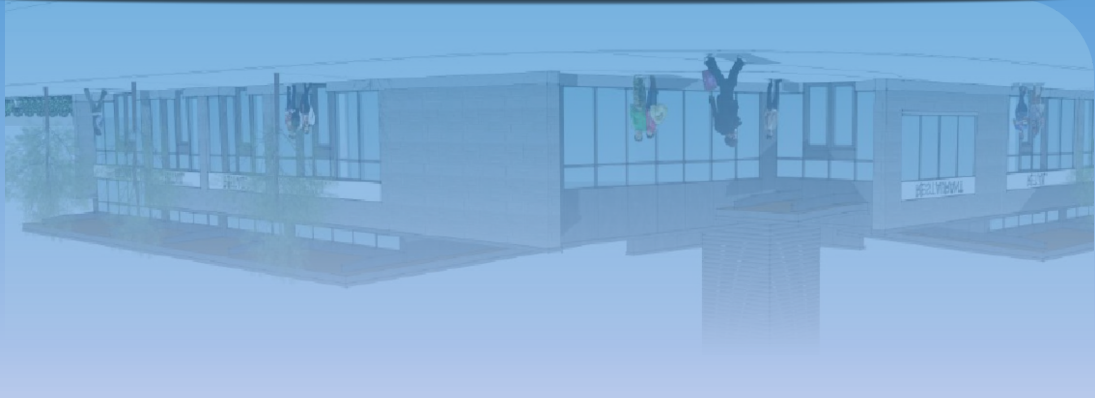


605 Longfields Drive Commercial Plaza

Transportation Impact Assessment Study



**605 Longfields Drive
Commercial Plaza
Transportation Impact Assessment Report**

prepared for:
Campanale Homes
1187 Bank Street, Suite 200
Ottawa, Ontario
K1S 3X7

prepared by:
PARSONS
1223 Michael Street
Suite 100
Ottawa, Ontario
K1J 7T2

December 13, 2017

476513 - 01000

Table of Contents

1.0	INTRODUCTION	1
2.0	EXISTING AND PLANNED CONDITIONS	1
2.1	PROPOSED DEVELOPMENT.....	1
2.2	EXISTING CONDITIONS	3
2.2.1	Adjacent Roads.....	3
2.2.2	Peak Hour Traffic Volumes	3
2.2.3	Collison History	3
2.3	PLANNED CONDITIONS.....	3
3.0	STUDY AREA AND TIME PERIODS.....	4
4.0	EXEMPTIONS REVIEW	4
5.0	DEVELOPMENT GENERATED TRAVEL DEMAND	5
5.1	TRIP GENERATION RATES	5
5.2	MODAL SHARE AND PASS-BY PERCENTAGES.....	6
5.3	TRIP DISTRIBUTION AND ASSIGNMENT	7
6.0	BACKGROUND NETWORK TRAVEL DEMANDS.....	7
6.1	OTHER AREA DEVELOPMENTS.....	7
6.2	BACKGROUND GROWTH	8
7.0	DEMAND RATIONALIZATION	10
8.0	DEVELOPMENT DESIGN	11
8.1	DESIGN FOR SUSTAINABLE MODES.....	11
8.2	CIRCULATION AND ACCESS.....	11
9.0	PARKING	11
10.0	BOUNDARY STREETS.....	12
10.1	MOBILITY	12
10.2	ROAD SAFETY.....	12
10.3	NEIGHBOURHOOD TRAFFIC MANAGEMENT.....	12
11.0	ACCESS INTERSECTIONS AND INTERSECTION DESIGN	12
12.0	TRANSIT.....	13
13.0	TRANSPORTATION DEMAND MANAGEMENT.....	13
14.0	SUMMARY OF IMPROVEMENTS INDICATED AND MODIFICATION OPTIONS.....	13
15.0	RECOMMENDATIONS	13

List of Figures

Figure 1: Site Context.....	1
Figure 2: Site Plan	2
Figure 3: Site-Generated Traffic (New and Pass-by)	7
Figure 4: Area Development	8
Figure 5: Background 2019 Traffic Volumes.....	9
Figure 6: Background 2024 Traffic Volumes.....	9
Figure 7: Total Projected 2019 Traffic Volumes.....	10
Figure 8: Total Projected 2024 Traffic Volumes.....	10

List of Tables

Table 1: ITE Trip Generation Rates	5
Table 2: Modified Person Trip Generation	5
Table 3: Specialty Retail Modal Site Trip Generation.....	6
Table 4: Office Modal Site Trip Generation.....	6
Table 5: Restaurant Modal Site Trip Generation	6
Table 6: Total Site Vehicle Trip Generation.....	6
Table 7: Projected Mode Share Targets.....	7
Table 8: Projected Area Development Generated Traffic Volumes	8
Table 9: MMLOS Assessment.....	12

List of Appendices

Appendix A – Screening Form
Appendix B – Local Street Cross-Section
Appendix C – City 2013 Traffic Count
Appendix D – Collision History
Appendix E – MMLOS
Appendix F – TDM-Supportive Development Design and Infrastructure Checklist

1.0 INTRODUCTION

This Transportation Impact Assessment Report is a compilation of the previously submitted and reviewed Screening Form, Scoping Report, Forecasting Report and Strategy Report, and addresses the City's comments on each. The Screening Form is included as Appendix A.

2.0 EXISTING AND PLANNED CONDITIONS

2.1 Proposed Development

The proposed commercial plaza development is comprised of 1,618 m² (17,425 ft²) neighbourhood plaza and 43 parking spaces. It is located on a narrow piece of land located between Longfields Drive and the Longfields Transitway Station and fronts onto two local streets (Via Modugno Ave. and Via Campanale Ave.) as shown in **Figure 1**. The proposed Site Plan is provided in **Figure 2**.

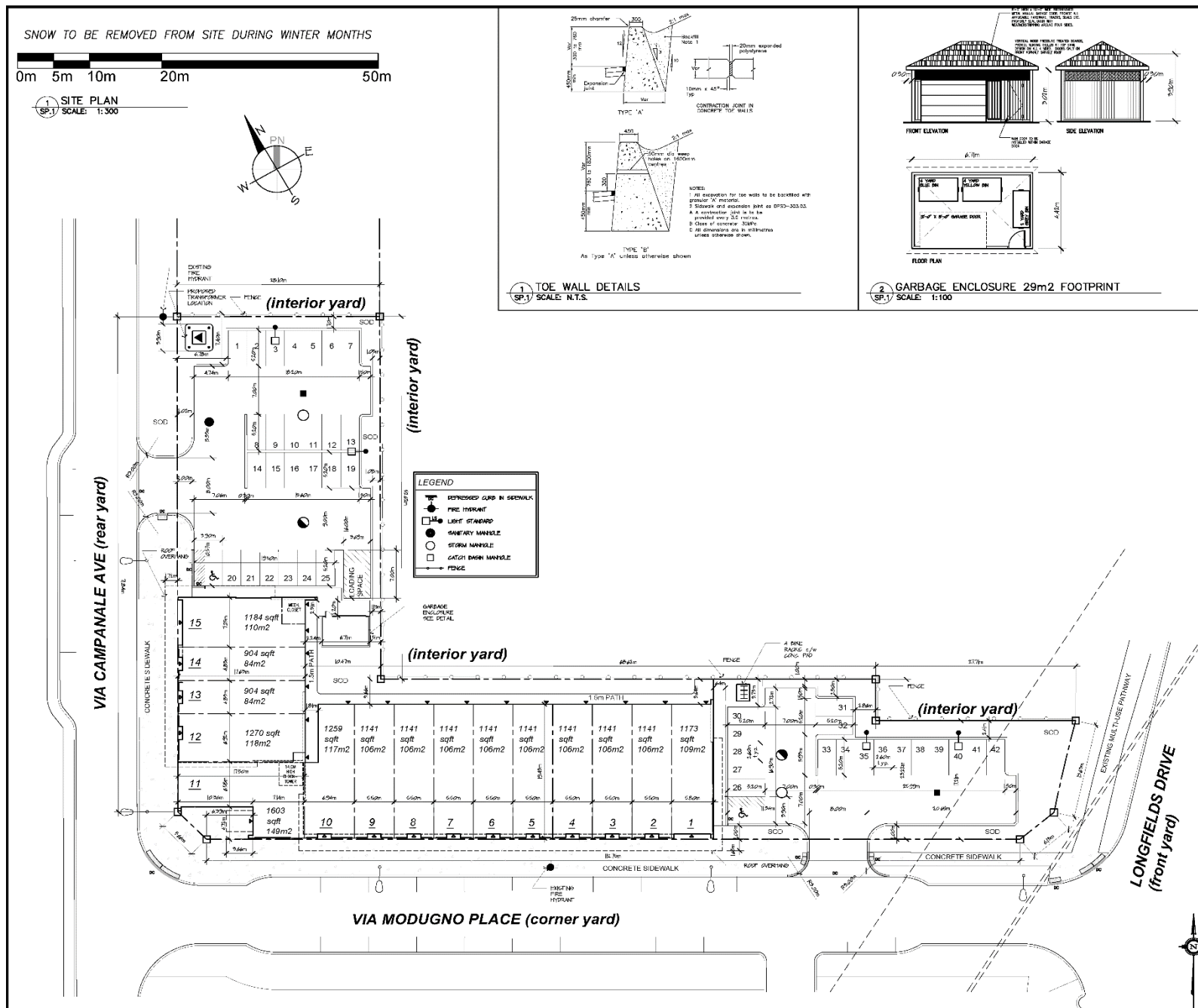
Figure 1: Site Context



The 43 on-site parking spaces are provided in two lots located at the south (18 spaces) and east (25 spaces) ends of the site. Both of these lots have a driveway connection to the adjacent local streets. As shown in **Figure 1**, Via Modugno Ave. adjacent to the south of the site, connects to Longfields Drive. Via Campanale Ave. adjacent to the west, also connects to Longfields Drive, further north and less directly, via Via Mattino Way and Mount Shannon Drive and further south but directly to Longfields Drive.

There is no phasing associated with this project. It is hoped that Site Plan Approval will be obtained in the first half of 2018, followed by construction in 2018/2019.

Figure 2: Site Plan



2.2 Existing Conditions

2.2.1 Adjacent Roads

Longfields Drive is a two-lane collector, and, with a speed limit of 50 km/h. At some locations along its length, on-street parking is provided along the south or east side. Where parking is provided, the pavement width is approximately 11.75 m. Where it is not provided, the pavement width is approximately 9.25 m.

Via Modugno Ave. is a two-lane local street. With development of the subject site, a sidewalk is proposed along the site's frontage and on-street parallel parking (approximately 19 spaces in total) is proposed on both sides. Ultimately, when the street is complete the pavement will be approximately 8.25 m wide where parking is not provided and 11 m wide where it is provided as per the Appendix B cross-section.

Via Campanale Ave. is also a two-lane local street. With development of the site, a sidewalk is proposed along the site's frontage and on-street parallel parking (5 spaces) is proposed on the north side of the street.

At the Longfields/Modugno intersection, the Modugno approach is STOP sign controlled, however, there are pedestrian crossing signals on Longfields at this location to facilitate its crossing by students from the adjacent (to the northeast) elementary school. This signal is pedestrian activated. The walk green times have been requested from the City, but they have not yet been provided. The Longfields/Mountshannon intersection is a four-way STOP controlled intersection.

With regard to facilities for active transportation modes, there are multi-use pathways on both sides of Longfields Drive. Sidewalks exist and/or are being constructed on Mountshannon, and do not yet exist on Modugno or Campanale. There is, however, a temporary sidewalk along the north side of the site that connects the MUP along Longfields to the Longfields Transitway station. Once the subject site is built, the permanent sidewalk along the north side of Modugno Ave. will replace the existing temporary sidewalk. With regard to bus services, as shown in Figure 1, there are local bus stops on Longfields Drive approximately 230 m and 380 m east of the site and there is express transitway service at the adjacent transitway station located 75 m west of the site.

2.2.2 Peak Hour Traffic Volumes

Based on a City 2013 traffic count (Appendix C), peak hour volumes on Longfields Drive in the vicinity of the site are approximately 350 veh/h eastbound and 150 veh/h westbound during the morning peak hour and 260 veh/h eastbound and 210 veh/h westbound during the afternoon peak hour. Two-way volumes on Mountshannon Drive are approximately 175 veh/h and 230 veh/h during the weekday morning and afternoon peak hour respectively.

Traffic counts on Via Modugno Ave. are not available and were not undertaken as there is no existing development using it and the adjacent lands are under construction.

2.2.3 Collision History

Five years of collision history (January 2012 to December 31, 2016, included as Appendix D) was obtained for the 650 m section of Longfields Drive from Mount Shannon to Highbury Park. In total there were only five collisions over five years. At the Longfields/Mount Shannon intersection, one was a rear end collision on wet pavement and one was a turning-related collision due to failure to yield. Mid-block there was a one vehicle/pedestrian collision (non-fatal), one was a side swipe due to improper lane change and one was a single vehicle collision as the driver fell asleep. Based on the foregoing there is no vehicle collision issues along the subject section of Longfields Drive.

2.3 Planned Conditions

From the review of the City's Transportation Master Plan, there are no major road modifications planned in the immediate vicinity of the site. Further to the west along Strandherd, there are plans (design underway) to widen it to four lanes from Jockvale to Marivista with an overpass of the VIA rail line.

With regard to other study area developments, on the south side of Modugno, Campanale is building mid-rise (4 storey) apartment buildings and three storey linked townhomes. These developments, which extend for a few blocks, will have numerous local road connections to Longfields, including, Modugno, Campanale, Chianti Grove and Verona. As such, its traffic generation will be efficiently and broadly distributed.

3.0 STUDY AREA AND TIME PERIODS

At 1,618 m² (17,425 ft²) the proposed commercial development is quite small. Its tenants are envisioned to be a mix of local service uses such as local retail, medical/dental, office and possible restaurant. Given its small size and location in the midst of Barrhaven, the majority of its clientele are assumed to be local, with a reasonably high walk, bike and transit modal split.

Previous transportation studies have been done for this sector of Barrhaven which addressed the transportation impacts and requirements of full build-out of the lands bounded by Woodroffe, Strandherd, Greenbank and VIA rail corridor. This study was done for the City by Parsons (previously Delcan) to confirm the suitability of land use and density and to ensure that all collector roads (including Longfields) and their intersections with the adjacent arterials were designed to have sufficient capacity. As this macro level transportation study has already been done, the focus of the TIA for 605 Longfields Drive will be the site intersections along Modugno and the adjacent intersections of Longfields/Modugno and Longfields/Mountshannon. All pedestrian and cycling facilities in this immediate area will also be assessed. Typical for the subject land use and its location, the analysis time frames will be the weekday morning and afternoon peak hours.

With regard to horizon year analysis, this is likely not relevant as the project fronts onto local and collector streets well removed from the area's arterial roads, and with the exception of the immediate adjacent lands, the majority of the borader study is fully built-out. As such, the horizon year condition we proposed to analyze is existing volumes plus site-generated traffic plus traffic from the adjacent under-construction developments.

4.0 EXEMPTIONS REVIEW

Based on the type and size of the proposed development for which a Site Plan Application is being submitted, the following identifies which analyses are required and which are exempt in further analysis/modules.

Design Review Component:

Development Design

- Circulation and Access.....REQUIRED
- New Street Networks.....EXEMPT

Parking

- Parking Supply.....REQUIRED
- Spillover Parking.....EXEMPT

Network Impact Component

Development Design

- Transportation Demand Management.....EXEMPT
- Neighbourhood Traffic Management.....EXEMPT
- Network Concept.....EXEMPT

In summary, as this submission accompanies a Site Plan Application for a neighbourhood use that has excellent adjacent walking, cycling and transit facilities, and is a relatively low traffic generator, the only items that require further assessment are on-site operations, the site driveway connections to the adjacent streets, the traffic impacts and adjacent intersection requirements (if any) and the MMLOS along these roadways due, in part, to the adjacent school.

5.0 DEVELOPMENT GENERATED TRAVEL DEMAND

5.1 Trip Generation Rates

As previously noted, the proposed commercial development at 605 Longfields Drive totals 1,618 m² of office/retail/restaurant uses accommodated within 14 rental bays. For the purpose of peak hour traffic generation we have assumed a tenant mix of 10 retail bays, 4 office bays and 1 restaurant bay. Appropriate trip generation rates for the proposed development were obtained from the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, which are summarized in Table 1.

Table 1: ITE Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Specialty Retail Centre	ITE 826	$T = 1.36(X)$; $T = 1.20(X) + 10.74$	$T = 2.71(X)$; $T = 2.40(X) + 21.48$
Medical/Dental Office	ITE 720	$T = 2.39(X)$;	$T = 3.57(X)$; $\ln(T) = 0.90 \ln(X) + 1.53$
Restaurant	ITE 932	$T = 10.81(X)$;	$T = 9.85(X)$;
Notes: T = Average Vehicle Trip Ends X = 1000 ft ² Gross Floor Area Specialty Retail AM Peak is assumed to be 50% of the PM Peak			

As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the more urban study area context were applied to attain estimates of person trips for the proposed development. This approach is considered appropriate within the industry for urban infill developments.

To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Our review of available literature suggests that a combined factor of approximately 1.28 is considered reasonable to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%. The person trip generation for the proposed development is summarized in Table 2.

Table 2: Modified Person Trip Generation

Land Use	Area	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Specialty Retail	11,129 ft ²	17	14	31	27	36	63
Medical/Dental Office	4,693 ft ²	11	4	15	6	18	24
Restaurant	1,603 ft ²	12	11	23	12	9	21
Total Person Trips		40	29	69	45	63	108
Note: 1.28 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%							

The person trips shown in Table 2 for the proposed site were then reduced by modal share values, including a reduction for 'pass-by' trips based on the site's location and proximity to adjacent communities, employment, other shopping uses and transit availability. Modal share and 'pass-by' values for specialty retail, office and restaurant land uses within the proposed development are summarized in Tables 3, 4, and 5, respectively, with the total site-generated vehicle traffic summarized in Table 6.

Table 3: Specialty Retail Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	40%	7	6	13	11	15	26
Auto Passenger	10%	2	2	4	3	4	7
Transit	30%	5	4	9	8	10	18
Non-motorized	20%	3	2	5	5	7	12
Total Person Trips	100%	17	14	31	27	36	63
Less Retail 30% Pass-By		-2	-2	-4	-4	-4	-8
Total 'New' Auto Trips		5	4	9	7	11	18

Table 4: Office Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	40%	5	2	7	3	8	11
Auto Passenger	15%	2	1	3	1	3	4
Transit	30%	3	1	4	2	5	7
Non-motorized	15%	1	0	1	0	2	2
Total Person Trips	100%	11	4	15	6	18	24
Total 'New' Auto Trips		5	2	7	3	8	11

Table 5: Restaurant Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	6	6	12	6	5	11
Auto Passenger	20%	3	2	5	3	2	5
Transit	10%	1	1	2	1	1	2
Non-motorized	20%	2	2	4	2	1	3
Total Person Trips	100%	12	11	23	12	9	21
Total 'New' Auto Trips		6	6	12	6	5	11

Table 6: Total Site Vehicle Trip Generation

Land Use	AM Peak (veh/h)			PM Peak (veh/h)		
	In	Out	Total	In	Out	Total
Specialty Retail	7	6	13	11	15	26
Medical/Dental Office	5	2	7	3	8	11
Restaurant	6	6	12	6	5	11
Retail Pass-By (30%)	-2	-2	-4	-4	-4	-8
Total 'New' Auto Trips	16	12	28	16	24	40

As shown in Table 6, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 30 and 40 veh/h during the weekday morning and afternoon peak hours, respectively.

5.2 Modal Share and Pass-By Percentages

The following Table 7 identifies the modal splits assumed for site-generated person trips based on a combination of its location, function, connectivity to adjacent neighbourhoods, and proximity to transit. Note there is a slight variation for each on-site use.

Table 7: Projected Mode Share Targets

Travel Mode	Mode Share Target			Rationale
	Retail	Office	Restaurant	
Transit	30%	20%	10%	Site has good transit but most customers are local.
Walking/Cycling	15%	10%	20%	Typical for neighbourhood land uses.
Auto Passenger	10%	20%	20%	Higher vehicle occupancy for trips to local office and restaurant than to a retail store.
Auto Driver	45%	50%	50%	Reflective of community-wide draw.

Retail pass-by values were obtained from the ITE Trip Generation Manual and are noted to be 30%.

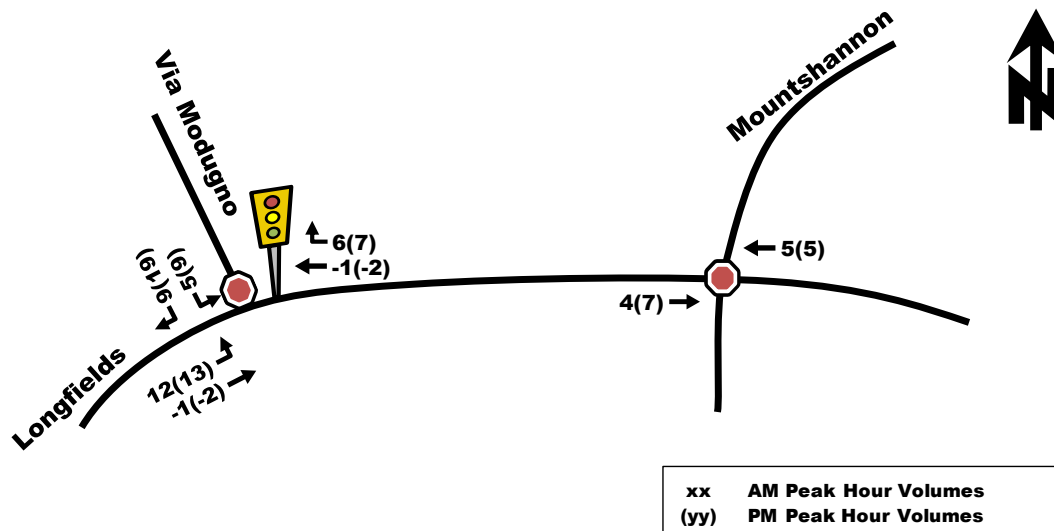
5.3 Trip Distribution and Assignment

Based on the existing traffic volume counts and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes is as follows:

- 30% to/from the east; and
- 70% to/from the southwest.

Given the above-noted distributions, site-generated traffic was distributed to the study area, which is illustrated in Figure 3.

Figure 3: Site-Generated Traffic (New and Pass-by)



6.0 BACKGROUND NETWORK TRAVEL DEMANDS

6.1 Other Area Developments

Based on the City's development application search tool, the following applications are currently being developed and/or are planned within the vicinity of the site.

615 Longfields Drive

Campanale has constructed the mixed-use development located at the above-noted address, which is located adjacent to the south of the proposed development. The 615 Longfields Drive development consists of 46

residential units and 1 commercial unit, with vehicle access to Via Campanale Avenue and Via Modugno Place. No traffic impact study was completed for this development.

591 Longfields Drive

Mattino Developments has constructed a subdivision consisting of approximately 209 residential units (townhouses and condominiums) at the above-noted address. Vehicle access is provided to Via Martino Way, which connects to Mountshannon Drive and Via Campanale Avenue. The Transportation Impact Study Update (prepared by Novatech), projected an increase of 132 and 145 veh/h during the weekday peak hours. It is understood that the majority of these units have been constructed.

In addition to the above-noted developments, the lands to the south and west of the development will eventually be developed. Townhomes have recently been constructed to the north of the site, along Via Campanale Avenue. These future development are outlined in the following Figure 4.

Figure 4: Area Development



Traffic associated with these recently constructed developments will be added to the study area intersections as background traffic in the ensuing section.

6.2 Background Growth

Background traffic growth for the study area was developed based on the recently constructed developments (noted-above) within the vicinity of the subject site. As the most recent Mountshannon/Longfields intersection count was conducted in 2013, all recently constructed development traffic was added to the 'existing' 2013 traffic volumes.

The following Table 8 summarizes the projected traffic associated with each constructed development:

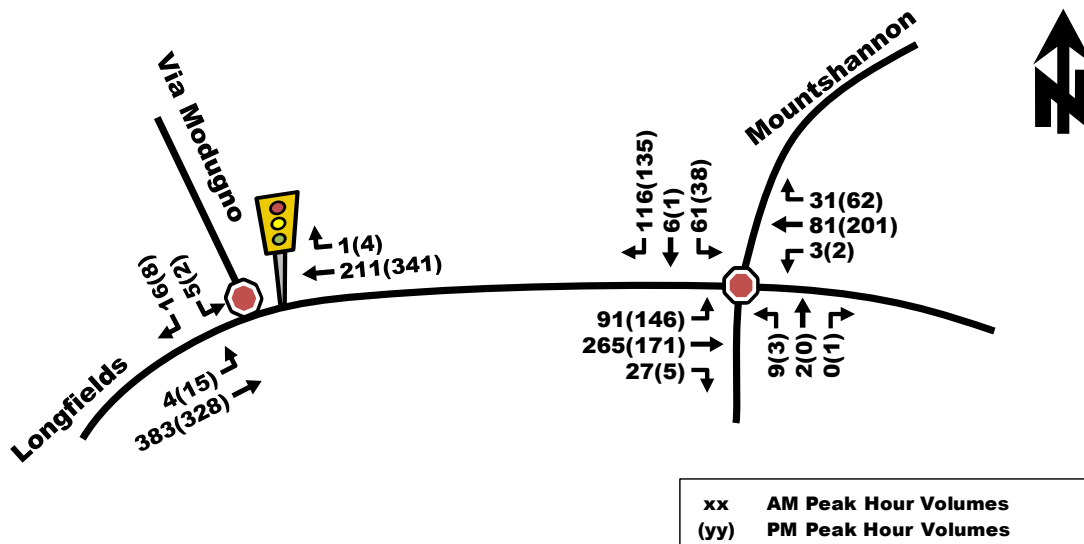
Table 8: Projected Area Development Generated Traffic Volumes

Development	Constructed/Planned	Vehicle Trips (veh/h)				Source
		AM Peak Hour		PM Peak Hour		
		IN	OUT	IN	OUT	
615 Longfields Drive	46 condos constructed	3	17	16	8	ITE Trip Generation
519 Longfields Drive	209 Towns/Condos constructed	33	99	94	51	Novatech TIS

Development	Constructed/Planned	Vehicle Trips (veh/h)				Source
		AM Peak Hour		PM Peak Hour		
		IN	OUT	IN	OUT	
600-641 Via Campanale Ave	42 Townhomes constructed	3	15	14	8	ITE Trip Generation

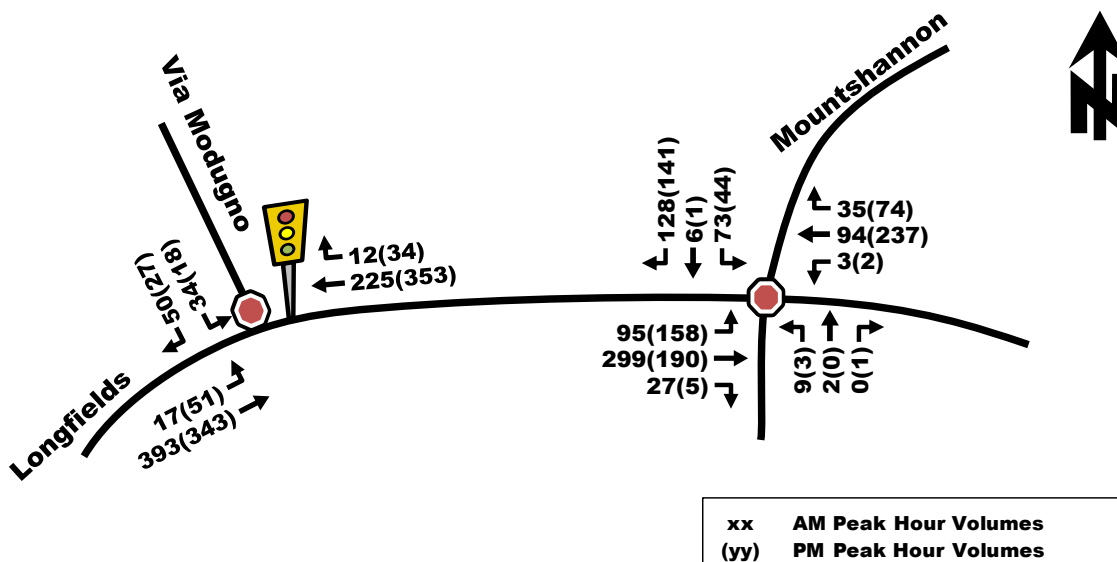
The trips associated with the constructed developments have been distributed to study area intersections and superimposed onto 2013 traffic counts volumes to represent the 2019 horizon year (built-out of subject development). In addition, the lands to the east (south of Longfield Drive) have recently been developed. As such, a 5% increase in through vehicle volumes along Longfields Drive was applied for the background 2019 traffic volumes. The resulting background 2019 traffic volumes are illustrated as Figure 5.

Figure 5: Background 2019 Traffic Volumes



For the Horizon Year 2024, which represent 5-years beyond full-build out, the turning movements onto and off of Via Modugno Place and Mountshannon were increased based on the projected vehicle traffic associated with Phase 4 of the Longfields Subdivision, as outlined in the Novatech TIS. The resulting projected 2024 volumes are illustrated as Figure 6.

Figure 6: Background 2024 Traffic Volumes



7.0 DEMAND RATIONALIZATION

Based on the foregoing analysis of trip-generation and background traffic growth, the site-generated traffic volumes were superimposed onto the background 2019 and background 2024 traffic volumes, resulting in total projected 2019 and 2014 traffic volumes, which are illustrated as Figure 7 and Figure 8, respectively.

Figure 7: Total Projected 2019 Traffic Volumes

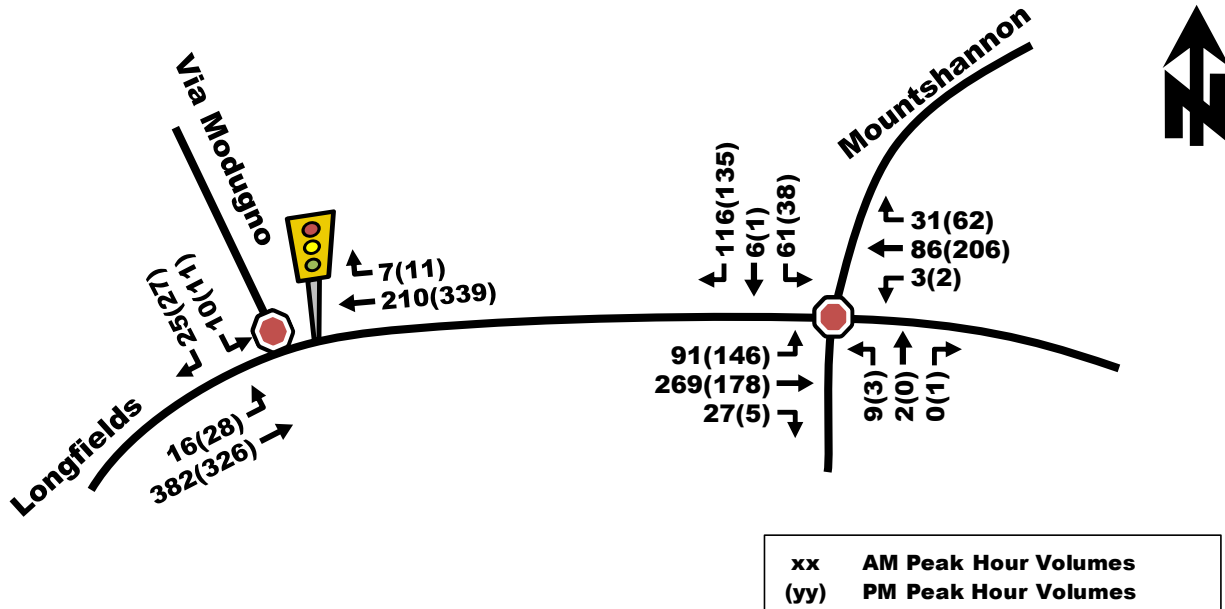
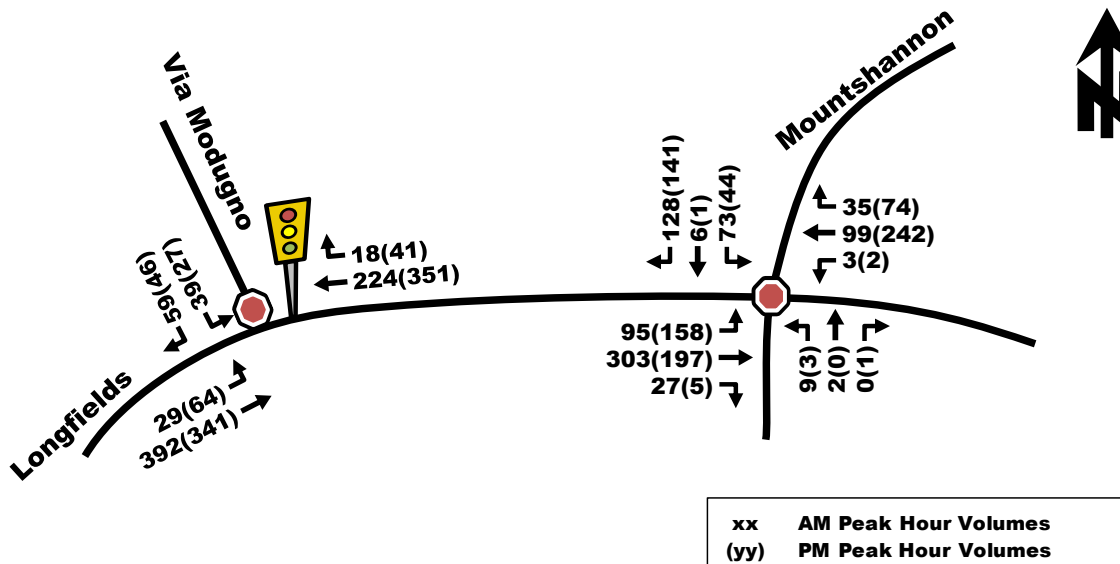


Figure 8: Total Projected 2024 Traffic Volumes



Based on the above-noted traffic volumes, there do not appear to be any capacity constraints for the study area intersections. It is noteworthy that the signalized pedestrian crossing is located adjacent to the unsignalized Longfields/Via Modugno intersection. Southbound left-turning vehicles will have to yield to pedestrians crossing at the signalized crosswalk. During the projected 2019 peak hours, there are approximately 15 veh/h projected to turn southbound left across the crosswalk, which equates to approximately 1 vehicle every 4 minutes.

8.0 DEVELOPMENT DESIGN

8.1 Design for Sustainable Modes

Automobile Parking is proposed in two on-site lots located at the south (18 spaces) and north (25 spaces) ends of the development, for a total of 43 spaces. All aisle and parking space dimensions meet By-Law requirements, as does the total supply. As shown on the Figure 2: Site Plan, approximately 22 parallel parking spaces are also proposed on the two adjacent local streets (Modugno and Capanale).

Bicycle Parking is provided in close proximity to the northeast corner of the building footprint. The By-Law requires 3 spaces and 4 bike racks are proposed.

Bus Stops exist in both directions on Longfields and are located approximately 230 m and 280 m east of the site as shown on Figure 2. Express Transitway service is available at the adjacent Longfields Station located only 75 m west of the site.

Sidewalks and Multi-Use Pathways (MUP) both exist or will be provided in the immediate study area. MUP's (3 m wide) exist on both sides of the Longfields Drive. Sidewalks exist and/or are being constructed on Mountshannon, and do not yet exist on Modugno or Campanale. There is, however, a temporary sidewalk adjacent to the east of the site that connects the MUP along Longfields to the Longfields Transitway station. Once the subject site is developed, the permanent sidewalks along the north side of Mondugno Ave. will replace the existing temporary sidewalk. Overall the site will have excellent connectivity to the Transitway station and to the area's MUP and sidewalk systems. As depicted in the Figure 2: Site Plan, concrete sidewalks are proposed on all building frontages linking parking lots and people to the proposed development and to the area's sidewalk system. Typically, the sidewalks along the proposed development's frontage are the responsibility of the developer. Sidewalks on the other side of the street are the responsibility of others. As the MUP's along Longfields already exist, there will be no more MUP construction, however the new sidewalks on the northside of Modugno will tie into the Longfields MUP.

8.2 Circulation and Access

The two parking lots have either a 7 m or 8 m wide two-way driveway connecting them to the adjacent local streets. These driveways are located a sufficient distance from any adjacent intersections (approximately 35 m and 55 m).

9.0 PARKING

This topic was addressed in the foregoing Section 8.1. Even though the proposed 43 spaces slightly exceeds By-Law requirements, if there were to be any spillover parking, approximately 22 on-street parking spaces are proposed along the site's frontage on the immediate adjacent streets. The on-street parking on Modugno and Campanale give consideration to the following:

- Appropriate off-set from adjacent intersections and driveways;
- Fire hydrant location on Modugno;
- Bus routes/stops are not on these two streets;
- Overall 11 m pavement width; and
- The free parallel parking spaces can be painted and signed (duration of stay) if considered appropriate/necessary.

10.0 BOUNDARY STREETS

10.1 Mobility

As previously noted, the proposed development is a low traffic generator with 2 or 3 local street options to connect to Longfields Drive, the area's collector road. Also, as identified in the Scoping report, the existing traffic volumes on Longfields are well below the threshold for collector roads and there is no meaningful collision history on the adjacent section of Longfields, or its intersections. As such, there are no access or operational problems associated with the proposed development, and STOP sign control on the Modugno approach to Longfields remains an appropriate solution. Also, as the additional site traffic using the Longfields/Modugno intersection will be low, and as the majority is distributed to/from the southwest, the site traffic impact on the adjacent pedestrian-activated traffic signal is negligible.

With regard to short-term delivery service, it is assumed that all deliveries will be by van or small single unit trucks. Vans can park in the parking lots, but single unit trucks will have to park on-street near the relevant rental unit. With regard to the garbage pick-up, the north parking lot has been modified/designed to accommodate garbage truck access/egress.

As previously noted, Longfields Drive is a community-wide collector with parking on one side and multi-use pathways on both sides. Both Modugno and Campanale are local streets with parking bays proposed for both sides of Modugno and one side of Campanale. The connectivity of the site to the adjacent Transitway station and to the MUP's along Longfields has been discussed and there are no connectivity gaps.

With regard to MMLOS for the Longfields/Modugno intersection for projected horizon year volumes, it is summarized in the following Table 9.

Table 9: MMLOS Assessment

Road Segment	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck (TkLOS)	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Longfields Drive Between Via Modugno and Mountshannon	B	A	A	B	D	No target	B	No target

The pedestrian level of service does not meet the target PLOS 'A' because of vehicle volumes over 3,000 per day on Longfields Drive and vehicle speeds higher than 30 km/h. The bicycle level of service is met given the MUP along Longfields Drive. As there is not transit priority or truck route along Longfields Drive, there are no targets for these modes, however, they are both operating at level of service 'D' or better. The detailed MMLOS analysis is provided in Appendix E.

10.2 Road Safety

The five year collision history of the adjacent 650 m section of Longfields Drive is summarized in Section 2.2.3. There were only 5 collisions over 5 years, and there is no pattern.

10.3 Neighbourhood Traffic Management

We are not aware of any operational concerns in the immediate study area, and as such there are no existing issues to be addressed by the proposed development.

11.0 ACCESS INTERSECTIONS AND INTERSECTION DESIGN

Site access is discussed in Section 8.2. The proposal is to have a 7 m wide and 8 m wide driveway (with 3 m radius) serving two small parking lots and connecting to two adjacent local street at sufficient off-set from any

adjacent street intersections. STOP signs will control traffic exiting the parking lots. As previously noted, the Modugno approaches to both Longfields and Campanale will be STOP sign controlled, (as it is now) and the MMLOS analysis is included in Section 10.1. As previously noted there is a pedestrian-activated traffic signal adjacent to the north on Longfields at Modugno. Full traffic signals are not warranted.

12.0 TRANSIT

This topic has been previously addressed in a number of sections of this report.

13.0 TRANSPORTATION DEMAND MANAGEMENT

The foregoing Table 7 identified the mode shares considered appropriate for this neighborhood commercial development. As previously discussed, the combination of; excellent sidewalk connectivity; the very close proximity of community-wide multi-use pathways; the local bus service on Longfields and the adjacent Longfields Transit Station all assist in maximizing the non-auto mode share for the proposed development. Providing sufficient and well located bicycle parking is also beneficial. The TDM-Supportive Development Design and Infrastructure Checklist is included as Appendix F.

14.0 SUMMARY OF IMPROVEMENTS INDICATED AND MODIFICATION OPTIONS

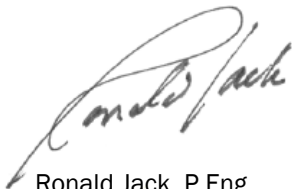
As presented herein, no improvements or modifications to site driveways or adjacent roads/intersections are required/recommended to accommodate multi-mode traffic generated by the proposed development.

15.0 RECOMMENDATIONS

Based on the foregoing and the City's review of the previous four submissions (Screening, Scoping, Forecasting and Strategy Reports), the proposed development is recommended from a transportation perspective.

Please call if you have any questions of the foregoing. We look forward to preparing/submitting as soon as possible.

Prepared by:

A handwritten signature in black ink, appearing to read "Ronald Jack", is written over a light blue horizontal line.

Ronald Jack, P.Eng.
Senior Transportation Engineer

Attachments

Appendix A

Screening Form

City of Ottawa 2017 TIA Guidelines

Date

26-Oct-17

TIA Screening Form

Project Longfields Station Commercial Plaza

Project Number

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

Module 1.1 - Description of Proposed Development

Municipal Address	605 Longfields Drive, Nepean
Description of location	Frontage on two local street in the midst of residential community
Land Use	Commercial plaza
Development Size	1,619 m ²
Number of Accesses and Locations	Two driveway connections to local streets
Development Phasing	None
Buildout Year	2018/2019
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger

Land Use Type	Destination Retail
Development Size	1619 sq. m
Trip Generation Trigger Met?	Yes

Module 1.3 - Location Triggers

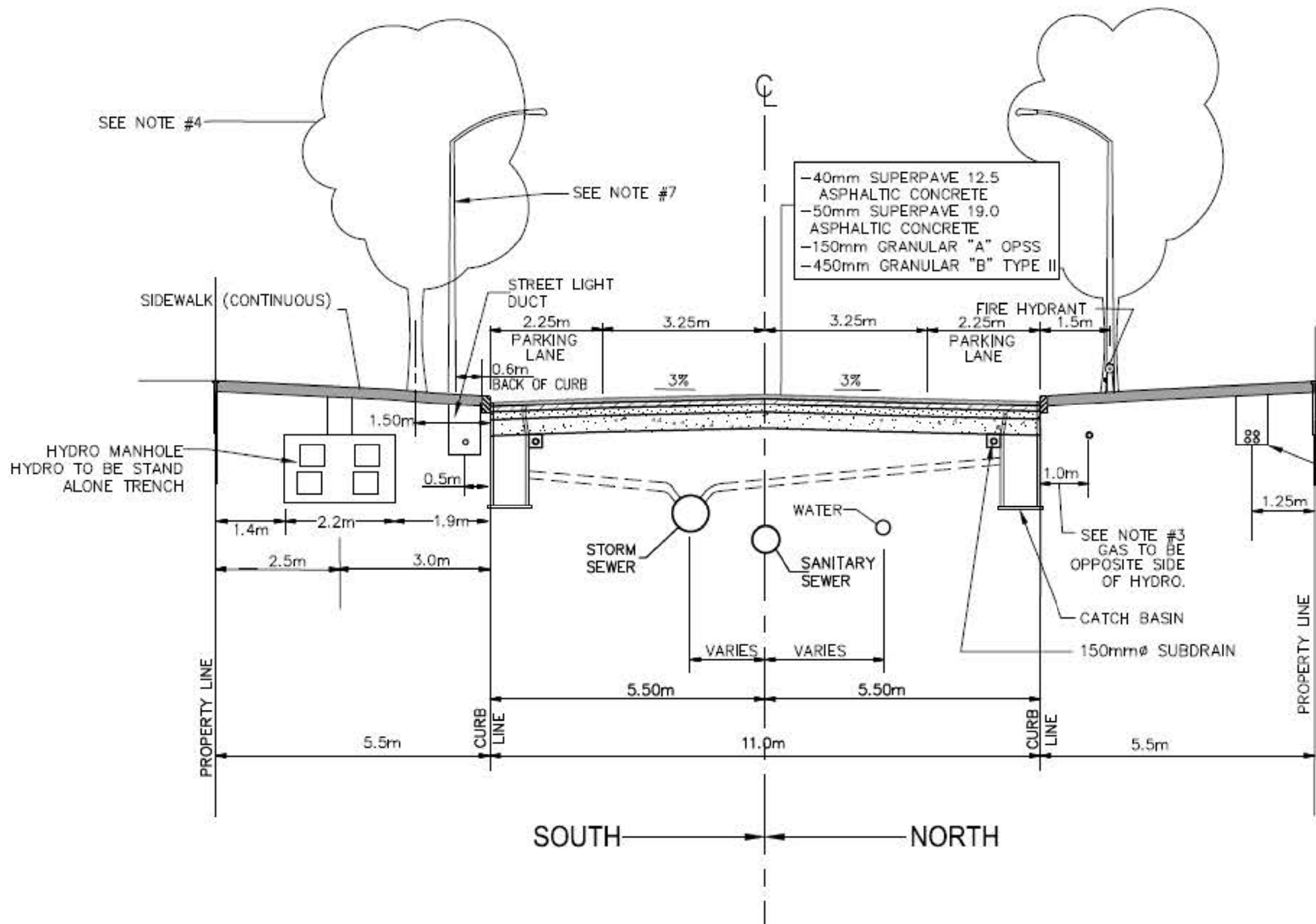
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	No
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	No
Location Trigger Met?	No

Module 1.4 - Safety Triggers

Posted Speed Limit on any boundary road	<80 km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	Yes
A proposed driveway makes use of an existing median break that serves an existing site	No
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No
The development includes a drive-thru facility	No
Safety Trigger Met?	Yes

Appendix B

Local Street Cross-Section



Appendix C

City 2013 Traffic Count



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

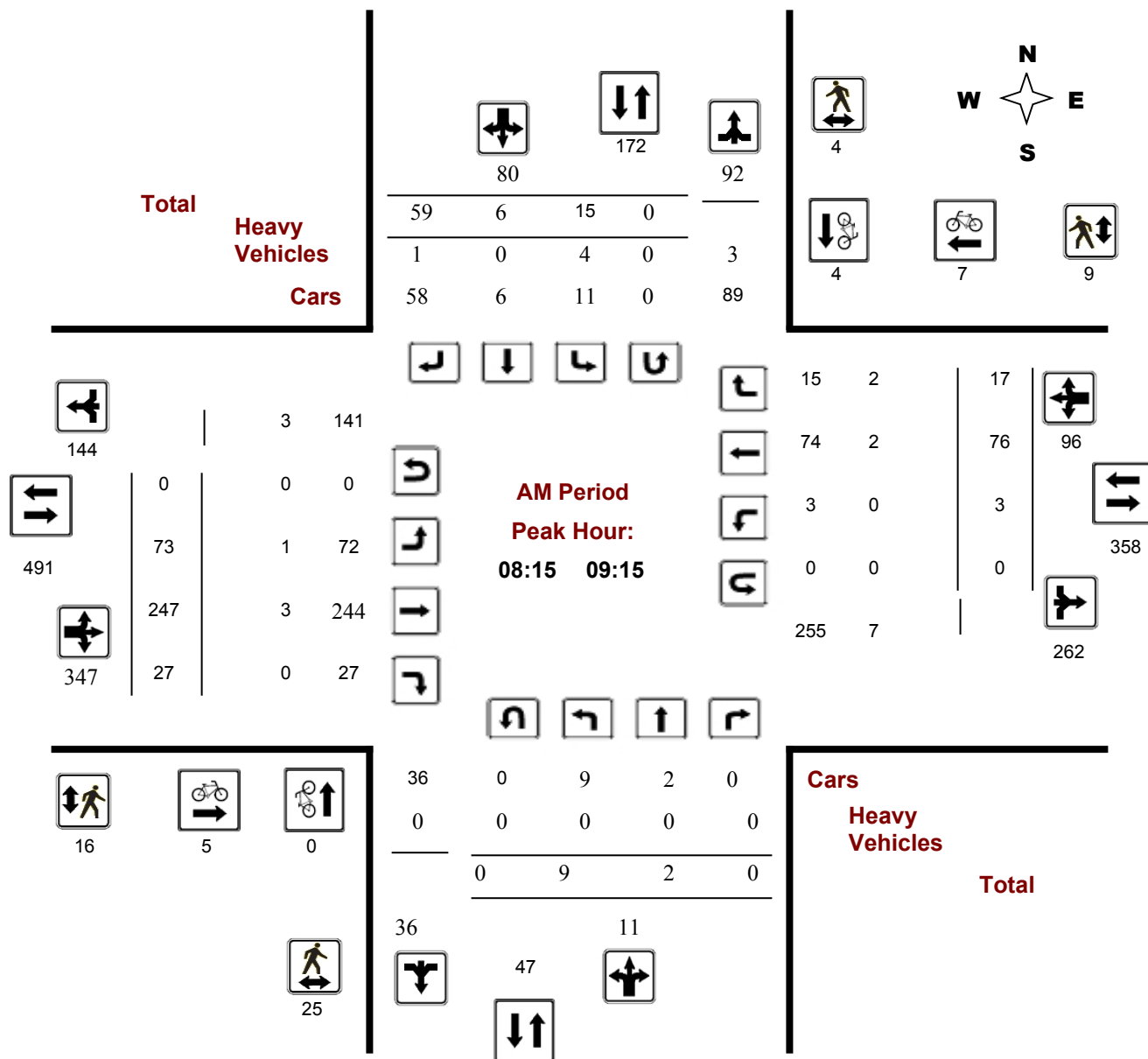
LONGFIELDS DR @ MOUNTSHANNON DR W

Survey Date: Friday, May 31, 2013

Start Time: 07:00

WO No: 31252

Device:

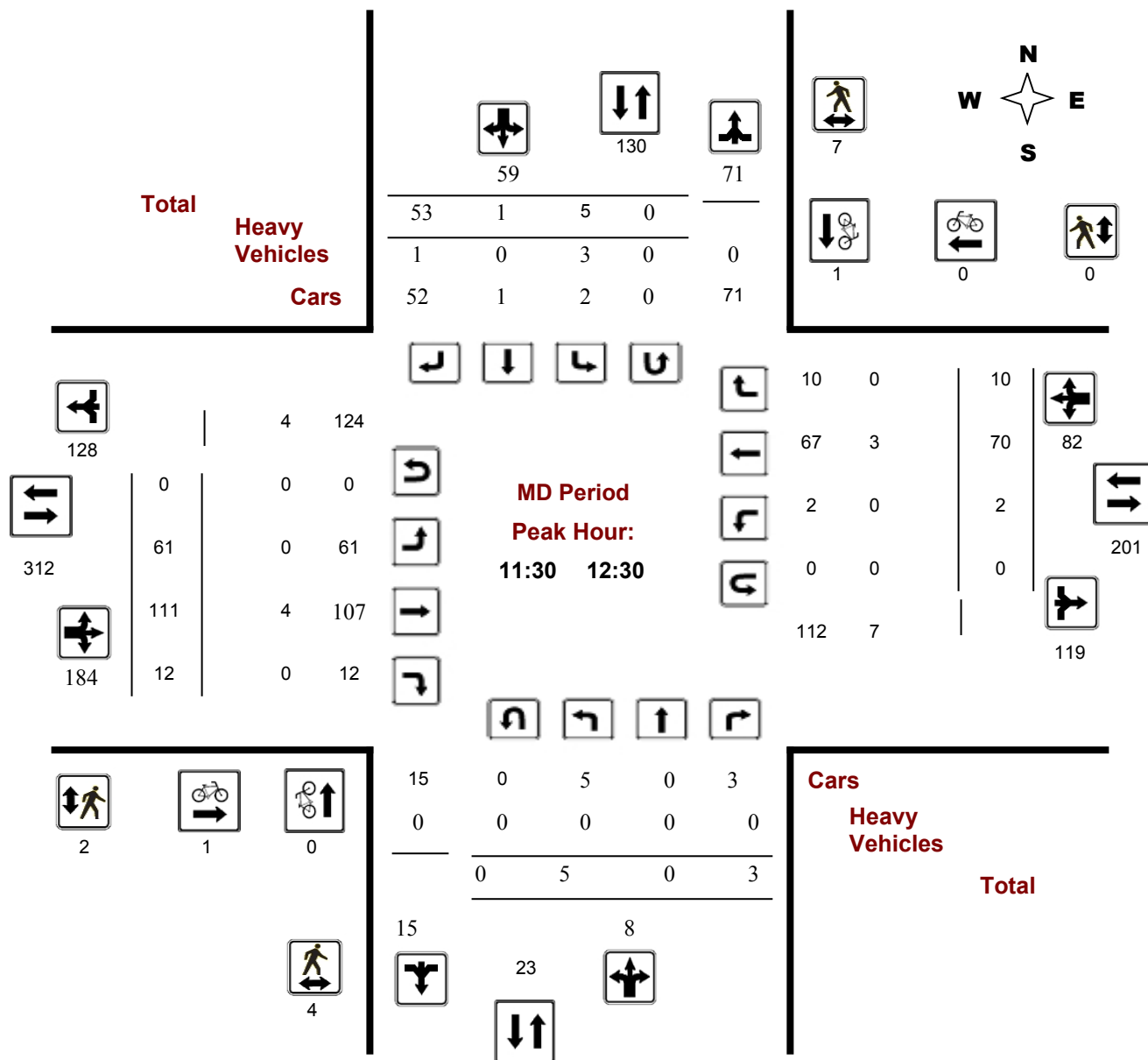


Survey Date: Friday, May 31, 2013

Start Time: 07:00

WO No: 31252

Device:



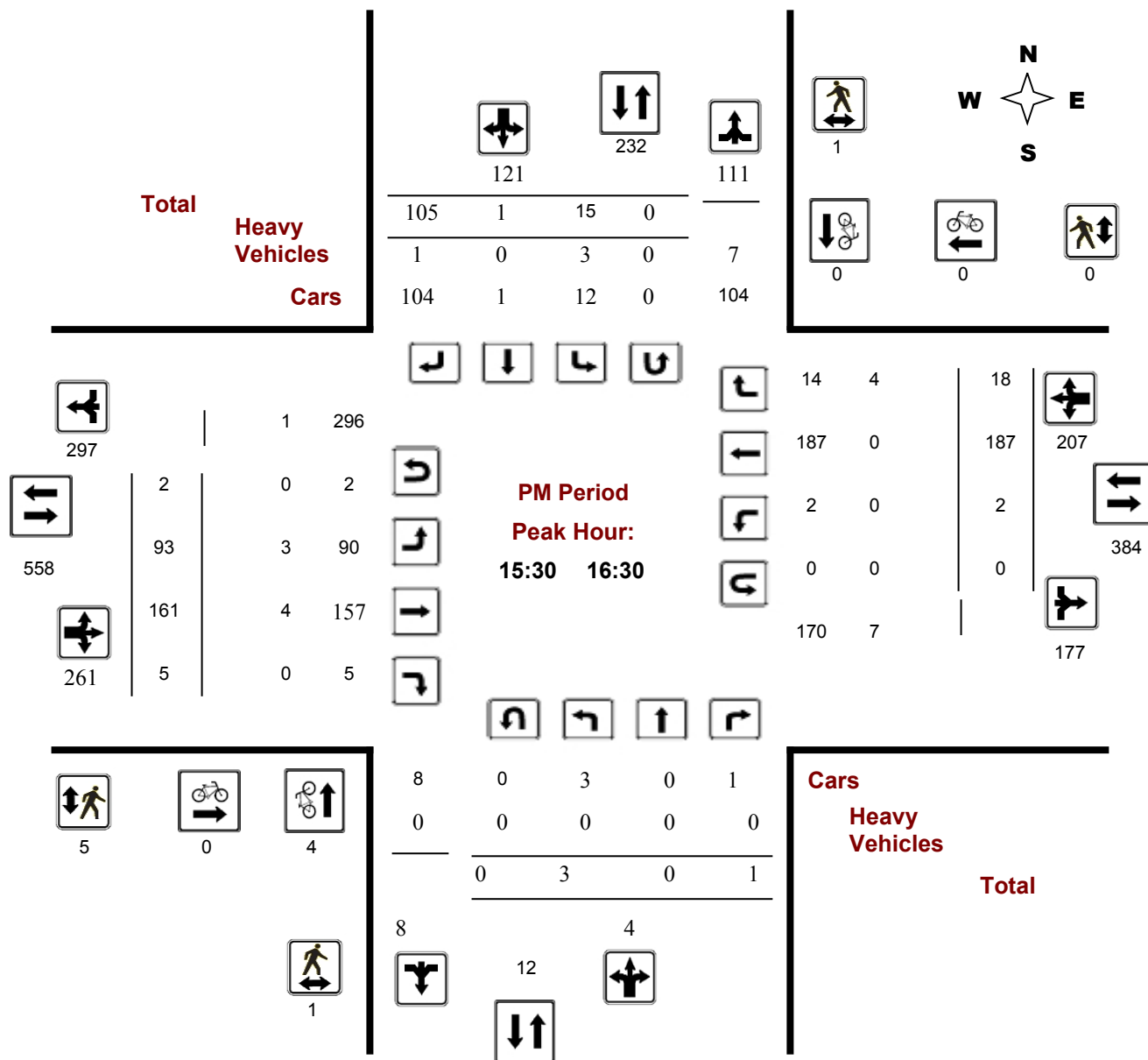
Comments

Survey Date: Friday, May 31, 2013

Start Time: 07:00

WO No: 31252

Device:



Comments

Appendix D

Collision History



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** January 1, 2017

Location: LONGFIELDS DR @ MOUNTSHANNON DR W

Traffic Control: Stop sign

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Feb-19, Thu,07:18	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	

Location: LONGFIELDS DR btwn MOUNTSHANNON DR W & 250 W OF MOUNTSHANNON E/MOTHER

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2016-Nov-04, Fri,13:14	Clear	SMV other	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Pedestrian	1

Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

LONGFIELDS DR, MOUNTSHANNON DR to ProposedHIGBURY PARK DR

Former Municipality: Nepean

Traffic Control: No control

Number of Collisions: 2

COLLISION ID	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	DRIVER ACTION	No. PED
11300376980	2013-02-12	Tue	15:40	Clear	Daylight	Sideswipe	P.D. only	V1 E	Dry	Changing lanes	Pick-up truck	Other motor vehicle	Improper lane change	
								V2 E	Dry	Stopped	Automobile, station	Other motor vehicle	Driving Properly	
COMMENTS: D1 HTA 142 1														
2130059378	2013-03-09	Sat	07:30	Clear	Daylight	Single vehicle	P.D. only	V1 W	Dry	Going ahead	Automobile, station	Snowbank / drift	Lost control	0
COMMENTS: D1 HTA 130, D1 FELL ASLEEP.														

LONGFIELDS DR & MOUNTSHANNON DR W

Former Municipality: Nepean

Traffic Control: Stop sign

Number of Collisions: 1

COLLISION ID	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	DRIVER ACTION	No. PED
4130067534	2013-03-18	Mo	08:20	Clear	Daylight	Turning	P.D. only	V1 E	Dry	Turning right	Passenger van	Other motor vehicle	Failed to yield	
right-of-way								V2 W	Dry	Turning left	Automobile, station	Other motor vehicle	Driving Properly	
COMMENTS: REDUCED VISIBILITY DUE TO BRIGHT SUN.														

(Note: Time of Day = "00:00" represents unknown collision time)

Monday, November 20, 2017

Page 1 of 1

Appendix E

MMLOS

Multi-Modal Level of Service - Segments Form

Consultant
Scenario
Comments

Parsons

Existing/Future

Project
Date

605 Longfields

Nov-17

SEGMENTS		Street A	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	Section 9
Pedestrian	Sidewalk Width Boulevard Width	B	≥ 2 m > 2 m								
	Avg Daily Curb Lane Traffic Volume		> 3000								
	Operating Speed On-Street Parking		> 30 to 50 km/h no								
	Exposure to Traffic PLoS		B	-	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m								
	Pedestrian Volume		250 ped/hr								
	Crowding PLoS		B	-	-	-	-	-	-	-	-
	Level of Service		B	-	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	A	Physically Separated								
	Number of Travel Lanes										
	Operating Speed										
	# of Lanes & Operating Speed LoS		-	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)										
	No. of Lanes at Unsignalized Crossing										
	Sidestreet Operating Speed										
	Unsignalized Crossing - Lowest LoS		A	-	-	-	-	-	-	-	-
	Level of Service		A	-	-	-	-	-	-	-	-
Transit	Facility Type	D	Mixed Traffic								
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8								
	Level of Service		D	-	-	-	-	-	-	-	-
Truck	Truck Lane Width	B	> 3.7 m								
	Travel Lanes per Direction		1								
	Level of Service		B	-	-	-	-	-	-	-	-

Appendix F

TDM-Supportive Development Design and Infrastructure Checklist

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

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

TDM-supportive design & infrastructure measures: <i>Non-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	<input checked="" type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
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 checked="" type="checkbox"/> <i>Adjacent Transitway station is only 75 m away and connected by sidewalk</i>
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>)	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-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>)	<input checked="" type="checkbox"/>
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>)	<input checked="" type="checkbox"/>
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>)	<input checked="" type="checkbox"/> Existing pedestrian-activated signal is located at the adjacent Longfield/Modugno intersection
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input checked="" type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input checked="" type="checkbox"/>
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 checked="" type="checkbox"/> Adjacent streets are "local"
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	<input checked="" type="checkbox"/> Likely no benches
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"/> N/A

TDM-supportive design & infrastructure measures: <i>Non-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>)	<input checked="" type="checkbox"/>
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>)	<input checked="" type="checkbox"/>
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>)	<input checked="" type="checkbox"/>
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	<input type="checkbox"/> To be determined
BETTER	2.1.5 Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	<input type="checkbox"/> To be determined
2.2 Secure bicycle parking		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see <i>Zoning By-law Section 111</i>)	<input type="checkbox"/> N/A
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	<input type="checkbox"/> To be determined
2.3 Shower & change facilities		
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	<input checked="" type="checkbox"/> No showers
BETTER	2.3.2 In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	<input type="checkbox"/> N/A
2.4 Bicycle repair station		
BETTER	2.4.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/> N/A

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
3. TRANSIT		
3.1 Customer amenities		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/> N/A
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	<input type="checkbox"/> N/A
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"/> N/A
4. RIDESHARING		
4.1 Pick-up & drop-off facilities		
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input type="checkbox"/> N/A
4.2 Carpool parking		
BASIC	4.2.1 Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	<input type="checkbox"/> N/A
BETTER	4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	<input type="checkbox"/> N/A
5. CARSHARING & BIKESHARING		
5.1 Carshare parking spaces		
BETTER	5.1.1 Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces (<i>see Zoning By-law Section 94</i>)	<input type="checkbox"/> N/A
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"/> N/A

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
6. PARKING		
6.1 Number of parking spaces		
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	<input checked="" type="checkbox"/> Small variance required
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 checked="" 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 checked="" 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"/> N/A
6.2 Separate long-term & short-term parking areas		
BETTER	6.2.1 Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	<input type="checkbox"/> N/A
7. OTHER		
7.1 On-site amenities to minimize off-site trips		
BETTER	7.1.1 Provide on-site amenities to minimize mid-day or mid-commute errands	<input checked="" type="checkbox"/> Mixed use project including office, retail, and restaurant

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	<input type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input type="checkbox"/>
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"/>
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>)	<input type="checkbox"/>

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>)	<input type="checkbox"/>
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>)	<input type="checkbox"/>
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>)	<input type="checkbox"/>
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/>
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	<input type="checkbox"/>
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>)	<input type="checkbox"/>
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>)	<input type="checkbox"/>
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>)	<input type="checkbox"/>
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"/>
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	<input type="checkbox"/>
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 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 (see <i>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 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 (see <i>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 (see <i>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"/>