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39 Years

Proposed Elementary School

820 Miikana Road

Transportation Impact Assesment

Proposed Elementary School
820 Miikana Road

Transportation Impact Assessment

Prepared By:

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

June 2022

Novatech File: 122054
Ref: R-2022-069

NOVATECH
Engineers, Planners & Landscape Architects

June 24, 2022

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

Attention: **Mr. Mike Giampa**
Senior Engineer, Infrastructure Applications

Dear Mr. Giampa:

Reference: **820 Miikana Road**
Transportation Impact Assessment
Novatech File No. 122054

We are pleased to submit the following Transportation Impact Assessment, in support of a Site Plan Control application at 820 Miikana Road, for your review and signoff. 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 Brad Byvelds, or the undersigned.

Yours truly,

NOVATECH

Joshua Audia, B.Sc.
E.I.T. | 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.

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Dated at Ottawa (City) this 24 day of June, 2022 .

Name: Brad Byvelds
(Please Print)

Professional Title: P. Eng. - Project Manager

B. Byvelds

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

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of a Site Plan Control application for the property located at 820 Miikana Road. The subject site is approximately 2.55 hectares in size and is currently vacant.

The subject site is surrounded by the following:

- Miikana Road, followed by residences and parkland to the north,
- Residences, followed by Salamander Way to the south,
- Residences and Quest Private to the east, and
- Kelly Farm Drive, followed by residences to the west.

The proposed development consists of a new elementary school, including a surface parking lot with 101 parking spaces and access to Miikana Road, a lay-by for pick-ups and drop-offs on the south side of Miikana Road, and an on-site bus loading loop with access on Kelly Farm Drive.

The subject site is designated as 'General Urban Area' on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Minor Institutional Zone' (I1A) and 'Residential Fourth Density' (R4Z), and the site is within the Leitrim Community Design Plan area. The subject site was identified as a future school block within the Remer Lands of the Leitrim Community Design Plan, and was originally considered as part of the Community Transportation Study (CTS) prepared by IBI Group in May 2016, in support of the Remer Lands development at 4800 Bank Street.

The study area for this report includes the boundary roadways Miikana Road and Kelly Farm Drive, as well as the following intersections:

- Bank Street/Blais Road/Miikana Road;
- Bank Street/Dun Skipper Drive;
- Kelly Farm Drive/Miikana 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 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 Miikana Road and Kelly Farm Drive. Sidewalks across the proposed accesses to Miikana Road and Kelly Farm Drive will be continuous, per City of Ottawa Specification SC 7.1.

- Pedestrians from the subdivision will be able to enter/exit the subject site via existing sidewalks along Miikana Road and Kelly Farm Drive, which extend as far as Bank Street to the east and Leitrim Road to the north. At the northwest corner of the site, pedestrians on Miikana Road or Kelly Farm Drive will be able to cross to the school via the all-way stop-controlled intersection at Miikana Road/Kelly Farm Drive.

- Bicycle parking will be provided in the northeast corner of the proposed bus pick-up/drop-off loop on Kelly Farm Drive, and immediately west of the proposed parking lot for staff/visitors.

- All required Transportation Demand Management (TDM)-supportive design and infrastructure measures in the TDM checklist are met.

- The proposed double-wide bus loop along Kelly Farm Drive will have a width of 7.5m and a parallel length of approximately 50m. The width of the bus loop allows for two rows for buses to queue within the site and wait for students to load. Once all students are loaded onto the buses, the buses will depart one at a time. A sidewalk with a width of 2.5m will be provided along the bus loop, connecting the loop to a gate to enter the schoolyard.

- The proposed lay-by along Miikana Road will have a width of 2.5m and a parallel length of approximately 80m. A sidewalk with a width of 1.8m will be provided along the lay-by. Locating the lay-by directly adjacent to the sidewalk is proposed, so that students will not have to travel through any snow storage areas to enter/exit vehicles that are picking them up or dropping them off. Depressed curb will be provided along the length of the proposed lay-by, adjacent to the eastbound travel lane on Miikana Road.

- Garbage collection will take place at the southwest corner of the staff/visitor parking lot. One loading space is provided adjacent to the eastern face of the proposed school. The proposed on-site fire route will include the northern entrance of the bus loop to Kelly Farm Drive, and will run on an east-west alignment within the schoolyard, between the proposed school and the location of any future portables.

- The proposed parking lot meets the minimum requirements for vehicle parking, bicycle parking, accessible parking, and loading spaces.

Boundary Streets

- Miikana Road and Kelly Farm Drive achieve the target pedestrian level of service (PLOS) A, but do not achieve the target bicycle level of service (BLOS) B/D. Both boundary streets achieve a transit level of service (TLOS) E and a truck level of service (TkLOS) B, but no targets are identified in the *MMLOS Guidelines* for these two modes.

- The target BLOS can be achieved without implementing any cycling facilities, by reducing the operating speed to 50 km/h. Since the operating speed is assumed to equal the posted speed limit plus 10 km/h, it is anticipated that introducing school zone speed limits (i.e. 40 km/h) in vicinity of the proposed school will achieve this. Therefore, no other recommendations are identified.

Access Design

- The parking lot access to Miikana Road and bus loading accesses to Kelly Farm Drive meet all relevant width, location, and spacing provisions of the City's *Private Approach By-Law* (PABL) and the Transportation Association of Canada's *Geometric Design Guide for Canadian Roads*.

- As the location of the driveway adheres to the requirements of the PABL and since the proposed 4% grade towards the roadway will not impact sight lines to pedestrians, cyclists,

and vehicles along the roadway, the proposed access is not anticipated to create a traffic hazard. Relief from the requirements of Section 25(u) is requested.

- As Miikana Road and Kelly Farm Drive do not have any vertical or horizontal curves that impact sightlines from any proposed access location, the required stopping sight distance and intersection sight distance requirements are met.

Transportation Demand Management

- The Ottawa-Carleton District School Board (OCDSB) provides bus transportation for all students who reside within the following distances from the school:
  - Junior and senior kindergarten: 0.8km or further from the school;
  - First through eighth grade: 1.6km or further from the school.

- The Ottawa Student Transportation Authority (OSTA) offers transportation alternatives, designed to promote active transportation and healthy living. As the student population of the school increases, consideration could be given by the OCDSB and OSTA to providing active transportation programs for this elementary school.

- The following measures will be implemented for the proposed school:
  - Designate an internal coordinator, or contract with an external coordinator;
  - Display local area maps with walking/cycling access routes and key destinations at major entrances;
  - Display relevant transit schedules and route maps at entrances;
  - Provide online links to OC Transpo and STO information;
  - Provide dedicated ridematching portal at OttawaRideMatch.com.

Neighbourhood Traffic Management

- Street-level photography from 2021 indicate that flex posts have been implemented on Kelly Farm Drive, north of Miikana Road. To reduce the operating speed of the boundary streets Miikana Road and Kelly Farm Drive, implementing flex posts along the frontages of the subject site could be considered. In addition, SCHOOL pavement markings on boundary streets and posted school zone speed limits of 40 km/h are recommended.

Transit

- It is anticipated that the proposed development will not generate any new transit trips for staff, visitors, parents, or students.

Intersection MMLOS

- The study area intersections do not meet the target PLOS C, BLOS B/C, or TkLOS D.

- All approaches of Bank Street/Blais Road/Miikana Road have an undivided cross-section equivalent to four or five lanes crossed. There is limited opportunity in improving the PLOS at each approach to the target PLOS C without reducing the number of travel lanes or restricting turning movements. Therefore, no recommendations are identified.

- The east and west approaches of Bank Street/Blais Road/Miikana Road do not meet the target BLOS, based on left turn characteristics. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists would enable eastbound and westbound cyclists to utilize the protected intersection, and meet the target BLOS. This is identified for the City's consideration.

- All approaches of Bank Street/Blais Road/Miikana Road do not meet the target TkLOS, which requires either multiple receiving lanes or a curb radius greater than 15m. Given the recent construction of the intersection, it is anticipated that truck movements were considered in the design. Therefore, no recommendations are identified.

- All approaches of Bank Street/Dun Skipper Drive have an undivided cross-section equivalent to five lanes crossed. There is limited opportunity in improving the PLOS at each approach to the target PLOS C without reducing the number of travel lanes or restricting turning movements. Therefore, no recommendations are identified.

- The west approach of Bank Street/Dun Skipper Drive does not meet the target BLOS C, based on left and right turn characteristics. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists would enable eastbound and westbound cyclists to utilize the protected intersection, and meet the target BLOS. This is identified for the City's consideration.

- All approaches of Bank Street/Dun Skipper Drive do not meet the target TkLOS, which requires either multiple receiving lanes or a curb radius greater than 15m. As Dun Skipper Drive is not a designated truck route, no recommendations are identified.

- The study area intersections are anticipated to operate at an acceptable vehicular level of service (Auto LOS) D or better during both analysis periods.

1.0 SCREENING

1.1 Introduction

This Transportation Impact Assessment (TIA) has been prepared in support of a Site Plan Control application for the property located at 820 Miikana Road. The subject site is approximately 2.55 hectares in size and is currently vacant.

The subject site is surrounded by the following:

- Miikana Road, followed by residences and parkland to the north,
- Residences, followed by Salamander Way to the south,
- Residences and Quest Private to the east, and
- Kelly Farm Drive, followed by residences to the west.

An aerial of the vicinity around the subject site is provided in **Figure 1**.

Figure 1: View of the Subject Site

1.2 Proposed Development

The proposed development consists of a new elementary school, including a surface parking lot with 101 parking spaces and access to Miikana Road, a lay-by for pick-ups and drop-offs on the south side of Miikana Road, and an on-site bus loading loop with access on Kelly Farm Drive.

The subject site is designated as 'General Urban Area' on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Minor Institutional Zone' (I1A) and 'Residential Fourth Density' (R4Z), and the site is within the Leitrim Community Design Plan area. The subject site was identified as a future school block within the Remer Lands of the Leitrim Community Design Plan, and was originally considered as part of the Community Transportation Study (CTS) prepared by IBI Group in May 2016, in support of the Remer Lands development at 4800 Bank Street.

The proposed school is anticipated to be constructed in a single phase, and is planned to be open for the 2024-2025 school year. A copy of the proposed site plan 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, which is included in **Appendix B**. The trigger results are as follows:

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

- Location Triggers – The development does not propose a new connection to a designated Rapid Transit or Transit Priority (RTTP) corridor or a Spine Cycling Route, and is not located within a Design Priority Area or Transit-Oriented Development Zone; further assessment is **not required** based on this trigger.

- Safety Triggers – The development does not meet any of the safety triggers identified in the TIA Screening Form; further assessment is **not required** based on this trigger.

2.0 SCOPING

2.1 Existing Conditions

2.1.1 Roadways

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

Bank Street is an arterial roadway that generally runs on a north-south alignment between Wellington Street and Belmeade Road/Marionville Road. South of Belmeade Road/Marionville Road, the roadway continues as Ottawa Regional Road 34. Within the study area, Bank Street has a two-lane undivided rural cross-section, paved shoulders, and a posted speed limit of 80 km/h. Bank Street is classified as a truck route, allowing full loads. On-street parking is permitted, as paved shoulders are provided.

Blais Road is a collector roadway that runs on an east-west alignment between Bank Street and Hawthorne Road. West of Bank Street, the roadway continues as Miikana Road. Within the study area, Blais Road has a two-lane undivided rural cross-section with gravel shoulders for 400m east of Bank Street, and an unposted speed limit of 80 km/h. Blais Road is classified as a truck route, allowing restricted loads. On-street parking is permitted in areas where gravel shoulders are provided.

Miikana Road is a collector roadway that generally runs on an east-west alignment between Bank Street and Paakanaak Avenue. East of Bank Street, the roadway continues as Blais Road. Within the study area, Miikana Road has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and an unposted speed limit of 50 km/h. Miikana Road is not classified as a truck route. On-street parking is permitted on the south side of the roadway.

Kelly Farm Drive is a roadway that generally runs on a north-south alignment between Leitrim Road and Paakanaak Avenue/Rallidale Street. The roadway is designated as a collector roadway from Leitrim Road to Miikana Road, and as a local roadway from Miikana Road to Paakanaak Avenue/ Rallidale Street. Within the study area, Kelly Farm Drive has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and an unposted speed limit of 50 km/h. Kelly Farm Drive is not classified as a truck route. On-street parking is permitted on the east side of the roadway.

Dun Skipper Drive is a local roadway that generally runs on an east-west alignment between Bank Street and Miikana Road. Within the study area, Dun Skipper Drive has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and an unposted speed limit of 50 km/h. Dun Skipper Drive is not classified as a truck route. On-street parking is permitted on both sides of the roadway.

2.1.2 Intersections

Bank Street/Blais Road/Miikana Road

- Signalized and protected four-legged intersection
- North Approach (Bank Street):
  one left turn lane, one through lane, and one right turn lane
- South Approach (Bank Street):
  one left turn lane and one shared through/right turn lane
- East Approach (Blais Road):
  one left turn lane and one shared through/right turn lane
- West Approach (Miikana Road):
  one left turn lane and one shared through/right turn lane
- Zebra-striped crosswalks provided on all approaches
- Crossrides provided on all approaches

Bank Street/Dun Skipper Drive

- Signalized and protected three-legged intersection
- North Approach (Bank Street):
  one through lane and one right turn lane
- South Approach (Bank Street):
  one left turn lane and one through lane
- West Approach (Dun Skipper Drive):
  one left turn lane and one right turn lane
- Zebra-striped crosswalks provided on north and east approaches; standard crosswalks provided on south approach
- Crossrides provided on north and east approaches, as well as a jug handle for northbound left-turning cyclists

Kelly Farm Drive/Miikana Road

- Unsignalized four-legged intersection
- All-way stop-controlled
- North/South Approaches (Kelly Farm Drive):
  one shared left turn/through/right turn lane
- East/West Approaches (Miikana Road):
  one shared left turn/through/right turn lane

2.1.3 Driveways

In accordance with the *2017 TIA Guidelines*, a review of the existing adjacent driveways along the boundary roads are provided below. This review considers the driveways on Miikana Road between Kelly Farm Drive and Cedar Creek Drive, and the driveways on Kelly Farm Drive between Miikana Road and Dun Skipper Drive.

Miikana Road, North Side

- 15 driveways to residences at 801-839 Miikana Road

Miikana Road, South Side

- Two private intersections to Quest Private and Escapade Private, which serve 34 residences

Kelly Farm Drive, East Side

- Nine driveways to residences at 4511-4527 Kelly Farm Drive

Kelly Farm Drive, West Side

- 15 driveways to residences at 4500-4534 Kelly Farm Drive

2.1.4 Pedestrian and Cycling Facilities

Concrete sidewalks are provided on both sides of Miikana Road, Kelly Farm Drive, and Dun Skipper Drive. Paved/gravel shoulders are provided on both sides of Bank Street and Blais Road, and localized off-street bicycle pathways are provided on the Bank Street approaches of Bank Street/Blais Road/ Miikana Road and Bank Street/Dun Skipper Drive, as these intersections are at least partially protected intersections.

In the City of Ottawa's primary cycling network, Bank Street is classified as a Spine Route, Miikana Road is classified as a Local Route, and the other study area roadways have no cycling route designations. North of the study area, Kelly Farm Drive is classified as a Local Route between Shepody Circle and Helen Rapp Way/Silverbell Crescent.

2.1.5 Transit

The locations of OC Transpo bus stops in the vicinity of the subject site are described in **Table 1**, and are shown in **Figure 2**. A summary of the various routes which serve the study area is included in **Table 2**. Detailed route information and an excerpt from the OC Transpo System Map are included in **Appendix C**.

Table 1: OC Transpo Transit Stops

Stop	Location	Routes Serviced
#0435	West side of Kelly Farm Drive, north of Maberly Way	294, 699
#0436	East side of Kelly Farm Drive, south of Sora Way	294, 699
#0454	East side of Kelly Farm Drive, south of Miikana Road	294
#0455	West side of Kelly Farm Drive, north of Miikana Road	294, 699
#0490	West side of Kelly Farm Drive, north of Zaatiik Grove	294
#0491	East side of Kelly Farm Drive, north of Dun Skipper Drive	294

Table 2: OC Transpo Route Information

Route	From ↔ To	Frequency
294	Hurdman ↔ Findlay Creek	Peak period and peak direction service only; Monday to Friday, 30-minute headways
699	Findlay Creek ↔ Pierre de Blois School	Service at select times on school days only

2.1.6 Area Traffic Management

There are no Area Traffic Management (ATM) studies within the study area that are currently in progress.

Signage on Kelly Farm Drive indicates that the neighbourhood to the north of the subject site is traffic-calmed. Street-level photography from September 2021 shows that flex posts and max 50 km/h line painting have been implemented on Kelly Farm Drive north of Miikana Road.

Figure 2: OC Transpo Bus Stop Locations

2.1.7 Existing Traffic Volumes

Weekday traffic counts completed by the City of Ottawa were used to determine the existing pedestrian, cyclist, and vehicular traffic volumes at the signalized study area intersections. Traffic counts at Miikana Road/Kelly Farm Drive have not been conducted. The City counts were completed on the dates listed below:

- Bank Street/Blais Road/Miikana Road October 19, 2021
- Bank Street/Dun Skipper Drive October 19, 2021

All traffic count data previously discussed are included in **Appendix D**. It is noted that the aforementioned traffic counts were conducted during the COVID-19 pandemic. As such, a comparison of the 2021 traffic counts and the 2015 traffic counts used in the 2016 Remer Lands CTS has been conducted. Relevant excerpts from the 2016 Remer Lands CTS are included in **Appendix E**.

Comparing the 2015 and 2021 data, traffic volumes on Bank Street in the peak direction (i.e. northbound during the AM peak hour and southbound during the PM peak hour) decreased by 15% to 30% from 2015 to 2021. Therefore, traffic volumes presented in the 2016 Remer Lands CTS are considered a conservative representation of traffic volumes along Bank Street.

2.1.8 Collision Records

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

The collision data has been evaluated to determine if there are any identifiable collision patterns, which are defined in the *2017 TIA Guidelines* as 'more than six collisions in five years' for any one movement. The number of collisions at each intersection from January 1, 2016 to December 31, 2020 is summarized in **Table 3**.

Table 3: Reported Collisions

Intersection/ Street Segment	Impact Types						Total
	Approach	Angle	Rear End	Sideswipe	Turning Mvmt	SMV[1]/ Other	
Bank Street/ Blais Road/Miikana Road	1	2	9	1	-	-	**13**
Bank Street/ Dun Skipper Drive	-	-	-	-	1	-	**1**

1. SMV = Single Motor Vehicle

Bank Street/Blais Road/Miikana Road
A total of 13 collisions were reported at this intersection in the last five years, of which there was one approaching impact, two angle impacts, nine rear-end impacts, and one sideswipe impact. Four of the 13 collisions resulted in personal injuries, but none caused fatalities. Five of the collisions occurred in poor driving conditions. No collisions involved cyclists or pedestrians.

Of the nine rear-end impacts, three involved northbound vehicles, five involved southbound vehicles, and one involved westbound vehicles. Three of the rear-end impacts occurred in poor driving conditions, and two collisions resulted in injuries.

Bank Street/Dun Skipper Drive
One collision was reported at this intersection in the last five years, which was a turning movement impact that involved two eastbound right-turning vehicles and caused no injuries.

2.2 Planned Conditions

2.2.1 Planned Transportation Projects

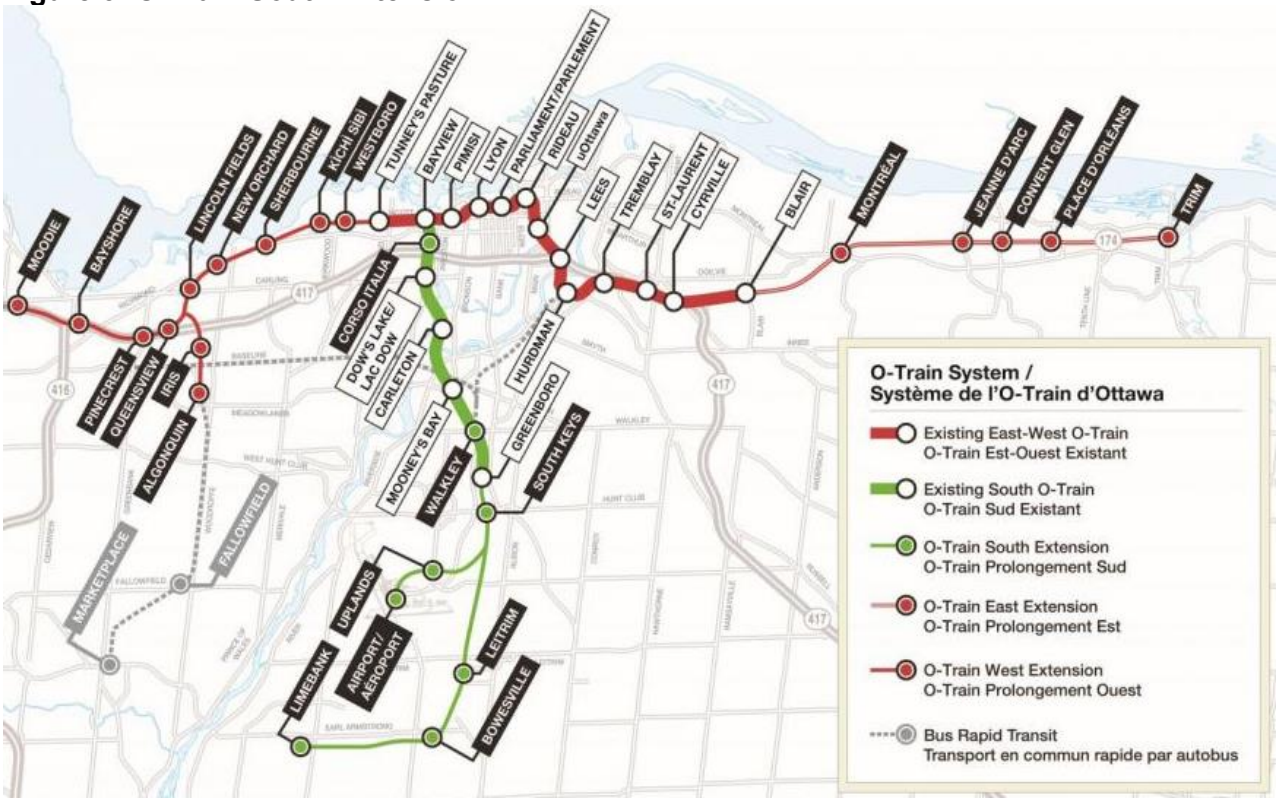
Within the study area, the 2013 Ottawa Cycling Plan and 2013 Ottawa Pedestrian Plan do not identify any improvements within the study area.

The City's 2013 Transportation Master Plan (TMP) identify roadway improvement projects within the study area in its Affordable Road Network. In the Affordable Road Network, the 2013 TMP identifies the widening of Bank Street from two to four lanes between Leitrim Road and Blais Road as a Phase 2 (2020-2025) project, while further widening between Blais Road and Rideau Road is identified as a Phase 3 (2026-2031) project. In the 2031 Network Concept, widening of Bank Street is further identified from Rideau Road to south of the urban boundary.

South of the study area, an Environmental Assessment (EA) study was prepared in support of an extension of Earl Armstrong Road from Albion Road to Bank Street, and presented to Transportation Committee and City Council in June 2019, where the functional design was approved. This project is not included in the Affordable Network, but is included in the Network Concept.

The 2013 TMP does not identify any RTTP projects within the study area. West of the subject site, the O-Train South Extension will continue the Trillium Line from Greenboro Station to Limebank Road in Riverside South, along with a link to the Ottawa Macdonald-Cartier International Airport. Revenue service for this extension is planned for 2023. A figure of the proposed O-Train station locations is included in **Figure 3**.

Figure 3: O-Train South Extension



2.2.2 Other Area Developments

In proximity of the proposed development, there are other residential and mixed-use developments are under construction, approved, or in the approval process. Other developments in the area include the following.

4836 Bank Street
Approximately 125 hotel suites, a 2,997 m^2 hardware store, a 502 m^2 restaurant, and a 987 m^2 commercial building are proposed at this property, which is located at the southwestern corner of Bank Street/Dun Skipper Drive. A TIA was prepared by IBI Group in April 2019 in support of this development, and estimated that the hardware store would be built out by 2021, with the remainder of the development being built out by 2023.

4840 Bank Street
A total of 80 back-to-back townhouses are proposed at this property, which is located south of Dun Skipper Drive and east of Rallidale Street. No transportation study was prepared in support of this development.

2.3 Study Area and Time Periods

The study area for this report includes the boundary roadways Miikana Road and Kelly Farm Drive, as well as the following intersections:

- Bank Street/Blais Road/Miikana Road;
- Bank Street/Dun Skipper Drive;
- Kelly Farm Drive/Miikana 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.

2.4 Exemptions Review

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the *2017 TIA Guidelines*. The applicable exemptions for this site are shown in **Table 4**.

Table 4: TIA Exemptions

Module	Element	Exemption Criteria	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

Module	Element	Exemption Criteria	Status
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	Not 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

City staff has confirmed that, since the 2016 Remer Lands CTS considered an elementary school for the subject lands and included intersection analysis, this TIA is not required to include new intersection capacity analysis. Therefore, the Intersection Design module will only evaluate the existing multi-modal levels of service (MMLOS) for the signalized study area intersections. Intersection operations for future conditions will reference intersection capacity analysis presented in the 2016 CTS for the Phase 1 buildout year of the Remer Lands subdivision (i.e. 2020) and the ultimate buildout year of the Remer Lands subdivision (i.e. 2025).

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

Design Review Component
- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.4: Access Design

Network Impact Component
- Module 4.5: Transportation Demand Management
- Module 4.6: Neighbourhood Traffic Management
- Module 4.7: Transit
- Module 4.9: Intersection Design

3.0 FORECASTING

3.1 Development-Generated Traffic

3.1.1 Trip Generation

To maintain consistency with the 2016 Remer Lands CTS, the estimated number of trips generated by the proposed school have been carried forward in this TIA. Relevant excerpts of the 2016 CTS, including site-generated traffic volumes for the entire subdivision, are included in **Appendix E**.

Vehicle trips generated by the proposed school were estimated using rates from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 9th Edition*, for the Elementary School land use (code 520). These vehicle trips were then converted from vehicle trips to person trips using a factor of 1.35. This factor was determined using vehicle occupancy factor and non-auto mode shares included for the South Gloucester/Leitrim district, as defined in the *2011 TRANS O-D Survey Report*. Person trips generated by the proposed school can therefore be summarized in **Table 5**.

Table 5: Proposed School – Person Trip Generation

Land Use	ITE Code	AM Peak Hour (pph[1])			PM Peak Hour (pph)		
		IN	OUT	TOT	IN	OUT	TOT
Elementary School	520	107	88	*195*	40	41	*81*

1. pph: Person Trips per Hour

From the previous table, the proposed school is estimated to generate 195 person trips during the AM peak hour and 81 person trips during the PM peak hour.

The 2016 CTS assumed that 70% of all person trips generated by the proposed school would be vehicle trips. Therefore, the proposed elementary school is estimated to generate 137 vehicle trips during the AM peak hour (including 75 inbound trips and 61 outbound trips), and 57 vehicle trips during the PM peak hour (including 28 inbound trips and 29 outbound trips).

3.1.2 Trip Distribution

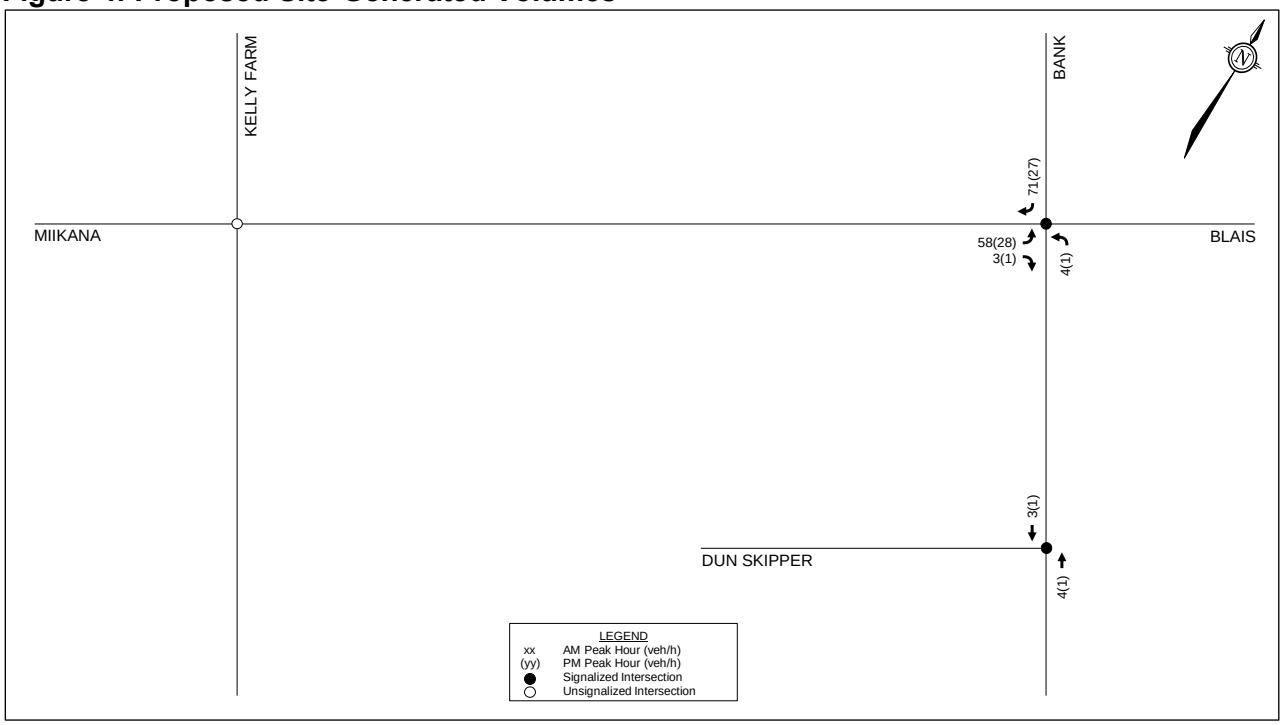
The 2016 Remer Lands CTS included trip distribution assumptions for all trips generated by the subdivision, which can be summarized as 95% to/from the north via Bank Street and 5% to/from the south via Bank Street.

At the time of writing of the 2016 CTS, Kelly Farm Drive did not extend to Leitrim Road from the Findlay Creek subdivision, and the CTS estimated that approximately 20% of vehicle trips to/from the north on Bank Street would utilize Kelly Farm Drive as an alternative north-south route upon opening. While Kelly Farm Drive now connects to Leitrim Road north of the study area, the analysis included in the 2016 CTS did not consider this reduction in traffic on Findlay Creek Drive and Bank Street.

As the school will serve residents of Findlay Creek and the surrounding community, it is acknowledged that some vehicle trips will arrive and depart to/from the north and south via Kelly Farm Drive. However, to maintain consistency with the 2016 Remer Lands CTS and to provide a conservative representation of signalized intersection operations within the area, the distribution presented in the parent study has been carried forward.

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

Figure 4: Proposed Site-Generated Volumes



3.2 Background Traffic

3.2.1 Other Area Developments

As first discussed in Section 2.2.2, there is one TIA for another proposed development in the study area (for 4836 Bank Street). Approximately 125 hotel suites, a 2,997 m^2 hardware store, a 502 m^2 restaurant, and a 987 m^2 commercial building are proposed at this property, which is located at the southwestern corner of Bank Street/Dun Skipper Drive. A TIA was prepared by IBI Group in April 2019 in support of this development, and estimated that the hardware store would be built out by 2021, with the remainder of the development being built out by 2023. Traffic generated by this development was not considered in the 2016 Remer Lands CTS. Relevant excerpts of this TIA are included in **Appendix G**. However, the 4836 Bank Street TIA accounted for traffic by the Remer Lands development.

3.2.2 General Background Growth Rate

A review of snapshots of the City's *Strategic Long-Range Model* has been conducted, and the snapshots are included in **Appendix H**. Comparing snapshots of the 2011 and 2031 AM peak hour traffic volumes on Bank Street south of Leitrim Road, the *Strategic Long-Range Model* generally identifies projected growth between 0% and 2% per annum. This is generally consistent with the 2016 Remer Lands CTS, which assumed an annual growth rate of 1% for traffic volumes on Bank Street.

The 2016 Remer Lands CTS included future traffic volumes for the Phase 1 year 2020 (including the proposed school) and full buildout year 2025. The future traffic volumes for both years as estimated in the 2016 CTS and the site-generated volumes described above are included in **Figure 5** and **Figure 6**.

Figure 5: Total Traffic Volumes, Phase 1 Year 2020

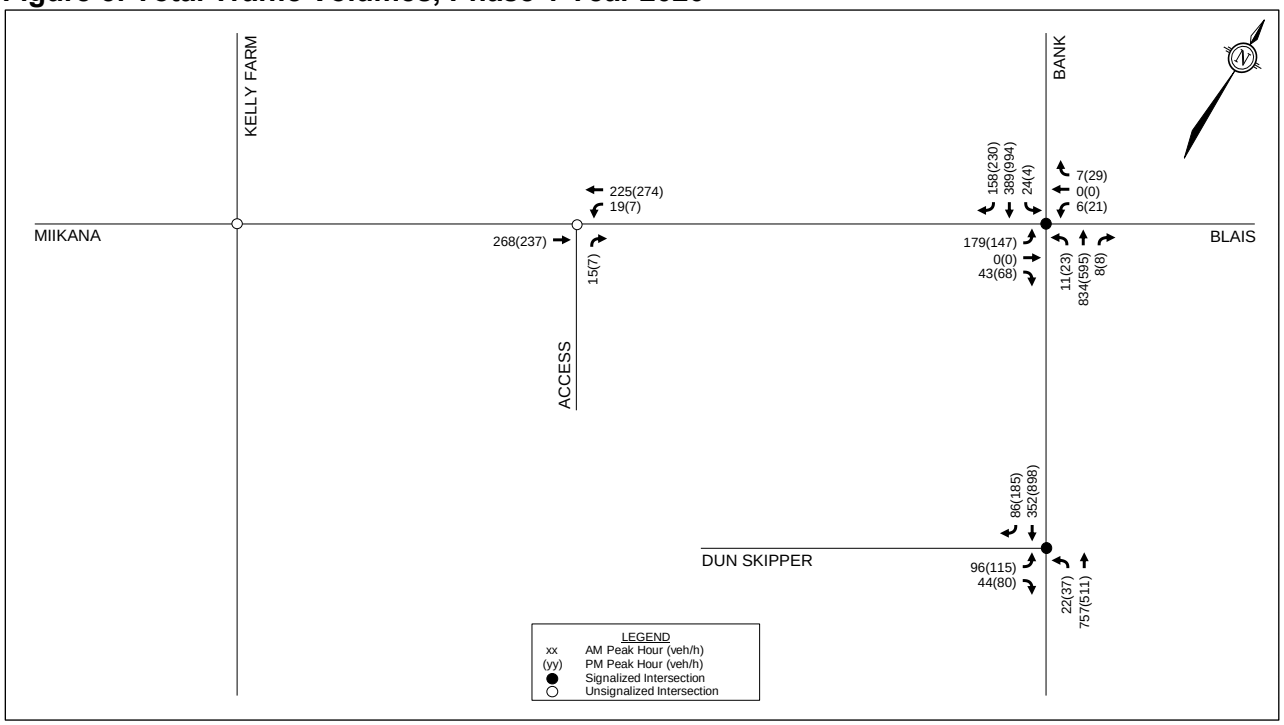
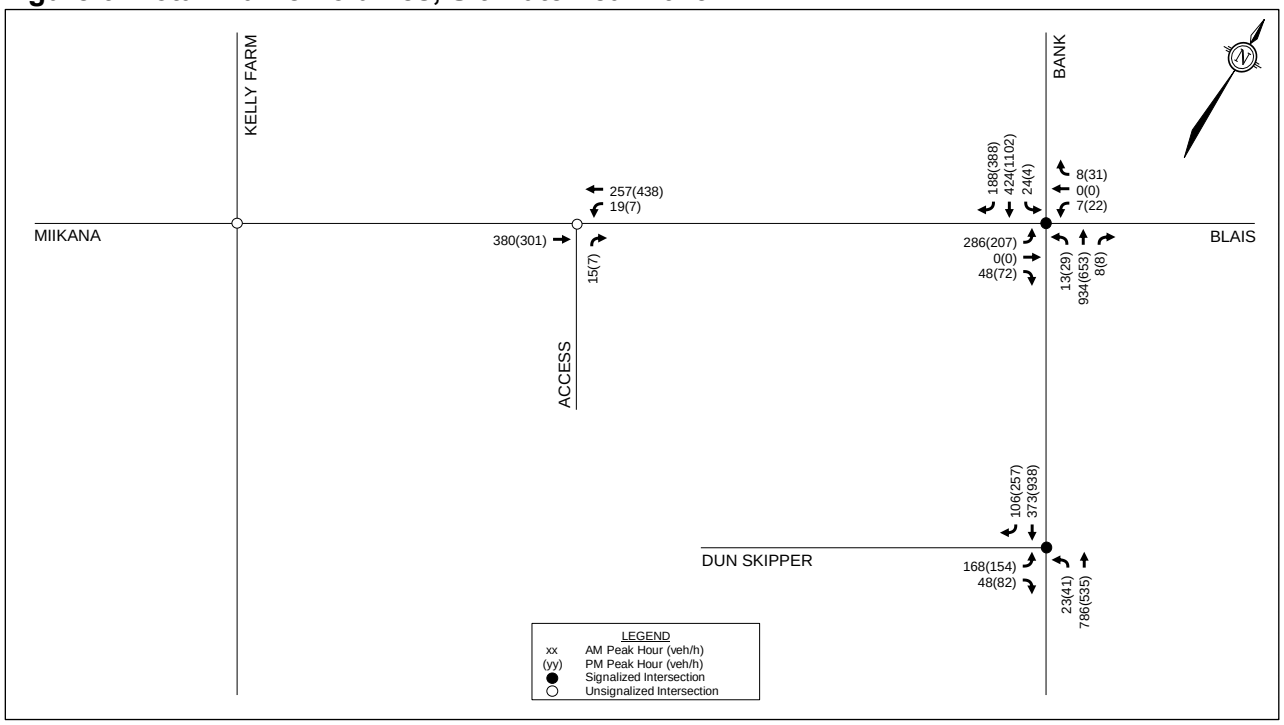


Figure 6: Total Traffic Volumes, Ultimate Year 2025



3.3 Demand Rationalization

Future background intersection analysis at Bank Street/Blais Road/Miikana Road was included in the 2016 Remer Lands CTS, for the Phase 1 buildout year 2020 and full buildout year 2025. During both years of analysis, both intersections were projected to operate at a vehicular level of service (Auto LOS) D or better (i.e. an acceptable level of service). Relevant excerpts of the 2016 CTS are included in **Appendix E**.

For the 2020 and 2025 analysis years, Bank Street/Blais Road/Miikana Road was modelled based on the existing intersection at that time, which was a side-street stop-controlled intersection. The results of the total intersection analysis, which assumed signalization of this intersection and accounts for traffic generated by the subdivision and the proposed school, is included in Section 4.8.2. The results of the background intersection analysis for Bank Street/Blais Road/Miikana Road is shown in **Table 6**.

Table 6: Background Intersection Analysis

Intersection	Peak Hour	Critical v/c (Delay)	Critical Mvmt	LOS
2020 Analysis				
Bank Street/ Blais Road/Miikana Road	AM	0.06 (25 sec)	EBL/T/R	C
	PM	0.30 (50 sec)	EBL/T/R	E
2025 Analysis				
Bank Street/ Blais Road/Miikana Road	AM	0.25 (19 sec)	WBL/T/R	C
	PM	0.19 (41 sec)	EBL/T/R	E

From the previous table, the study area intersections are anticipated to operate at an acceptable Auto LOS C during the weekday AM peak hour and an unacceptable Auto LOS E during the weekday PM peak hour. It should be noted that in the 2025 analysis, the 2016 CTS assumed a widening of Bank Street from two lanes to four lanes throughout the study area. As described in Section 2.2.1, the 2013 TMP identifies the widening of Bank Street between Leitrim Road and Blais Road as a Phase 2 (2020-2025) project, while further widening between Blais Road and Rideau Road is identified as a Phase 3 (2026-2031) project.

4.0 ANALYSIS

4.1 Development Design

4.1.1 Design for Sustainable Modes

Pedestrian facilities will be provided between the main building entrances and the sidewalks along Miikana Road and Kelly Farm Drive. Sidewalks across the proposed accesses to Miikana Road and Kelly Farm Drive will be continuous, per the City of Ottawa Specification SC 7.1. Pedestrians from the subdivision will be able to enter/exit the subject site via existing sidewalks along Miikana Road and Kelly Farm Drive, which extend as far as Bank Street to the east and Leitrim Road to the north. At the northwest corner of the site, pedestrians on Miikana Road or Kelly Farm Drive will be able to cross to the school via the all-way stop-controlled intersection at Miikana Road/Kelly Farm Drive.

Bicycle parking will be provided in the northeast corner of the proposed bus pick-up/drop-off loop on Kelly Farm Drive, and immediately west of the proposed parking lot for staff/visitors.

As shown in Section 2.1.6, the subject site is within 400m walking distance of OC Transpo bus stops #0435, #0436, #0454, #0455, #0490, and #0491, which are served by routes 294 or 699. Stop #0454 is located at the southeast corner of the Miikana Road/Kelly Farm Drive intersection, and is therefore within the subject lands.

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 I**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met. In addition to the required measures, the proposed school also meets the following 'basic' or 'better' measures as defined in the *TDM-Supportive Development Design and Infrastructure Checklist*:

- Locate building close to the street, and do not locate parking areas between the street and building entrances;
- Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations;
- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort;
- Provide safe, direct, and attractive walking routes from building entrances to nearby transit stops.

4.1.2 Circulation and Access

A double-wide on-site bus loop is proposed with ingress/egress along Kelly Farm Drive. 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 depart one at a time. A sidewalk with a width of 2.5m will be provided along the proposed bus loop, connecting the bus loop to a gate to enter the schoolyard. Turning movement figures for school buses entering and exiting the bus loop are included in **Figure 7**.

A lay-by is also proposed on the south side of Miikana Road, for pick-ups and drop-offs. This proposed lay-by will have a width of 2.5m and a parallel length of approximately 80m. A sidewalk with a width of 1.8m will be provided along the lay-by, and will connect the lay-by to the school entrances along Miikana Road. The lay-by will be directly adjacent to the sidewalk (i.e. no boulevard will be provided), so that students will not have to travel through any snow storage areas to enter/exit vehicles that are picking them up or dropping them off. Depressed curb will be provided along the proposed lay-by, adjacent to the eastbound travel lane on Miikana Road.

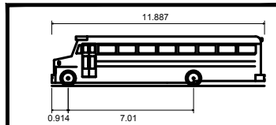
Garbage collection will take place at the southwest corner of the staff/visitor parking lot. One loading space is provided adjacent to the eastern face of the proposed school. Turning movement figures for a Medium Single Unit (MSU) design vehicle entering and exiting the staff/visitor parking lot are included in **Figure 8** and **Figure 9**.

The proposed on-site fire route will include the northern entrance of the bus loop to Kelly Farm Drive, and will run on an east-west alignment within the schoolyard, between the proposed school and the location of any future portables.

PROPOSED FINDLAY CREEK
PUBLIC SCHOOL
(TWO STOREY)

Sidewalk
Concrete
Concrete
Sidewalk
SSIB(AOG)
SSIB
Concrete
Sidewalk
Concrete
Sidewalk
Concrete
SSIB
SSIB(AOG)
Concrete
Sidewalk
Concrete

Conventional School Bus (65 pass.) - S-BUS 36



School Bus

Overall Length	11.887m
Overall Width	2.438m
Overall Body Height	2.762m
Min Body Ground Clearance	0.178m
Track Width	2.438m
Lock-to-lock time	5.00s
Curb to Curb Turning Radius	11.765m

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Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

820 MIIKANA ROAD

TURNING MOVEMENT (SCHOOL BUS)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE JUNE 2022 | JOB 122054 | FIGURE FIGURE 7

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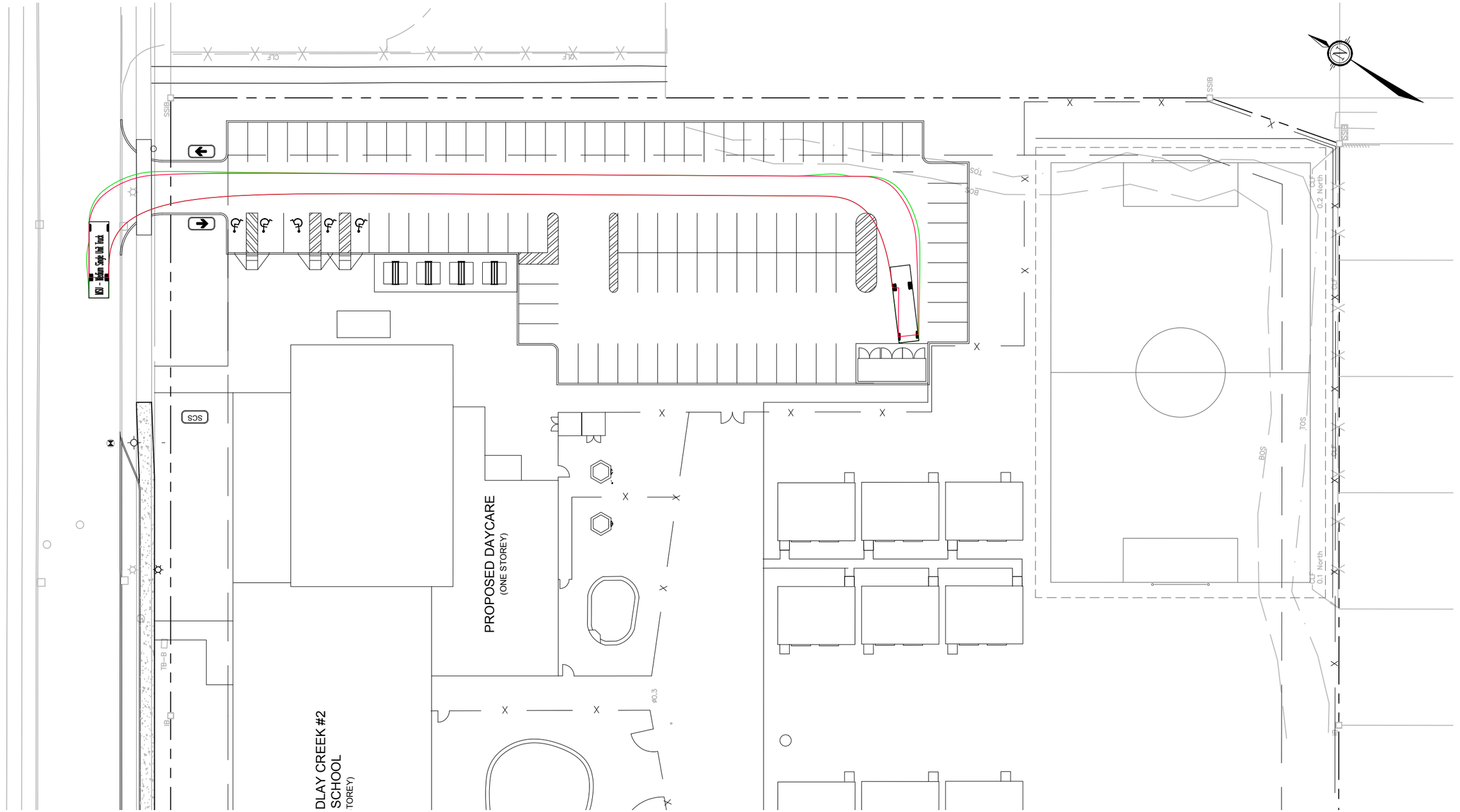

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

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Website www.novatech-eng.com

820 MIIKANA ROAD

TURNING MOVEMENT (MSU/GARBAGE TRUCK)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE JUNE 2022 | JOB 122054 | FIGURE FIGURE 8

SHT11X17.DWG - 279mmX432mm

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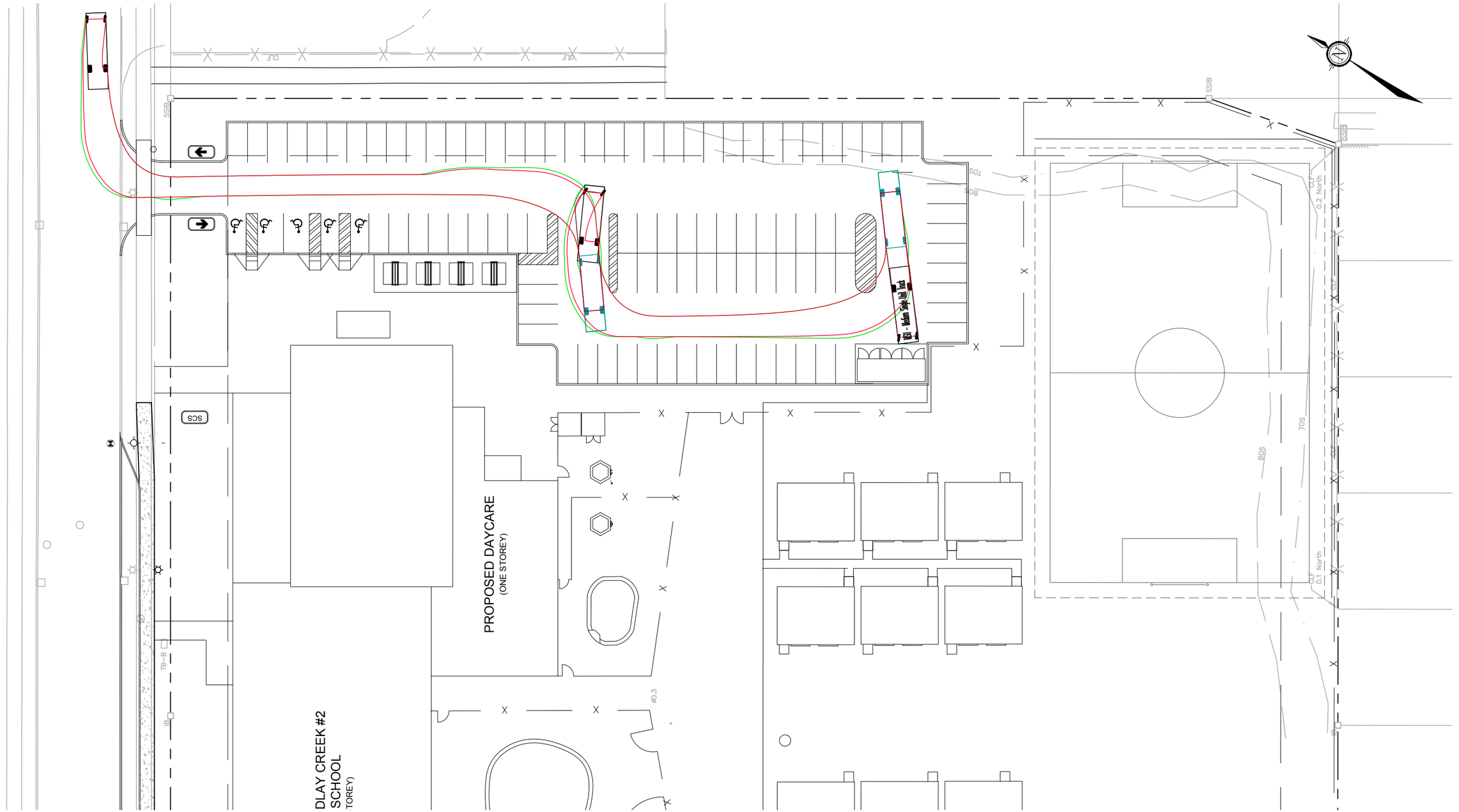

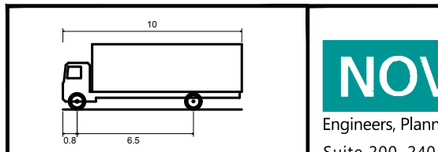

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

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820 MIIKANA ROAD

TURNING MOVEMENT (MSU/GARBAGE TRUCK)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE JUNE 2022 | JOB 122054 | FIGURE FIGURE 9

SHT11X17.DWG - 279mmX432mm

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4.2 Parking

The subject site is located within Area C on Schedules 1 and 1A of the City's *Zoning By-Law* (ZBL). Minimum vehicle parking, bicycle parking, and loading space rates for the proposed development are identified in Sections 101, 111, and 113 of the ZBL, and minimum accessible parking rates are identified in Section 3.1 of the City's *Accessibility Design Standards*. These minimum rates and the number of proposed spaces are summarized in **Table 7**.

Table 7: Required and Proposed Parking

Land Use	Rate	Units/GFA	Required	Provided
Minimum Vehicle Parking				
School, other	1.5 spaces per classroom (including portables)	45 rooms(1)	68	101
Daycare	2.0 spaces per 100 m^2 GFA	400 m^2	8	
		Total	**76**	**101**
Minimum Bicycle Parking				
School	1.0 spaces per 100 m^2 GFA	4,441 m^2	44	56
Minimum Loading Space				
School	1 space when GFA is between 2,000 and 4,999 m^2	4,441 m^2	1	1
Minimum Accessible Parking				
School	5 spaces when parking supply is between 101 and 133	101 spaces	5	5

1. Consisting of 27 classrooms in the proposed building, plus the potential for 18 additional portables

4.3 Boundary Streets

This section provides a review of the boundary streets Miikana Road and Kelly Farm Drive, using complete streets principles. The *MMLOS Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation on the boundary streets. Miikana Road and Kelly Farm Drive have been evaluated against the targets for any roadways 'within 300m of a school.'

The detailed MMLOS review of the boundary streets is included in **Appendix J**. A summary of the results are provided in **Table 8**.

Table 8: Segment MMLOS Summary

Boundary Street	PLOS		BLOS		TLOS		TkLOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Miikana Road	A	A	**F**	B	E	-	B	-
Kelly Farm Drive	A		**F**	D	E		B	

From the previous table, Miikana Road and Kelly Farm Drive achieve the target pedestrian level of service (PLOS) A, but do not achieve the target bicycle level of service (BLOS) B or D. Both boundary streets achieve a transit level of service (TLOS) E and a truck level of service (TkLOS) B, but no targets are identified in the *MMLOS Guidelines* for these two modes.

Based on Exhibit 11 of the *MMLOS Guidelines*, the target BLOS B or D can be achieved without implementing any cycling facilities on the boundary streets, by reducing the operating speed to 50 km/h. Since the operating speed is assumed to equal the posted speed limit plus 10 km/h, it is anticipated that introducing school zone speed limits (i.e. 40 km/h) in vicinity of the proposed school will achieve this. Therefore, no other recommendations are identified.

4.4 Access Intersections

A full-movement access to an on-site parking lot for staff and visitors is proposed on Miikana Road, east of the proposed school building. This access will serve 101 vehicle parking spaces. In addition, a lay-by is proposed on the south side of Miikana Road west of the proposed parking lot, and a bus loading zone is proposed on the east side of Kelly Farm Drive. The parking lot access to Miikana Road and bus loading accesses to Kelly Farm Drive have been evaluated using the relevant provisions of the City's *Private Approach By-Law* (PABL) and the Transportation Association of Canada (TAC)'s *Geometric Design Guide for Canadian Roads*.

Section 25(a) of the PABL identifies that a minimum of 46m of frontage is required to permit two one-way private approaches to one street. As the subject site has approximately 148m of frontage to Kelly Farm Drive, the proposed bus loading zone meets this requirement.

Sections 25(c) and 25(d) of the PABL identifies a maximum width requirement of 9m for any two-way private approach and 7.5m for any one-way private approach, as measured at the street line. Since a width of 6.7m is proposed for the access to Miikana Road and widths of 7.5m are proposed for the bus loading accesses to Kelly Farm Drive, this requirement is met.

Section 25(h) of the PABL identifies a minimum separation distance of 2m between any two one-way private approaches to the same property, as measured at the street line. Since the two bus loading accesses are approximately 63m apart at the street line, this requirement is met.

Section 25(p) of the PABL identifies a minimum separation distance of 3m between the nearest edge of a private approach and the property line, as measured at the street line. Since the proposed access to Miikana Road is 8.4m west of the nearest property line, this requirement is met.

Section 25(u) of the PABL identifies a maximum grade of 2% for the first 9m inside the property line, for any private approach serving a parking area of 50 or more parking spaces. However, Section 25(v) of the PABL identifies that deviations from the requirements of Section 25(u) may be permitted if the private approach is:

- a safe distance from the access serving the adjacent property,
- in such a manner that there are adequate sight lines for vehicles exiting the property, and
- in such a manner that it does not create a traffic hazard.

At the Miikana Road parking lot access, a grade of 4% towards the roadway is proposed for approximately 7.5m within the property, where it transitions to a 2% grade towards the parking lot. As the location of the driveway adheres to the requirements of the PABL and since the proposed 4% grade towards the roadway will not impact sight lines to pedestrians, cyclists, and vehicles along the roadway, the proposed access is not anticipated to create a traffic hazard. Relief from the requirements of Section 25(v) is requested.

TAC's *Geometric Design Guide* identifies minimum corner clearance distances between the nearest edge of a private approach and the nearest edge of an intersecting roadway. When accessing a collector roadway, TAC identifies a minimum corner clearance requirement of 20m to the nearest unsignalized intersection. This requirement is met by the proposed access to Miikana Road, as the nearest edge of the access is approximately 155m from Kelly Farm Drive. When accessing a local roadway, TAC identifies a minimum corner clearance requirement of 15m to the nearest

unsignalized intersection. This requirement is met by the proposed bus loading accesses to Kelly Farm Drive, as the northern edge of the loading zone is approximately 60m from Miikana Road and the southern edge of the loading zone is approximately 55m from Salamander Way.

A review of stopping sight distance (SSD) and intersection sight distance (ISD) at the proposed accesses has been conducted, in accordance with the minimum requirements outlined in TAC's *Geometric Design Guide*. For the purposes of this review, an operating speed of 50 km/h has been assumed (i.e. 10 km/h greater than the anticipated school zone speed limit of 40 km/h). Therefore, TAC outlines the following SSD and ISD requirements for the accesses to Miikana Road and Kelly Farm Drive.

- SSD: 65m required;
- ISD, looking right to turn left out of access: 105m required;
- ISD, looking left to turn right out of access: 95m required.

Miikana Road and Kelly Farm Drive do not have any vertical or horizontal curves that impact sightlines from any proposed access. As such, the required SSD and ISD are met.

A Roadway Modification Approval (RMA) application has been submitted under separate cover, in support of the proposed lay-by on the south side of Miikana Road. The functional design for this lay-by is included in **Appendix K**.

4.5 Transportation Demand Management

The proposed school conforms to the City's TDM initiatives by providing easy access to pedestrian and transit facilities in the study area. In addition, the Ottawa-Carleton District School Board (OCDSB) provides bus transportation for all students who reside within the following distances from the school:

- Junior and senior kindergarten: 0.8km or further from the school;
- First through eighth grade: 1.6km or further from the school.

The Ottawa Student Transportation Authority (OSTA) offers transportation alternatives, designed to promote active transportation and healthy living. As the student population of the school increases, consideration could be given by the OCDSB and OSTA to providing active transportation programs for this elementary school.

A review of the *TDM Measures Checklist* has been conducted and is included in **Appendix I**. The following measures will be implemented for the proposed school:

- Designate an internal coordinator, or contract with an external coordinator;
- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances;
- Provide online links to OC Transpo and STO information;
- Provide dedicated ridematching portal at OttawaRideMatch.com.

4.6 Neighbourhood Traffic Management

The City's *2017 TIA Guidelines* identify two-way peak hour traffic volume thresholds for considering when a Neighbourhood Traffic Management (NTM) plan should be developed, when a site relies on local or collector roadways for access. In proximity of the subject site, Miikana Road is classified as a collector roadway, and Kelly Farm Drive is classified as a collector roadway north of Miikana Road and a local roadway south of Miikana Road. The NTM two-way volume thresholds identified in the *2017 TIA Guidelines* are 300 vehicles during the peak hour or 2,500 vehicles per day for collector roadways, and 120 vehicles during the peak hour or 1,000 vehicles per day for local roadways.

For the purposes of this TIA, it is assumed that both Miikana Road and Kelly Farm Drive will meet their respective NTM thresholds. As discussed in Section 2.1.6, street-level photography from 2021 indicate that flex posts have been implemented on Kelly Farm Drive, north of Miikana Road. To reduce the operating speed of the boundary streets, implementing centreline flex posts along the frontages of the subject site to Miikana Road and Kelly Farm Drive could be considered. In addition, SCHOOL pavement markings on boundary streets and posted school zone speed limits of 40 km/h are recommended.

4.7 Transit

Based on OC Transpo's current bus routes in the study area, Route 294 (Hurdman ↔ Findlay Creek) is a peak-period, peak-direction route, and Route 699 (Findlay Creek ↔ Pierre de Blois School) is a route for a school west of the study area. All students attending the school and will arrive/depart by bus will take school buses rather than transit. Therefore, it is anticipated that the proposed development will not generate any new transit trips for staff, visitors, parents, or students.

4.8 Intersection Design

4.8.1 Intersection MMLOS

This section provides a review of the signalized study area intersections, using complete streets principles. Bank Street/Blais Road/Miikana Road and Bank Street/Dun Skipper Drive have been evaluated for PLOS, BLOS, and TkLOS. Since the *MMLOS Guidelines* does not identify a target TLOS for roadways without a RTTP designation, the TLOS of the study area intersections has not been evaluated. These intersections have been evaluated against the targets for intersections in the General Urban Area, per Schedule B of the City's Official Plan.

The full intersection MMLOS analysis is included in **Appendix J**. A summary of the results is shown in **Table 9**.

Table 9: Intersection MMLOS Summary

Intersection	PLOS		BLOS		TLOS		TkLOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Bank Street/Blais Road/Miikana Road	**E**	C	**F**	B	N/A		**E**	D
Bank Street/Dun Skipper Drive	**E**		**F**	C			**E**	D

From the previous table, the study area intersections do not meet the target PLOS C, BLOS B or C, or TkLOS D.

Bank Street/Blais Road/Miikana Road
The intersection does not meet the target PLOS C, BLOS B, or TkLOS D.

All approaches have an undivided cross-section equivalent to four or five lanes crossed (assuming a lane width equals 3.5m, per the *MMLOS Guidelines*). There is limited opportunity in improving the PLOS at each approach to the target PLOS C without reducing the number of travel lanes or restricting turning movements. Therefore, no recommendations are identified.

The east and west approaches do not meet the target BLOS, based on left turn characteristics. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists would enable eastbound and westbound cyclists to utilize the protected intersection, and meet the target BLOS. This is identified for the City's consideration.

All approaches do not meet the target TkLOS, which requires either multiple receiving lanes or a curb radius greater than 15m. Given the recent construction of the intersection, it is anticipated that truck movements were considered in the design. Therefore, no recommendations are identified.

Bank Street/Dun Skipper Drive
The intersection does not meet the target PLOS C, BLOS C, or TkLOS D.

All approaches have an undivided cross-section equivalent to five lanes crossed. There is limited opportunity in improving the PLOS at each approach to the target PLOS C without reducing the number of travel lanes or restricting turning movements. Therefore, no recommendations are identified.

The west approach does not meet the target BLOS C, based on left and right turn characteristics. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists would enable eastbound and westbound cyclists to utilize the protected intersection, and meet the target BLOS. This is identified for the City's consideration.

All approaches do not meet the target TkLOS, which requires either multiple receiving lanes or a curb radius greater than 15m. As Dun Skipper Drive is not a designated truck route, no recommendations are identified.

4.8.2 Total Traffic Analysis

Future total intersection analysis at Bank Street/Blais Road/Miikana Road and Bank Street/Dun Skipper Drive was included in the 2016 Remer Lands CTS, for the Phase 1 buildout year 2020 and full buildout year 2025. During both years of analysis, both intersections were projected to operate at a vehicular level of service (Auto LOS) D or better (i.e. an acceptable level of service). Relevant excerpts of the 2016 CTS are included in **Appendix E**.

For the 2020 and 2025 analysis years, Bank Street/Blais Road/Miikana Road and Bank Street/Dun Skipper Drive were modelled as both two-lane roundabouts and traffic signals. Since both intersections have been signalized, the analysis where traffic signals were assumed for both intersections is included in **Table 10**.

Table 10: Total Intersection Analysis

Intersection	Peak Hour	Critical v/c (LOS)	Critical Mvmt	Intersection LOS
2020 Analysis				
Bank Street/ Blais Road/Miikana Road	AM	0.86 (D)	NBL/T/R	B
	PM	0.90 (D)	SBL/T	C
Bank Street/ Dun Skipper Drive	AM	0.64 (B)	NBT	-
	PM	0.87 (D)	SBT	-
2025 Analysis				
Bank Street/ Blais Road/Miikana Road	AM	0.77 (C)	EBL	B
	PM	0.74 (C)	EBL	A
Bank Street/ Dun Skipper Drive	AM	0.47 (A)	NBT	-
	PM	0.52 (A)	SBT	-

From the previous table, the study area intersections are anticipated to operate at an acceptable vehicular level of service (Auto LOS) D or better during both analysis periods. It should be noted that in the 2025 analysis, the 2016 CTS assumed a widening of Bank Street from two lanes to four lanes throughout the study area. As described in Section 2.2.1, the 2013 TMP identifies the widening of Bank Street between Leitrim Road and Blais Road as a Phase 2 (2020-2025) project, while further widening between Blais Road and Rideau Road is identified as a Phase 3 (2026-2031) project.

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 Miikana Road and Kelly Farm Drive. Sidewalks across the proposed accesses to Miikana Road and Kelly Farm Drive will be continuous, per City of Ottawa Specification SC 7.1.

- Pedestrians from the subdivision will be able to enter/exit the subject site via existing sidewalks along Miikana Road and Kelly Farm Drive, which extend as far as Bank Street to the east and Leitrim Road to the north. At the northwest corner of the site, pedestrians on Miikana Road or Kelly Farm Drive will be able to cross to the school via the all-way stop-controlled intersection at Miikana Road/Kelly Farm Drive.

- Bicycle parking will be provided in the northeast corner of the proposed bus pick-up/drop-off loop on Kelly Farm Drive, and immediately west of the proposed parking lot for staff/visitors.

- All required Transportation Demand Management (TDM)-supportive design and infrastructure measures in the TDM checklist are met.

- The proposed double-wide bus loop along Kelly Farm Drive will have a width of 7.5m and a parallel length of approximately 50m. The width of the bus loop allows for two rows for buses to queue within the site and wait for students to load. Once all students are loaded onto the

buses, the buses will depart one at a time. A sidewalk with a width of 2.5m will be provided along the bus loop, connecting the loop to a gate to enter the schoolyard.

- The proposed lay-by along Miikana Road will have a width of 2.5m and a parallel length of approximately 80m. A sidewalk with a width of 1.8m will be provided along the lay-by. Locating the lay-by directly adjacent to the sidewalk is proposed, so that students will not have to travel through any snow storage areas to enter/exit vehicles that are picking them up or dropping them off. Depressed curb will be provided along the length of the proposed lay-by, adjacent to the eastbound travel lane on Miikana Road.

- Garbage collection will take place at the southwest corner of the staff/visitor parking lot. One loading space is provided adjacent to the eastern face of the proposed school. The proposed on-site fire route will include the northern entrance of the bus loop to Kelly Farm Drive, and will run on an east-west alignment within the schoolyard, between the proposed school and the location of any future portables.

- The proposed parking lot meets the minimum requirements for vehicle parking, bicycle parking, accessible parking, and loading spaces.

Boundary Streets

- Miikana Road and Kelly Farm Drive achieve the target pedestrian level of service (PLOS) A, but do not achieve the target bicycle level of service (BLOS) B/D. Both boundary streets achieve a transit level of service (TLOS) E and a truck level of service (TkLOS) B, but no targets are identified in the *MMLOS Guidelines* for these two modes.

- The target BLOS can be achieved without implementing any cycling facilities, by reducing the operating speed to 50 km/h. Since the operating speed is assumed to equal the posted speed limit plus 10 km/h, it is anticipated that introducing school zone speed limits (i.e. 40 km/h) in vicinity of the proposed school will achieve this. Therefore, no other recommendations are identified.

Access Design

- The parking lot access to Miikana Road and bus loading accesses to Kelly Farm Drive meet all relevant width, location, and spacing provisions of the City's *Private Approach By-Law* (PABL) and the Transportation Association of Canada's *Geometric Design Guide for Canadian Roads*.

- As the location of the driveway adheres to the requirements of the PABL and since the proposed 4% grade towards the roadway will not impact sight lines to pedestrians, cyclists, and vehicles along the roadway, the proposed access is not anticipated to create a traffic hazard. Relief from the requirements of Section 25(u) is requested.

- As Miikana Road and Kelly Farm Drive do not have any vertical or horizontal curves that impact sightlines from any proposed access location, the required stopping sight distance and intersection sight distance requirements are met.

Transportation Demand Management

- The Ottawa-Carleton District School Board (OCDSB) provides bus transportation for all students who reside within the following distances from the school:
    - Junior and senior kindergarten: 0.8km or further from the school;

- First through eighth grade: 1.6km or further from the school.

- The Ottawa Student Transportation Authority (OSTA) offers transportation alternatives, designed to promote active transportation and healthy living. As the student population of the school increases, consideration could be given by the OCDSB and OSTA to providing active transportation programs for this elementary school.

- The following measures will be implemented for the proposed school:
  - Designate an internal coordinator, or contract with an external coordinator;
  - Display local area maps with walking/cycling access routes and key destinations at major entrances;
  - Display relevant transit schedules and route maps at entrances;
  - Provide online links to OC Transpo and STO information;
  - Provide dedicated ridematching portal at OttawaRideMatch.com.

Neighbourhood Traffic Management

- Street-level photography from 2021 indicate that flex posts have been implemented on Kelly Farm Drive, north of Miikana Road. To reduce the operating speed of the boundary streets Miikana Road and Kelly Farm Drive, implementing flex posts along the frontages of the subject site could be considered. In addition, SCHOOL pavement markings on boundary streets and posted school zone speed limits of 40 km/h are recommended.

Transit

- It is anticipated that the proposed development will not generate any new transit trips for staff, visitors, parents, or students.

Intersection MMLOS

- The study area intersections do not meet the target PLOS C, BLOS B/C, or TkLOS D.

- All approaches of Bank Street/Blais Road/Miikana Road have an undivided cross-section equivalent to four or five lanes crossed. There is limited opportunity in improving the PLOS at each approach to the target PLOS C without reducing the number of travel lanes or restricting turning movements. Therefore, no recommendations are identified.

- The east and west approaches of Bank Street/Blais Road/Miikana Road do not meet the target BLOS, based on left turn characteristics. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists would enable eastbound and westbound cyclists to utilize the protected intersection, and meet the target BLOS. This is identified for the City's consideration.

- All approaches of Bank Street/Blais Road/Miikana Road do not meet the target TkLOS, which requires either multiple receiving lanes or a curb radius greater than 15m. Given the recent construction of the intersection, it is anticipated that truck movements were considered in the design. Therefore, no recommendations are identified.

- All approaches of Bank Street/Dun Skipper Drive have an undivided cross-section equivalent to five lanes crossed. There is limited opportunity in improving the PLOS at each approach to the target PLOS C without reducing the number of travel lanes or restricting turning movements. Therefore, no recommendations are identified.

- The west approach of Bank Street/Dun Skipper Drive does not meet the target BLOS C, based on left and right turn characteristics. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists would enable eastbound and westbound cyclists to utilize the protected intersection, and meet the target BLOS. This is identified for the City's consideration.

- All approaches of Bank Street/Dun Skipper Drive do not meet the target TkLOS, which requires either multiple receiving lanes or a curb radius greater than 15m. As Dun Skipper Drive is not a designated truck route, no recommendations are identified.

- The study area intersections are anticipated to operate at an acceptable vehicular level of service (Auto LOS) D or better during both analysis periods.

Based on the foregoing, the proposed school is recommended from a transportation perspective.

NOVATECH

Prepared by:

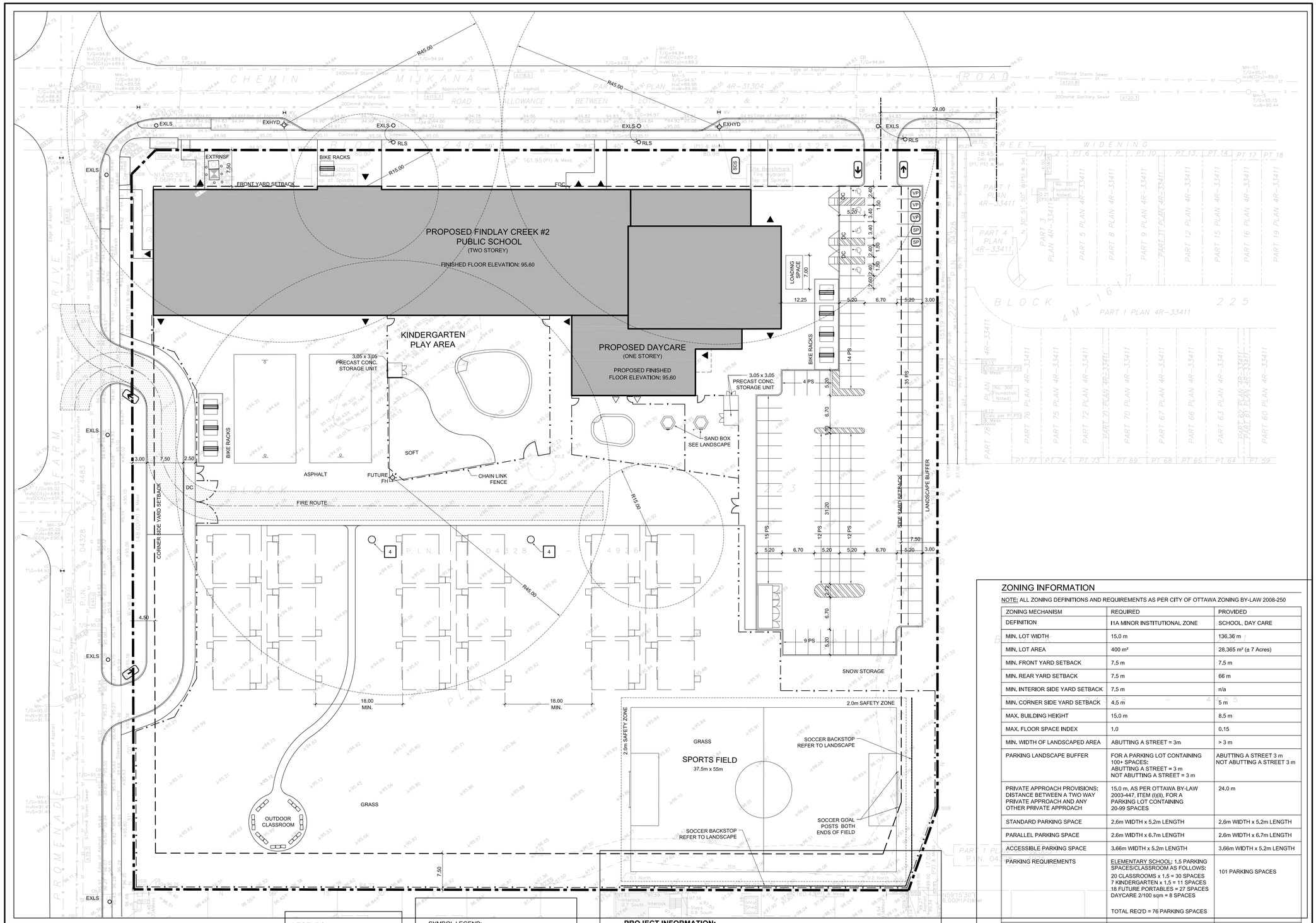
Joshua Audia, B.Sc.
E.I.T. | Transportation/Traffic

Reviewed by:

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

APPENDIX A

Proposed Site Plan



1 SITE PLAN
A-001 SCALE 1:400

LEGENDS

SIGNAGE LEGEND:

- NO TRESPASSING
- FR — FIRE ROUTE
- BF — HANDICAP PARKING
- ONE WAY
- D — DROP OFF ONLY
- VP — VISITOR PARKING
- SP — STAFF PARKING
- TP — TEMPORARY PARKING
- SCS — SCHOOL SIGN

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
STMH	STORM MANHOLE - SEE CIVIL
	BUILDING ENTRANCE/EXIT
EXTRNSF	EXISTING TRANSFORMER
FDC	FIRE DEPARTMENT CONNECTION
DC	NEW DEPRESSED CURB
	NEW CURB
	PROPERTY LINE
	NEW CHAIN LINK FENCE

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, PLAN OF BLOCK 223, REGISTERED PLAN 4M-1617, CITY OF OTTAWA

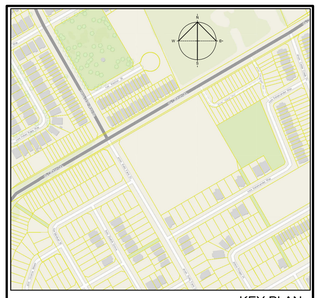
PREPARED BY FARLE Y, SMITH & DENIS SURVEYING LTD, APRIL 12, 2022

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 100+ SPACES: ABUTTING A STREET = 3 m NOT ABUTTING A STREET = 3 m	ABUTTING A STREET 3 m NOT ABUTTING A STREET 3 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	24,0 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: 20 CLASSROOMS x 1,5 = 30 SPACES 7 KINDERGARTEN x 1,5 = 11 SPACES 18 FUTURE PORTABLES = 27 SPACES DAYCARE 2/100 sqm = 8 SPACES TOTAL REQ'D = 76 PARKING SPACES	101 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 101-133 SPACES, 5 BARRIER FREE ACCESSIBLE SPACES ARE REQUIRED	5 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.	

OTTAWA-CARLETON
DISTRICT SCHOOL BOARD



KEY PLAN

APPROVED ☐ REFUSED ☐

DATE _____

_____
Xxxx Xxxx, P. Eng., Manager Development Review, Suburban Services

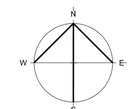
no.	revision	date
3		
2		
1	ISSUED FOR SITE PLAN CONTROL	XX MAY 22

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

project
FINDLAY CREEK #2 PUBLIC SCHOOL

820 MIIKANA ROAD
OTTAWA, ON

project north



seal

drawing title
SITE PLAN

scale AS NOTED	drawn by NF
date JUNE 2022	checked by VP
project number 22-719	drawing number A-001

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	**4501 Kelly Farm Drive**
Description of Location	**Southeast corner of Kelly Farm Drive and Miikana Road**
Land Use Classification	**Elementary School**
Development Size (units)	
Development Size (m^2)	
Number of Accesses and Locations	**One surface parking lot access to Miikana Road** **Two one-way bus loop accesses to Kelly Farm Drive**
Phase of Development	**One**
Buildout Year	

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?		×
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		×

**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?		×
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		×
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?		×
Does the proposed driveway make use of an existing median break that serves an existing site?		×
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		×
Does the development include a drive-thru facility?		×

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?		×
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

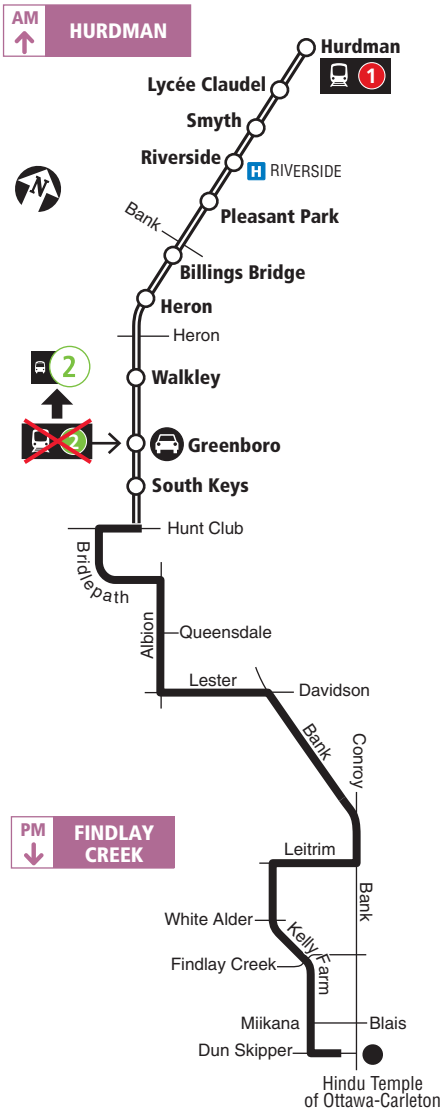
OC Transpo Route Maps

294 Connexion

HURDMAN
FINDLAY CREEK

Monday to Friday / Lundi au vendredi

Peak periods only
Périodes de pointe seulement



Transitway & Station

Park & Ride / Parc-o-bus

2021.06

Schedule / Horaire 613-560-1000
Text / Texto* 560560
plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres
*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service
Service à la clientèle **613-741-4390**

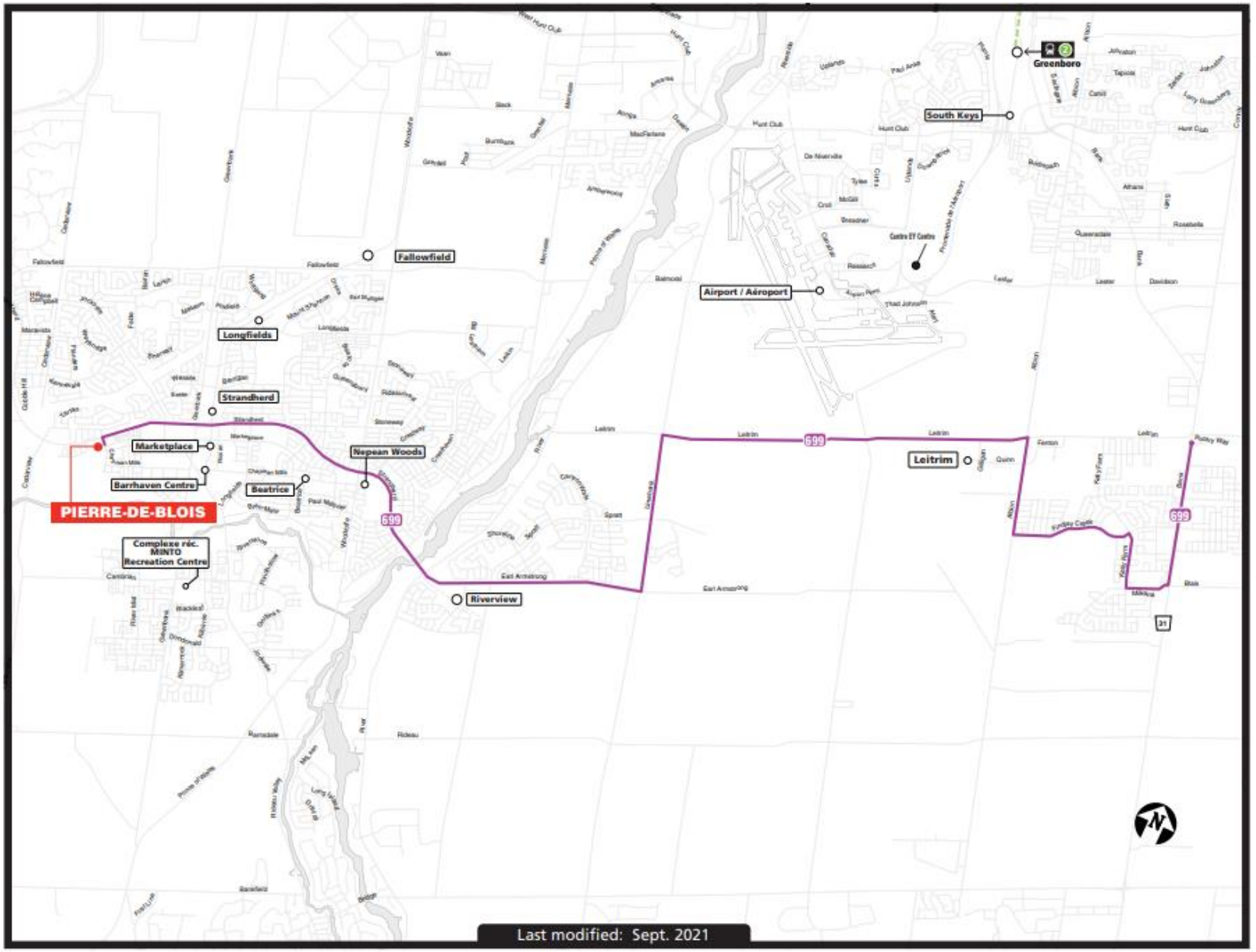
Lost and Found / Objets perdus..... **613-563-4011**

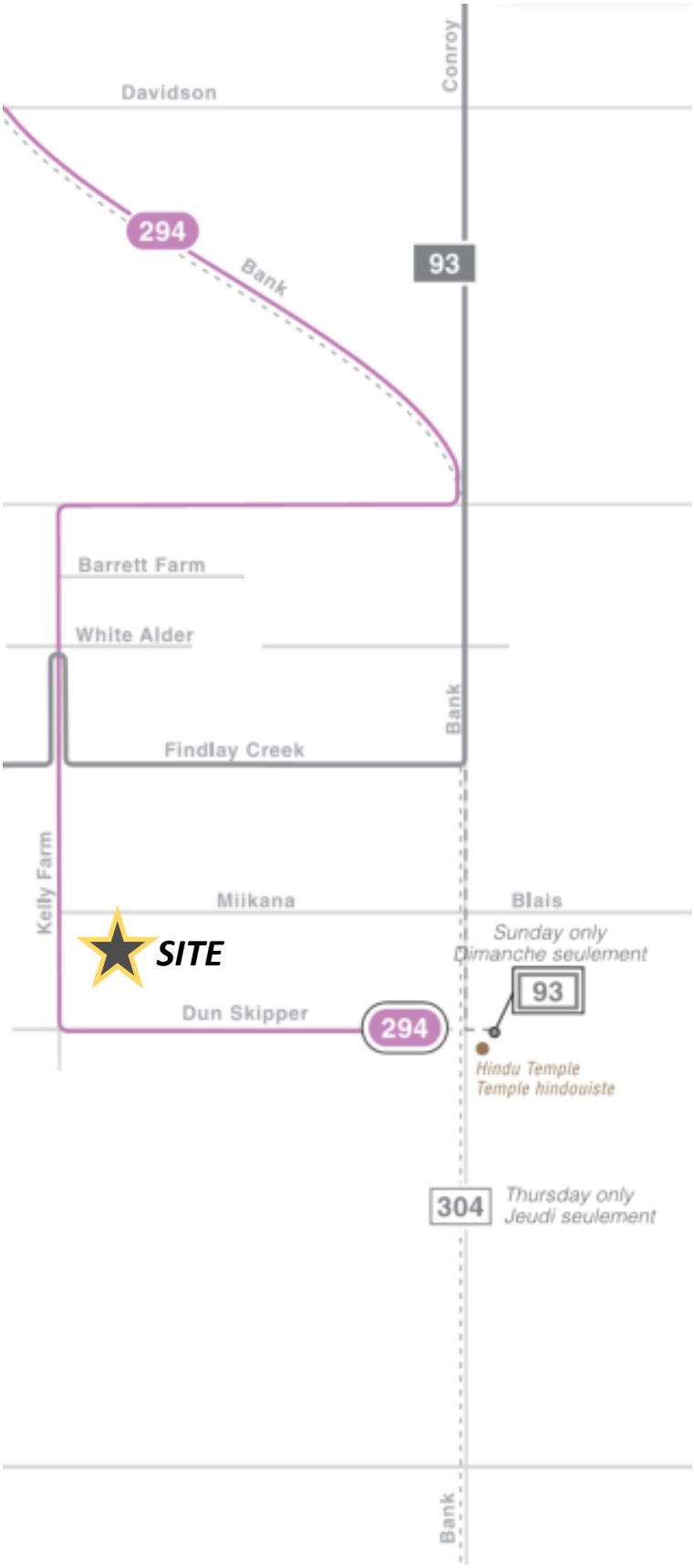
Security / Sécurité **613-741-2478**

Effective June 20, 2021
En vigueur 20 juin 2021

OC Transpo

INFO 613-741-4390
octranspo.com


Greenboro
South Keys
Fallowfield
Longfields
Strandherd
Marketplace
Barrhaven Centre
PIERRE-DE-BLOIS
Complexe récr. MINTO Recreation Centre
Beatrice
Nepean Woods
Riverview
Airport / Aéroport
Centre EY Centre
Leitrim
699
31
Last modified: Sept. 2021


Conroy
Davidson
294
Bank
93
Barrett Farm
White Alder
Bank
Findlay Creek
Kelly Farm
Miikana
Blais
SITE
Sunday only
Dimanche seulement
93
Dun Skipper
294
Hindu Temple
Temple hindouiste
304
Thursday only
Jeudi seulement
Bank

APPENDIX D

Traffic Count Data

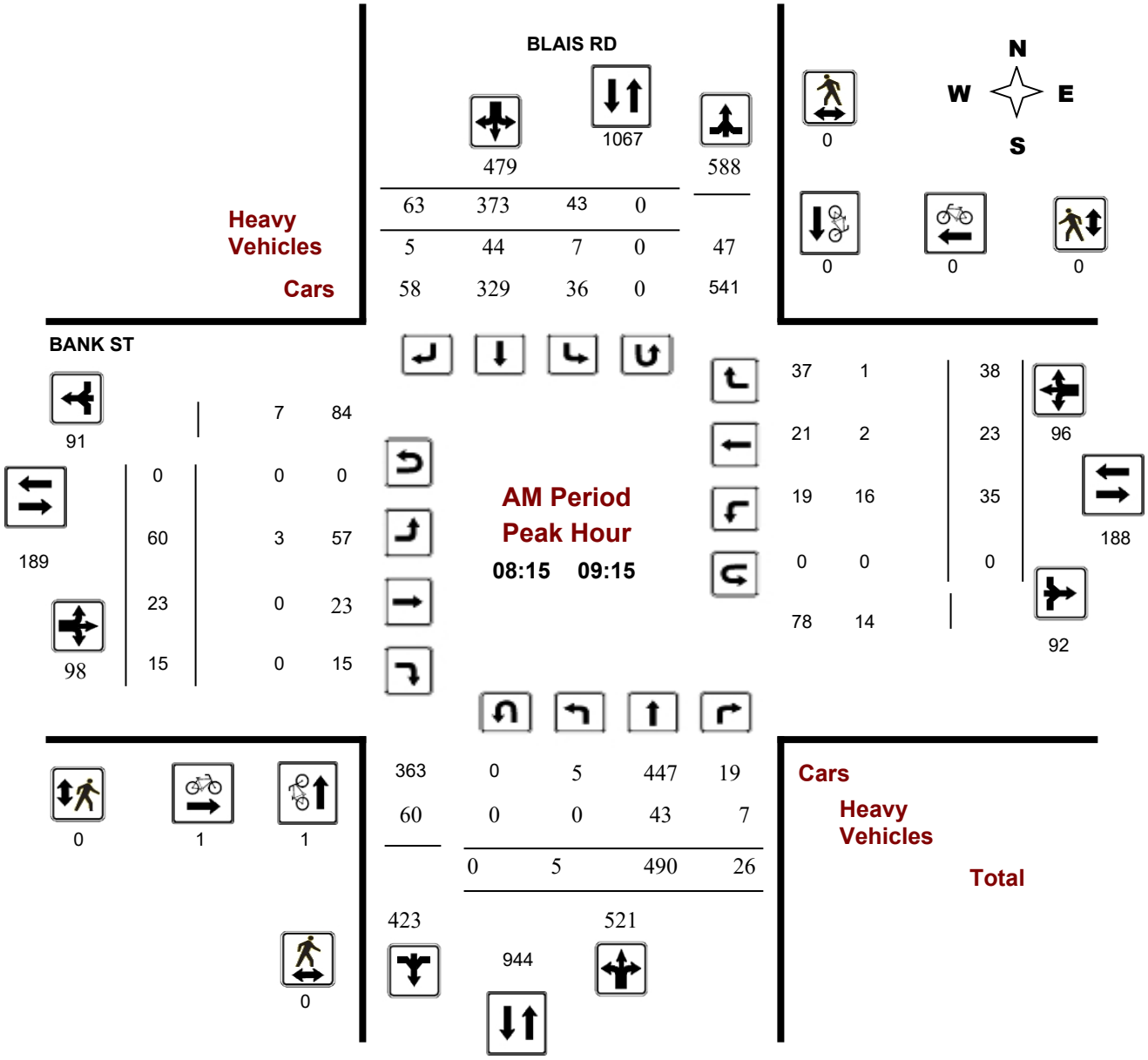
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ BLAIS RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39938

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



Comments

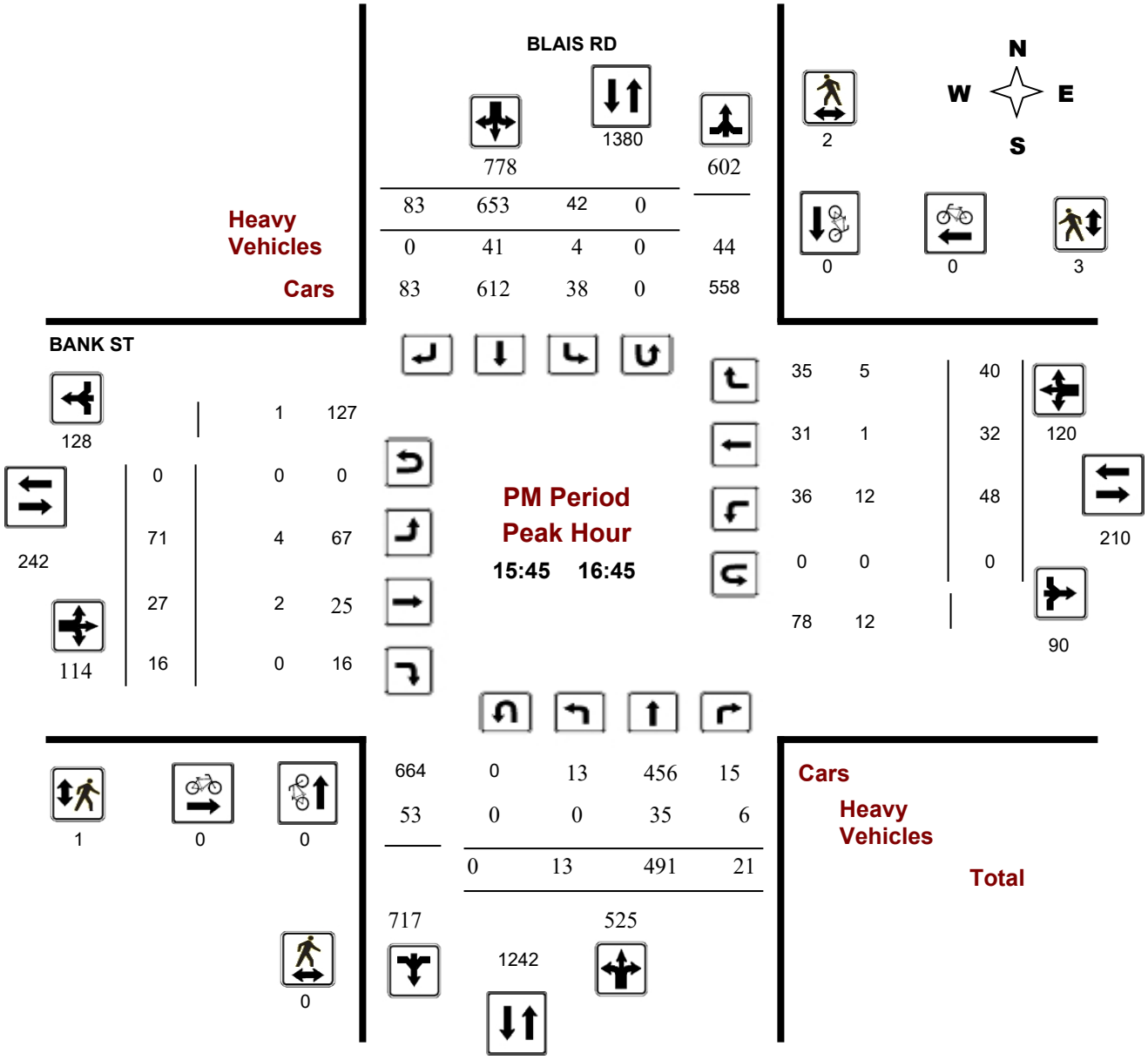
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ BLAIS RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39938

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BANK ST @ BLAIS RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39938

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, October 19, 2021

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

.90

	BLAIS RD									BANK ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	3	461	34	**498**	28	305	43	**376**	**874**	46	30	8	**84**	27	20	44	**91**	**175**	**1049**
08:00 09:00	6	476	36	**518**	44	377	59	**480**	**998**	63	33	10	**106**	35	20	35	**90**	**196**	**1194**
09:00 10:00	4	444	21	**469**	29	405	50	**484**	**953**	54	8	8	**70**	34	18	32	**84**	**154**	**1107**
11:30 12:30	8	436	29	**473**	26	468	62	**556**	**1029**	62	17	9	**88**	31	12	41	**84**	**172**	**1201**
12:30 13:30	8	411	25	**444**	32	490	59	**581**	**1025**	48	7	8	**63**	36	18	29	**83**	**146**	**1171**
15:00 16:00	9	418	36	**463**	38	599	63	**700**	**1163**	66	29	14	**109**	46	35	46	**127**	**236**	**1399**
16:00 17:00	12	478	19	**509**	42	648	78	**768**	**1277**	65	19	15	**99**	47	26	53	**126**	**225**	**1502**
17:00 18:00	14	422	29	**465**	32	492	70	**594**	**1059**	42	11	13	**66**	34	28	44	**106**	**172**	**1231**
Sub Total	64	3546	229	**3839**	271	3784	484	**4539**	**8378**	446	154	85	**685**	290	177	324	**791**	**1476**	**9854**
U Turns	0			**0**	0			**0**	**0**	**0**			**0**	0			**0**	**0**	**0**
Total	64	3546	229	**3839**	271	3784	484	**4539**	**8378**	446	154	85	**685**	290	177	324	**791**	**1476**	**9854**
EQ 12Hr	89	4929	318	**5336**	377	5260	673	**6310**	**11646**	620	214	118	**952**	403	246	450	**1099**	**2051**	**13697**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	80	4436	286	**4802**	339	4734	606	**5679**	**10481**	558	193	106	**857**	363	221	405	**989**	**1846**	**12327**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	105	5811	375	**6291**	444	6202	794	**7440**	**13731**	731	253	139	**1123**	476	290	531	**1297**	**2420**	**16151**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

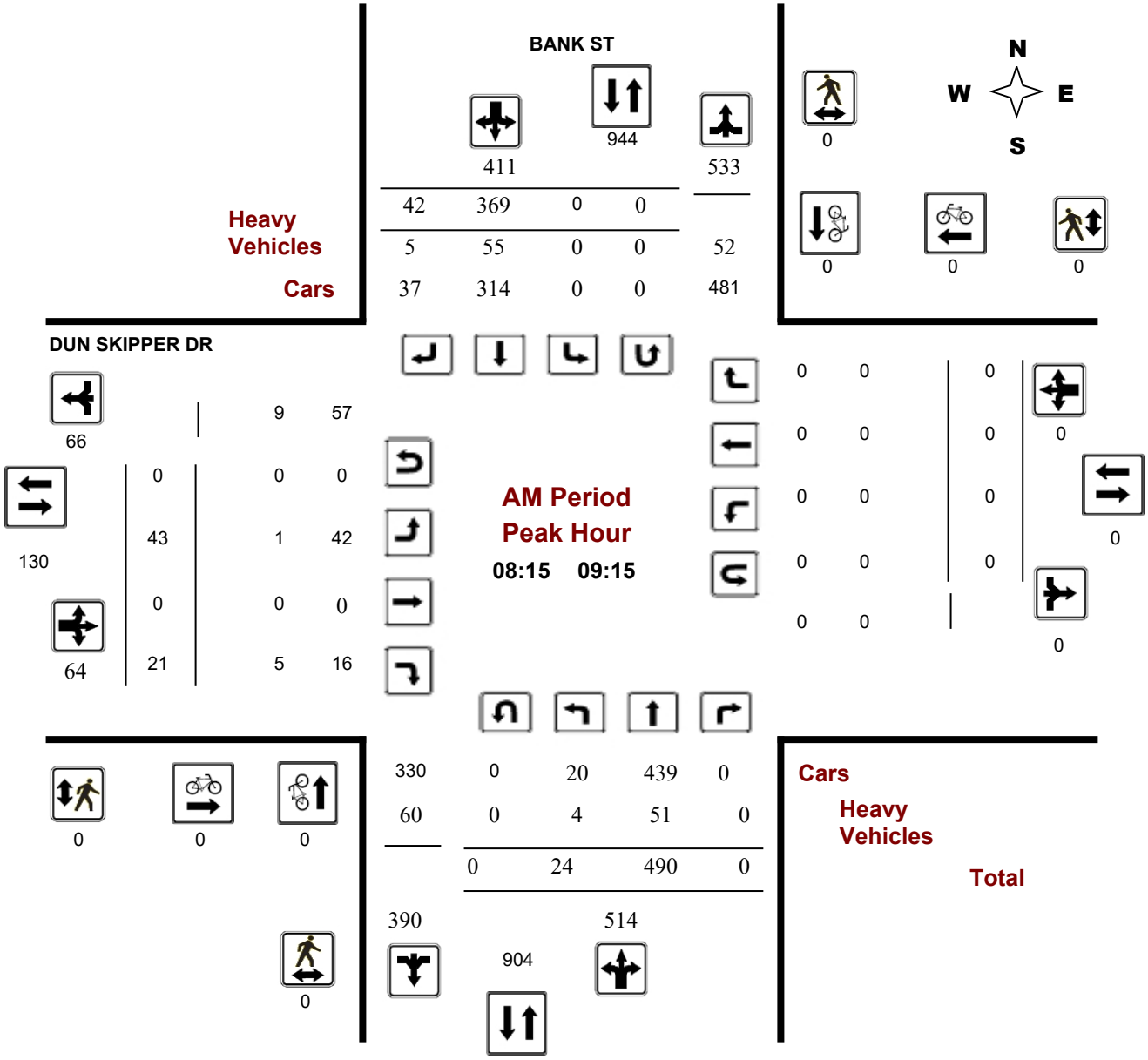
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ DUN SKIPPER DR

Survey Date: Tuesday, October 19, 2021 **WO No:** 39939

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



Comments

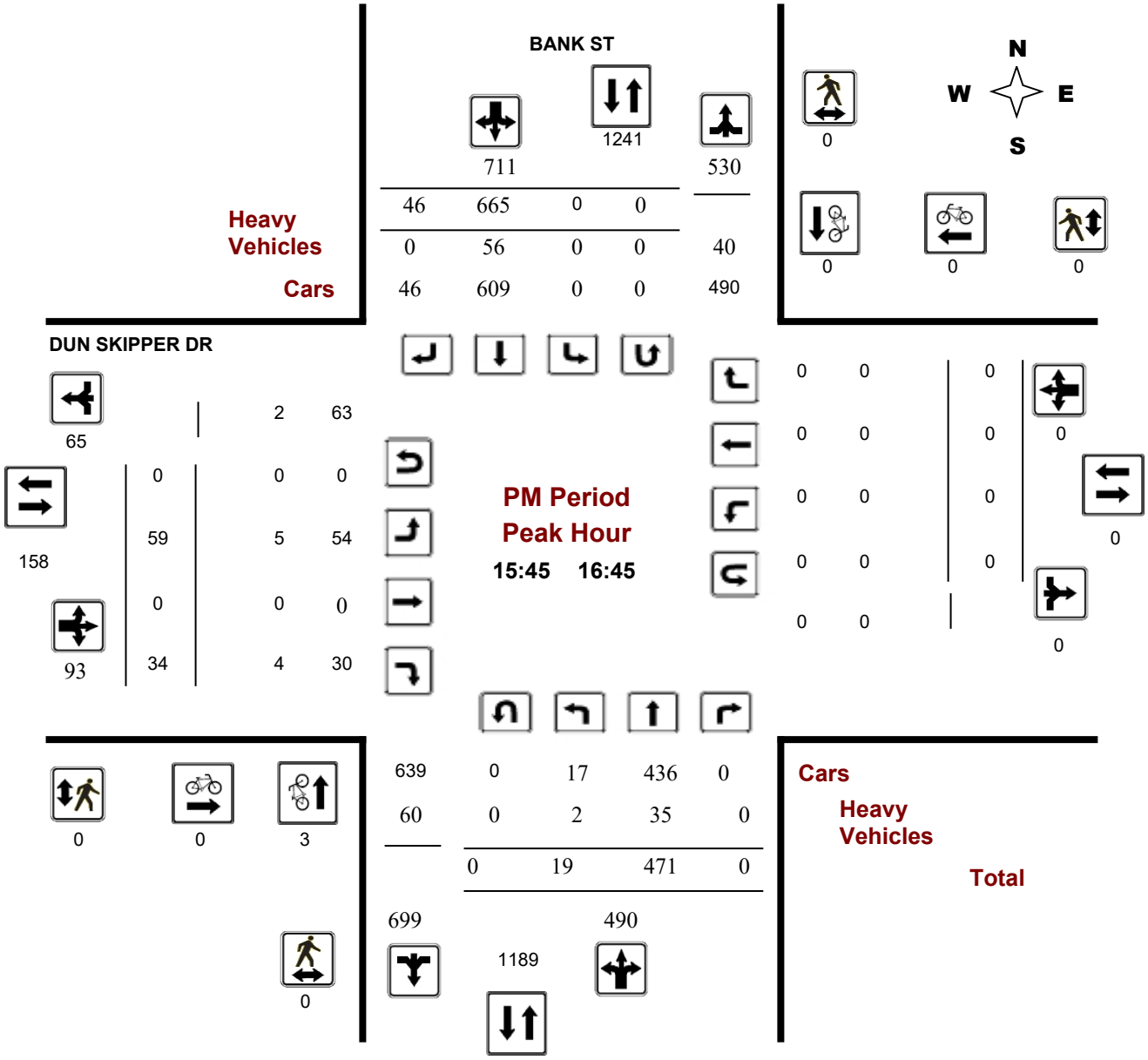
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ DUN SKIPPER DR

Survey Date: Tuesday, October 19, 2021 **WO No:** 39939

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



Comments

APPENDIX E

Relevant Excerpts of 2016 Remer Lands CTS

3.2 Existing Traffic Volumes

Peak period turning movement counts at existing study area intersections were provided by the City of Ottawa.

- Findlay Creek Drive and Bank Street (Friday June 5, 2015)
- Findlay Creek Shopping Centre Access and Bank Street (Wednesday, May 27, 2015)

Existing (2016) peak hour traffic were derived from these counts by factoring all through movements along Bank Street and Blais Road by a 1% linear background growth rate. A justification for the 1% background growth rate has been provided in Section 4.1: Future Background Growth.

The resulting peak hour traffic volumes are shown in Exhibit 4. Raw traffic count sheets and existing signal timing plans have been provided Appendix A.

3.3 Existing Bicycle and Pedestrian Facilities

There are currently no formal pedestrian facilities along Bank Street linking the facilities provided at the intersections. Sidewalks are expected to be provided along the collector roads to facilitate access to the adjacent network. Some local roadways will also have sidewalks to provide connections to local parks and pathways.

According to the Ottawa Cycling Plan (November 2013), Bank Street is classified as a Spine or City-Wide cycling route. An exclusive bike lane exists in the southbound direction between Findlay Creek Drive and the Findlay Creek Shopping Centre access. Paved shoulders are provided along Bank Street in the north and southbound directions between Leitrim Road and Blais Road (source: geoOttawa, 2016). Paved shoulders are not provided on any of the other arterial roads within the study area. No dedicated bicycle lanes or facilities are planned within the proposed development at this time. Further review of active transportation facilities may be reviewed at the site plan stage.

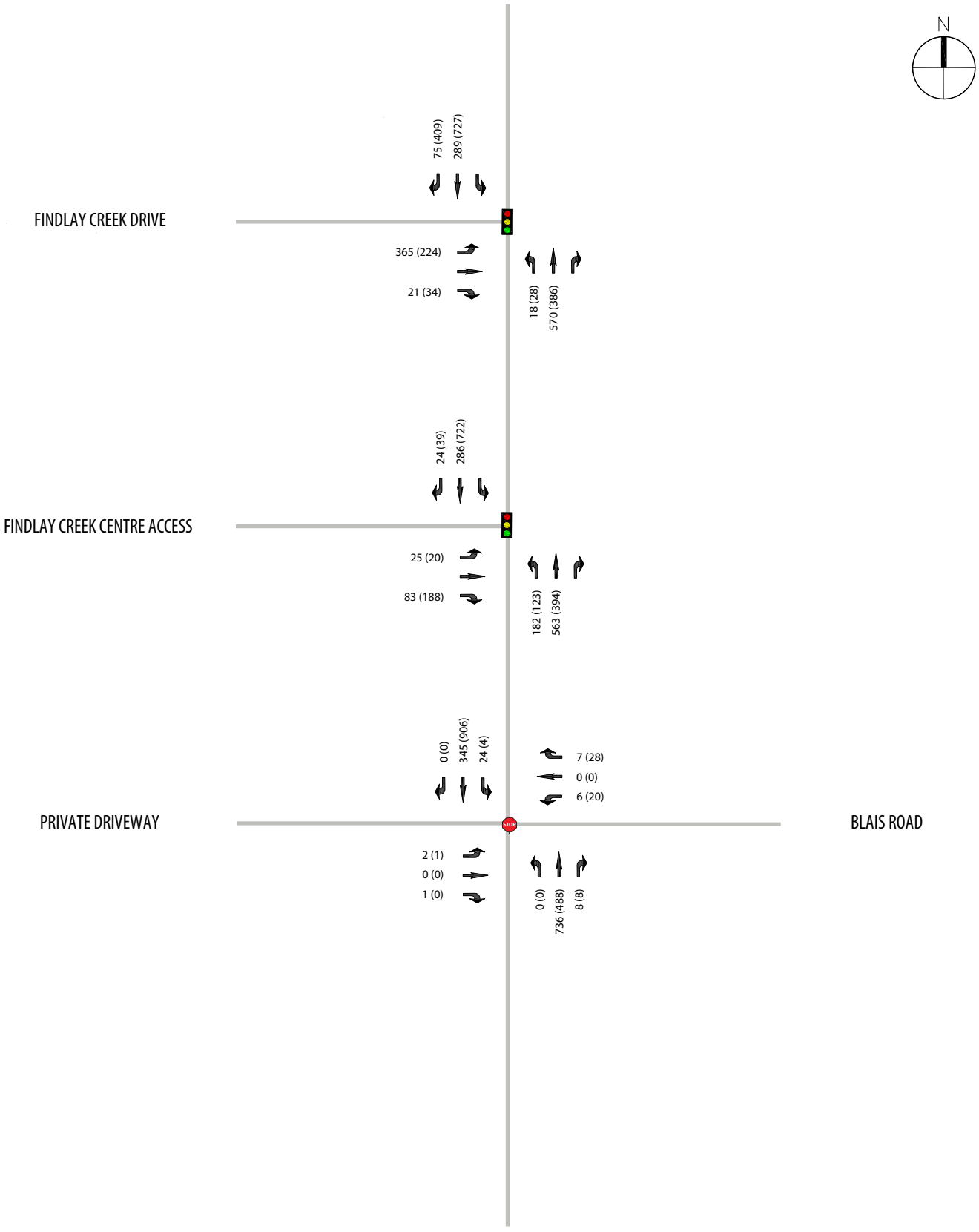
3.4 Existing Transit Facilities and Service

Transit service is currently provided along Bank Street and through the Findlay Creek Subdivision. Details of routes currently in operation within the study area are provided in Table 4 and in Exhibit 5 below. Transit service maps have been provided in Appendix B.

TABLE 4 – Existing Transit Service

ROUTE	DESCRIPTION	SERVICE PERIOD	PEAK HOUR FREQUENCY
99	Greenboro to Riverview/ Manotick	Weekdays: 6am-Midnight	15 to 30-minute
144	Leitrim to South Keys	Weekdays: 6:30am-12:30am	30-minute
204	Greely/Metcalfe to South Keys/Billings Bridge	Thursdays: 9:45am NB & 2:45pm SB (Free Service)	One Trip Every Thursday Per Direction

The nearest bus stops (#3284 and #3289) with daily service are located approximately 800m north of the intersection of Blais Road, as shown in Exhibit 6. These bus stops provide access to route 144, which is meant to service the Findlay Creek Village Community.



LEGEND

XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES

IBI

Regional Group - Remer Lands
Community Transportation Study

EXHIBIT 3
Existing (2016) AM & PM Peak
Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS

4.2.1 Kelly Farm Drive

Kelly Farm Drive - a north-south collector road in Findlay Creek Village - will be extended from White Alder Avenue to Leitrim Road as part of the proposed Barrett Lands Subdivision, located directly north of Findlay Creek Village. It is anticipated that this will trigger a redistribution of existing traffic volumes from the Findlay Creek Village development. Currently, the most direct route to Leitrim Road for Findlay Creek residents is along Bank Street. The new Kelly Farm Drive extension is expected to provide an attractive alternative. It is estimated that this redistribution will result in a transfer of approximately 20% of existing to/from Bank Street via the Findlay Creek Drive intersection to the Kelly Farm Drive extension. This redistributed traffic will then access Bank Street via the Bank Street/Leitrim Road intersection.

This redirection was not considered in this report due to the uncertainty about the Barrett Lands Subdivision development plans. However, this point is important to note; the reduction in traffic at Findlay Creek Drive and Bank Street will not be insignificant once the extension is ultimately completed, and should be taken into consideration in the final analysis.

4.3 Future Total Background Traffic Volumes

The estimated future (2020) and (2025) background weekday peak hour traffic volumes are shown in Exhibits 10 and 11 respectively.

4.4 Trip Generation

The peak hour traffic volumes from the proposed development were determined using standard peak hour trip generation rates from the ITE Manual, “Trip Generation”, 9th Edition, 2012, published by the Institute of Transportation Engineers (ITE), Washington.

The proposed density and layout of the proposed commercial blocks were not known at the time of this study. Therefore, the traffic generation for these uses were estimated using a blended trip generation rate derived from local data. The data was recorded during the weekday morning and afternoon peak hours at the existing Findlay Creek Centre, located approximately 300m south of Findlay Creek Drive.

Findlay Creek Centre is a typical example of a mixed-used commercial development in suburban Ottawa. It consists of a mix of retail (supermarket, automotive store, pharmacy and specialty retail stores) together with service uses (banks, medical offices, day care) and restaurants. It was assumed the commercial blocks within the proposed development will be of a similar mix.

Findlay Creek Centre has approximately 150,000 sq ft of gross floor area (GFA), comprising two main buildings located to the rear of the site and smaller buildings along the Bank Street and Findlay Creek Drive frontages. The calculated floor area ratio (the gross floor area vs. the total property area) was 0.23 or 23%. This ratio was applied to both proposed commercial blocks to estimate the density.

The data collection exercise at Findlay Creek Centre was conducted on Tuesday, January 21, 2014 and consisted of peak period traffic counts at each of the three access driveways. Based on the peak hour volumes recorded, the average trip generation rates for the morning and afternoon peak hours were 3.07 veh/h/1,000 sq ft GFA and 5.83 veh/h/1,000 sq ft GFA respectively.

The ITE trip generation results for the subject site is summarized in Table 8. The relevant extracts from the ITE Manual have been provided in Appendix E.

TABLE 8 – Remer Lands Development Vehicle Trip Generation

LAND USE	SIZE	SOURCE	RATE	PERIOD	SPLIT		GENERATED TRAFFIC (VPH)		
					IN	OUT	IN	OUT	TOTAL
Single Family	422 DU	ITE 210	Formula 1	AM	25%	75%	76	229	305
				PM	63%	37%	242	142	384
Apartment	84 DU	ITE 220	Formula 2	AM	20%	80%	9	36	45
				PM	65%	35%	42	22	64
Townhomes/ Semi-Detached	399 DU	ITE 230	Formula 3	AM	17%	83%	21	100	121
				PM	67%	33%	91	45	136
Elementary School	400 students	ITE 520	Formula 4	AM	55%	45%	79	65	144
				PM	49%	51%	29	31	60
Commercial Block 1	84,326 ft²	Local Rate	Formula 5	AM	58%	42%	150	109	259
				PM	48%	52%	236	256	492
Commercial Block 2	74,435 ft²	Local Rate	Formula 5	AM	58%	42%	133	96	229
				PM	48%	52%	208	226	434
TOTAL VEHICLE TRIPS				AM			474	664	1,138
				PM			882	738	1,620

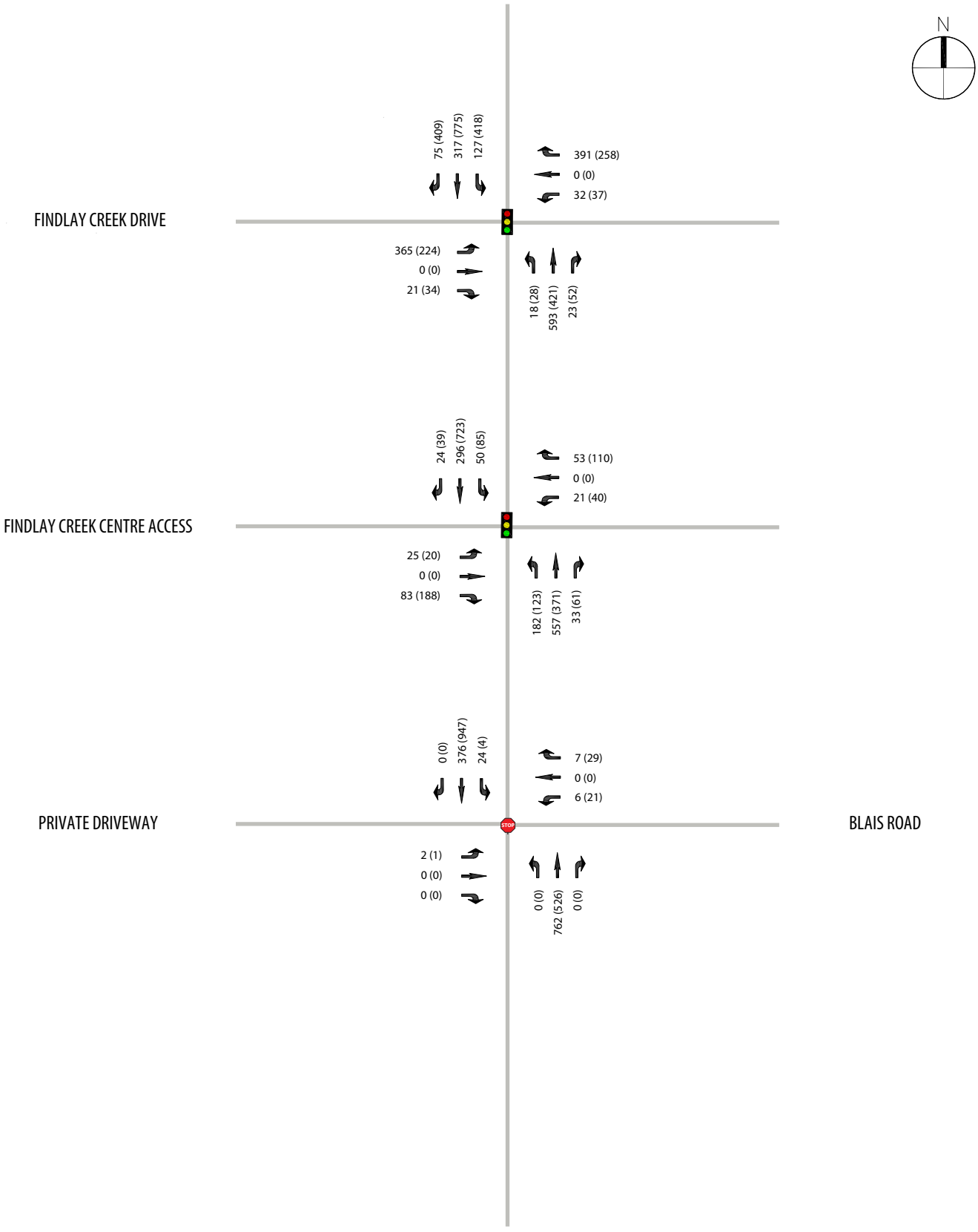
Notes:
vph = vehicles per hour; DU = Dwelling Units
1 - Formula Rate for Single Family Detached Land Use:
AM T= 0.70(X) + 9,74
PM T= e^(0.90Ln(X) + 0.51)
2 - Formula Rate for Apartment Land Use:
AM T= 0.49*(X) + 3.73
PM T= 0.55*(X) + 17.65
3 - Formula Rate for Condo/ Townhouse Land Use:
AM T= e^(0.80Ln(X) + 0.26)
PM T= e^(0.82Ln(X) + 0.32)
4 – Formula Rate for Elementary School Land Use
AM T= e^(1.14Ln(X)-1.86)
PM T= 0.15(X)
5 – Formula Rate for Commercial Land Use from Findlay Creek Centre Local Count
AM T= 3.07(X/1000)
PM T= 5.83(X/1000)

The ITE trip generation rates are based on data collected from traffic surveys conducted across North America, but mostly in suburban areas of the United States where the level of transit use is traditionally very low (estimates show that ITE rates average approximately 96% auto mode split). This statistic was not considered representative in the City of Ottawa that has a well-established transit system and pedestrian/ cycling network. Therefore, the ITE trip generation results in Table 3 were converted into person trips and adjusted for observed modal share percentages based on the 2011 TRANS O-D Survey Report specific to the South Gloucester/ Leitrim TRANS district.

To convert the ITE vehicle trip rates to person trip rates, two adjustment factors have been applied:

- Vehicle Occupancy Factor: 1.29 (TRANS Survey)
- Non-Auto Usage Factor: 1.05 (Conservatively assumes ITE trips rates have 5% non-auto mode share)

Therefore, the vehicle to person trip conversion factor is approximately 1.35. This factor was applied to the results in Table 8 to generate the corresponding person trips per hour. Table 9 shows this conversion of estimated vehicular trips per hour to person trips per hour for the proposed development.



LEGEND

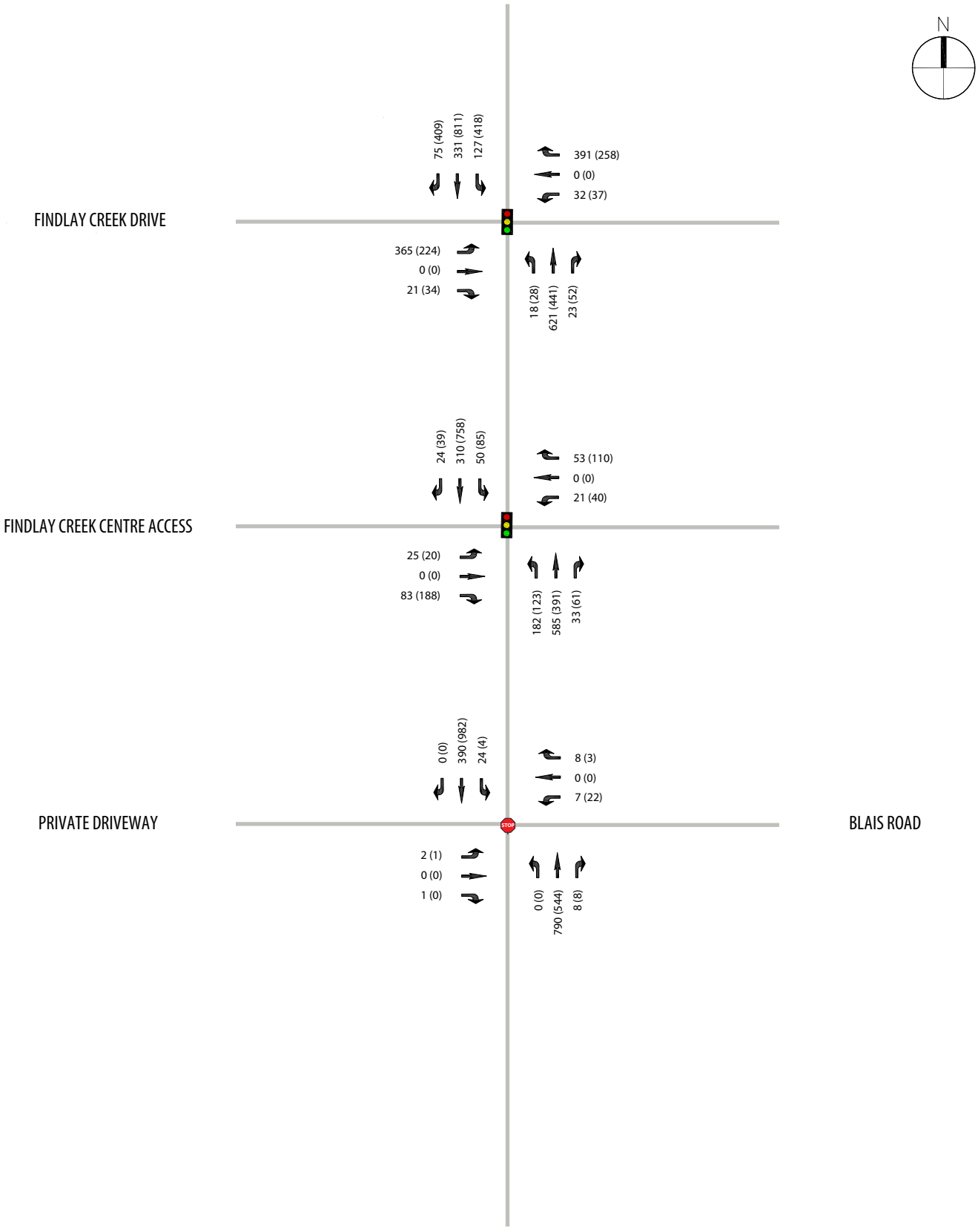
XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES

IBI

Regional Group - Remer Lands
Community Transportation Study

EXHIBIT 10
Future (2020) Background AM & PM Peak Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS



LEGEND

XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES

IBI

Regional Group - Remer Lands
Community Transportation Study

EXHIBIT 11
Future (2025) Background AM & PM Peak Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS

TABLE 9 – Remer Lands Development Person Trip Generation

LAND USE	PERIOD	VEHICLE TRIPS PER HOUR			FACTOR	PERSON TRIPS PER HOUR		
		IN	OUT	TOTAL		IN	OUT	TOTAL
Single Family	AM	76	229	305	1.35	103	310	413
	PM	242	142	384		328	192	520
Apartment	AM	9	36	45		12	49	61
	PM	42	22	64		56	30	86
Townhomes/ Semi-Detached	AM	21	100	121		36	176	212
	PM	91	45	136		170	84	253
Elementary School	AM	79	65	144		107	88	195
	PM	29	31	60		40	41	81
Commercial Block 1	AM	150	109	259		203	147	351
	PM	236	256	492		320	346	666
Commercial Block 2	AM	133	96	229		180	130	310
	PM	208	226	434		282	306	588

4.4.1 Commercial Pass-by Trips

The person trips generated by the commercial retail uses were stratified between new and pass-by trips by the application of a pass-by proportion, as described below.

Pass-by trips are trips made as an intermediate stop on the way from an origin to a primary destination. They are assumed to enter the site and then resume travel in the same direction. Pass-by trips differ from new trips in that they are an alteration of the travel paths of background traffic as a result of a traffic generator within a development (e.g. retail, service, fast-food restaurant). The ITE manual indicates that pass-by proportions of 50%–80% are typical for shopping centres of 100,000 - 150,000 sq.ft. The combined size of the two commercial block within the proposed development is approximately 160,000 sq.ft. Therefore, a pass-by proportion of 65% was assumed for each block.

4.4.2 Person Trip Generation by Mode

The modal share proportions for the various proposed development uses were derived from the 2011 TRANS survey. The residential mode share was based on the 'From District' mode split. The Retail mode share was based on the 'Within District' mode split. The school mode share was based on the 'To District' mode split. These percentages are shown in Table 10.

TABLE 10 – Remer Lands Development Mode Share by Land Use

TRAVEL MODE	MODE SHARE		
	Residential	Retail	School
Auto Driver	65%	45%	70%
Auto Passenger	15%	25%	15%
Transit	10%	5%	5%
Other/ Non-Motorized	10%	25%	10%

The projected auto driver and transit trips, shown in Table 11, were developed by factoring the total person trips per hour for each use, from Table 9, by the corresponding mode share results, from Table 10.

TABLE 11 – Remer Lands Development Auto Driver and Transit Trip Totals

TRAVEL MODE	PERIOD	PERSON TRIPS PER HOUR									
		RESIDENTIAL USES			RETAIL USES			SCHOOL USE			TOTAL TRIPS
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	
Auto Driver	AM	98	347	446	60	44	104	75	61	137	686
	PM	360	199	559	95	103	197	28	29	57	813
Auto Driver – Passby (65%)	AM	-	-	-	*97*	*97*	*193*	-	-	-	*193*
	PM	-	-	-	*183*	*183*	*367*	-	-	-	*367*
Transit	AM	15	53	69	7	5	12	5	4	10	90
	PM	55	31	86	11	11	22	2	2	4	112

The results from Table 6 show the proposed development is expected to generate the following:

- Approximately 690 morning and 815 afternoon peak hour vehicular trips; and,
- Approximately 90 morning and 115 afternoon peak hour transit trips

4.5 Trip Distribution and Assignment

Traffic generated by the residential and mixed-use commercial areas in the proposed development has been distributed to the adjacent road network according to the following proportions:

Residential and Commercial Retail Trips

- To/from the north: 95%
- To/from the south: 5%

Commercial Retail – Pass-by trips

- From the north: 75%
- From the south: 25%

The estimated site generated traffic volumes for Phase 1 and at Full Buildout were developed using the distributions above. The results are shown in Exhibits 12 and 13 respectively.

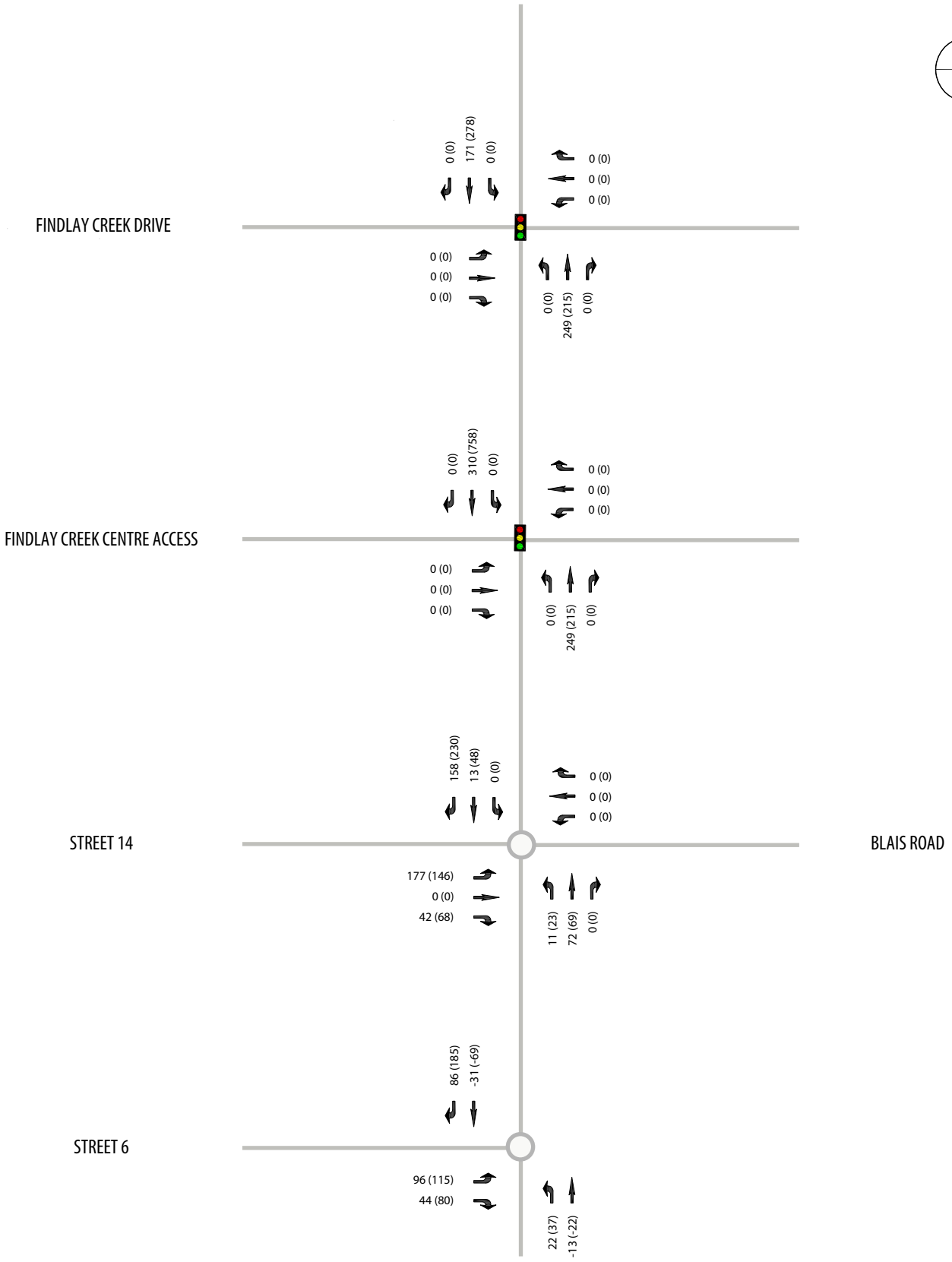
These volumes were added to the future (2020) and (2025) background traffic volumes in Exhibits 10 and 11, respectively, above to obtain future (2020) and (2025) background plus site generated traffic volumes, as shown in Exhibits 14 and 15.

4.6 Daily Traffic Volumes

Daily traffic volumes were estimated using the ITE Trip Generation Manual daily rates. Daily volumes were generated using the same process for peak hour volumes. The ITE rates were converted into person trips and split by mode based on OD survey results. The results of the daily traffic generation are summarized in Table 12 below.

TABLE 12 – Remer Lands Development Daily Traffic Volumes

TRAVEL MODE	MODE SHARE	AADT (vpd)		
		IN	OUT	TOTAL
Auto Driver	65%	3,035	3,035	6,070
Auto Passenger	15%	700	700	1,400



LEGEND

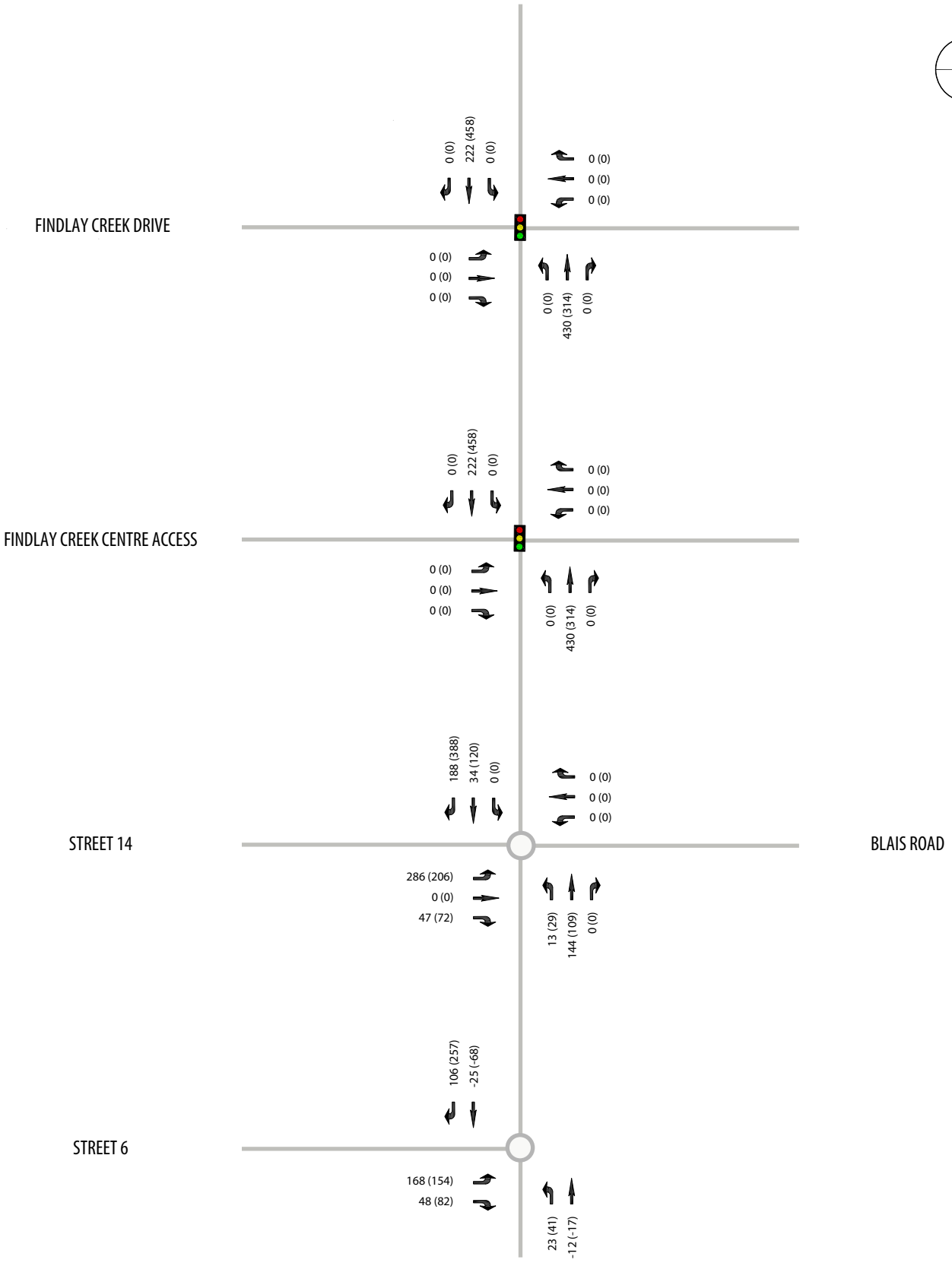
XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES

IBI

Regional Group - Remer Lands
Community Transportation Study

EXHIBIT 12
Site Generated Phase 1 AM & PM Peak Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS



LEGEND

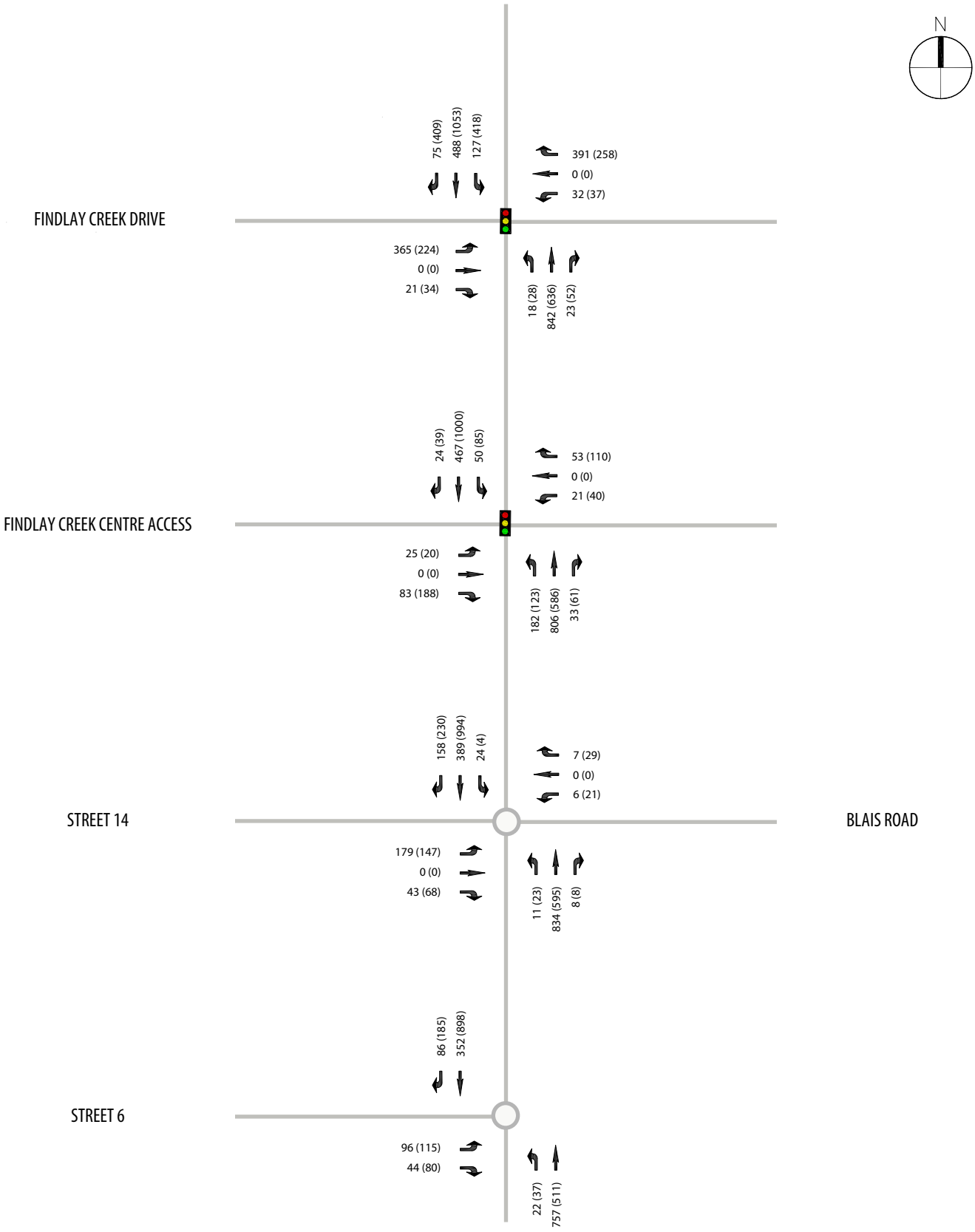
XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES

IBI

Regional Group - Remer Lands
Community Transportation Study

EXHIBIT 13
Site Generated Full Buildout AM & PM Peak Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS



LEGEND

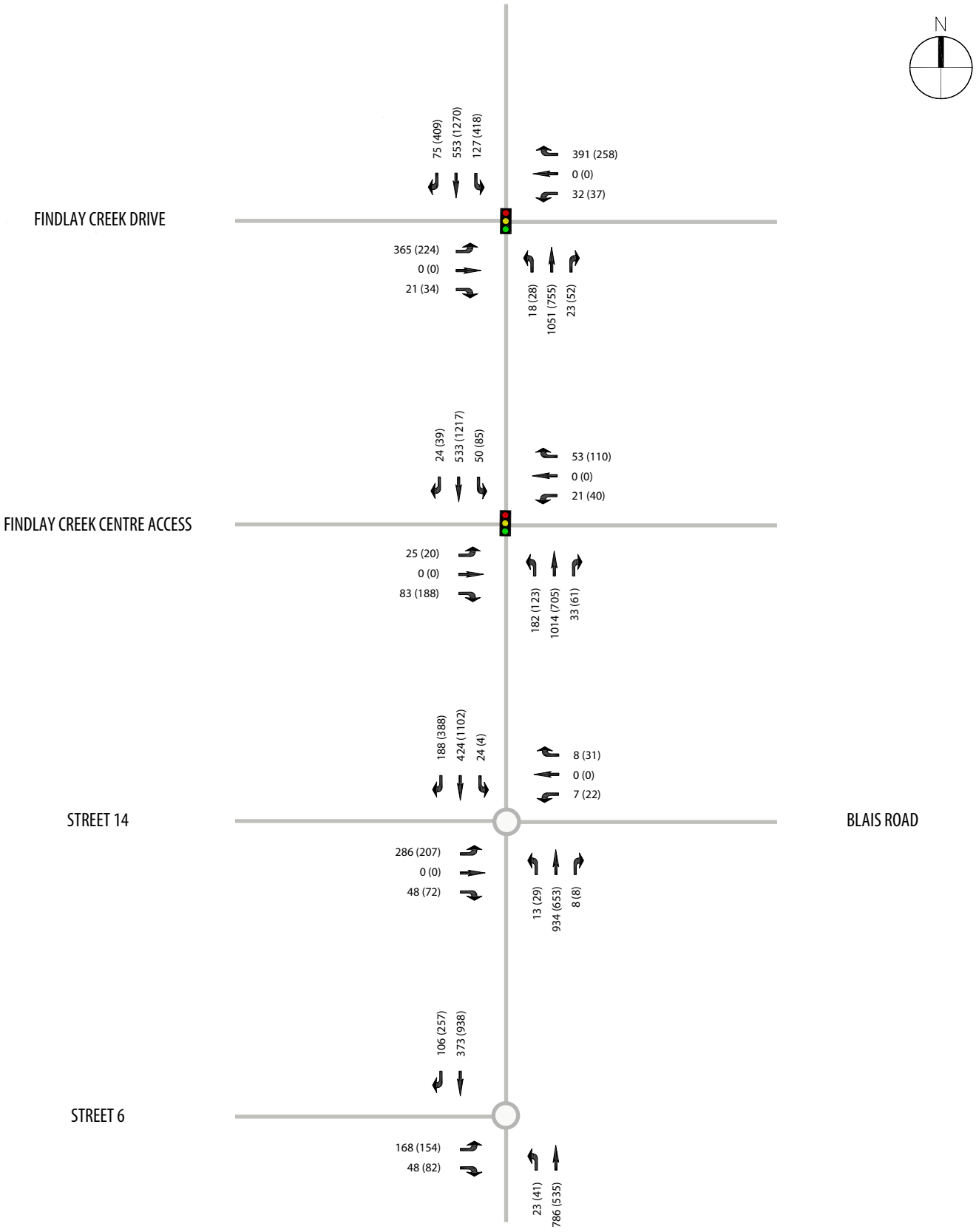
XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES

IBI

Regional Group - Remer Lands
Community Transportation Study

EXHIBIT 14
Future (2020) Total AM & PM Peak
Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS



LEGEND

XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES

IBI

Regional Group - Remer Lands
Community Transportation Study

EXHIBIT 15
Future (2025) Total AM & PM Peak
Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS

5 Intersection Operational Review

5.1 Intersection Analysis Criteria

Intersection capacity analyses have been carried out for the intersections indicated in Exhibit 3 above, under the following weekday morning and weekday afternoon peak hour traffic conditions:

- Existing Traffic (2016)
- Future Background Traffic (2020 and 2026)
- Future Background plus Site Generated Traffic (2020 and 2026)

Capacity analysis of the signalized and stop-controlled intersections has been carried out using Synchro Version 9 software. The analysis has incorporated traffic signal timing plans provided by the City of Ottawa.

5.1.1 Signalized Intersections

In qualitative terms, the LOS defines operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of such factors as delay, speed and travel time, freedom to manoeuvre, traffic interruptions, safety, comfort and convenience. LOS can also be related to the ratio of the volume to capacity (v/c) which is simply the relationship of the traffic volume (either measured or forecast) to the capability of the intersection or road section to accommodate a given traffic volume. This capability varies depending on the factors described above. LOS are given letter designations from A to F. LOS "A" represents the best operating conditions and LOS "E" represents the level at which the intersection or an approach to the intersection is carrying the maximum traffic volume that can, practicably, be accommodated. LOS F indicates that the intersection is operating beyond its theoretical capacity.

The City of Ottawa has developed criteria as part of the Transportation Impact Assessment Guidelines, which directly relate the volume to capacity (v/c) ratio of a signalized intersection to a LOS designation. These criteria are as follows:

TABLE 13 – LOS Criteria for Signalized Intersections

Level of Service (LOS)	Volume to Capacity Ratio (V/C)
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

The intersection capacity analysis technique provides an indication of the LOS for each movement at the intersection under consideration and for the intersection as a whole. The overall v/c ratio for an intersection is defined as the sum of equivalent volumes for all critical movements at the intersection divided by the sum of capacities for all critical movements.

5.1.2 Unsignalized Intersections

The capacity of an unsignalized intersection can also be expressed in terms of the LOS it provides. For an un-signalized intersection, the Level of Service is defined in terms of the average movement delays at the intersection. This is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line;

this includes the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position. The average delay for any particular minor movement at the un-signalized intersection is a function of the capacity of the approach and the degree of saturation.

The Highway Capacity Manual 2010 (HCM), prepared by the Transportation Research Board, includes the following Levels of Service criteria for un-signalized intersections, related to average movement delays at the intersection, as indicated in Table 8.

TABLE 14 – LOS Criteria for Unsignalized Intersections

LOS	DELAY
A	<10
B	>10 and <15
C	>15 and <25
D	>25 and <35
E	>35 and <50
F	>50

5.1.3 Roundabouts

The roundabout capacity analysis was completed using SIDRA analysis software. SIDRA is an industry accepted program that uses a similar delay-based methodology from the HCM 2010. Any movement with a v/c ratio greater than 1.0 triggers an LOS F for that movement. If the v/c ratio for any movement is equal or less than 1.0, the delay criteria for unsignalized intersections, shown in Table 8, should be followed.

5.2 Analysis Methodology

Based on the established intersection capacity analysis criteria described above, the existing and future conditions were analyzed using the weekday peak hour traffic volumes derived in the previous sections of this report. Existing traffic conditions were analyzed using existing (2016) weekday peak hour traffic counts. Future traffic conditions were analyzed in two stages:

1. Background – Estimated weekday peak hour traffic volumes in 2020 and 2025 from regional growth and anticipated developments
2. Background plus Site Generated – Background weekday peak hour traffic volumes plus the proposed development generated traffic volumes.

For each horizon year, the existing (2016) road network was assumed to provide a starting point for the intersection capacity analysis. Any known infrastructure improvements planned by the City of Ottawa or adjacent developers were accounted for separately.

5.2.1 Base Road Network

Prior to the Synchro analysis, a base road network was established for each condition outlined above. The existing (2016) road network was shown in Exhibit 4.

The 4-lane widening of Bank Street between Leitrim Road and the Earl Armstrong Road Extension, as noted in Section 3.6: Future Road Network, was considered in the following analysis. The timing for the construction of the 4-lane widening is between 2020 and 2025, based on the City TMP (2013) Affordable Network Plan. Therefore, base road network in the 2025 horizon year assumed the 4-lane widening.

The proposed development access intersections, Street 14 and Street 6 with Bank Street, were designed as multi-lane roundabouts in the Bank Street EA (2014). Therefore, a roundabout design was assumed at both intersections in the buildout year (2020) of the proposed development and in the 2025 horizon year.

The following intersection designs (including auxiliary lane requirements and storage lengths) at the Findlay Creek Drive and Findlay Creek Centre intersections with Bank Street were also based on the Bank Street EA in the future horizons.

Findlay Creek Drive and Bank Street:

- New east leg to service OPA 76 Lands with auxiliary left and right-turn lanes
- Add southbound left-turn lane 250m storage
- Increase existing southbound right-turn storage to 250m
- Increase existing northbound left-turn storage to 130m (will be back to back left-turn lanes)
- Adjust EB through-left and right-turn lane configuration to a through-right and left-turn configuration

Findlay Creek Centre and Bank Street:

- New east leg to service OPA 76 Lands with auxiliary left and right-turn lanes
- Add southbound left-turn lane with 130m storage (will be back to back left-turn lanes)
- Adjust EB through-left and right-turn lane configuration to a through-right and left-turn configuration

No further future road network modifications were made.

5.2.2 Traffic Signal Warrant

Traffic control signal warrants were completed for all unsignalized stop or yield controlled intersections. The warrant was based on the established methodology outlined in the Ontario Traffic Manual, Book 12, Ministry of Transportation Ontario (MTO), 2007. If the MTO traffic signal warrant procedure for any unsignalized intersection was triggered, a traffic control signal should be considered. This procedure is normally applied for existing conditions; however, it can be used in future analyses using the following methodology.

With only morning and afternoon peak hour data for the future horizons, the remaining six hours of traffic data can be estimated using the following equation:

$$\text{Future Non-Peak Hour Volume} = \frac{(\text{AM Peak Hour Volume} + \text{PM Peak Hour Volume})}{2}$$

This formula can be applied to each movement in each off-peak hour in the warrant procedure. The traffic signal warrants showed that both Blais Road 13 and Street 6 accesses would trigger the warrant by the 2020 horizon year. Therefore, either signals or a roundabout will be required to accommodate expected traffic.

Details of the MTO TCS warrant analysis are provided in Appendix F.

5.3 Intersection Capacity Analysis Results

The following section discusses the results of the intersection capacity analysis and roundabout capacity analysis. All tables summarize study area intersection LOS results during the morning and afternoon peak hour periods. The worst/ critical observed LOS movement at each study area intersection was recorded; if the LOS was E or lower, it was compared to the intersection LOS. If the intersection LOS was also indicated to be below City standards, potential roadway modifications or measures were considered and the intersection was re-evaluated.

Synchro and SIDRA analysis output files have been provided in Appendix G.

5.3.1 Existing (2016) and Future (2020) & (2025) Background Traffic

TABLE 15 - Intersection Capacity Analysis: Existing (2016) Traffic

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	V/C RATIO		LEVEL OF SERVICE	
			CRITICAL MOVEMENT	INTERSECTION	CRITICAL MOVEMENT	INTERSECTION
Bank Street and Findlay Creek Drive	Traffic Signals	AM	0.82	-	D	-
		PM	0.87	-	D	-
Bank Street and Findlay Creek Centre	Traffic Signals	AM	0.40	-	A	-
		PM	0.60	-	A	-
Bank Street and Blais Road	EB-WB Stop	AM	0.06	-	C	-
		PM	0.26	-	E [1]	-

Notes:
1 – Failure occurs on the west approach to private residence, with only one vehicle in design hour. All other approaches were LOS D or better. No modifications recommended.

TABLE 16 - Intersection Capacity Analysis: Future (2020) Background Traffic

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	V/C RATIO		LEVEL OF SERVICE	
			CRITICAL MOVEMENT	INTERSECTION	CRITICAL MOVEMENT	INTERSECTION
Bank Street and Findlay Creek Drive	Traffic Signals	AM	0.88	-	D	-
		PM	0.86	-	D	-
Bank Street and Findlay Creek Centre	Traffic Signals	AM	0.45	-	A	-
		PM	0.56	-	A	-
Bank Street and Blais Road	EB-WB Stop	AM	0.06	-	C	-
		PM	0.30	-	E [1]	-

Notes:
1 – Failure occurs on the west approach to private residence, with only one vehicle in design hour. All other approaches were LOS D or better. No modifications recommended.

TABLE 17 - Intersection Capacity Analysis: Future (2025) Background Traffic

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	V/C RATIO		LEVEL OF SERVICE	
			CRITICAL MOVEMENT	INTERSECTION	CRITICAL MOVEMENT	INTERSECTION
Bank Street and Findlay Creek Drive	Traffic Signals	AM	0.84	-	D	-
		PM	0.85	-	D	-
Bank Street and Findlay Creek Centre	Traffic Signals	AM	0.26	-	A	-
		PM	0.58	-	A	-
Bank Street and Blais Road	EB-WB Stop	AM	0.25	-	C	-
		PM	0.19	-	E [1]	

Notes:
It's been assumed that Bank Street has been widened from 2 to 4-lanes between Leitrim Road and Rideau Road, as per Bank Street EA (2014)
1 – Failure occurs on the west approach to private residence, with only one vehicle in design hour. All other approaches were LOS C or better. No modifications recommended.

5.3.2 Future Background plus Site Generated Traffic

TABLE 18 - Intersection Capacity Analysis: Future (2020) Background plus Site Generated Traffic

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	V/C RATIO		LEVEL OF SERVICE	
			CRITICAL MOVEMENT	INTERSECTION	CRITICAL MOVEMENT	INTERSECTION
Bank Street and Findlay Creek Drive	Traffic Signals	AM	1.03	1.02	F	F
		PM	1.00	1.00	F	F
	Traffic Signals [1]	AM	0.86	-	D	-
		PM	0.81	-	D	-
Bank Street and Findlay Creek Centre	Traffic Signals	AM	0.59	-	A	-
		PM	0.76	-	C	-
	Traffic Signals [1]	AM	0.35	-	A	-
		PM	0.61	-	B	-
Bank Street and Street 14/ Blais Road	Single Lane Roundabout [2]	AM	1.02	-	F	D
		PM	1.00	-	F	D
	Two Lane Roundabout	AM	0.60	-	B	A
		PM	0.74	-	C	B
	Traffic Signals [3]	AM	0.86	-	C	B
		PM	0.90	-	D	C
Bank Street and Street 6	Single Lane Roundabout [2]	AM	0.85	-	C	C
		PM	0.95	-	E	D
	Two Lane Roundabout	AM	0.49	-	A	A
		PM	0.69	-	C	B
	Traffic Signals	AM	0.64	-	B	-
		PM	0.87	-	D	-

Notes:
1 – Widen Bank Street from 2 to 4-lanes, as per Bank Street EA (2014)
2 – Single Lane Roundabout with a southbound right-turn lane
3 – Add southbound right-turn lane

TABLE 19 - Intersection Capacity Analysis: Future (2025) Background plus Site Generated Traffic

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	V/C RATIO		LEVEL OF SERVICE	
			CRITICAL MOVEMENT	INTERSECTION	CRITICAL MOVEMENT	INTERSECTION
Bank Street and Findlay Creek Drive	Traffic Signals	AM	0.90	-	D	-
		PM	0.84	-	D	-
Bank Street and Findlay Creek Centre	Traffic Signals	AM	0.39	-	A	-
		PM	0.67	-	B	-
Bank Street and Street 14/ Blais Road	Two Lane Roundabout	AM	0.74	-	C	B
		PM	0.84	-	E	C
	Traffic Signals	AM	0.77	-	C	B
		PM	0.74	-	D	A
Bank Street and Street 6	Two Lane Roundabout	AM	0.55	-	B	A
		PM	0.76	-	C	C
	Traffic Signals	AM	0.47	-	A	-
		PM	0.52	-	A	-

Notes:
It's been assumed that Bank Street has been widened from 2 to 4-lanes between Leitrim Road and Rideau Road, as per Bank Street EA (2014)

APPENDIX F

Collision Records

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: BANK ST @ BLAIS RD

Traffic Control: Stop sign **Total Collisions:** 13

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-07, Thu,06:35	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2016-Feb-09, Tue,09:00	Snow	Approaching	P.D. only	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Oct-02, Sun,15:56	Clear	Rear end	Non-fatal injury	Wet	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2017-May-14, Sun,21:45	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Pick-up truck	Other motor vehicle	
2018-Apr-12, Thu,12:53	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jul-25, Wed,10:00	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2019-May-24, Fri,17:45	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-01, Fri,21:57	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Jan-09, Thu,16:10	Clear	Sideswipe	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2020-Jan-22, Wed,10:59	Clear	Angle	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
2020-Apr-09, Thu,16:49	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: BANK ST @ BLAIS RD

Traffic Control: Stop sign **Total Collisions:** 13

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-May-28, Thu,12:45	Clear	Rear end	P.D. only	Dry	South	Pulling away from shoulder or curb	Truck - closed	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Oct-01, Thu,12:30	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	

Location: BANK ST @ DUN SKIPPER DR

Traffic Control: Traffic signal **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Jun-04, Thu,15:20	Clear	Turning movement	P.D. only	Dry	East	Turning right	Truck - dump	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	

APPENDIX G

Other Area Developments

3.1.2 Land Use Details

The proposed development is indicated in **Exhibit 2**. The land is currently the location of the Leitrim Home Hardware, and is zoned as Rural Commercial within the Official Plan Amendment (OPA) 8a. The proposed development will consist of hotel, hardware and commercial land uses, as shown in **Table 1**.

Table 1 – Land Use Statistics

LAND USE	BUILDING	UNITS/ GROSS FLOOR AREA (GFA)
Hardware Store (incl. Drive-Thru Shed)	Building 'A'	2,997 m^2
Hotel	Building 'B'	Approx. 125 Suites
Restaurant (incl. Drive-Thru Facility)	Building 'C'	502 m^2
Commercial	Building 'D'	987 m^2

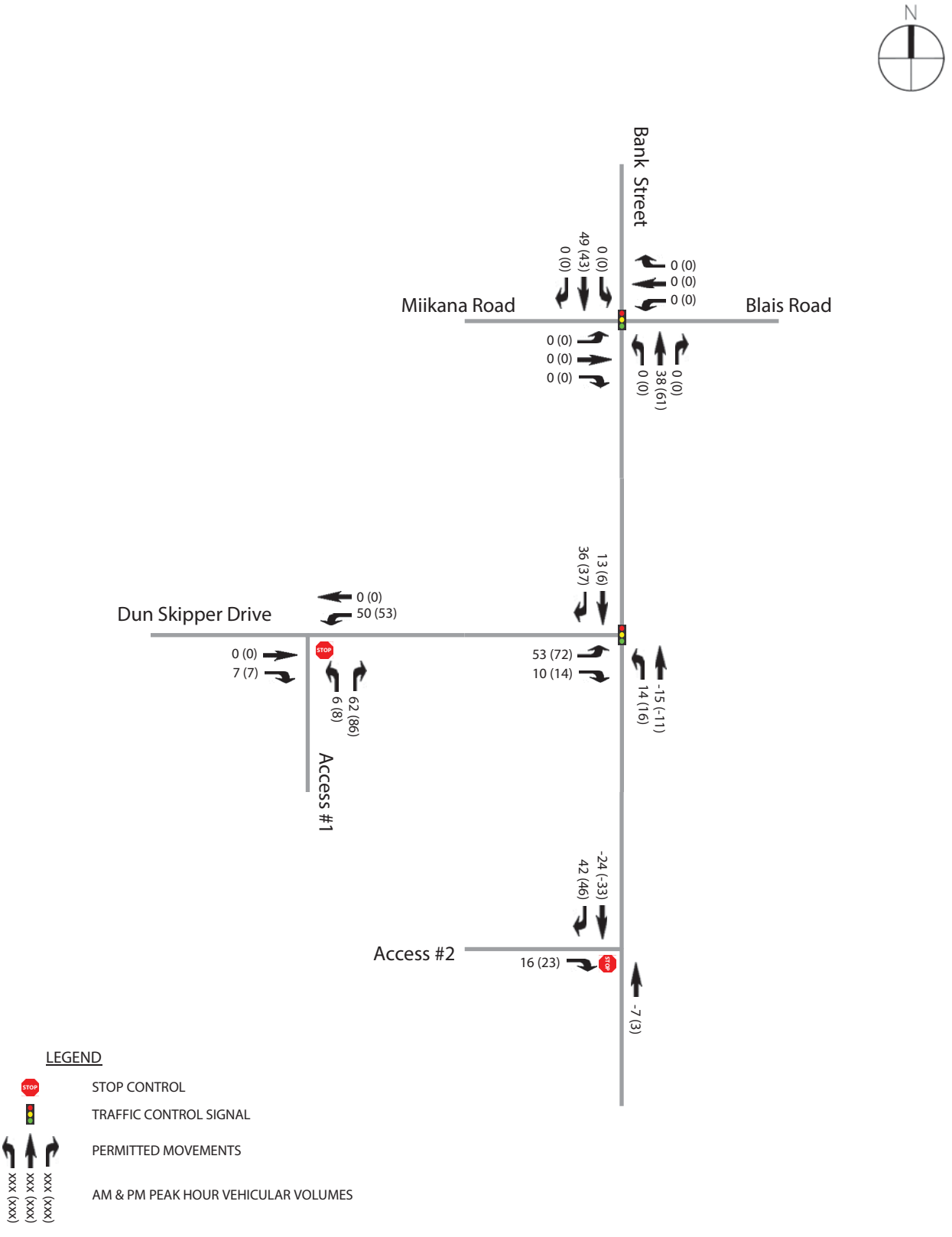
The Home Hardware is expected to be built and occupied by 2021, while the remainder of the site is expected to be built and occupied by 2023.

3.1.3 Site Layout

The proposed development will provide a total of 280 surface parking stalls including 11 accessible spaces and 14 oversized spaces.

The development will be served by two private approaches: an all-movements access proposed off of Dun Skipper Drive along the northern limits of the property, as well as a right-in/ right-out access proposed off of Bank Street along the eastern limits of the property.

The Draft Plan for the proposed development is illustrated in **Exhibit 2**.



IBI

4836 Bank Street
Transportation Impact Assessment

Exhibit 6:
Net Site-Generated Traffic

PROJECT No. 119351
DATE: April 2019
SCALE: N.T.S.

APPENDIX H

Long-Range Model Snapshots

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Findlay Creek Area

2011 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: April, 2022
EMME Scenario: 21713

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

500 1000 1500 2000

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Findlay Creek Area

2031 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: April, 2022
EMME Scenario: 21715

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

500 1000 1500 2000

+1.7%

+1.7%

+1.7%

JOHNSTON CORNERS

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

APPENDIX I

Transportation Demand Management

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	☑
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)*	☐ - N/A
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)*	☐ - N/A
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	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	☐

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☒
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	☒
	2.2	**Bicycle skills training**	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
	2.3	**Valet bike parking**	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances	☒
BASIC		3.1.2	Provide online links to OC Transpo and STO information	☒ www.ottawaschoolbus.ca www.octranspo.com/en/alerts
BETTER		3.1.3	Provide real-time arrival information display at entrances	☐
		3.2	**Transit fare incentives**	
			Commuter travel	
BETTER		3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER	★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
			Visitor travel	
BETTER		3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3	**Enhanced public transit service**	
			Commuter travel	
BETTER		3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4	**Private transit service**	
			Commuter travel	
BETTER		3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	4.	**RIDESHARING**	
	4.1	**Ridematching service**	
		Commuter travel	
BASIC	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☒ service suspended during COVID-19
	4.2	**Carpool parking price incentives**	
		Commuter travel	
BETTER	4.2.1	Provide discounts on parking costs for registered carpools	☐
	4.3	**Vanpool service**	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Bikeshare stations & memberships**	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐ safety issue. not possible
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	☐
	5.2	**Carshare vehicles & memberships**	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	☐
	6.	**PARKING**	
	6.1	**Priced parking**	
		Commuter travel	
BASIC	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐ safety issue. not possible
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☐ OCDSB HR
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐ work hours are not flexible and are tied to school instruction hours
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

APPENDIX J

MMLOS Analysis

Segment MMLOS Analysis

This section provides a review of the boundary streets Miikana Road and Kelly Farm Drive, using complete streets principles. The *Multi-Modal Level of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation, based on the targets for roadways within 300m of a school.

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

Exhibit 11 of the *MMLOS Guidelines* has been used to evaluate the segment bicycle level of service (BLOS) of the boundary streets. Exhibit 22 of the *MMLOS Guidelines* identify a target BLOS B for Local Routes within 300m of a school (Miikana Road), and a target BLOS D for all roadways with no cycling designation within 300m of a school (Kelly Farm Drive). The results of the segment BLOS analysis are summarized in **Table 2**.

Exhibit 15 of the *MMLOS Guidelines* has been used to evaluate the segment transit level of service (TLOS) of the boundary streets, as school buses are anticipated to use both Miikana Road and Kelly Farm Drive. Exhibit 22 of the *MMLOS Guidelines* do not identify a target TLOS for the boundary streets, as they are not roadways included in the City's RTTP Network. The results of the segment TLOS analysis are summarized in **Table 3**.

Exhibit 20 of the *MMLOS Guidelines* has been used to evaluate the segment truck level of service (TkLOS) of the boundary streets. Exhibit 22 of the *MMLOS Guidelines* do not identify a target TkLOS for collector or local roadways without a truck route designation. The results of the segment TkLOS analysis are summarized in **Table 4**.

Table 1: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed[1]	PLOS
Miikana Road (north side, Kelly Farm Drive to Bank Street)					
≥ 2.0m	> 2.0m	≤ 3,000 vpd	No	60 km/h	A
Miikana Road (south side, Kelly Farm Drive to Bank Street)					
≥ 2.0m	> 2.0m	≤ 3,000 vpd	Yes	60 km/h	A
Kelly Farm Drive (east side, Miikana Road to Salamander Way)					
≥ 2.0m	> 2.0m	≤ 3,000 vpd	Yes	60 km/h	A
Kelly Farm Drive (west side, Miikana Road to Salamander Way)					
≥ 2.0m	> 2.0m	≤ 3,000 vpd	No	60 km/h	A

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

Table 2: BLOS Segment Analysis

Road Class	Bike Route	Type of Bikeway	Travel Lanes	Operating Speed	BLOS
Miikana Road (Kelly Farm Drive to Bank Street)					
Collector	Local Route	Mixed Traffic	2	60 km/h	**F**
Kelly Farm Drive (Miikana Road to Salamander Way)					
Local	No Class	Mixed Traffic	2	60 km/h	**F**

Table 3: TLOS Segment Analysis

Facility Type	Exposure to Congestion Delay, Friction, and Incidents			TLOS
	Congestion	Friction	Incident Potential	
Miikana Road (Kelly Farm Drive to Bank Street)				
Mixed Traffic – Moderate Parking/Driveway Friction	Yes	Medium	Medium	E
Kelly Farm Drive (Miikana Road to Salamander Way)				
Mixed Traffic – Moderate Parking/Driveway Friction	Yes	Medium	Medium	E

Table 4: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	TkLOS
Miikana Road (Kelly Farm Drive to Bank Street)		
> 3.7m	1	B
Kelly Farm Drive (Miikana Road to Salamander Way)		
> 3.7m	1	B

Intersection MMLOS Analysis

The following is a review of the MMLOS of the signalized intersections within the study area, using complete streets principles. Both signalized study area intersections (Bank Street/Blais Road/ Miikana Road and Bank Street/Dun Skipper Drive) are located in the General Urban Area, and have been evaluated based on existing conditions.

Exhibit 5 of the Addendum to the *MMLOS Guidelines* has been used to evaluate the existing PLOS at the intersections listed above. Exhibit 22 of the *MMLOS Guidelines* identifies a target PLOS C for all roadways in the General Urban Area. The results of the intersection PLOS analysis are summarized in **Table 5** and **Table 6**. Signal timing plans for the study area intersections are included at the end of this appendix.

Exhibit 12 of the *MMLOS Guidelines* has been used to evaluate the existing BLOS at the study area intersections at the intersections listed above. Exhibit 22 of the *MMLOS Guidelines* identifies a target BLOS B for Local Routes in the General Urban Area (Miikana Road), a target BLOS C for Spine Routes in the General Urban Area (Bank Street), and a target BLOS D for all roadways with no cycling route designation in the General Urban Area (Blais Road, Dun Skipper Drive). The results of the intersection BLOS analysis are summarized in **Table 7**.

Exhibit 22 of the *MMLOS Guidelines* does not identify a target TLOS for roadways without a Rapid Transit or Transit Priority designation, and therefore the TLOS of the study area intersections has not been evaluated.

Exhibit 21 of the *MMLOS Guidelines* has been used to evaluate the existing TkLOS at the intersections listed above. Exhibit 22 of the *MMLOS Guidelines* identifies a target TkLOS D for arterial or collector truck routes in the General Urban Area (Bank Street, Blais Road). No target is identified for collector or local roadways that are not designated as a truck route in the General Urban Area (Miikana Road, Kelly Farm Drive, Dun Skipper Drive). The results of the intersection TkLOS analysis are summarized in **Table 8**.

Table 5: PLOS Intersection Analysis – Bank Street/Blais Road/Miikana Road

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	72	No	88	No	88	No	88
Lanes Crossed (3.5m Lane Width)	5		4		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	Permissive	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 10m to 15m	-6	> 10m to 15m	-6	> 10m to 15m	-6	> 10m to 15m	-6
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4
PETSI SCORE		**40**		**56**		**56**		**56**
LOS		**E**		**D**		**D**		**D**
DELAY SCORE								
Cycle Length		130		130		130		130
Pedestrian Walk Time		24.4		24.4		77.4		77.4
DELAY SCORE		**42.9**		**42.9**		**10.6**		**10.6**
LOS		**E**		**E**		**B**		**B**
OVERALL		**E**		**E**		**D**		**D**

Table 6: PLOS Intersection Analysis – Bank Street/Dun Skipper Drive

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	72	No	72	N/A	0	No	72
Lanes Crossed (3.5m Lane Width)	5		5		N/A		5	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	No Left Turn/Prohibited	0	N/A	0	Permissive	-8
Right Turn Conflict	No Right Turn/Prohibited	0	Permissive or Yield	-5	N/A	0	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	N/A	0	N/A	0	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	N/A	0	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	> 10m to 15m	-6	N/A	0	> 10m to 15m	-6
Parallel Right Turn Channel	No Right Turn	0	No Right Turn Channel	-4	N/A	0	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Zebra Stripe	-4	Standard	-7	N/A	0	Zebra Stripe	-4
PETSI SCORE		**55**		**48**		**-**		**40**
LOS		**D**		**D**		**-**		**E**
DELAY SCORE								
Cycle Length		130		130		130		130
Pedestrian Walk Time		24.4		24.4		75.3		75.3
DELAY SCORE		**42.9**		**42.9**		**11.5**		**11.5**
LOS		**E**		**E**		**B**		**B**
OVERALL		**E**		**E**		**B**		**E**

Table 7: BLOS Intersection Analysis

Approach	Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Bank Street/Blais Road/Miikana Road				
North Approach	Bike Lane	Right Turn Lane Characteristics	Protected approach	A
		Left Turn Accommodation		
South Approach	Bike Lane	Right Turn Lane Characteristics	Protected approach	A
		Left Turn Accommodation		
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed, ≥ 60 km/h	**F**
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed, ≥ 60 km/h	**F**
Bank Street/Dun Skipper Drive				
North Approach	Bike Lane	Right Turn Lane Characteristics	Protected approach	A
		Left Turn Accommodation		
South Approach	Bike Lane	Right Turn Lane Characteristics	Protected approach	A
		Left Turn Accommodation		
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane ≤ 50m, turning speed ≤ 25 km/h	**D**
		Left Turn Accommodation	One lane crossed, ≥ 60 km/h	**F**

Table 8: TkLOS Intersection Analysis

Approach	Effective Corner Radius	Number of Receiving Lanes Departing Intersection	TkLOS
Bank Street/Blais Road/Miikana Road			
North Approach	10m to 15m	1	**E**
South Approach	10m to 15m	1	**E**
East Approach	10m to 15m	1	**E**
West Approach	10m to 15m	1	**E**
Bank Street/Dun Skipper Drive			
North Approach	10m to 15m	1	**E**
South Approach	10m to 15m	1	**E**
West Approach	10m to 15m	1	**E**

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

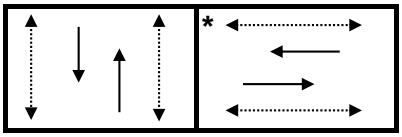
Intersection:	***Main:*** Bank	***Side:***	Blais / Miikana
Controller:	**MS 3200**	**TSD:**	**5866**
Author:	Matthew Anderson	**Date:**	29-Mar-2022

Existing Timing Plans†

	Plan						Ped Minimum Time		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	**AM Heavy** 11	***Walk***	***DW***	***A+R***
Cycle	110	75	120	70	70	130			
Offset	58	0	18	0	0	16			
NB Thru	80	45	90	40	40	90	7	6	4.6+2.0
SB Thru	80	45	90	40	40	90	7	6	4.6+2.0
EB Thru	30	30	30	30	30	40	7	9	3.3+3.3
WB Thru	30	30	30	30	30	40	7	9	3.3+3.3

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:15	4
6:30	1
7:00	11
8:00	1
9:30	2
15:00	3
18:30	2
22:30	4

Weekend

Time	Plan
0:15	4
6:30	2
11:00	5
19:30	2
22:00	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $61.16 ($54.12 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

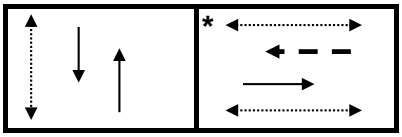
Intersection:	***Main:*** Bank	***Side:***	Dun Skipper
Controller:	**MS 3200**	**TSD:**	**5869**
Author:	Matthew Anderson	**Date:**	29-Mar-2022

Existing Timing Plans†

	Plan						**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	**AM Heavy** 11	***Walk***	***DW***	***A+R***
Cycle	110	75	120	70	70	130			
Offset	58	0	18	0	0	16			
NB Thru	80	45	90	40	40	90	7	8	4.6+2.1
SB Thru	80	45	90	40	40	90	7	8	4.6+2.1
EB Thru	30	30	30	30	30	40	7	9	3.3+3.3
WB Thru	30	30	30	30	30	40	7	9	3.3+3.3

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:15	4
6:30	1
7:00	11
8:00	1
9:30	2
15:00	3
18:30	2
22:30	4

Weekend

Time	Plan
0:15	4
6:30	2
11:00	5
19:30	2
22:00	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

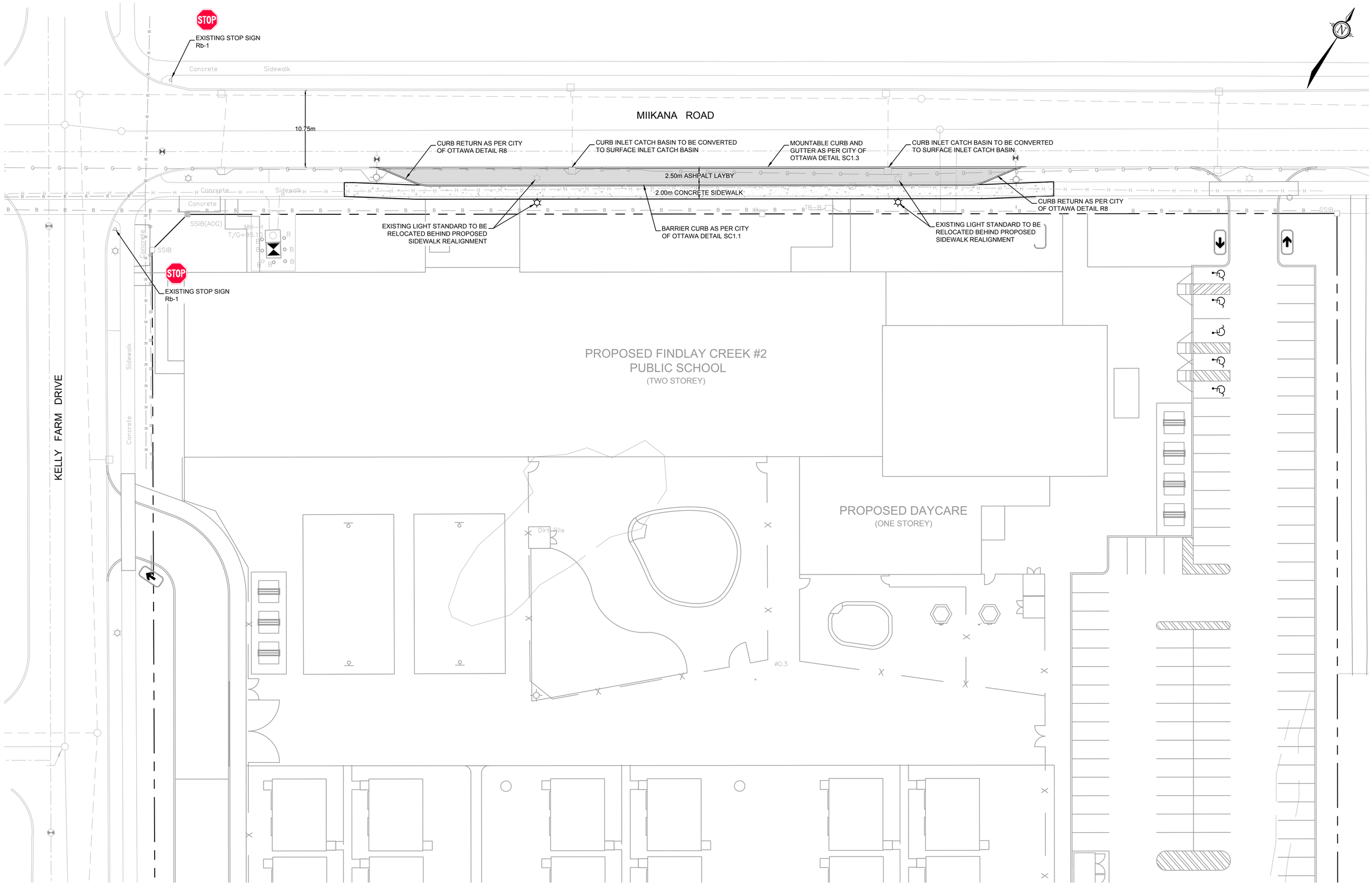
◄·····► Pedestrian signal

▬ ▬ ► Bike signal

Cost is $61.16 ($54.12 + HST)

APPENDIX K

Functional Design of Proposed Roadway Modification



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.

WATERMAIN
STORM SEWER
SANITARY SEWER
HYDRO DUCT
CABLE DUCT
BELL DUCT
GAS MAIN

No.	REVISION	DATE	BY
1.	ISSUED FOR CITY REVIEW	JUN 23/22	BJB

SCALE
1:250
1:250
0 2 4 6 8 10

DESIGN RCH
CHECKED BJB
DRAWN RCH
CHECKED BJB
APPROVED BJB

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
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Ottawa, Ontario, Canada K2M 1P6
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Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
820 MIIKANA ROAD

DRAWING NAME
FUNCTIONAL DESIGN OF PROPOSED PARKING LAYBY

PROJECT No. 122054
REV REV # 1
DRAWING No. 122054-FD

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