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36 Years

480 Cope Drive
Fernbank Public School

Transportation Impact Assessment

480 Cope Drive
Fernbank Public School

Transportation Impact Assessment

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

November 2019

Novatech File: 119153
Ref: R-2019-154

NOVATECH
Engineers, Planners & Landscape Architects

November 26th, 2019

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

Attention: **Mr. Mike Giampa**
Project Manager, Infrastructure Approvals

Dear Mr. Giampa:

Reference: **480 Cope Drive – Fernbank Public School**
Transportation Impact Assessment
Novatech File No. 119153

We are pleased to submit the following Transportation Impact Assessment in support of a Site Plan Control application for the proposed elementary school at 480 Cope Drive. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

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

Yours truly,

NOVATECH

B. Byvelds

Brad Byvelds, P. Eng.
Project Coordinator | Transportation/Traffic

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

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.**

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at Ottawa (City) this 26th day of November, 2019.

Name: Brad Byvelds
(Please Print)

Professional Title: P. Eng. - Project Coordinator

B. Byvelds

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

Office Contact Information (Please Print)	
Address:	240 Michael Cowpland Drive
City / Postal Code:	Ottawa, ON K2M 1P6
Telephone / Extension:	613-254-9643 ext. 286
E-Mail Address:	b.byvelds@novaetch-eng.com

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of a Site Plan Control application for the proposed elementary school located at 480 Cope Drive, in the southwest corner of the Cope Drive/Rouncey Road intersection.

The proposed elementary school is located within the Blackstone development. A Transportation Impact Study (TIS), dated May 2017, and subsequent Addendum, dated February 2018, were prepared by Parsons in support of Blackstone Phases 4-8.

The subject site will be surrounded by the following upon build-out of Blackstone Phases 4-8:

- Cope Drive and residential development to the north,
- Parkland and residential development to the south,
- Rouncey Road and residential development to the east, and
- Continental Avenue and residential development to the west.

The proposed development is a two-storey elementary school containing 30 classrooms and the potential for 12 future portables. The proposed elementary school is anticipated to have a capacity of 650 students. A daycare facility will provide extended care for approximately 20 kindergarten aged students and 30 elementary school aged students. The subject site is currently zoned I1A/R3YY[2317], which permits the proposed elementary school.

One all movement access is proposed on Continental Avenue, serving a surface parking lot containing 114 parking spaces and a daycare drop of area. Two accesses are proposed on Rouncey Road, serving a bus drop-off area. An on-street lay-by is to be constructed along Cope Drive adjacent to the site as part of the surrounding subdivision roadways. Two new on-street lay-bys are proposed along Continental Avenue north and south of the proposed surface parking lot access.

The proposed elementary school is anticipated to be constructed in a single phase, and is anticipated to be open by the 2021 school year.

The conclusions and recommendations of this TIA can be summarized as follows:

<u>Development Design and Parking</u>

- Pedestrian facilities will be provided between the main building entrances and the sidewalks along Cope Drive, Rouncey Road, and Continental Avenue. A 2.5m sidewalk will be provided along the proposed bus loop, connecting to a gate to enter the playground.
- Garbage collection will be conducted at the southern limits of the surface parking lot.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicle parking, bicycle parking, and loading spaces conform to the requirements of the City's Zoning By-law.

<u>Boundary Streets</u>

- No changes to the design of Cope Drive are proposed as part of this development. No driveways to the subject site are proposed along Cope Drive.
- It is proposed that the multi-use pathway from the Cope Drive/Rouncey Road roundabout extend to south of the bus loop egress where it will transition to an on-road cycling

facility/concrete sidewalk. This modification is not anticipated to impact the pedestrian or cycling level of service along Rouncey Road.
- Two on-street lay-bys are proposed along Continental Avenue, north and south of the proposed surface parking lot access. The proposed on-street lay-bys will be used for parent pick-up and drop-off activity.
- The proposed on-street lay-bys are not anticipated to impact the pedestrian or bicycle level of service along Continental Avenue. However, the on-street lay-bys will prohibit on-street parking on the east side of Continental Avenue adjacent to the subject site.

Access Design
- The width and location of the surface parking lot access on Continental Avenue conform to the requirements of the City's Zoning By-law and Private Approach By-law.
- The width, location, and angle of the proposed bus loop ingress and egress on Rouncey Road adhere to the requirements of the City's Private Approach By-law.

Transportation Demand Management
- The proposed elementary school conforms to the City's TDM initiatives by providing easy access to area pedestrian, cycling and transit facilities. In addition, the OCDSB provides bus transportation for students who live a certain distance a way from the school.
- As the student population of the school increases, consideration could be given by the OCDSB and OSTA to providing a walking school bus program for this elementary school.

Transit
- Students of the school are anticipated to take the school bus, bike/walk, or get driven to school by their parents.
- Some teachers or staff may take public transit to the school. However, the overall number of transit trips generated by the school are anticipated to be minimal.
- The proposed elementary school is not anticipated to have a significant impact on the transit facilities planned for the area.

Intersection MMLOS
- As none of the study area intersections will be signalized, the intersection MMLOS is not required.
- Trips generated by the proposed elementary school were included in the analysis presented in the Blackstone Phases 4-8 TIS. As the intersection analysis in the TIS was completed within the last five years, it is considered an accurate representation of intersection operations following the proposed development. A summary of the future intersection operations, based on the analysis presented in the Blackstone Phases 4-8 TIS, is provided below.

  Fernbank Road/Rouncey Road
  - Under the 2025 total traffic conditions, the southbound approach to this intersection is anticipated to operate with a LOS E during both the AM and PM peak hours.
  - Under the 2030 total traffic conditions the southbound approach to this intersection is anticipated to operate with a LOS F during both the AM and PM peak hours.
  - Traffic signalization warrants using Ontario Traffic Manual (OTM) Book 12 identify traffic signal controls are not warranted at this intersection under the 2030 total traffic conditions.
  - An eastbound left turn lane and westbound right turn lane are warranted at this intersection.

Cope Drive/Rouncey Road

- Under both the 2025 and 2030 total traffic conditions, critical movements at this intersection are anticipated to operate with a LOS A during both the AM and PM peak hours.

1.0 SCREENING

1.1 Introduction

This Transportation Impact Assessment (TIA) has been prepared in support of a Site Plan Control application for the proposed elementary school located at 480 Cope Drive, in the southwest corner of the Cope Drive/Rouncey Road intersection.

The proposed elementary school is located within the Blackstone development. A Transportation Impact Study (TIS), dated May 2017, and subsequent Addendum, dated February 2018, were prepared by Parsons in support of Blackstone Phases 4-8. A concept plan from the February 2018 Addendum, showing the location of the proposed elementary school within the Blackstone development, is provided in **Figure 1**. A key map of the surrounding area is shown in **Figure 2**.

Figure 1: Location of Subject Site

Figure 2: Key Map

The subject site will be surrounded by the following upon build-out of Blackstone Phases 4-8:

- Cope Drive and residential development to the north,
- Parkland and residential development to the south,
- Rouncey Road and residential development to the east, and
- Continental Avenue and residential development to the west.

1.2 Proposed Development

The proposed development is a two-storey elementary school containing 30 classrooms and the potential for 12 future portables. The proposed elementary school is anticipated to have a capacity of 650 students. A daycare facility will provide extended care for approximately 20 kindergarten aged students and 30 elementary school aged students. The subject site is currently zoned I1A/R3YY[2317], which permits the proposed elementary school.

One all movement access is proposed on Continental Avenue, serving a surface parking lot containing 114 parking spaces and a daycare drop of area. Two accesses are proposed on Rouncey Road, serving a bus drop-off area. An on-street lay-by is to be constructed along Cope Drive adjacent to the site as part of the surrounding subdivision roadways. Two new on-street lay-bys are proposed along Continental Avenue north and south of the proposed surface parking lot access.

The proposed elementary school is anticipated to be constructed in a single phase, and is anticipated to be open by the 2021 school year.

A copy of the proposed site plan (by others) is included in **Appendix A**.

1.3 Screening Form

The City's 2017 TIA Guidelines identify three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form. The trigger results are as follows:

- Trip Generation Trigger – The development is expected to generate over 60 person trips during the peak hour; further assessment is required based on this trigger.

- Location Triggers – The development does not propose a driveway on a roadway that is part of the City's Transit Priority, Rapid Transit, or Spine Cycling Network, and is not located in a Transit Oriented Development (TOD) Zone or Design Priority Area (DPA); further assessment is not required based on this trigger.

- Safety Triggers – The development proposes new accesses within 150m of the future Cope Drive/Rouncey Road roundabout; further assessment is required based on this trigger.

A copy of the TIA Screening Form is included in **Appendix B**.

2.0 SCOPING

2.1 Existing and Planned Conditions

2.1.1 Existing Roadways

All roadways within the study area fall under the jurisdiction of the City of Ottawa.

Fernbank Road is an arterial roadway that runs on an east-west alignment between Eagleson Road and Dwyer Hill Road. It has a two-lane undivided rural cross section with a posted speed limit of 80km/hr in the vicinity of the subject site. Fernbank Road transitions into a two-lane urban cross section with a posted speed limit of 60km/hr east of Terry Fox Drive.

Cope Drive is currently a discontinuous major collector roadway that travels on an east-west alignment. Currently Cope Drive is constructed from Robert Grant Avenue to Defence Street, and continues between Terry Fox Drive and Eagleson Road. As part of the Blackstone Phases 4-8 development, Cope Drive will be extended east of Defence Street to Terry Fox Drive.

Rouncey Road is a major collector roadway that travels on a north-south alignment. Currently Rouncey Road is constructed from Abbott Street to south of Groningen Street. As part of the Blackstone Phases 4-8 development, Rouncey Road will be extended further south, connecting to Fernbank Road.

Continental Avenue is a future local roadway to be constructed as part of the Blackstone Phases 4-8 development. It will run on a north-south alignment in the vicinity of the subject site.

2.1.2 Existing Intersections

The Cope Drive/Rouncey Road intersection will be constructed as part of the Blackstone Phases 4-8 development. This intersection will be constructed as a single lane roundabout with an inscribed circle diameter of approximately 40m.

The Fernbank Road/Rouncey Road intersection is currently a construction access for the Blackstone Phase 4-8 development. Based on the TIS prepared for the Blackstone development, this intersection will operate under stop control along Rouncey Road, maintaining free flow conditions along Fernbank Road. Auxiliary left turn and right turn lanes are to be constructed along Fernbank Road at Rouncey Road.

The Cope Drive/Continental Avenue intersection will be constructed as part of the Blackstone Phases 4-8 development. This intersection is anticipated to operate under stop control along Continental Avenue, maintaining free flow conditions on Cope Drive.

2.1.3 Existing Driveways

A review of adjacent driveways along the boundary roads has been conducted based on the concept plan provided in the February 2018 TIS Addendum for 5505 Fernbank Road. Future driveways in proximity to the subject site are summarized as follows:

Cope Drive, North Side:
- 29 driveways to residential townhouse dwellings between Continental Avenue and Rouncey Road

Cope Drive, South Side:
- 26 driveways to residential townhouse dwellings east of Rouncey Road
- 31 driveways to residential townhouse dwellings west of Continental Avenue

Continental Avenue, East Side:
- 8 driveways to single detached residential dwellings south of the subject site

Continental Drive, West Side:
- 16 driveways to single detached residential dwellings south of the subject site

Rouncey Road, West Side:
- 5 driveways to single detached residential dwellings
- 8 driveways to residential townhouse dwellings

Rouncey Road, East Side:
- 26 driveways to residential townhouse dwellings

2.1.4 Existing Pedestrian and Cycling Facilities

A concrete sidewalk will be provided on the south side, and a multi-use pathway will be provided on the north side of Cope Drive. Concrete sidewalks will be provided on both sides of Rouncey Road and the east side of Continental Avenue.

Cope Drive is classified as a spine cycling route, and Rouncey Road is classified as a local cycling route in the City's Ultimate Cycling Network.

2.1.5 Existing Area Traffic Management

There are no Area Traffic Management (ATM) studies within the study area that have been completed or are currently in progress. There are no traffic calming measures in place along the study area roadways.

2.1.6 Existing Transit Facilities

OC Transpo bus stop #8493 is currently located along Cope Drive, west of Defence Street. This bus stop serves OC Transpo routes 167 and 252.

OC Transpo route 167 is a weekday local route that travels between the Terry Fox Transit Station and Cope Drive. OC Transpo route 252 is a weekday peak period route that travels between Mackenzie King Transit Station and Cope Drive.

OC Transpo maps for the routes outlined previously and a copy of the OC Transpo System Map are included in **Appendix C**.

2.1.7 Existing Traffic Volumes

As the study area intersections have not been constructed, existing traffic counts were not completed. Background traffic along the area roadways will be reviewed in Section 5.0 of the TIA Forecasting Report.

2.1.8 Existing Collision Records

As the study area intersections have not been constructed, a review of historical collisions within the last five years at the study area intersections has not been completed.

2.1.9 Planned Conditions

The City of Ottawa's 2013 Transportation Master Plan (TMP) identifies the widening of Fernbank Road between Stittsville Main Street and Terry Fox Drive, and the widening of Terry Fox Drive between Winchester Drive and Eagleson Road in its 2031 Network Concept.

The City's 2013 TMP identifies the extension of the west transitway between the Eagleson Transit Station and Fernbank Road in its Rapid Transit and Transit Priority Network – 2031 Network Concept. The West Transitway Connection Environmental Project Report was prepared by Delcan in January 2012. The West Transitway Extension will travel its own alignment between the Eagleson Transit Station and Hazeldean Road, where it will transition to median Bus Rapid Transit along Robert Grant Avenue, terminating at Fernbank Road. The extension will include new transit stations at Didsbury, Carp, Campeau, Canadian Tire Center, Maple Grove, Hazeldean (Park and Ride), Abbott (Park and Ride), and Fernbank (Park and Ride).

The Kanata Light Rail Transit (LRT) Planning and Environmental Assessment Study was prepared in January 2019. The Kanata LRT facility will extend LRT from the Moodie Transit Station (terminus of Stage 2 LRT) to the future Hazeldean Transit Station to be developed as part of the West Transitway Extension. New LRT stations will be developed at March, Kanata Town Centre, Didsbury, Campeau, Palladium (Canadian Tire Centre), Maple Grove, and Hazeldean.

Cope Drive between Defence Street and 125m west of Terry Fox Drive, Rouncey Road between Fernbank Road and 275m south of Groningen Street, and Continental Avenue adjacent to the subject site will be constructed as part of the surrounding subdivision. These roadways will have a two-lane urban cross section. An on-street lay-by will be constructed along the south side of Cope Drive adjacent to the subject site. OC Transpo bus stops will be provided on all approaches to the future Cope Drive/Rouncey Road roundabout.

In proximity of the proposed development, there are multiple other developments that are under construction, approved, or in the approval process. The other area developments included in this analysis are summarized below. An aerial photo showing the location of other area developments is provided in **Figure 3**.

Phases 1-3 of the Abbott-Fernbank subdivision are generally built-out. Construction of Phase 4 of the subdivision is currently ongoing and is anticipated to be built-out by 2021. The Abbott-Fernbank subdivision is located north of Fernbank Road, between Robert Grant Avenue and Phase 5 of the Blackstone subdivision. A TIA dated March 2019 was prepared by Novatech in support of Site Plan Control application for 360 Haliburton Heights within the Phase 3 of the Fernbank Crossing subdivision. The development consists of 58 residential units.

Phases 1-3 of the Blackstone subdivision, located north of the Monahan Drain between the Abbott-Fernbank subdivision and Terry Fox Drive, are generally built-out. A TIS dated May 2017 and Addendum dated February 2018 were prepared by Parsons in support of a Draft Plan of Subdivision application for 5505 Fernbank Road, also known as Blackstone Phases 4-8. The development consists of 219 townhouse units, 241 single detached dwelling units, a condominium block containing 156 units, an elementary school accommodating 650 students (the subject site), and a high school accommodating 1916 students. A subsequent TIA dated May 2019 was prepared by Parsons in support of a Site Plan Control application for the condominium block within the aforementioned subdivision.

A Transportation Letter dated January 2011 was prepared by IBI Group in support of Draft Plan of Subdivision applications for 5786 Fernbank Road, also known as the CRT Lands Phases 1-2. The development consists of 510 single family detached dwellings, 364 townhouses, an elementary school, and a high school. Construction of Phase 1 of the CRT Lands is currently ongoing. A TIA dated July 2019 was prepared Parsons in support of a Site Plan Control application for 700 Cope Drive, which forms part of the CRT lands. The proposed development consists of a High School (Grades 7-12) with a capacity of 1800 students.

A TIA dated September 2018 was prepared by Stantec in support of a Zoning By-law Amendment application for 5331 Fernbank Road. The development consists of 89,100ft^2 of commercial development.

A TIA dated March 2019 was prepared by Novatech in support of a Draft Plan of Subdivision application for 1039 Terry Fox Drive. The development consists of 129 townhouse units and 55 single detached dwelling units.

A TIA dated May 2019 was prepared by Novatech in support of Draft Plan of Subdivision and Zoning By-law Amendment applications for 866 Eagleson Road. The development consists of 47 single detached dwelling units, 227 townhouse units, and 120 back-to-back townhouse units.

A TIS dated July 2015 was prepared by Stantec in support of Zoning By-law Amendment and Site Plan Conrol applications for 80, 110, 140, 151, and 180 Cope Drive. The proposed development consists of 260 residential units.

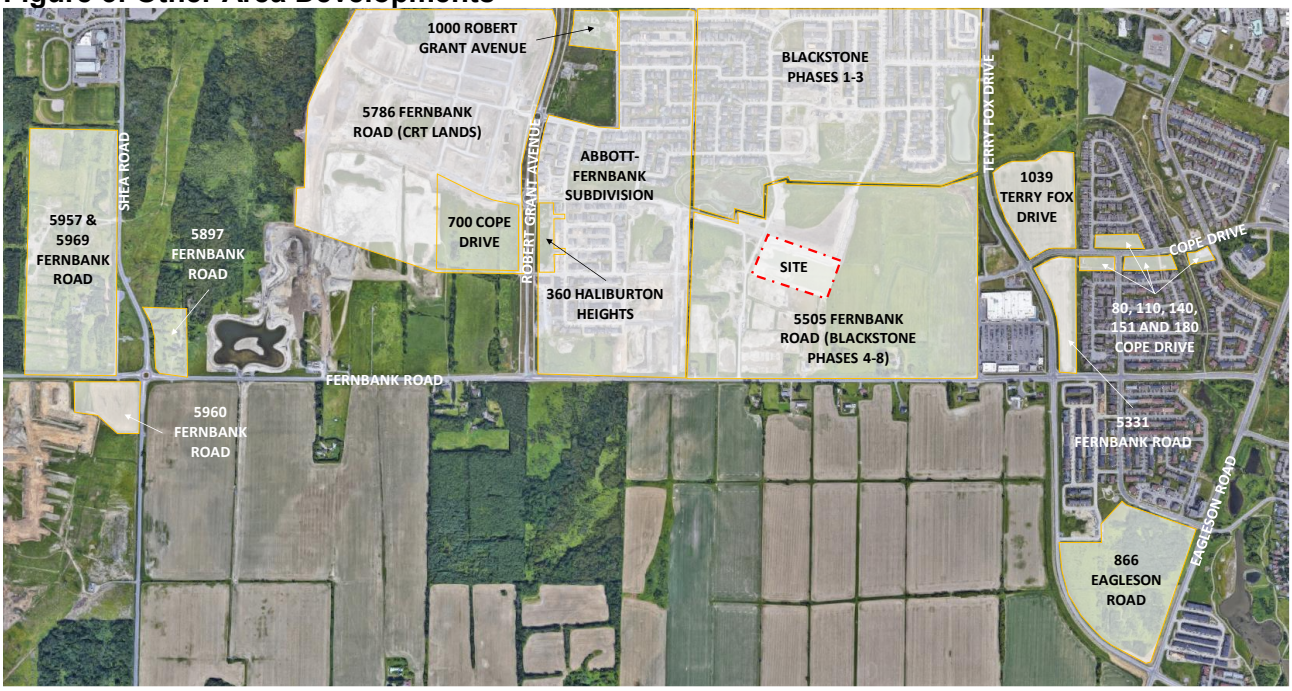
A TIA dated June 2019 was prepared by Parsons in support of a Zoning By-law Amendment application for 1000 Robert Grant Avenue. The proposed development consists of three residential towers with a total of 566 units.

A TIS dated February 2017 was prepared by Parsons in support of a Zoning By-law Amendment application for 5897 Fernbank Road. The development consists of 59,740ft^2 of retail and a 2,287ft^2 medical clinic.

A TIA dated May 2018 was prepared by Parsons in support of a Draft Plan of Subdivision application for 5957 and 5969 Fernbank Road. The development consists of 238 townhouse units and 119 single detached dwelling units.

A TIS dated March 2016 was prepared by Parsons in support of a Zoning By-law Amendment application for 5960 Fernbank Road. The development consists of a 40,000ft^2 supermarket, 19,250ft^2 of retail, and a 5,900ft^2 restaurant.

Figure 3: Other Area Developments



2.2 Study Area and Time Periods

The study area for this report includes the roundabout at Cope Drive/Rouncey Road and the unsignalized intersection of Fernbank Road/Rouncey Road.

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. The

proposed development will be constructed in one phase, and is anticipated to be open by the 2021 school year. However, as the development is only anticipated to be operational for a short period prior to build-out of the subdivision, and to maintain consistency with the 5505 Fernbank Road TIS, the intersection analysis will review the build-out condition of the surrounding subdivision.

2.3 Exemptions Review

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the TIA guidelines. The applicable exemptions for this site are shown in **Table 1**.

Table 1: TIA Exemptions

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

Access to the surface parking lot will be provided on Continental Avenue, a future local roadway within the Blackstone subdivision. Based on projections presented in Section 3.0, a total of 184 vehicles (98 northbound, 86 southbound) during the AM peak hour and 166 (63 northbound, 103 southbound) during the PM peak hour are anticipated along Continental Avenue south of Cope Drive. These traffic volumes exceed the Area Traffic Management (ATM) threshold of 120 vehicles per hour identified in the TIA guideline. However, the traffic volumes are well within the lane capacity of 400 vehicles per hour per lane for a local roadway based on the City's Long-Range Transportation Model.

As the design for the roadways surrounding the site were recently approved, and the future traffic volumes are anticipated to be within capacity thresholds for a local roadway, Module 4.6 – Neighbourhood Traffic Management has not been reviewed in this report.

As the proposed elementary school conforms to the established zoning for this site, Module 4.8 – Network Concept is exempt from the analysis.

Trips generated by the proposed elementary school were included in the analysis presented in the Blackstone Phases 4-8 TIS. As this analysis was completed within the last five years, it is considered an accurate representation of intersection operations following the proposed development. Based on the foregoing, Module 4.9 – Intersection Design will provide a review of the intersection analysis presented in the Blackstone Phases 4-8 TIS.

Based on the foregoing, the following modules will be included in the TIA report:

- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.4: Access Design
- Module 4.5: Transportation Demand Management
- Module 4.7: Transit
- Module 4.9: Intersection Design

3.0 FORECASTING

3.1 Development-Generated Travel Demand

3.1.1 Trip Generation

The proposed elementary school will have a capacity for 650 students. Based on discussions with the Ottawa-Carleton District School Board (OCDSB), approximately 50% of the overall students (325 students) are anticipated to be bussed to school, 25% (160 students) are anticipated to be driven to school, and 25% (160 students) are anticipated to walk/bike to school.

Vehicular trips generated by the proposed elementary school were included in the trip generation presented in the Blackstone Phases 4-8 TIS. To maintain consistency with the TIS, vehicular trips generated by the proposed elementary school have been estimated using rates for the Elementary School (Land Use Code 520) in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. Trip generation using the ITE rates have been converted to person trips using a factor of 1.3, consistent with the Blackstone Phases 4-8 TIS. Person trips generated by the proposed elementary school are summarized in the following table.

Table 2: Person Trip Generation

Land Use	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Elementary School	210	171	381	62	65	127

The Blackstone Phases 4-8 TIS assumed that 60% of all person trips generated using the ITE rates would be vehicle trips. For consistency, this assumption has been carried forward for the proposed development. Based on the foregoing, the proposed elementary school is anticipated to generate 229 vehicle trips (126 in, 103 out) during the AM peak hour and 77 vehicle trips (38 in, 39 out) during the PM peak hour.

3.1.2 Trip Distribution

Trips generated by the proposed elementary school were included in the Blackstone Phases 4-8 TIS. This report distributed traffic generated by the development to the study area intersections as follows:

- 40% to/from the north
- 10% to/from the south
- 40% to/from the east
- 10% to/from the west

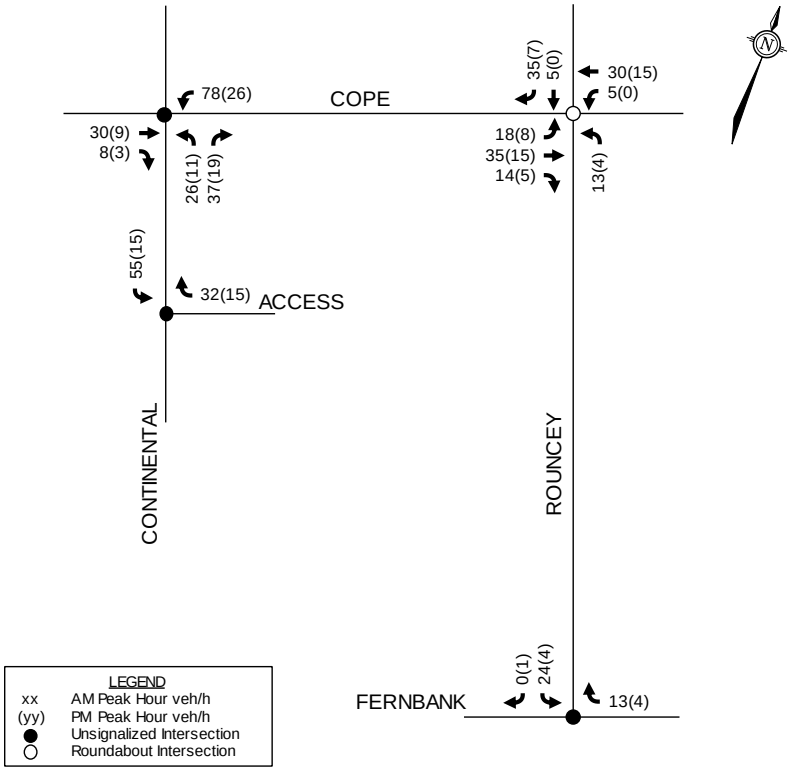
Relevant excerpts from the Blackstone Phases 4-8 TIS, including site generated traffic volumes for the entire subdivision, are provided in **Appendix D**.

Trips generated by the proposed elementary school have been assigned to the proposed site accesses as follows:

- 75% of all vehicle trips arriving from the west via Cope Drive are assumed to use the on-street lay-by along Cope Drive.
- 50% of the all vehicle trips arriving from the east via Cope Drive and Fernbank Road, and from the north via Rouncey Road are anticipated to use on-street lay-bys along Continental Avenue.
- All remaining vehicle trips are anticipated to access the site using the Continental Avenue driveway.

Vehicle trips generated by the proposed development are shown in **Figure 4**.

Figure 4: Site Generated Traffic



3.2 Background Network Travel Demand

3.2.1 Transportation Network Plans

As identified in Section 2.1.9, the City of Ottawa's 2013 Transportation Master Plan (TMP) identifies the following roadway and transit projects in the vicinity of the subject site.

- widening of Fernbank Road between Stittsville Main Street and Terry Fox Drive (2031 Network Concept);
- widening of Terry Fox Drive between Winchester Drive and Eagleson Road (2031 Network Concept); and
- extension of the west transitway between the Eagleson Transit Station and Fernbank Road (2031 Network Concept).

The Kanata Light Rail Transit Planning and Environmental Assessment Study was prepared in January 2019. The Kanata LRT facility will extend LRT from the Moodie Transit Station (terminus of Stage 2 LRT) to the future Hazeldean Transit Station to be developed as part of the West Transitway Extension.

Cope Drive between Defence Street and 125m west of Terry Fox Drive, Rouncey Road between Fernbank Road and 275m south of Groningen Street, and Continental Avenue adjacent to the subject site will be constructed as part of the surrounding subdivision. Background traffic at the study area intersections are anticipated to be generally consistent with the projections in the Blackstone Phases 4-8 TIS, which assumed the aforementioned roadway connections to be constructed.

3.2.2 Background Growth

Background traffic at the study area intersections is anticipated to be generally consistent with the traffic projections presented in the Blackstone Phases 4-8 TIS. The background traffic projections in the Blackstone Phases 4-8 TIS applied a compound annual background growth rate of 2% to the existing traffic volumes along Fernbank Road.

3.2.3 Other Developments

Other area developments in the vicinity of the subject site were reviewed in Section 2.1.3, and are summarized as follows:

- Abbott-Fernbank Subdivision/360 Haliburton Heights
- Blackstone Subdivision
- CRT Lands – Phase 1-2/700 Cope Drive
- 5331 Fernbank Road
- 1039 Terry Fox Drive
- 866 Eagleson Road
- 80, 110, 140, 151, and 180 Cope Drive
- 1000 Robert Grant Avenue
- 5897 Fernbank Road
- 5957 and 5969 Fernbank Road
- 5960 Fernbank Road

Background traffic at the study area intersections is anticipated to be generally consistent with the traffic projections presented in the Blackstone Phases 4-8 TIS. The background traffic projections in the Blackstone Phases 4-8 TIS accounted for the other area developments in the vicinity of the subject site at the time of writing.

Total traffic projections for the Fernbank Road/Rouncey Road and Cope Drive/Rouncey Road intersection presented in the Blackstone Phases 4-8 TIS include trips generated by the proposed elementary school. As such, the total traffic projections presented in the TIS have been carried forward for the purposes of this report. Total traffic volumes at the Cope Drive/Continental Avenue intersection have been derived from the total traffic projections presented in the TIS for the adjacent intersections and the overall lay-out of the subdivision.

Relevant excerpts from the Blackstone Phases 4-8 TIS are included in **Appendix D**. For the purposes of this report, total traffic projections for the 2025 build-out year and 2030 horizon year of the overall Blackstone Phases 4-8 subdivision are summarized in **Figures 5** to **6**.

Figure 5: 2025 Total Traffic

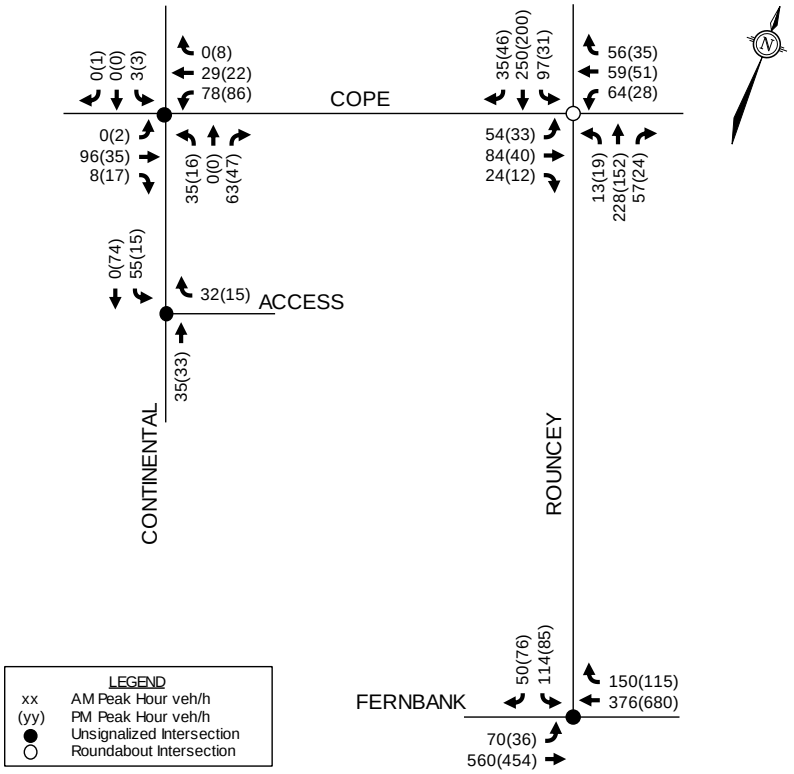
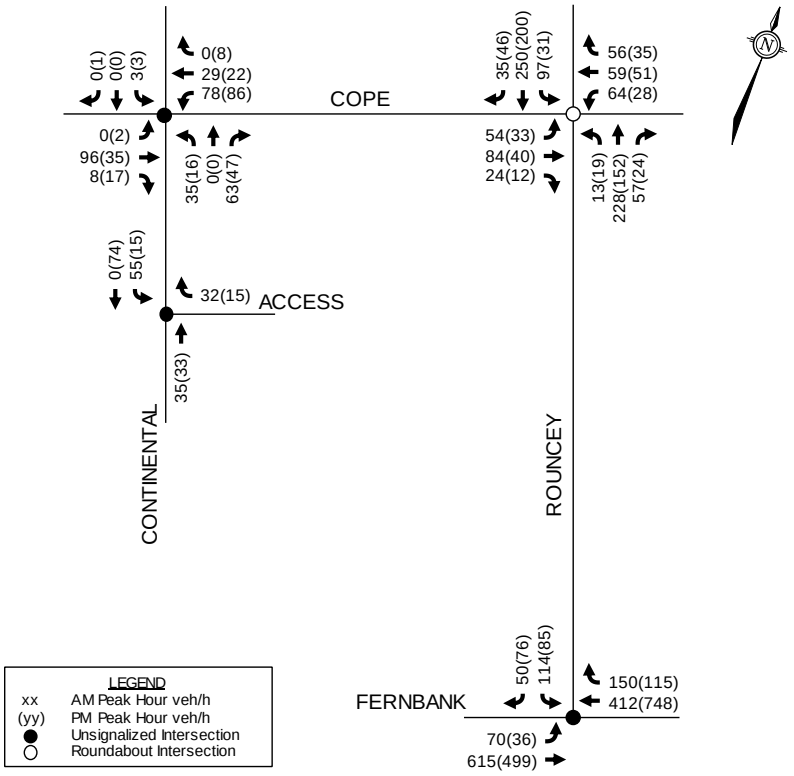


Figure 6: 2030 Total Traffic



3.3 Demand Rationalization

Based on the projected traffic volumes, capacity deficiencies are not anticipated at the study area intersections.

4.0 ANALYSIS

4.1 Development Design

Pedestrian facilities will be provided between the main building entrances and the sidewalks along Cope Drive, Rouncey Road, and Continental Avenue. Bicycle parking for the proposed development will be located in the southeast corner of the proposed surface parking lot. A day care drop-off zone will also be provided in the southeast corner of the proposed surface parking lot. One loading space will be provided near the southwest corner of the building. Garbage collection will be conducted at the southern limits of the surface parking lot.

The sites frontage along Rouncey Road is insufficient to accommodate a single bus lay-by for the anticipated number of buses. As such, a double wide on-site bus loop is proposed with ingress/egress along Rouncey Road. The proposed bus loop will have a width of 7.5m and a parallel length of approximately 50m. The width of the bus loop allows for two rows of buses to queue within the site and wait for students to load. Once all students are loaded onto the buses, the buses will leave one at a time. A 2.5m sidewalk will be provided along the proposed bus loop, connecting the bus loop to a gate to enter the playground.

OC Transpo bus stop #8493 is currently located along Cope Drive, west of Defence Street. This bus stop serves OC Transpo routes 167 and 252. New OC Transpo bus stops will be provided on all approaches to the future Cope Drive/Rouncey Road roundabout.

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

4.2 Parking

The subject site is located in Area C of Schedule 1 and 1A of the City's Zoning By-law. Minimum vehicular parking, bicycle parking, and loading space rates for the proposed development are identified in the City's Zoning By-law and are summarized in the following table.

Table 3: Parking Requirements

Land Use	Rate	Classrooms or GFA	Required		Provided
Vehicle Spaces					
Elementary School	1.5 Spaces per Classroom	30 Classrooms + 12 Future Portables	63	71 Total	114
Day Care	2 per 100m^2 of GFA	400m^2	8		

Land Use	Rate	Classrooms or GFA	Required	Provided
Bicycle Spaces				
Elementary School	1 Space per 100m^2 of GFA	4,441m^2	45	56
Loading Spaces				
Elementary School	1 Space per 2,000m^2 – 4,999m^2 of GFA	4,441m^2	1	1

The proposed vehicle parking, bicycle parking, and loading spaces conform to the requirements of the City's Zoning By-law.

4.3 Boundary Streets

All boundary roadways within the surrounding subdivision were recently approved and are currently under construction. A review of the proposed developments impact on the approved design for the boundary roadways is provided below.

Cope Drive

- 10.3m road platform containing a 2.3m parking bay on the south side of the roadway, a 4.0m eastbound travel lane and a 3.8m westbound travel lane
- 3.0m multi-use pathway and 3.1m boulevard on the north side of the roadway
- 2.0m concrete sidewalk and 3.1m boulevard on the south side of the roadway

No changes to the design of Cope Drive are proposed as part of this development. No driveways to the subject site are proposed along Cope Drive.

Rouncey Road

- 11.0m road platform containing two travel lanes
- 2.0m sidewalk and 2.0m boulevard on both sides of the roadway

The northern ingress to the proposed bus loop will conflict with the multi-use pathway transition to the on-road cycling facility/concrete sidewalk in the southwest corner of the Cope Drive/Rouncey Road roundabout. It is proposed that the multi-use pathway extend to south of the bus loop egress where it will transition to an on-road cycling facility/concrete sidewalk. This modification is not anticipated to impact the pedestrian or cycling level of service along Rouncey Road.

Continental Avenue

- 8.5m road platform containing two travel lanes
- 1.8m concrete sidewalk on the east side of the roadway

Two on-street lay-bys are proposed along Continental Avenue, north and south of the proposed surface parking lot access. The proposed on-street lay-bys will be used for parent pick-up and drop-off activity. Both lay-bys will have a width of 3.25m and a parallel length of approximately 35m. The 1.8m wide curbside sidewalk along Continental Avenue is proposed to veer to the back of the proposed on-street lay-bys. A functional design of the proposed on-street lay-bys is provided in **Appendix F**. A Roadway Modification Approval (RMA) document will be submitted to the City under a separate cover.

The proposed on-street lay-bys are not anticipated to impact the pedestrian or bicycle level of service along Continental Avenue. However, the on-street lay-bys will prohibit on-street parking on the east side of Continental Avenue adjacent to the subject site.

4.4 Access Intersections Design

Section 25 (c) of the City of Ottawa's Private Approach By-law identifies that no private approach intended for two-way vehicular traffic shall exceed 9m in width at the street line. Section 25 (d) of the City's Private Approach By-law identifies that no private approach intended for one-way traffic shall exceed 7.5m in width at the street line. Section 107 (1)(a) of the City's Zoning By-law identifies a driveway serving a parking lot must have a minimum width of 6.7m for a double traffic lane.

Section 25 (l) of the City's Private Approach By-law identifies where a driveway leading to 100 to 199 parking spaces on a property that abuts or is within 46m of an arterial or major collector roadway, a minimum distance of 30m is required between the driveway and the nearest intersecting street line. Section 25 (o) of the City's Private Approach By-law identifies that no private approach shall be constructed within 3m of any property line.

Access to the surface parking lot is proposed through a two-way driveway on Continental Avenue, opposite Brittanic Road. This driveway will operate under side street stop control with free flow conditions along Continental Avenue. The curbside sidewalk will be depressed and continuous across the proposed access, per City of Ottawa Specification SC7.1.

The proposed Continental Avenue access will be 7m in width and will be located approximately 80m from the southern property line and 70m from the Cope Drive Right-of-Way (ROW) limit. The width and location of this access conforms to the requirements of the City's Zoning By-law and Private Approach By-law.

Access to the bus loop is proposed through two one-way driveways along Rouncey Road. The northern driveway will be the ingress, while the southern driveway will be the egress to the proposed bus loop. Both the ingress and egress will intersect Rouncey Road at an acute angle of 70 degrees and will have a width of 7.5m, measured at the street line. The northern ingress will be located 36m from the Cope Drive ROW limit, while the southern egress will be located 8m from the southern property line. The ingress and egress will be located 60m apart, measured from curb to curb. The width, location, and angle of the proposed bus loop ingress and egress adhere to the requirements of the City's Private Approach By-law.

4.5 Transportation Demand Management

The proposed elementary school conforms to the City's TDM initiatives by providing easy access to area pedestrian, cycling, and transit facilities. In addition, the OCDSB provides bus transportation for all students who reside within the following distances from the school.

- Junior and Senior Kindergarten – 0.8km or more from their school
- Grades 1 through 8 – 1.6km or more from their school

The Ottawa Student Transportation Authority (OSTA) offers a walking school bus program for children who walk to school. The walking school bus program is designed to promote active transportation and healthy living. Students walk to school with a group of up to ten peers and a

professional leader, following a specific route and schedule. As the student population of the school increases, consideration could be given by the OCDSB and OSTA to providing a walking school bus program for this elementary school.

4.6 Neighbourhood Traffic Management

Access to the surface parking lot will be provided on Continental Avenue, a future local roadway within the Blackstone subdivision. However, as discussed in Section 2.3 above, the Neighbourhood Traffic Management module is exempt from the analysis.

4.7 Transit

As described in Section 5.1, students of the school are anticipated to take the school bus, bike/walk, or get driven to school by their parents. Some school staff may take public transit to the school. However, the overall number of transit trips generated by the school are anticipated to be minimal. As such, the proposed elementary school is not anticipated to have a significant impact on the planned transit facilities in this area.

4.8 Network Concept

As the proposed elementary school conforms to the established zoning for this site, the Network Concept module is exempt from the analysis.

4.9 Network Intersections

The Multi-Modal Level of Service (MMLOS) guidelines produced by IBI Group in October 2015 provide the methodology to evaluate the LOS of signalized intersections for each mode of transportation. However, the MMLOS guidelines are not to be used to evaluate the LOS of unsignalized (stop control or roundabout) intersections. As none of the study area intersections will be signalized, intersection MMLOS is not required.

Trips generated by the proposed elementary school were included in the analysis presented in the Blackstone Phases 4-8 TIS. As the intersection analysis in the TIS was completed within the last five years, it is considered an accurate representation of intersection operations following the proposed development. A summary of the future intersection operations, based on the analysis presented in the Blackstone Phases 4-8 TIS, is provided below. Relevant excerpts from the Blackstone Phases 4-8 TIS are included in **Appendix G**.

Fernbank Road/Rouncey Road

- Under the 2025 total traffic conditions, the southbound approach to this intersection is anticipated to operate with a LOS E during both the AM and PM peak hours.
- Under the 2030 total traffic conditions the southbound approach to this intersection is anticipated to operate with a LOS F during both the AM and PM peak hours.
- Traffic signalization warrants using Ontario Traffic Manual (OTM) Book 12 identify traffic signal controls are not warranted at this intersection under the 2030 total traffic conditions.
- An eastbound left turn lane and westbound right turn lane are warranted, and will be constructed at this intersection.

Cope Drive/Rouncey Road

- Under both the 2025 and 2030 total traffic conditions, critical movements at this intersection are anticipated to operate with a LOS A during both the AM and PM peak hours.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing, the conclusions and recommendations of this TIA can be summarized as follows:

Development Design and Parking

- Pedestrian facilities will be provided between the main building entrances and the sidewalks along Cope Drive, Rouncey Road, and Continental Avenue. A 2.5m sidewalk will be provided along the proposed bus loop, connecting to a gate to enter the playground.
- Garbage collection will be conducted at the southern limits of the surface parking lot.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicle parking, bicycle parking, and loading spaces conform to the requirements of the City's Zoning By-law.

Boundary Streets

- No changes to the design of Cope Drive are proposed as part of this development. No driveways to the subject site are proposed along Cope Drive.
- It is proposed that the multi-use pathway from the Cope Drive/Rouncey Road roundabout extend to south of the bus loop egress where it will transition to an on-road cycling facility/concrete sidewalk. This modification is not anticipated to impact the pedestrian or cycling level of service along Rouncey Road.
- Two on-street lay-bys are proposed along Continental Avenue, north and south of the proposed surface parking lot access. The proposed on-street lay-bys will be used for parent pick-up and drop-off activity.
- The proposed on-street lay-bys are not anticipated to impact the pedestrian or bicycle level of service along Continental Avenue. However, the on-street lay-bys will prohibit on-street parking on the east side of Continental Avenue adjacent to the subject site.

Access Design

- The width and location of the surface parking lot access on Continental Avenue conform to the requirements of the City's Zoning By-law and Private Approach By-law.
- The width, location, and angle of the proposed bus loop ingress and egress on Rouncey Road adhere to the requirements of the City's Private Approach By-law.

Transportation Demand Management

- The proposed elementary school conforms to the City's TDM initiatives by providing easy access to area pedestrian, cycling and transit facilities. In addition, the OCDSB provides bus transportation for students who live a certain distance a way from the school.
- As the student population of the school increases, consideration could be given by the OCDSB and OSTA to providing a walking school bus program for this elementary school.

Transit

- Students of the school are anticipated to take the school bus, bike/walk, or get driven to school by their parents.
- Some teachers or staff may take public transit to the school. However, the overall number of transit trips generated by the school are anticipated to be minimal.
- The proposed elementary school is not anticipated to have a significant impact on the transit facilities planned for the area.

Intersection MMLOS

- As none of the study area intersections will be signalized, the intersection MMLOS is not required.
- Trips generated by the proposed elementary school were included in the analysis presented in the Blackstone Phases 4-8 TIS. As the intersection analysis in the TIS was completed within the last five years, it is considered an accurate representation of intersection operations following the proposed development. A summary of the future intersection operations, based on the analysis presented in the Blackstone Phases 4-8 TIS, is provided below.

  Fernbank Road/Rouncey Road
  - Under the 2025 total traffic conditions, the southbound approach to this intersection is anticipated to operate with a LOS E during both the AM and PM peak hours.
  - Under the 2030 total traffic conditions the southbound approach to this intersection is anticipated to operate with a LOS F during both the AM and PM peak hours.
  - Traffic signalization warrants using Ontario Traffic Manual (OTM) Book 12 identify traffic signal controls are not warranted at this intersection under the 2030 total traffic conditions.
  - An eastbound left turn lane and westbound right turn lane are warranted at this intersection.

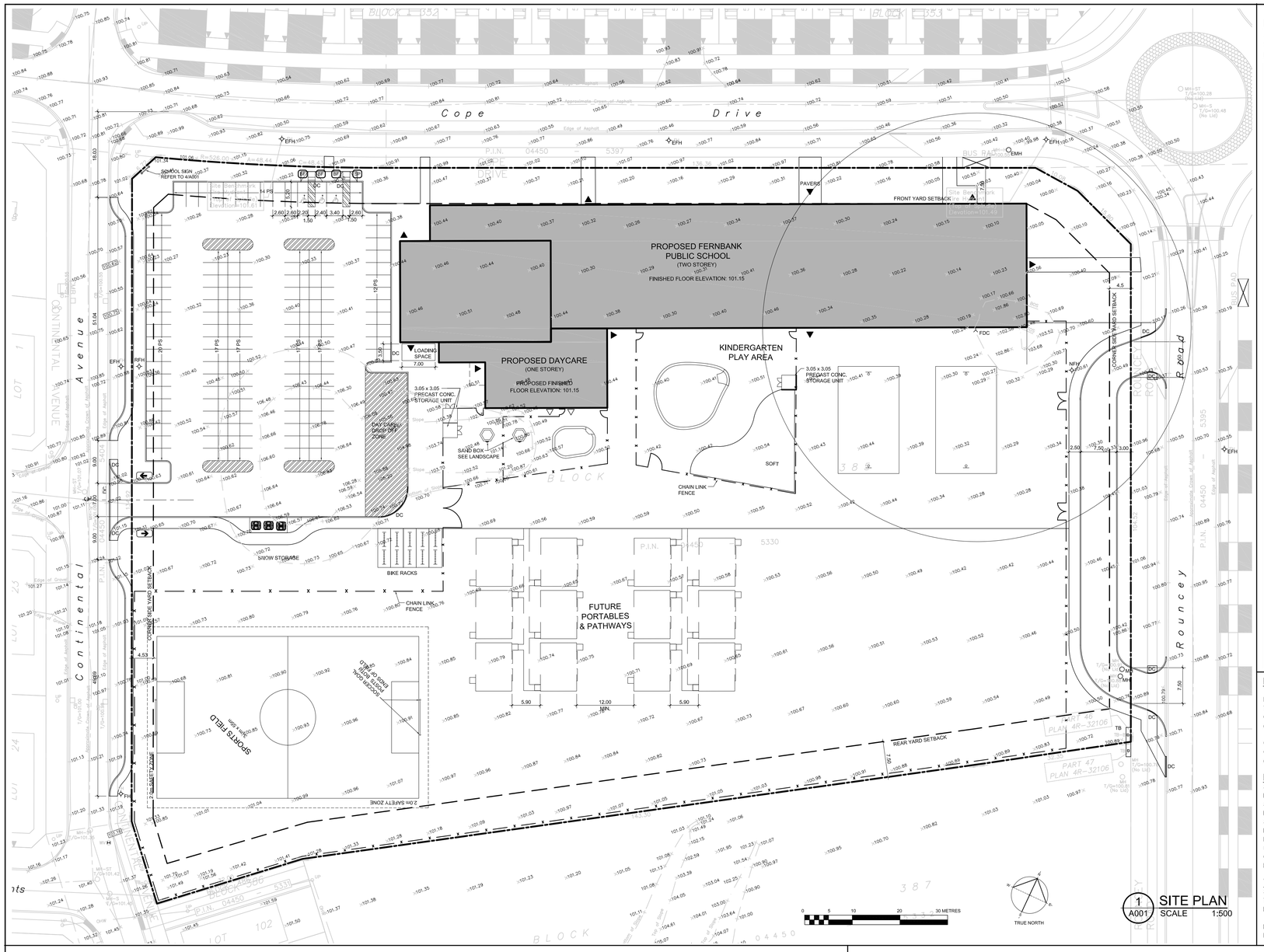
  Cope Drive/Rouncey Road
  - Under both the 2025 and 2030 total traffic conditions, critical movements at this intersection are anticipated to operate with a LOS A during both the AM and PM peak hours.

NOVATECH
Prepared by:

Brad Byvelds, P. Eng.
Project Coordinator | Transportation/Traffic

APPENDIX A

Proposed Site Plan



1 SITE PLAN
A001 SCALE 1:500

FERNBANK PUBLIC SCHOOL
ZONING INFORMATION

NOTE: ALL ZONING DEFINITIONS AND REQUIREMENTS AS PER CITY OF OTTAWA ZONING BY-LAW 2008-250

ZONING MECHANISM	REQUIRED	PROVIDED
DEFINITION	I1A MINOR INSTITUTIONAL ZONE	SCHOOL, DAY CARE
MIN.LOT WIDTH	15.0 m	136.36 m
MIN. LOT AREA	400 m²	28,365 m² (± 7 Acres)
MIN. FRONT YARD SETBACK	7.5 m	7.5 m
MIN. REAR YARD SETBACK	7.5 m	66 m
MIN. INTERIOR SIDE YARD SETBACK	7.5 m	n/a
MIN. CORNER SIDE YARD SETBACK	4.5 m	5 m
MAX. BUILDING HEIGHT	15.0 m	8.5 m
MAX. FLOOR SPACE INDEX	1.0	0.15
MIN. WIDTH OF LANDSCAPED AREA	ABUTTING A STREET = 3m	> 3 m
PARKING LANDSCAPE BUFFER	FOR A PARKING LOT CONTAINING 11-99 SPACES: ABUTTING A STREET = 3 m NOT ABUTTING A STREET = 1.5 m	ABUTTING A STREET > 3 m NOT ABUTTING A STREET > 1.5 m
PRIVATE APPROACH PROVISIONS: DISTANCE BETWEEN A TWO WAY PRIVATE APPROACH AND ANY OTHER PRIVATE APPROACH	15.0 m, AS PER OTTAWA BY-LAW 2003-447, ITEM (i)(ii), FOR A PARKING LOT CONTAINING 20-99 SPACES	XX.X m
STANDARD PARKING SPACE	2.6m WIDTH x 5.2m LENGTH	2.6m WIDTH x 5.2m LENGTH
PARALLEL PARKING SPACE	2.6m WIDTH x 6.7m LENGTH	2.6m WIDTH x 6.7m LENGTH
ACCESSIBLE PARKING SPACE	3.66m WIDTH x 5.2m LENGTH	3.66m WIDTH x 5.2m LENGTH
PARKING REQUIREMENTS	ELEMENTARY SCHOOL- 1.5 PARKING SPACES/CLASSROOM AS FOLLOWS: 22 CLASSROOMS x 1.5 = 33 SPACES 8 KINDERGARTEN x 1.5 = 12 SPACES 12 FUTURE PORTABLES = 18 SPACES DAYCARE 2/100 sqm = 8 SPACES TOTAL REQ'D = 71 PARKING SPACES	114 PARKING SPACES
BARRIER FREE ACCESSIBLE	AS PER OTTAWA TRAFFIC & PARKING BY-LAW 2003-530, PART "C", ITEM 122 (1), FOR A PARKING AREA WITH A CAPACITY OF 20-99 SPACES, 1 BARRIER FREE ACCESSIBLE SPACE IS REQ'D	3 ACCESSIBLE PARKING SPACES
LOADING SPACES	1 per 2,000 m² - 4,999 m² of G.F.A.	4,441 m² G.F.A. = 1 SPACE
BICYCLE PARKING RATE	1 per 100m² of G.F.A. 4,441 m²/ 100m² = 45 BICYCLE SPACES	56 BICYCLE SPACES
MAX. NUMBER OF PRIVATE APPROACH ALLOWED:	AS PER OTTAWA USE OF PRIVATE APPROACHES BY-LAW 2003-447, ITEM 25 (a)(iv), ONE TWO-WAY APPROACH AND TWO ONE-WAY APPROACH OR TWO TWO-WAY APPROACHES ARE PERMITTED.	1 - TWO-WAY APPROACH 1 - ONE-WAY APPROACH BUS LAY-BY LANE
MIN DISTANCE BETWEEN THE PRIVATE APPROACH & ROADWAY AND OTHER PRIVATE APPROACHES:	AS PER OTTAWA USE OF PRIVATE APPROACHES BY-LAW 2003-447, ITEM 25 (i)(ii), REQUIRED 18m CLEARANCE BETWEEN A PRIVATE APPROACH AND THE INTERSECTION. REQUIRED 15m CLEARANCE BETWEEN PRIVATE APPROACHES.	

PROJECT INFORMATION:

BUILDING CLASSIFICATION:
THE BUILDING IS CLASIFIED AND DESIGN TO CONFORM TO THE ONTARIO BUILDING CODE 2012 (CURRENT EDITION) PART 3

OCCUPANCY:
GROUP A, DIVISION 2, SPRINKLERED, TWO STOREY (3.2.2.24)

BUILDING STATISTICS:

SCHOOL AREA (FOOTPRINT):	3529 sq.m.
DAY CARE AREA (FOOTPRINT):	363 sq.m.
SCHOOL ZONING GFA:	4174 sq.m.
DAY CARE ZONING GFA:	267 sq.m.
SCHOOL NUMBER OF STOREYS:	2
DAY CARE NUMBER OF STOREYS:	1
BUILDING SPRINKLERED:	YES
# OF STREET ACCESS ROUTES:	1
CONSTRUCTION TYPE:	NON-COMB.
FLOOR ASSEMBLY & F.R.R.:	1 HOUR

TOPOGRAPHICAL PLAN INFORMATION:
SURVEY PROPERTY BOUNDARIES TAKEN FROM TOPOGRAPHICAL PLAN OF BLOCK 385, REGISTERED PLAN 4M-1637, CITY OF OTTAWA

PREPARED BY FARLE Y, SMITH & DENIS SURVEYING LTD, SEPTEMBER 3, 2019

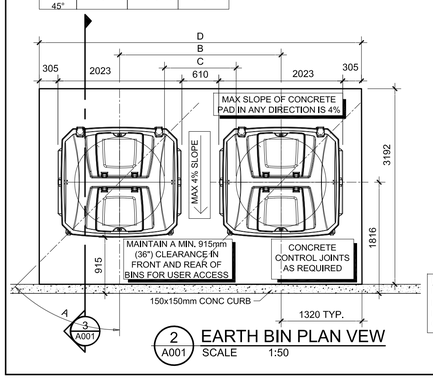
SPECIFIC CONSTRUCTION NOTES:

1 CHAIN LINK GAS METER ENCLOSURE:
- PERPENDICULAR AND AT RIGHT ANGLES TO BUILDING
- 915 DEEP x 3660 LONG x 2135 HIGH
- TOP: CHAIN LINK FENCE INSTALLED ACROSS THE TOP
- FENCE FABRIC; 6 GAUGE, VINYL COATED, BLACK
- LOCKING DOUBLE GATES @ 1220 WIDE EACH
- LOCKING DEVICE; ENBRIDGE TO SUPPLY MASTER X2268 LOCK UPON COMPLETION
- FENCE POSTS - 100mm, SCHEDULE 80, IN CONCRETE

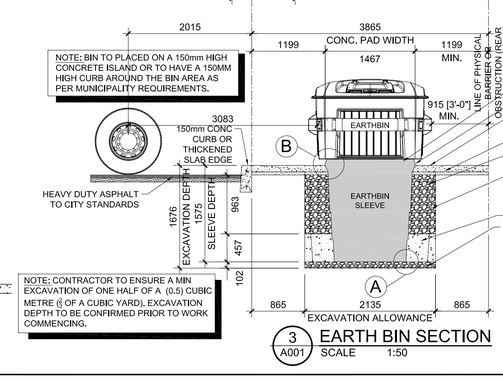
2 PROVIDE PERIMETER FOUNDATION DRAINAGE; 100 TO 150mm Ø, GEOTEXTILE-WRAPPED, PERFORATED, CORRUGATED, PLASTIC PIPE SURROUNDED ON ALL SIDES BY 150mm OF 10mm CLEAR CRUSHED STONE. PLACE AT THE FOOTING LEVEL AROUND THE EXTERIOR OF THE STRUCTURE. THE PIPE TO HAVE A POSITIVE GRAVITY CONNECTION TO THE STORM SEWER OUTLET, SEE CIVIL.

MINIMUM DIMENSIONS BETWEEN BINS

A	B	C	D
0°	2640 [104"]	1170 [46"]	5485 [216"]
15°	2745 [108"]	1270 [50"]	5790 [228"]
30°	3050 [120"]	1575 [62"]	6170 [243"]
45°	3860 [152"]	2390 [94"]	6425 [253"]



2 EARTH BIN PLAN VEW
A001 SCALE 1:50



NOTE: BIN TO PLACED ON A 150mm HIGH CONCRETE ISLAND OR TO HAVE A 150MM HIGH CURB AROUND THE BIN AREA AS PER MUNICIPALITY REQUIREMENTS.

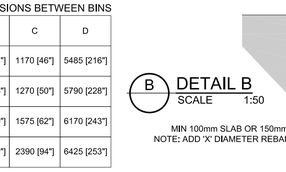
NOTE: CONTRACTOR TO ENSURE A MIN EXCAVATION OF ONE HALF OF A (0.5) CUBIC METRE (½ OF A CUBIC YARD), EXCAVATION DEPTH TO BE CONFIRMED PRIOR TO WORK COMMENCING.

NOTE:CONTRACTOR TO ENSURE ADEQUATE SPACE TO PHYSICAL BARRIER OR OBSTRUCTION TO ALLOW BIN TO BE PICKED UP.

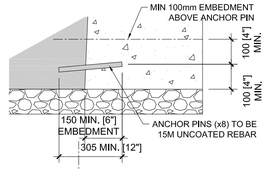
- GROUND SLEEVE
- EXPANSION JOINT
- CONCRETE PAD 2-4% GRADED SLOPE AWAY FROM SLEEVE
- HEAVY DUTY CONCRETE PAD
- 3/4" GRAVEL BACK FILL, SEE INSTALLATION GUIDE
- LANDSCAPE OR GEO-TEXTILE FABRIC TO LINE PIT TO PREVENT CONTAMINANTS FROM ENTERING BACKFILL, SEE INSTALLATION GUIDE
- CONCRETE
- 3/4" GRAVEL BACK FILL OR COMPACTED SAND BASE, SEE INSTALLATION GUIDE

ANCHOR PIN NOTE:
PLACE ANCHOR PINS (X8) IN HOLES AROUND GROUND SLEEVE PRIOR TO POURING CONCRETE. ENSURE THERE IS A MIN 150mm EMBEDMENT FOR ANCHOR PINS. ANCHOR PINS ARE TO HAVE A MIN 100mm OF COVERAGE ABOVE AND BELOW.

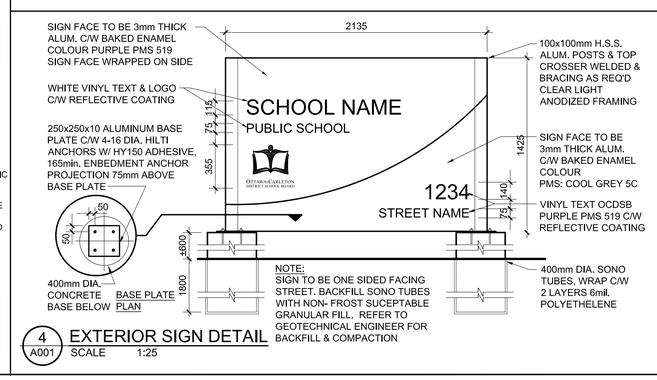
3 EARTH BIN SECTION
A001 SCALE 1:50



B DETAIL B
SCALE 1:50



A DETAIL A
SCALE 1:50



4 EXTERIOR SIGN DETAIL
A001 SCALE 1:25

SIGNAGE LEGEND:

- NO TRESPASSING
- FR FIRE ROUTE
- BF BF PARKING
- ONE WAY
- D DROP OFF ONLY/NO PARKING
- VP VISITOR PARKING
- SP STAFF PARKING
- TP TEMPORARY PARKING

SYMBOL LEGEND:

EXHYD	EXISTING FIRE HYDRANT
FP	FLAG POLE
EXLS	EXISTING LIGHT STANDARD
R-EXLS	RELOCATED EXISTING LIGHT STANDARD
LS	LIGHT STANDARD - SEE ELECTRICAL
EXCB	EXISTING CATCH BASIN
CB	CATCH BASIN - SEE CIVIL
CBMH	CATCH BASIN/MANHOLE - SEE CIVIL
SAMH	SANITARY MANHOLE - SEE CIVIL
STMH	STORM MANHOLE - SEE CIVIL
DI	DITCH INLET - SEE CIVIL
	BUILDING ENTRANCE/EXIT
DC	NEW DEPRESSED CURB - SEE LANDSCAPE
	NEW CURB
	PROPERTY LINE
	NEW CHAIN LINK FENCE

OTTAWA - CARLETON DISTRICT SCHOOL BOARD

APPROVED ☐ REFUSED ☐

DATE _____

_____, Manager Development
Review, Suburban Services

no.	revision	date
01	ISSUED FOR SITE PLAN	25NOV19

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario, K1P 5N2
tel. 613.224.0095 fax 613.224.9811

FERNBANK ELEMENTARY SCHOOL
OTTAWA-CARLETON DISTRICT SCHOOL BOARD

COPE DRIVE
OTTAWA, ONTARIO
K2S 1B6

seal
ONTARIO ASSOCIATION of ARCHITECTS
VLADIMIR POPOVIC
LICENCE 5918

drawing title
SITE PLAN

scale	drawn by
AS NOTED	VP
date	checked by
01AUG19	VP
project number	drawing number
19-467	A001

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.

DO NOT SCALE DRAWINGS

revision

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	**Fernbank Elementary School (OCDSB)**
Description of Location	**Southwest corner of Cope Drive/Rouncey Road**
Land Use Classification	**Elementary School**
Development Size (units)	**Approximately 650 Students** **30 Classrooms and 12 Future Portables**
Development Size (m^2)	**4,441m^2**
Number of Accesses and Locations	**One all movement access on Continental Avenue** **Two one-way accesses on Cope Drive** **On-Street lay-bys on all frontages**
Phase of Development	**One**
Buildout Year	**2020**

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

2. Trip Generation Trigger

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

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

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

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

3. Location Triggers

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

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

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

4. Safety Triggers

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

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

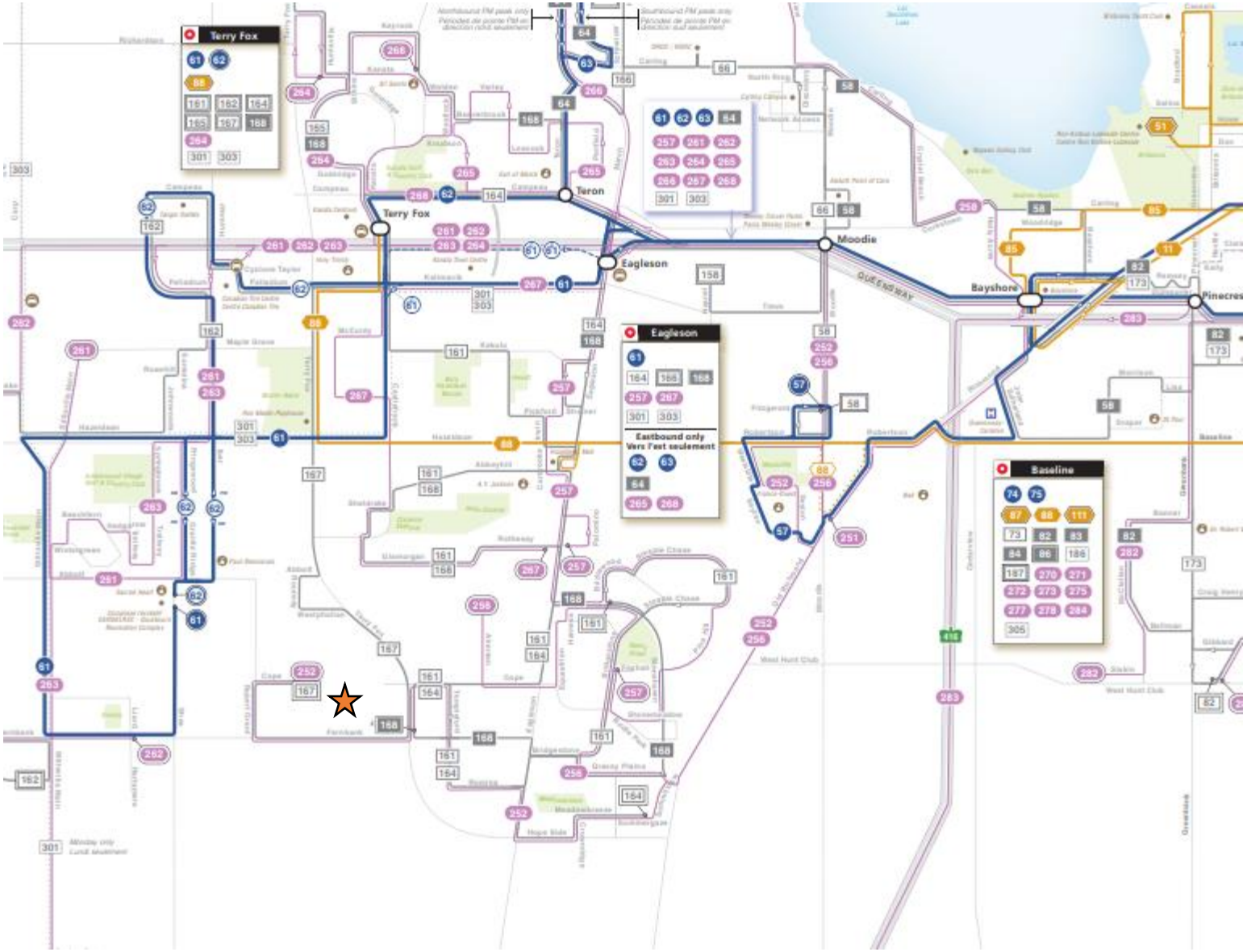
5. Summary

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

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

APPENDIX C

OC Transpo Route Maps

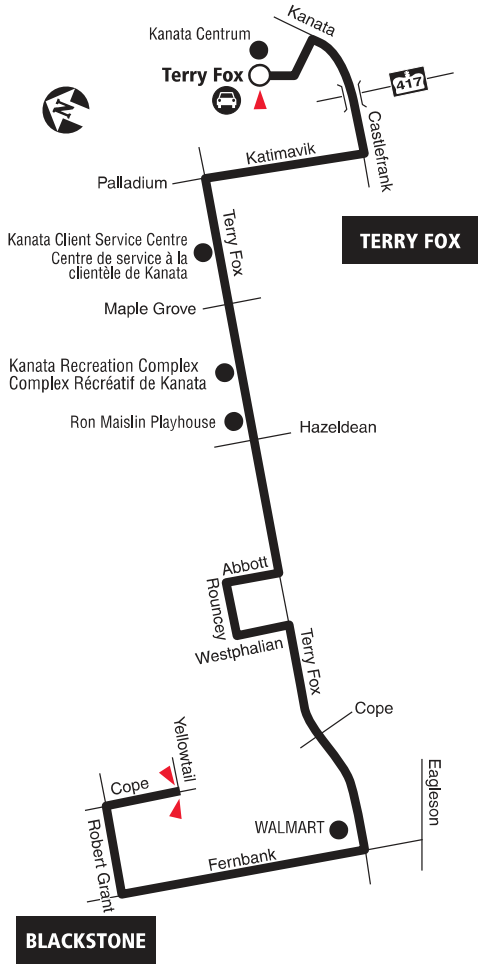


★ SUBJECT SITE

167 TERRY FOX / BLACKSTONE

Local

Monday to Friday/ Lundi au vendredi



Transitway Station / Station du Transitway

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

2017.12

Schedule / Horaire.....613-560-1000
Text / Texto 560560

plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

Customer Relations
Service à la clientèle **613-842-3600**

Lost and Found / Objets perdus.....**613-563-4011**

Security / Sécurité.....**613-741-2478**

Effective December 24, 2017
En vigueur 24 décembre 2017

OC Transpo

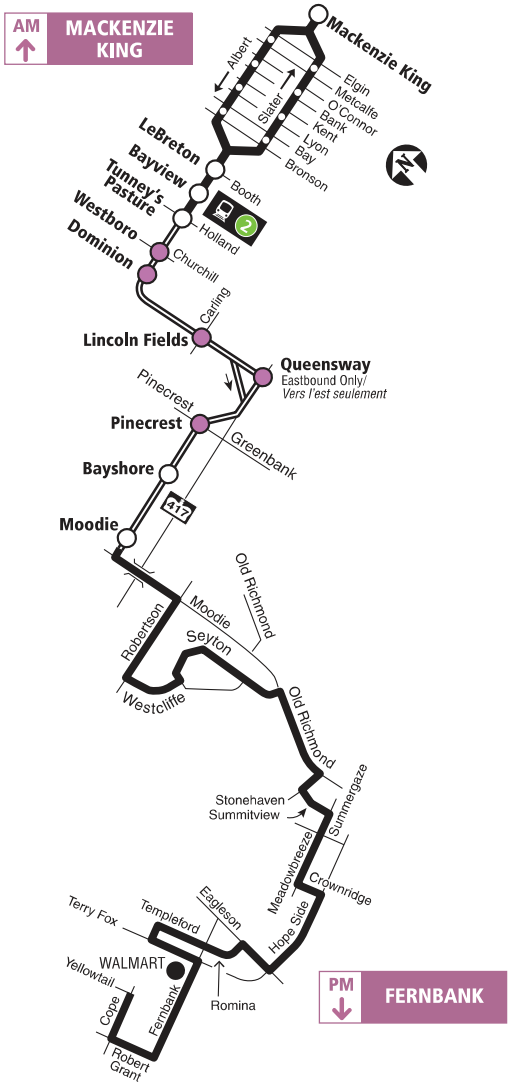
INFO 613-741-4390
octranspo.com

252 Connexion

MACKENZIE KING
FERNBANK

Monday to Friday / Lundi au vendredi

Peak periods only
Périodes de pointe seulement



2019.04

Schedule / Horaire.....613-560-1000
Text / Texto 560560

plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

Customer Relations
Service à la clientèle **613-842-3600**

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité..... **613-741-2478**

Effective December 24, 2017
En vigueur 24 décembre 2017

OC Transpo

INFO 613-741-4390
octranspo.com

APPENDIX D

Relevant Excerpts from Blackstone Phases 4-8 TIS –
Trip Generation/Distribution

mattamyHOMES CARDEL HOMES

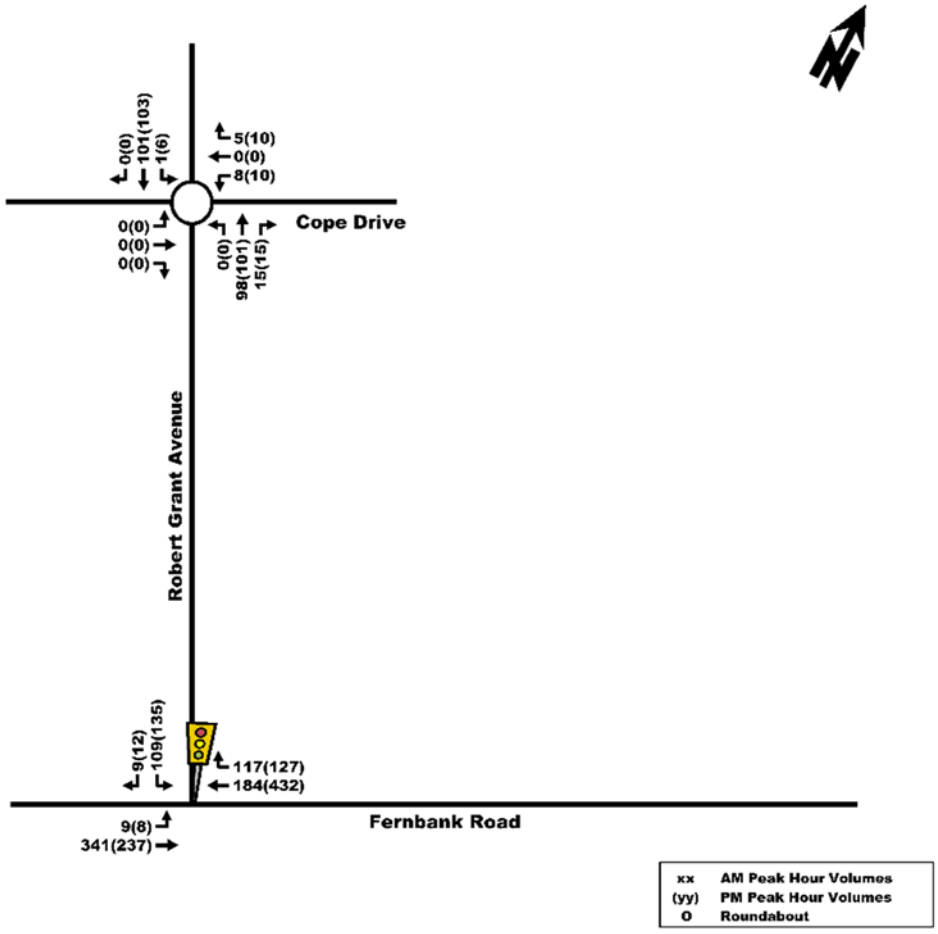
May 2017

5505 Fernbank Road
Blackstone Phases 4-8

Transportation Impact Study

PARSONS

Figure 5: Existing Peak Hour Traffic Volumes



3. DEMAND FORECASTING

3.1. BACKGROUND TRAFFIC GROWTH

To account for background growth along Fernbank Road and Robert Grant Avenue several background developments have been considered. All the developments considered are expected to reach full build-out prior to the 2025 horizon. To account for background growth beyond the study area, a 2% background growth rate per annum (compounded) has been applied. The background development traffic volumes were combined with the existing traffic volumes and the percent background growth to estimate the future background traffic for 2025 and 2030. Figure 6 shows the future background traffic volumes for the 2025 horizon. Figure 7 shows the future background traffic volumes for the 2030 horizon.

3.2. SITE TRIP GENERATION

The number of vehicle trips has been estimated, based on the proposed land uses, to project the impact of the proposed development on the surrounding road network. Table 2 documents the proposed land uses, the ITE Land Use Codes, and the independent variables that are being proposed for the Blackstone South Development.

Table 2: Proposed Land Uses

Land Use	Data Source	Independent Variable
Single-Family Detached Housing	ITE 210	423 Units
Residential Condominium / Townhouse	ITE 230	376 Units
Residential Condominium Block	ITE 220	156 Units
High School	ITE 530	1,916 Students
Elementary School	ITE 520	650 Students

The ITE Land Use Codes and independent variables described above were used to develop the baseline automobile trip generation. The baseline automobile trip generation is multiplied by 1.30 to estimate the number of peak hour person trips that could be generated by the proposed development. The 2011 NCR Household Origin – Destination Survey was reviewed to determine the mode share characteristics of the subject area, specifically, the Kanata – Stittsville Area. Table 3 documents the mode share based on the O-D survey.

Table 3: South Nepean Existing Mode Share

Travel Mode	Mode Share
Auto Driver	60%
Auto Passenger	15%
Transit	10%
Non-motorized	15%
Total Person Trips	100%

Table 4 summarizes the vehicle trip generation for the full build-out of the proposed development based on the foregoing assumptions. A full trip generation table is included in Appendix F.

Table 4: Site Trip Generation (Full Build-Out)

	AM Peak Hour			PM Peak Hour		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Net new Vehicle Trips	666	683	1,349	514	362	876

3.3. VEHICLE TRAFFIC DISTRIBUTION AND ASSIGNMENT

The vehicle traffic distribution and assignment was developed using the 2011 NCR Household Origin – Destination Survey. The resultant distribution is outlined in Table 5.

Table 5: Traffic Distribution

To/From	Distribution
North	40%
South	10%
East	40%
West	10%
Total	100%

Using these distributions and the access configuration, new site-generated trips were assigned to the study area intersections. Figure 8 shows the full build-out site generated traffic volumes.

3.4. PROJECTED TRAFFIC VOLUMES

The background traffic volumes were combined with the site traffic to determine the weekday AM and PM peak hour total traffic forecasts. The future total traffic volumes for the 2025, and 2030 horizon years are shown in Figure 9, and Figure 10 respectively.

Figure 6: Future Background Traffic (2025)

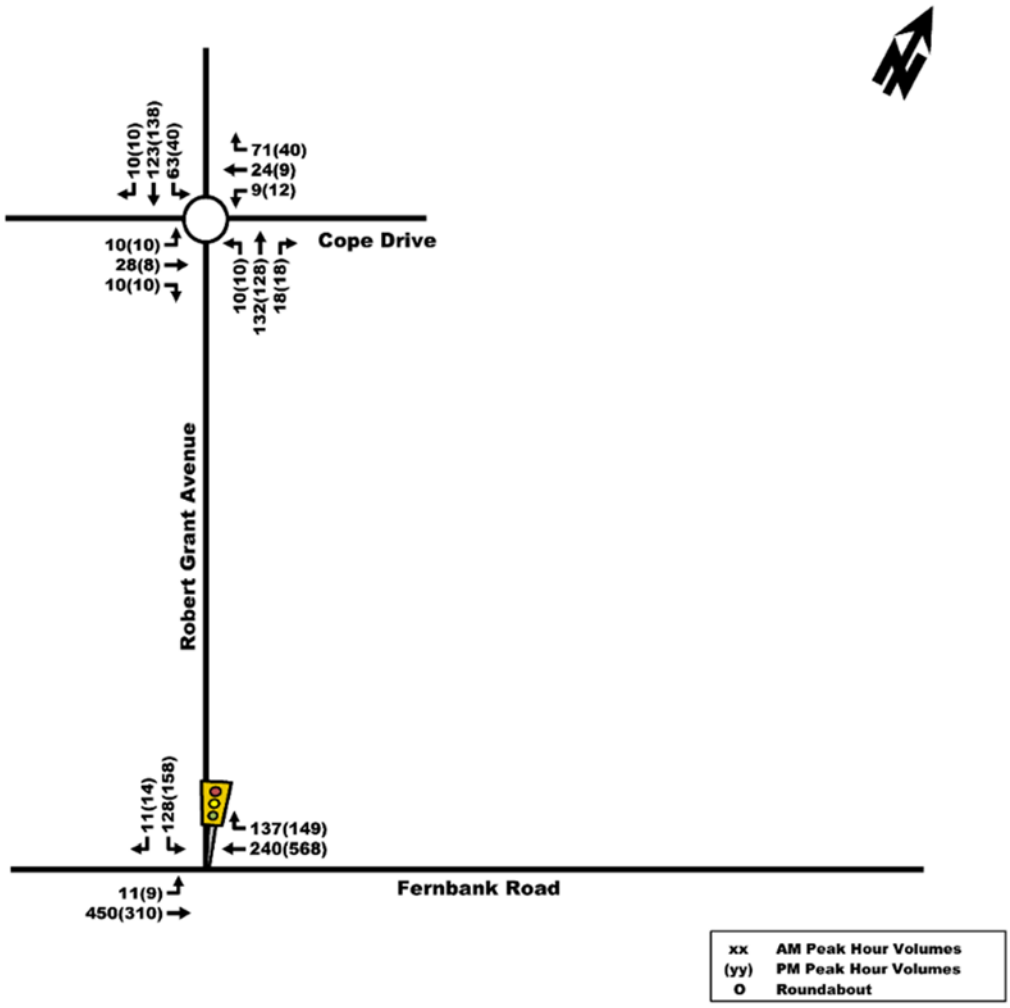


Figure 7: Future Background Traffic (2030)

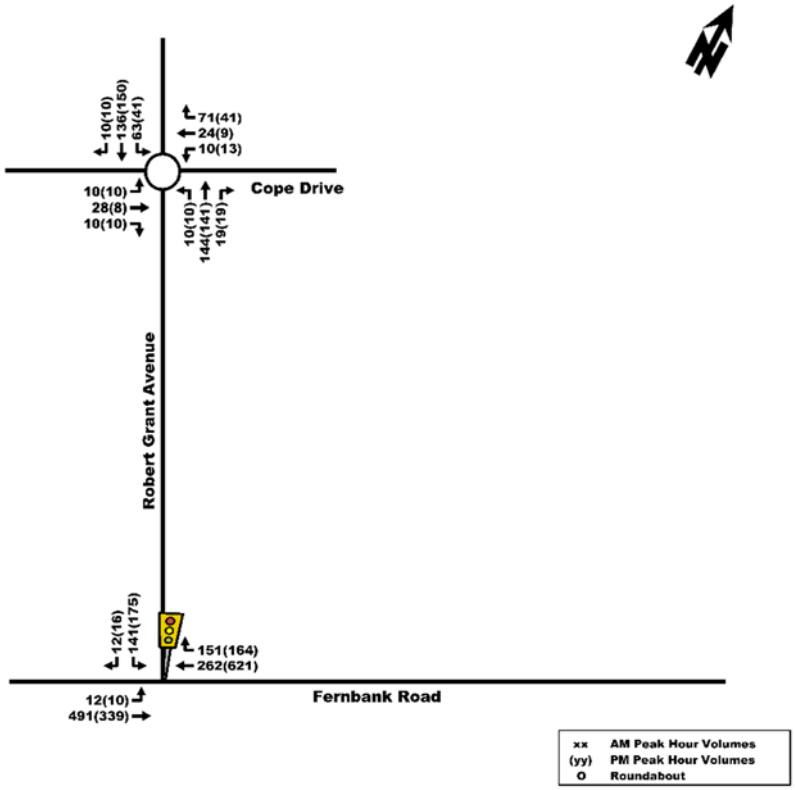


Figure 8: Site Generated Traffic Volumes (Full Build-Out)

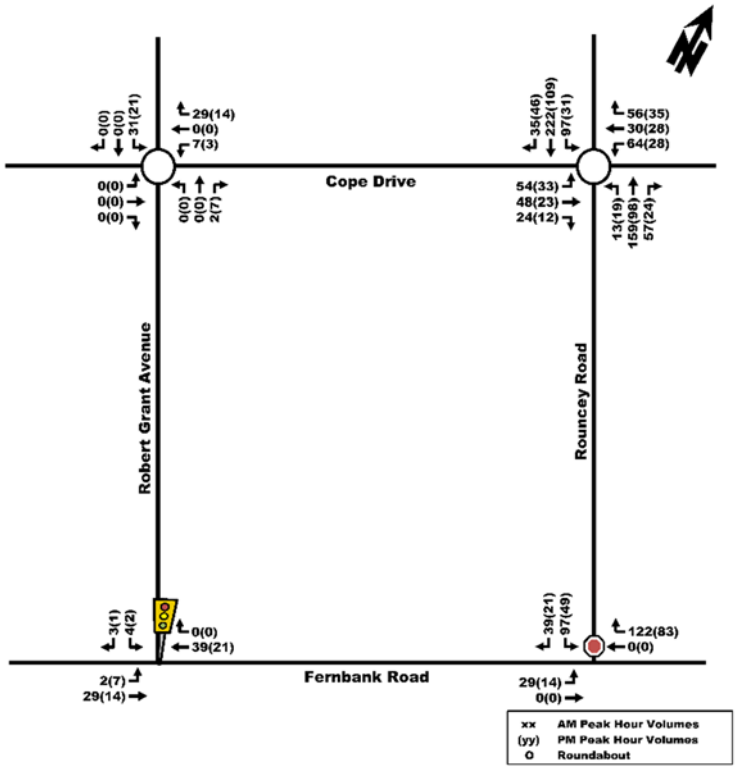


Figure 9: Future Total Traffic (2025)

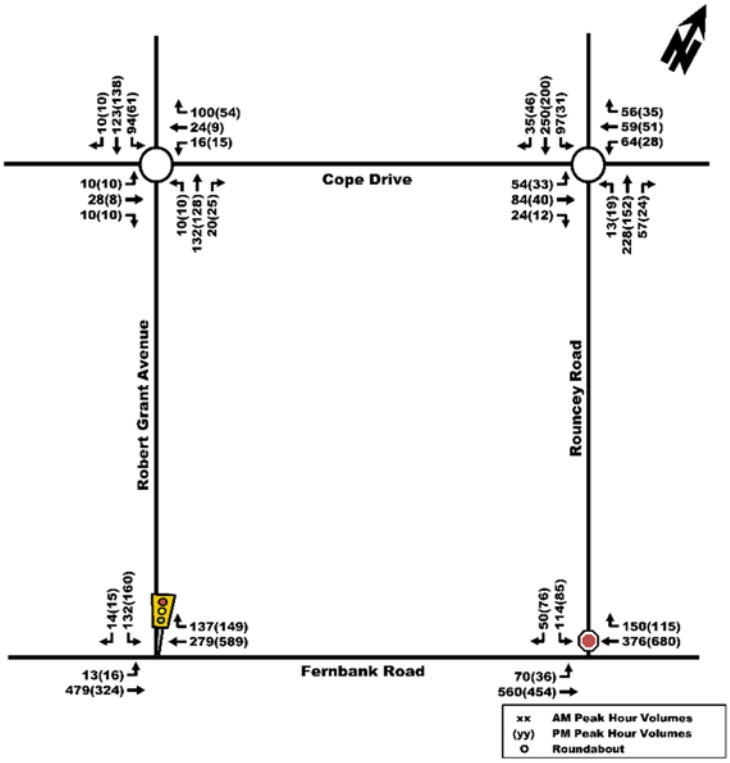
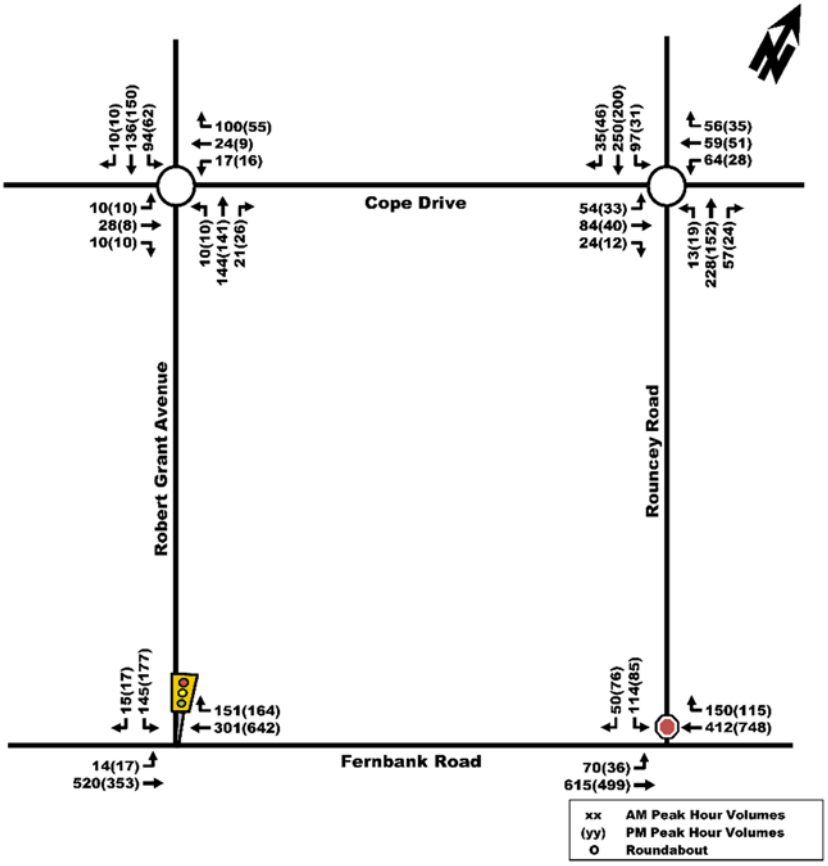


Figure 10: Future Total Traffic (2030)



APPENDIX E

Transportation Demand Management 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: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	✓ Building is located close to Cope Drive, with parking located on the west side of the building
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	✓
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	✓
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	✓
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	✓

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	✓
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	✓
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	✓
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	✓
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	✓
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	✓
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	✗ Not Applicable
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	✓
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

APPENDIX F

Functional Design of Lay-bys

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
1.	ISSUED FOR CITY REVIEW	NOV 22/19	BJB

SCALE

DESIGN	RCH
CHECKED	BJB
DRAWN	RCH
CHECKED	BJB
APPROVED	JLL

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
480 COPE DRIVE

DRAWING NAME
FUNCTIONAL DESIGN

PROJECT No. 119153-00
REV: REV # 1
DRAWING No. 119153-FD

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APPENDIX G

Relevant Excerpts from Blackstone Phases 4-8 TIS – Intersection Analysis

4. FUTURE TRAFFIC OPERATIONS

4.1. 2025 FUTURE BACKGROUND CONDITIONS

A level of service analysis of the future background AM and PM peak hour operating conditions was undertaken using the same parameters as in the analysis of existing conditions. Table 6 summarizes the operational analysis for the projected 2025 future background conditions. Sidra analysis outputs are included in Appendix G.

Table 6: Intersection Operational Analysis
2025 Future Background Conditions

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Fernbank Road/Robert Grant Avenue [1]	A(A)	0.43(0.60)	EBT(WBT)	9.9(12.1)	A(A)	0.40(0.56)
Robert Grant Avenue/Cope Drive[3]	A(A)	5.3(5.2)	NB(NB)	5.2(5.0)	-	-
Note: *1- Signalized Intersection* *2- Unsignalized Intersection* *3- Roundabout Intersection*						

The roundabout intersection of Robert Grant Avenue and Cope Drive, with the addition of the background developments, is projected to operate well, with Level of Service A (LOS A) during the AM and PM peak periods. The signalized intersection at Fernbank Road and Robert Grant Avenue is projected to operate at LOS B for the AM and PM peak periods.

4.2. 2025 TOTAL FUTURE CONDITIONS

A level of service analysis of the future AM and PM peak hour operating conditions, including the subject development, was undertaken using the same parameters as in the analysis of existing conditions, with the addition of the intersections of Rouncey Road at Cope Drive and Rouncey Road at Fernbank Road.

Table 7 summarizes the operational analysis for the projected 2025 total future conditions. Sidra and Synchro analysis outputs are included in Appendix H.

Table 7: Intersection Operational Analysis
2025 Future Traffic Conditions

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Fernbank Road/Robert Grant Avenue [1]	A(B)	0.50(0.65)	EBT(WBT)	10.3(12.8)	A(A)	0.47(0.60)
Rouncey Road/Fernbank Road [2]	E(E)	41.6(47.0)	SB(SB)	5.6(5.5)	-	-
Robert Grant Avenue/Cope Drive [3]	A(A)	5.7(5.4)	NB(NB)	5.5(5.2)	-	-
Rouncey Road /Cope Drive [3]	A(A)	8.9(6.8)	NB(NB)	8.5(6.1)	-	-
Note: *1- Signalized Intersection* *2- Unsignalized Intersection* *3- Roundabout Intersection*						

The new unsignalized intersection at Fernbank Road and Rouncey Road will operate at LOS E during the AM and PM peak hour. The poor operation is due to the high through volumes along Fernbank Road. It should be noted that the through volumes on the east – west legs of the intersection operate with LOS A. A signal warrant was examined using OTM Book 12 methodology for a future intersection with future volumes. Using this methodology, a traffic control signal is not warranted at this location for the 2025 Total Future Conditions. The roundabout at Robert Grant Avenue and the newly added roundabout at Rouncey Road and Cope Drive is projected to operate at LOS A for both AM and PM peak periods. The signalized intersection at Fernbank Road and Robert Grant Avenue is projected to operate at LOS B in the AM and LOS C in the PM peak hour.

A left turn lane warrant was examined at Rouncey Road and Fernbank Road for the eastbound direction along Fernbank Road, and was found to be warranted. For the westbound direction along Fernbank a right turn lane was added to improve the conditions at the intersection of Fernbank Road and Rouncey Road as the right turn volumes were greater than 60 veh/h for both AM and PM peak periods. Appendix I documents the left turn lane warrant.

4.3. 2030 FUTURE BACKGROUND CONDITIONS

A level of service analysis of the 2030 future background AM and PM peak hour operating conditions was undertaken using the same parameters as in the analysis of 2025 future background conditions. Table 8 summarizes the operational analysis for the projected 2030 future background conditions. Sidra and Synchro analysis outputs are included in Appendix J.

Table 8: Intersection Operational Analysis
2030 Future Background Conditions

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Fernbank Road/Robert Grant Avenue [1]	B(B)	0.61(0.68)	EBT(WBT)	11.6(13.4)	A(B)	0.56(0.64)
Robert Grant Avenue/Cope Drive [3]	A(A)	5.5(5.3)	NB(NB)	5.3(5.1)	-	-
Note: *1- Signalized Intersection* *2- Unsignalized Intersection* *3- Roundabout Intersection*						

The roundabout at Robert Grant Avenue and Cope Drive is shown to operate well with LOS A and short delays in both the AM and PM peak hours. The signalized intersection at Fernbank Road and Robert Grant Avenue is shown to operate at LOS B for AM and PM peak periods.

4.4. 2030 TOTAL FUTURE CONDITIONS

A level of service analysis of the 2030 total future AM and PM peak hour operating conditions was undertaken using the same parameters as in the analysis of 2025 total future conditions. Table 9 summarizes the operational analysis for the projected 2030 total future conditions. Sidra and Synchro analysis outputs are included in Appendix K.

Table 9: Intersection Operational Analysis
2030 Future Traffic Conditions

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Fernbank Road/Robert Grant Avenue [1]	B(B)	0.63(0.69)	EBT(WBT)	11.9(13.7)	A(B)	0.58(0.64)
Rouncey Road/Fernbank Road [2]	F(F)	55.4(67.4)	SB(SB)	6.9(7.2)	-	-
Robert Grant Avenue/Cope Drive [3]	A(A)	5.9(5.5)	NB(NB)	5.7(5.3)	-	-
Rouncey Road/Cope Drive [3]	A(A)	8.9(6.8)	NB(NB)	8.5(6.1)	-	-
Note: *1- Signalized Intersection* *2- Unsignalized Intersection* *3- Roundabout Intersection*						

With the addition of traffic from the full build-out of the proposed site, the roundabout at Robert Grant Avenue and Cope Drive will continue to operate at LOS A during both peak hours. The signalized intersection at Robert Grant Avenue and Fernbank Road will operate at LOS C with the addition of the site traffic.

Similar to 2025 total future conditions the unsignalized intersection of Rouncey Road and Fernbank Road will operate with poor LOS, and high delays. This is caused by the high volume of east/west traffic on Fernbank Road causing delays to the minor, southbound approach of the intersection. The east/west legs of the intersection are projected to operate with LOS A. Additionally, a signal warrant was examined using OTM Book 12 methodology for a future intersection with future volumes. Using the methodology, a traffic control signal is not warranted at this location for the 2030 Total Future Conditions.

5. TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) strategies have the potential to be an integral part of a planned development. For this site, the proximity of dedicated on-road cycling facilities will contribute to maximizing the bicycle mode split. As well, several other TDM measures could be considered to reduce vehicle use, including:

- Improving the quality and safety of pedestrian facilities, such as enhanced sidewalks/lighting
- Ride-sharing programs (e.g. community forum where residents can register/arrange carpooling or on-site parking can be reserved for VRTUCAR cars)
- Provide a transit information to encourage residents to utilize transit
- Develop a program to encourage both residents to have transit passes

TDM strategies are important in encouraging active modes of transportation to/from the site, further lessening the reliance on the private automobile.