**24**	**17**
09:45	10:00	2	3	1	**7**	1	1	0	**5**	**12**	0	7	0	**14**	0	5	0	**14**	**28**	**20**
11:30	11:45	3	0	0	**3**	0	0	1	**1**	**4**	0	5	0	**16**	0	7	0	**12**	**28**	**16**
11:45	12:00	0	0	0	**0**	0	0	3	**4**	**4**	1	3	0	**11**	0	4	0	**7**	**18**	**11**
12:15	12:30	0	0	0	**0**	1	0	0	**2**	**2**	0	6	0	**8**	0	2	1	**10**	**18**	**10**
12:30	12:45	0	0	0	**2**	1	2	0	**3**	**5**	0	5	0	**10**	0	5	0	**11**	**21**	**13**
12:45	13:00	1	0	0	**1**	0	0	1	**1**	**2**	0	1	0	**5**	0	2	0	**3**	**8**	**5**
13:00	13:15	1	1	0	**2**	0	0	0	**2**	**4**	0	8	0	**10**	0	1	1	**10**	**20**	**12**
13:15	13:30	0	1	0	**2**	0	1	0	**2**	**4**	0	6	0	**12**	0	6	0	**12**	**24**	**14**
15:45	16:00	1	1	1	**3**	1	0	0	**2**	**5**	0	3	0	**5**	0	1	0	**6**	**11**	**8**
16:00	16:15	1	0	0	**1**	2	0	0	**4**	**5**	0	4	0	**7**	0	2	2	**10**	**17**	**11**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**6**	0	2	0	**6**	**12**	**6**
16:45	17:00	0	0	0	**0**	1	0	1	**2**	**2**	0	5	0	**8**	0	2	0	**8**	**16**	**9**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**4**	0	3	0	**4**	**8**	**4**
17:15	17:30	0	0	0	**0**	0	0	1	**1**	**1**	0	3	0	**7**	0	3	0	**6**	**13**	**7**
17:30	17:45	1	1	1	**3**	0	0	0	**1**	**4**	0	9	0	**13**	0	3	0	**13**	**26**	**15**
16:15	16:30	0	0	0	**0**	0	0	0	**1**	**1**	1	4	0	**7**	0	2	0	**6**	**13**	**7**
12:00	12:15	0	1	0	**1**	1	0	0	**2**	**3**	0	0	0	**3**	0	3	0	**4**	**7**	**5**
15:30	15:45	0	0	0	**1**	1	1	1	**3**	**4**	0	1	0	**7**	0	5	0	**7**	**14**	**9**
15:00	15:15	1	1	0	**3**	0	0	0	**1**	**4**	0	2	0	**5**	1	2	0	**5**	**10**	**7**
15:15	15:30	0	0	0	**3**	1	3	0	**4**	**7**	0	5	0	**9**	0	4	0	**10**	**19**	**13**
Total:	None	27	30	9	**81**	16	12	12	**86**	**167**	8	132	2	**280**	1	99	8	**265**	**545**	**356**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOOTH ST @ GLADSTONE AVE

Survey Date: Thursday, March 03, 2022 **WO No:** 40210

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

Full Study 15 Minute U-Turn Total

		BOOTH ST		GLADSTONE AVE		
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
17:45	18:00	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	2	0	0	0	2
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
12:15	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
15:45	16:00	0	0	0	0	0
16:00	16:15	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
16:15	16:30	0	0	0	0	0
12:00	12:15	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
Total		2	0	0	0	2

Name: Rani Nahas Date: 2022-09-15 Road Conditions: Dry, Clear

Intersection: Rochester/Balsam Weather: Sunny. 7 C

15 Minute Interval	Road: Rochester						Road: Balsam					
	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
8:00 - 8:15	2		9	1		2	0	0	9	7	1	0
8:15 - 8:30	2		5	0		0	0	1	3	8	2	0
8:30 - 8:45	3		7	1		0	1	1	3	4	3	3
8:45 - 9:00	2		11	1		2	0	0	11	2	3	1
Total:	9	0	32	3	0	4	1	2	26	21	9	4

15 Minute Interval	Road: Rochester						Road: Balsam					
	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
3:45 - 4:00	2		9	2		0	1	1	4	3	1	2
4:00 - 4:15	0		9	1		2	4	5	6	4	2	0
4:15 - 4:30	2		9	1		2	0	4	6	0	3	2
4:30 - 4:45	1		11	0		0	2	3	5	5	1	0
Total:	5	0	38	4	0	4	7	13	21	12	7	4

Name: Rani Nahas

Date: 2022-09-15

Intersection: Booth/Balsam

Road Conditions: Dry, Clear

Weather: Sunny. 7 C

15 Minute Interval	Road: Booth				Road: Balsam	
	Movement					
	NBL	NBT	SBT	SBR	EBL	EBR
8:00 - 8:15	5			5	8	2
8:15 - 8:30	5			2	6	1
8:30 - 8:45	5			6	9	4
8:45 - 9:00	2			2	10	0
Total:	17	0	0	15	33	7

15 Minute Interval	Road: Booth				Road: Balsam	
	Movement					
	NBL	NBT	SBT	SBR	EBL	EBR
4:00 - 4:15	5			3	10	2
4:15 - 4:30	1			4	10	4
4:30 - 4:45	3			2	11	2
4:45 - 5:00	4			2	12	5
Total:	13	0	0	11	43	13

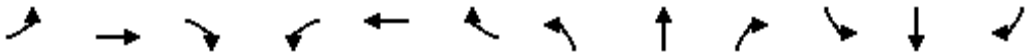
Appendix B

Collision Data

DATE	YEAR	LOCATION	ACCIDENT LOCATION	CLASS OF ACCIDENT	IMPACT TYPE	ENVIRONMENT	LIGHT	ROAD SURFACE CONDITION	TRAFFIC CONTROL	TRAFFIC CONTROL CONDITION	NO OF PEDESTRIANS
2015/07/09 04:00:00+00	2015	GLADSTONE AVE btwn ROCHESTER ST & BOOTH ST		02 - Non-fatal injury	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
5/10/2019	2019	ROCHESTER ST btwn BALSAM ST & GLADSTONE AVE (__3ZAAJL)	04 - At/near private drive	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	02 - Wet	10 - No control		
2015/01/22 05:00:00+00	2015	ROCHESTER ST btwn BALSAM ST & GLADSTONE AVE		03 - P.D. only	06 - SMV unattended vehic	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
2015/02/05 05:00:00+00	2015	GLADSTONE AVE @ ROCHESTER ST		03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	02 - Wet	01 - Traffic signal	01 - Functioning	0
2016/02/08 05:00:00+00	2016	GLADSTONE AVE @ ROCHESTER ST		02 - Non-fatal injury	05 - Turning movement	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning	0
3/14/2017 4:00:00 AM	2017	GLADSTONE AVE @ ROCHESTER ST	02 - Intersection related	03 - P.D. only	03 - Rear end	03 - Snow	01 - Daylight	03 - Loose snow	01 - Traffic signal		
2016/04/28 04:00:00+00	2016	GLADSTONE AVE @ ROCHESTER ST		02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2/9/2017 5:00:00 AM	2017	GLADSTONE AVE @ ROCHESTER ST	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		
2015/05/27 04:00:00+00	2015	GLADSTONE AVE @ ROCHESTER ST		02 - Non-fatal injury	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	1
2016/07/15 04:00:00+00	2016	GLADSTONE AVE @ ROCHESTER ST		03 - P.D. only	02 - Angle	02 - Rain	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	0
5/23/2017 4:00:00 AM	2017	GLADSTONE AVE @ ROCHESTER ST	03 - At intersection	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		
2016/11/08 05:00:00+00	2016	GLADSTONE AVE @ ROCHESTER ST		02 - Non-fatal injury	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	1
2015/05/14 04:00:00+00	2015	GLADSTONE AVE @ ROCHESTER ST		03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
10/19/2019	2019	GLADSTONE AVE @ ROCHESTER ST (0006496)	03 - At intersection	03 - P.D. only	03 - Rear end	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning	
2018/09/14 00:00:00+00	2018	GLADSTONE AVE @ ROCHESTER ST (0006496)	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2015/08/05 04:00:00+00	2015	GLADSTONE AVE @ ROCHESTER ST		03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2018/12/19 00:00:00+00	2018	GLADSTONE AVE @ ROCHESTER ST (0006496)	03 - At intersection	02 - Non-fatal injury	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	1
1/21/2019	2019	GLADSTONE AVE @ ROCHESTER ST (0006496)	03 - At intersection	03 - P.D. only	05 - Turning movement	01 - Clear	07 - Dark	03 - Loose snow	01 - Traffic signal	01 - Functioning	
11/4/2019	2019	GLADSTONE AVE @ ROCHESTER ST (0006496)	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	02 - Wet	01 - Traffic signal	01 - Functioning	
3/8/2019	2019	GLADSTONE AVE @ ROCHESTER ST (0006496)	02 - Intersection related	03 - P.D. only	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	
2018/01/09 00:00:00+00	2018	GLADSTONE AVE @ ROCHESTER ST (0006496)	03 - At intersection	03 - P.D. only	05 - Turning movement	01 - Clear	07 - Dark	02 - Wet	01 - Traffic signal	01 - Functioning	0
2018/02/10 00:00:00+00	2018	GLADSTONE AVE @ ROCHESTER ST (0006496)	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	04 - Slush	01 - Traffic signal	01 - Functioning	0
2016/02/03 05:00:00+00	2016	GLADSTONE AVE @ ROCHESTER ST		03 - P.D. only	05 - Turning movement	04 - Freezing Rain	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	0
2016/09/07 04:00:00+00	2016	GLADSTONE AVE @ ROCHESTER ST		02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
7/29/2017 4:00:00 AM	2017	GLADSTONE AVE @ ROCHESTER ST	03 - At intersection	02 - Non-fatal injury	99 - Other	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		
1/19/2017 5:00:00 AM	2017	GLADSTONE AVE @ ROCHESTER ST	03 - At intersection	02 - Non-fatal injury	02 - Angle	01 - Clear	07 - Dark	02 - Wet	01 - Traffic signal		
2016/08/30 04:00:00+00	2016	GLADSTONE AVE @ ROCHESTER ST		03 - P.D. only	03 - Rear end	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning	0
4/15/2017 4:00:00 AM	2017	BOOTH ST @ GLADSTONE AVE	03 - At intersection	03 - P.D. only	02 - Angle	02 - Rain	01 - Daylight	02 - Wet	01 - Traffic signal		
2015/10/30 04:00:00+00	2015	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2015/01/08 05:00:00+00	2015	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
9/3/2017 4:00:00 AM	2017	BOOTH ST @ GLADSTONE AVE	02 - Intersection related	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		
2015/06/19 04:00:00+00	2015	BOOTH ST @ GLADSTONE AVE		02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2016/11/09 05:00:00+00	2016	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	05 - Turning movement	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning	0
2015/04/02 04:00:00+00	2015	BOOTH ST @ GLADSTONE AVE		02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2016/10/12 04:00:00+00	2016	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2016/06/11 04:00:00+00	2016	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	99 - Other	02 - Rain	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	0
2015/11/25 05:00:00+00	2015	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2018/07/22 00:00:00+00	2018	BOOTH ST @ GLADSTONE AVE (0002211)	02 - Intersection related	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
2018/08/13 00:00:00+00	2018	BOOTH ST @ GLADSTONE AVE (0002211)	03 - At intersection	03 - P.D. only	05 - Turning movement	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning	0
3/15/2019	2019	BOOTH ST @ GLADSTONE AVE (0002211)	03 - At intersection	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	
2/28/2017 5:00:00 AM	2017	BOOTH ST @ GLADSTONE AVE	02 - Intersection related	03 - P.D. only	99 - Other	02 - Rain	07 - Dark	02 - Wet	01 - Traffic signal		
5/21/2017 4:00:00 AM	2017	BOOTH ST @ GLADSTONE AVE	03 - At intersection	02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		
2015/01/12 05:00:00+00	2015	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	05 - Turning movement	03 - Snow	03 - Dawn	03 - Loose snow	01 - Traffic signal	01 - Functioning	0
2016/02/17 05:00:00+00	2016	BOOTH ST @ GLADSTONE AVE		03 - P.D. only	03 - Rear end	03 - Snow	07 - Dark	05 - Packed snow	01 - Traffic signal	01 - Functioning	0
8/4/2017 4:00:00 AM	2017	BOOTH ST @ GLADSTONE AVE	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	02 - Wet	01 - Traffic signal		
11/13/2019	2019	BOOTH ST @ GLADSTONE AVE (0002211)	02 - Intersection related	03 - P.D. only	04 - Sideswipe	01 - Clear	05 - Dusk	04 - Slush	01 - Traffic signal	01 - Functioning	
3/10/2017 5:00:00 AM	2017	BOOTH ST @ GLADSTONE AVE	02 - Intersection related	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		
1/3/2017 5:00:00 AM	2017	BOOTH ST btwn BALSAM ST & GLADSTONE AVE	01 - Non intersection	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	06 - Ice	10 - No control		
11/12/2019	2019	BOOTH ST btwn BALSAM ST & GLADSTONE AVE (__3ZA314)	01 - Non intersection	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	02 - Wet	10 - No control		
2016/07/14 04:00:00+00	2016	BALSAM ST @ ROCHESTER ST		03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	0
2016/05/09 04:00:00+00	2016	GLADSTONE AVE btwn BOOTH ST & LEBRETON ST N		02 - Non-fatal injury	07 - SMV other	01 - Clear	03 - Dawn	01 - Dry	10 - No control		1
2015/07/03 04:00:00+00	2015	BALSAM ST @ ROCHESTER ST		03 - P.D. only	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	0
9/13/2019	2019	BALSAM ST @ ROCHESTER ST (0006571)	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	
12/7/2019	2019	BALSAM ST @ ROCHESTER ST (0006571)	03 - At intersection	03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	02 - Wet	02 - Stop sign	01 - Functioning	
2018/06/13 00:00:00+00	2018	BALSAM ST @ ROCHESTER ST (0006571)	03 - At intersection	02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	0
2018/04/29 00:00:00+00	2018	BALSAM ST @ ROCHESTER ST (0006571)	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	02 - Not functioning	0
2016/09/27 04:00:00+00	2016	BALSAM ST @ ROCHESTER ST		03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	0
7/13/2017 4:00:00 AM	2017	BALSAM ST @ ROCHESTER ST	02 - Intersection related	02 - Non-fatal injury	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign		
10/10/2019	2019	GLADSTONE AVE btwn PRESTON ST & ROCHESTER ST (__3ZA31S	01 - Non intersection	02 - Non-fatal injury	03 - Rear end	01 - Clear	07 - Dark	01 - Dry	10 - No control		
2018/06/03 00:00:00+00	2018	ROCHESTER ST btwn GLADSTONE AVE & HWY417 IC121B RAMP1	01 - Non intersection	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
6/9/2017 4:00:00 AM	2017	ROCHESTER ST btwn GLADSTONE AVE & HWY417 IC121B RAMP1	01 - Non intersection	03 - P.D. only	06 - SMV unattended vehic	01 - Clear	07 - Dark	01 - Dry	10 - No control		
2015/03/15 04:00:00+00	2015	BALSAM ST @ BOOTH ST		03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	02 - Wet	02 - Stop sign	01 - Functioning	0
2015/09/10 04:00:00+00	2015	GLADSTONE AVE btwn PRESTON ST & ROCHESTER ST		03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
4/23/2019	2019	BOOTH ST btwn WILLOW ST & BALSAM ST (__3ZA31A)	01 - Non intersection	03 - P.D. only	06 - SMV unattended vehic	01 - Clear	00 - Unknown	01 - Dry	10 - No control		

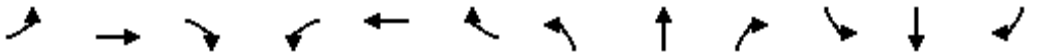
Appendix C

Existing and Background Conditions Synchro Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	26	21	9	4	9	178	32	3	255	4
Future Volume (vph)	1	2	26	21	9	4	9	178	32	3	255	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	35	0	0	230	0	0	275	0
Sign Control		Stop			Stop			Free			Free	

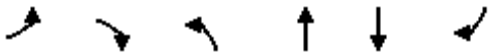
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 33.2%	ICU Level of Service A
Analysis Period (min) 15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	26	21	9	4	9	178	32	3	255	4
Future Volume (Veh/h)	1	2	26	21	9	4	9	178	32	3	255	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	27	22	9	4	9	187	34	3	268	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								73				
pX, platoon unblocked												
vC, conflicting volume	506	515	270	526	500	204	272			221		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	506	515	270	526	500	204	272			221		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	95	98	100	99			100		
cM capacity (veh/h)	464	459	769	442	468	837	1291			1348		

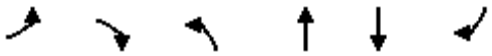
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	35	230	275
Volume Left	1	22	9	3
Volume Right	27	4	34	4
cSH	721	474	1291	1348
Volume to Capacity	0.04	0.07	0.01	0.00
Queue Length 95th (m)	0.9	1.7	0.1	0.0
Control Delay (s)	10.2	13.2	0.4	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	10.2	13.2	0.4	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	33.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	7	17	317	242	15
Future Volume (vph)	33	7	17	317	242	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	0	352	271	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 42.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	7	17	317	242	15
Future Volume (Veh/h)	33	7	17	317	242	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	35	7	18	334	255	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				55		
pX, platoon unblocked	0.98					
vC, conflicting volume	633	263	271			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	617	263	271			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	99	99			
cM capacity (veh/h)	439	776	1292			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	42	352	271
Volume Left	35	18	0
Volume Right	7	0	16
cSH	473	1292	1700
Volume to Capacity	0.09	0.01	0.16
Queue Length 95th (m)	2.0	0.3	0.0
Control Delay (s)	13.3	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	13.3	0.5	0.0
Approach LOS	B		

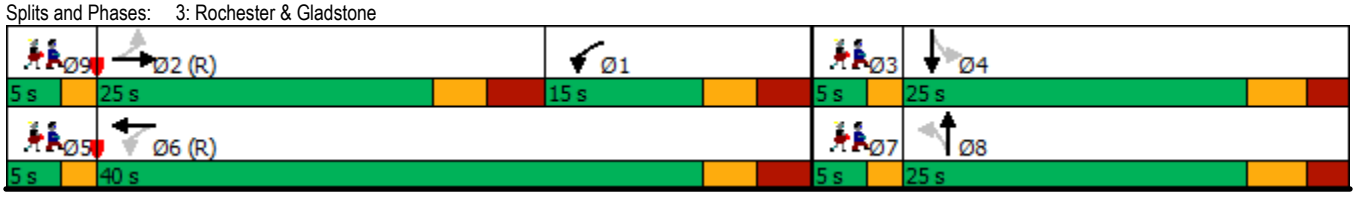
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	262	71	64	205	16	135	151	115	25	218	12
Future Volume (vph)	11	262	71	64	205	16	135	151	115	25	218	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	363	0	67	233	0	142	280	0	0	268	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		11.2	28.2		26.8	26.8		26.8	26.8	
Total Split (s)	25.0	25.0		15.0	40.0		25.0	25.0		25.0	25.0	
Total Split (%)	33.3%	33.3%		20.0%	53.3%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.2	3.2		3.2	3.2		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.2		6.2	6.2		5.8	5.8			5.8	
Lead/Lag	Lag	Lag			Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		21.8		33.8	33.8		19.2	19.2			19.2	
Actuated g/C Ratio		0.29		0.45	0.45		0.26	0.26			0.26	
v/c Ratio		0.72		0.15	0.29		0.66	0.61			0.63	
Control Delay		34.9		8.6	8.7		42.1	26.8			32.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		34.9		8.6	8.7		42.1	26.8			32.2	
LOS		C		A	A		D	C			C	
Approach Delay		34.9			8.7			31.9			32.2	
Approach LOS		C			A			C			C	
Queue Length 50th (m)		42.8		3.7	14.9		16.5	26.3			30.6	
Queue Length 95th (m)		#82.7		m6.0	m20.8		#39.2	48.1			52.3	
Internal Link Dist (m)		40.8			95.4			50.0			49.1	
Turn Bay Length (m)				35.0			35.0					
Base Capacity (vph)		503		441	790		216	458			425	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	
Reduced v/c Ratio		0.72		0.15	0.29		0.66	0.61			0.63	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 3 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 27.6	Intersection LOS: C
Intersection Capacity Utilization 82.3%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Rochester & Gladstone



Lane Group	Ø3	Ø5	Ø7	Ø9
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	5	7	9
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	2.0	2.0	2.0	2.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
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				

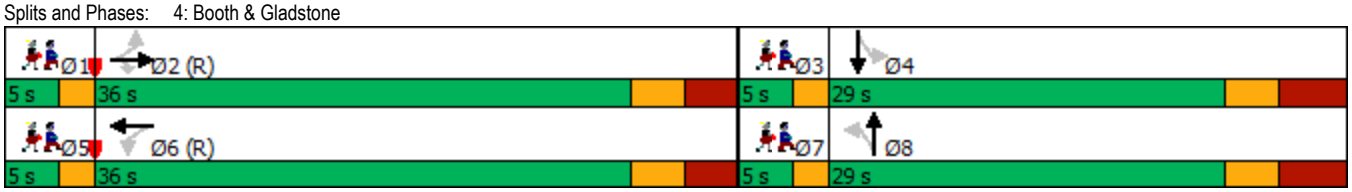
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	284	5	23	199	36	100	202	47	34	123	85
Future Volume (vph)	79	284	5	23	199	36	100	202	47	34	123	85
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	299	5	24	247	0	0	367	0	0	254	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Minimum Split (s)	22.1	22.1	22.1	22.1	22.1		23.9	23.9		23.9	23.9	
Total Split (s)	36.0	36.0	36.0	36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (%)	48.0%	48.0%	48.0%	48.0%	48.0%		38.7%	38.7%		38.7%	38.7%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.1	3.1	3.1	3.1	3.1		3.9	3.9		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1			6.9			6.9	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)	29.9	29.9	29.9	29.9	29.9			22.1			22.1	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40			0.29			0.29	
v/c Ratio	0.20	0.43	0.01	0.07	0.35			0.89			0.54	
Control Delay	12.1	15.1	0.0	14.7	16.6			51.6			23.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	12.1	15.1	0.0	14.7	16.6			51.6			23.9	
LOS	B	B	A	B	B			D			C	
Approach Delay		14.3			16.4			51.6			23.9	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	4.5	25.3	0.0	1.9	20.4			44.3			23.3	
Queue Length 95th (m)	m7.5	m47.9	m0.0	6.0	35.8			#88.6			43.2	
Internal Link Dist (m)		95.4			42.7			60.8			31.6	
Turn Bay Length (m)	40.0		30.0	30.0								
Base Capacity (vph)	411	703	667	367	696			411			469	
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	0.20	0.43	0.01	0.07	0.35			0.89			0.54	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 16 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 27.4	Intersection LOS: C
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

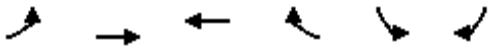
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Booth & Gladstone



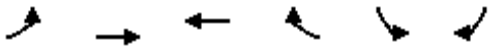
Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	40	34	0	0	0
Future Volume (vph)	0	40	34	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	42	36	0	0	0
Sign Control		Free	Free		Stop	

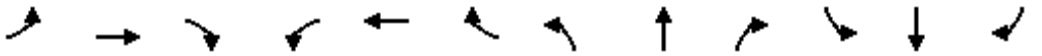
Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 6.7%		ICU Level of Service A
Analysis Period (min) 15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	40	34	0	0	0
Future Volume (Veh/h)	0	40	34	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	42	36	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	36				78	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36				78	36
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1575				925	1037

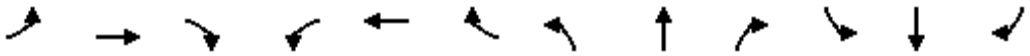
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	42	36	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1575	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	13	21	12	7	4	5	214	38	4	165	4
Future Volume (vph)	7	13	21	12	7	4	5	214	38	4	165	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	24	0	0	270	0	0	182	0
Sign Control		Stop			Stop			Free			Free	

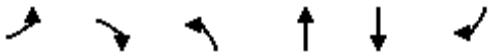
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 26.9%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	13	21	12	7	4	5	214	38	4	165	4
Future Volume (Veh/h)	7	13	21	12	7	4	5	214	38	4	165	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	14	22	13	7	4	5	225	40	4	174	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								73				
pX, platoon unblocked	0.91	0.91		0.91	0.91	0.91				0.91		
vC, conflicting volume	446	459	176	468	441	245	178			265		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	343	356	176	366	337	121	178			143		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	97	97	99	100	100			100		
cM capacity (veh/h)	546	515	867	510	528	847	1398			1310		

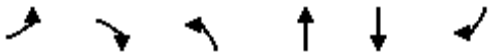
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	24	270	182
Volume Left	7	13	5	4
Volume Right	22	4	40	4
cSH	658	552	1398	1310
Volume to Capacity	0.07	0.04	0.00	0.00
Queue Length 95th (m)	1.5	1.0	0.1	0.1
Control Delay (s)	10.9	11.8	0.2	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	10.9	11.8	0.2	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	26.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	13	13	385	237	11
Future Volume (vph)	43	13	13	385	237	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	59	0	0	419	261	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	13	13	385	237	11
Future Volume (Veh/h)	43	13	13	385	237	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	45	14	14	405	249	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				55		
pX, platoon unblocked	0.79					
vC, conflicting volume	688	255	261			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	471	255	261			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	99			
cM capacity (veh/h)	430	784	1303			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	59	419	261
Volume Left	45	14	0
Volume Right	14	0	12
cSH	482	1303	1700
Volume to Capacity	0.12	0.01	0.15
Queue Length 95th (m)	2.9	0.2	0.0
Control Delay (s)	13.5	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	13.5	0.4	0.0
Approach LOS	B		

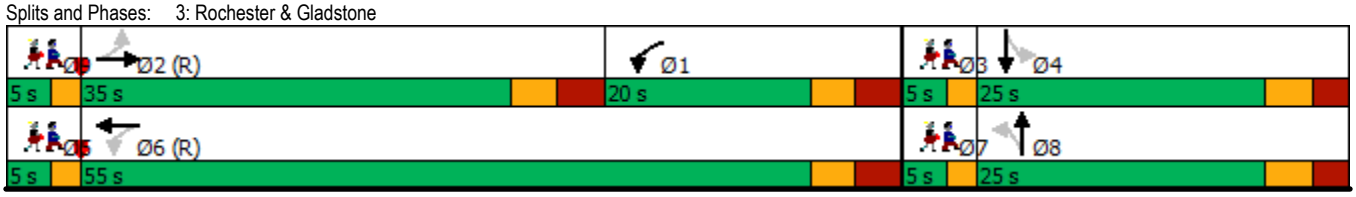
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	315	71	93	438	21	104	175	109	15	135	15
Future Volume (vph)	18	315	71	93	438	21	104	175	109	15	135	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	426	0	98	483	0	109	299	0	0	174	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		11.2	28.2		26.8	26.8		26.8	26.8	
Total Split (s)	35.0	35.0		20.0	55.0		25.0	25.0		25.0	25.0	
Total Split (%)	38.9%	38.9%		22.2%	61.1%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.2	3.2		3.2	3.2		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.2		6.2	6.2		5.8	5.8			5.8	
Lead/Lag	Lag	Lag			Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		32.8		48.8	48.8		19.2	19.2			19.2	
Actuated g/C Ratio		0.36		0.54	0.54		0.21	0.21			0.21	
v/c Ratio		0.69		0.19	0.51		0.52	0.79			0.55	
Control Delay		32.9		15.2	18.4		41.3	46.4			38.2	
Queue Delay		0.0		0.0	1.3		0.0	0.0			0.0	
Total Delay		32.9		15.2	19.7		41.3	46.4			38.2	
LOS		C		B	B		D	D			D	
Approach Delay		32.9			18.9			45.1			38.2	
Approach LOS		C			B			D			D	
Queue Length 50th (m)		59.4		9.4	55.1		15.4	40.6			24.1	
Queue Length 95th (m)		#101.1		m16.4	m72.0		30.8	#76.7			42.8	
Internal Link Dist (m)		40.8			95.4			50.0			49.1	
Turn Bay Length (m)				35.0			35.0					
Base Capacity (vph)		615		531	951		211	379			316	
Starvation Cap Reductn		0		0	264		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	
Reduced v/c Ratio		0.69		0.18	0.70		0.52	0.79			0.55	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 31.5	Intersection LOS: C
Intersection Capacity Utilization 89.8%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Rochester & Gladstone



Lane Group	Ø3	Ø5	Ø7	Ø9
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	5	7	9
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	2.0	2.0	2.0	2.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
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				

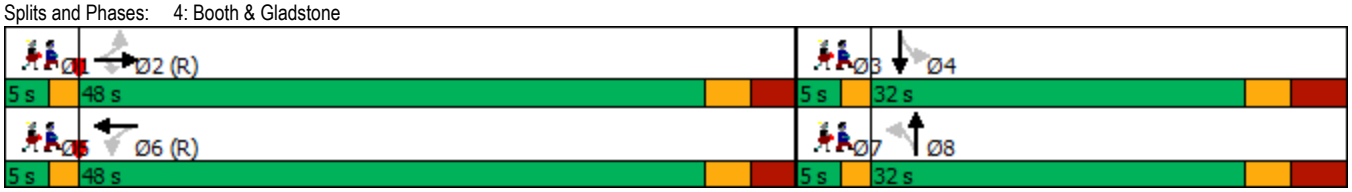
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	344	28	39	327	28	84	255	35	36	121	80
Future Volume (vph)	102	344	28	39	327	28	84	255	35	36	121	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	362	29	41	373	0	0	393	0	0	249	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Minimum Split (s)	22.1	22.1	22.1	22.1	22.1		23.9	23.9		23.9	23.9	
Total Split (s)	48.0	48.0	48.0	48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		35.6%	35.6%		35.6%	35.6%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.1	3.1	3.1	3.1	3.1		3.9	3.9		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1			6.9			6.9	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)	41.9	41.9	41.9	41.9	41.9			25.1			25.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47			0.28			0.28	
v/c Ratio	0.29	0.44	0.04	0.11	0.46			0.99			0.60	
Control Delay	26.1	27.1	3.3	14.6	18.3			77.5			31.7	
Queue Delay	0.0	0.9	0.0	0.0	0.0			0.0			0.0	
Total Delay	26.1	28.0	3.3	14.6	18.3			77.5			31.7	
LOS	C	C	A	B	B			E			C	
Approach Delay		26.1			18.0			77.5			31.7	
Approach LOS		C			B			E			C	
Queue Length 50th (m)	13.4	45.5	0.0	3.5	38.1			61.4			30.2	
Queue Length 95th (m)	m19.3	m62.4	m0.0	9.0	59.4			#114.4			52.9	
Internal Link Dist (m)		95.4			42.7			60.8			31.6	
Turn Bay Length (m)	40.0		30.0	30.0								
Base Capacity (vph)	374	821	749	383	815			396			417	
Starvation Cap Reductn	0	232	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	0.29	0.61	0.04	0.11	0.46			0.99			0.60	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 37.8	Intersection LOS: D
Intersection Capacity Utilization 77.2%	ICU Level of Service D
Analysis Period (min) 15	

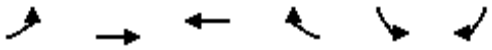
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Booth & Gladstone



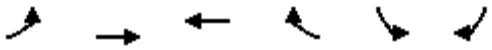
Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	56	23	0	0	0
Future Volume (vph)	0	56	23	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	59	24	0	0	0
Sign Control		Free	Free		Stop	

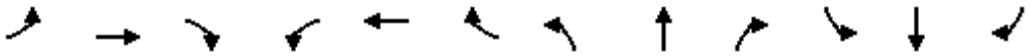
Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 6.7%		ICU Level of Service A
Analysis Period (min) 15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	56	23	0	0	0
Future Volume (Veh/h)	0	56	23	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	59	24	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	24				83	24
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	24				83	24
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1591				919	1052

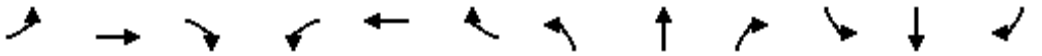
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	59	24	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1591	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	26	21	9	4	9	180	32	3	257	4
Future Volume (vph)	1	2	26	21	9	4	9	180	32	3	257	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	35	0	0	232	0	0	278	0
Sign Control		Stop			Stop			Free			Free	

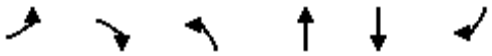
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 33.3%	ICU Level of Service A
Analysis Period (min) 15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	26	21	9	4	9	180	32	3	257	4
Future Volume (Veh/h)	1	2	26	21	9	4	9	180	32	3	257	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	27	22	9	4	9	189	34	3	271	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								73				
pX, platoon unblocked												
vC, conflicting volume	512	520	273	531	505	206	275			223		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512	520	273	531	505	206	275			223		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	95	98	100	99			100		
cM capacity (veh/h)	460	456	766	438	465	835	1288			1346		

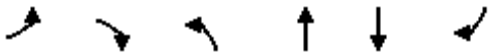
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	35	232	278
Volume Left	1	22	9	3
Volume Right	27	4	34	4
cSH	717	471	1288	1346
Volume to Capacity	0.04	0.07	0.01	0.00
Queue Length 95th (m)	0.9	1.7	0.1	0.0
Control Delay (s)	10.2	13.3	0.4	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	10.2	13.3	0.4	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	33.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	7	17	319	242	15
Future Volume (vph)	33	7	17	319	242	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	0	354	271	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 42.4%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	7	17	319	242	15
Future Volume (Veh/h)	33	7	17	319	242	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	35	7	18	336	255	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				55		
pX, platoon unblocked	0.98					
vC, conflicting volume	635	263	271			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	619	263	271			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	99	99			
cM capacity (veh/h)	438	776	1292			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	42	354	271
Volume Left	35	18	0
Volume Right	7	0	16
cSH	472	1292	1700
Volume to Capacity	0.09	0.01	0.16
Queue Length 95th (m)	2.0	0.3	0.0
Control Delay (s)	13.4	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	13.4	0.5	0.0
Approach LOS	B		

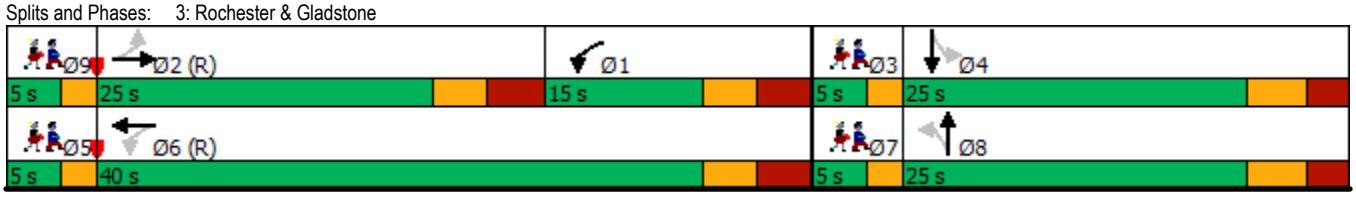
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	262	71	64	205	16	136	153	122	25	220	12
Future Volume (vph)	11	262	71	64	205	16	136	153	122	25	220	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	363	0	67	233	0	143	289	0	0	271	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		11.2	28.2		26.8	26.8		26.8	26.8	
Total Split (s)	25.0	25.0		15.0	40.0		25.0	25.0		25.0	25.0	
Total Split (%)	33.3%	33.3%		20.0%	53.3%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.2	3.2		3.2	3.2		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.2		6.2	6.2		5.8	5.8			5.8	
Lead/Lag	Lag	Lag			Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		21.8		33.8	33.8		19.2	19.2			19.2	
Actuated g/C Ratio		0.29		0.45	0.45		0.26	0.26			0.26	
v/c Ratio		0.72		0.15	0.29		0.67	0.63			0.64	
Control Delay		34.9		8.6	8.7		43.0	27.3			32.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		34.9		8.6	8.7		43.0	27.3			32.4	
LOS		C		A	A		D	C			C	
Approach Delay		34.9			8.7			32.5			32.4	
Approach LOS		C			A			C			C	
Queue Length 50th (m)		42.8		3.7	14.9		16.7	27.3			31.0	
Queue Length 95th (m)		#82.7		m5.9	m21.0		#39.8	49.7			52.9	
Internal Link Dist (m)		40.8			95.4			50.0			49.1	
Turn Bay Length (m)				35.0			35.0					
Base Capacity (vph)		503		441	790		214	459			425	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	
Reduced v/c Ratio		0.72		0.15	0.29		0.67	0.63			0.64	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 3 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 83.0%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Rochester & Gladstone



Lane Group	Ø3	Ø5	Ø7	Ø9
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	5	7	9
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	2.0	2.0	2.0	2.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
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				

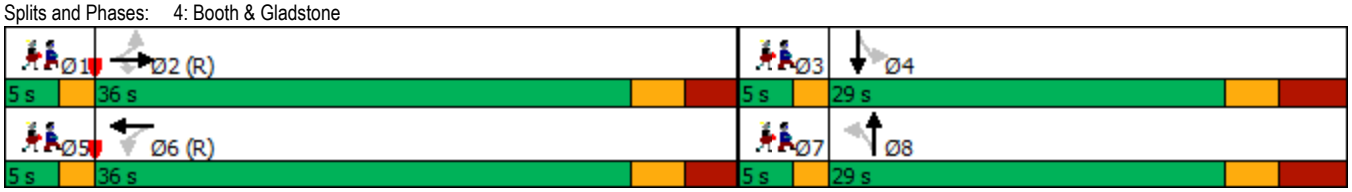
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	291	5	24	199	36	100	204	48	34	123	85
Future Volume (vph)	79	291	5	24	199	36	100	204	48	34	123	85
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	306	5	25	247	0	0	371	0	0	254	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Minimum Split (s)	22.1	22.1	22.1	22.1	22.1		23.9	23.9		23.9	23.9	
Total Split (s)	36.0	36.0	36.0	36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (%)	48.0%	48.0%	48.0%	48.0%	48.0%		38.7%	38.7%		38.7%	38.7%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.1	3.1	3.1	3.1	3.1		3.9	3.9		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1			6.9			6.9	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)	29.9	29.9	29.9	29.9	29.9			22.1			22.1	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40			0.29			0.29	
v/c Ratio	0.20	0.44	0.01	0.07	0.35			0.90			0.54	
Control Delay	12.4	15.6	0.0	14.8	16.6			52.3			23.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	12.4	15.6	0.0	14.8	16.6			52.3			23.9	
LOS	B	B	A	B	B			D			C	
Approach Delay		14.7			16.4			52.3			23.9	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	4.7	27.2	0.0	2.0	20.4			44.8			23.3	
Queue Length 95th (m)	m7.6	m51.2	m0.0	6.2	35.8			#89.7			43.3	
Internal Link Dist (m)		95.4			42.7			60.8			31.6	
Turn Bay Length (m)	40.0		30.0	30.0								
Base Capacity (vph)	411	703	667	361	696			413			468	
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	0.20	0.44	0.01	0.07	0.35			0.90			0.54	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 16 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 27.7	Intersection LOS: C
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

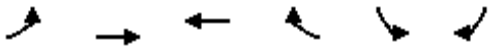
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Booth & Gladstone



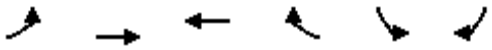
Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	40	34	0	0	0
Future Volume (vph)	0	40	34	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	42	36	0	0	0
Sign Control		Free	Free		Stop	

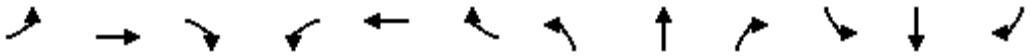
Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 6.7%		ICU Level of Service A
Analysis Period (min) 15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	40	34	0	0	0
Future Volume (Veh/h)	0	40	34	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	42	36	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	36				78	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36				78	36
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1575				925	1037

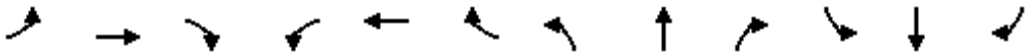
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	42	36	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1575	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	13	21	12	7	4	5	215	38	4	175	4
Future Volume (vph)	7	13	21	12	7	4	5	215	38	4	175	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	24	0	0	271	0	0	192	0
Sign Control		Stop			Stop			Free			Free	

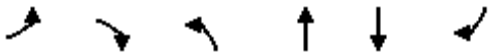
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 27.0%	ICU Level of Service A
Analysis Period (min) 15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	13	21	12	7	4	5	215	38	4	175	4
Future Volume (Veh/h)	7	13	21	12	7	4	5	215	38	4	175	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	14	22	13	7	4	5	226	40	4	184	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								73				
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	458	470	186	479	452	246	188			266		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380	393	186	403	374	152	188			174		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	97	97	99	100	100			100		
cM capacity (veh/h)	527	502	856	493	515	832	1386			1305		

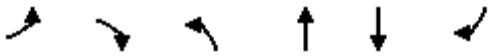
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	24	271	192
Volume Left	7	13	5	4
Volume Right	22	4	40	4
cSH	643	536	1386	1305
Volume to Capacity	0.07	0.04	0.00	0.00
Queue Length 95th (m)	1.5	1.0	0.1	0.1
Control Delay (s)	11.0	12.0	0.2	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	11.0	12.0	0.2	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	13	13	387	238	11
Future Volume (vph)	43	13	13	387	238	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	59	0	0	421	263	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 42.6%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	13	13	387	238	11
Future Volume (Veh/h)	43	13	13	387	238	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	45	14	14	407	251	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				55		
pX, platoon unblocked	0.79					
vC, conflicting volume	692	257	263			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	472	257	263			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	98	99			
cM capacity (veh/h)	428	782	1301			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	59	421	263
Volume Left	45	14	0
Volume Right	14	0	12
cSH	479	1301	1700
Volume to Capacity	0.12	0.01	0.15
Queue Length 95th (m)	2.9	0.2	0.0
Control Delay (s)	13.6	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	13.6	0.4	0.0
Approach LOS	B		

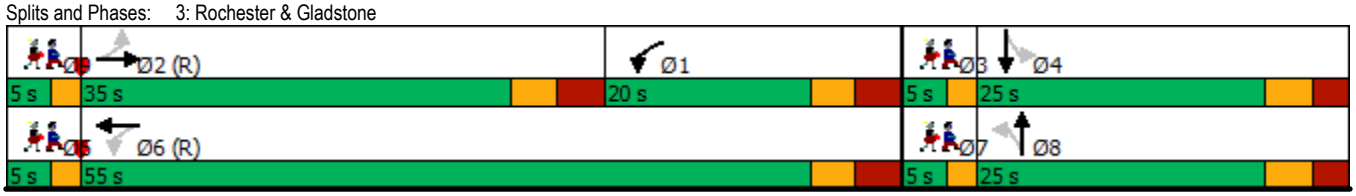
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	315	75	97	438	21	105	176	114	15	145	15
Future Volume (vph)	18	315	75	97	438	21	105	176	114	15	145	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	430	0	102	483	0	111	305	0	0	185	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		11.2	28.2		26.8	26.8		26.8	26.8	
Total Split (s)	35.0	35.0		20.0	55.0		25.0	25.0		25.0	25.0	
Total Split (%)	38.9%	38.9%		22.2%	61.1%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.2	3.2		3.2	3.2		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.2		6.2	6.2		5.8	5.8			5.8	
Lead/Lag	Lag	Lag			Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		32.8		48.8	48.8		19.2	19.2			19.2	
Actuated g/C Ratio		0.36		0.54	0.54		0.21	0.21			0.21	
v/c Ratio		0.70		0.20	0.51		0.55	0.80			0.60	
Control Delay		33.2		13.7	15.1		43.2	47.6			40.1	
Queue Delay		0.0		0.0	1.5		0.0	0.0			0.0	
Total Delay		33.2		13.7	16.5		43.2	47.6			40.1	
LOS		C		B	B		D	D			D	
Approach Delay		33.2			16.1			46.4			40.1	
Approach LOS		C			B			D			D	
Queue Length 50th (m)		60.1		6.5	32.5		15.8	41.6			26.0	
Queue Length 95th (m)		#102.5		m13.4	m62.7		31.7	#78.9			45.7	
Internal Link Dist (m)		40.8			95.4			50.0			49.1	
Turn Bay Length (m)				35.0			35.0					
Base Capacity (vph)		615		529	951		202	380			310	
Starvation Cap Reductn		0		0	282		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	
Reduced v/c Ratio		0.70		0.19	0.72		0.55	0.80			0.60	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 20 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 93.0%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Rochester & Gladstone



Lane Group	Ø3	Ø5	Ø7	Ø9
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	5	7	9
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	2.0	2.0	2.0	2.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
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				

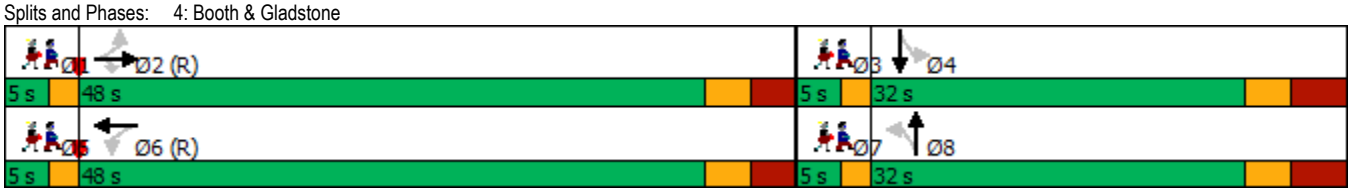
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	349	28	41	331	28	84	257	36	36	122	80
Future Volume (vph)	102	349	28	41	331	28	84	257	36	36	122	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	367	29	43	377	0	0	397	0	0	250	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Minimum Split (s)	22.1	22.1	22.1	22.1	22.1		23.9	23.9		23.9	23.9	
Total Split (s)	48.0	48.0	48.0	48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		35.6%	35.6%		35.6%	35.6%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.1	3.1	3.1	3.1	3.1		3.9	3.9		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1			6.9			6.9	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)	41.9	41.9	41.9	41.9	41.9			25.1			25.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47			0.28			0.28	
v/c Ratio	0.29	0.45	0.04	0.11	0.46			1.00			0.60	
Control Delay	22.7	24.0	1.4	14.7	18.4			80.1			31.8	
Queue Delay	0.0	1.4	0.0	0.0	0.0			0.0			0.0	
Total Delay	22.7	25.4	1.4	14.7	18.4			80.1			31.8	
LOS	C	C	A	B	B			F			C	
Approach Delay		23.5			18.0			80.1			31.8	
Approach LOS		C			B			F			C	
Queue Length 50th (m)	16.2	57.1	0.0	3.7	38.7			~62.5			30.4	
Queue Length 95th (m)	m24.3	m79.5	m0.0	9.4	60.1			#116.1			53.1	
Internal Link Dist (m)		95.4			42.7			60.8			31.6	
Turn Bay Length (m)	40.0		30.0	30.0								
Base Capacity (vph)	371	821	749	379	815			396			417	
Starvation Cap Reductn	0	268	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	0.29	0.66	0.04	0.11	0.46			1.00			0.60	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 60		
Control Type: Pretimed		
Maximum v/c Ratio: 1.00		
Intersection Signal Delay: 37.6	Intersection LOS: D	
Intersection Capacity Utilization 77.7%	ICU Level of Service D	
Analysis Period (min) 15		

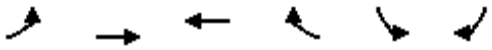
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Booth & Gladstone



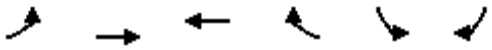
Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	56	23	0	0	0
Future Volume (vph)	0	56	23	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	59	24	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 6.7%		ICU Level of Service A
Analysis Period (min) 15		



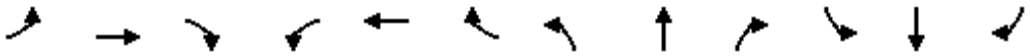
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	56	23	0	0	0
Future Volume (Veh/h)	0	56	23	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	59	24	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	24				83	24
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	24				83	24
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1591				919	1052

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	59	24	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1591	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

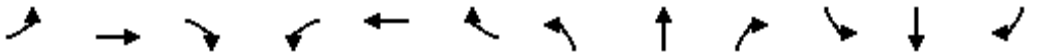
Appendix D

Future Conditions Synchro Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	26	25	9	4	9	180	33	3	257	4
Future Volume (vph)	1	2	26	25	9	4	9	180	33	3	257	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	0	0	39	0	0	233	0	0	278	0
Sign Control		Stop			Stop			Free			Free	

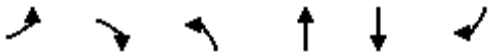
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 33.6%	ICU Level of Service A
Analysis Period (min) 15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	26	25	9	4	9	180	33	3	257	4
Future Volume (Veh/h)	1	2	26	25	9	4	9	180	33	3	257	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	2	27	26	9	4	9	189	35	3	271	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								73				
pX, platoon unblocked												
vC, conflicting volume	512	521	273	532	506	206	275			224		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512	521	273	532	506	206	275			224		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	94	98	100	99			100		
cM capacity (veh/h)	460	456	766	438	465	834	1288			1345		

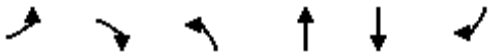
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	39	233	278
Volume Left	1	26	9	3
Volume Right	27	4	35	4
cSH	717	467	1288	1345
Volume to Capacity	0.04	0.08	0.01	0.00
Queue Length 95th (m)	0.9	1.9	0.1	0.0
Control Delay (s)	10.2	13.4	0.4	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	10.2	13.4	0.4	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	33.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	34	11	20	319	242	15
Future Volume (vph)	34	11	20	319	242	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	357	271	0
Sign Control	Stop			Free	Free	

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 45.0%		ICU Level of Service A
Analysis Period (min) 15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	11	20	319	242	15
Future Volume (Veh/h)	34	11	20	319	242	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	36	12	21	336	255	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				55		
pX, platoon unblocked	0.98					
vC, conflicting volume	641	263	271			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	625	263	271			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	98	98			
cM capacity (veh/h)	433	776	1292			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	48	357	271
Volume Left	36	21	0
Volume Right	12	0	16
cSH	487	1292	1700
Volume to Capacity	0.10	0.02	0.16
Queue Length 95th (m)	2.3	0.3	0.0
Control Delay (s)	13.2	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	13.2	0.6	0.0
Approach LOS	B		

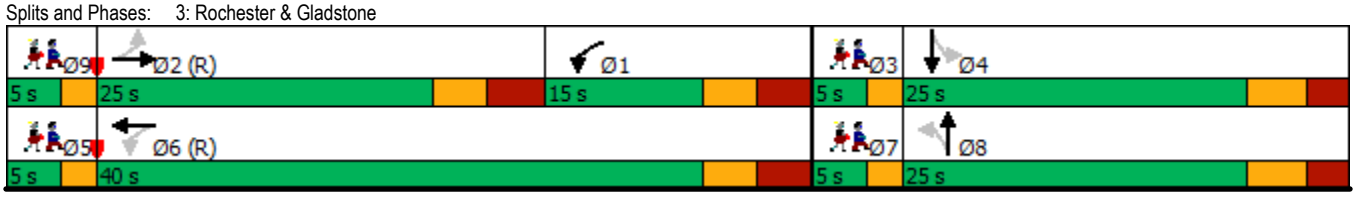
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	263	71	64	205	16	136	154	122	25	221	15
Future Volume (vph)	11	263	71	64	205	16	136	154	122	25	221	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	364	0	67	233	0	143	290	0	0	275	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		11.2	28.2		26.8	26.8		26.8	26.8	
Total Split (s)	25.0	25.0		15.0	40.0		25.0	25.0		25.0	25.0	
Total Split (%)	33.3%	33.3%		20.0%	53.3%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.2	3.2		3.2	3.2		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.2		6.2	6.2		5.8	5.8			5.8	
Lead/Lag	Lag	Lag			Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		None	C-Min		Max	Max		Max	Max	
Act Effct Green (s)		21.6		32.1	31.0		29.5	29.5			29.5	
Actuated g/C Ratio		0.29		0.43	0.41		0.39	0.39			0.39	
v/c Ratio		0.73		0.19	0.32		0.37	0.43			0.42	
Control Delay		33.9		10.7	11.1		23.0	18.3			21.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		33.9		10.7	11.1		23.0	18.3			21.4	
LOS		C		B	B		C	B			C	
Approach Delay		33.9			11.0			19.9			21.4	
Approach LOS		C			B			B			C	
Queue Length 50th (m)		38.7		2.3	9.5		13.5	22.7			26.1	
Queue Length 95th (m)		#83.1		m7.8	m28.2		32.1	49.1			52.6	
Internal Link Dist (m)		40.8			95.4			50.0			49.1	
Turn Bay Length (m)				35.0			35.0					
Base Capacity (vph)		499		429	809		388	678			657	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	
Reduced v/c Ratio		0.73		0.16	0.29		0.37	0.43			0.42	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 3 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 83.3%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Rochester & Gladstone



Lane Group	Ø3	Ø5	Ø7	Ø9
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	5	7	9
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	2.0	2.0	2.0	2.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	None	None	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				

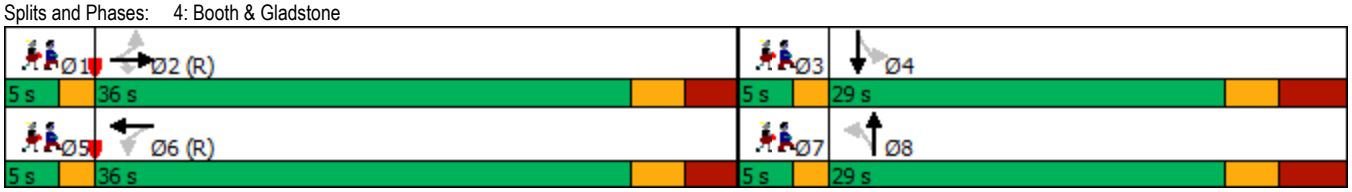
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	291	5	24	199	37	100	205	48	37	124	85
Future Volume (vph)	80	291	5	24	199	37	100	205	48	37	124	85
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	306	5	25	248	0	0	372	0	0	259	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Minimum Split (s)	22.1	22.1	22.1	22.1	22.1		23.9	23.9		23.9	23.9	
Total Split (s)	36.0	36.0	36.0	36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (%)	48.0%	48.0%	48.0%	48.0%	48.0%		38.7%	38.7%		38.7%	38.7%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.1	3.1	3.1	3.1	3.1		3.9	3.9		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1			6.9			6.9	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)	29.9	29.9	29.9	29.9	29.9			22.1			22.1	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40			0.29			0.29	
v/c Ratio	0.20	0.44	0.01	0.07	0.36			0.91			0.56	
Control Delay	15.2	18.5	0.0	14.8	16.6			53.4			24.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	15.2	18.5	0.0	14.8	16.6			53.4			24.6	
LOS	B	B	A	B	B			D			C	
Approach Delay		17.5			16.5			53.4			24.6	
Approach LOS		B			B			D			C	
Queue Length 50th (m)	7.9	40.4	0.0	2.0	20.5			45.1			24.1	
Queue Length 95th (m)	m8.8	m50.1	m0.0	6.2	35.9			#90.2			44.6	
Internal Link Dist (m)		95.4			42.7			60.8			31.6	
Turn Bay Length (m)	40.0		30.0	30.0								
Base Capacity (vph)	410	703	667	361	695			411			462	
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	0.20	0.44	0.01	0.07	0.36			0.91			0.56	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 16 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 75.9%	ICU Level of Service D
Analysis Period (min) 15	

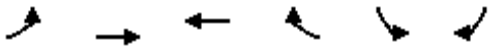
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Booth & Gladstone



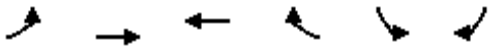
Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	40	34	3	5	4
Future Volume (vph)	1	40	34	3	5	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	39	0	9	0
Sign Control		Free	Free		Stop	

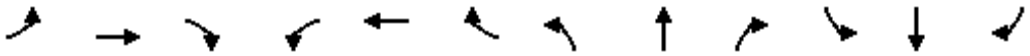
Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 13.3%		ICU Level of Service A
Analysis Period (min) 15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	40	34	3	5	4
Future Volume (Veh/h)	1	40	34	3	5	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	42	36	3	5	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	39				82	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				82	38
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1571				920	1035

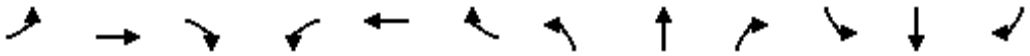
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	43	39	9
Volume Left	1	0	5
Volume Right	0	3	4
cSH	1571	1700	968
Volume to Capacity	0.00	0.02	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.2	0.0	8.8
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	13	21	14	7	4	5	215	39	4	175	4
Future Volume (vph)	7	13	21	14	7	4	5	215	39	4	175	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	26	0	0	272	0	0	192	0
Sign Control		Stop			Stop			Free			Free	

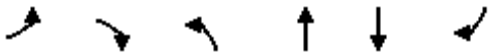
Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 27.5%	ICU Level of Service A
Analysis Period (min) 15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	13	21	14	7	4	5	215	39	4	175	4
Future Volume (Veh/h)	7	13	21	14	7	4	5	215	39	4	175	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	14	22	15	7	4	5	226	41	4	184	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								73				
pX, platoon unblocked	0.92	0.92		0.92	0.92	0.92				0.92		
vC, conflicting volume	458	471	186	480	452	246	188			267		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	372	386	186	395	366	143	188			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	97	97	99	100	100			100		
cM capacity (veh/h)	529	503	856	495	516	836	1386			1305		

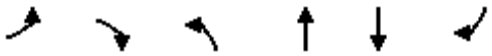
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	26	272	192
Volume Left	7	15	5	4
Volume Right	22	4	41	4
cSH	644	534	1386	1305
Volume to Capacity	0.07	0.05	0.00	0.00
Queue Length 95th (m)	1.5	1.1	0.1	0.1
Control Delay (s)	11.0	12.1	0.2	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	11.0	12.1	0.2	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	27.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	44	15	18	387	238	12
Future Volume (vph)	44	15	18	387	238	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	62	0	0	426	264	0
Sign Control	Stop			Free	Free	

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 47.2%	ICU Level of Service A	
Analysis Period (min) 15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	15	18	387	238	12
Future Volume (Veh/h)	44	15	18	387	238	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	46	16	19	407	251	13
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				55		
pX, platoon unblocked	0.78					
vC, conflicting volume	702	258	264			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	483	258	264			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	98	99			
cM capacity (veh/h)	419	781	1300			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	62	426	264
Volume Left	46	19	0
Volume Right	16	0	13
cSH	476	1300	1700
Volume to Capacity	0.13	0.01	0.16
Queue Length 95th (m)	3.1	0.3	0.0
Control Delay (s)	13.7	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	0.5	0.0
Approach LOS	B		

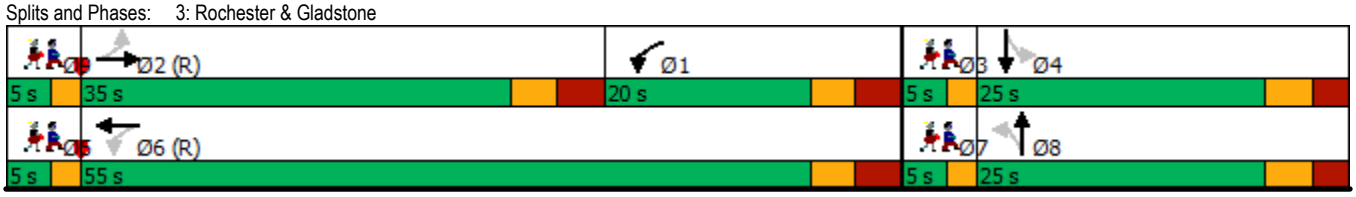
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	317	75	97	438	21	105	177	114	15	146	16
Future Volume (vph)	18	317	75	97	438	21	105	177	114	15	146	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	432	0	102	483	0	111	306	0	0	187	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		11.2	28.2		26.8	26.8		26.8	26.8	
Total Split (s)	35.0	35.0		20.0	55.0		25.0	25.0		25.0	25.0	
Total Split (%)	38.9%	38.9%		22.2%	61.1%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.2	3.2		3.2	3.2		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.2		6.2	6.2		5.8	5.8			5.8	
Lead/Lag	Lag	Lag			Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		None	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		32.8		48.8	48.8		19.2	19.2			19.2	
Actuated g/C Ratio		0.36		0.54	0.54		0.21	0.21			0.21	
v/c Ratio		0.70		0.20	0.51		0.55	0.81			0.60	
Control Delay		33.4		8.4	10.2		43.4	47.8			40.4	
Queue Delay		0.0		0.0	0.3		0.0	0.0			0.0	
Total Delay		33.4		8.4	10.5		43.4	47.8			40.4	
LOS		C		A	B		D	D			D	
Approach Delay		33.4			10.1			46.6			40.4	
Approach LOS		C			B			D			D	
Queue Length 50th (m)		60.5		5.9	33.7		15.9	41.7			26.3	
Queue Length 95th (m)		#103.2		m9.2	m46.6		31.8	#79.2			46.1	
Internal Link Dist (m)		40.8			95.4			50.0			49.1	
Turn Bay Length (m)				35.0			35.0					
Base Capacity (vph)		615		528	951		201	380			310	
Starvation Cap Reductn		0		0	115		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	
Reduced v/c Ratio		0.70		0.19	0.58		0.55	0.81			0.60	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 29.2	Intersection LOS: C
Intersection Capacity Utilization 93.3%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Rochester & Gladstone



Lane Group	Ø3	Ø5	Ø7	Ø9
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	5	7	9
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	2.0	2.0	2.0	2.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
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				

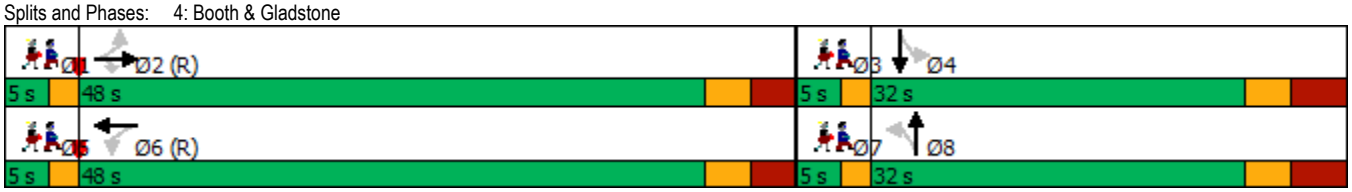
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	349	28	41	331	30	84	258	36	37	123	80
Future Volume (vph)	104	349	28	41	331	30	84	258	36	37	123	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	367	29	43	380	0	0	398	0	0	252	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Minimum Split (s)	22.1	22.1	22.1	22.1	22.1		23.9	23.9		23.9	23.9	
Total Split (s)	48.0	48.0	48.0	48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		35.6%	35.6%		35.6%	35.6%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.1	3.1	3.1	3.1	3.1		3.9	3.9		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1			6.9			6.9	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)	41.9	41.9	41.9	41.9	41.9			25.1			25.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47			0.28			0.28	
v/c Ratio	0.30	0.45	0.04	0.11	0.47			1.01			0.61	
Control Delay	11.0	12.3	0.1	14.7	18.5			81.3			32.1	
Queue Delay	0.0	1.8	0.0	0.0	0.0			0.0			0.0	
Total Delay	11.0	14.0	0.1	14.7	18.5			81.3			32.1	
LOS	B	B	A	B	B			F			C	
Approach Delay		12.6			18.1			81.3			32.1	
Approach LOS		B			B			F			C	
Queue Length 50th (m)	5.9	27.9	0.0	3.7	38.9			~63.1			30.8	
Queue Length 95th (m)	m10.1	m47.2	m0.0	9.4	60.7			#116.5			53.6	
Internal Link Dist (m)		95.4			42.7			60.8			31.6	
Turn Bay Length (m)	40.0		30.0	30.0								
Base Capacity (vph)	369	821	749	379	814			395			415	
Starvation Cap Reductn	0	294	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	0.30	0.70	0.04	0.11	0.47			1.01			0.61	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 77.6%	ICU Level of Service D
Analysis Period (min) 15	

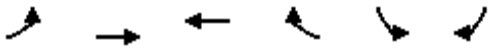
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Booth & Gladstone



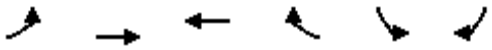
Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Peak Hour Factor				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?				
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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	56	23	6	3	2
Future Volume (vph)	1	56	23	6	3	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	60	30	0	5	0
Sign Control		Free	Free		Stop	

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 14.0%		ICU Level of Service A
Analysis Period (min) 15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	56	23	6	3	2
Future Volume (Veh/h)	1	56	23	6	3	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	59	24	6	3	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	30				88	27
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30				88	27
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1583				912	1048

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	60	30	5
Volume Left	1	0	3
Volume Right	0	6	2
cSH	1583	1700	962
Volume to Capacity	0.00	0.02	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.1	0.0	8.8
Lane LOS	A		A
Approach Delay (s)	0.1	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

Segments MMLOS Analysis

Multi-Modal Level of Service - Segments Form

Consultant	**J.L. Richards and Associates**	**Project**	**245 - 267 Rochester Street**
Scenario	**Existing Conditions**	**Date**	**23-Dec-22**
Comments			

SEGMENTS		**Street A**	Rochester East	Rochester West	Balsam North	Balsam South
Pedestrian	Sidewalk Width Boulevard Width	-	1.8 m < 0.5 m	≥ 2 m < 0.5	1.5 m < 0.5 m	1.5 m < 0.5 m
	Avg Daily Curb Lane Traffic Volume		≤ 3000	≤ 3000	≤ 3000	≤ 3000
	Operating Speed On-Street Parking		> 30 to 50 km/h yes	> 30 to 50 km/h yes	> 30 to 50 km/h no	> 30 to 50 km/h yes
	Exposure to Traffic PLoS		**B**	**B**	**E**	**E**
	Effective Sidewalk Width					
	Pedestrian Volume					
	Crowding PLoS		-	-	-	-
	Level of Service		**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility	**A**	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Number of Travel Lanes		≤ 2 (no centreline)	≤ 2 (no centreline)	≤ 2 (no centreline)	≤ 2 (no centreline)
	Operating Speed		≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h
	# of Lanes & Operating Speed LoS		**A**	**A**	**A**	**A**
	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	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h
	Unsignalized Crossing - Lowest LoS		**A**	**A**	**A**	**A**
	Level of Service		**A**	**A**	**A**	**A**
Transit	Facility Type	-				
	Friction or Ratio Transit:Posted Speed					
	Level of Service		**-**	**-**	**-**	**-**
Truck	Truck Lane Width	-				
	Travel Lanes per Direction					
	Level of Service		**-**	**-**	**-**	**-**

Appendix F

Collision Analysis

Total Area

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
03 - P.D. only	0	14	7	5	9	0	2	2	39	74%
02 - Non-fatal injury	0	5	1	0	4	0	3	1	14	26%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**19**	**8**	**5**	**13**	**0**	**5**	**3**	**53**	100%
	#7 or 0%	#1 or 36%	#3 or 15%	#4 or 9%	#2 or 25%	#7 or 0%	#4 or 9%	#6 or 6%		

GLADSTONE AVE @ ROCHESTER ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	24	n/a	1825	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
03 - P.D. only	0	6	3	2	3	0	1	0	15	63%
02 - Non-fatal injury	0	3	0	0	2	0	3	1	9	38%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**9**	**3**	**2**	**5**	**0**	**4**	**1**	**24**	100%
	0%	38%	13%	8%	21%	0%	17%	4%		

BOOTH ST @ GLADSTONE AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	20	n/a	1825	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
03 - P.D. only	0	4	4	2	5	0	0	2	17	85%
02 - Non-fatal injury	0	1	0	0	2	0	0	0	3	15%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**5**	**4**	**2**	**7**	**0**	**0**	**2**	**20**	100%
	0%	25%	20%	10%	35%	0%	0%	10%		

BALSAM ST @ ROCHESTER ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	8	n/a	1825	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
03 - P.D. only	0	3	0	1	1	0	1	0	6	75%
02 - Non-fatal injury	0	1	1	0	0	0	0	0	2	25%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**4**	**1**	**1**	**1**	**0**	**1**	**0**	**8**	100%
	0%	50%	13%	13%	13%	0%	13%	0%		

BALSAM ST @ BOOTH ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2015-2019	1	n/a	1825	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
03 - P.D. only	0	1	0	0	0	0	0	0	1	100%
02 - Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	100%
	0%	100%	0%	0%	0%	0%	0%	0%		

Appendix G

Intersections MMLOS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	**J.L. Richards and Associates**	**Project**	**245 - 267 Rochester Street**
Scenario	**Existing Conditions**	**Date**	**23-Dec-22**
Comments			

	INTERSECTIONS	Rochester/Gladstone				Booth/Gladstone			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	0 - 2	3	3	3	0 - 2	3	3	4
	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	No left turn / Prohib.	Protected/ 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	No right turn
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	Smart Channel	No Channel	Smart Channel
	Corner Radius	5-10m	5-10m	5-10m	5-10m	5-10m	5-10m	5-10m	5-10m
	Crosswalk Type	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings
	PETSI Score	**99**	**76**	**76**	**76**	**91**	**82**	**76**	**70**
	Ped. Exposure to Traffic LoS	**A**	**B**	**B**	**B**	**A**	**B**	**B**	**C**
	Cycle Length	90	90	90	90	90	90	90	90
	Effective Walk Time	47	27	19	19	43	43	25	25
	Average Pedestrian Delay	**10**	**22**	**28**	**28**	**12**	**12**	**23**	**23**
	Pedestrian Delay LoS	**B**	**C**	**C**	**C**	**B**	**B**	**C**	**C**
	Level of Service	**B**	**C**	**C**	**C**	**B**	**B**	**C**	**C**
		C				**C**			
	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	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h
	Cyclist relative to RT motorists	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**D**
	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	One lane crossed	No lane crossed	No lane crossed	No lane crossed	One lane crossed	One 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**	**D**	**B**	**B**	**B**	**D**	**D**
	Level of Service	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**D**
		D				**D**			
Transit	Average Signal Delay			≤ 20 sec	≤ 30 sec			≤ 30 sec	≤ 20 sec
	Level of Service	**-**	**-**	**C**	**D**	**-**	**-**	**D**	**C**
		D				**D**			
Truck	Effective Corner Radius	< 10 m	< 10 m	< 10 m	< 10 m	< 10 m	< 10 m	< 10 m	< 10 m
	Number of Receiving Lanes on Departure from Intersection	1	1	1	1	1	1	1	1
	Level of Service	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**
		F				**F**			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60			
	Level of Service	**A**				**A**			

Appendix H

Transportation Demand Checklists

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	☐ To be considered at time of construction
		1.2 Travel surveys	
BETTER		1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐ To be considered at time of construction
		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)*	☐N/A
		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)	☐N/A
		4. CARSHARING & BIKESHARING	
		4.1 Bikeshare stations & memberships	
BETTER		4.1.1 Contract with provider to install on-site bikeshare station (*multi-family)*	☐ To be considered at time of construction.
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)*	☐ N/A
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:
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	☑ Building is located at the corner of Balsam and Rochester Street. All vehicle and bicycle parking areas are underground.
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑ Building entrance is directly adjacent to existing sidewalk network.
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑ Building doors face Balsam Street. Building windows face both Balsam and Rochester Street and on-site pedestrian facilities.
	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)*	☑ Existing concrete sidewalks and pedestrian crossings will be utilized to integrate pedestrians into the existing pedestrian network.

	TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
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)*	☑ Existing concrete sidewalks and pedestrian crossings will be utilized to integrate pedestrians into the existing pedestrian network.
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)*	☑ Existing concrete sidewalks and pedestrian crosswalks are differentiable from vehicle areas.
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)*	☑ Existing sidewalks are easily accessible with gradual grade transitions and depressed curbs at street corners.
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)*	☑ Building entrance is directly adjacent to existing sidewalk network.
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑ Building entrance is directly adjacent to existing sidewalk network.
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑ Walking routes to transit stops are secure and visible
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	☐ N/A

	TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	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	☑ Lighting will be provided around the building exterior in conjunction with existing street lighting. Landscaping will be provided along walking routes between the building entrance and streets/sidewalks.
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)	☐ N/A
	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)*	☑ Bicycle parking is provided in the underground parking garage
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)*	☑ Bicycle parking exceeds the Zoning By-Law requirements
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)*	☑ Bicycle parking exceeds the Zoning By-Law requirements
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	☑ Bicycle parking exceeds the Zoning By-Law requirements
	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)*	☑ All bicycle parking spaces will be located in the underground parking garage
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☑ Bicycle parking spaces exceed the number of dwelling units

	TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	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	☐ N/A
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	☐ N/A
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ N/A
	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	☐ Given the proximity of the site to the future LRT station, less vehicle parking spaces than required have been provided to support multi-modal transportation and encourage alternative modes of travel. A Zoning By-Law variance can be applied for, if needed.

	TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
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)*	☐ N/A
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)	☐

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