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393 McArthur Avenue
Transportation Impact Assessment

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393 McArthur Avenue
Transportation Impact Assessment

Prepared By:

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December 2022

Novatech File: 121085
Ref: R-2022-186

December 5, 2022

City of Ottawa
Planning and Growth Management Department
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

Attention: Mr. Wally Dubyk
Project Manager, Infrastructure Approvals

Dear Mr. Dubyk:

Reference: 393 McArthur Avenue
Transportation Impact Assessment Report
Novatech File No. 121085

We are pleased to submit the following Transportation Impact Assessment (TIA) Report in support of Minor Zoning and Site Plan applications for the proposed development at 393 McArthur Avenue. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

If you have any questions or comments regarding this report, please feel free to contact the undersigned, or Jennifer Luong.

Yours truly,

NOVATECH



Rochelle Fortier, P.Eng.
Project Engineer | Transportation



TIA Plan Reports

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

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

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

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed¹ or registered² professional in good standing, whose field of expertise [check appropriate field(s)] is either transportation engineering or transportation planning .

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

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Dated at Ottawa this 5 day of December, 2022.
(City)

Name: Jennifer Luong, P.Eng.
(Please Print)

Professional Title: Senior Project Manager, Transportation/Traffic



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

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of Minor Zoning and Site Plan Control applications for 393 McArthur Avenue. The development will replace an existing gravel parking lot with access to McArthur Avenue.

The proposed development is a six-storey mixed-use building including 207m² of ground floor commercial space and 66 apartment units with 31 parking spaces (3 surface and 28 underground). A full movement driveway is proposed to Belisle Street approximately 50m north of McArthur Avenue. Buildout of the proposed development is anticipated in 2023.

The main conclusions and recommendations from this report are summarized below:

Development Design & Parking

- A new sidewalk will be provided on Belisle Street along the frontage of the proposed development, linking to the existing sidewalk on McArthur Avenue and the proposed building entrances.
- Proposed bicycle parking is shown on the ground floor of the building, with 35 spaces in the bike room. There will be an additional three bicycle parking spaces provided outdoors along the McArthur Avenue frontage of the site.
- The development has exterior access doors within a 100m walking distance from two OC Transpo stops. Stop #7066 is being relocated for this development. The proposed stop will continue to be along McArthur Avenue in front of the building. Riders will board / alight from the existing hard surface curbside along McArthur Avenue and can wait for the bus in the (canopy covered) 1.5m wide sloped private walkway area abutting the building. This area is accessible from the sidewalk along Belisle Street and includes stairway connections to McArthur Avenue.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- There is an existing layby on the west side of Belisle Street fronting the subject site. This layby is proposed to be maintained to serve as a drop-off location for people and deliveries to the apartment and commercial units.
- The proposed bicycle parking exceeds the requirements of the Zoning By-law.
- The proposed vehicle parking does not achieve the Zoning By-law requirement for visitor parking, and a zoning amendment is required, however, vehicle parking is 97% met and a review of spillover parking is not required.

Boundary Streets

- Belisle Street does not meet the target Pedestrian Level of Service (PLOS) or Bicycle Level of Service (BLOS).
 - The existing pathway on the east side achieves a PLOS C and the west side achieves a PLOS F. In order to achieve a PLOS A, a 1.8m sidewalk with a 2.0m boulevard or a 2.0m sidewalk with a minimum 0.5m boulevard would be required. As part of this development, a new 2.0m sidewalk with a boulevard will be constructed on the west side of Belisle Street along the frontage of the subject site. This new sidewalk will achieve a PLOS A.
 - Currently, there are no dedicated cycling facilities along Belisle Street and the operating speed is assumed to be 60km/h. A reduction in the operating speed to 50km/h would achieve a BLOS B. The Ontario Traffic Manual (OTM) *Book 18* –

Cycling Facilities desirable cycling facility pre-selection nomograph suggests a designated operating space (such as bike lanes) for a posted speed limit of 50km/h and average daily traffic volumes of 5,000vpd or less. Bike lanes would achieve a BLOS C. This is identified for the City's consideration.

- McArthur Avenue meets the target BLOS and Truck Level of Service (TkLOS) but does not meet the target PLOS or Transit Level of Service (TLOS).
 - Exhibit 4 of the MMLOS guidelines suggests that a PLOS A is not achievable for an operating speed of 50km/h or more and an AADT over 3,000vpd. The existing sidewalk on McArthur Avenue is 1.5m wide with a 1.2m asphalt boulevard and achieves a PLOS C. There are utility poles within the boulevard on the north side which limits the opportunity for a wider sidewalk.
 - McArthur Avenue does not currently meet the target TLOS D, based on moderate parking/driveway friction. The City's 2031 RTTP Network identifies McArthur Avenue as a Transit Priority Corridor with isolated measures. This transit priority project would improve the TLOS along McArthur Avenue.

Access Intersections Design

- The development will be served by one full movement access to Belisle Street.
- The proposed access will have a width of 6.0m and will be located approximately 50m north of McArthur Avenue.
- The proposed access will meet all requirements of the City's Private Approach By-law, Zoning By-law, and Transportation Association of Canada Geometric Design Guidelines.

Transportation Demand Management

- The following measures will be implemented upon opening of the proposed residential development:
 - Display local area maps with walking/cycling access routes and key destinations at major entrances;
 - Display relevant transit schedules and route maps at entrances;
 - Provide a multimodal travel option information package to new residents;
 - Unbundle parking cost from monthly rent;
 - Contract with provider to install on-site carshare vehicles and promote their use by residents; and,
 - Offer personalized trip planning to new residents.

1.0 SCREENING

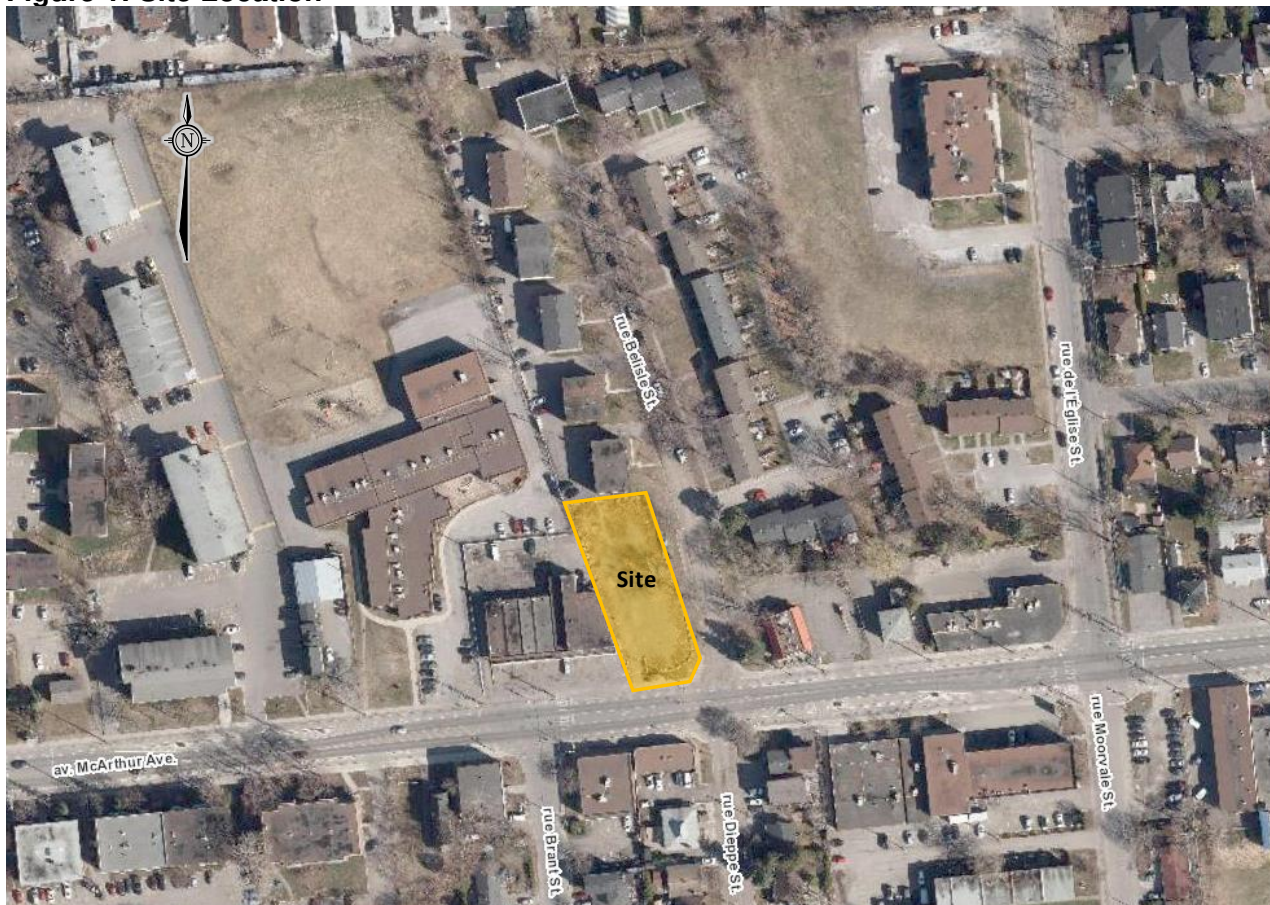
1.1 Introduction

This Transportation Impact Assessment (TIA) has been prepared in support of Minor Zoning and Site Plan Control applications for 393 McArthur Avenue. The development will replace an existing gravel parking lot with access to McArthur Avenue.

The subject site is surrounded by the following:

- residential development in the north,
- commercial and institutional (school) development in the west,
- Belisle Street and commercial development in the east, and
- McArthur Avenue and the McArthur Medical Centre to the south.

Figure 1: Site Location



1.2 Proposed Development

The subject site is within the Inner Urban Transect, is designated Mainstreet Corridor, and is within the Evolving Neighbourhood Overlay on Schedule B2 of the City of Ottawa's 2021 Official

Plan. The current zoning of the site is Traditional Mainstreet (TM). A minor variance is required to amend some performance standards for the development.

The proposed development is a six-storey mixed-use building including 207m² of ground floor commercial space and 66 apartment units with 31 parking spaces (3 surface and 28 underground). A full movement driveway is proposed to Belisle Street approximately 50m north of McArthur Avenue.

The site plan is included in **Appendix A**. Buildout of the proposed development is anticipated in 2023.

1.3 Screening Form

The City's 2017 TIA Guidelines identifies three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the TIA Screening Form (see **Appendix B**).

The trigger results are as follows:

- Trip Generation Trigger – The development is not anticipated to generate over 60 peak hour person trips; further assessment **is not required** based on this trigger.
- Location Triggers – The development site is within a Design Priority Area; further assessment **is required** based on this trigger.
- Safety Triggers – The development is within 150m of a signalized intersection; further assessment **is required** based on this trigger.

2.0 SCOPING

2.1 Existing Conditions

2.1.1 Roadways

All roadways discussed below fall under the jurisdiction of the City of Ottawa.

McArthur Avenue is an arterial roadway that runs on an east-west alignment between North River Road and St. Laurent Boulevard. Within the study area, the roadway has a two-lane undivided urban cross-section with on-street buffered bicycle lanes on both sides. McArthur Avenue has a posted speed limit of 40 km/h fronting the site for Robert E. Wilson Public School. McArthur Avenue is classified as a truck route between Vanier Parkway and St. Laurent Boulevard, allowing full loads. On-street parking is not permitted except in specific locations, where it is time restricted. The OP does not identify a right-of-way (ROW) protection for McArthur Avenue and the existing ROW is 20m in this area.

Belisle Street is a local roadway that runs about 160m from McArthur Avenue to its terminus in the north. South of McArthur Avenue it continues as Dieppe Street, a local roadway. Belisle Street has a two-lane urban cross-section with a regulatory speed limit of 50 km/h. There is a layby on

the west side of Belisle Street fronting the site and this layby is expected to remain with site development. Belisle Street is not classified as a truck route. Street parking is permitted. Brant Street is a local roadway that runs on a north-south alignment between McArthur Avenue and Donald Street. It has a two-lane urban cross-section with a posted speed limit of 40km/h. Brant Street is not classified as a truck route and trucks are prohibited. Street parking is permitted.

2.1.2 Intersections

McArthur Avenue/Belisle Street/Dieppe Street

- Side street stop controlled intersection, with free flow on McArthur Avenue.
- Eastbound/Westbound: one shared approach lane and one buffered bicycle lane
- Northbound/Southbound: one shared approach lane
- Standard crosswalks on the north and south approaches



McArthur Avenue/Brant Street

- Signalized three-legged intersection.
- Eastbound: one shared approach lane, one buffered bicycle lane
- Westbound: one left turn lane, one through lane, one buffered bicycle lane
- Northbound: one left turn and one right turn lane
- Ladder crosswalk on the east approach and standard crosswalks on the south and west approaches



2.1.3 Driveways

A review of adjacent driveways along Belisle Street in this area is provided as follows:

Belisle Street, west side:

- One lay-by along the site's frontage
- Five shared driveways serving the residential units at 378, 376, 374, 372, 370 and 368 Belisle Street

Belisle Street, east side:

- One driveway (signed as an exit only) serving the fast-food restaurant with drive-thru at 401 McArthur Avenue
- Two driveways to the parking lots serving the residential units at 751 Belisle Street

2.1.4 Pedestrian and Cycling Facilities

Within the vicinity of the subject site, sidewalks are provided on both sides of McArthur Avenue, on the east side of Belisle Street, and on the east side of Brant Street north of Spartan Avenue. Buffered bicycle lanes are provided on both sides of McArthur Avenue.

None of the above study area roadways have cycling route designations in the City's Ultimate Cycling Network.

2.1.5 Transit

The nearest transit stops to the subject site are described in **Table 1**.

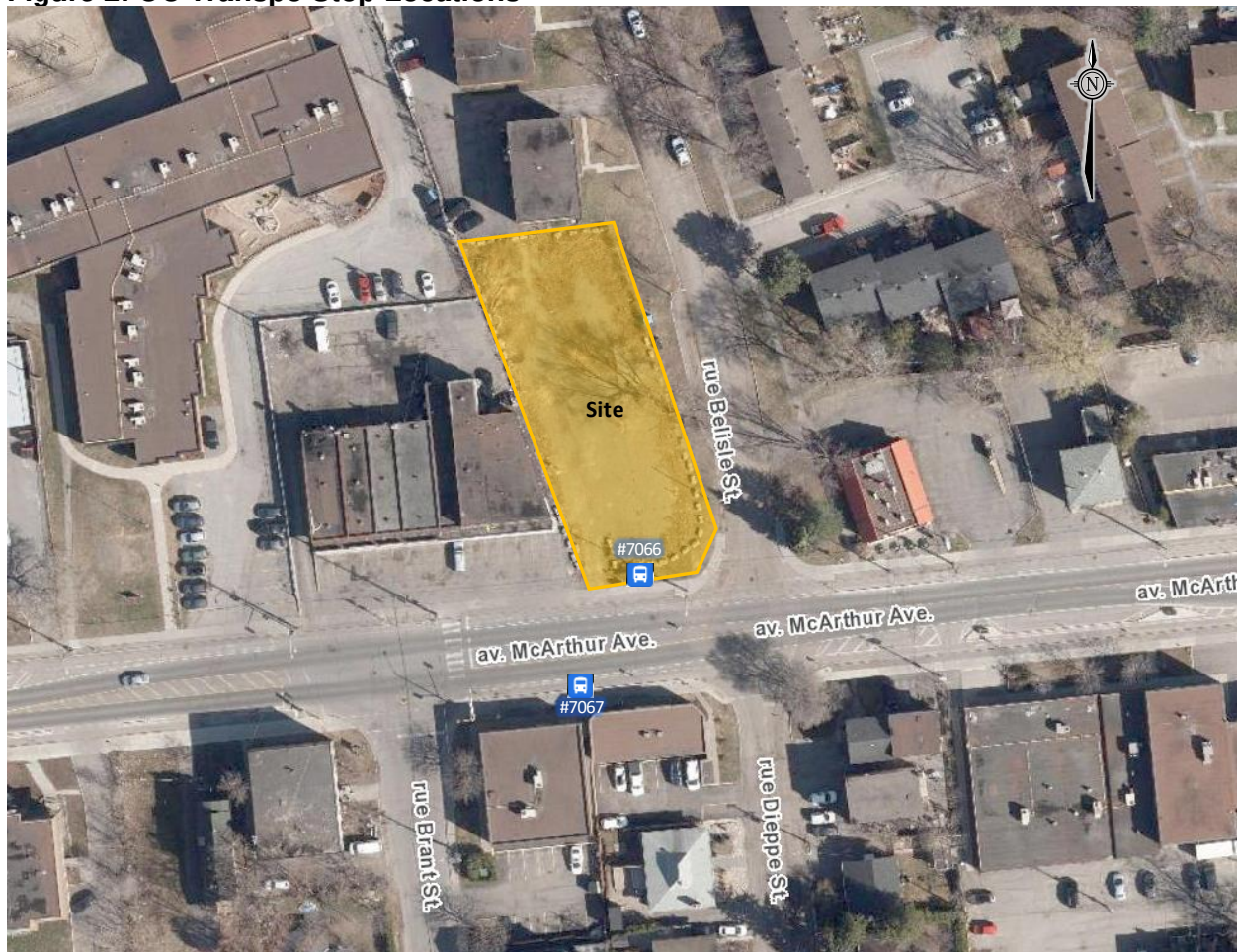
Table 1: OC Transpo Stops

Stop Number	Location	Route(s) Serviced
#7066	North side of McArthur Avenue between Belisle Street/Dieppe Street and Brant Street	14, 615, 616
#7067	South side of McArthur Avenue between Belisle Street/Dieppe Street and Brant Street	14, 615, 616

The locations of the nearby transit stops are shown in **Figure 2** and OC Transpo Route information is included in **Appendix C**.

OC Transpo Route #14 runs from St. Laurent Station to Tunney's Pasture Station on 15-minute headways with all day service, 7-days per week. OC Transpo Route #615 is a school route that runs from Lester B. Pearson High School to Parliament Station. OC Transpo Route #616 is a school route that runs from Gloucester High School to Parliament Station.

Figure 2: OC Transpo Stop Locations



2.1.6 Existing Area Traffic Management Measures

McArthur Avenue previously had a four-lane undivided cross-section but was reconstructed in 2018 in order to incorporate bicycle lanes. Through the McArthur Avenue Improvement Plan, McArthur Avenue has been reconfigured with new lane markings to separate the bike lane from traffic with a painted buffer, and in some areas, concrete curbs, bicycle friendly bulb-outs, planters, flex posts, and on-street parking.

Brant Street has painted midblock narrowings.

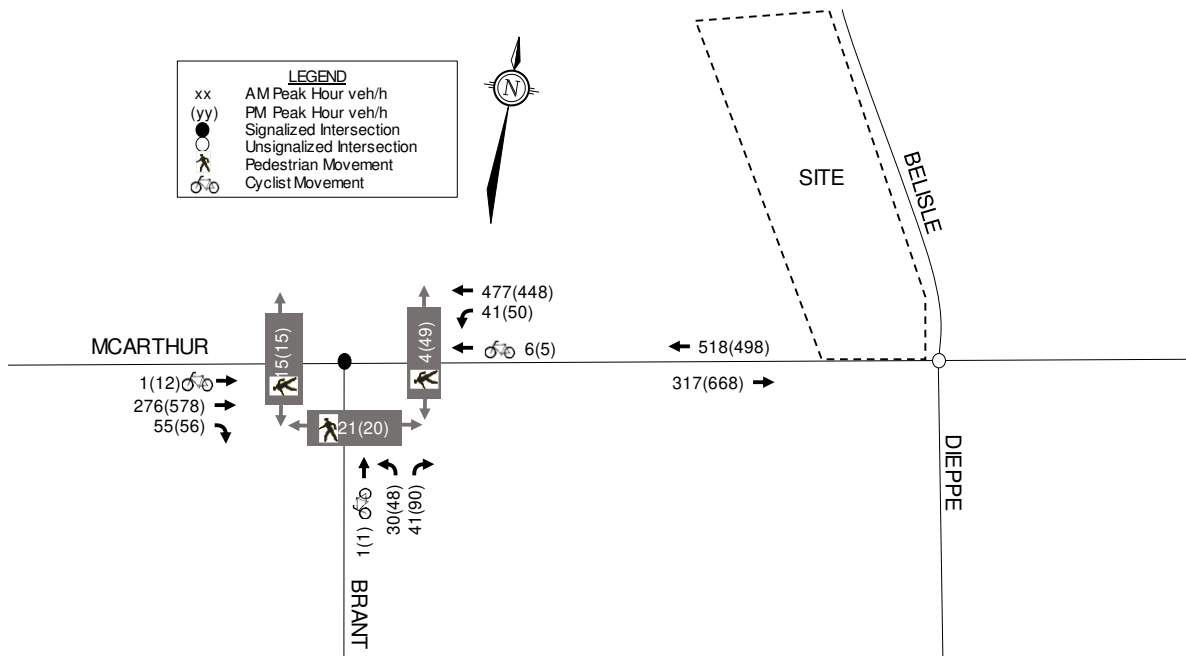
Currently, there are no other existing Area Traffic Management (ATM) measures within the study area.

2.1.7 Existing Traffic Volumes

A weekday traffic count was obtained from the City of Ottawa for the McArthur Avenue/Brant Street intersection to determine the nearby existing pedestrian, cyclist and vehicular traffic volumes. The available traffic count was performed on October 4, 2018 (Thursday).

Peak hour summary sheets of the traffic count are included in **Appendix D**. Existing peak hour traffic volumes are shown in **Figure 3**.

Figure 3: Existing Traffic Volumes



2.1.8 Collision Records

Historical collision data for the study area from the last five years were obtained from the City’s Public Works and Service Department. Copies of the collision summary reports are included in **Appendix E**.

The collision data have been evaluated to identify collision patterns. **Table 3** summarizes the number of collisions at each intersection from January 1, 2016 to December 31, 2020. During the five-year period there were no reported fatal collisions in the analyzed area.

Table 2: Reported Collisions

Intersection/ Roadway Segment	Impact Type					Total
	Rear End	Turning	Sideswipe	Angle	SMV ⁽¹⁾ / Other	
McArthur Avenue/Brant Street	5	-	2	-	1	8
McArthur Avenue/Belisle Street/Dieppe Street	1	-	-	1	-	2
Belisle Street between McArthur Avenue and end of Belisle Street	-	-	-	-	2	2
McArthur Avenue between Belisle Street/Dieppe Street and Brant Street	-	1	1	-	-	2

1. SMV: Single Motor Vehicle

McArthur Avenue/Brant Street

Over the course of the last five years, there were eight collisions reported at this intersection. Of these, five were rear end collisions (three eastbound and two westbound), two were sideswipe collisions, and one was a single vehicle impact. All collisions were classified as causing property damage only (i.e., no injuries). Two collisions occurred under snowy conditions, one under rainy conditions, and the rest under clear conditions. No pedestrians or cyclists were involved.

McArthur Avenue/Belisle Street/Dieppe Street

Over the course of the last five years, there were two collisions reported at this intersection. Of these, one was a rear end impact involving three vehicles travelling westbound and one was an angle impact involving a northbound left and eastbound through vehicle. Both collisions were classified as causing property damage only.

Belisle Street between McArthur Avenue and end of Belisle Street

Over the course of the last five years, there were two collisions reported midblock at this location. Of these, both were classified as single vehicle collisions involved unattended vehicles. One of the collisions involved a snowplow. Both collisions were classified as causing property damage only.

McArthur Avenue between Belisle Street/Dieppe Street and Brant Street

Over the course of the last five years, there were two collisions reported midblock at this location. Of these, one was a sideswipe collision involving westbound vehicles changing lanes and one was a turning movement collision involving an eastbound left turning vehicle and a westbound vehicle. Both collisions caused injuries, but none caused fatalities. Both collisions occurred prior to the reconstruction of McArthur Avenue (i.e., when McArthur Avenue had a four-lane undivided cross-section with no bicycle lanes).

2.2 Planned Conditions

The City's Transportation Master Plan (TMP) identifies McArthur Avenue as a Transit Priority Corridor with isolated measures within the City's Rapid Transit and Transit Priority (RTTP) Network Concept. This is not included as part of the RTTP Affordable Network.

The City's TMP does not identify any other transit, pedestrian, cycling, or roadway projects in the vicinity of the subject site.

The Draft 2023 TMP identifies a pedestrian project for Brant Street south of Spartan Avenue.

2.2.1 Other Study Area Developments

A review of the City's Development Application search tool identifies the following developments in proximity of the subject site that are under construction, approved, or in the approval process.

374 McArthur Avenue

Site Plan Control was granted for the construction of a 6-storey rental apartment building at 374 McArthur Avenue. A Transportation Impact Assessment was prepared in July 2021 by D.J. Halpenny & Associates Ltd. in support of this development. The development would replace an existing single-family home with an apartment building containing 64 rental units. A total of 17

underground parking spaces would be provided via McArthur Avenue. A buildout year of 2022 was contemplated.

455 McArthur Avenue

A Site Plan Control application was filed for a new four storey residential apartment building with 12 units at 455 McArthur Avenue. As no transportation documents are available on the Development Application search tool, the assumed traffic generated by the subject site is anticipated to be negligible.

216 McArthur Avenue

A Site Plan Control application was filed for a new 3-storey mixed use development (12 apartment units and ground floor retail) which would replace the existing single-family home at 216 McArthur Avenue. As no transportation documents are available on the Development Application search tool, the assumed traffic generated by the subject site is anticipated to be negligible.

2.3 Study Area and Time Periods

The study area for this report includes the boundary roadways McArthur Avenue and Belisle Street.

The selected time periods for this study are the weekday AM peak hour and PM peak hour, as they represent the ‘worst case’ combination of site generated traffic and adjacent street traffic.

The proposed development is expected to be completed with full occupancy in 2023. The 2023 buildout and 2028 horizon year have been considered.

2.4 Exemptions Review

This module reviews possible exemptions from the final TIA, as outlined in the TIA Guidelines. The applicable exemptions for this site are shown in **Table 3**.

Table 3: TIA Exemptions

Module	Element	Exemption Criteria	Exemption Status
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	<ul style="list-style-type: none"> Only required for site plans 	Not Exempt
	4.1.3 New Street Networks	<ul style="list-style-type: none"> Only required for plans of subdivision 	Exempt
4.2 Parking	4.2.1 Parking Supply	<ul style="list-style-type: none"> Only required for site plans 	Not Exempt
	4.2.2 Spillover Parking	<ul style="list-style-type: none"> Only required for site plans where parking supply is 15% below unconstrained demand 	Exempt

As the trip generation trigger is not met, the Network Impact modules (Modules 4.5 through 4.9) are exempt from further analysis. However, City staff have requested that Module 4.5: Transportation Demand Management be included in this TIA. Therefore, the following modules will be included in the TIA report:

- Module 4.1 – Development Design
- Module 4.2 – Parking
- Module 4.3 – Boundary Street Design
- Module 4.4 – Access Intersections Design
- Module 4.5 – Transportation Demand Management

3.0 FORECASTING

3.1 Development-Generated Travel Demand

3.1.1 Trip Generation

As stated in Section 1.3, the proposed development is not anticipated to meet the trip generation trigger of 60 net new person trips during the peak hour. The trip generation estimates below serve to confirm that this trigger is not met.

The proposed development will consist of a six-storey mixed-use building with 207m² of ground floor commercial space and 66 apartment units. Trips generated by the residential component of the proposed development during the weekday AM and PM peak period have been estimated based on relevant rates presented in the *TRANS Trip Generation Manual Summary Report*, prepared in October 2020 by WSP. The manual includes data to estimate the trip generation and mode shares for residential uses, divided into single-family detached housing, low-rise multifamily housing (one to two storeys), and high-rise multifamily housing (three or more storeys). Trips generated by the proposed commercial uses have been estimated using the *ITE Trip Generation Manual*, 11th Edition, specific to the Shopping Centre land use (code 820).

The peak hour person trips generated by the proposed development are summarized in the following table. The peak hour person trips generated by the proposed residences are based on the High-Rise Multifamily Housing rates for the Ottawa East district, and the peak hour person trips generated by the proposed commercial uses were calculated using an ITE Trip to Person Trip factor of 1.28, consistent with the 2017 *TIA Guidelines*.

Table 4: Peak Hour Person Trip Generation

Land Use	Units/ GFA	AM Peak Hour (pph ⁽¹⁾)			PM Peak Hour (pph)		
		IN	OUT	TOT	IN	OUT	TOT
High-Rise Multifamily Housing	66 units	8	18	26	15	9	26
Shopping Centre	207m ²	1	1	2	5	5	10
Total		9	19	28	20	14	36

1. pph: Person Trips per Peak Hour

From the previous table, the proposed development is anticipated to generate 28 person trips during the AM peak hour and 36 person trips during the PM peak hour.

The TRANS *Trip Generation Manual Summary Report*, prepared in October 2020 by WSP, includes data to estimate the mode shares for commercial trip generators (in Table 13 of the manual) and high-rise multifamily housing (in Table 8 of the manual) for the AM and PM peak periods, based on district. The TRANS *Trip Generation Manual* identifies the subject site as being located within the Ottawa East district, and outlines the following mode shares for commercial and residential developments in the Ottawa East district.

Residential Mode Shares

- Auto Driver: 39% AM, 40% PM
- Auto Passenger: 7% AM, 14% PM
- Transit: 38% AM, 28% PM
- Cyclist: 2% AM, 3% PM
- Pedestrian: 13% AM, 15% PM

Commercial Mode Shares

- Auto Driver: 57% AM, 55% PM
- Auto Passenger: 10% AM, 18% PM
- Transit: 15% AM, 11% PM
- Cyclist: 1% AM, 1% PM
- Pedestrian: 17% AM, 15% PM

A breakdown of the peak hour person trips by modal share is shown in **Table 6**.

Table 5: Peak Hour Person Trips by Modal Share

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOT	IN	OUT	TOT
Residential Person Trips		8	18	26	15	9	26
Auto Driver	40%	3	7	10	6	4	10
Auto Passenger	10%	1	2	3	1	1	2
Transit	32%	3	5	8	5	3	8
Cyclist	3%	0	1	1	1	0	1
Pedestrian	15%	1	3	4	2	1	3
Commercial Person Trips		1	1	2	5	5	10
Auto Driver	55%	1	1	2	3	3	6
Auto Passenger	15%	0	0	0	1	1	2
Transit	14%	0	0	0	0	0	0
Cyclist	1%	0	0	0	0	0	0
Pedestrian	15%	0	0	0	1	1	2
Total Peak Hour Person Trips		9	19	28	20	14	36
Auto Driver		4	8	12	9	7	16
Auto Passenger		1	2	3	2	2	4
Transit		3	5	8	5	3	8
Cyclist		0	1	1	1	0	1
Pedestrian		1	3	4	3	2	5

From the previous table, the proposed development is estimated to generate 12 vehicle trips during the AM peak hour and 16 vehicle trips during the PM peak hour.

3.2 Background Traffic

3.2.1 Other Area Developments

A description of other study area development is included in Section 2.2.1.

Buildout of the 374 McArthur Avenue development was anticipated for 2022. Traffic generated by this development has been added to the 2023 buildout and 2028 horizon years, using the

distribution outlined in the 2021 TIA. Relevant excerpts from the TIA for this development are included in **Appendix F**.

3.2.2 General Background Growth Rate

A review of the City's *Intersection Traffic Growth Rates* (2000 to 2016) and other recent studies was completed to establish general background growth. Excerpts are included in **Appendix F**.

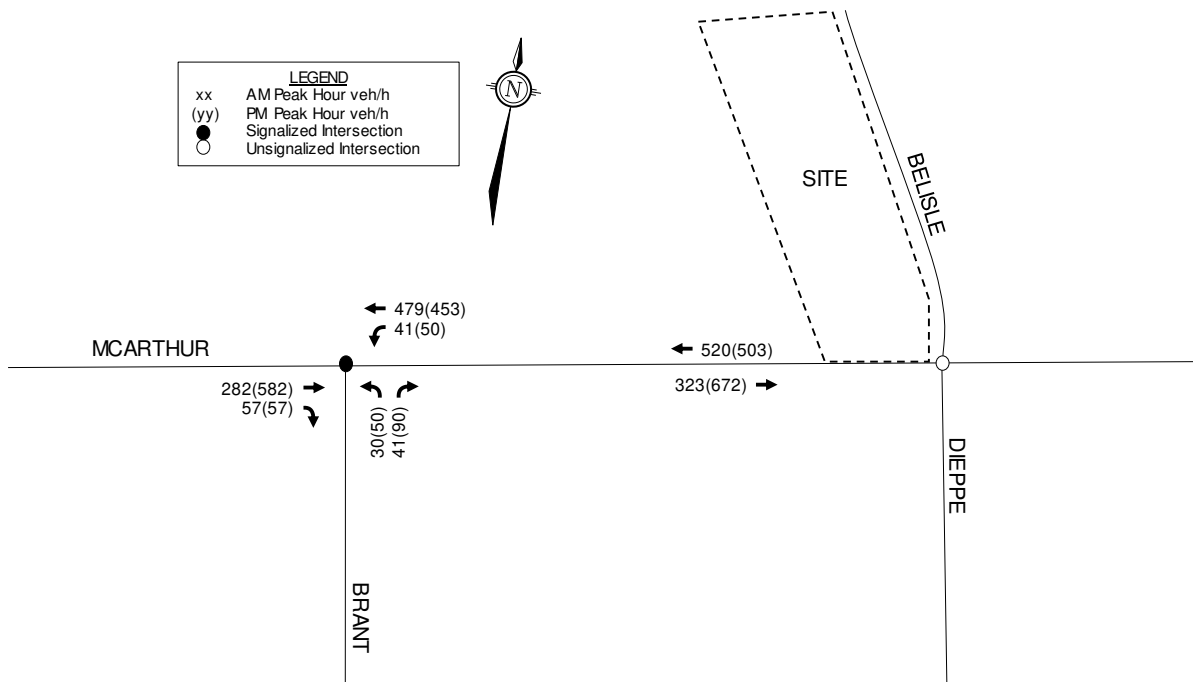
The City's Intersection Traffic Growth Rates figures, which determine growth rates based on total vehicular volumes entering the intersection, identify that traffic at the nearby McArthur Avenue/Brant Street intersection decreased by 0.2% to 2% annually in the AM and PM peak hours between 2000 and 2016.

The 374 McArthur Avenue TIA utilized a 1% annual growth rate for traffic along McArthur Avenue/Brant Street but noted that the *National Capital Region Travel Trends* document showed that trips from the Ottawa East area decreased at an average annual compounded rate of -1.12%, and trips to the Ottawa East area decreased at an average annual compounded rate of -1.04% between the years 2005 and 2011.

Based on the foregoing, no growth rate was applied to the study area. Other area developments have been accounted for separately.

Background traffic volumes for the 2023 buildout and 2028 horizon years is shown in **Figure 4**.

Figure 4: Background Traffic Volumes



3.3 Demand Rationalization

Based on the 2017 *TIA Guidelines*, the Demand Rationalization module includes identifying any locations and approaches where total auto demand is projected to exceed capacity, and what reductions in peak hour volumes are required for demand to meet capacity. However, determining whether any approach at any study area intersection has volumes that exceed capacity requires intersection analysis. Since the proposed development does not meet the trip generation trigger, this is outside the scope of this study.

4.0 ANALYSIS

4.1 Development Design

4.1.1 Design for Sustainable Modes

A new sidewalk will be provided on Belisle Street along the frontage of the proposed development, linking to the existing sidewalk on McArthur Avenue and the proposed building entrances.

Proposed bicycle parking is shown on the ground floor of the building, with 35 spaces in the bike room. There will be an additional three bicycle parking spaces provided outdoors along the McArthur Avenue frontage of the site.

OC Transpo's service design guideline for peak period service is to provide service within a five minute (400m) walk of the home, school and work location of 95% of urban residents. The development has exterior access doors within a 100m walking distance from both OC Transpo stops identified above. Stop #7066 is being relocated for this development. The proposed stop will continue to be along McArthur Avenue in front of the building. Riders will board / alight from the existing hard surface curbside along McArthur Avenue and can wait for the bus in the (canopy covered) 1.5m wide sloped private walkway area abutting the building. This area is accessible from the sidewalk along Belisle Street and includes stairway connections to McArthur Avenue.

A review of the Transportation Demand Management (TDM) – Supportive Development Design and Infrastructure checklist has been conducted, and is included in **Appendix G**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

4.1.2 Circulation and Access

Surface parking and underground parking will be accessed from an all-movement driveway to Belisle Street, approximately 50m north of McArthur Avenue. Stop control will be provided at the site's vehicular access, with free flow conditions on Belisle Street.

There is an existing layby on the west side of Belisle Street fronting the subject site. This layby is proposed to be maintained to serve as a drop-off location for people and deliveries to the apartment and commercial units.

Garbage is stored on the ground floor within the building and will be rolled out and collected curbside along Belisle Street. The proposed fire route for the development is located curbside along the boundary roadways.

4.2 Parking

The site is within Area Y on Schedule 1A of the City’s Zoning By-Law. Minimum vehicular and bicycle parking are identified in the Zoning By-law and are summarized in **Table 6**.

Table 6: Vehicular and Bicycle Parking Requirements

Land Use	Rate	Units/GFA	Requirement	Provided
<i>Vehicle Parking</i>				
Mid-high rise apartment	Resident: 0.5 per unit ¹ Visitor: 0.1 per unit ²	66 units	27 resident 5 visitor (32 total)	28 resident 3 visitor (31 total)
Commercial	None Required ³	207 m ²	-	
<i>Bicycle Parking</i>				
Mid-high rise apartment	0.5 per unit	66 units	33	38
Commercial	1 per 500m ² of GFA	207 m ²	-	

1. Within Area Y, where a residential use is located within a building of five or more storeys, no off-street motor vehicle parking is required to be provided for the first twelve units.
2. Within Area Y, no visitor parking spaces are required for the first twelve dwelling units on a lot.
3. Within Area Y, where a non-residential use located partly or entirely on the ground floor has a gross area of 500 square metres or less, no off-street motor vehicle parking is required to be provided.

Proposed bicycle parking is shown on the ground floor of the building and along the McArthur Avenue frontage. The proposed bicycle parking exceeds the requirements of the Zoning By-law. The proposed vehicle parking does not achieve the Zoning By-law requirement for visitor parking, and a zoning amendment is required, however, vehicle parking is 97% met and a review of spillover parking is not required.

The development is not an obligated organization under the Accessibility for Ontarians with Disabilities Act (AODA). The site does not have public parking and only three private residential visitor spaces. No barrier free parking spaces are required under the AODA or the City of Ottawa’s Traffic and Parking Bylaw, however, one accessible space is shown in the underground parking garage.

4.3 Boundary Streets

A review of the boundary streets (McArthur Avenue and Belisle Street) has been conducted, using complete streets principles. The *Multi-Modal Level of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation. Both of the boundary roadways are located within 300m of a school.

Targets for pedestrian level of service (PLOS), bicycle level of service (BLOS), transit level of service (TLOS), and truck level of service (TkLOS) adhere to those outlined in Exhibit 22 of the MMLOS Guidelines.

The boundary street review evaluates the MMLOS for the boundary roadways based on existing conditions. A detailed MMLOS review is included in **Appendix H**, and a summary of the segment MMLOS analysis is included in the following table.

Table 7: Segment MMLOS Summary

Segment	PLOS	BLOS	TLOS	TkLOS
Belisle Street	F	F	-	-
Target	A	D	-	-
McArthur Avenue	C	B	E	C
Target	A	D	D	D

Belisle Street

Belisle Street does not meet the target PLOS or BLOS.

Currently, there is no sidewalk on the west side and there is a 1.5m asphalt pathway with a boulevard along the east side of Belisle Street. The pathway on the east side achieves a PLOS C and pedestrians walking along Belisle Street may choose to utilize this pathway. In order to achieve a PLOS A, a 1.8m sidewalk with a 2.0m boulevard or a 2.0m sidewalk with a minimum 0.5m boulevard would be required. As part of this development, a new 2.0m sidewalk with a boulevard will be constructed on the west side of Belisle Street along the frontage of the subject site. This new sidewalk will achieve a PLOS A.

Currently, there are no dedicated cycling facilities along Belisle Street and the operating speed is assumed to be 60km/h (10km/h above the speed limit). A reduction in the operating speed to 50km/h would achieve a BLOS B. The street dead-ends approximately 160m north of McArthur Avenue and serves mostly residential properties. There is no marked centreline or posted speed limit. The Ontario Traffic Manual (OTM) *Book 18 – Cycling Facilities* desirable cycling facility pre-selection nomograph suggests a designated operating space (such as bike lanes) for a posted speed limit of 50km/h and average daily traffic volumes of 5,000vpd or less. Bike lanes would achieve a BLOS C. This is identified for the City’s consideration.

McArthur Avenue

McArthur Avenue meets the target BLOS and TkLOS but does not meet the target PLOS or TLOS.

Exhibit 4 of the MMLOS guidelines suggests that a PLOS A is not achievable for an operating speed of 50km/h or more and an AADT over 3,000vpd. The existing sidewalk on McArthur Avenue is 1.5m wide with a 1.2m asphalt boulevard and achieves a PLOS C. There are utility poles within the boulevard on the north side which limits the opportunity for a wider sidewalk.

McArthur Avenue does not currently meet the target TLOS D, based on moderate parking/driveway friction. The City’s 2031 RTTP Network identifies McArthur Avenue as a Transit Priority Corridor with isolated measures. This transit priority project would improve the TLOS along McArthur Avenue.

4.4 Access Intersections Design

The development will be served by one full movement access to Belisle Street. A review of the proposed access location and configuration with respect to the City's Private Approach By-law, Zoning By-law, and Transportation Association of Canada (TAC) *Geometric Design Guidelines for Canadian Roadways* has been conducted.

Section 25 (c) of the Private Approach By-law identifies a maximum width of 9m for two-way driveways. The Zoning By-law identifies a minimum driveway width of 6.0m leading to a parking lot or garage and a maximum width of 6.7m for a driveway leading to 20 or more parking spaces for a mid-rise apartment building. The proposed access will have a width of 6.0m, thereby meeting these requirements.

For parking lots containing less than 50 parking spaces, Section 25 (t) of the Private Approach By-law identifies a maximum access grade of 2% for a distance of 6m within the property. The proposed grading at the access will conform to the requirements of the Private Approach By-law.

A clear throat of approximately 9m is provided at the site's vehicular access, this is considered sufficient given the local classification of Belisle Street and the low number of expected vehicle trips.

Section 25 (p) of the Private Approach By-Law indicates that no private approach should be constructed within 3m of an adjoining property line. The proposed driveway is located 3m from the northern property line, thereby meeting this requirement.

Section 25 (m) of the Private Approach By-Law identifies spacing between driveways and streets for properties abutting arterial and major collector roads. For residential sites with 20-99 parking spaces, the spacing requirement is 18m between the driveway and the nearest intersecting ROW. TAC *Geometric Design Guidelines* identify a minimum corner clearance of 15m for an access on a local roadway with stop control provided at the nearby intersection. The site's proposed driveway to Belisle Street is approximately 50m north of McArthur Avenue, meeting these requirements.

The Stopping Sight Distance (SSD) along roadways with a design speed of 60km/h is 85m. Available SSD for traffic in both directions along McArthur Avenue at Belisle Street is greater than 85m. The sight triangle for the northwest (site) corner of the intersection is being increased to 5m x 5m and accommodates over 130m of sight distance for drivers looking right along McArthur Avenue from Belisle Street, sufficient intersection sight distance for a 60km/h design speed.

4.5 Transportation Demand Management

4.5.1 Context for TDM

The proposed development will consist of a six-storey mixed-use building with 207m² of ground floor commercial space and 66 apartment units.

4.5.2 Need and Opportunity

The proposed redevelopment is located within the Ottawa East district.

As described in Section 3.1, the proposed modal shares are based on modal shares as described in the TRANS *Trip Generation Manual* for commercial and residential developments in the Ottawa East district in the AM and PM peak hours.

4.5.3 TDM Program

A review of the *Transportation Demand Management (TDM) – Measures Checklist* has been conducted. A copy of the TDM checklist is included in **Appendix H**.

The following measures will be implemented upon opening of the proposed residential development:

- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances;
- Provide a multimodal travel option information package to new residents;
- Unbundle parking cost from monthly rent;
- Contract with provider to install on-site carshare vehicles and promote their use by residents; and,
- Offer personalized trip planning to new residents.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The main conclusions and recommendations from this report are summarized below:

Development Design & Parking

- A new sidewalk will be provided on Belisle Street along the frontage of the proposed development, linking to the existing sidewalk on McArthur Avenue and the proposed building entrances.
- Proposed bicycle parking is shown on the ground floor of the building, with 35 spaces in the bike room. There will be an additional three bicycle parking spaces provided outdoors along the McArthur Avenue frontage of the site.
- The development has exterior access doors within a 100m walking distance from two OC Transpo stops. Stop #7066 is being relocated for this development. The proposed stop will continue to be along McArthur Avenue in front of the building. Riders will board / alight from the existing hard surface curbside along McArthur Avenue and can wait for the bus in the (canopy covered) 1.5m wide sloped private walkway area abutting the building. This area is accessible from the sidewalk along Belisle Street and includes stairway connections to McArthur Avenue.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- There is an existing layby on the west side of Belisle Street fronting the subject site. This layby is proposed to be maintained to serve as a drop-off location for people and deliveries to the apartment and commercial units.

- The proposed bicycle parking exceeds the requirements of the Zoning By-law.
- The proposed vehicle parking does not achieve the Zoning By-law requirement for visitor parking, and a zoning amendment is required, however, vehicle parking is 97% met and a review of spillover parking is not required.

Boundary Streets

- Belisle Street does not meet the target Pedestrian Level of Service (PLOS) or Bicycle Level of Service (BLOS).
 - The existing pathway on the east side achieves a PLOS C and the west side achieves a PLOS F. In order to achieve a PLOS A, a 1.8m sidewalk with a 2.0m boulevard or a 2.0m sidewalk with a minimum 0.5m boulevard would be required. As part of this development, a new 2.0m sidewalk with a boulevard will be constructed on the west side of Belisle Street along the frontage of the subject site. This new sidewalk will achieve a PLOS A.
 - Currently, there are no dedicated cycling facilities along Belisle Street and the operating speed is assumed to be 60km/h. A reduction in the operating speed to 50km/h would achieve a BLOS B. The Ontario Traffic Manual (OTM) *Book 18 – Cycling Facilities* desirable cycling facility pre-selection nomograph suggests a designated operating space (such as bike lanes) for a posted speed limit of 50km/h and average daily traffic volumes of 5,000vpd or less. Bike lanes would achieve a BLOS C. This is identified for the City's consideration.
- McArthur Avenue meets the target BLOS and Truck Level of Service (TkLOS) but does not meet the target PLOS or Transit Level of Service (TLOS).
 - Exhibit 4 of the MMLOS guidelines suggests that a PLOS A is not achievable for an operating speed of 50km/h or more and an AADT over 3,000vpd. The existing sidewalk on McArthur Avenue is 1.5m wide with a 1.2m asphalt boulevard and achieves a PLOS C. There are utility poles within the boulevard on the north side which limits the opportunity for a wider sidewalk.
 - McArthur Avenue does not currently meet the target TLOS D, based on moderate parking/driveway friction. The City's 2031 RTTP Network identifies McArthur Avenue as a Transit Priority Corridor with isolated measures. This transit priority project would improve the TLOS along McArthur Avenue.

Access Intersections Design

- The development will be served by one full movement access to Belisle Street.
- The proposed access will have a width of 6.0m and will be located approximately 50m north of McArthur Avenue.
- The proposed access will meet all requirements of the City's Private Approach By-law, Zoning By-law, and Transportation Association of Canada Geometric Design Guidelines.

Transportation Demand Management

- The following measures will be implemented upon opening of the proposed residential development:
 - Display local area maps with walking/cycling access routes and key destinations at major entrances;
 - Display relevant transit schedules and route maps at entrances;
 - Provide a multimodal travel option information package to new residents;
 - Unbundle parking cost from monthly rent;

- Contract with provider to install on-site carshare vehicles and promote their use by residents; and,
- Offer personalized trip planning to new residents.

NOVATECH

Prepared by:

Reviewed by:



Rochelle Fortier, P.Eng.
Project Engineer | Transportation



Jennifer Luong, P.Eng.
Senior Project Manager | Transportation

APPENDIX A

Site Plan



STAMP

REV DATE	ISSUE
14	2022-11-29 Issued for Site Plan Resubmission
12	2022-09-14 Issued for Coordination
10	2022-05-24 Issued for Site Plan Control
8	2021-12-06 Issued for Review
7	2021-11-23 Issued for Coordination
6	2021-11-11 Issued for Coordination
5	2021-11-03 Issued for Coordination
4	2021-10-28 Issued for Coordination
3	2021-10-17 Issued for Coordination
2	2021-09-09 Issued for Review
1	2021-08-13 Issued for Review

NOTES

1. OWNERSHIP OF THE COPYRIGHT OF THE DESIGN AND THE WORKS EXECUTED FROM THE DESIGN REMAINS WITH CSV ARCHITECTS, AND MAY NOT BE REPRODUCED IN ANY FORM WITHOUT THE WRITTEN CONSENT OF CSV ARCHITECTS.
2. THE DRAWINGS, PRESENTATIONS AND SPECIFICATIONS AS INSTRUMENTS OF SERVICE ARE AND SHALL REMAIN THE PROPERTY OF CSV ARCHITECTS. THEY ARE NOT TO BE USED BY THE CLIENT ON OTHER PROJECTS OR ON EXTENSIONS TO THIS PROJECT WITHOUT THE WRITTEN CONSENT OF CSV ARCHITECTS.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS AND SPECIFICATIONS.
4. DO NOT SCALE DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY DIMENSIONS ON SITE.
5. ALL WORK SHALL BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL SUPPLEMENTS AND APPLICABLE MUNICIPAL REGULATIONS.

CLIENT

OTTAWA
 ONTARIO, CANADA

PROJECT
McArthur Development

393 McArthur Avenue
 Ottawa, Ontario
 TITLE

SITE PLAN

PROJECT NO: 2019-1650
 DRAWN: MM
 APPROVED: JS
 SCALE: 1:200
 DATE PRINTED: 2022-12-07 11:44:32 AM

REV DRAWING NO.

SITE PLAN GENERAL NOTES:

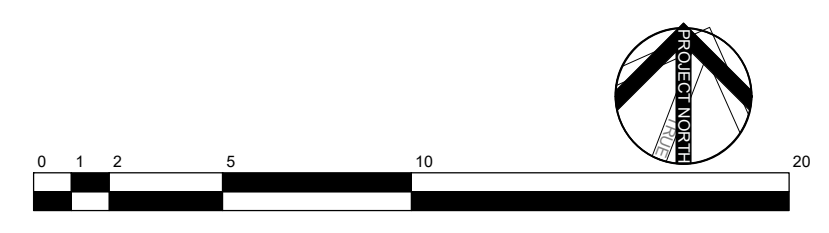
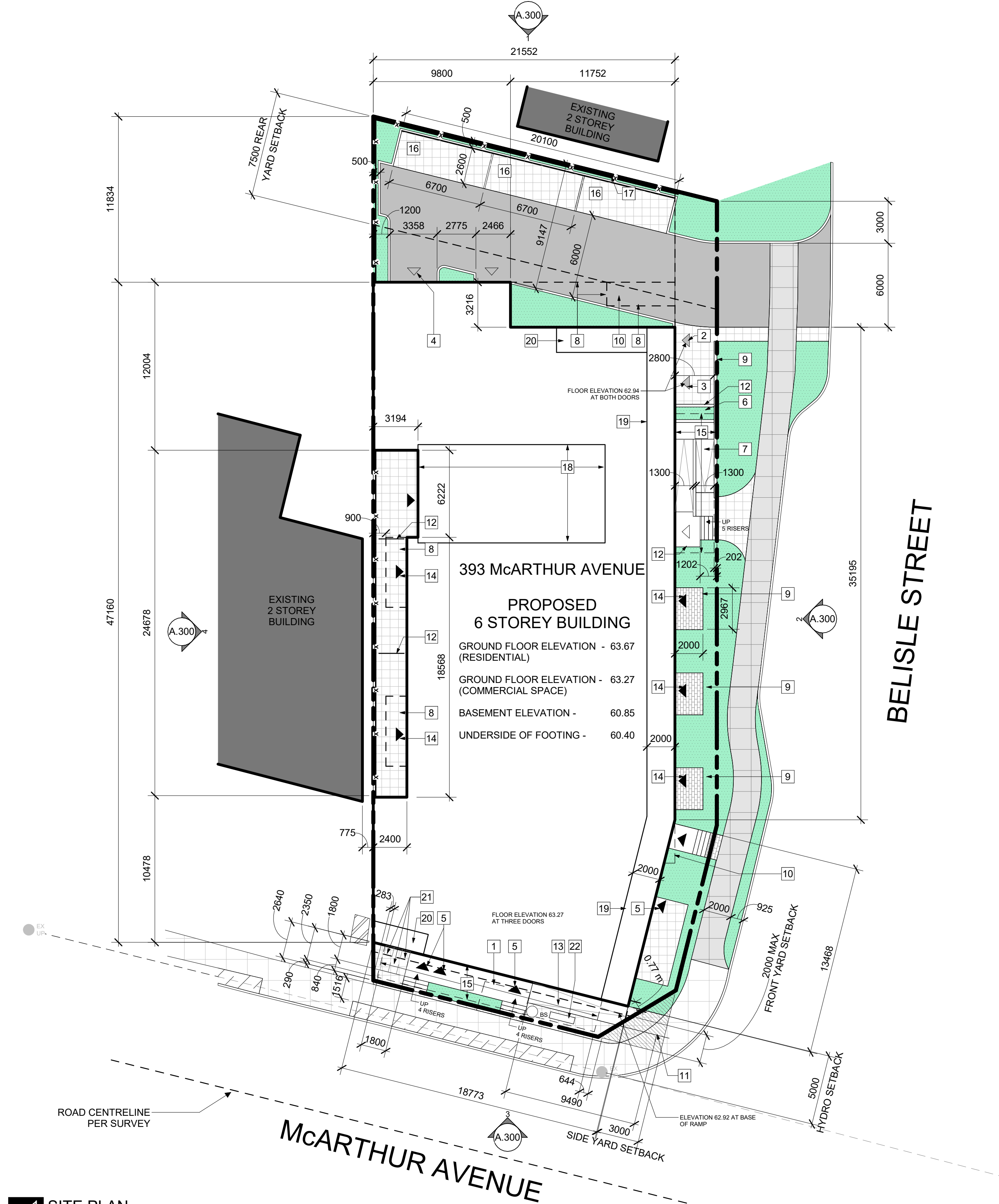
1. ALL GENERAL SITE INFORMATION AND CONDITIONS COMPILED FROM EXISTING PLANS AND SURVEYS
2. DO NOT SCALE THIS DRAWING
3. REPORT ANY DISCREPANCIES PRIOR TO COMMENCING WORK. NO RESPONSIBILITY IS BORN BY THE CONSULTANT FOR UNKNOWN SUBSURFACE CONDITIONS
4. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY ERRORS AND/OR OMISSIONS TO THE CONSULTANT
5. REINSTATE ALL AREAS AND ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE CONSULTANT
6. CONTRACTOR TO LAYOUT PLANTING BEDS, PATHWAYS ETC. TO APPROVAL OF CONSULTANT PRIOR TO ANY JOB EXCAVATION
7. THE ACCURACY OF THE POSITION OF UTILITIES IS NOT GUARANTEED - CONTRACTOR TO VERIFY PRIOR TO EXCAVATION
8. INDIVIDUAL UTILITY COMPANY MUST BE CONTACTED FOR CONFIRMATION OF UTILITY EXISTENCE AND LOCATION PRIOR TO DIGGING
9. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE NOTED

SITE PLAN KEYNOTES:

- 1 EXISTING BUS STOP TO BE RELOCATED
- 2 BIKE ROOM ENTRANCE
- 3 GARBAGE ROOM ENTRANCE
- 4 UNDERGROUND PARKING GARAGE ENTRANCE
- 5 COMMERCIAL SPACE ENTRANCE
- 6 PLANTER
- 7 RAMP, SLOPE 1:12
- 8 BUILDING OUTLINE ABOVE
- 9 RETAINING WALL
- 10 BALCONY ABOVE
- 11 5.0 m CORNER SIGHT TRIANGLE
- 12 SCREEN
- 13 SLOPED WALKWAY (SLOPE 1:20)
- 14 PRIVATE RESIDENTIAL PATIO ACCESS
- 15 OVERHANG/CANOPY ABOVE
- 16 VISITOR PARKING SPACE
- 17 1.8m HIGH OPAQUE FENCE
- 18 MECHANICAL PENTHOUSE
- 19 LINE OF STEPBACK AT FIFTH FLOOR
- 20 BALCONY BELOW
- 21 BICYCLE PARKING SPACE
- 22 BENCH

SITE PLAN LEGEND:

- EXISTING BUILDING
- ASPHALT PAVING
- NEW GRASS
- NEW SOFT LANDSCAPED AREA - REFER TO LANDSCAPE PLANS
- CONCRETE SIDEWALK (NEW)
- CONCRETE SIDEWALK (EXISTING)
- CONCRETE PAD
- MULCH/PLANTING
- GRAVEL/RIVERSTONE/MAINTENANCE STRIP
- STONE DUST/SAND
- PAVER TYPE 1
- PAVER TYPE 2
- PAVER TYPE 3
- EXISTING CONCRETE SLAB
- EXISTING MATERIAL 2
- EXISTING ASPHALT
- OTHER ENTRANCE/EXIT DOOR
- SERVICE DOORS
- BUILDING MAIN ENTRANCE
- PROPERTY LINE
- FENCE PER LANDSCAPE
- NEW DOMESTIC WATER
- NEW SANITARY
- NEW STORM
- NEW ELECTRICAL SERVICE (BELOW GRADE)
- GAS
- CATCH BASIN
- CATCH BASIN
- LIGHT STANDARD
- LIGHT STANDARD EXISTING
- FIRE HYDRANT
- FIRE HYDRANT EXISTING
- MANHOLE
- MANHOLE EXISTING
- UTILITY POLE
- UTILITY POLE EXISTING
- NEW BUS STOP SIGN
- SIAMESE CONNECTION
- DROPPED CURB



1 SITE PLAN
 A.100 1:200

LEGAL DESCRIPTION:
 PART OF LOT 7 JUNCTION GORE CITY OF OTTAWA

REFERENCE SURVEY:
 THIS DRAWING IS BASED ON A SURVEY PREPARED BY J.D. BARNES LIMITED DATED JULY 20, 2020.

MUNICIPAL ADDRESS:
 393 MCARTHUR AVENUE

DEVELOPMENT INFORMATION:

SITE AREA	1,471 m ²
BUILDING AREA	987 m ²
GROSS FLOOR AREA (PER ZONING BYLAW)	4,140 m ²
BUILDING HEIGHT	19.25 m / 6 STOREYS
ZONE	TM (TRADITIONAL MAIN STREET)
SCHEDULE 1	AREA B
SCHEDULE 2	DISTANCE EXCEEDS 600 m
NUMBER OF UNITS	1 BEDROOM 23 1 BEDROOM + DEN 30 2 BEDROOM 13 TOTAL 66

ZONING PROVISION	REQUIRED	PROVIDED
MIN. LOT WIDTH	N/A	21.8 m
MIN. LOT AREA	N/A	1,471 m ²
MAX. FRONT YARD SETBACK	5 m FROM HIGH VOLTAGE POWER LINES	5 m FROM HIGH VOLTAGE POWER LINES
MIN. CORNER YARD SETBACK	3 m	0.77 m
MIN. REAR YARD SETBACK	7.5 m	9.147 m
MAX. INTERIOR YARD SETBACK	3 m	0 m
MAX. HEIGHT	REFER TO ELEVATIONS	REFER TO ELEVATIONS
AMENITY AREA	396 m ²	552 m ²
COMMUNAL AMENITY AREA	198 m ²	204 m ²
LANDSCAPED AREA	TBD	

PARKING QUEING + LOADING	REQUIRED	PROVIDED
RESIDENTIAL SPACES	27	28
VISITOR SPACES	5	3
ACCESSIBLE PARKING	0 (TYPE A)	0
COMMERCIAL PARKING	0 (UNITS LESS THAN 500 m ²)	0
BICYCLE PARKING	33	38

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	393 McArthur Avenue
Description of Location	Northwest corner of McArthur Ave/Belisle St
Land Use Classification	Mixed Use (residential with ground floor commercial)
Development Size (units)	66 units
Development Size (m ²)	207m² (2,228ft²) of ground floor commercial
Number of Accesses and Locations	One full movement access to Belisle Street, approximately 50m north of McArthur Avenue (closure of existing site access to McArthur Avenue)
Phase of Development	1
Buildout Year	2023

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m ²
Industrial	5,000 m ²
Fast-food restaurant or coffee shop	100 m ²
Destination retail	1,000 m ²
Gas station or convenience market	75 m ²

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		X
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*	X	

*DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		X
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	X	
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		X
Does the development include a drive-thru facility?		X

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

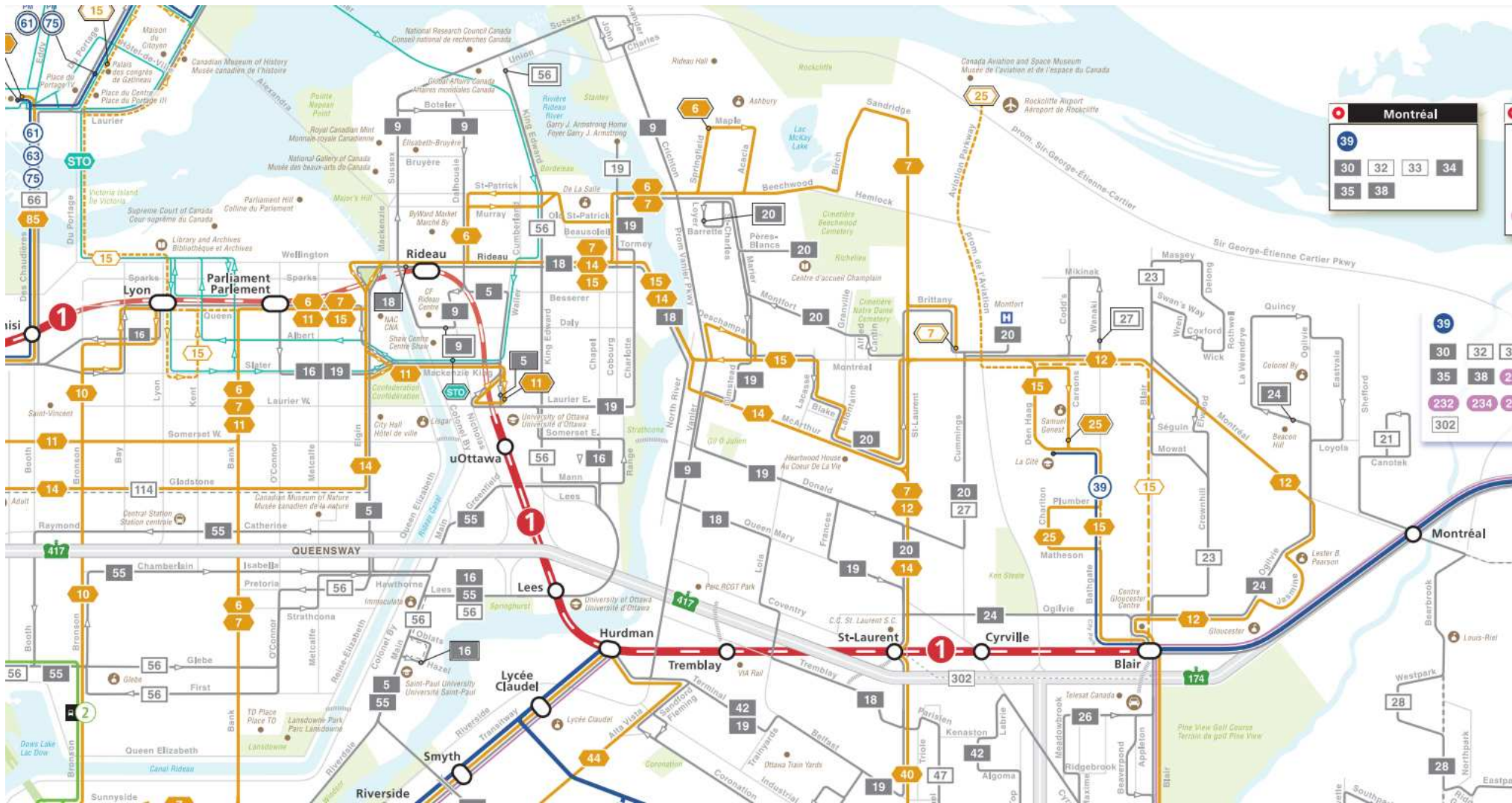
5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		X
Does the development satisfy the Location Trigger?	X	
Does the development satisfy the Safety Trigger?	X	

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

APPENDIX C

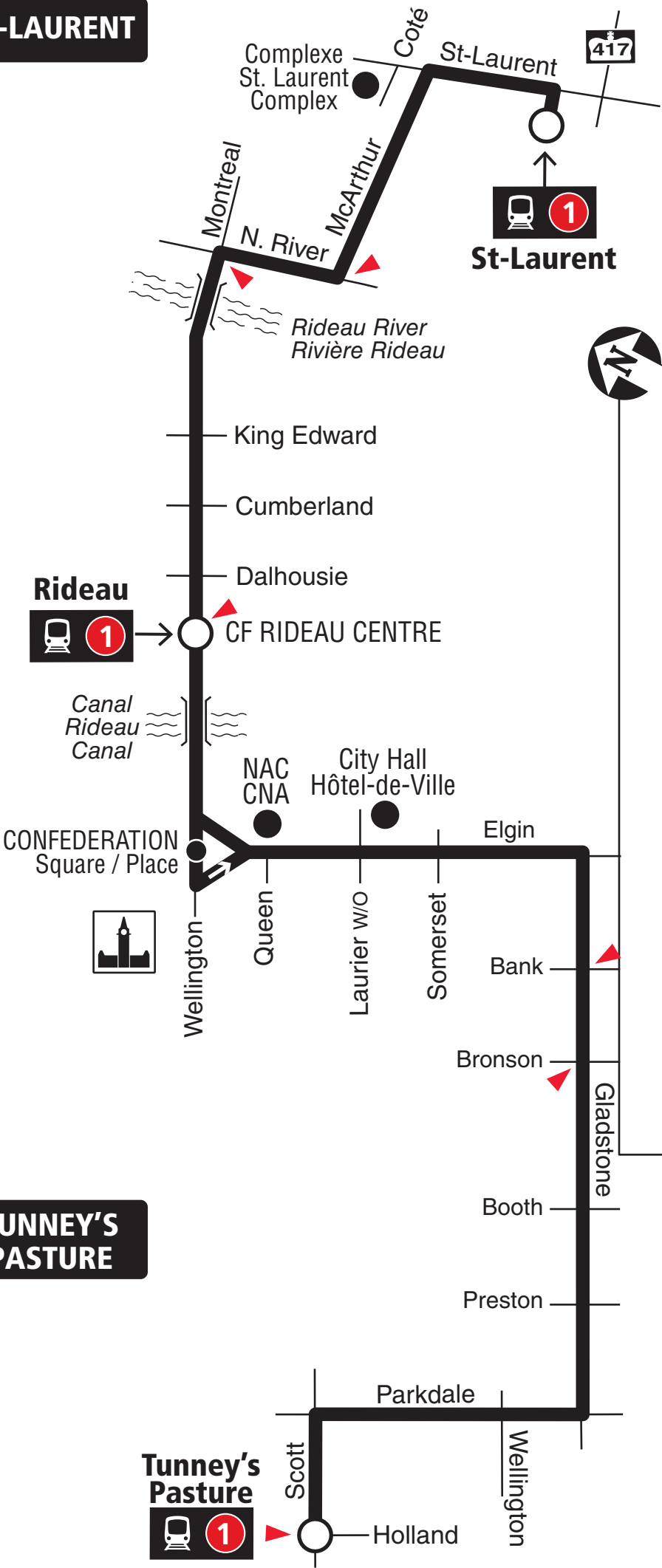
OC Transpo System Information



Montréal			
39	30	32	33
34	35	38	

39	30	32	33
34	35	38	2
232	234	2	
302			

ST-LAURENT



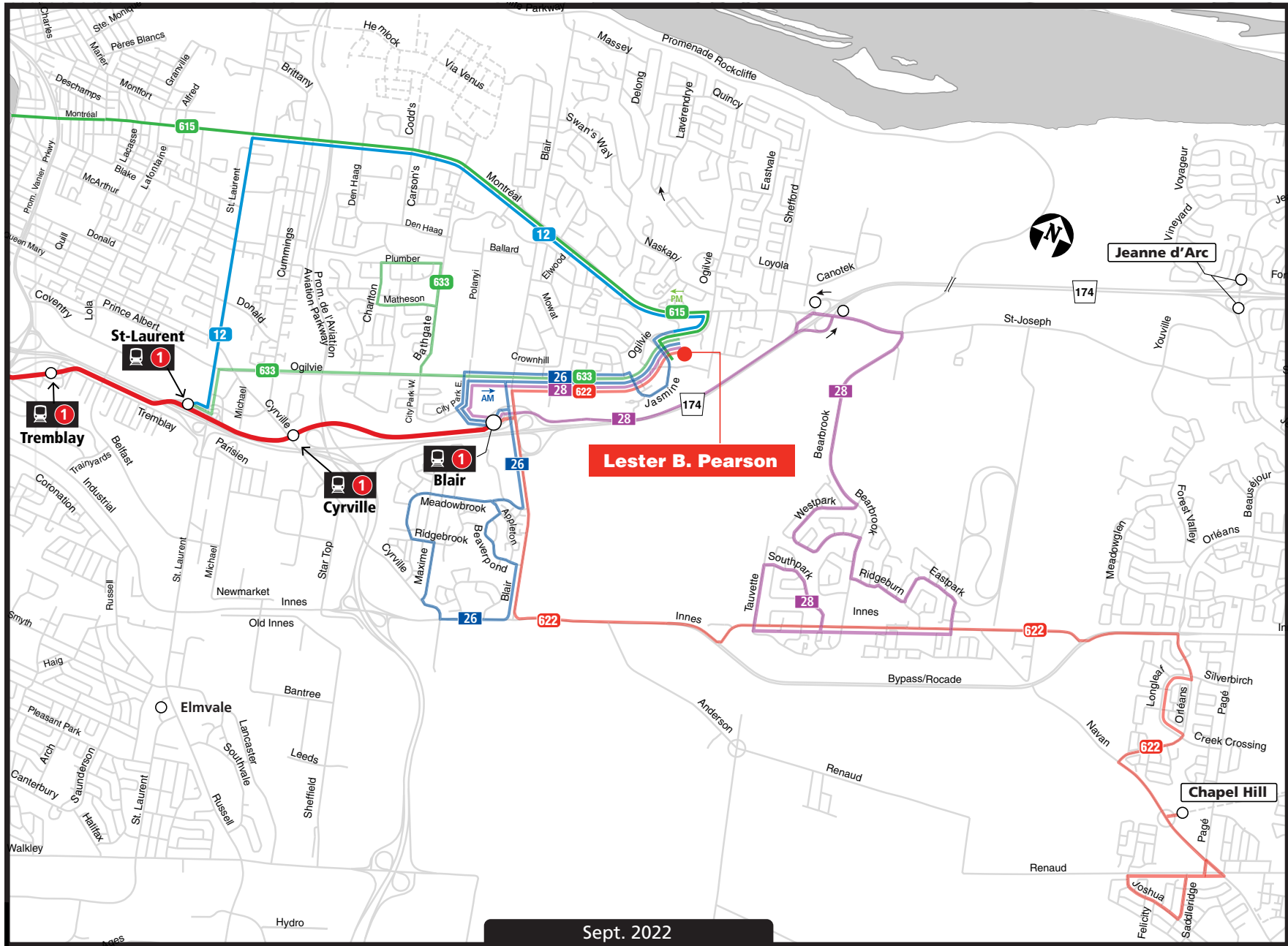
TUNNEY'S PASTURE

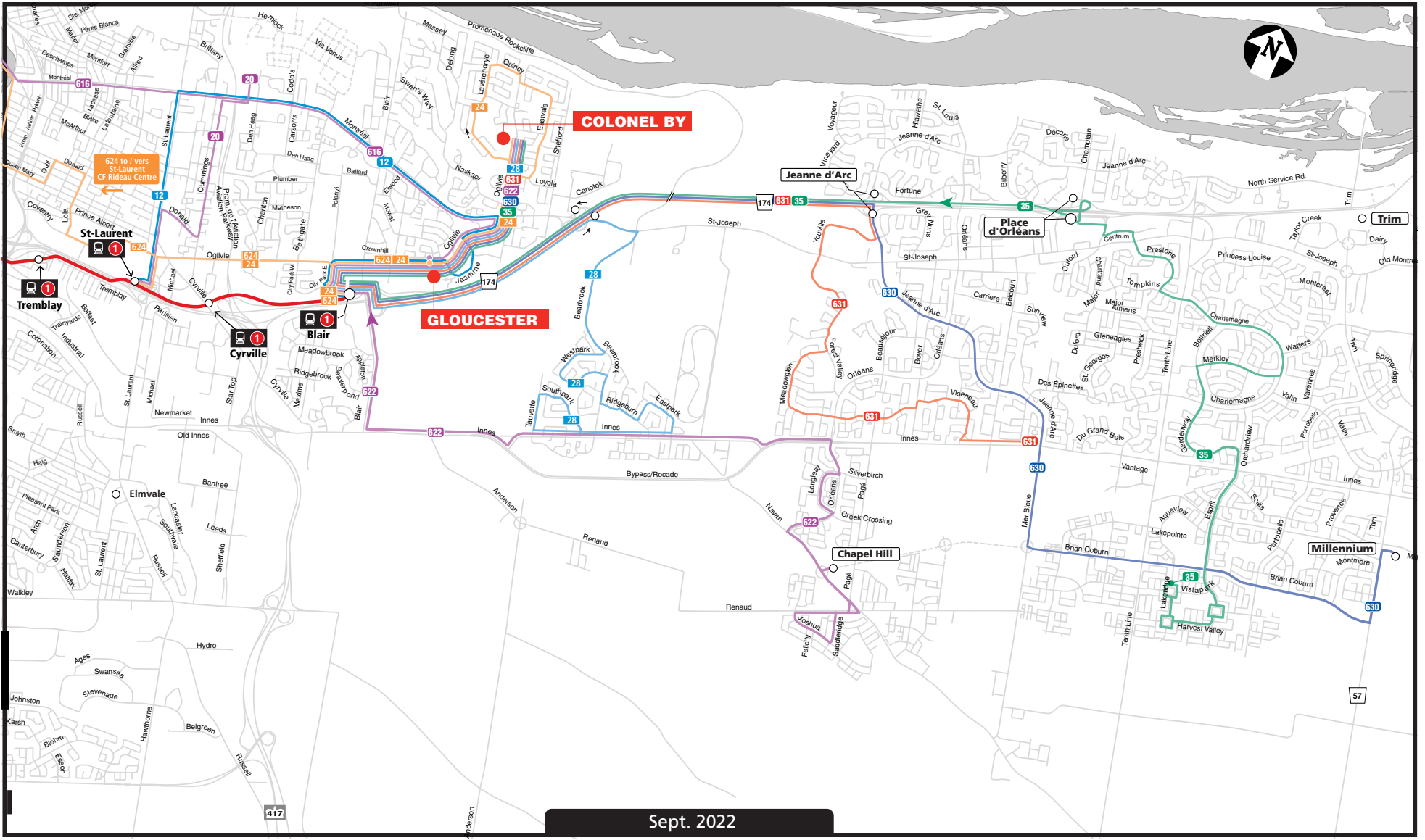


Station



Timepoint / Heures de passage





APPENDIX D

Traffic Count Data

Turning Movement Count - Study Results

BRANT ST @ MCARTHUR AVE

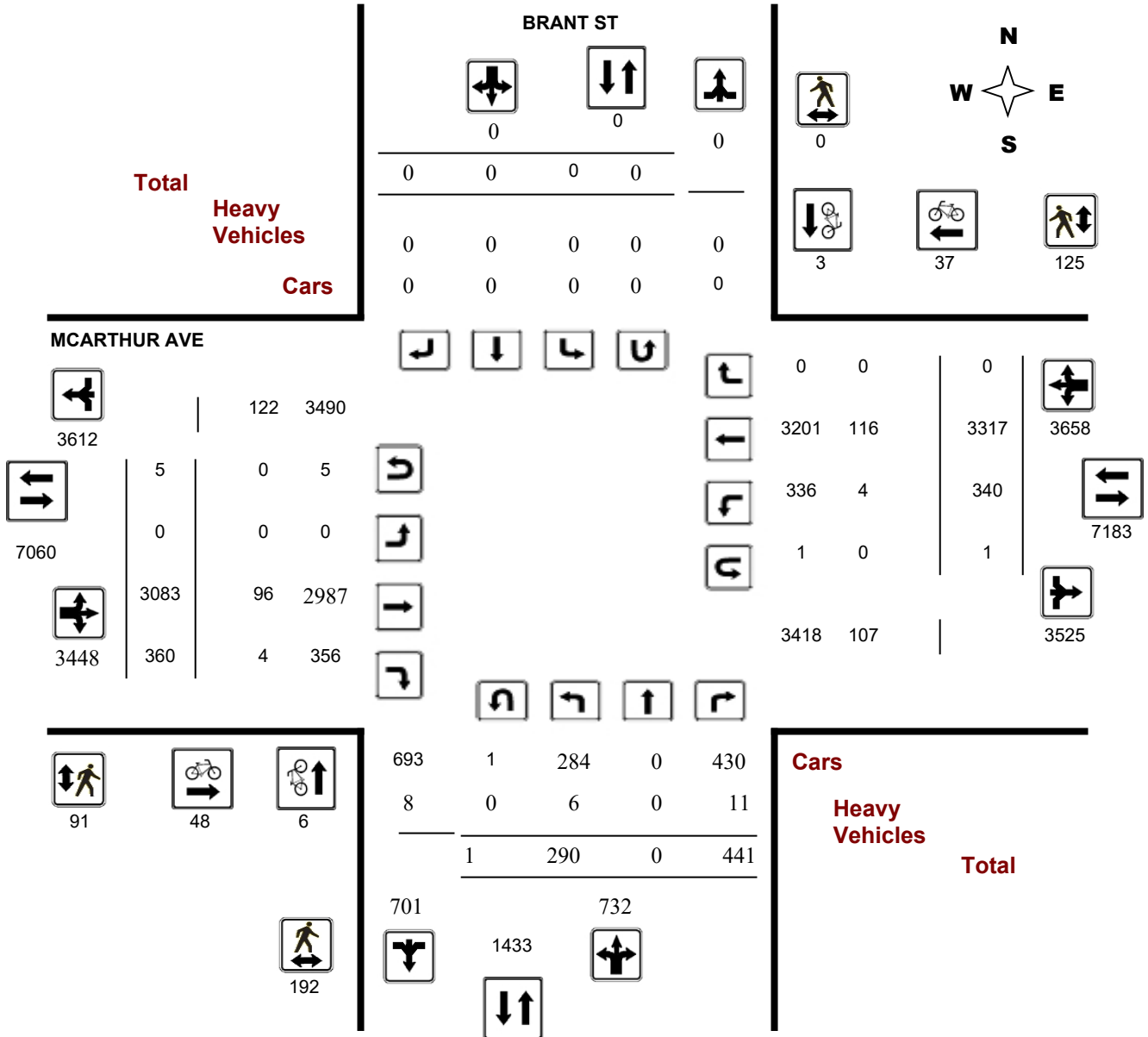
Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study Diagram



Turning Movement Count - Study Results

BRANT ST @ MCARTHUR AVE

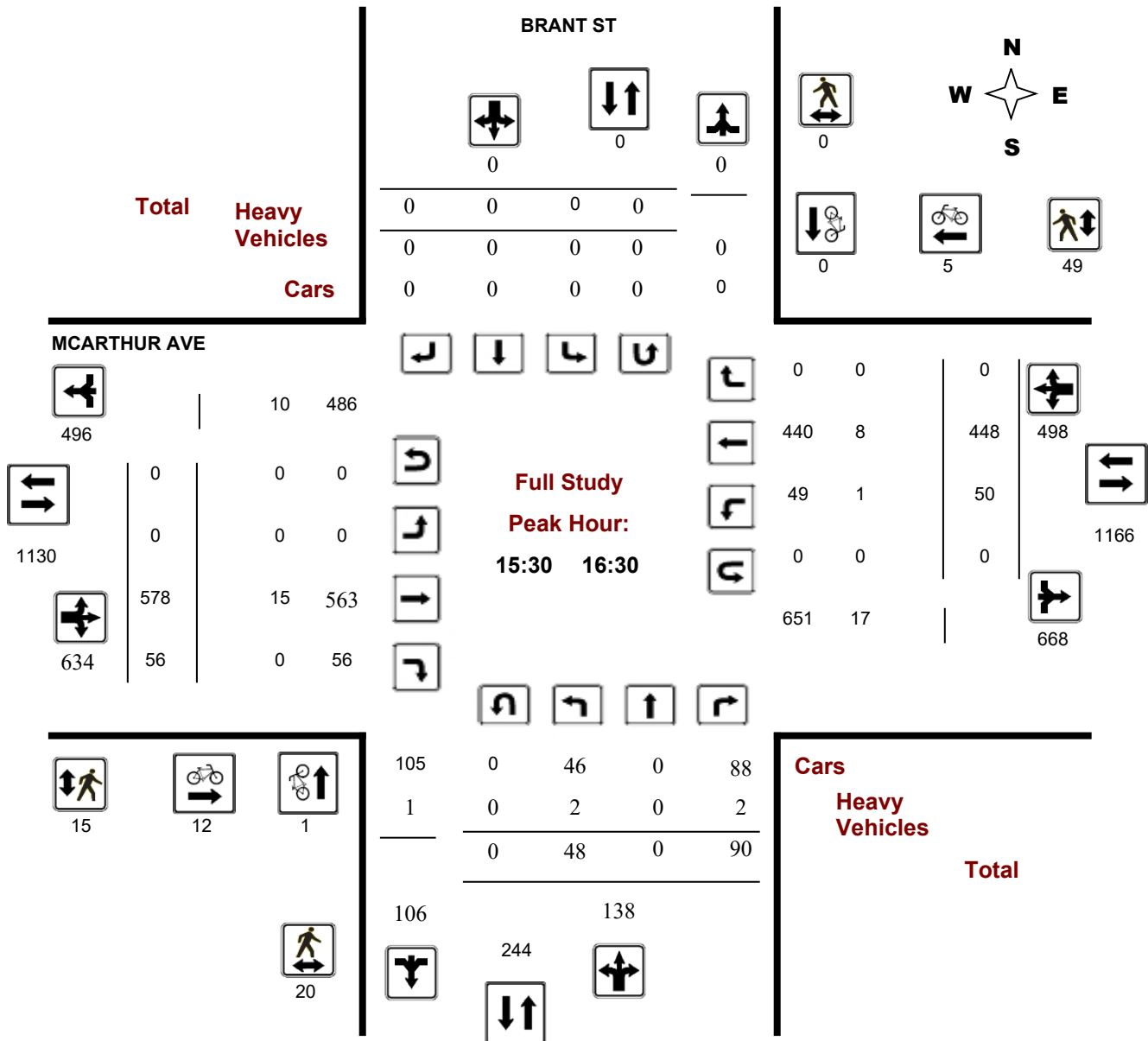
Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Turning Movement Count - Peak Hour Diagram

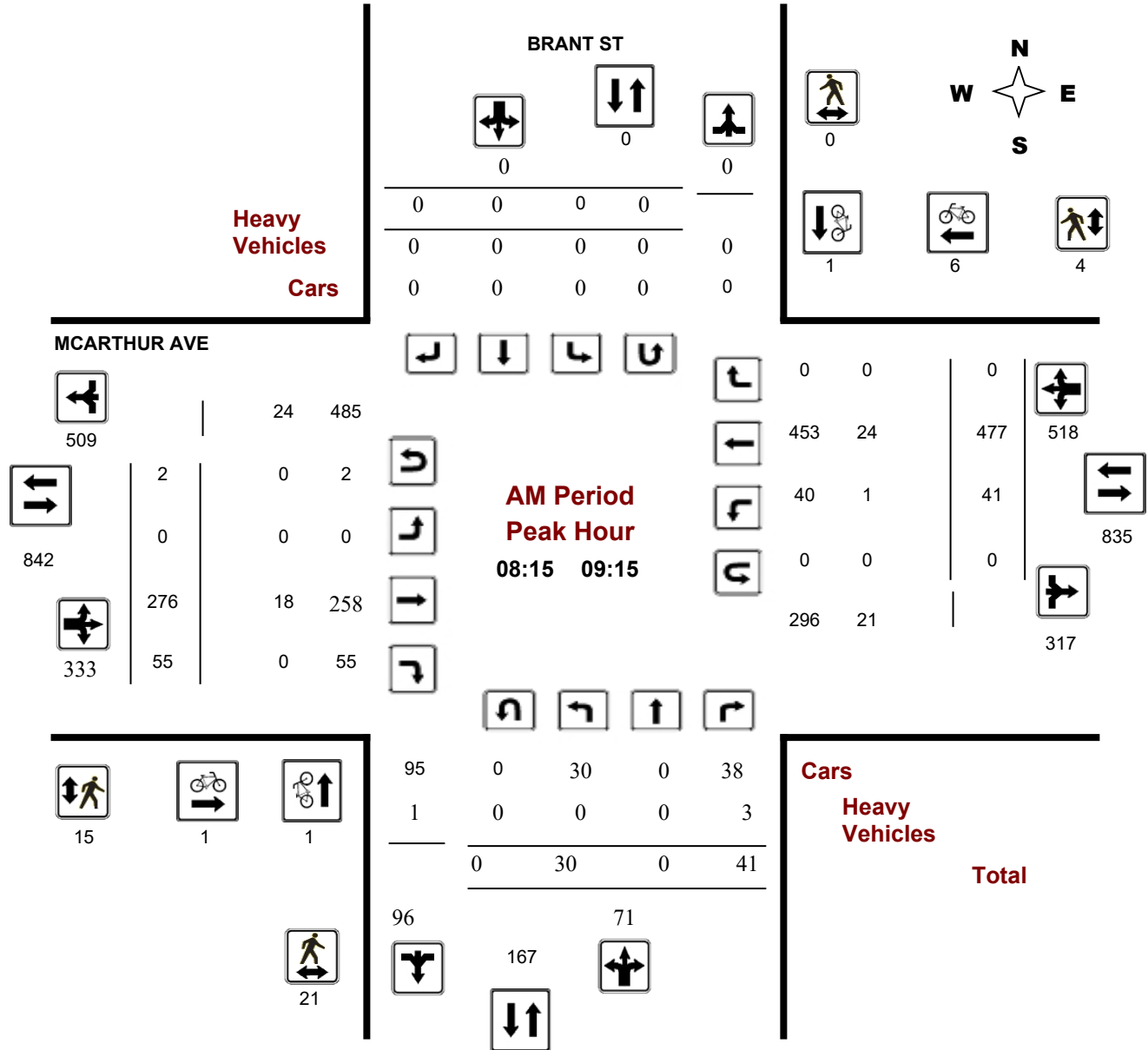
BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

Start Time: 07:00

WO No: 38013

Device: Miovision



Turning Movement Count - Peak Hour Diagram

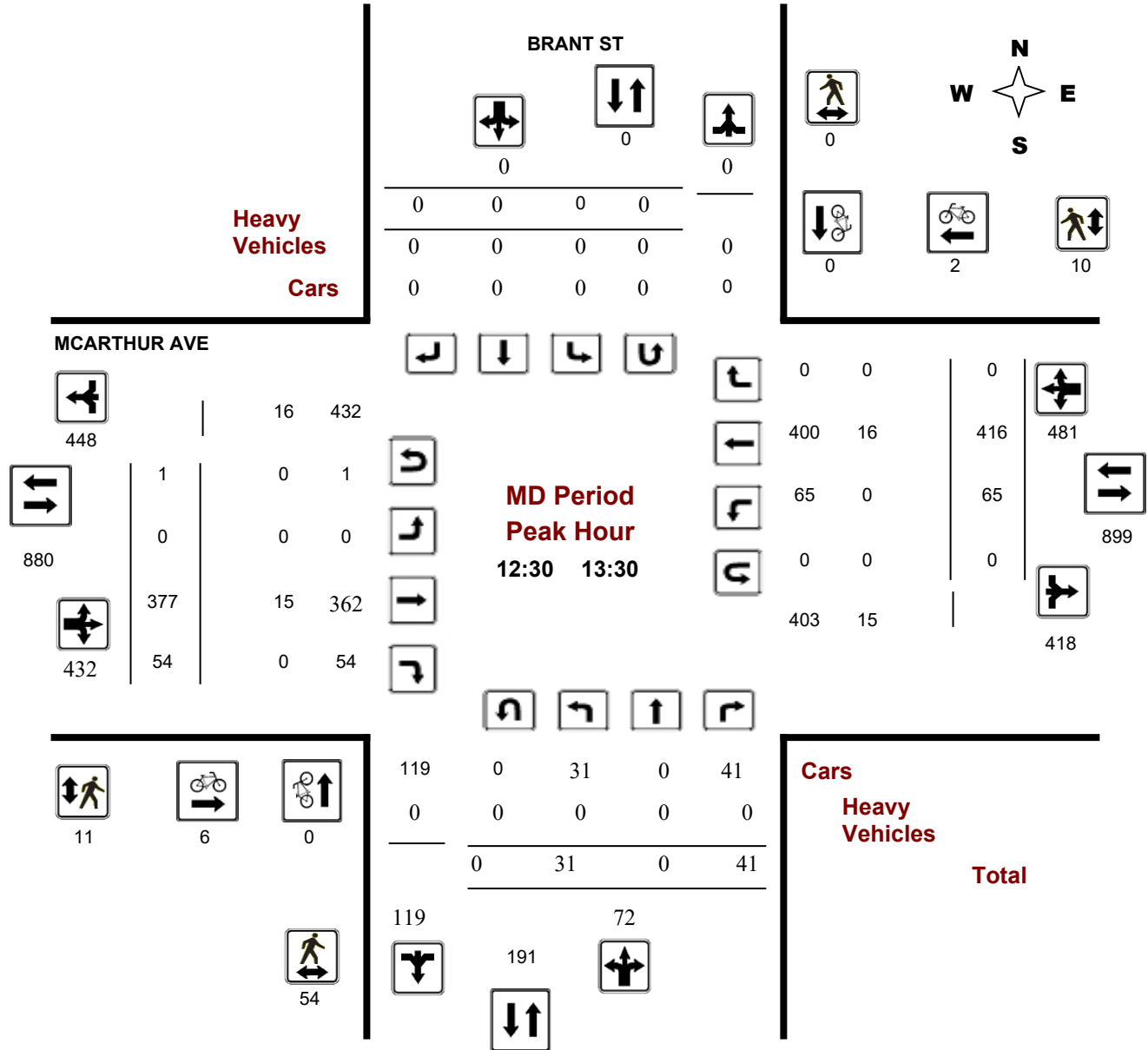
BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

Start Time: 07:00

WO No: 38013

Device: Miovision



Turning Movement Count - Peak Hour Diagram

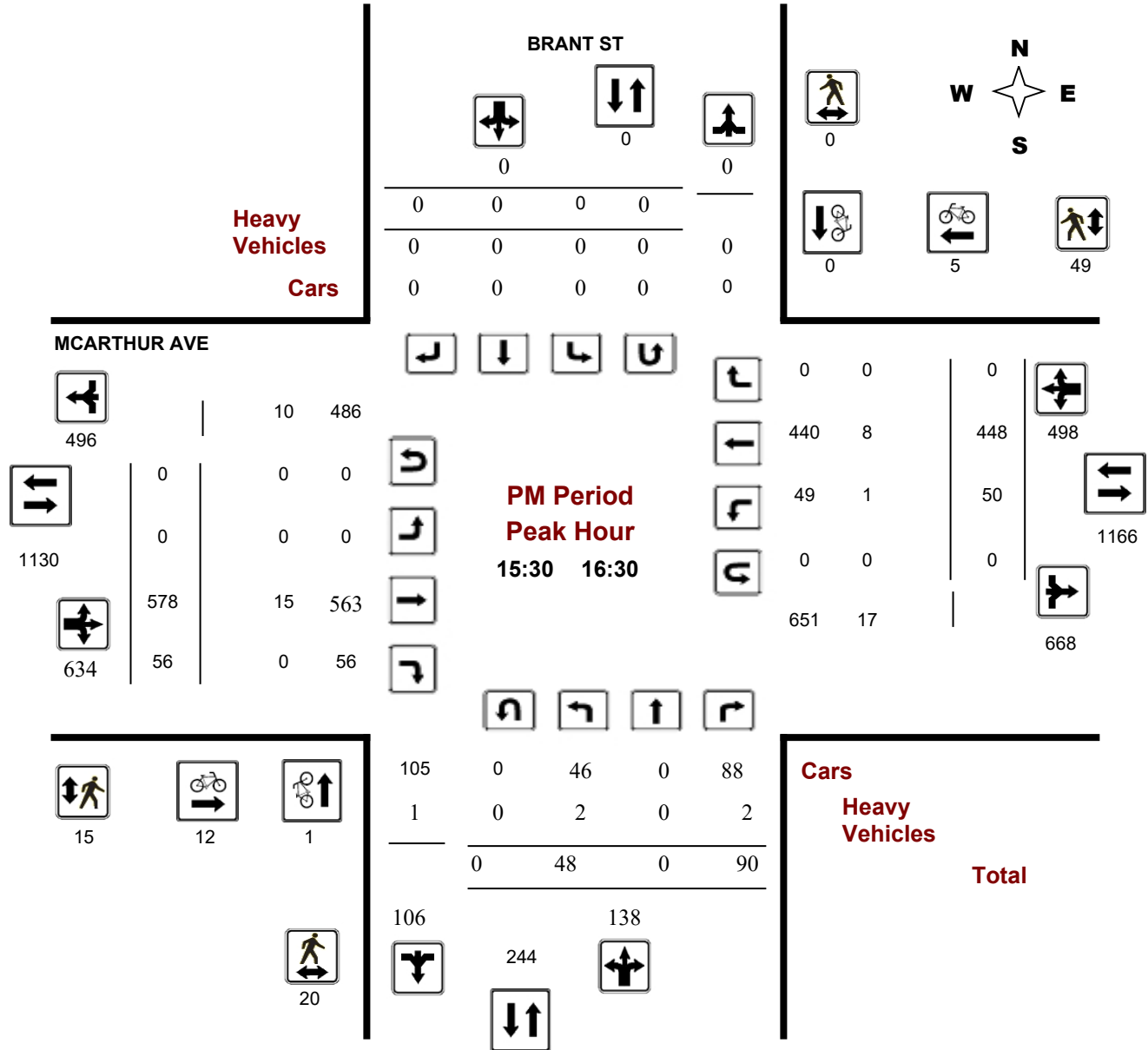
BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

Start Time: 07:00

WO No: 38013

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, October 04, 2018

Total Observed U-Turns

AADT Factor

Northbound: 1 Southbound: 0
 Eastbound: 5 Westbound: 1

.90

Period	BRANT ST										MCARTHUR AVE										Grand Total
	Northbound					Southbound					Eastbound					Westbound					
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	17	0	18	35	0	0	0	0	35	0	255	15	270	20	322	0	342	612	647		
08:00 09:00	32	0	42	74	0	0	0	0	74	0	261	43	304	31	488	0	519	823	897		
09:00 10:00	25	0	32	57	0	0	0	0	57	0	272	47	319	48	378	0	426	745	802		
11:30 12:30	39	0	59	98	0	0	0	0	98	0	423	48	471	32	370	0	402	873	971		
12:30 13:30	31	0	41	72	0	0	0	0	72	0	377	54	431	65	416	0	481	912	984		
15:00 16:00	56	0	84	140	0	0	0	0	140	0	493	65	558	49	428	0	477	1035	1175		
16:00 17:00	48	0	92	140	0	0	0	0	140	0	530	44	574	45	480	0	525	1099	1239		
17:00 18:00	42	0	73	115	0	0	0	0	115	0	472	44	516	50	435	0	485	1001	1116		
Sub Total	290	0	441	731	0	0	0	0	731	0	3083	360	3443	340	3317	0	3657	7100	7831		
U Turns				1				0	1				5				1	6	7		
Total	290	0	441	732	0	0	0	0	732	0	3083	360	3448	340	3317	0	3658	7106	7838		
EQ 12Hr	403	0	613	1017	0	0	0	0	1017	0	4285	500	4793	473	4611	0	5085	9877	10895		
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																1.39					
AVG 12Hr	342	0	520	863	0	0	0	0	915	0	3635	424	4065	401	3911	0	4313	8889	9806		
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																0.9					
AVG 24Hr	448	0	681	1131	0	0	0	0	1131	0	4762	556	5325	525	5123	0	5650	10975	12106		
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

BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

BRANT ST

MCARTHUR 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	4	0	1	5	0	0	0	0	0	0	52	3	55	2	73	0	75	0	135
07:15 07:30	2	0	5	7	0	0	0	0	1	0	62	4	66	3	74	0	77	1	150
07:30 07:45	6	0	6	12	0	0	0	0	1	0	68	4	72	9	85	0	94	1	178
07:45 08:00	5	0	6	11	0	0	0	0	0	0	73	4	77	6	90	0	96	0	184
08:00 08:15	8	0	14	22	0	0	0	0	0	0	57	3	60	7	115	0	122	0	204
08:15 08:30	6	0	6	12	0	0	0	0	1	0	53	11	65	4	124	0	128	1	205
08:30 08:45	7	0	8	15	0	0	0	0	0	0	68	13	81	10	120	0	130	0	226
08:45 09:00	11	0	14	25	0	0	0	0	2	0	83	16	100	10	129	0	139	2	264
09:00 09:15	6	0	13	19	0	0	0	0	0	0	72	15	87	17	104	0	121	0	227
09:15 09:30	6	0	9	15	0	0	0	0	1	0	69	14	83	7	94	0	101	1	199
09:30 09:45	8	0	4	12	0	0	0	0	1	0	57	8	66	11	99	0	110	1	188
09:45 10:00	5	0	6	11	0	0	0	0	0	0	74	10	84	13	81	0	94	0	189
11:30 11:45	5	0	15	20	0	0	0	0	0	0	109	15	124	13	98	0	111	0	255
11:45 12:00	19	0	14	33	0	0	0	0	1	0	101	10	112	5	96	0	101	1	246
12:00 12:15	6	0	16	22	0	0	0	0	0	0	113	11	124	6	84	0	90	0	236
12:15 12:30	9	0	14	24	0	0	0	0	1	0	100	12	112	8	92	0	100	1	236
12:30 12:45	12	0	13	25	0	0	0	0	0	0	99	13	112	14	95	0	109	0	246
12:45 13:00	5	0	5	10	0	0	0	0	0	0	91	9	100	16	93	0	109	0	219
13:00 13:15	7	0	13	20	0	0	0	0	0	0	91	18	110	20	121	0	141	0	271
13:15 13:30	7	0	10	17	0	0	0	0	0	0	96	14	110	15	107	0	122	0	249
15:00 15:15	17	0	15	32	0	0	0	0	2	0	91	9	100	16	99	0	115	2	247
15:15 15:30	12	0	19	31	0	0	0	0	0	0	111	24	135	8	119	0	127	0	293
15:30 15:45	13	0	28	41	0	0	0	0	1	0	144	19	163	17	89	0	106	1	310
15:45 16:00	14	0	22	36	0	0	0	0	3	0	147	13	160	8	121	0	129	3	325
16:00 16:15	12	0	24	36	0	0	0	0	0	0	157	11	168	14	111	0	125	0	329
16:15 16:30	9	0	16	25	0	0	0	0	0	0	130	13	143	11	127	0	138	0	306
16:30 16:45	12	0	24	36	0	0	0	0	0	0	114	11	125	8	120	0	128	0	289
16:45 17:00	15	0	28	43	0	0	0	0	1	0	129	9	138	12	122	0	134	1	315
17:00 17:15	14	0	18	32	0	0	0	0	0	0	126	10	136	13	102	0	115	0	283
17:15 17:30	11	0	18	29	0	0	0	0	1	0	123	21	144	13	111	0	124	1	297
17:30 17:45	9	0	18	27	0	0	0	0	0	0	109	4	113	15	112	0	128	0	268
17:45 18:00	8	0	19	27	0	0	0	0	0	0	114	9	123	9	110	0	119	0	269
Total:	290	0	441	732	0	0	0	0	17	0	3083	360	3448	340	3317	0	3658	17	7,838

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Time Period	BRANT ST			MCARTHUR AVE			Grand Total
	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00 07:15	0	0	0	3	0	3	3
07:15 07:30	0	0	0	0	1	1	1
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	1	0	1	1
08:00 08:15	0	0	0	0	2	2	2
08:15 08:30	0	0	0	0	1	1	1
08:30 08:45	1	1	2	0	1	1	3
08:45 09:00	0	0	0	0	3	3	3
09:00 09:15	0	0	0	1	1	2	2
09:15 09:30	0	0	0	1	0	1	1
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	1	0	1	0	1	1	2
11:30 11:45	0	0	0	0	1	1	1
11:45 12:00	0	0	0	3	0	3	3
12:00 12:15	0	0	0	1	0	1	1
12:15 12:30	0	0	0	1	6	7	7
12:30 12:45	0	0	0	1	0	1	1
12:45 13:00	0	0	0	3	2	5	5
13:00 13:15	0	0	0	1	0	1	1
13:15 13:30	0	0	0	1	0	1	1
15:00 15:15	0	0	0	2	1	3	3
15:15 15:30	1	0	1	3	0	3	4
15:30 15:45	0	0	0	1	1	2	2
15:45 16:00	1	0	1	4	1	5	6
16:00 16:15	0	0	0	4	0	4	4
16:15 16:30	0	0	0	3	3	6	6
16:30 16:45	2	0	2	2	1	3	5
16:45 17:00	0	0	0	4	4	8	8
17:00 17:15	0	1	1	4	3	7	8
17:15 17:30	0	0	0	1	2	3	3
17:30 17:45	0	0	0	1	0	1	1
17:45 18:00	0	1	1	2	2	4	5
Total	6	3	9	48	37	85	94



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

BRANT ST

MCARTHUR 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	0	1	0	2	2	3
07:15 07:30	1	0	1	3	6	9	10
07:30 07:45	1	0	1	3	2	5	6
07:45 08:00	1	0	1	3	4	7	8
08:00 08:15	1	0	1	2	1	3	4
08:15 08:30	5	0	5	2	2	4	9
08:30 08:45	4	0	4	0	0	0	4
08:45 09:00	8	0	8	12	2	14	22
09:00 09:15	4	0	4	1	0	1	5
09:15 09:30	4	0	4	2	1	3	7
09:30 09:45	3	0	3	0	1	1	4
09:45 10:00	2	0	2	0	0	0	2
11:30 11:45	11	0	11	4	3	7	18
11:45 12:00	5	0	5	2	2	4	9
12:00 12:15	5	0	5	2	3	5	10
12:15 12:30	8	0	8	1	1	2	10
12:30 12:45	7	0	7	6	3	9	16
12:45 13:00	22	0	22	4	1	5	27
13:00 13:15	5	0	5	1	2	3	8
13:15 13:30	20	0	20	0	4	4	24
15:00 15:15	11	0	11	5	6	11	22
15:15 15:30	14	0	14	12	6	18	32
15:30 15:45	7	0	7	10	4	14	21
15:45 16:00	4	0	4	4	32	36	40
16:00 16:15	7	0	7	1	8	9	16
16:15 16:30	2	0	2	0	5	5	7
16:30 16:45	7	0	7	1	7	8	15
16:45 17:00	5	0	5	5	3	8	13
17:00 17:15	4	0	4	3	6	9	13
17:15 17:30	5	0	5	0	0	0	5
17:30 17:45	3	0	3	0	2	2	5
17:45 18:00	5	0	5	2	6	8	13
Total	192	0	192	91	125	216	408



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

BRANT ST

MCARTHUR AVE

Northbound

Southbound

Eastbound

Westbound

Time Period	Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total	
	LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT				
07:00 07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4	4	
07:15 07:30	0	0	1	1	0	0	0	0	0	1	0	2	0	2	0	6	0	6	8	9
07:30 07:45	1	0	0	1	0	0	0	0	0	1	0	3	1	4	0	4	0	4	8	9
07:45 08:00	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5	5
08:00 08:15	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	1	0	1	4	4
08:15 08:30	0	0	1	1	0	0	0	0	0	1	0	2	0	2	0	6	0	6	8	9
08:30 08:45	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	5	0	6	10	10
08:45 09:00	0	0	2	2	0	0	0	0	0	2	0	7	0	7	0	4	0	4	11	13
09:00 09:15	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	9	0	9	14	14
09:15 09:30	0	0	1	1	0	0	0	0	0	1	0	3	0	3	0	5	0	5	8	9
09:30 09:45	1	0	0	1	0	0	0	0	0	1	0	0	0	0	4	0	4	4	5	5
09:45 10:00	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	4	0	4	6	6
11:30 11:45	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	5	0	5	9	9
11:45 12:00	1	0	0	1	0	0	0	0	0	1	0	6	0	6	0	6	0	6	12	13
12:00 12:15	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	4	5	5
12:15 12:30	0	0	1	1	0	0	0	0	0	1	0	3	0	3	0	2	0	2	5	6
12:30 12:45	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	7	0	7	9	9
12:45 13:00	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	2	0	2	8	8
13:00 13:15	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	4	0	4	8	8
13:15 13:30	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6	6
15:00 15:15	0	0	2	2	0	0	0	0	0	2	0	4	1	5	0	4	0	4	9	11
15:15 15:30	0	0	0	0	0	0	0	0	0	0	0	3	1	4	0	5	0	5	9	9
15:30 15:45	1	0	0	1	0	0	0	0	0	1	0	4	0	4	1	4	0	5	9	10
15:45 16:00	1	0	2	3	0	0	0	0	0	3	0	4	0	4	0	0	0	0	4	7
16:00 16:15	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6	6
16:15 16:30	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	1	0	1	5	5
16:30 16:45	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	2	0	3	7	7
16:45 17:00	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	0	1	1	2	2
17:00 17:15	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	1	0	1	4	4
17:15 17:30	1	0	0	1	0	0	0	0	0	1	0	1	1	2	1	2	0	3	5	6
17:30 17:45	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5	5
17:45 18:00	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4	4
Total: None	6	0	11	17	0	0	0	0	0	17	0	96	4	100	4	116	0	120	220	237



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRANT ST @ MCARTHUR AVE

Survey Date: Thursday, October 04, 2018

WO No: 38013

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

BRANT ST

MCARTHUR 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
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	1	0	1
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	1	0	1
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	1	0	1
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	1	0	1
12:00	12:15	0	0	0	0	0
12:15	12:30	1	0	0	0	1
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	1	0	1
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	1	1
17:45	18:00	0	0	0	0	0
Total		1	0	5	1	7

APPENDIX E

Collision Records



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 To: December 31, 2020

Location: BELISLE ST btwn END & MCARTHUR AVE

Traffic Control: No control

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Dec-27, Tue,07:03	Clear	SMV unattended vehicle	P.D. only	Ice	North	Going ahead	Snow plow	Unattended vehicle	0
2017-Mar-20, Mon,17:32	Clear	SMV unattended vehicle	P.D. only	Dry	South	Slowing or stopping	Truck - closed	Unattended vehicle	0

Location: BELISLE ST/DIEPPE ST @ MCARTHUR AVE

Traffic Control: Stop sign

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Nov-20, Tue,16:37	Clear	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Dec-18, Fri,10:39	Clear	Angle	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: BRANT ST @ MCARTHUR AVE

Traffic Control: Traffic signal

Total Collisions: 8

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Nov-08, Tue,17:45	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jan-06, Fri,17:30	Clear	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-May-30, Wed,19:40	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Truck - tank	Other motor vehicle	
2018-Nov-16, Fri,14:15	Snow	Sideswipe	P.D. only	Loose snow	East	Unknown	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Mar-28, Thu,17:19	Clear	SMV other	P.D. only	Dry	South	Reversing	Truck and trailer	Pole (utility, power)	0



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 To: December 31, 2020

Location: BRANT ST @ MCARTHUR AVE

Traffic Control: Traffic signal

Total Collisions: 8

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2020-Apr-27, Mon,17:45	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Aug-02, Sun,14:00	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Stopped	Truck - closed	Other motor vehicle	
2020-Aug-14, Fri,18:30	Clear	Rear end	P.D. only	Dry	East	Going ahead	Passenger van	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	

Location: MCARTHUR AVE btwn BELISLE ST & BRANT ST

Traffic Control: No control

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2016-Sep-02, Fri,16:30	Clear	Sideswipe	Non-fatal injury	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Sep-21, Thu,18:02	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

APPENDIX F

Excerpts From Relevant Traffic Studies

MODULE	ELEMENT	EXEMPTION CONSIDERATIONS
Design Review Component		
4.1 Development Design	4.1.2 Circulation and Access	No – Will discuss moving trucks and garbage pickup.
	4.1.3 New Street Networks	Yes – The development does not propose any new municipal streets.
4.2 Parking	4.2.1 Parking Supply	No – Parking does not meet the City of Ottawa parking Bylaws.
	4.2.2 Spillover Parking	No – Spillover will be examined as parking does not meet bylaws.
Network Impact Component		
4.5 Transportation Demand Management	All Elements	No – TDM measures will be examined.
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Yes – Access to the development will be from an arterial road.
4.8 Network Concept		Yes – The site would not generate more than 200 person-trips per peak hour in excess of the volume permitted by established zoning.

STEP 3 - FORECASTING

MODULE 3.1 - Development-generated Travel Demand

Element 3.1.1 – Trip Generation and Mode Shares

The development at 374 McArthur Avenue will consist of a 64 unit apartment building. The building will have one access onto McArthur Avenue from an underground parking garage. The site will provide 17 vehicle parking spaces including 5 visitor spaces.

Residential Land Use

The residential use would consist of 64 rental apartment units on all floors of a six storey apartment building. The number of expected site generated trips utilized the trip statistical data documented in the *2009 TRANS Trip Generation Study* report. The analysis used the Vehicle Trip Generation Rates from Table 6.3 of the TRANS document for ITE Land Use 223, “Mid-rise apartments (3-10 floors)” in an urban area inside the greenbelt. The number of site generated trips was proportioned inbound/outbound to the directional distribution shown in Table 3.17 of the document. The trips rates and distribution are shown in Table 3.1.

**TABLE 3.1
 VEHICLE TRIP GENERATION RATES - Residential Land Use**

Trip Rate	Peak AM Hour		Peak PM Hour	
Vehicle Trip Rate	0.24 T/Dwelling Units		0.28 T/Dwelling Units	
Directional Distribution	24% Entering	77% Exiting	62% Entering	39% Exiting

The site generated trips were determined by the product of the number of apartment units (64 units) and the trip rates during the peak hour as shown in Table 3.1. The total number of auto-trips is shown in Table 3.2. The person-trips were determined by the number of auto-trips divided by the mode share for the number of vehicle trips. The mode share used was from Table 3.13 of the *2009 TRANS Trip Generation Study* report for an apartment development in an urban area (within the greenbelt). The mode share is 0.37 vehicle trips for the peak AM hour and 0.40 vehicle trips for the peak PM hour. Table 3.2 shows the future peak hour person-trips.

**TABLE 3.2
 TOTAL PEAK HOUR SITE GENERATED TRIPS - Residential Land Use**

Apartment Units	AUTO-TRIP GENERATION		FUTURE PERSON-TRIPS	
	Peak AM Hour	Peak PM Hour	Peak AM Hour	Peak PM Hour
64 Apartments	15 veh.	18 veh.	41 per.	45 per.

The modal split of trips was determined from the City of Ottawa document, *2011 NCR Household Origin-Destination Survey*, January 2013. The primary travel modal share used the demographic characteristics for the Ottawa Inside Greenbelt area (Page 78) for trips. The residential modal share was calculated using the weighted average of from/within trips during the peak AM hour (leaving home), and to/within trips during the peak PM hour (returning home). Table 3.3 presents the modal share summary which will be used in the TIA study for the residential land use.

OC Transpo schedules Frequent Route 14 along McArthur Avenue past the site which provides service to the St. Laurent Transit Station to the east and the Ottawa downtown core to the west. Bus stops are located at the Brant/McArthur intersection. Cycling lanes have been provided in the McArthur Bicycle Lanes project which was completed in 2018. Pedestrian sidewalks are provided along both sides of McArthur Avenue.

The peak hour person-trips per mode were determined by the product of the peak hour future person-trips from Table 3.2 and the future mode share from Table 3.3. The result is shown in Table 3.4 for the residential portion of the development.

**TABLE 3.3
 MODE SHARE SUMMARY (Person-Trips) - Residential Land Use**

Future Mode Share Targets for the Development			
Travel Mode	AM	PM	Rationale
Auto Driver	53%	54%	Consistent with modal share targets and proximity to residential and employment areas
Auto Passenger	10%	15%	
Transit	19%	17%	Consistent with the 2009 TRANS and 2011 TRANS-OD reports and the local retail and commercial area
Bicycle	3%	3%	
Walk/Other	15%	11%	

**TABLE 3.4
 FUTURE SITE GENERATED PERSON-TRIPS - Residential Land Use**

TRAVEL MODE	DEVELOPMENT GENERATED PERSON-TRIPS	
	PEAK AM HR.	PEAK PM HR.
Auto Driver	22 per. trips	24 per. trips
Auto Passenger	4 per. trips	7 per. trips
Transit	8 per. trips	8 per. trips
Bicycle	1 per. trips	1 per. trips
Walk/Other	<u>6 per. trips</u>	<u>5 per. trips</u>
Total Trips	41 per. trips	45 per. trips

The TIA Guidelines allow for three Trip Reduction Factors that may be applied to the expected development trips. There were no trip reductions applied to the residential use as discussed below:

- 1) *Deduction of Existing Development Trips* - The existing vacant single-family house would not be generating any trips.
- 2) *Pass-by Vehicle Trips* - All residential trips are assumed as primary trips.
- 3) *Synergy or Internalization* - There would be no internalized trips with one land use.

Element 3.1.2 – Trip Distribution

The distribution of the peak hour site generated trips from the residential portion of the development was determined by examining the *2011 NCR Household Origin-Destination Survey* for the origin/destination of peak AM hour trips for the Ottawa East/Beacon Hill area, and the October 4, 2018 traffic counts during the peak AM and PM hours at the Brant/McArthur intersection. The trip distribution percentage for the residential trips during the weekday peak AM and PM hours are as follows:

	Peak AM	Peak PM
To/From the south along Brant Street	10%	10%
To/From the east along McArthur Ave.	35%	40%
To/From the west along McArthur Ave.	55%	50%

Element 3.1.3 – Trip Assignment

The distribution of trips entering and exiting the site was determined by applying the directional distribution of vehicle trips shown in Table 3.1 to the Auto Driver trips shown in Table 3.4 for the residential trips. Table 3.5 presents the distribution of vehicle trips entering and exiting the site during the peak AM and PM hours.

**TABLE 3.5
 PEAK HOUR DISTRIBUTION OF VEHICLE TRIPS**

PEAK HOUR TRIPS BUILDING USE	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
64 Apartment Units	22	5 (24%)	17 (77%)	24	15 (62%)	9 (39%)

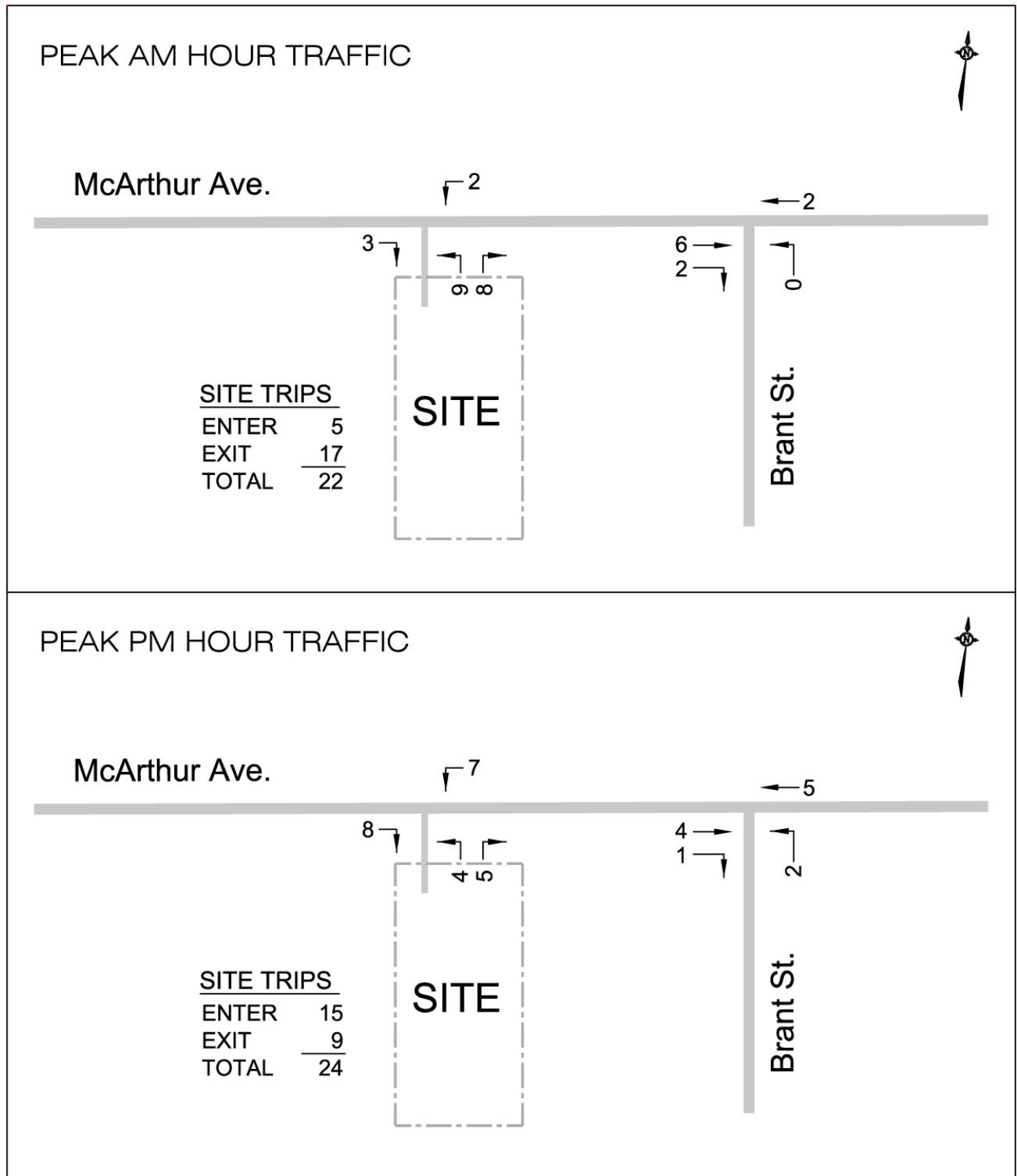
The peak AM and PM hour trips from Table 3.10 were distributed onto the adjacent roads using the distribution discussed in Element 3.1.2. Figure 3.1 shows the peak hour site generated trips for the residential land use.

MODULE 3.2 - Background Network Travel Demands

Element 3.2.1 – Transportation Network Plans

The City of Ottawa *Transportation Master Plan (TMP) 2013* was reviewed to identify transit and roadway projects in the vicinity of the development. The document did not identify any planned network changes which would have an impact on all modes of travel demand. The McArthur Bicycle Lane project, which was completed in 2018, would provide a safer facility for cyclists and increase traffic calming measures by

FIGURE 3.1
PEAK AM AND PM HOUR SITE GENERATED TRIPS



NOT TO SCALE

reducing the number of vehicle travel lanes and providing bulb-outs. The bicycle lanes would also provide a buffer between the vehicles and sidewalks which would increase the feeling of safety for pedestrians along the sidewalks.

Element 3.2.2 – Background Growth

The background growth in traffic represents the increase or decrease in traffic due to development outside the study area. The trip trend of trips to/from the Ottawa Inner Area for auto driver trips was examined in the *National Capital Region Travel Trends* document prepared by the IBI Group. The document showed that trips from the Ottawa East area decreased at an average annual compounded rate of -1.12 percent, and trips to the Ottawa East area decreased at an average annual compounded rate of -1.04 percent between the years of 2005 and 2011.

The study has assumed that the background traffic would experience an annual compounded increase of 1.0 percent which translates to the following growth factors which were applied to the 2018 traffic counts at all approaches to the intersection of Brant Street and McArthur Avenue:

Growth Factor at the Brant/McArthur Intersection

2018 → 2022 = 1.041	Completion
2018 → 2027 = 1.094	Completion + 5 Years

Element 3.2.3 – Other Developments

A search for all significant development in the approval process with the City of Ottawa determined that there were no proposed developments within the study area of the proposed Castle Heights Residence project.

Figure 3.2 presents the 2022 peak AM and PM peak hour background vehicle traffic (does not include trips from the proposed Castle Heights Residence project). Figure 3.3 shows the expected 2027 peak hour background traffic which represents five years beyond completion of the development. All background traffic includes the 1.0 percent average annual compounded increase in traffic.

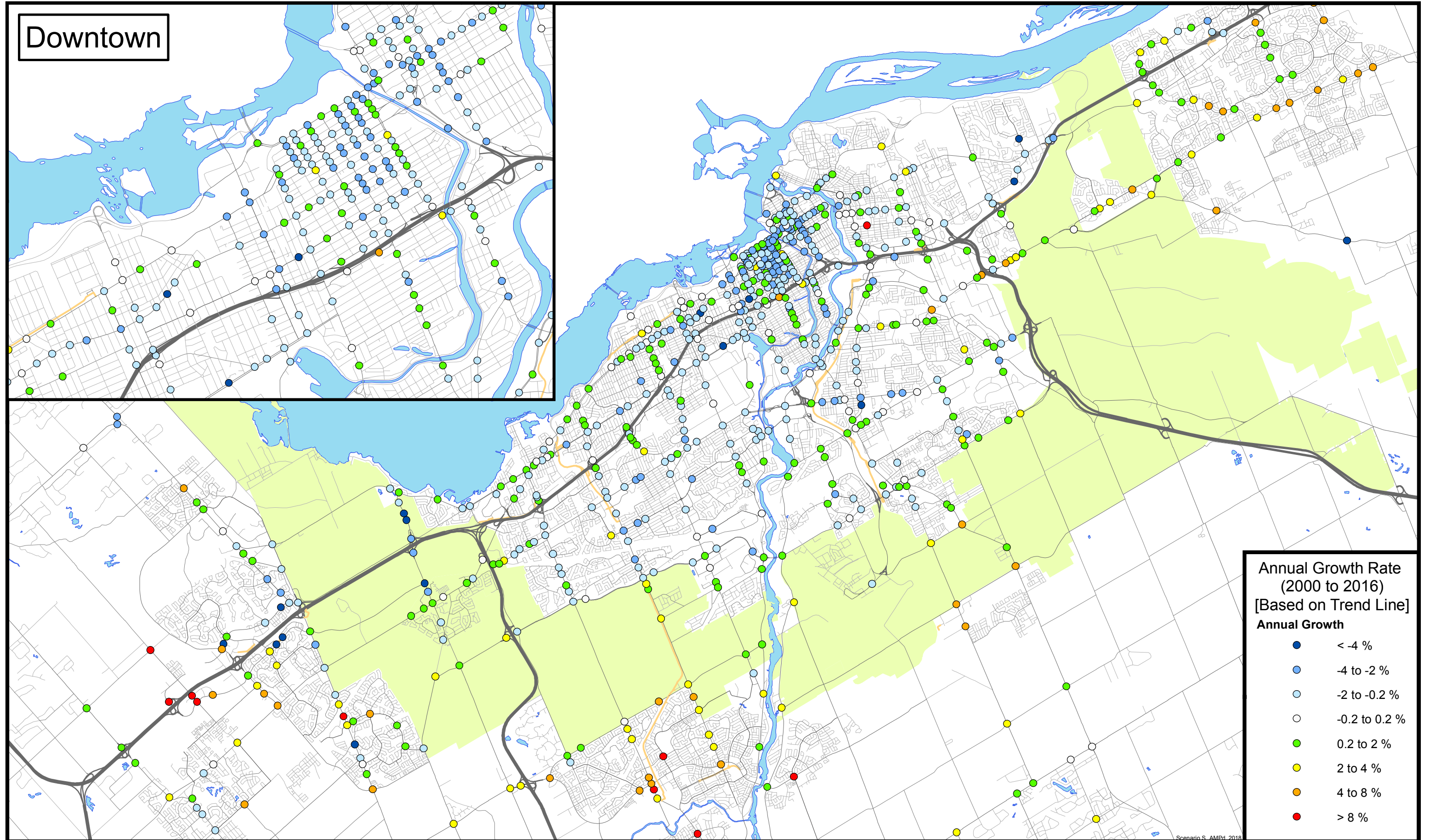
MODULE 3.3 - Demand Rationalization

There are no capacity limitations to the travel demands in the area. The approval of the reduction in travel lanes under the McArthur Bicycle Lanes project determined that future travel demand capacity would not be an issue.

The total vehicular traffic is the sum of the peak hour site generated trips and the peak hour background traffic. The site generated trips would be the addition of the site trips from Figure 3.1, and the background traffic (Figure 3.2 for the year 2022 and Figure 3.3 for the year 2027). Figure 3.4 presents the total 2022 peak hour vehicular traffic and Figure 3.5 the total 2027 peak hour vehicular traffic.

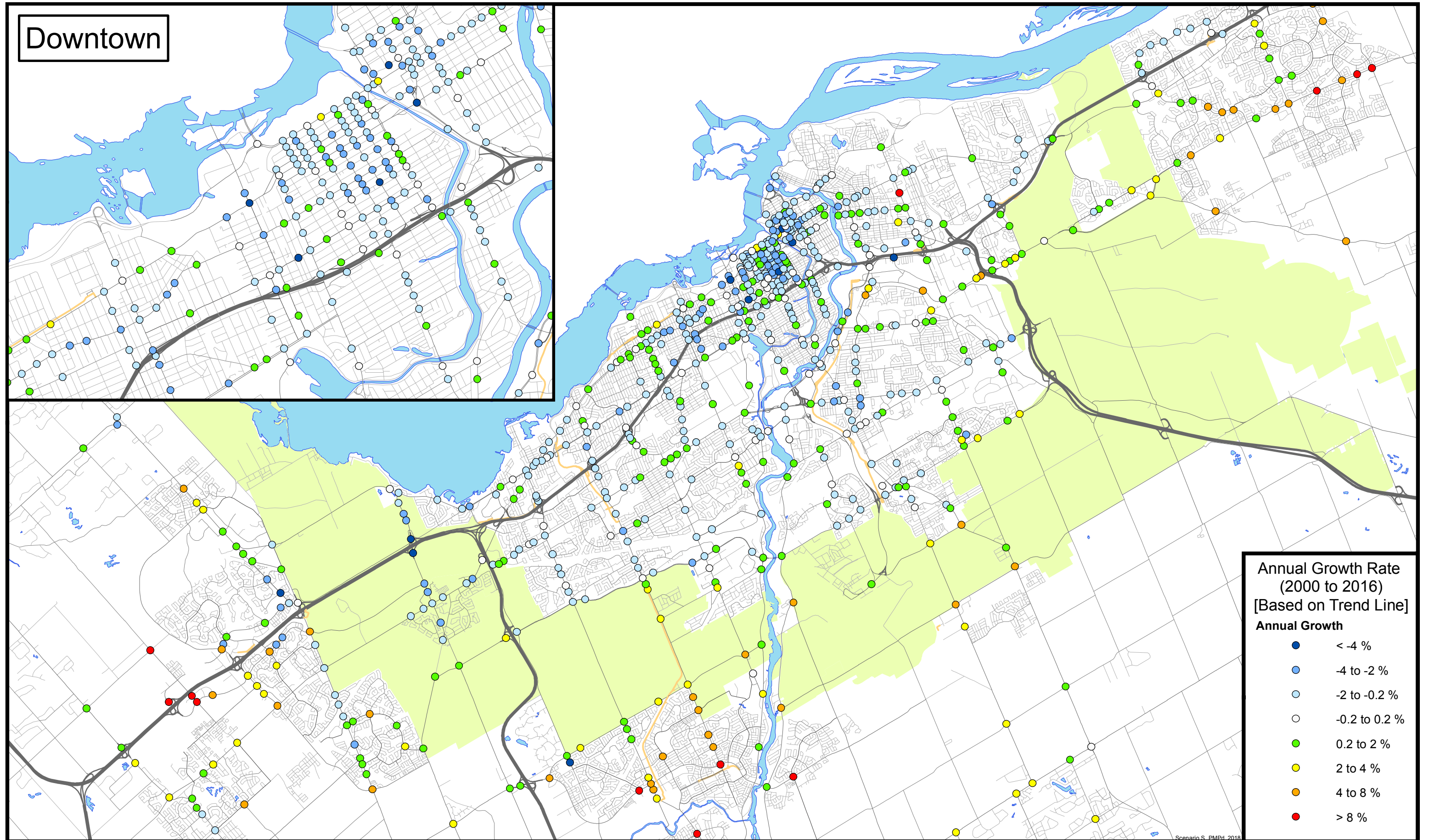
INTERSECTION TRAFFIC GROWTH RATE, AM PEAK PERIOD

Total Vehicular Volume Entering the Intersection, 2000 to 2016



INTERSECTION TRAFFIC GROWTH RATE, PM PEAK PERIOD

Total Vehicular Volume Entering the Intersection, 2000 to 2016



APPENDIX G

Transportation Demand Management Checklists

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: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
1. WALKING & CYCLING: ROUTES		
1.1 Building location & access points		
BASIC	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	✓
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	✓
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	✓
1.2 Facilities for walking & cycling		
REQUIRED	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (<i>see Official Plan policy 4.3.3</i>)	<input type="checkbox"/> N/A - no rapid transit
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 (<i>see Official Plan policy 4.3.12</i>)	✓

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3 Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks (<i>see Official Plan policy 4.3.10</i>)	✓
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 (<i>see Official Plan policy 4.3.10</i>)	✓
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 (<i>see Official Plan policy 4.3.11</i>)	✓
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	✓
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	✓
BASIC	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	<input type="checkbox"/>
1.3 Amenities for walking & cycling		
BASIC	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	✓
BASIC	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
2. WALKING & CYCLING: END-OF-TRIP FACILITIES		
2.1 Bicycle parking		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i>)	✓
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 <i>Zoning By-law Section 111</i>)	✓
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 <i>Zoning By-law Section 111</i>)	✓
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	<input type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input type="checkbox"/> N/A
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	<input type="checkbox"/>
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)	<input type="checkbox"/>
3. TRANSIT		
3.1 Customer amenities		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	✓
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
4. RIDESHARING		
4.1 Pick-up & drop-off facilities		
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input checked="" type="checkbox"/>
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 (<i>see Zoning By-law Section 94</i>)	<input type="checkbox"/>
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	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>
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	<input type="checkbox"/>
BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (<i>see Zoning By-law Section 104</i>)	<input type="checkbox"/>
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 (<i>see Zoning By-law Section 111</i>)	<input type="checkbox"/>
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)	<input type="checkbox"/>

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

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

TDM measures: Residential developments		Check if proposed & add descriptions
1. TDM PROGRAM MANAGEMENT		
1.1 Program coordinator		
BASIC	★	1.1.1 Designate an internal coordinator, or contract with an external coordinator
1.2 Travel surveys		
BETTER		1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress
		<input type="checkbox"/>
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 (<i>multi-family, condominium</i>)
		✓
2.2 Bicycle skills training		
BETTER		2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances (<i>multi-family, condominium</i>)	✓
BETTER	3.1.2 Provide real-time arrival information display at entrances (<i>multi-family, condominium</i>)	
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 (<i>subdivision</i>)	
3.4 Private transit service		
BETTER	3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	
4. CARSHARING & BIKESHARING		
4.1 Bikeshare stations & memberships		
BETTER	4.1.1 Contract with provider to install on-site bikeshare station (<i>multi-family</i>)	
BETTER	4.1.2 Provide residents with bikeshare memberships, either free or subsidized (<i>multi-family</i>)	
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 (<i>condominium</i>)	
BASIC ★	5.1.2 Unbundle parking cost from monthly rent (<i>multi-family</i>)	✓

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

APPENDIX H

Multi-Modal Level of Service Calculations

Segment MMLOS Analysis

This section provides a review of the boundary streets (McArthur Avenue and Belisle Street), using complete streets principles. The *Multi-Modal Level of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation. The boundary roadways are located within 300m of a school.

Exhibit 4 of the MMLOS Guidelines has been used to evaluate the segment pedestrian level of service (PLOS). Exhibit 22 of the MMLOS Guidelines suggest a target PLOS A for all roadways within a 300m of a school. The results of the segment PLOS analysis are summarized in **Table 1**.

Exhibit 11 of the MMLOS Guidelines has been used to evaluate the segment bicycle level of service (BLOS). Within 300m of a school, Exhibit 22 of the MMLOS Guidelines suggest a BLOS D for roadways without cycling designations. The results of the segment BLOS analysis are summarized in **Table 2**.

Exhibit 15 of the MMLOS Guidelines has been used to evaluate the segment transit level of service (TLOS). Within 300m of a school, Exhibit 22 of the MMLOS Guidelines suggest a TLOS D for arterial roadways with Transit Priority (Isolated Measures) designations (McArthur Avenue) and no TLOS target for roadways without transit designations (Belisle Street). The results of the segment TLOS analysis are summarized in **Table 3**.

Exhibit 20 of the MMLOS Guidelines has been used to evaluate the segment truck level of service (TkLOS). Within 300m of a school, Exhibit 22 of the MMLOS Guidelines suggests a target TkLOS D for arterial roadways classified as truck routes (McArthur Avenue) and no target TkLOS for local roadways not classified as truck routes (Belisle Street). The results of the segment TkLOS analysis are summarized in **Table 4**.

Table 1: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed ⁽¹⁾	PLOS
McArthur Avenue (north side)					
1.5m	1.2m	> 3,000 vpd	Yes	50 km/h	C
McArthur Avenue (south side)					
1.5m	1.2m	> 3,000 vpd	Yes	50 km/h	C
Belisle Street (west side)					
0m	0m	< 3,000 vpd	Yes	60 km/h	F
Belisle Street (east side)					
1.5m	>2m	< 3,000 vpd	Yes	60 km/h	C

1. Operating speed taken as the speed limit plus 10 km/h.

Table 2: BLOS Segment Analysis

Road Class	Type of Route	Type of Bikeway	Travel Lanes	Operating Speed	BLOS
McArthur Avenue					
Arterial	N/A	Bike Lane	2	50 km/h	B
Belisle Street					
Local	N/A	Mixed Traffic	2	60 km/h	F

Table 3: TLOS Segment Analysis

Facility Type	Exposure to Congestion Delay, Friction, and Incidents			TLOS
	Congestion	Friction	Incident Potential	
McArthur Avenue				
Mixed Traffic	Yes	Medium	Medium	E

Table 4: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	TkLOS
McArthur Avenue		
≤3.5m	One	C