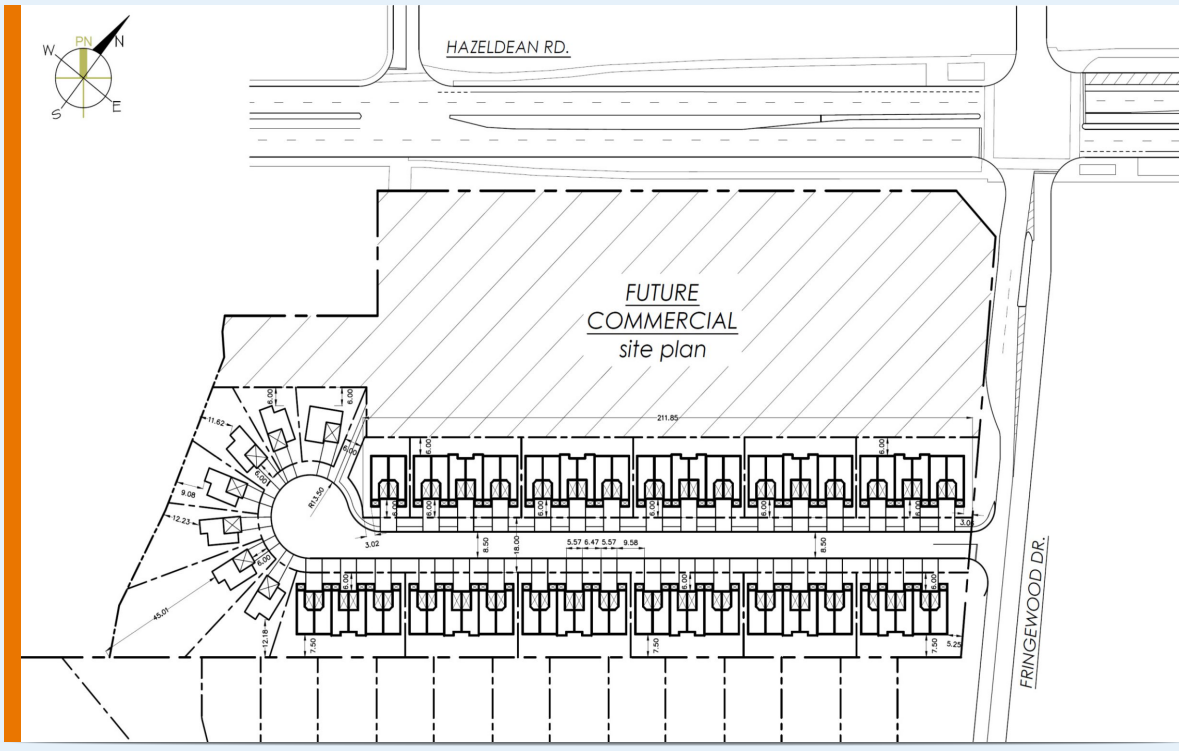
July 2018

Campanale Homes

Transportation Impact Assessment

5 Orchard Road



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TIA Plan Reports

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

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

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

CERTIFICATION

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

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

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Ottawa, ON K1P 1J1
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Ville d'Ottawa
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Dated at Ottawa this 30 day of July, 2018.
(City)

Name: André Sponder
(Please Print)

Professional Title: Transportation Engineer

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

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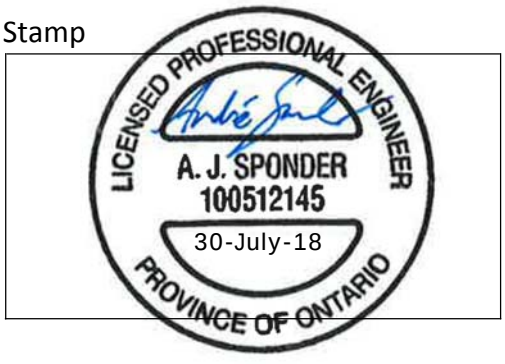
Stamp



5 Orchard Road

Transportation Impact Assessment

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July 30, 2018

476604 - 02000

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Transportation Impact Assessment

1. SCREENING FORM

The screening form was submitted for the subject development on March 7th, 2018 to City of Ottawa staff for review and confirmation of the need for a Transportation Impact Assessment (TIA). The safety triggers were met based on the proposed site driveway's proximity to the Hazeldean/Fringewood, which is located approximately 120 m south of the Hazeldean Road. City staff provided confirmation to proceed with Step 2 – Scoping Report on March 9th, 2018. The Screening Form and City Response are provided in Appendix A.

2. SCOPING REPORT

2.1. EXISTING AND PLANNED CONDITIONS

2.1.1. PROPOSED DEVELOPMENT

Based on the proposed Site Plan provided by Campanale Homes, it is our understanding that the proponent is proposing a two-phase development located at 5 Orchard Road with an expected date of occupancy for Phase 1 in 2022. Phase 1 is a residential development on the southern portion of the site and Phase 2 is a commercial development on the northern portion of the site. This application is for Plan of Subdivision and only includes Phase 1 of the development. The proposed residential development will consist of 67 townhomes and 7 single family homes. One unsignalized full-movement access is proposed along Fringewood Drive. The site is currently a vacant lot and zoned as AM9 – Arterial Mainstreet Zone. The local context of the site is provided as Figure 1 and the proposed Site Plan is provided as Figure 2.

Figure 1: Local Context

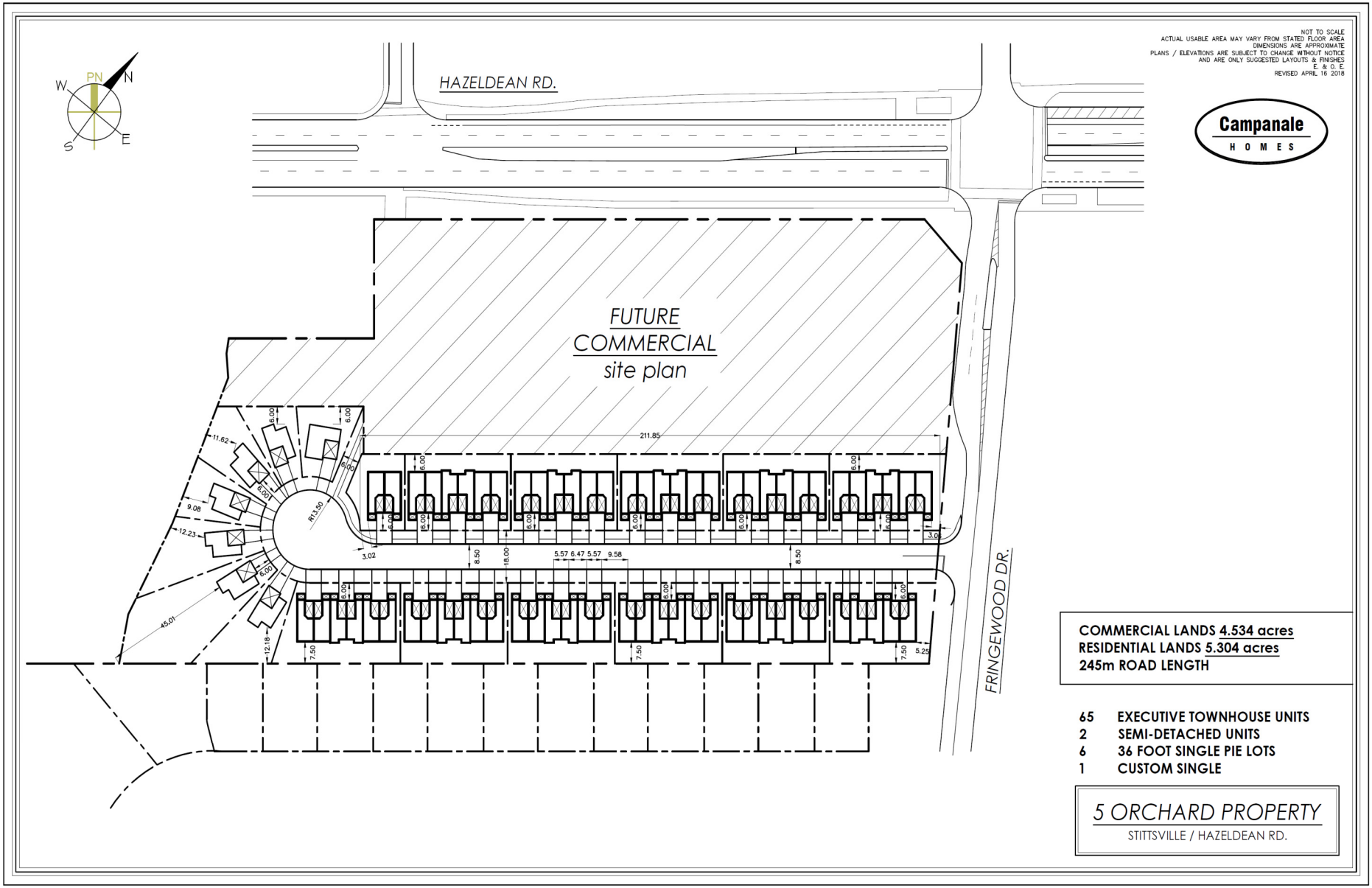

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Figure 2: Proposed Site Plan

2.1.2. EXISTING CONDITIONS

Area Road Network

Hazeldean Road is an east-west, city owned, arterial roadway that extends from Spruce Ridge Road in the west to Eagleson Road in the east, where is continues as Robertson Road. It provides access through an interchange to HWY 7. Within the study area, Hazeldean Road has a four-lane divided cross-section with auxiliary turn lanes provided as major intersections.. The posted speed limit is 60 km/h.

Fringewood Drive is a north-south, city owned, local roadway that extends from Hazeldean Road in the north to Harry Douglas Drive in the south, where it continues as Granite Ridge Drive. The roadway has a two-lane undivided cross-section and parking is prohibited along both sides of the roadway. The posted speed limit is 40 km/h and centre line flexible bollards are provided during warmer months.

Existing Study Area Intersections

Hazeldean/Fringewood

The Hazeldean/Fringewood intersection is a signalized 'T' intersection. The eastbound approach consists of a through lane and a shared through/right-turn lane. The westbound approach consists of two through lanes and an auxiliary left-turn lane. The northbound approach consists of a single full-movement lane. All movements are permitted at this location. The north leg of this intersection was recently constructed, however is not included in this report as the data was collected prior to construction.

Cycle lanes are provided east and westbound along Hazeldean Road.

Existing Driveways to Adjacent Developments

There are private residential driveways approximately every 25m on the east and west sides of Fringewood Drive approximately 90m south of the proposed site access.

Pedestrian/Cycling Network

With respect to pedestrians, sidewalk facilities in the vicinity of the site are provided along both sides of Hazeldean Road. A gravel shoulder is provided on the east side of Fringewood Drive from Hazeldean Road to Cloverloft Court.

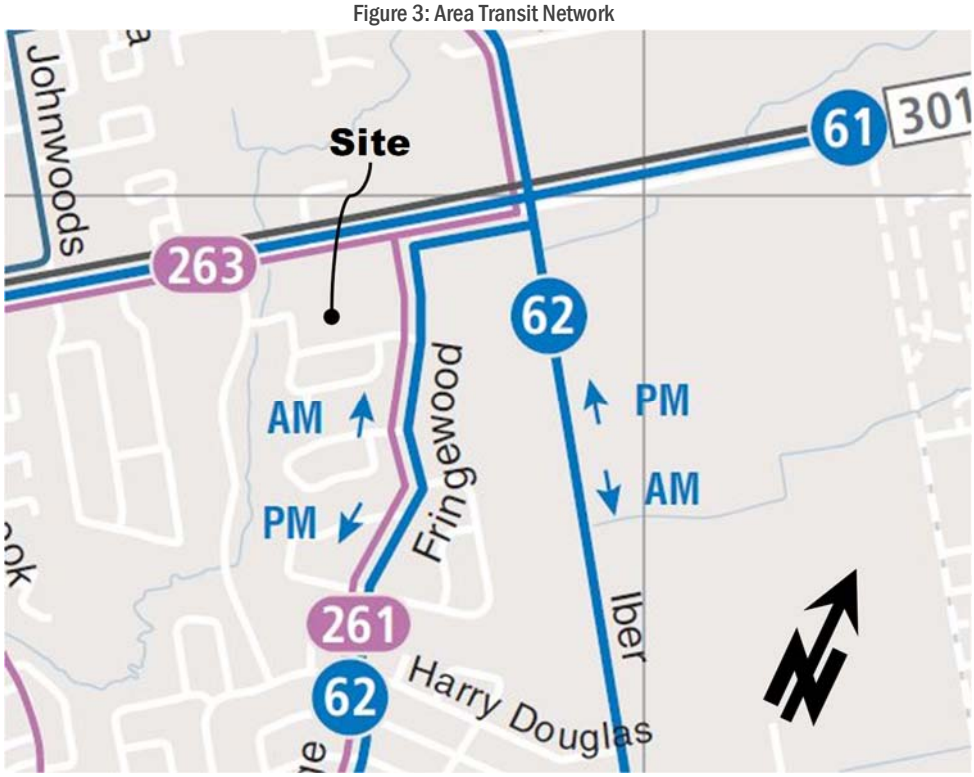
With respect to cyclists, according to the Ottawa Cycling Plan, Hazeldean Road is classified as a "Spine" cycling route and Fringewood Drive is classified as a "Local" cycling route. Cycling facilities are currently provided on Hazeldean Road in the form of curb-side bike lanes and cyclists operate in mixed traffic along Fringewood Drive. A pathway is planned west of the site, along Sweetnam Drive.

Transit Network

Transit service within the vicinity of the site is currently provided by OC Transpo Routes #61, #62, #261 and #263. Bus stops for routes #62 and #261 are located on Fringewood Drive, approximately 60m walking distance south of the site. Bus stops for Routes #61, #62, #261 and #263 are located on Hazeldean Road approximately 200m walking distance

north of the site. Local Routes #61 and 62 provide frequent all-day service, and Connexion Routes #261 and #263 provide morning service in the northbound direction and afternoon service in the southbound direction.

Figure 3: Area Transit Network



Existing Area Traffic Measures

Hazeldean Road

- Median barriers
- Sidewalks
- Traffic Signal at Hazeldean/Fringewood

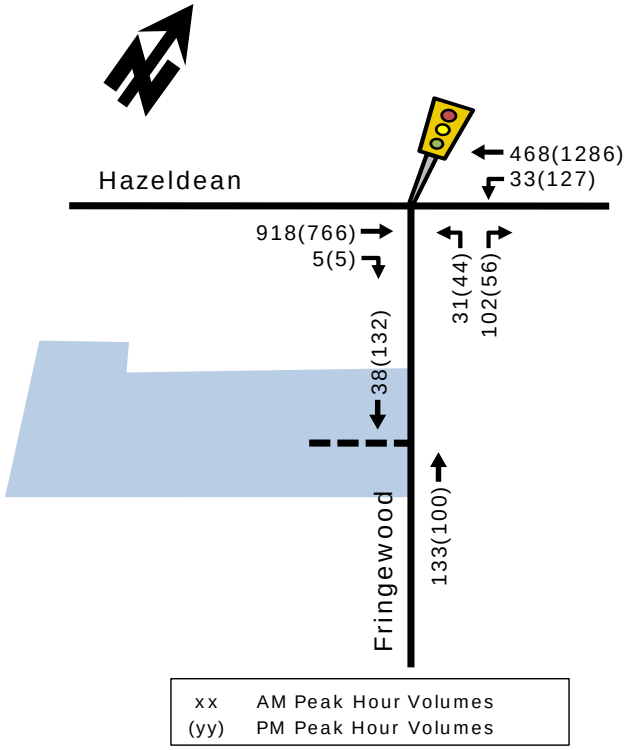
Fringewood Drive

- Speed flex posts south of Cloverloft Court
- Stop signs at major intersections

Peak hour travel demands

The existing peak hour traffic volumes are illustrated in Figure 4 below and were collected by the City of Ottawa in March 2016. The peak hour traffic volume count data is included as Appendix B.

Figure 4: Existing Peak Hour Traffic Volumes



Existing Road Safety Conditions

Collision history for the study area intersection (2012 to 2016, inclusive) was obtained from the City of Ottawa. A total of 7 collisions were recorded at the Hazeldean/Fringewood intersection in the 5-year period and one (1) collision was recorded along Fringewood Drive. Most collisions (62%) involved only property damage, indicating low impact speeds, and 38% involved personal injuries. The primary causes of collisions cited by police include; turning movement (50%) and single vehicle (25%) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At the signalized Hazeldean/Fringewood intersection, reported collisions have historically take place at a rate of 0.15/MEV.

It is noteworthy that within the five-years of recorded collision data there was one collision that involved a pedestrian (non-fatal injuries) and none involving cyclists. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

2.1.3. PLANNED CONDITIONS

Planned Study Area Transportation Network Changes

Transit signal priority (isolated measures) is planned on Hazeldean Road between Stittsville Main Street and Eagleson Road and is identified on the 2031 Affordable Network and Network Concept plans.

No road projects have been identified in the TMP or Planned Construction Program along Hazeldean Road and Fringewood Drive within the study area.

Other Area Development

According to the City's development application search tool, the following developments are planned within the vicinity of the subject site.

5731 Hazeldean Road
Wellings Communities Holding Inc and Extendicare (Canada) Inc. is proposing the construction of a long-term care facility, retirement home and an office/retail development at the above-noted address, which is located approximately 290 m north of the subject development. The Transportation Impact Study (prepared by Stantec) projected an increase in vehicle traffic of approximately 50 veh/h and 110 veh/h during the morning and afternoon peak hours, respectively.

5705 Hazeldean Road
North American (Goulbourn) Corporation is proposing a retail development and drive-through facility at the above-noted address, which is located approximately 530 m north of the subject development. The Transportation Impact Study Addendum (prepared by D.J. Halpenny and Associated Ltd.) projected an increase in vehicle traffic of approximately 120 veh/h and 215 veh/h during the morning and afternoon peak hours, respectively.

5734-5754 Hazeldean Road, 24 Iber Road
Huntington Properties is proposing a mixed-use project consisting of approximately 76,300 ft^2 of retail uses, 59,200 ft^2 of office uses, a 11,500 ft^2 pharmacy and 5,000 ft^2 of medical uses at the above-noted address, which is located approximately 270 m east of the subject development. The Transportation Impact Study (prepared by Parsons (formally Delcan)) projected an increase in vehicle traffic of approximately 270 veh/h and 447 veh/h during the morning and afternoon peak hours, respectively.

2.2. STUDY AREA AND TIME PERIODS

The proposed study area is outlined below and highlighted in Figure 5.

- Hazeldean/Fringewood intersection; and
- Fringewood Drive – adjacent to the site.

Figure 5: Study Area

2.3. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following modules/elements of the TIA process, summarized in Table 1, are recommended to be exempt in the subsequent steps of the TIA process:

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
3.1 Development-generated Travel Demand	All elements	As shown in the Screening Form, the site does not meet the trip generation trigger, as such, no trip-generation analysis is required. As the site does not meet the trip generation trigger, its impact on the surrounding network is considered negligible. As such, no traffic impact analysis is required for this development.
3.3 Demand Rationalization	All elements	
4.1 Development Design	4.1.2 Circulation and Access	Not required for applications involving subdivisions.
4.2 Parking	4.2.2 Spillover Parking	The parking is expected to meet By-Law requirements.
4.4 Access Intersection Design	4.4.3 Intersection Design	The proposed site access will not require an intersection screening for a signal or roundabout as the number of vehicle trips is negligible. As the proposed site access intersection is assumed to be unsignalized, MMLoS analysis is not possible for unsignalized intersection.
4.5 Transportation Demand Management	All elements	The site does not meet the trip generation trigger and as per City response in Appendix A, Modules 4.5 to 4.9 are exempt as the total number of vehicle trips will be negligible in terms of vehicle impact.
4.6 Neighbourhood Traffic Management	All elements	The site does not meet the trip generation trigger and as per City response in Appendix A, Modules 4.5 to 4.9 are exempt as the total number of vehicle trips will be negligible in terms of vehicle impact.
4.7 Transit	All elements	The site does not meet the trip generation trigger and as per City response in Appendix A, Modules 4.5 to 4.9 are exempt as the total number of transit trips will be negligible.
4.8 Review of Network Concept	All elements	The site is not expected to generate 200 trips more than the established zoning.
4.9 Intersection Design	All elements	The site does not meet the trip generation trigger and as per City response in Appendix A, Modules 4.5 to 4.9 are exempt as the total number of vehicle trips will be negligible in terms of vehicle impact.

3. FORECASTING

3.1. DEVELOPMENT-GENERATED TRAVEL DEMAND

Although exempt, the trip generation analysis indicates approximately 35 to 50 two-way vehicles trips are expected during the morning and afternoon peak hours. This equates to approximately 1 new vehicle every 1 to 2 minutes which is considered negligible.

3.2. BACKGROUND NETWORK TRAVEL DEMANDS

3.2.1. TRANSPORTATION NETWORK PLANS

See Section 2.1.3.

3.2.2. BACKGROUND TRAFFIC GROWTH

The following background traffic growth through the immediate study area (summarized in Table 2) was calculated based on historical traffic count data (years 2008, 2009, 2012, and 2016) provided by the City of Ottawa at the Hazeldean/Stittsville Main intersection. Detailed background traffic growth analysis is included as Appendix D.

Table 2: Hazeldean/Stittsville Historical Background Growth (2008 – 2016)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	8.25%	-0.07%	0.56%	3.67%	**2.30%**
AM Peak	9.62%	-1.86%	0.94%	2.37%	**2.31%**
PM Peak	12.77%	1.16%	2.86%	3.76%	**4.33%**

As shown in Table 2, the Hazeldean/Stittsville Main intersection has experienced an approximate 2.3% to 4.3% annual increase in vehicle traffic within recent years (calculated as a weighted average). A 3% per annum growth factor was applied to existing traffic volumes along Hazeldean Road to account for increased density within the area and to obtain background traffic volumes for the 2022 built-out horizon year and 2027 (5-years beyond site build-out). The resultant 2022 and 2027 background traffic volumes are depicted as Figure 6 and Figure 7, respectively.

Figure 6: 2022 Background Traffic Volumes

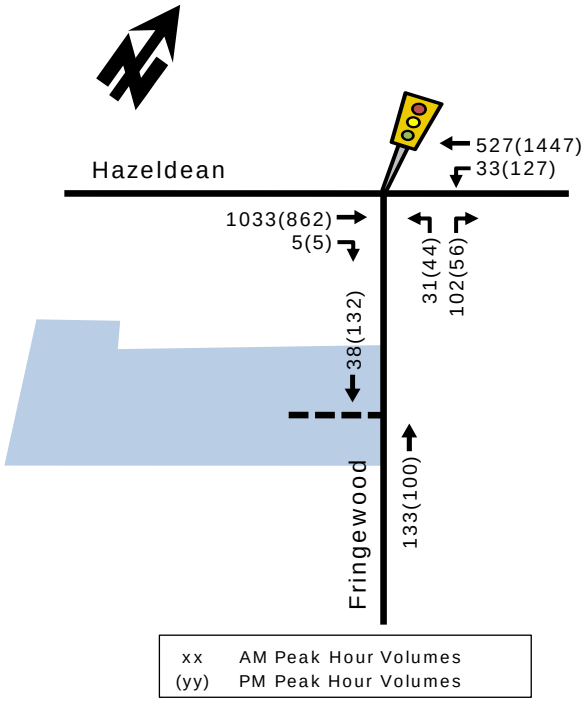
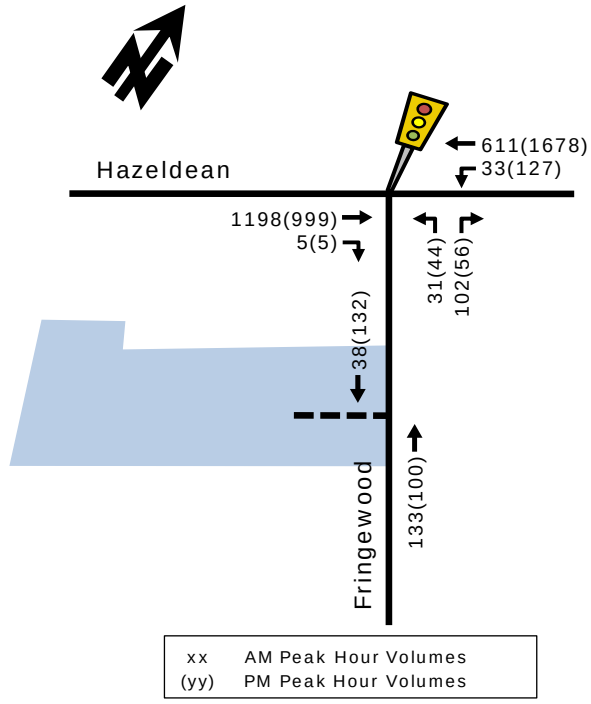


Figure 7: 2027 Background Traffic Volumes



3.2.3. OTHER DEVELOPMENTS

See Section 2.1.3.

3.3. DEMAND RATIONALIZATION

Exempt – Refer to Section 2.3.

4. ANALYSIS

4.1. DEVELOPMENT DESIGN

4.1.1. DESIGN FOR SUSTAINABLE MODES

Vehicle and Bicycle Parking
Shared off-road driveways are proposed for each residential unit. Bicycle parking will be available in each residential unit.

Transit Amenities
Transit service within the vicinity of the site is currently provided by OC Transpo Routes #61, #62, #261 and #263. Bus stops for routes #62 and #261 are located on Fringewood Drive, approximately 60m walking distance south of the site. Bus stops for Routes #61, #62, #261 and #263 are located on Hazeldean Road approximately 200m walking distance north of the site. Local Routes #61 and 62 provide frequent all-day service, and Connexion Routes #261 and #263 provide morning service in the northbound direction and afternoon service in the southbound direction.

Pedestrian Routes and Facilities
Existing today are gravel shoulders along the east side of Fringewood Drive and sidewalks are provided along both sides of Hazeldean Road. A major pathway/pathway link is planned, located west of the proposed development.

4.1.2. CIRCULATION AND ACCESS

Exempt – Refer to Section 2.3.

4.1.3. NEW STREETS NETWORK

The proposed new roadway will be designated as a local public roadway. Local roadways should have less than 100 veh/h during the peak hours. Given the subject roadway ends in a cul-de-sac and there are less than 100 residential units, the projected amount of traffic is less than 100 veh/h during peak hours, which is appropriate for a local roadway. The roadway is 8.5m wide terminating in a cul-de-sac that has a radius of 13.5m. An active mode pathway is proposed at the western edge of the roadway to connect to future development to the north, promoting non-auto travel within the neighbourhood.

4.2. PARKING

4.2.1. PARKING SUPPLY

Vehicle and Bicycle Parking
Shared off-road private driveways are proposed for each residential unit, which meets the City's minimum parking requirement of 1 parking space per unit. Garages will be provided for each residential unit, and as such, bicycle parking will be accommodated at each residential garage and no additional bicycle parking is required.

4.3. BOUNDARY STREET DESIGN

The boundary street for the development is Fringewood Drive. At this time, there has not been any complete street concepts prepared for the boundary street. The existing roadway's geometry consists of the following features:

- 1 vehicle travel lane in each direction;
- Less than 3,000 vehicles per day;
- Posted speed limit of 50 km/h, assumed operating speed of 30 to 50 km/h;
- 3.7 m wide lanes;
- No dedicated transit facilities;
- Gravel shoulder; and
- No on-street parking.

The multi-modal level of service analysis for the road segment along Fringewood Drive adjacent to the site is summarized in Table 3, with detail analysis provided in Appendix E. Truck level of service were not analyzed as Fringewood Drive is not a designated truck route.

Table 3: MMLOS – Projected Fringewood Drive Segment (West Side of Roadway, Adjacent to Site)

Road Segment	Level of Service					
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target
Fringewood Drive	F	C	B	B	D	N/A

Given the development's location within a general urban area along a local bicycle route and a local roadway, the target levels of service for pedestrians and cyclists are PLoS 'C' and BLoS 'B'. There are no transit priority plans for Fringewood Drive and as such there is no transit level of service target.

As shown in Table 3, the BLoS target is met along Fringewood Drive, adjacent to the site. A PLoS 'F' is realized because there are no sidewalks provided along the boundary street. As part of the future development to the north of the subject site, sidewalks or pedestrian pathways should be provided to connect to Hazeldean Road. As there are currently no sidewalks along Fringewood Drive, the proponent is willing to discuss with the City a potential plan to provide sidewalks along Fringewood Drive adjacent to the site with potential cost sharing between the City and the developer.

4.4. ACCESS INTERSECTION DESIGN

4.4.1. LOCATION AND DESIGN OF ACCESS

The site access roadway is proposed on Fringewood Drive, approximately 120m south of the Hazeldean/Fringewood signalized intersection. The roadway connection is proposed as a full movement roadway. The roadway width is noted to be 8.5 m and is STOP controlled on the minor approach only. The proximity of the roadway to the signalized intersection is considered acceptable given there are no auxiliary turn lanes that extend to the site's access roadway, queues along Fringewood are not expected to spill back to the site's access, and travel to/from the proposed development is low.

Phase 2 of the development, located north of the subject site, is planned as a commercial development and is anticipated to have between 100 to 200 parking spaces. If a full movement access is proposed for Phase 2 to Fringewood Drive the Private Approach By-Law should be consulted. According to the By-Law, the Phase 2 access to Fringewood Drive should be located at least 45 m from the Hazeldean/Fringewood signalized intersection and at least 45 m from the subject site's access roadway. If more than 200 parking spaces are provided for Phase 2, these intersection spacing distances would increase to 60 m.

4.4.2. INTERSECTION CONTROL AND DESIGN

As the trip-generation trigger has not been satisfied, the projected volumes are negligible and as such, the site driveway will operate acceptably with STOP control on the minor approach only.

4.4.3. INTERSECTION DESIGN

Exempt – Refer to Section 2.3.

4.5. TRANSPORTATION DEMAND MANAGEMENT

Exempt – Refer to Section 2.3.

4.6. NEIGHBOURHOOD TRAFFIC MANAGEMENT

Exempt – Refer to Section 2.3.

4.7. TRANSIT

Exempt – Refer to Section 2.3.

4.8. REVIEW OF NETWORK CONCEPT

Exempt – Refer to Section 2.3.

4.9. INTERSECTION DESIGN

Exempt – Refer to Section 2.3.

5. CONCLUSIONS

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

- A total of 74 residential units (67 townhomes and 7 single family homes) are being proposed at 5 Orchard Drive;
- Vehicle and bicycle parking will be provided through shared off-road driveways/garages;
- An active mode pathway is proposed to connect the west end of the development to the future development to the north;
- Transit service is provided along Hazeldean Road approximately 200m walking distance north of the site;
- One access roadway is proposed along Fringewood Drive into the development, approximately 120m south of the Hazeldean/Fringewood intersection. This roadway is located as far south as possible along the site's frontage and will not conflict with the operations of the Hazeldean/Fringewood intersection; and
- Based on the results herein, no Roadway Modification Application or monitoring plan is require.

Based on the foregoing, the proposed residential development at 5 Orchard Drive is recommended from a transportation perspective. Note that a separate TIA will be prepared for Phase 2 of development when a Site Plan for the retail component has been developed.

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Reviewed By:

Mark Baker, P.Eng.
Senior Project Manager

Appendix A

Screening Form

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City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date 9-Jan-18

Project 5 Orchard

Project Number

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

Module 1.1 - Description of Proposed Development	
Municipal Address	5 Orchard Drive
Description of location	Southwest quadrant of Hazeldean/Fringewood intersection
Land Use	Residential townhomes on southern portion of site and commercial on northern portion of site. Plan of subdivision is just for southern portion of the site
Development Size	67 Townhomes and 7 single family homes
Number of Accesses and Locations	One unsignalized full-movement access to Fringewood Drive
Development Phasing	One Phase
Buildout Year	Assume 2020
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	74	Units
Trip Generation Trigger Met?	No	

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

Traffic Counts

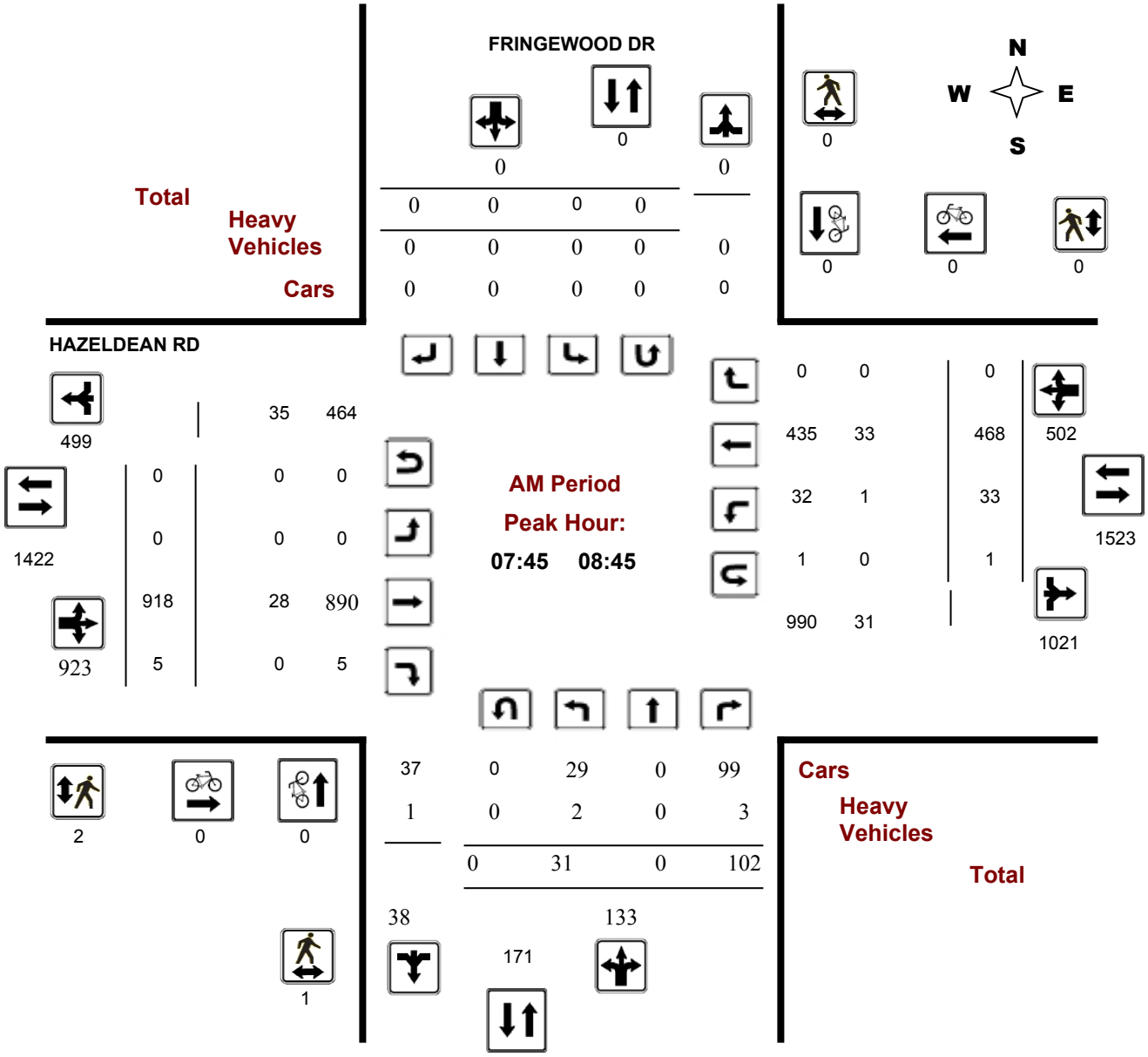
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

HAZELDEAN RD @ FRINGEWOOD DR

Survey Date: Wednesday, March 23, 2016 **WO No:** 35818

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



Comments

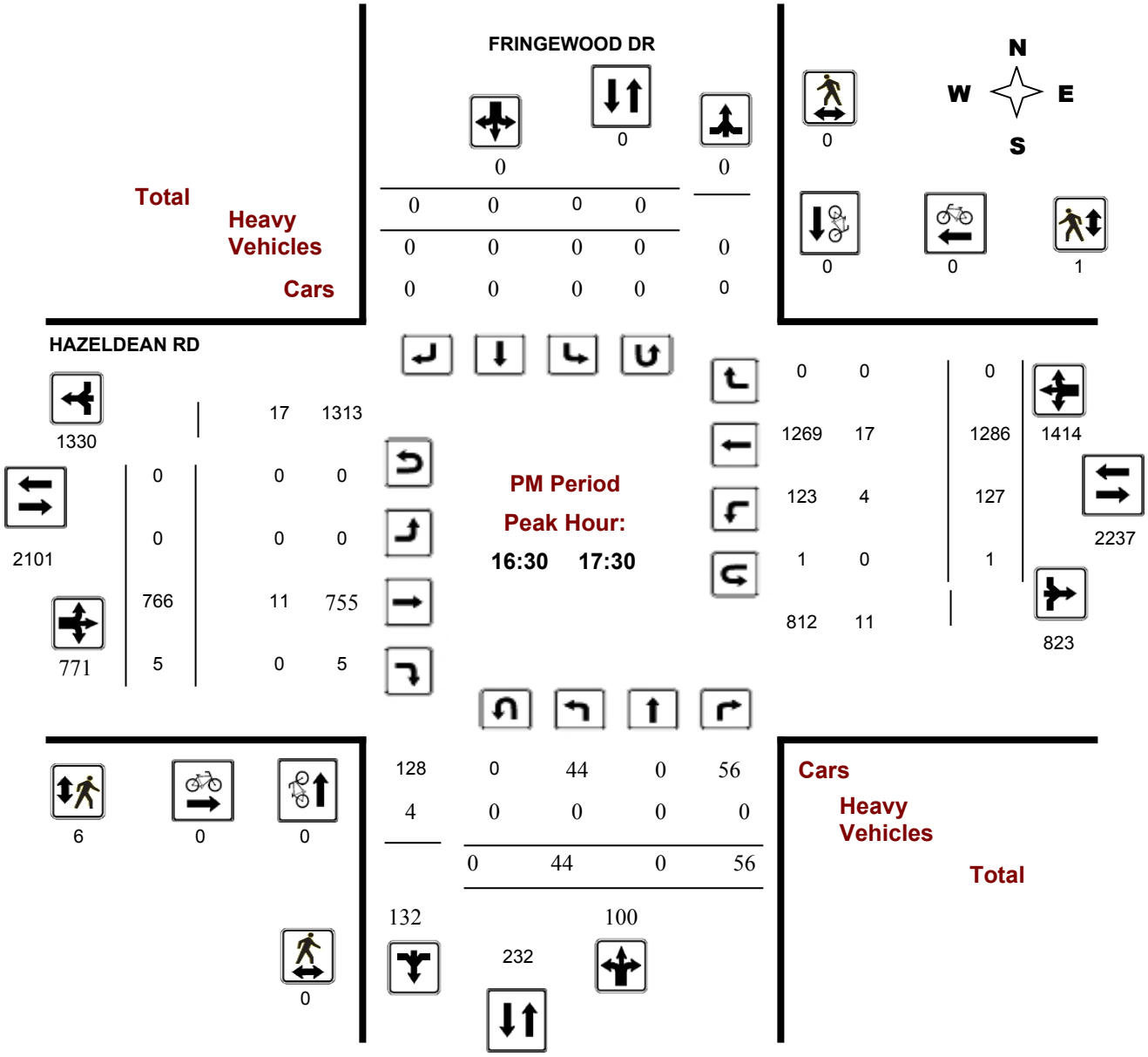
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

HAZELDEAN RD @ FRINGEWOOD DR

Survey Date: Wednesday, March 23, 2016 **WO No:** 35818

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



Comments

Appendix C

Collision Data

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2016

Location: HAZELDEAN RD @ FRINGEWOOD DR

Traffic Control: Stop sign **Total Collisions:** 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Sep-08, Mon,18:41	Clear	SMV other	Non-fatal injury	Dry	North	Turning left	Pick-up truck	Pedestrian	1
2015-Jun-22, Mon,16:55	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Aug-29, Sat,16:56	Rain	Turning movement	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jun-22, Wed,11:50	Clear	SMV other	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Ran off road	

From: January 1, 2014 **To:** December 31, 2016

Location: FRINGEWOOD DR btwn HAZELDEAN RD & CLOVERLOFT CRT

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

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jun-04, Thu,12:27	Clear	Turning movement	P.D. only	Dry	South	Making "U" turn	Pick-up truck	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	

Collision Main Detail Summary

OnTRAC Reporting System

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

FRINGEWOOD DR & HAZELDEAN RD

Former Municipality: **Goulbourn** Traffic Control: **Traffic signal** Number of Collisions: **3**

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2012-08-31	Fri	13:56	Clear	Daylight	Turning	Non-fatal	V1 W	Dry	Turning left	Automobile, station	Other motor vehicle	0
								V2 E	Dry	Going ahead	Automobile, station	Other motor vehicle	
2	2013-04-15	Mo	16:57	Clear	Daylight	Sideswipe	P.D. only	V1 W	Dry	Going ahead	Unknown	Other motor vehicle	0
								V2 W	Dry	Stopped	Municipal transit bus	Other motor vehicle	
3	2013-09-19	Thu	07:30	Clear	Daylight	Turning	P.D. only	V1 W	Dry	Turning left	Automobile, station	Other motor vehicle	0
								V2 E	Dry	Going ahead	Automobile, station	Other motor vehicle	

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

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	2	1	0	0	1	0	0	5	63%
Non-fatal injury	0	2	0	0	0	1	0	0	3	38%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**4**	**1**	**0**	**0**	**2**	**0**	**0**	**8**	100%
	#3 or 13%	#1 or 50%	#3 or 13%	#5 or 0%	#5 or 0%	#2 or 25%	#5 or 0%	#5 or 0%		

FRINGEWOOD DR / HAZELDEAN RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2013	7	25,102	1825	**0.15**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	1	1	0	0	1	0	0	4	57%
Non-fatal injury	0	2	0	0	0	1	0	0	3	43%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**3**	**1**	**0**	**0**	**2**	**0**	**0**	**7**	100%
	14%	43%	14%	0%	0%	29%	0%	0%		

FRINGEWOOD DR, HAZELDEAN RD to CLOVERLOFT CRT

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2012-2013	1	n/a	730	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	1	0	0	0	0	0	0	1	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	100%
	0%	100%	0%	0%	0%	0%	0%	0%		

Appendix D

Background Traffic Analysis

Hazeldean / Stittsville Main
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2008	Tuesday 6 May	1103	1051	3334	3280	5261	6372	2740	2765	25906
2009	Tuesday 5 May	1405	1193	3295	3314	4799	6413	2702	2281	25402
2012	Friday 8 June	1703	1319	2419	2114	4162	3996	2536	3390	21639
2016	Wednesday 13 March	2405	1814	3463	3442	6360	6115	3043	3900	30542

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2008	1051	1103	2154	25906				
2009	1193	1405	2598	25402	13.5%	27.4%	20.6%	-1.9%
2012	1319	1703	3022	21639	10.6%	21.2%	16.3%	-14.8%
2016	1814	2405	4219	30542	37.5%	41.2%	39.6%	41.1%

Regression Estimate	2008	1050	1155	2205
Regression Estimate	2016	1774	2384	4158
Average Annual Change		**6.77%**	**9.49%**	**8.25%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2008	2740	2765	5505	25906				
2009	2702	2281	4983	25402	-1.4%	-17.5%	-9.5%	-1.9%
2012	2536	3390	5926	21639	-6.1%	48.6%	18.9%	-14.8%
2016	3043	3900	6943	30542	20.0%	15.0%	17.2%	41.1%

Regression Estimate	2008	2640	2501	5141
Regression Estimate	2016	2923	3936	6859
Average Annual Change		**1.28%**	**5.83%**	**3.67%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2008	6372	5261	11633	25906				
2009	6413	4799	11212	25402	0.6%	-8.8%	-3.6%	-1.9%
2012	3996	4162	8158	21639	-37.7%	-13.3%	-27.2%	-14.8%
2016	6115	6360	12475	30542	53.0%	52.8%	52.9%	41.1%

Regression Estimate	2008	5984	4690	10673
Regression Estimate	2016	5345	5812	11156
Average Annual Change		**-1.40%**	**2.72%**	**0.56%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2008	3334	3280	6614	25906				
2009	3295	3314	6609	25402	-1.2%	1.0%	-0.1%	-1.9%
2012	2419	2114	4533	21639	-26.6%	-36.2%	-31.4%	-14.8%
2016	3463	3442	6905	30542	43.2%	62.8%	52.3%	41.1%

Regression Estimate	2008	3127	3053	6179
Regression Estimate	2016	3129	3015	6145
Average Annual Change		**0.01%**	**-0.15%**	**-0.07%**

Hazeldean / Stittsville Main
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2008	Tuesday 6 May	139	95	407	270	484	756	387	285	2823
2009	Tuesday 5 May	219	157	385	331	523	705	354	286	2960
2012	Friday 8 June	278	87	304	234	382	627	317	333	2562
2016	Wednesday 13 March	388	191	341	280	519	845	431	363	3358

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2008	95	139	234	2823				
2009	157	219	376	2960	65.3%	57.6%	60.7%	4.9%
2012	87	278	365	2562	-44.6%	26.9%	-2.9%	-13.4%
2016	191	388	579	3358	119.5%	39.6%	58.6%	31.1%

Regression Estimate	2008	106	163	270
Regression Estimate	2016	171	392	562
Average Annual Change		**6.07%**	**11.57%**	**9.62%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2008	387	285	672	2823				
2009	354	286	640	2960	-8.5%	0.4%	-4.8%	4.9%
2012	317	333	650	2562	-10.5%	16.4%	1.6%	-13.4%
2016	431	363	794	3358	36.0%	9.0%	22.2%	31.1%

Regression Estimate	2008	353	283	636
Regression Estimate	2016	401	366	767
Average Annual Change		**1.60%**	**3.28%**	**2.37%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2008	756	484	1240	2823				
2009	705	523	1228	2960	-6.7%	8.1%	-1.0%	4.9%
2012	627	382	1009	2562	-11.1%	-27.0%	-17.8%	-13.4%
2016	845	519	1364	3358	34.8%	35.9%	35.2%	31.1%

Regression Estimate	2008	696	477	1173
Regression Estimate	2016	787	477	1265
Average Annual Change		**1.55%**	**0.01%**	**0.94%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2008	407	270	677	2823				
2009	385	331	716	2960	-5.4%	22.6%	5.8%	4.9%
2012	304	234	538	2562	-21.0%	-29.3%	-24.9%	-13.4%
2016	341	280	621	3358	12.2%	19.7%	15.4%	31.1%

Regression Estimate	2008	388	289	676
Regression Estimate	2016	317	264	582
Average Annual Change		**-2.47%**	**-1.08%**	**-1.86%**

Hazeldean / Stittsville Main
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2008	Tuesday 6 May	142	170	476	568	940	719	369	490	3874
2009	Tuesday 5 May	207	213	478	557	809	846	535	389	4034
2012	Friday 8 June	253	201	353	354	696	581	397	563	3398
2016	Wednesday 13 March	421	425	538	649	1244	866	456	719	5318

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2008	170	142	312	3874				
2009	213	207	420	4034	25.3%	45.8%	34.6%	4.1%
2012	201	253	454	3398	-5.6%	22.2%	8.1%	-15.8%
2016	425	421	846	5318	111.4%	66.4%	86.3%	56.5%

Regression Estimate	2008	157	150	307
Regression Estimate	2016	392	410	802
Average Annual Change		**12.12%**	**13.42%**	**12.77%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2008	369	490	859	3874				
2009	535	389	924	4034	45.0%	-20.6%	7.6%	4.1%
2012	397	563	960	3398	-25.8%	44.7%	3.9%	-15.8%
2016	456	719	1175	5318	14.9%	27.7%	22.4%	56.5%

Regression Estimate	2008	434	425	860
Regression Estimate	2016	447	708	1155
Average Annual Change		**0.36%**	**6.58%**	**3.76%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2008	719	940	1659	3874				
2009	846	809	1655	4034	17.7%	-13.9%	-0.2%	4.1%
2012	581	696	1277	3398	-31.3%	-14.0%	-22.8%	-15.8%
2016	866	1244	2110	5318	49.1%	78.7%	65.2%	56.5%

Regression Estimate	2008	727	792	1519
Regression Estimate	2016	791	1113	1904
Average Annual Change		**1.06%**	**4.35%**	**2.86%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2008	476	568	1044	3874				
2009	478	557	1035	4034	0.4%	-1.9%	-0.9%	4.1%
2012	353	354	707	3398	-26.2%	-36.4%	-31.7%	-15.8%
2016	538	649	1187	5318	52.4%	83.3%	67.9%	56.5%

Regression Estimate	2008	445	511	956
Regression Estimate	2016	485	563	1048
Average Annual Change		**1.10%**	**1.21%**	**1.16%**

Appendix E

Multi-Modal Level of Service Analysis

Multi-Modal Level of Service - Segments Form

Consultant	Parsons	**Project**	5 Orchard TIA
Scenario		**Date**	
Comments			

SEGMENTS		Street A	Fringewood 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	Section 9
Pedestrian	Sidewalk Width Boulevard Width	-	no sidewalk n/a								
	Avg Daily Curb Lane Traffic Volume		≤ 3000								
	Operating Speed On-Street Parking		> 30 to 50 km/h no								
	Exposure to Traffic PLoS		F	-	-	-	-	-	-	-	-
	Effective Sidewalk Width										
	Pedestrian Volume										
	Crowding PLoS		-	-	-	-	-	-	-	-	-
	Level of Service		-	-	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	B	Mixed Traffic								
	Number of Travel Lanes		≤ 2 (no centreline)								
	Operating Speed		>40 to <50 km/h								
	# of Lanes & Operating Speed LoS		B	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge								
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes								
	Sidestreet Operating Speed		≤ 40 km/h								
	Unsignalized Crossing - Lowest LoS		A	-	-	-	-	-	-	-	-
	Level of Service		B	-	-	-	-	-	-	-	-
Transit	Facility Type	D	Mixed Traffic								
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8								
	Level of Service		D	-	-	-	-	-	-	-	-
Truck	Truck Lane Width	-									
	Travel Lanes per Direction										
	Level of Service		-	-	-	-	-	-	-	-	-