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Proposed Commercial Development
150 Dun Skipper Drive, Ottawa

Transportation Impact Assessment

Proposed Commercial Development
150 Dun Skipper Drive

Transportation Impact Assessment

Prepared By:

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

Dated: October 2024
Revised: January 2025

Novatech File: 124107
Ref: R-2024-091

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January 10, 2025

City of Ottawa
Planning, Development, and Building Services Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: Ms. Josiane Gervais
Transportation Project Manager, Infrastructure Approvals

Dear Ms. Gervais:

Reference: 150 Dun Skipper Drive
Revised Transportation Impact Assessment
Novatech File No. 124107

We are pleased to submit the following revised Transportation Impact Assessment (TIA), in support of a Site Plan Control application at 150 Dun Skipper Drive, for your review and signoff. The structure and format of this report is in accordance with the City of Ottawa's *Revised Transportation Impact Assessment Guidelines* (June 2023).

The original TIA in support of this application was submitted in October 2024, and has been revised to reflect updates to the Site Plan and address City comments.

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, P.Eng.
Project Engineer | Transportation

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

Certification Form for Transportation Impact Assessment (TIA) Study Program Manager

TIA Plan Reports

On April 14, 2022, the Province's Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

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 they meet the four criteria listed below.

Certification

- ☑ 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 (Update Effective July 2023);
- ☑ 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;
- ☑ 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

City of Ottawa
Transportation Engineering Services
Planning, Real Estate and Economic Development
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

☑ I am either a licensed or registered[1] professional in good standing, whose field of expertise [check ✓ appropriate field(s)]:

- ☑ is either transportation engineering
- ☐ or transportation planning.

Dated at Ottawa (City) this 10th day of January, 20 25.

Name: Brad Byvelds, P.Eng.

Professional Title: Senior Project Manager

B. Byvelds

Signature of Individual certifier that they meet the above four criteria

Office Contact Information (Please Print)	
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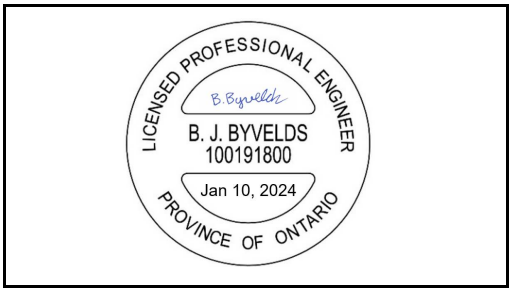
Stamp



[1] 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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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of a Site Plan Control application for the eastern portion of the property located at 150 Dun Skipper Drive. The entire property is approximately 2.93 hectares in area, with frontages to Bank Street, Dun Skipper Drive, and Cedar Creek Drive and is currently vacant. The subject portion of the property is approximately 1.93 hectares in area.

The subject site is surrounded by the following:

- Residential and commercial uses, followed by Miikana Road to the north,
- Dun Skipper Drive, followed by commercial uses or vacant land to the south,
- Bank Street, followed by a storage yard and vacant land to the east, and
- Existing and planned residences, followed by Cedar Creek Road to the west.

The proposed development consists of four single-storey retail units, containing a total of 58,300 ft^2 of gross floor area (GFA). This will include a 32,700 ft^2 supermarket and 25,600 ft^2 of other retail spaces.

A total of 195 surface parking spaces will be provided within the subject site. The proposed development will include a right-in loading access to Bank Street, a right-in/right-out (RIRO) access to Bank Street, and a full-movement access to Dun Skipper Drive. The development will be constructed in a single phase, with a buildout year of 2026. The western section of the property (i.e. between Cedar Creek Drive and the subject site) is not part of the subject application, but is anticipated to be developed as residential lands. A separate Site Plan Control application will be submitted for the future residential development.

The subject site is designated as 'Evolving Neighbourhood' and 'Corridor – Mainstreet' (Bank Street) on Schedule B7 of the City of Ottawa's Official Plan. The implemented zoning for the property is 'General Mixed Use' (GM), and the site is within the Leitrim Community Design Plan (CDP) area.

The study area for this report includes the boundary roadways Bank Street and Dun Skipper Drive, as well as the signalized intersections at Bank Street/Blais Road/Miikana Road and Bank Street/ Dun Skipper Drive. As the western portion of the subject property is not part of this application, Cedar Creek Drive has been excluded from this analysis.

The selected time periods for the analysis are the weekday PM peak hour and Saturday peak hour. The PM and Saturday peak hours include the highest observed traffic volumes at both study area intersections in existing conditions. As the proposed development is commercial in nature, the site-generated traffic volumes will also be highest during the PM and Saturday peak hours. Analysis will be completed for the buildout year 2026 and horizon year 2031.

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

Site-Generated Traffic

- The proposed development is estimated to generate 724 person trips (including 506 vehicle trips) during the PM peak hour, and 721 person trips (including 505 vehicle trips) during the Saturday peak hour.

Access Design

- The design of the proposed accesses generally follow 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(1)(m)(i) of the PABL identifies a minimum separation of 60m between a two-way private approach and any other private approach to the same property. It is requested that this requirement be waived, as the northern access to Bank Street is designated for loading and will not typically be used by patrons of the proposed retail uses. Additionally, shifting the proposed RIRO access further south is not desired.

- Section 25(1)(u) of the PABL identifies that a requirement that any private approach serving a parking area with more than 50 parking spaces shall not have a grade exceeding 2% for the first 9m inside the property line. A waiver of this requirement is requested, as maximum grades of 3.5% for the RIRO access to Bank Street and 3.1% for the full-movement access to Dun Skipper Drive are proposed.

Development Design and Parking

- Pedestrian facilities will be provided between the entrance to each retail unit and the parking areas. A wide pathway between Units 'C' and 'D' will provide a direct connection to the signalized Bank Street/Dun Skipper Drive intersection. Bicycle parking will be provided adjacent to each retail unit. An on-site pedestrian route to the residential lands immediately west is proposed, which will provide a pedestrian connection from the subject site to Cedar Creek Drive.

- The subject site is within 400m walking distance of OC Transpo bus stops #0490, #0491, #0496, #0497, and #1069.

- Delivery trucks serving retail units 'A' and 'B' will arrive from the north on Bank Street. All delivery trucks will exit the site onto Dun Skipper Drive towards Bank Street. Garbage collection for retail units will occur in the loading areas for each retail unit.

- The fire route for the proposed development will include the main east-west drive aisle in front of retail units 'A' and 'B' (i.e. entering or exiting the site via the RIRO access to Bank Street), the north-south drive aisle that is aligned with the access to Dun Skipper Drive, and the main east-west drive aisle in front of retail units 'C' and 'D.' The pork chop island at the Bank Street access will accommodate turning movements of a fire truck.

- All minimum parking/loading requirements are met by the proposed development.

Boundary Streets

- The results of the segment multi-modal level of service (MMLOS) analysis can be summarized as follows:
    - Dun Skipper Drive meets the target pedestrian level of service (PLOS), while Bank Street does not;
    - Neither Bank Street nor Dun Skipper Drive meet the target bicycle level of service (BLOS);
    - Both Bank Street and Dun Skipper Drive achieve a transit level of service (TLOS) D;
    - Both Bank Street and Dun Skipper Drive achieve a truck level of service (TkLOS) B.

- Bank Street does not meet the target PLOS C or BLOS C. The future Bank Street widening project south of Blais Avenue will provide a concrete sidewalk and cycle track along Bank Street.

- Dun Skipper Drive does not meet the target BLOS D. Bike lanes with a minimum width of 1.2m would be required to achieve the target. This is identified for the City's consideration, although it is noted that Dun Skipper Drive is a recently constructed roadway.

Transportation Demand Management

- The following TDM measures will be considered by the proponent:
    - Provide on-site amenities/services to minimize mid-day or mid-commute errands.

Intersection MMLOS

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

- The study area intersections do not meet the target PLOS C. There is limited opportunity in improving any approach to the target without reducing the number of travel lanes or restricting turning movements.

- The east and west approaches of Bank Street/Blais Road/Miikana Road and west approach of Bank Street/Dun Skipper Drive do not meet the target BLOS C. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists is identified for the City's consideration.

- The study area intersections do not meet the target TkLOS D, which requires either multiple receiving lanes or a curb radius greater than 15m. No recommendations are identified.

Existing and Background Traffic Conditions

- The study area intersections operate at acceptable levels of service in existing, 2026 background, and 2031 background conditions.

Total Traffic Conditions

- The study area intersections and proposed accesses are anticipated to operate at acceptable levels of service in 2026 and 2031 total traffic conditions.

- During the PM peak hour, the 95th-percentile (i.e. maximum) queue length of the eastbound left turn movement at Bank Street/Dun Skipper Drive is approximately 98m, which exceeds the distance between the intersection and the proposed full-movement access to Dun Skipper Drive. The signal timing can be adjusted to allow all movements to continue operating acceptably, while reducing the maximum eastbound queues.

Roadway Modifications and Monitoring

- An auxiliary southbound right turn lane is recommended for the proposed RIRO access to Bank Street. A 35m storage length and 85m taper is proposed. The existing paved shoulder on the west side of Bank Street will transition to a pocket bike lane and the auxiliary southbound right turn lane will be introduced on the right. A transition returning cyclists to the paved shoulder will occur south of the proposed RIRO access. The location of the proposed RIRO access will require the shortening of the existing southbound right turn lane to Dun Skipper Drive. Shortening the auxiliary southbound right turn lane can be justified to include approximately 30m of storage and a 60m taper length, based on projected queues.

- These roadway modifications will only be recommended and pursued if the future widening is not anticipated to be constructed in the short- or medium-term. The construction timelines will be reviewed as part of the City's ongoing TMP update. It is proposed that updates to the TMP be monitored. If the TMP updates are finalized and the Bank Street widening is approved and scheduled within ten years of site construction/occupancy, it is recommended that the roadway modifications above be deferred to construction of the widening.

- The proposed development is recommended from a transportation perspective.

1.0 SCREENING

1.1 Introduction

This Transportation Impact Assessment (TIA) has been prepared in support of a Site Plan Control application for the eastern portion of the property located at 150 Dun Skipper Drive. The entire property is approximately 2.93 hectares in area, with frontages to Bank Street, Dun Skipper Drive, and Cedar Creek Drive and is currently vacant. The subject portion of the property is approximately 1.93 hectares in area.

The subject site is surrounded by the following:

- Residential and commercial uses, followed by Miikana Road to the north,
- Dun Skipper Drive, followed by commercial uses or vacant land to the south,
- Bank Street, followed by a storage yard and vacant land to the east, and
- Existing and planned residences, followed by Cedar Creek Road to the west.

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

1.2 Proposed Development

The proposed development consists of four single-storey retail units, containing a total of 58,300 ft^2 of gross floor area (GFA). This will include a 32,700 ft^2 supermarket and 25,600 ft^2 of other retail spaces.

A total of 195 surface parking spaces will be provided within the subject site. The proposed development will include a right-in loading access to Bank Street, a right-in/right-out (RIRO) access to Bank Street, and a full-movement access to Dun Skipper Drive. The development will be constructed in a single phase, with a buildout year of 2026. The western section of the property (i.e. between Cedar Creek Drive and the subject site) is not part of the subject application, but is anticipated to be developed as residential lands. A separate Site Plan Control application will be submitted for the future residential development.

The subject site is designated as 'Evolving Neighbourhood' and 'Corridor – Mainstreet' (Bank Street) on Schedule B7 of the City of Ottawa's Official Plan. The implemented zoning for the property is 'General Mixed Use' (GM), and the site is within the Leitrim Community Design Plan (CDP) area.

A copy of the preliminary site plan is included in **Appendix A**.

1.3 Screening Form

The City's *Revised 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 Crosstown Bikeway, and is not located within a Hub, Protected Major Transit Station Area (PMTSA), or Design Priority Area (DPA); further assessment is **not required** based on this trigger.

- Safety Triggers – The subject site has frontage to a street with a posted speed limit of 80 km/h (Bank Street), the proposed accesses are within the area of influence of an adjacent traffic signal, and the proposed primary access to Bank Street is located within the auxiliary southbound right turn lane at Bank Street/Dun Skipper Drive; further assessment is **required** based on this trigger.

Figure 1: View of the Subject Site

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. Schedule C16 of the City's *Official Plan* identifies a right-of-way (ROW) protection of 44.5m for Bank Street along the subject site's frontage. It appears that a widening has already been taken, and no further widening along the subject site is required.

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 regulatory 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.

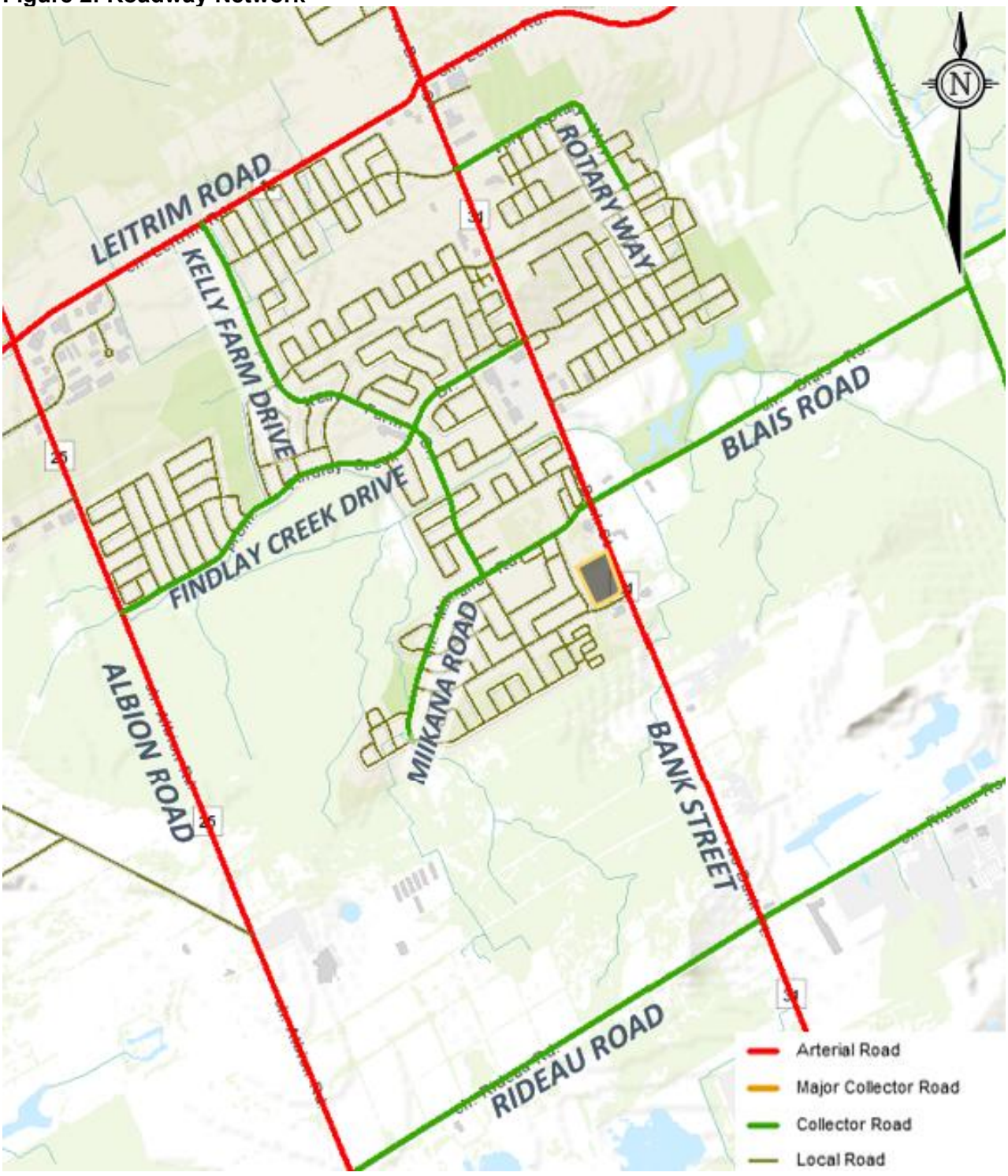
Miikana Road is a collector roadway that generally runs on an east-west alignment between Bank Street and Paakanaak Avenue. East of Bank Street, the roadway continues as Blais Road. Within the study area, Miikana Road has a two-lane undivided urban cross-section and an unposted speed limit of 50 km/h. Sidewalks are provided discontinuously on the north side of the roadway, and continuously on the south side of the roadway. Miikana Road is not classified as a truck route. On-street parking is permitted on the south 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 and an unposted speed limit of 50 km/h. Sidewalks are provided discontinuously on the north side of the roadway, and continuously on the south side of the roadway. Dun Skipper Drive is not classified as a truck route. On-street parking is permitted on both sides of the roadway. The ROW of Dun Skipper Drive is approximately 24m along the subject site's frontage. Schedule C16 of the City's *Official Plan* does not identify a ROW protection for Dun Skipper Drive, and therefore no widening is anticipated.

Cedar Creek Drive is a local roadway that generally runs on a north-south alignment between Miikana Road and Dun Skipper Drive. Within the study area, Cedar Creek Drive has a two-lane undivided urban cross-section, sidewalks on the east side of the roadway where residences have been constructed, and an unposted speed limit of 50 km/h. Cedar Creek Drive is not classified as a truck route. On-street parking is permitted on both sides of the roadway. The ROW of Cedar Creek Drive is approximately 20m along the subject site's frontage. Schedule C16 of the City's *Official Plan* does not identify a ROW protection for Cedar Creek Drive, and therefore no widening is anticipated.

The roadway of the greater area surrounding the subject site is illustrated in **Figure 2**.

Figure 2: Roadway Network



2.1.2 Intersections

Bank Street/Blais Road/Miikana Road

- Signalized 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 on all approaches
- Crossrides on all approaches

Bank Street/Dun Skipper Drive

- Signalized 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 on all approaches
- Crossrides on north and east approaches, plus a jug handle for northbound left-turning cyclists

2.1.3 Driveways

A review of the existing adjacent driveways along the boundary roads are provided as follows:

Bank Street, east side

- Two driveways to an RV storage yard at 4815 Bank Street
- One driveway to the Hindu Temple of Ottawa Carleton at 4835 Bank Street

Bank Street, west side

- Two driveways to residences at 4816 and 4820 Bank Street

Dun Skipper Drive, north side

- One driveway to a residence at 116 Dun Skipper Drive

Dun Skipper Drive, south side

- Ten driveways to residences at 113-131 Dun Skipper Drive

Cedar Creek Drive, east side

- Ten driveways to residences at 1020-1054 Cedar Creek Drive

Cedar Creek Drive, west side

- Eight driveways to residences at 1017-1047 Cedar Creek Drive

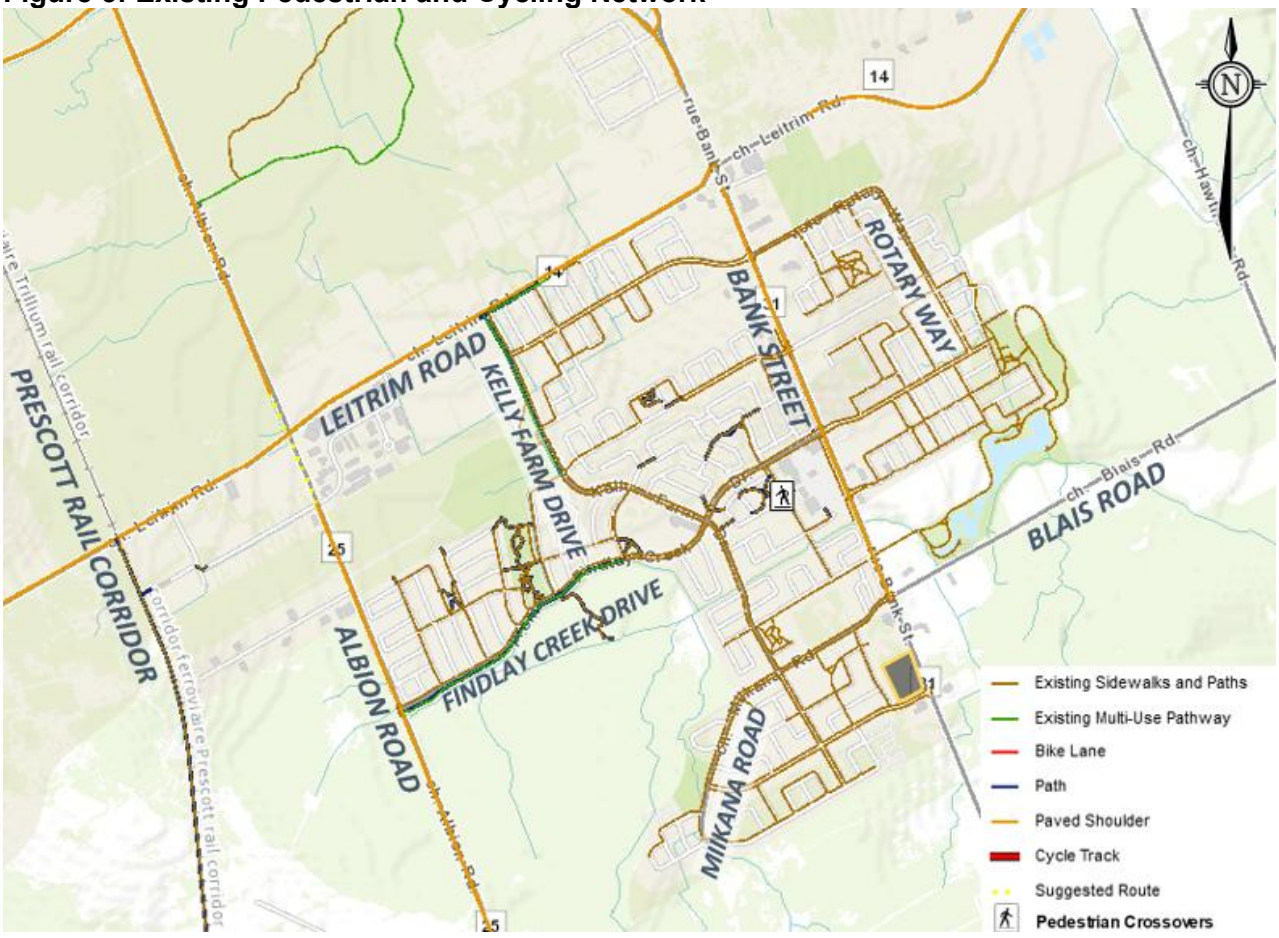
2.1.4 Pedestrian and Cycling Facilities

Sidewalks are provided continuously on the south sides of Dun Skipper Drive and Miikana Road, and discontinuous on the north sides of Dun Skipper Drive and Miikana Road, and on the east side of Cedar Creek Drive. Paved shoulders are provided on both sides of Bank Street.

No study area roadways are identified in the City's cycling network.

The existing pedestrian and cycling network of the greater area surrounding the subject site is illustrated in **Figure 3**.

Figure 3: Existing Pedestrian and Cycling Network



2.1.5 Area Traffic Management

Within the study area, there are no Area Traffic Management (ATM) studies that are 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.

2.1.6 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 4**. 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
#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
#0496	South side of Dun Skipper Drive, east of Cedar Creek Drive	None
#0497	North side of Dun Skipper Drive, east of Cedar Creek Drive	294
#1069	East side of Bank Street, south of Dun Skipper Drive	93, 304

Figure 4: OC Transpo Bus Stop Locations

Table 2: OC Transpo Route Information

Route	From ↔ To	Frequency
93	Hurdman / Greenboro ↔ Leitrim / Blossom Park	Stop #1069 only served on Sundays at 10:50am and 14:32pm (Hindu Temple service)
294	Hurdman ↔ Findlay Creek	Peak period and peak direction service only; Monday to Friday, 30-minute headways
304	Billings Bridge ↔ Metcalfe, Greely, Osgoode	Stop #1069 only served on Thursdays at 9:41am (inbound rural shopping route)

2.1.7 Existing Traffic Volumes

Weekday and Saturday traffic counts completed by the City of Ottawa or coordinated by Novatech were used to determine the existing pedestrian, cyclist, and vehicular traffic volumes at the study area intersections. These counts were completed on the dates listed below:

- Bank Street/Blais Road/Miikana Road — Thu, July 6, 2023 and Sat, June 22, 2024
- Bank Street/Dun Skipper Drive — Thu, Sept 14, 2023 and Sat, June 22, 2024

Based on the weekday count at Bank Street/Dun Skipper Drive, the average annual daily traffic (AADT) volumes on Bank Street and Dun Skipper Drive are approximately 16,290 vehicles per day and 3,210 vehicles per day, respectively.

All traffic count data previously discussed are included in **Appendix D**. Traffic volumes within the study area are shown in **Figure 5**.

2.1.8 Collision Records

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

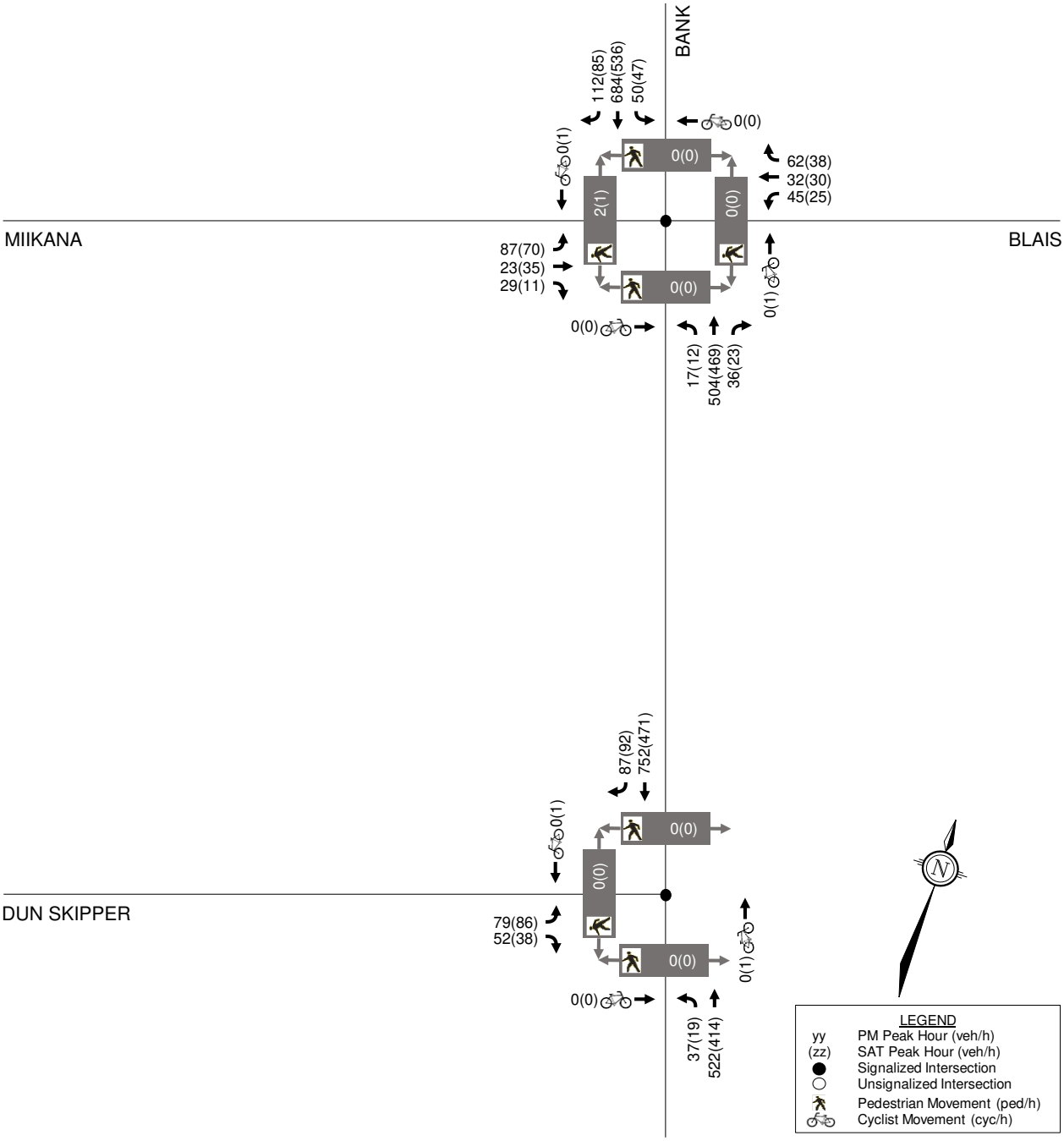
The collision data has been evaluated to determine if there are any identifiable collision patterns, which are defined in the *Revised TIA Guidelines* as 'more than six collisions in five years' for any one movement. The number of collisions at each intersection from January 1, 2017 to December 31, 2021 is summarized in **Table 3**.

Table 3: Reported Collisions

Intersection or Segment	Impact Types						Total
	Approach	Angle	Rear End	Sideswipe	Turning Movement	SMV[1]/ Other	
Bank St/ Blais Rd/Miikana Rd	-	3	8	1	-	-	**12**
Bank St/ Dun Skipper Dr	-	-	1	-	1	1	**3**
Bank St btwn Blais Rd & Dun Skipper Dr	-	-	2	-	-	-	**2**
Dun Skipper Dr btwn Bank St & Cedar Creek Dr	-	-	-	-	-	-	**0**
Cedar Creek Dr btwn Miikana Rd & Dun Skipper Dr	-	-	-	-	-	-	**0**

1. SMV = Single Motor Vehicle

Figure 5: Existing Traffic Volumes



Bank Street/Blais Road/Miikana Road
A total of 12 collisions were reported at this intersection in the last five years, of which there were three angle impacts, eight rear-end impacts, and one sideswipe impact. Three of the 12 collisions resulted in personal injuries, but none caused fatalities. Four of the collisions (33%) occurred in poor driving conditions. No collisions involved cyclists or pedestrians.

Of the eight rear-end impacts, three involved northbound vehicles, four involved southbound vehicles, and one involved westbound vehicles. Two of the rear-end impacts occurred in poor driving conditions, and one collision resulted in injuries.

Bank Street/Dun Skipper Drive
A total of three collisions were reported at this intersection in the last five years, consisting of a rear-end impact, one turning movement impact, and one single vehicle/other impact. No collisions resulted in injuries or fatalities. One of the collisions (33%) occurred in poor driving conditions. No collisions involved cyclists or pedestrians.

Bank Street between Blais Road/Miikana Road & Dun Skipper Drive
A total of two collisions were reported along this segment in the last five years. Both collisions were rear-end impacts involving southbound vehicles, did not result in injuries or fatalities, and occurred in fair driving conditions.

Dun Skipper Drive between Bank Street & Cedar Creek Drive
No collisions were reported along this segment in the last five years.

Cedar Creek Drive between Miikana Road & Dun Skipper Drive
No collisions were reported along this segment in the last five years.

2.2 Planned Conditions

2.2.1 Planned Transportation Projects

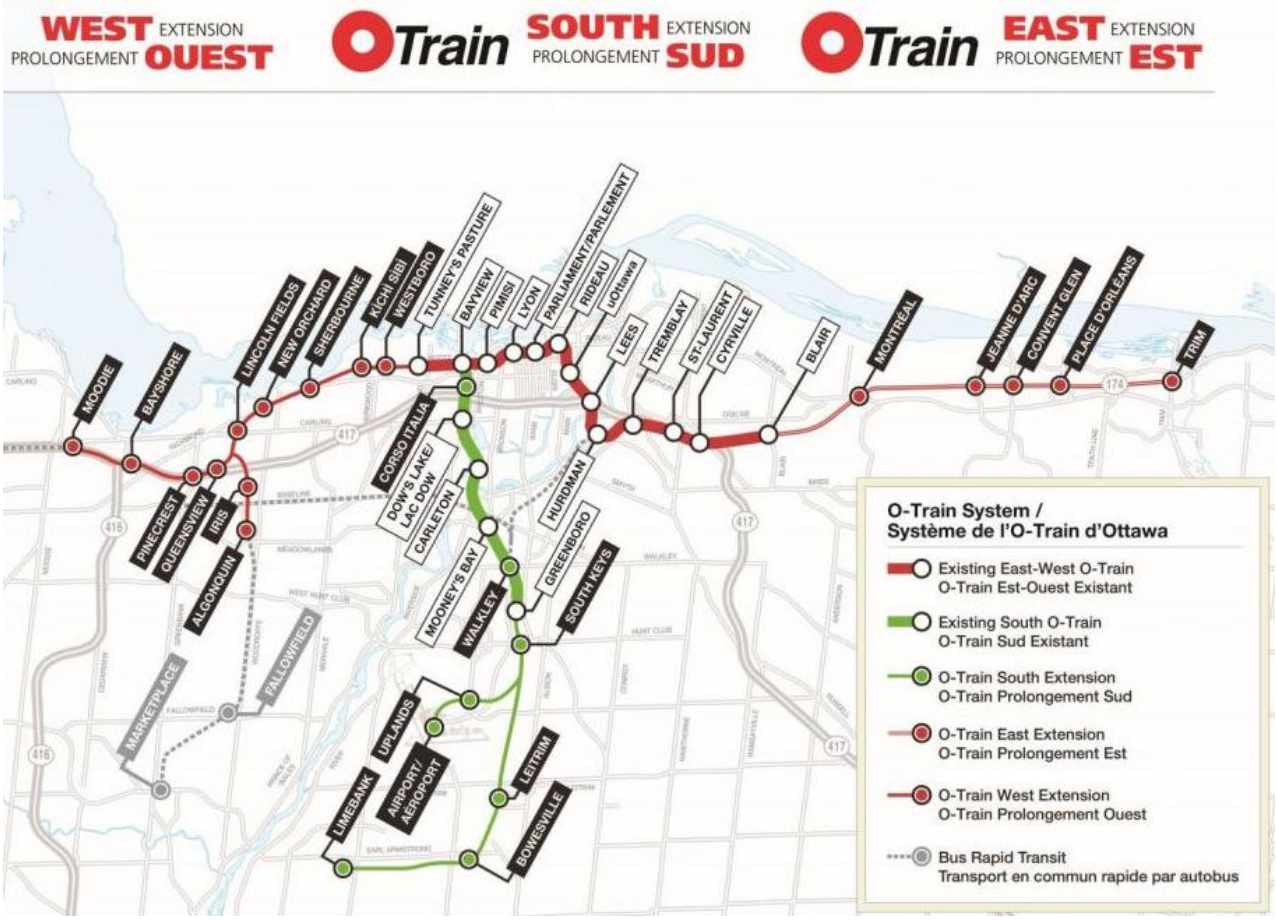
The City's *2013 Transportation Master Plan (TMP)* identify roadway improvement projects within the study area in its Affordable Road Network. In the Affordable Road Network, the 2013 TMP identifies the widening of Bank Street from two to four lanes between Leitrim Road and Blais Road as a Phase 2 (2020-2025) project, and this project is underway at the time of writing. 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.

An Environmental Assessment (EA) study has been completed for the Bank Street widening. The widening will include a four-lane cross-section along the subject site's frontage, sidewalks and cycle tracks in each direction, and a raised median. Pavement marking plans of the widening within the study area are included in **Appendix F**. The *Bank Street Widening Class EA Study from Leitrim Road to Rideau Road Environmental Study Report* (ESR), prepared by AECOM in July 2014, identifies a future posted speed limit of 70 km/h on Bank Street.

South of the study area, an 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 2013 TMP 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. Construction is anticipated to be complete in 2025. A figure of the proposed O-Train station locations is included in **Figure 6**.

Figure 6: O-Train South Extension



OC Transpo will be revising transit service with the opening of the O-Train Lines 2 and 4. The future transit network, including revised routes, is described within the City's 'New Ways to Bus' network. Within the study area, Route 93 will continue to serve the site only on Sundays, a new Route 94 will operate between Leitrim Station and Dun Skipper Drive during peak periods, and Route 294 will be removed from the study area.

The City's *TMP – Part 1* includes a list of upcoming active transportation projects, superseding the *2013 Ottawa Cycling Plan* and *2013 Ottawa Pedestrian Plan*. North of the study area, the *TMP – Part 1* identifies a pavement markings and signage project to provide bike lanes on Findlay Creek Drive wherever feasible.

West of the study area, the Rural Active Transportation Network identifies Albion Road being as a roadway in the proposed Paved Shoulder Network, and includes a major pathway is planned from Miikana Road (west of Kelly Farm Drive) to Findlay Creek Drive, continuing to Albion Road, the Prescott Rail Corridor, and the Riverside South Rail Corridor.

2.2.2 Other Area Developments

In proximity of the proposed development, there are multiple other developments that have recently been completed, are under construction, approved, or are in the approval process. These developments are summarized as follows.

820 Miikana Road (Findlay Creek School)
A one-storey elementary school has opened at this property. A TIA was prepared by Novatech in June 2022 in support of this school, which was completed for the 2024-2025 school year.

4781 Bank Street
A total of 96 stacked apartment dwellings are proposed at this property. A TIA Screening Form was submitted in January 2022, and no TIA study was prepared.

4800 Bank Street (Remer Lands)
A Community Transportation Study (CTS) was prepared by IBI Group in May 2016, in support of the subdivision that includes the subject site. A majority of the subdivision has been constructed. Full buildout of the subdivision was estimated to occur in 2025.

4835 Bank Street
An assembly hall is proposed at the current Hindu Temple of Ottawa-Carleton. A Transportation Brief and Addendum were prepared by D.J. Halpenny & Associates in October 2017 and July 2020, respectively. The assembly hall was anticipated initially to be completed in 2020, but has construction has not yet occurred. Analysis was completed for the Sunday peak hour, and this development is not anticipated to generate any trips during the PM and Saturday peak hours.

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.

It is also noted that the western portion of the subject address (150 Dun Skipper Drive) is anticipated to include residential dwellings and a single access to Cedar Creek Drive. A development application has not yet been filed. However, an assumed development of approximately 240 apartment dwellings has been considered for the purposes of developing background traffic projections.

2.3 Study Area and Time Periods

The study area for this report includes the boundary roadways Bank Street and Dun Skipper Drive, as well as the signalized intersections at Bank Street/Blais Road/Miikana Road and Bank Street/ Dun Skipper Drive. As the western portion of the subject property is not part of this application, Cedar Creek Drive has been excluded from this analysis.

The selected time periods for the analysis are the weekday PM peak hour and Saturday peak hour. The PM and Saturday peak hours include the highest observed traffic volumes at both study area intersections in existing conditions. As the proposed development is commercial in nature, the site-generated traffic volumes will also be highest during the PM and Saturday peak hours. Analysis will be completed for the buildout year 2026 and horizon year 2031.

2.4 Development-Generated Travel Demand

2.4.1 Trip Generation

The proposed retail development has a gross floor area of approximately 58,300 ft^2, including a 32,700 ft^2 supermarket and 25,600 ft^2 of other retail uses.

The number of peak hour person trips generated by the proposed development has been estimated using the *ITE Trip Generation Manual, 11th Edition* (released in 2021 by the Institute of Transportation Engineers) and the *TRANS Trip Generation Manual* (prepared in 2020 by WSP).

For this study, the rates associated with the Shopping Plaza (with Supermarket) land use have been considered for the entire development, as the rates are appropriate for sites between 40,000 ft^2 and 150,000 ft^2. The Shopping Plaza rates are different for sites with a supermarket anchor versus without. The 'Supermarket – Yes' land use subcategory has therefore been considered, as the proposed supermarket will be the primary use on-site. The Shopping Plaza rates also account for internally captured trips without requiring a separate process for estimation.

Per the *TIA Guidelines*, a conversion factor of 1.28 has been applied to the ITE rates to convert from trips to person trips during the peak hours. The estimated number of person trips generated by the proposed development during the peak hours are shown in **Table 4**.

Table 4: Peak Hour Trip Generation

Land Use (ITE Code)	Area	PM Peak Hour (pph)(1)			SAT Peak Hour (pph)		
		IN	OUT	TOT	IN	OUT	TOT
Shopping Plaza (821) Supermarket – Yes	58,300 ft^2	348	376	*724*	371	350	*721*

1: pph: person trips per hour

The *TRANS Trip Generation Manual* identifies that the subject site is located within the South Gloucester/Leitrim district, which has the following observed mode shares for commercial-generated trips during the AM and PM peak hours. Observed mode shares for the Saturday peak hour were not included in the *TRANS Trip Generation Manual*.

- Auto Driver: 74% in AM peak, 70% in PM peak;
- Auto Passenger: 13% in AM peak, 22% in PM peak;
- Transit: 4% in AM peak, 2% in PM peak;
- Cyclist: 0% in AM peak, 0% in PM peak;
- Pedestrian: 10% in AM peak, 6% in PM peak.

One set of mode shares has been assumed for the PM and Saturday peak hours, based on the observed shares for the South Gloucester/Leitrim district and adjusted to reflect the extremely limited transit options during the PM and Saturday peak hours. Therefore, the assumed set of mode shares can be summarized as 70% auto driver, 20% auto passenger, 0% transit, 0% cyclist, and 10% pedestrian.

The estimated number of trips generated by the proposed development, broken down by mode share, is included in **Table 5**.

Table 5: Peak Hour Trips by Mode Share

Travel Mode	Mode Share	PM Peak Hour			SAT Peak Hour		
		IN	OUT	TOT	IN	OUT	TOT
Shopping Plaza Trips		**348**	**376**	***724***	**371**	**350**	***721***
Auto Driver	70%	243	263	*506*	260	245	*505*
Auto Passenger	20%	70	75	*145*	74	70	*144*
Transit	0%	-	-	*0*	-	-	*0*
Cyclist	0%	-	-	*0*	-	-	*0*
Pedestrian	10%	35	38	*73*	37	35	*72*

From the previous table, the proposed development is estimated to generate 724 person trips (including 506 vehicle trips) during the PM peak hour, and 721 person trips (including 505 vehicle trips) during the Saturday peak hour.

Pass-by Trips

The proposed development is anticipated to generate two types of external peak hour trips: primary trips and pass-by trips. Primary trips are made for the specific purpose of visiting the site, while pass-by trips are made as intermediate stops on the way to another destination. The *ITE Trip Generation Manual* includes PM peak hour and Saturday peak hour pass-by percentages for the Shopping Plaza and Supermarket land uses. For the purposes of this TIA, the percentages of both land uses have been blended, to reflect that the proposed supermarket is anticipated to be the largest trip generator of the development.

The pass-by percentages identified in the *ITE Trip Generation Manual* and the blended pass-by rates assumed in this TIA are summarized as follows:

- PM Peak Hour: 40% (Shopping Plaza) and 24% (Supermarket) = 32% (blended rate)
- SAT Peak Hour: 31% (Shopping Plaza) and 19% (Supermarket) = 25% (blended rate)

The projected primary and pass-by trips generated by the proposed development are summarized in **Table 6**.

Table 6: Primary and Pass-by Trips

Trip Type	PM Peak Hour (vph)			SAT Peak Hour (vph)		
	IN	OUT	TOT	IN	OUT	TOT
Shopping Plaza Trips						
Total Vehicle Trips	243	263	*506*	260	245	*505*
Pass-by Adjustment (32% PM, 25% SAT)	-81	-81	*-162*	-63	-63	*-126*
Primary Trips (68% PM, 75% SAT)	**162**	**182**	***344***	**197**	**182**	***379***

From the previous table, the proposed development is estimated to generate 344 primary vehicle trips during the PM peak hour and 379 primary vehicle trips during the Saturday peak hour.

2.4.2 Trip Distribution

The distribution of primary trips generated by the proposed development is based on the two-way traffic volumes observed on during the Saturday peak hour, as it represents the regional draw of a commercial site. An increase to the trips arriving/departing the study area via Dun Skipper Drive has been applied, to represent future patrons that live in the communities immediately north and west of the study area. The trip distribution can be summarized as follows:

- 45% to/from the north via Bank Street;
- 30% to/from the south via Bank Street;
- 5% to/from the east via Blais Road;
- 5% to/from the west via Miikana Road;
- 15% to/from the west via Dun Skipper Drive.

2.4.3 Trip Assignment

As the proposed development includes an access that is restricted to RIRO operations, some primary trips are anticipated to arrive from one access but depart from a separate access. For example, primary trips arriving from north of the subject site (i.e. from Bank Street, Miikana Road, or Blais Road) are assumed to enter the site via the RIRO access to Bank Street, and exit the site via the full-movement Dun Skipper Drive access. All trips arriving from the south via Bank Street have been assigned to the Dun Skipper Drive access, but half of all trips departing to the south have been assigned to the Bank Street access.

Primary trips to/from the proposed development have been assigned to the proposed accesses as follows:

- Bank Street access
    - 100% of trips **from the north** via Bank Street;
    - 50% of trips **to the south** via Bank Street;
    - 100% of trips **from the east** via Blais Road;
    - 100% of trips **from the west** via Miikana Road.

- Dun Skipper Drive access
    - 100% of trips **to the north** via Bank Street;
    - 100% of trips **from the south** and 50% of trips **to the south** via Bank Street;
    - 100% of trips **to the east** via Blais Road
    - 100% of trips **to the west** via Miikana Road;
    - 100% of trips **to** and **from the west** via Dun Skipper Drive.

All pass-by trips are assumed to be originate from existing trips on Bank Street, as it carries far more volume than Dun Skipper Drive. For the purposes of this TIA, 60% of pass-by trips have been assigned to the Bank Street access (originating from the north) and 40% of pass-by trips have been assigned to the Dun Skipper Drive access (originating from the south).

Based on the above, the primary site-generated traffic volumes within the study area and pass-by traffic volumes within the study area are shown in **Figure 7** and **Figure 8**, respectively. The total site-generated traffic volumes are shown in **Figure 9**.

Figure 7: Primary Site-Generated Traffic Volumes

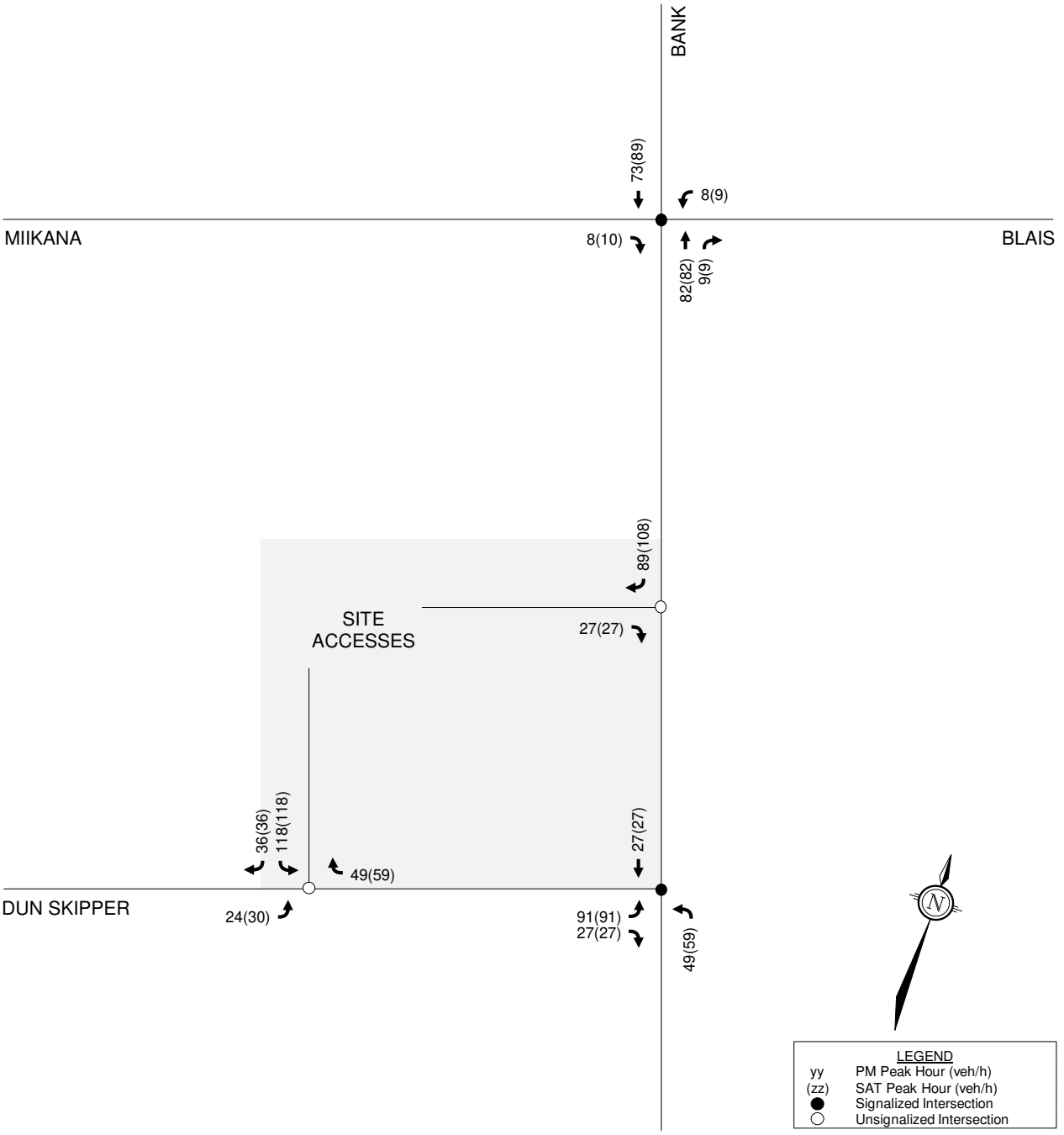


Figure 8: Pass-by Site-Generated Traffic Volumes

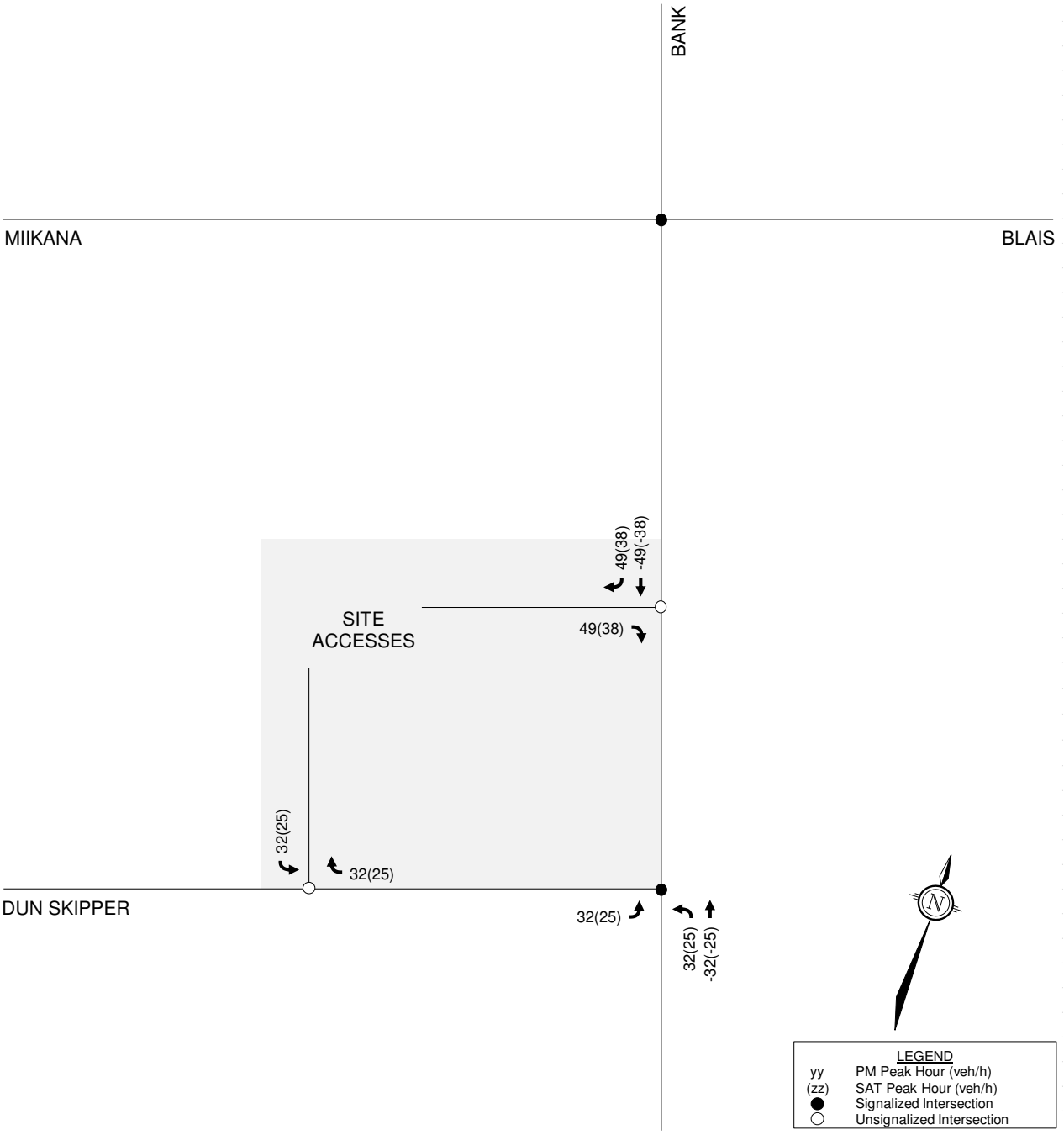
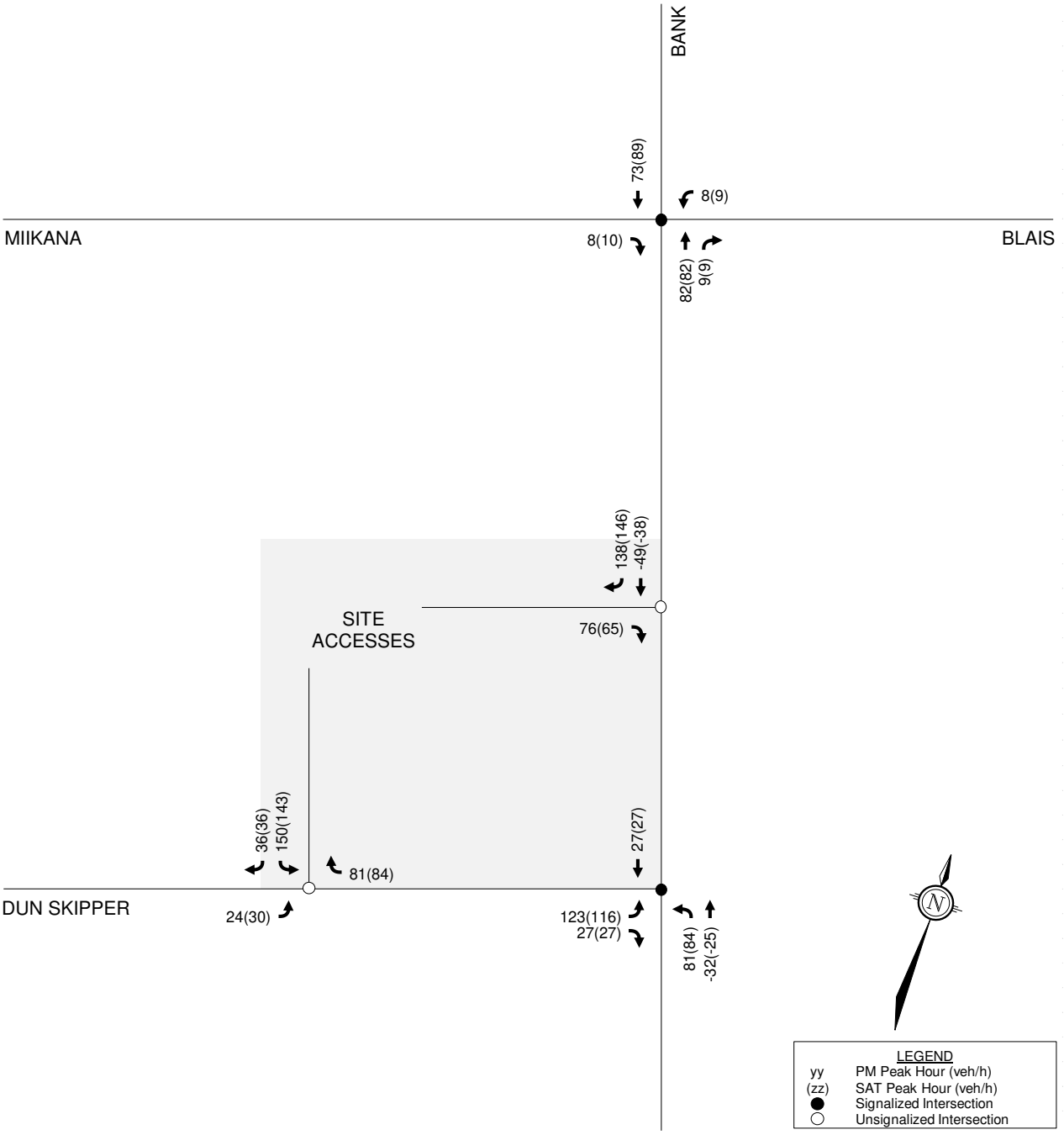


Figure 9: Total Site-Generated Traffic Volumes



2.5 Access Design

The proposed development includes two accesses to Bank Street and one access to Dun Skipper Drive. The loading access to Bank Street is limited to right-in operations only, the primary access to Bank Street is limited to right-in/right-out operations, and the access to Dun Skipper Drive is full-movement.

As Bank Street is a designated Mainstreet Corridor per Schedule B7 of the *Official Plan*, it is acknowledged that *Official Plan* policy 6.2.1.4 (b) applies to the subject site, which states that for developments with frontage to a corridor street and a parallel/side street, 'vehicular access shall generally be provided from the parallel street or side street.' It is also acknowledged that as Bank Street includes existing and planned cycling facilities, *Official Plan* policy 4.1.2.4 applies, which states that 'development of land abutting an existing or planned cycling facility identified in the TMP and associated plans will be designed to minimize vehicle access across the cycling facility in order to reduce potential conflict points, such as by providing vehicular access to parking and service areas from side streets or rear lanes.' Justification for the two proposed accesses to Bank Street despite these policies is included below.

The loading access to Bank Street is proposed to be limited to right-in operations only, allowing delivery trucks to enter the site behind the retail units (i.e. eliminating the conflicts with pedestrians entering/exiting the stores) and limiting conflicts with passenger vehicles as they enter and exit the loading zones. Approximately ten trucks per week are anticipated at the loading access to Bank Street, and are anticipated to arrive during off-peak hours. Further, the existing configuration of Bank Street/Dun Skipper Drive is not anticipated to accommodate the southbound right turn movement for tractor-trailers, and modifications to the intersection would be required if delivery trucks were forced to the Dun Skipper Drive access (such as removal of the raised median on Dun Skipper Drive).

The primary access to Bank Street is proposed to be limited to right-in/right-out operations only, based on the magnitude of traffic volumes on Bank Street. A pork chop island is proposed as an interim measure to restrict left turns at this access. Ultimately, the pork chop island can be removed once a median is constructed and the sidewalk/cycle track are extended, as part of the City's future Bank Street widening project. As discussed in Section 2.4.1, the proposed development is projected to generate over 500 two-way vehicle trips during the PM and Saturday peak hours. Limiting patrons to enter and exit the proposed development at only one full-movement access to Dun Skipper Drive is not recommended, and significant operational and queueing issues would be anticipated within the subject site, as well as on Dun Skipper Drive. Maintaining an access to Bank Street is therefore considered essential to the viability of the proposed development, and will maintain acceptable traffic operations within the existing surrounding community.

The design of the proposed accesses 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(1)(a) of the PABL identifies a minimum of 46m of frontage to permit two two-way private approaches to one street. The subject site exceeds this frontage along both Bank Street and Dun Skipper Drive. Therefore, the number of accesses to each frontage is permitted.

Sections 25(1)(c) of the PABL identifies a maximum width requirement of 9m for two-way private approaches. The access to Dun Skipper Drive is approximately 9.0m in width at the street line, meeting the requirement, and approximately 22m at the edge of roadway due to the curb radii. This width is required to accommodate truck movements entering and exiting the access. The access to Bank Street is approximately 9.2m in width at the street line, marginally exceeding the requirement, and approximately 36m at the edge of roadway due to the curb radii and central island prohibiting all left turns. This width is required to accommodate truck movements entering and exiting the access.

Section 25(1)(d) of the PABL identifies a maximum width requirement of 7.5m for one-way private approaches. The loading access to Bank Street is approximately 6.5m in width at the street line, meeting the requirement, and approximately 19m in width at the edge of roadway due to the curb radii. This width is required to accommodate inbound truck movements at the loading access.

Section 25(1)(g) of the PABL identifies a minimum separation requirement of 9m between a two-way private approach and any other private approach to the same property. This is superseded by the requirements of Section 25(1)(m)(i) of the PABL, which apply when a property abuts or is within 46m of an arterial or major collector roadway.

Section 25(1)(m)(i) of the PABL identifies a minimum separation requirement of 60m between a two-way private approach and any other private approach to the same property, when the property has a total of 200 to 299 parking spaces and is a retail use. The proposed accesses to Bank Street are approximately 51m apart, as measured at the street line, and therefore the requirement is not met. It is requested that this requirement be waived, as the northern access to Bank Street is designated for loading and will not typically be used by patrons of the proposed retail uses. Additionally, shifting the proposed RIRO access further south is not desired.

Section 25(1)(m)(i) of the PABL also identifies a minimum separation requirement of 60m between the nearest edge of a private approach and the nearest street line. The proposed accesses to Bank Street and Dun Skipper Drive meet this requirement. TAC's *Geometric Design Guide* identifies a higher minimum corner clearance requirement of 70m for the accesses to Bank Street, and this requirement is also met by the proposed accesses.

Section 25(1)(p) of the PABL identifies a minimum separation requirement of 3m between the nearest edge of a private approach and the nearest property line. The loading access to Bank Street is approximately 4.5m from the northern property line and the full-movement access to Dun Skipper Drive is approximately 5.3m from the western property line. These separations meet the requirement at the street lines to Bank Street and Dun Skipper Drive. Curb radii at the loading access to Bank Street and access to Dun Skipper Drive extend through the projections of the nearest property lines, but are required to accommodate truck movements.

Section 25(1)(u) of the PABL identifies that a requirement that any private approach serving a parking area with more than 50 parking spaces shall not have a grade exceeding 2% for the first 9m inside the property line. Section 25(1)(v) of the PABL includes a provision that this requirement can be waived, provided that the proposed access is located a safe distance from accesses serving adjacent properties, in such a manner that there are adequate sight lines for vehicles exiting the property, and in such a manner that does not create a traffic hazard. A waiver of this requirement is requested, as maximum grades of 3.5% for the RIRO access to Bank Street and 3.1% for the full-movement access to Dun Skipper Drive are proposed.

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, a design speed has been taken as the posted speed limit plus 10 km/h. Therefore, a design speed of 60 km/h has been considered for Dun Skipper Drive and a design speed of 90 km/h has been considered for Bank Street. TAC outlines the following minimum SSD required and minimum ISD desired for the proposed accesses.

Bank Street Accesses

- SSD: 160m
- ISD, left turns: 190m
- ISD, right turns: 165m

Dun Skipper Drive Access

- SSD: 85m
- ISD, left turns: 130m
- ISD, right turns: 110m

Bank Street is a level and straight roadway, and no sightline concerns are identified for the proposed accesses to Bank Street. Dun Skipper Drive descends toward Bank Street, and slight horizontal curves from the proposed access to west of Cedar Creek Drive. No sightline concerns are identified for the proposed access to Dun Skipper Drive, as the proposed retail units along Dun Skipper Drive are sufficiently set back and the lands adjacent to the west are vacant.

TAC's *Geometric Design Guide* outlines a minimum clear throat length for accesses serving uses including shopping centres and supermarkets. The minimum clear throat lengths for supermarkets has been considered in this review, as they are the most critical. For supermarkets greater than 2,000 m^2 in GFA, TAC identifies minimum clear throat lengths of 40m for arterial accesses and 25m for collector accesses.

Measuring from the end of the curb radii to the first point of conflict, the proposed RIRO access to Bank Street will include 40.0m of clear throat length, and the proposed full-movement access to Dun Skipper Drive will include 25.2m of clear throat length. Therefore, the minimum clear throat length requirements for these two accesses are met, and queueing from within the site is not anticipated to extend back onto Bank Street or Dun Skipper Drive.

The proposed loading access to Bank Street will include 17.0m of clear throat length. This length can be considered adequate, as this access will be used infrequently and is limited to right-in operations only.

2.6 Exemptions Review

This module reviews possible exemptions from the final TIA, as outlined in the *2023 Revised TIA Guidelines*. The applicable exemptions for this site are shown in **Table 7**.

Table 7: TIA Exemptions

Module	Element	Exemption Criteria	Status
4.1 Development Design	*4.1.2* Circulation and Access	• Required for site plan control and zoning by-law amendment applications	Not Exempt
	4.1.3 New Street Networks	• Required for draft plan of subdivision applications	Exempt
4.2 Parking	*All elements*	• Required for site plan control and zoning by-law amendment applications	Not Exempt

Module	Element	Exemption Criteria	Status
4.6 Neighbourhood Traffic Calming	*All elements*	• If all of the following criteria are met: 1. Access is provided to a collector or local road 2. Application is for zoning by-law amendment or draft plan of subdivision 3. Proposed development generates more than 75 vehicle trips 4. Site trip infiltration is expected, and site-generated traffic will increase peak hour volumes by 50%+ along the route between the site and an arterial road 5. The subject street segment is adjacent to two or more of the following significant sensitive land uses: ○ School (within 250m walking distance) ○ Park ○ Retirement/older adult facility ○ Licensed child care centre ○ Community centre ○ 50+% of adjacent properties along the route(s) are occupied by residential lands and at least ten dwellings are occupied	Exempt
4.7 Transit	*4.7.1* Transit Route Capacity	• Required when proposed development generates more than 75 transit trips	Exempt
	4.7.2 Transit Priority Requirements	• Required when proposed development generates more than 75 vehicle trips	Not Exempt
4.8 Network Concept	*All elements*	• Required when proposed development generates 200+ person trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Exempt
4.9 Intersection Design	*All elements*	• Required when proposed development generates more than 75 vehicle trips	Not Exempt

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

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

3.0 BACKGROUND NETWORK TRAVEL DEMAND

3.1 General Background Growth Rate

A review of the City's *Strategic Long-Range Model* has been conducted, comparing snapshots of the 2011 and 2031 AM peak hour traffic volumes. The long-range snapshots are included in **Appendix G**.

Within the study area, the long-range snapshots generally projects traffic growth on Bank Street (south of Leitrim Road) between 0% and 2% per annum. An annual background growth rate of 1% has been assumed for volumes on Bank Street and Blais Road, consistent with other traffic studies in the study area.

3.2 Other Area Developments

There are multiple other developments in proximity of the subject site that are under construction, approved, or are in the approval process, and are significant enough to have included traffic projections. A summary of each significant development is included below, and relevant excerpts of the studies/projections in support of these developments are included in **Appendix H**.

820 Miikana Road (Findlay Creek School)
A one-storey elementary school has opened for the 2024-2025 school year. A TIA was prepared by Novatech in June 2022 in support of this school. Projected traffic generated by the school has been added to the 2026 and 2031 background volumes.

4800 Bank Street (Remer Lands)
A Community Transportation Study (CTS) was prepared by IBI Group in May 2016, in support of the subdivision that includes the subject site. The CTS considered a subdivision with 422 single-detached homes, 399 townhomes, 82 apartment dwellings, an elementary school with 400 students, and approximately 158,761 ft^2 of commercial space across two blocks. Full buildout of the subdivision was estimated to occur in 2025.

For the purposes of this study, it has been assumed that approximately 90% of the projected traffic generated by the subdivision has been captured by the 2024 traffic counts, and the remaining 10% has been added to the 2026 and 2031 background volumes.

4836 Bank Street
A TIA was prepared by IBI Group in April 2019 in support of this development. The TIA considered a development with 125 hotel suites, a 2,997 m^2 hardware store, a 502 m^2 restaurant, and a 987 m^2 commercial building. The TIA estimated that the hardware store would be built out by 2021, with the remainder of the development being built out by 2023. Therefore, projected traffic generated by this development has been added to the 2026 and 2031 background volumes.

150 Dun Skipper Drive
A development application has not yet been filed. An assumed development of approximately 240 apartment dwellings has been considered for the purposes of developing background traffic projections in 2026 and 2031, as these residences will add traffic volumes to Miikana Road and Cedar Creek Drive.

For the purposes of this study, it has been assumed that the apartment dwellings will generate 50 two-way vehicle trips during the PM and Saturday peak hours, evenly split between Miikana Road and Dun Skipper Drive. All trips on Miikana Road are assumed to arrive from/depart to the north via Bank Street, and trips on Dun Skipper are assumed to have an 80%/20% split between arriving from/departing to the north and south via Bank Street.

3.3 Future Traffic Conditions

The figures below present the following future traffic conditions:

- Other area development-generated volumes in 2026/2031 are shown in **Figure 10**;
- Background traffic volumes in 2026 are shown in **Figure 11**;
- Background traffic volumes in 2031 are shown in **Figure 12**;
- Total traffic volumes in 2026 are shown in **Figure 13**;
- Total traffic volumes in 2031 are shown in **Figure 14**.

3.4 Demand Rationalization

A review of the existing and background intersection operations has been conducted to determine if and when traffic volumes exceed capacity within the study area, using Synchro 11 software. The intersection parameters used in the analysis are consistent with the *TIA Guidelines* (Saturated Flow Rate: 1,800 vphpl, Peak Hour Factor: 0.9 in existing conditions and 1.0 in future conditions). Per Exhibit 22 of the *Multi-Modal Level of Service (MMLOS) Guidelines*, the target vehicular levels of service (Auto LOS) is an Auto LOS D for intersections within the General Urban Area.

Signal timing plans for the study area intersections are included in **Appendix I**.

3.4.1 Existing Traffic Operations

Intersection capacity analysis has been conducted for the existing traffic conditions. The results of the analysis are summarized in **Table 8** for the weekday PM and Saturday peak hours. Detailed reports are included in **Appendix J**.

Table 8: Existing Intersection Analysis

Intersection	PM Peak Hour			SAT Peak Hour		
	Max v/c	LOS	Mvmt	Max v/c	LOS	Mvmt
Bank Street/ Blais Road/Miikana Road	0.58	A	SBT	0.52	A	SBT
Bank Street/ Dun Skipper Drive	0.60	A	SBT	0.39	A	SBT

From the previous table, the study area intersections operate at acceptable levels of service in existing conditions.

Figure 10: 2026/2031 Other Area Development-Generated Traffic Volumes

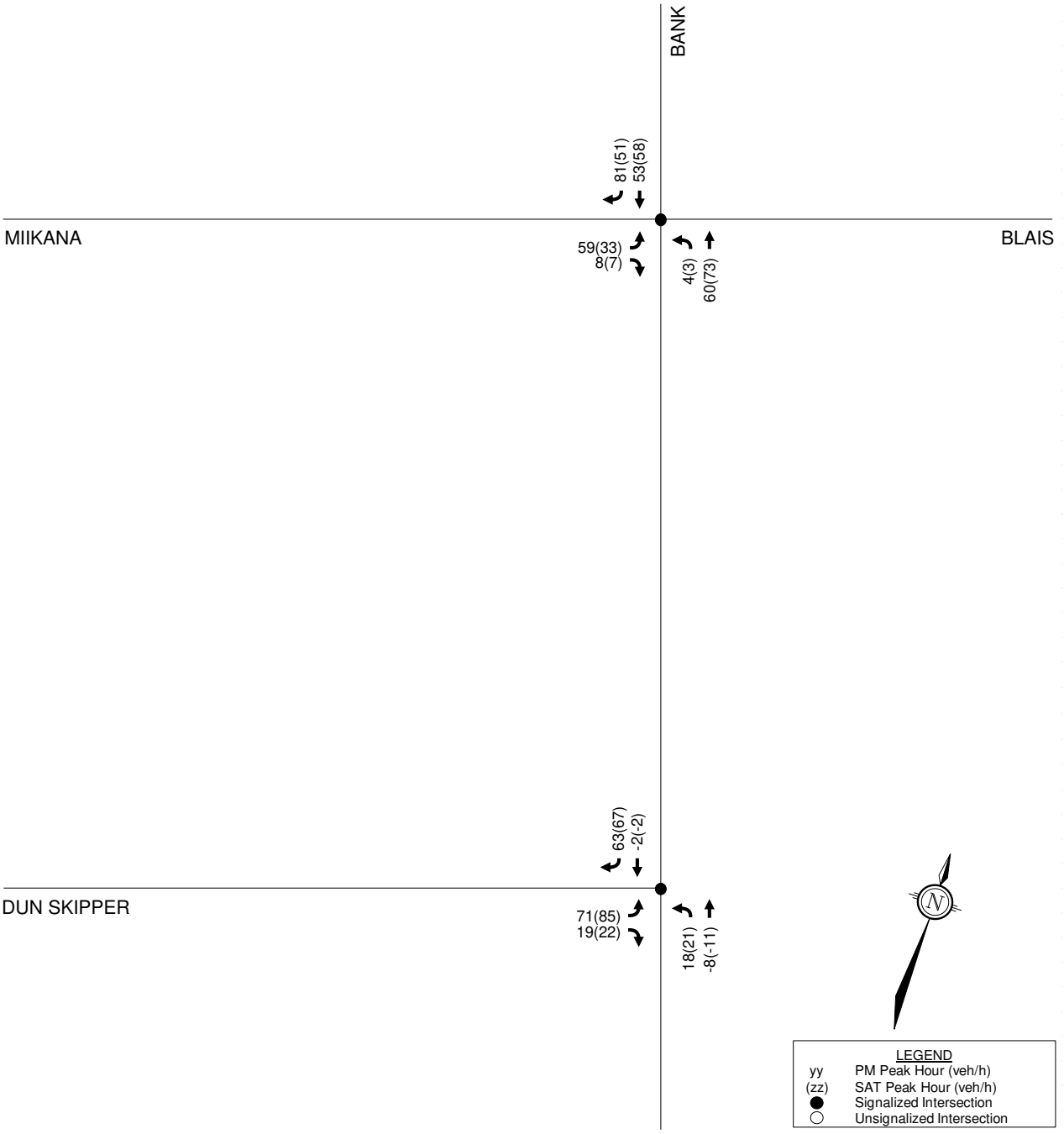


Figure 11: 2026 Background Traffic Volumes

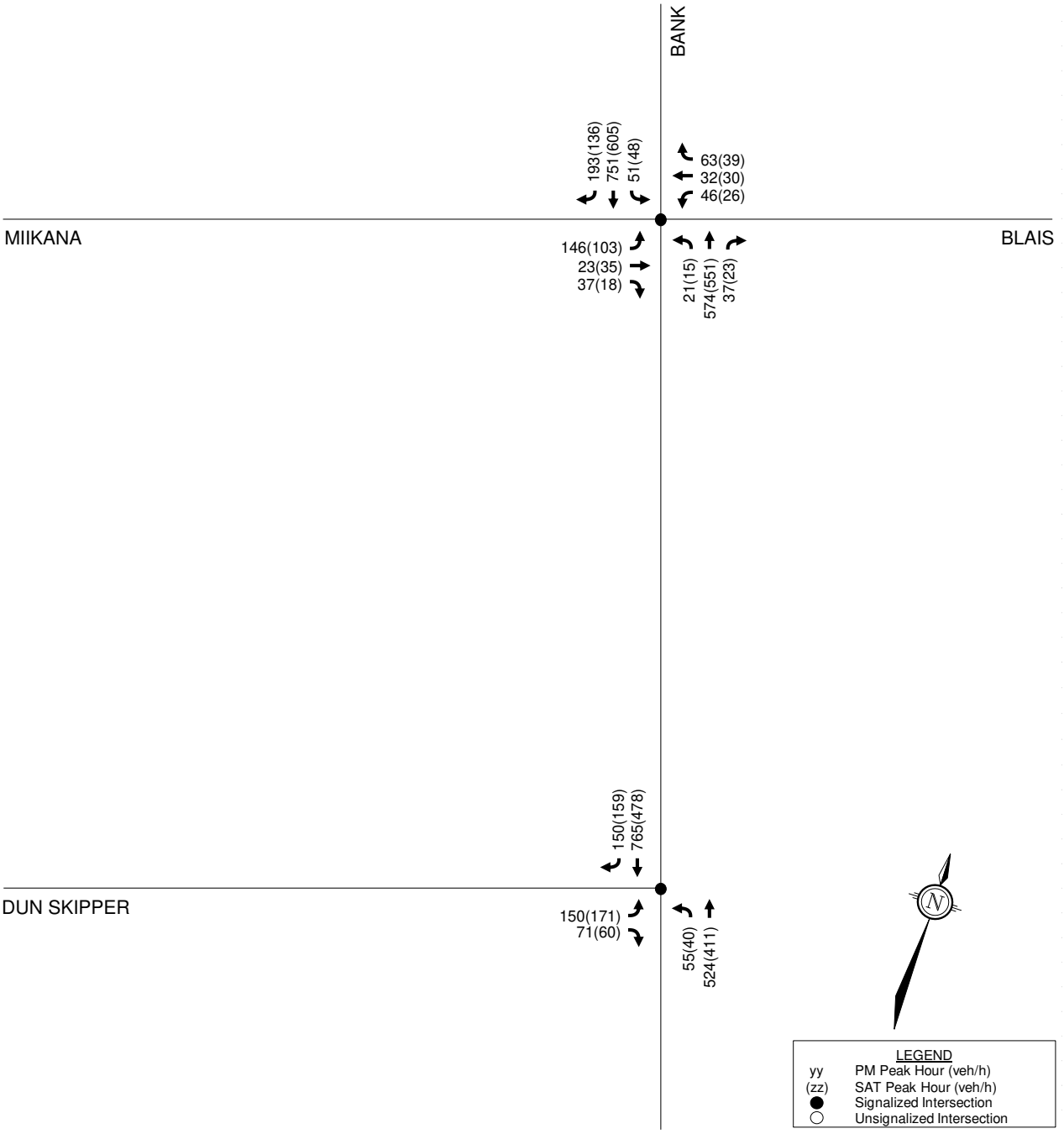


Figure 12: 2031 Background Traffic Volumes

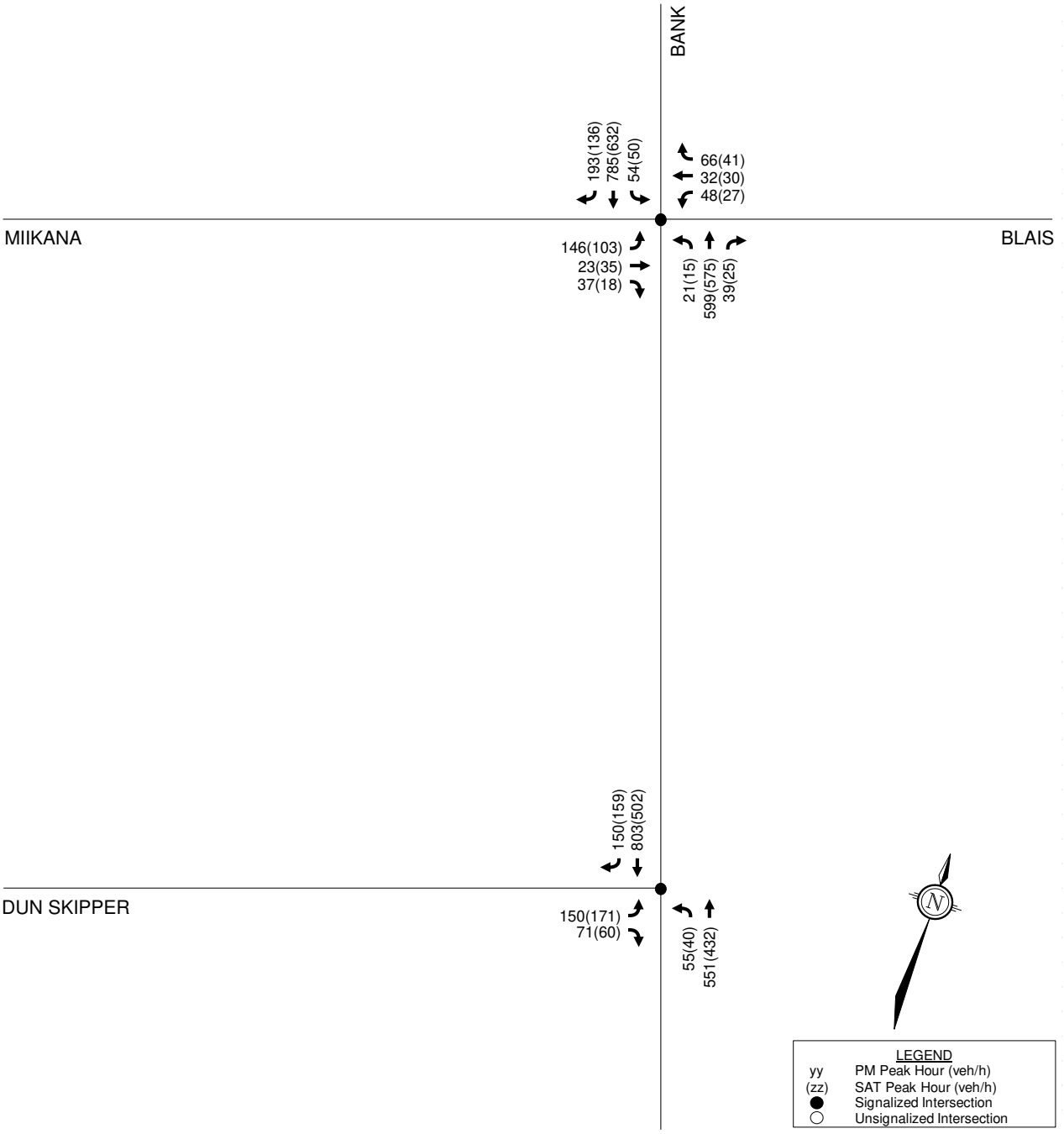


Figure 13: 2026 Total Traffic Volumes

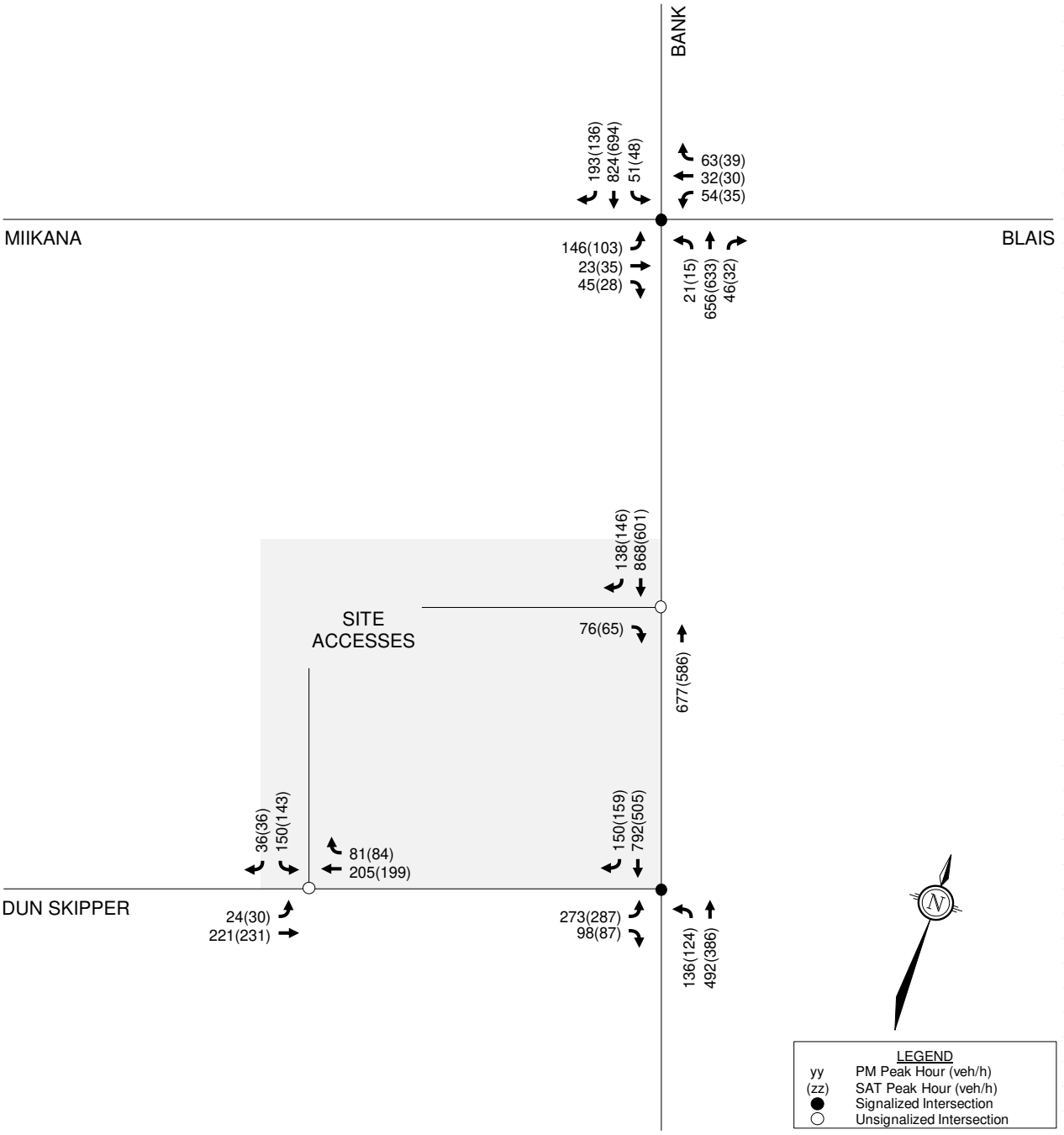
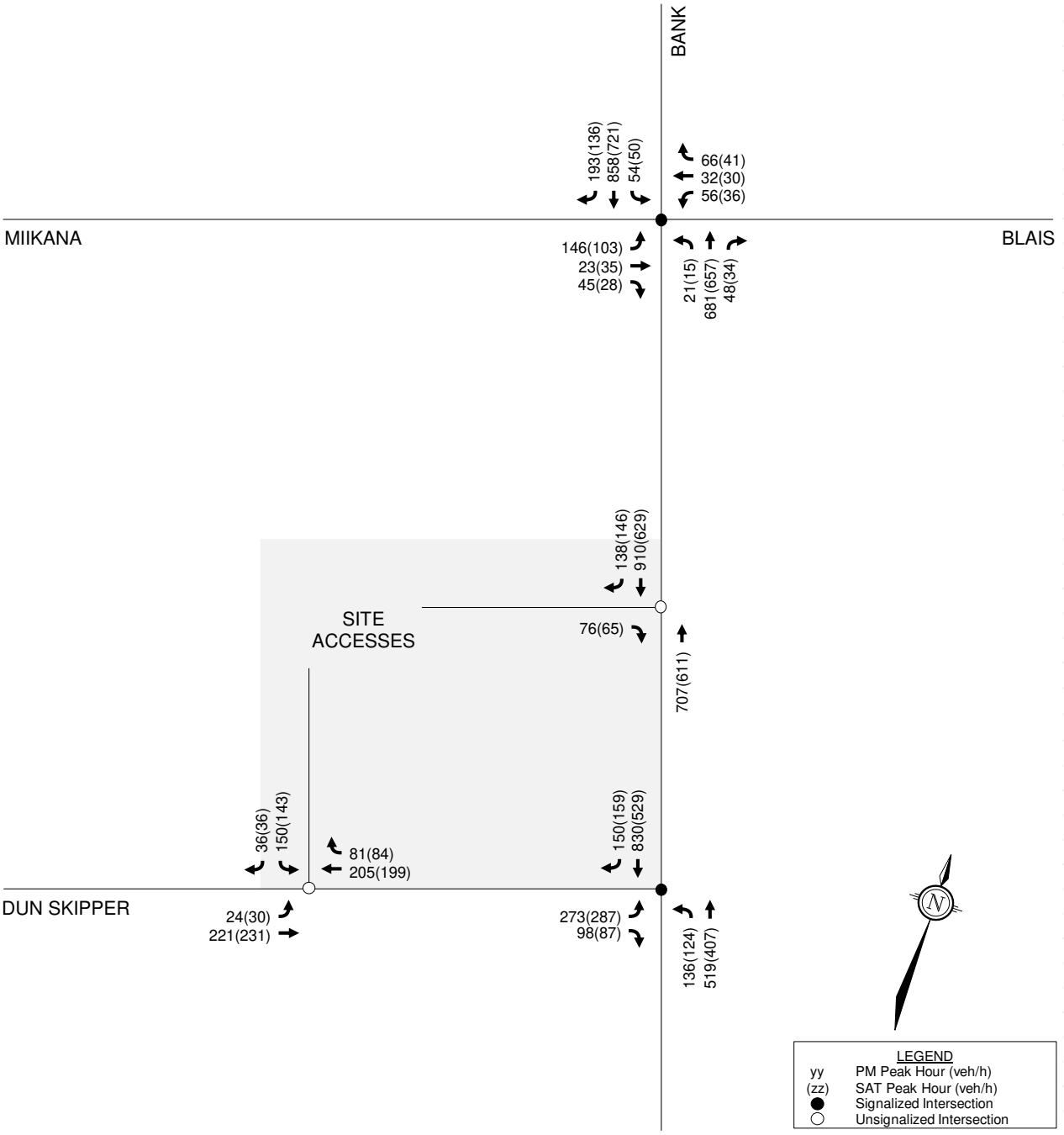


Figure 14: 2031 Total Traffic Volumes



3.4.2 2026 Background Traffic Operations

Intersection capacity analysis has been conducted for the 2026 background traffic conditions. The results of the analysis are summarized in **Table 9** for the weekday PM and Saturday peak hours. Detailed reports are included in **Appendix J**.

Table 9: 2026 Background Intersection Analysis

Intersection	PM Peak Hour			SAT Peak Hour		
	Max v/c	LOS	Mvmt	Max v/c	LOS	Mvmt
Bank Street/ Blais Road/Miikana Road	0.64	B	EBL	0.53	A	SBT
Bank Street/ Dun Skipper Drive	0.68	B	EBL	0.54	A	EBL

From the previous table, the study area intersections operate at acceptable levels of service in the 2026 background conditions.

3.4.3 2031 Background Traffic Operations

Intersection capacity analysis has been conducted for the 2031 background traffic conditions. The results of the analysis are summarized in **Table 10** for the weekday PM and Saturday peak hours. Detailed reports are included in **Appendix J**.

Table 10: 2031 Background Intersection Analysis

Intersection	PM Peak Hour			SAT Peak Hour		
	Max v/c	LOS	Mvmt	Max v/c	LOS	Mvmt
Bank Street/ Blais Road/Miikana Road	0.65	B	EBL	0.55	A	SBT
Bank Street/ Dun Skipper Drive	0.68	B	EBL	0.54	A	EBL

From the previous table, the study area intersections operate at acceptable levels of service in the 2031 background conditions.

4.0 ANALYSIS

4.1 Development Design

4.1.1 Design for Sustainable Modes

Pedestrian facilities will be provided between the entrance to each retail unit and the parking areas. Continuous walkways will connect Units 'C' and 'D' to each other and the existing sidewalk on Dun Skipper Drive. A wide pathway is proposed between Units 'C' and 'D,' providing a direct connection to the signalized Bank Street/Dun Skipper Drive intersection. Sidewalks across the proposed access to Dun Skipper Drive will be continuous, per the City of Ottawa Specification 7.1. An on-site pedestrian route to the residential lands immediately west is proposed, which will provide a pedestrian connection from the subject site to Cedar Creek Drive.

Bicycle parking will be provided adjacent to each retail unit. The required number of bike parking spaces on-site will be reviewed in Section 4.2.

OC Transpo's service design guideline for peak period service is to provide service within a five-minute (400m) walk of home, work, or school for 95% of urban residents. The subject site is within 400m walking distance of OC Transpo bus stops #0490, #0491, #0496, #0497, and #1069.

A review of the City's *Transportation Demand Management (TDM)-Supportive Development Design and Infrastructure Checklist* has been conducted. A copy of the non-residential TDM checklist is included in **Appendix K**. All applicable required TDM-supportive design and infrastructure measures in the TDM checklist are met. In addition to the required measures, the proposed development also provides on-site amenities to minimize mid-day or mid-commute errands.

4.1.2 Circulation and Access

Individual loading spaces are provided for the retail units labelled 'A,' 'B,' and 'C,' as shown on the site plan included in **Appendix A**. As retail unit 'A' represents the proposed supermarket, turning movements of a Wb-20 delivery vehicle were considered. Delivery vehicles for retail units 'B' and 'C' are anticipated to be a smaller vehicle, and therefore, the Heavy Single Unit (HSU) design vehicle was considered. Turning templates are included on the site plan included in **Appendix A**.

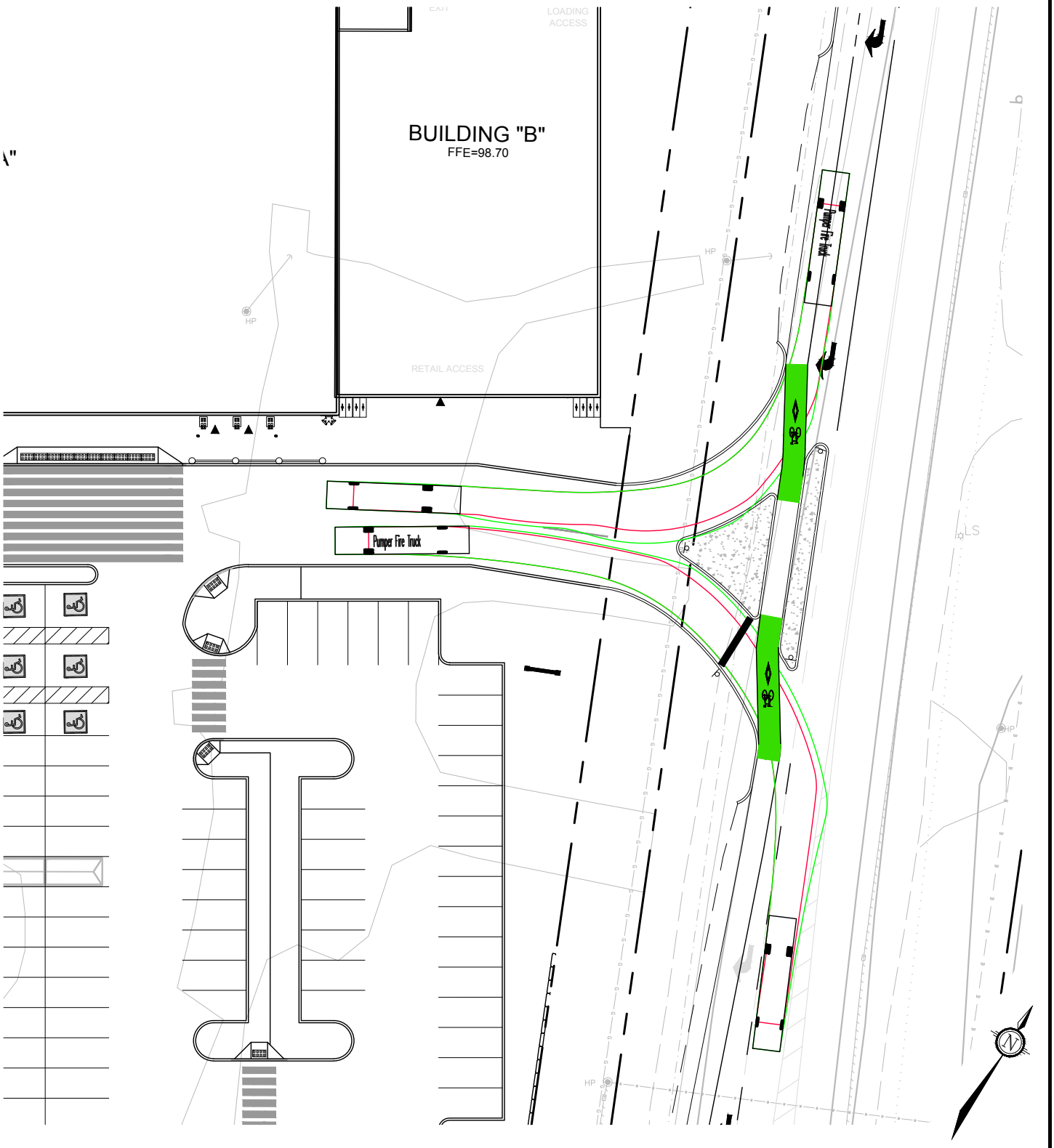
Delivery trucks serving retail units 'A' and 'B' will arrive from the north on Bank Street. Loading for retail unit 'B' will require vehicles to reverse into the space at the northeastern corner of the building. Loading for retail unit 'A' will require trucks to travel around the north side of the building and reverse into the loading space on the west side of the building. Delivery trucks serving retail unit 'C' will arrive from Dun Skipper Drive. Loading for retail unit 'C' will require vehicles to reverse into the space on the west side of the building (i.e. adjacent to the access to Dun Skipper Drive). All delivery trucks will exit the site onto Dun Skipper Drive towards the signalized intersection with Bank Street.

Garbage collection for the retail units will occur in the loading areas for each retail unit.

The fire route for the proposed development will include the main east-west drive aisle in front of retail units 'A' and 'B' (i.e. entering or exiting the site via the RIRO access to Bank Street), the north-south drive aisle that is aligned with the access to Dun Skipper Drive, and the main east-west drive aisle in front of retail units 'C' and 'D.' The pork chop island at the Bank Street access accommodates turning movements of a fire truck, as shown in **Figure 15**.

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 11**.



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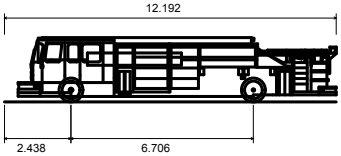

Pumper Fire Truck

Overall Length	12.192m
Overall Width	2.489m
Overall Body Height	2.361m
Min Body Ground Clearance	0.200m
Track Width	2.489m
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

150 DUN SKIPPER

TURNING MOVEMENT (FIRE TRUCK)

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

DATE JAN 2025 | JOB 124107 | FIGURE FIGURE 15

SHT8X11.DWG - 216mmx279mm

C:\temp\AcPublish_14536\124107-FD.dwg, Fig15, Jan 09, 2025 - 2:38pm, rhillier

Table 11: Required and Proposed Parking

Land Use	Rate	GFA	Required	Provided
Minimum Vehicle Parking				
Retail Food Store Retail Store	3.4 spaces per 100 m^2 GFA	5,145 m^2	175	195
Minimum Bicycle Parking				
Retail Food Store Retail Store	1.0 spaces per 250 m^2 GFA when total GFA is less than 8,000 m^2	5,145 m^2	21	24
Minimum Loading Space				
Retail Food Store Retail Store	2 spaces when total GFA falls between 5,000 m^2 and 9,999 m^2	5,145 m^2	2	3
Minimum Accessible Parking				
-	7 required when total parking supply falls between 167 and 250 spaces	195 spaces	7	10

From the previous table, all parking/loading requirements will be met by the proposed development.

4.3 Boundary Streets

This section provides a review of the boundary streets Bank Street and Dun Skipper Drive, using complete streets principles. The *MMLOS Guidelines* were used to evaluate the levels of service for each alternative mode of transportation. The boundary streets have been evaluated based on the targets for roadways within the General Urban Area.

The detailed MMLOS review of the boundary streets is included in **Appendix L**. A summary of the results are provided in **Table 12**.

Table 12: Segment MMLOS Summary

Boundary Street	PLOS		BLOS		TLOS		TkLOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Bank Street	**F**	C	**E**	C	D	-	B	D
Dun Skipper Drive	A		**F**	D	D		B	-

The results of the segment MMLOS analysis can be summarized as follows:

- Dun Skipper Drive meets the target pedestrian level of service (PLOS), while Bank Street does not;
- Neither Bank Street nor Dun Skipper Drive meet the target bicycle level of service (BLOS);
- Both Bank Street and Dun Skipper Drive achieve a transit level of service (TLOS) D;
- Both Bank Street and Dun Skipper Drive achieve a truck level of service (TkLOS) B.

Bank Street does not meet the target PLOS C or BLOS C. Exhibit 4 of the *MMLOS Guidelines* identifies that a PLOS D is the best-possible score based on the high operating speed and traffic volumes, which can be achieved by providing a sidewalk with a minimum width of 2.0m and minimum boulevard width of 2.0m. To achieve the target BLOS C, a separated cycling facility is required. The future Bank Street widening project south of Blais Avenue will provide a concrete sidewalk and cycle track along Bank Street. No pedestrian or cycling improvements are proposed along Bank Street of this proposed development, since they will be implemented as part of the future Bank Street widening.

Dun Skipper Drive does not meet the target BLOS D. Exhibit 11 of the *MMLOS Guidelines* identifies that bike lanes with a minimum width of 1.2m would be required to achieve the target. This is identified for the City's consideration, although it is noted that Dun Skipper Drive is a recently constructed roadway.

4.4 Transportation Demand Management

4.4.1 Context for TDM

The proposed development consists of four single-storey retail units, containing a total GFA of 58,300 ft^2. This will include a 32,700 ft^2 supermarket within retail unit 'A' and 25,600 ft^2 of other retail spaces. The tenants of each retail unit are not known, and therefore the proportion of employees by type of occupation are also not known.

4.4.2 Need and Opportunity

The subject site is designated as 'Evolving Neighbourhood' and 'Corridor – Mainstreet' (Bank Street) on Schedule B7 of the City of Ottawa's Official Plan. The implemented zoning for the property is 'General Mixed Use' (GM), and the site is within the Leitrim Community Design Plan (CDP) area.

As first discussed in Section 2.4.1, the assumed mode shares for the subject application are generally consistent with the surveyed non-residential mode shares of the South Gloucester/Leitrim district (as outlined in the *TRANS Trip Generation Manual*), and includes a 70% driver share. Failure to meet the assumed driver share is not anticipated.

4.4.3 TDM Program

A review of the *TDM Measures Checklist* has been conducted and is included in **Appendix K**. The proposed development itself will include on-site amenities/services to minimize mid-day or mid-commute errands, as the development includes a variety of commercial spaces and a supermarket.

4.5 Transit

4.5.1 Transit Route Capacity

Per the Exemptions Review included in Section 2.6, this element is exempt from the TIA, as the proposed development is projected to generate fewer than 75 peak hour transit trips.

4.5.2 Transit Priority Requirements

The City's *TIA Guidelines* identifies that this module shall assess the effect of development driveways and development-generated transit trips to the existing transit service within the study area. As discussed in Section 2.4.1, the proposed development is not anticipated to generate any transit trips during the peak hours, based on the existing transit routes.

The *TIA Guidelines* also identifies that this module shall assess the need and benefit of transit priority measures to offset delays. The proposed development is anticipated to have no impacts to transit ridership. When considering 2031 total traffic, approach delays along Bank Street are anticipated to remain below 30 seconds during the peak hours, which corresponds to a TLOS D. This is consistent with the target for roadways that are designated in the City's RTTP Network as Transit Priority Corridors with Isolated Measures. No transit priority measures for the study area are recommended, as none are required.

4.6 Intersection Design

4.6.1 Intersection MMLOS

This section provides a review of the study area intersections, using complete streets principles. The intersection has been evaluated for PLOS, BLOS, TLOS, and TkLOS. The MMLOS targets associated for intersections within the General Urban Area has been used in this review. The full intersection MMLOS analysis is included in **Appendix L**. A summary of the results is shown in **Table 13**.

Table 13: 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**	C	C	-	**E**	D
Bank Street/Dun Skipper Drive	**E**		**F**		B		**E**	

From the previous table, the study area intersections do not meet the target PLOS C, BLOS C, or TkLOS D. Further discussion of the study area intersections is included below.

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 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.

4.6.2 2026 Total Traffic Operations

Intersection capacity analysis has been conducted for the 2026 total traffic conditions. The results of the analysis are summarized in **Table 14** for the weekday PM and Saturday peak hours. Detailed reports are included in **Appendix M**.

Table 14: 2026 Total Intersection Analysis

Intersection	PM Peak Hour			SAT Peak Hour		
	Max v/c or delay	LOS	Mvmt	Max v/c or delay	LOS	Mvmt
Bank Street/ Blais Road/Miikana Road	0.64	B	EBL	0.61	B	SBT
Bank Street/ Dun Skipper Drive	0.89	D	EBL	0.69	B	EBL
RIRO Access to Bank Street	18 sec	C	EBR	13 sec	B	EBR
Full Access to Dun Skipper Drive	15 sec	B	SBL	15 sec	B	SBL

From the previous table, the study area intersections and proposed accesses are anticipated to operate at acceptable levels of service in 2026 total traffic conditions.

4.6.3 2031 Total Traffic Operations

Intersection capacity analysis has been conducted for the 2031 total traffic conditions. The results of the analysis are summarized in **Table 15** for the weekday PM and Saturday peak hours. Detailed reports are included in **Appendix M**.

Table 15: 2031 Total Intersection Analysis

Intersection	PM Peak Hour			SAT Peak Hour		
	Max v/c or delay	LOS	Mvmt	Max v/c or delay	LOS	Mvmt
Bank Street/ Blais Road/Miikana Road	0.66	B	SBT	0.63	B	SBT
Bank Street/ Dun Skipper Drive	0.89	D	EBL	0.69	B	EBL
RIRO Access to Bank Street	20 sec	B	EBR	13 sec	B	EBR
Full Access to Dun Skipper Drive	15 sec	B	SBL	15 sec	B	SBL

From the previous table, the study area intersections and proposed accesses are anticipated to operate at acceptable levels of service in 2031 total traffic conditions.

During the PM peak hour, the 95th-percentile (i.e. maximum) queue length of the eastbound left turn movement at Bank Street/Dun Skipper Drive is approximately 98m, which exceeds the distance between the intersection and the proposed full-movement access to Dun Skipper Drive. The existing signal timing plan for the PM peak hour includes a 90-second split for north-south traffic and a 30-second split for eastbound traffic. Synchro analysis suggests that adjusting the splits to 80 seconds for north-south traffic and 40 seconds for eastbound traffic allows all movements to continue operating at an acceptable level of service, while reducing the maximum eastbound queues. Detailed Synchro reports of this alternate scenario are included in **Appendix M**.

Section 9.14.2 of the TAC's *Geometric Design Guide* recommends auxiliary right turn lanes at unsignalized locations when the volume of decelerating or accelerating vehicles compared with the through traffic volume causes undue hazard. Consideration should be given to right turn lanes when the number of right turning vehicles exceed 60 vehicles during the peak hour and/or the number of right turning vehicles equates to 10% of the adjacent through traffic. Based on the 2031 total traffic projections, it is estimated that about 140 to 145 vehicles will perform a southbound right turn at the proposed RIRO access to Bank Street during the PM and Saturday peak hours. Compared to the projected southbound through traffic volumes, this equates to about 13% during the PM peak hour and 19% during the Saturday peak hour. As such, an auxiliary southbound right turn lane is recommended for the proposed RIRO access to Bank Street.

To determine the storage length of the southbound right turn lane on Bank Street, TAC's *Geometric Design Guide* includes the equation NL/30, where N is the number of peak hour vehicles and L is the average vehicle length (assumed to be 7m, per the *TIA Guidelines*). Based on the 2031 total traffic volumes shown in **Figure 14**, the required storage length is 35m. Therefore, a 35m storage length and 85m taper is proposed. The existing paved shoulder on the west side of Bank Street is proposed to transition to a pocket bike lane and the auxiliary southbound right turn lane will be introduced on the right. A transition returning cyclists to the paved shoulder will occur south of the proposed RIRO access.

The location of the proposed RIRO access will require the shortening of the existing southbound right turn lane to Dun Skipper Drive, as a continuous southbound right turn lane for both the RIRO access and Dun Skipper Drive is not desired. Synchro analysis of the 2031 total traffic conditions identifies maximum southbound right turn queues of approximately 11m during the peak hours. Therefore, shortening the auxiliary southbound right turn lane can be justified to include approximately 30m of storage and a 60m taper length.

A functional design of the roadway modifications described above are included in **Appendix N**. A Roadway Modification Approval (RMA) package has been submitted to the City under separate cover.

Based on the projected 2031 total traffic volumes, it is estimated that approximately 85 vehicles will perform the westbound right turn at the Dun Skipper Drive access during the peak hours. While the right turn volumes exceed the 60 vph threshold, through traffic on Dun Skipper Drive is relatively low and speeds are not anticipated to be high. As such, right turning traffic is not anticipated to become a hazard and a right turn lane is not recommended.

A review of the Ministry of Transportation of Ontario (MTO)'s left turn lane warrant graphs has also been conducted at the Dun Skipper Drive access. Based on the advancing (eastbound) and opposing (westbound) traffic volumes along Dun Skipper Drive at the proposed access, a left turn lane is not recommended. The relevant left turn lane warrant graphs are included in **Appendix O**.

4.7 Monitoring Rationale

The preliminary design for the Bank Street widening project includes the extension of the existing southbound right turn lane at Dun Skipper Drive to beyond the site limits. The extension of the southbound right turn lane could be used as a continuous right turn lane at the proposed site access.

Discussions with City staff have been initiated regarding monitoring of the planned widening of Bank Street along the subject site, as the roadway modifications described in the previous section will only be recommended and pursued if the future widening is not anticipated to be constructed in the short- or medium-term. The City's *TIA Guidelines* states that a monitoring plan shall be prepared 'where the proponent can offer a defensible rationale for deferring mitigation actions such as infrastructure modifications or TDM program measures or where modal shares must be shifted to achieve the City's goals.'

Although the City's current TMP identifies a construction timeline of 2026-2031 for the widening of Bank Street south of Blais Road/Miikana Road, it is understood that the widening currently has no assured timeline. The construction timelines will be reviewed as part of the City's ongoing TMP update. It is proposed that updates to the TMP be monitored. If the TMP updates are finalized and the Bank Street widening is approved and scheduled within ten years of site construction and occupancy, it is recommended that the roadway modifications described in the previous section be deferred to construction of the widening. This deferment will limit the throwaway costs of constructing roadway modifications, and will also limit the impacts of road construction to traffic travelling on Bank Street.

5.0 CONCLUSIONS AND RECOMMENDATIONS

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

Site-Generated Traffic

- The proposed development is estimated to generate 724 person trips (including 506 vehicle trips) during the PM peak hour, and 721 person trips (including 505 vehicle trips) during the Saturday peak hour.

Access Design

- The design of the proposed accesses generally follow 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(1)(m)(i) of the PABL identifies a minimum separation of 60m between a two-way private approach and any other private approach to the same property. It is requested that this requirement be waived, as the northern access to Bank Street is designated for loading and will not typically be used by patrons of the proposed retail uses. Additionally, shifting the proposed RIRO access further south is not desired.

- Section 25(1)(u) of the PABL identifies that a requirement that any private approach serving a parking area with more than 50 parking spaces shall not have a grade exceeding 2% for the first 9m inside the property line. A waiver of this requirement is requested, as maximum grades of 3.5% for the RIRO access to Bank Street and 3.1% for the full-movement access to Dun Skipper Drive are proposed.

Development Design and Parking

- Pedestrian facilities will be provided between the entrance to each retail unit and the parking areas. A wide pathway between Units 'C' and 'D' will provide a direct connection to the signalized Bank Street/Dun Skipper Drive intersection. Bicycle parking will be provided adjacent to each retail unit. An on-site pedestrian route to the residential lands immediately west is proposed, which will provide a pedestrian connection from the subject site to Cedar Creek Drive.

- The subject site is within 400m walking distance of OC Transpo bus stops #0490, #0491, #0496, #0497, and #1069.

- Delivery trucks serving retail units 'A' and 'B' will arrive from the north on Bank Street. All delivery trucks will exit the site onto Dun Skipper Drive towards Bank Street. Garbage collection for retail units will occur in the loading areas for each retail unit.

- The fire route for the proposed development will include the main east-west drive aisle in front of retail units 'A' and 'B' (i.e. entering or exiting the site via the RIRO access to Bank Street), the north-south drive aisle that is aligned with the access to Dun Skipper Drive, and the main east-west drive aisle in front of retail units 'C' and 'D.' The pork chop island at the Bank Street access will accommodate turning movements of a fire truck.

- All minimum parking/loading requirements are met by the proposed development.

Boundary Streets

- The results of the segment multi-modal level of service (MMLOS) analysis can be summarized as follows:
    - Dun Skipper Drive meets the target pedestrian level of service (PLOS), while Bank Street does not;
    - Neither Bank Street nor Dun Skipper Drive meet the target bicycle level of service (BLOS);
    - Both Bank Street and Dun Skipper Drive achieve a transit level of service (TLOS) D;
    - Both Bank Street and Dun Skipper Drive achieve a truck level of service (TkLOS) B.

- Bank Street does not meet the target PLOS C or BLOS C. The future Bank Street widening project south of Blais Avenue will provide a concrete sidewalk and cycle track along Bank Street.

- Dun Skipper Drive does not meet the target BLOS D. Bike lanes with a minimum width of 1.2m would be required to achieve the target. This is identified for the City's consideration, although it is noted that Dun Skipper Drive is a recently constructed roadway.

Transportation Demand Management

- The following TDM measures will be considered by the proponent:
    - Provide on-site amenities/services to minimize mid-day or mid-commute errands.

Intersection MMLOS

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

- The study area intersections do not meet the target PLOS C. There is limited opportunity in improving any approach to the target without reducing the number of travel lanes or restricting turning movements.

- The east and west approaches of Bank Street/Blais Road/Miikana Road and west approach of Bank Street/Dun Skipper Drive do not meet the target BLOS C. Providing an off-road refuge area for cyclists in the same manner as provided for northbound and southbound cyclists is identified for the City's consideration.

- The study area intersections do not meet the target TkLOS D, which requires either multiple receiving lanes or a curb radius greater than 15m. No recommendations are identified.

Existing and Background Traffic Conditions

- The study area intersections operate at acceptable levels of service in existing, 2026 background, and 2031 background conditions.

Total Traffic Conditions

- The study area intersections and proposed accesses are anticipated to operate at acceptable levels of service in 2026 and 2031 total traffic conditions.

- During the PM peak hour, the 95th-percentile (i.e. maximum) queue length of the eastbound left turn movement at Bank Street/Dun Skipper Drive is approximately 98m, which exceeds the distance between the intersection and the proposed full-movement access to Dun Skipper Drive. The signal timing can be adjusted to allow all movements to continue operating acceptably, while reducing the maximum eastbound queues.

Roadway Modifications and Monitoring

- An auxiliary southbound right turn lane is recommended for the proposed RIRO access to Bank Street. A 35m storage length and 85m taper is proposed. The existing paved shoulder on the west side of Bank Street will transition to a pocket bike lane and the auxiliary southbound right turn lane will be introduced on the right. A transition returning cyclists to the paved shoulder will occur south of the proposed RIRO access. The location of the proposed RIRO access will require the shortening of the existing southbound right turn lane to Dun Skipper Drive. Shortening the auxiliary southbound right turn lane can be justified to include approximately 30m of storage and a 60m taper length, based on projected queues.

- These roadway modifications will only be recommended and pursued if the future widening is not anticipated to be constructed in the short- or medium-term. The construction timelines will be reviewed as part of the City's ongoing TMP update. It is proposed that updates to the TMP be monitored. If the TMP updates are finalized and the Bank Street widening is approved and scheduled within ten years of site construction/occupancy, it is recommended that the roadway modifications above be deferred to construction of the widening.

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

NOVATECH

Prepared by:

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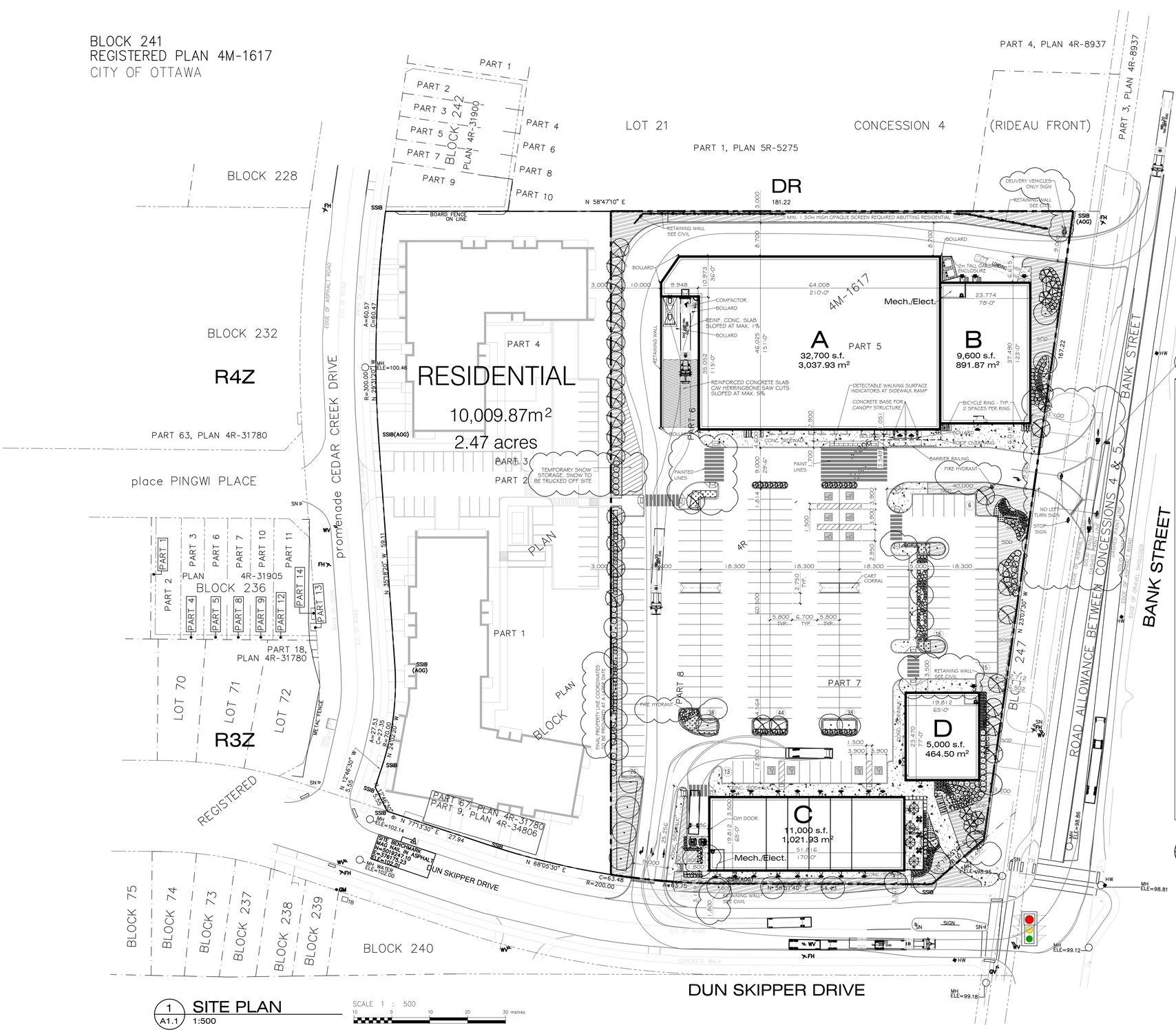
Project Engineer | Transportation

Reviewed by:

Brad Byvelds, P.Eng.
Senior Project Manager | Transportation

APPENDIX A

Site Plan



1 A1.1 SITE PLAN
1:500

SCALE 1 : 500
10 0 10 20 30 metres

ZONE : GM General Mixed Use Zone		
TOTAL SITE AREA	19,272.67 m²	4.76 acres
ZONING MECHANISMS	REQUIRED	PROVIDED
Minimum Lot Area	No minimum	21,185.50 m²
Minimum Lot Width	No minimum	109.30 metres
Min. Front Yard & Corner Yard setbacks	3.0m	3.0 metres
Minimum Interior Side Yard setback	5.0m from Res.	16.1 metres
Minimum Interior Side Yard setback	No minimum	N/A
Minimum Rear Yard Setback	7.50m from Res.	11.22 metres
Minimum Rear Yard Setback	3.0m abutting street	N/A
Minimum Rear Yard Setback	No minimum	N/A
Maximum Building Height	18.0m	11.50 metres
Maximum Floor Space Index	2	0.28
Minimum Width of Landscaped Area	3.0m	3.00 metres
Landscape % of Parking Area	N/A	18.3%
Parking Area		9,127.8 m²
Landscape Area		1,669.4 m²
Min. Parking Lot Landscaping	3.0m	3.00 metres

BUILDING	FLOOR AREA ft.²	FLOOR AREA m²	GLFA m²
A	32,700	3,037.93	2,886.03
B	9,600	891.87	847.28
C	11,000	1,021.93	970.84
D	5,000	464.52	441.29
TOTAL	58,300	5,416.25	5,145.43

PARKING MINIMUM	REQUIRED	PROVIDED
3.60 spaces / 100 m² Gross Leasable Floor Area	185 spaces	195 spaces 3.6 spaces / 1,000 s.f.

ACCESSIBLE PARKING
16 spaces provided
REQUIRED PARKING SPACE : 2.60m x 5.20m, 6.70m AISLE
BARRIER FREE SPACE MIN. : 3.90m x 5.20m
FIRE ROUTE : 6.0m WIDE, MIN. 12.0m ℄ RADIUS

LOADING	REQUIRED	PROVIDED
4.30m x 13.0m & 3.50m x 9.0m 5,000-9,999m² GFA	1+1 spaces	3 spaces

BICYCLE PARKING	REQUIRED	PROVIDED
0.6m x 1.80m 1 space / 250m GFA²	22 spaces	24 space

2 A1.1 SITE STATISTICS
N.T.S.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO:
- CHECK AND VERIFY ALL DIMENSIONS ON SITE;
- REPORT ALL ERRORS AND/OR OMISSIONS TO GREYSTONE ARCHITECTURAL PARTNERS BEFORE CONTINUING WITH ANY WORK.

THESE DRAWINGS MAY NOT BE USED FOR CONSTRUCTION UNLESS NOTED OTHERWISE

THESE DRAWINGS ARE NOT TO BE SCALED. ERRORS MADE BY PERSONS SCALING THESE DRAWINGS SHALL NOT BE THE RESPONSIBILITY OF GREYSTONE ARCHITECTURAL PARTNERS

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER RELATED DOCUMENTS.

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PROJECT NORTH

Greystone
Cambridge
154 King Street East
Cambridge, Ontario N3H 3M4
(519) 896-1010 ext.100
Toronto
522 Mount Pleasant Rd
Suite 200
Toronto, Ontario M4S 2M3
(416) 440-0058

REV.	DESCRIPTION	DATE
4	SPA SECOND SUBMISSION	2025.01.09
3	FOR CONSULTANT COORD	2025.01.02
2	FOR CONSULTANT COORD	2024.12.18
1	ISSUED FOR SPA	2024.10.24

△ REVISION ☐ ISSUED ○ APPROVAL

PROJECT FOR:
MAVERICK DEVELOPMENT CORPORATION

PROJECT:
NEW BUILD

FINDLAY CREEK
DUN SKIPPER & BANK STREET
OTTAWA, ONTARIO

DRAWING:
SITE PLAN

DRAWN:	CHECKED:	JOB NUMBER:
N.B.	S.R.	24422
DATE (YYYY/MM/DD): 2025.01.10	SCALE: 1:500	
DRAWING NUMBER: A1.1	REVISION NUMBER: R0	

FILE:\\Maverick\2024\24422 - Findlay Creek - Bank St. Ottawa, ON\Site\Maverick Ottawa BankDunSkipper-A1.0 R2 (2025.01.09).dwg
LAST SAVED BY:MDesmarais, 1/10/2025 8:39 AM

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines TIA Screening

1. Description of Proposed Development

Municipal Address	150 Dun Skipper Drive
Description of Location	North side of Dun Skipper, west side of Bank
Land Use Classification	Destination retail (incl. supermarket)
Development Size (units)	-
Development Size square metre (m^2)	5,416 m2 (58,300 ft2)
Number of Accesses and Locations	1 access to Dun Skipper, 2 accesses to Bank
Phase of Development	1
Buildout Year	2026

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.

Table notes:

1. Table 2, Table 3 & Table 4 TRANS Trip Generation Manual
2. Institute of Transportation Engineers (ITE) Trip Generation Manual 11.1 Ed.

Land Use Type	Minimum Development Size
Single-family homes	**60 units**
Multi-Use Family (Low-Rise)[1]	**90 units**
Multi-Use Family (High-Rise)[1]	**150 units**
Office[2]	**1,400 m^2**
Industrial[2]	**7,000 m^2**
Fast-food restaurant or coffee shop[2]	**110 m^2**
Destination retail[2]	**1,800 m^2**
Gas station or convenience market[2]	**90 m^2**

If the proposed development size is equal to or 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 Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	☐	☑
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?[2]	☐	☑

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 kilometers per hour (km/h) 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 metre [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?	☐	☑

[2] Hubs are identified in Schedules B1 to B8 of the City of Ottawa Official Plan. PMTSAs are identified in Schedule C1 of the Official Plan. DPAs are identified in Schedule C7A and C7B of the Official. See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA.

	Yes	No
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

Results of Screening	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

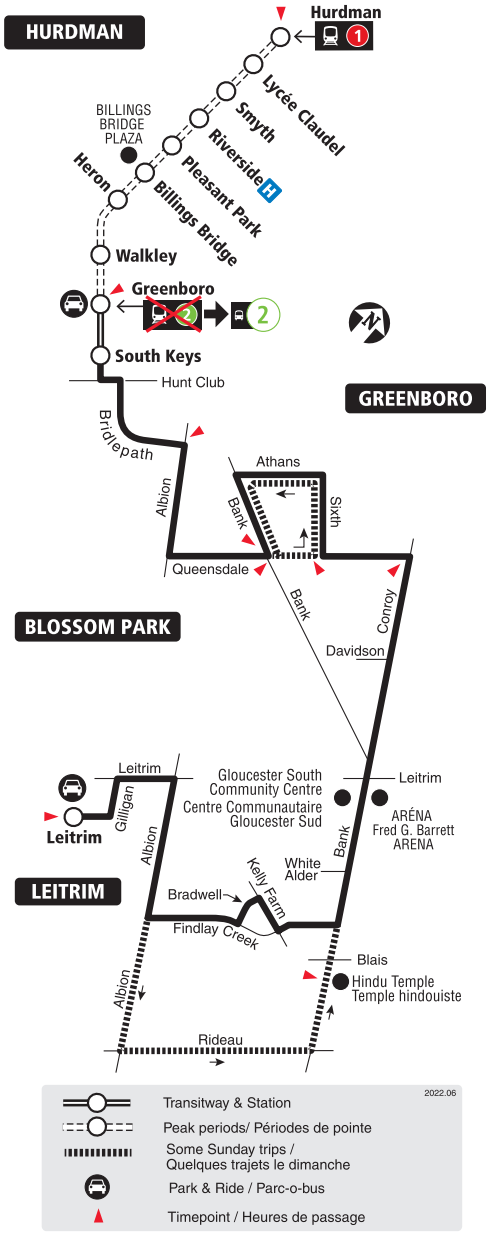
93

LEITRIM BLOSSOM PARK

GREENBORO HURDMAN

Local

7 days a week / 7 jours par semaine
All day service
Service toute la journée



2022.06

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 **613-560-5000**
Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité **613-741-2478**

Effective June 26, 2022
En vigueur 26 juin 2022

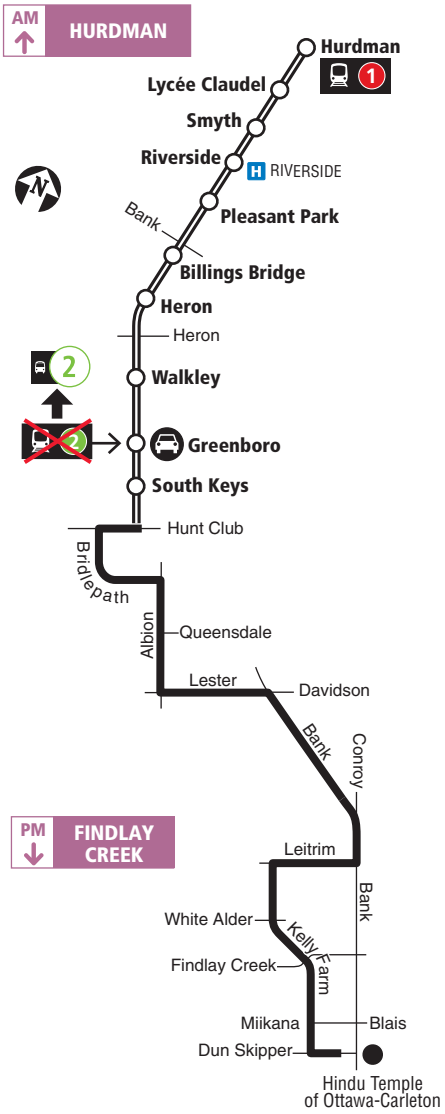
OC Transpo
INFO 613-560-5000
octranspo.com

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

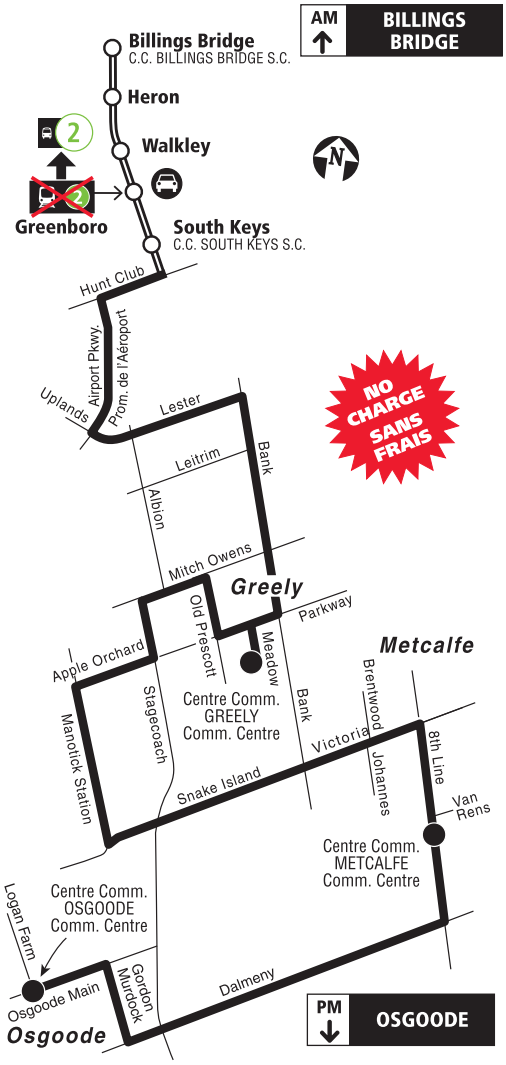
304

BILLINGS BRIDGE
METCALFE, GREELY OSGOODE

Local

Thursday only / Jeudi seulement

Selected time periods
Périodes sélectionnées



Transitway & Station

Park & Ride / Parc-o-bus

2020.04

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

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

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

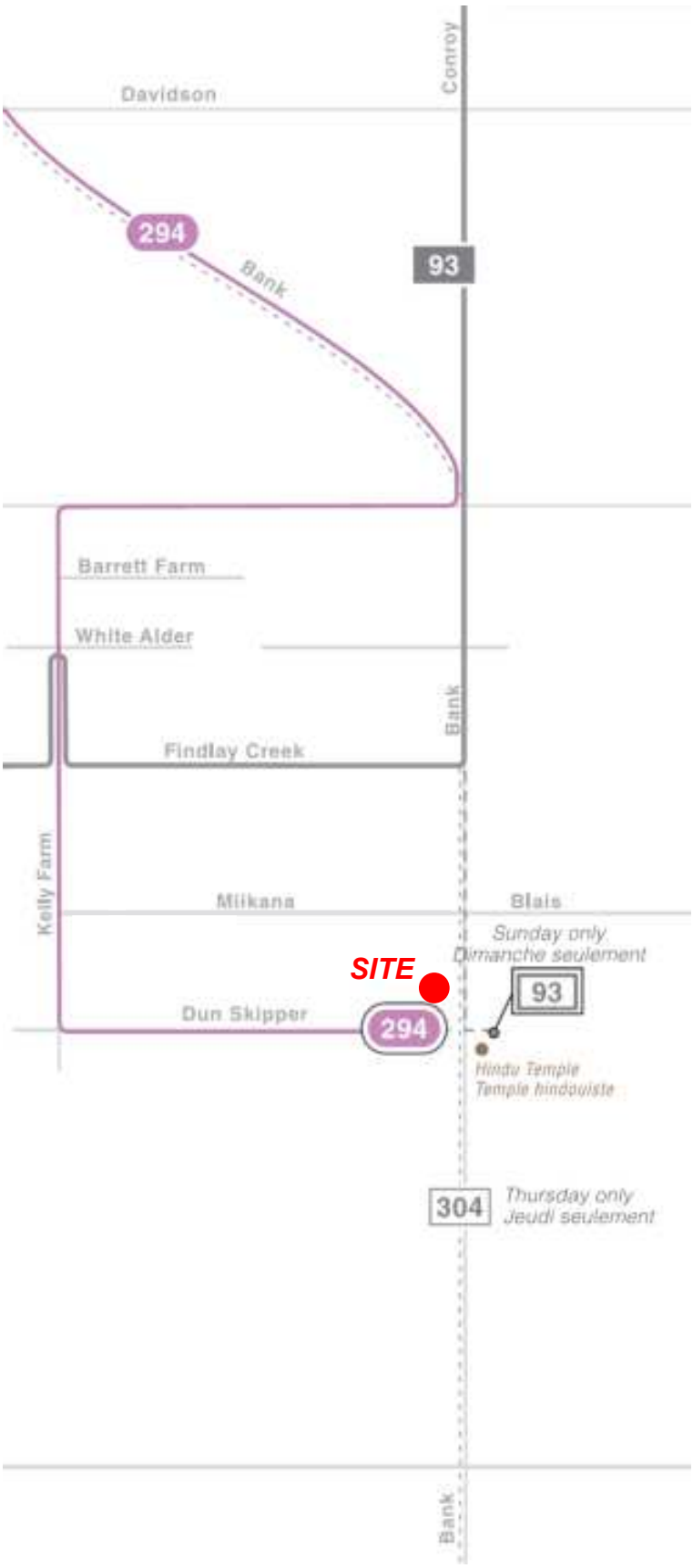
Lost and Found / Objets perdus..... **613-563-4011**

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

Effective May 3, 2020
En vigueur 3 mai 2020

OC Transpo

INFO 613-741-4390
octranspo.com


Conroy
Davidson
294
Bank
93
Barrett Farm
White Alder
Bank
Findlay Creek
Kelly Farm
Mlikana
Blais
Sunday only
Dimanche seulement
SITE
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 - Study Results

BLAIS RD @ BANK ST

Survey Date: Thursday, July 06, 2023 **WO No:** 41064

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, July 06, 2023

Total Observed U-Turns

Northbound: 0 Southbound: 1

Eastbound: 0 Westbound: 0

AADT Factor

.90

	BANK ST									BLAIS RD									
	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	6	480	34	**520**	35	284	39	**358**	**878**	79	38	11	**128**	32	11	36	**79**	**207**	**1085**
08:00 09:00	9	471	39	**519**	46	342	46	**434**	**953**	94	45	19	**158**	35	21	40	**96**	**254**	**1207**
09:00 10:00	10	472	33	**515**	31	365	52	**448**	**963**	60	29	11	**100**	38	19	33	**90**	**190**	**1153**
11:30 12:30	7	511	40	**558**	34	465	72	**571**	**1129**	80	24	17	**121**	42	19	44	**105**	**226**	**1355**
12:30 13:30	8	482	38	**528**	40	525	79	**644**	**1172**	56	21	13	**90**	39	18	49	**106**	**196**	**1368**
15:00 16:00	10	466	48	**524**	42	585	101	**728**	**1252**	69	24	17	**110**	51	31	59	**141**	**251**	**1503**
16:00 17:00	21	506	27	**554**	49	654	112	**815**	**1369**	86	19	25	**130**	42	41	69	**152**	**282**	**1651**
17:00 18:00	10	483	34	**527**	36	603	100	**739**	**1266**	66	26	21	**113**	37	53	56	**146**	**259**	**1525**
Sub Total	81	3871	293	**4245**	313	3823	601	**4737**	**8982**	590	226	134	**950**	316	213	386	**915**	**1865**	**10847**
U Turns				**0**				**1**	**1**				**0**				**0**	**0**	**1**
Total	81	3871	293	**4245**	313	3823	601	**4738**	**8983**	590	226	134	**950**	316	213	386	**915**	**1865**	**10848**
EQ 12Hr	113	5381	407	**5901**	435	5314	835	**6586**	**12486**	820	314	186	**1320**	439	296	537	**1272**	**2592**	**15079**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	102	4843	366	**5311**	392	6265	985	**5927**	**11237**	738	283	167	**1188**	395	266	483	**1145**	**2333**	**13571**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	134	6344	479	**6957**	514	8207	1290	**7764**	**14720**	967	371	219	**1556**	517	348	633	**1500**	**3056**	**17778**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

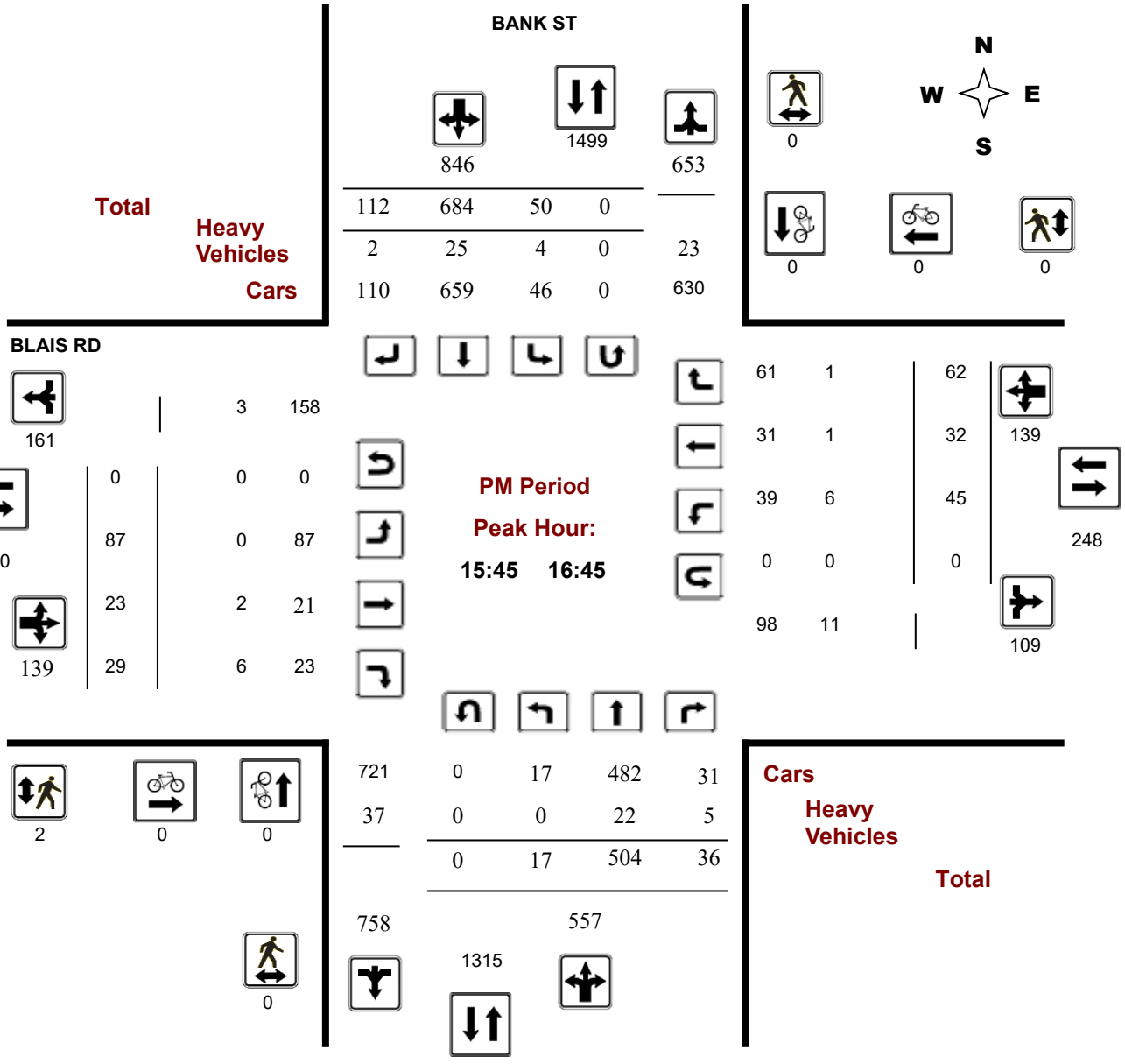
Turning Movement Count - Study Results

BLAIS RD @ BANK ST

Survey Date: Thursday, July 06, 2023 **WO No:** 41064

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

PM Period Peak Hour Diagram

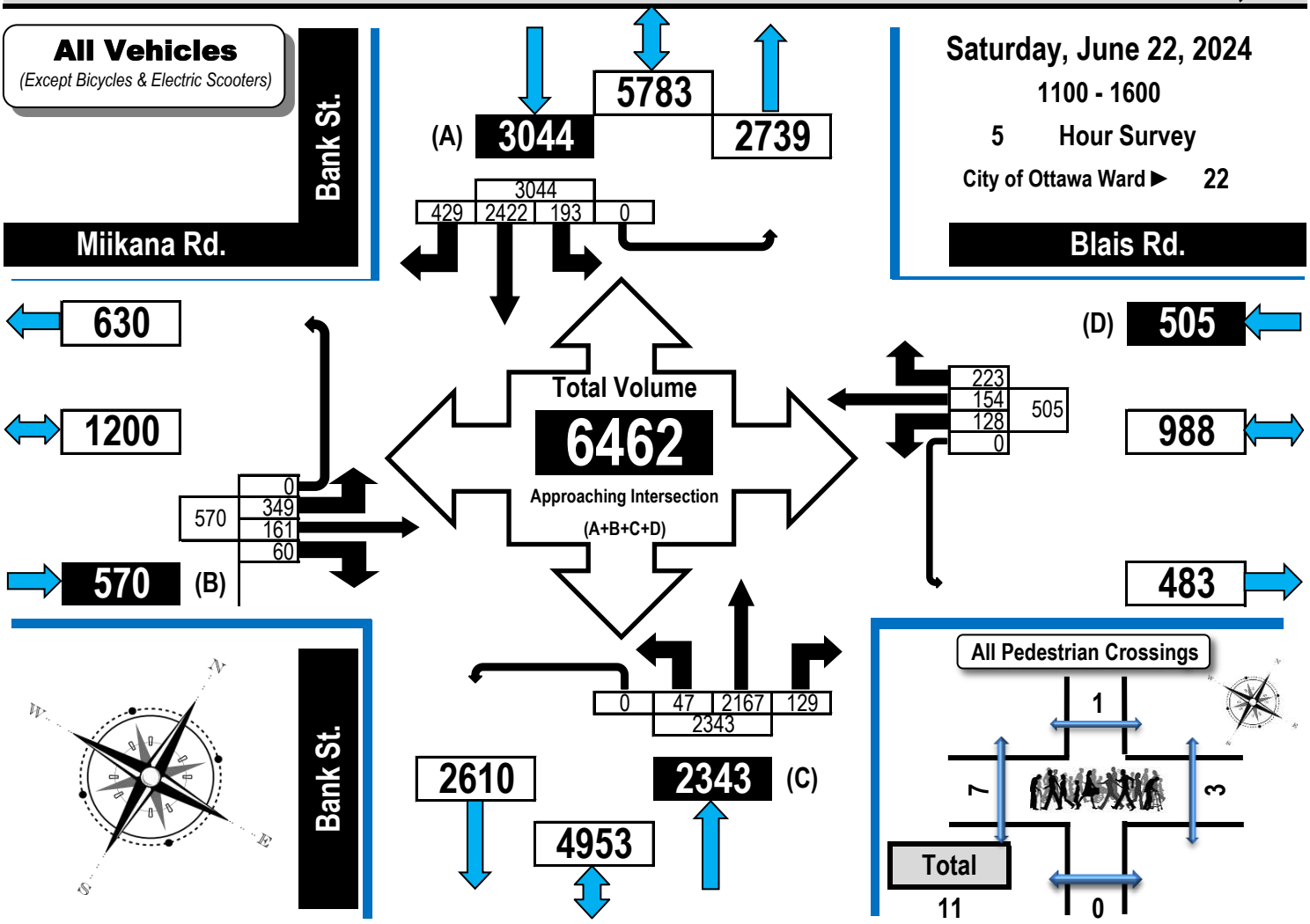


Turning Movement Count
Summary, OFF and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

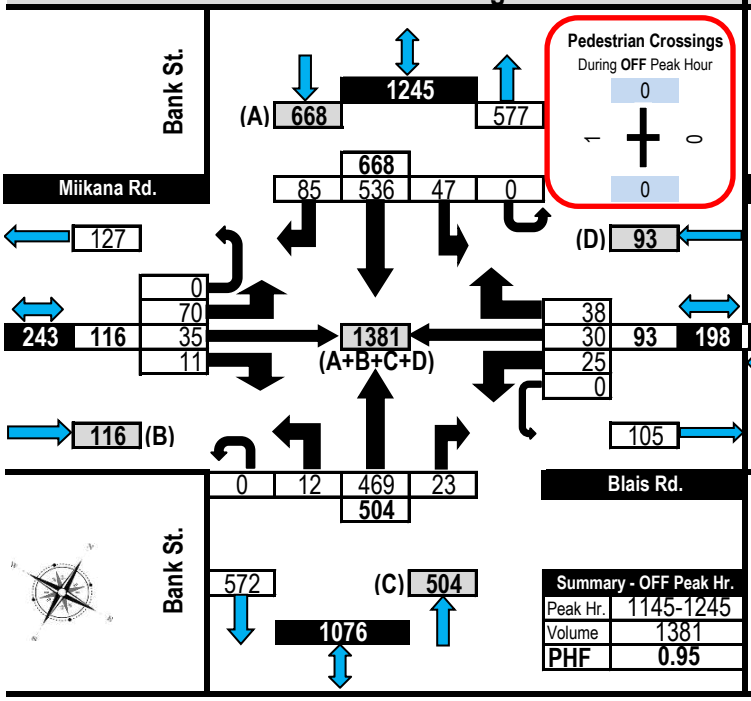
Bank Street & Blais Road/Miikana Road — Gloucester, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Saturday, June 22, 2024
1100 - 1600
5 Hour Survey
City of Ottawa Ward ▶ 22

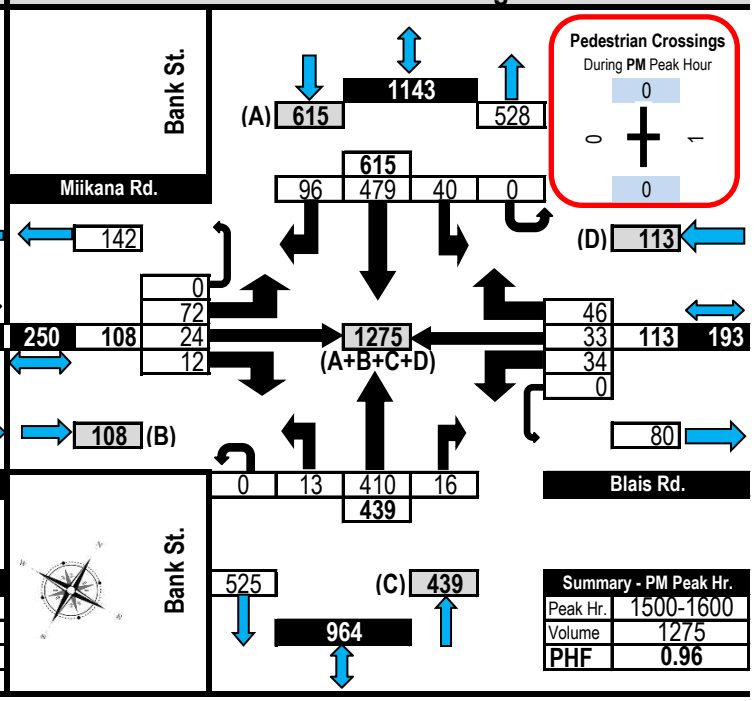


Off Peak Hour Flow Diagram



Summary - OFF Peak Hr.	
Peak Hr.	1145-1245
Volume	1381
PHF	0.95

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1500-1600
Volume	1275
PHF	0.96

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BANK ST @ DUN SKIPPER DR

Survey Date: Thursday, September 14, 2023 **WO No:** 41167

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, September 14, 2023

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

1.00

	BANK ST									DUN SKIPPER DR									
	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	29	547	0	**576**	0	286	37	**323**	**899**	58	0	35	**93**	0	0	0	**0**	**93**	**992**
08:00 09:00	20	507	0	**527**	0	395	41	**436**	**963**	83	0	28	**111**	0	0	0	**0**	**111**	**1074**
09:00 10:00	20	457	0	**477**	0	395	70	**465**	**942**	65	0	29	**94**	0	0	0	**0**	**94**	**1036**
11:30 12:30	15	459	0	**474**	0	466	80	**546**	**1020**	75	0	30	**105**	0	0	0	**0**	**105**	**1125**
12:30 13:30	21	409	0	**430**	0	512	72	**584**	**1014**	61	0	25	**86**	0	0	0	**0**	**86**	**1100**
15:00 16:00	27	442	0	**469**	0	604	82	**686**	**1155**	78	0	49	**127**	0	0	0	**0**	**127**	**1282**
16:00 17:00	37	522	0	**559**	0	752	87	**839**	**1398**	79	0	52	**131**	0	0	0	**0**	**131**	**1529**
17:00 18:00	27	475	0	**502**	0	601	85	**686**	**1188**	64	0	31	**95**	0	0	0	**0**	**95**	**1283**
Sub Total	196	3818	0	**4014**	0	4011	554	**4565**	**8579**	563	0	279	**842**	0	0	0	**0**	**842**	**9421**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	196	3818	0	**4014**	0	4011	554	**4565**	**8579**	563	0	279	**842**	0	0	0	**0**	**842**	**9421**
EQ 12Hr	272	5307	0	**5579**	0	5575	770	**6345**	**11925**	783	0	388	**1170**	0	0	0	**0**	**1170**	**13095**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	272	5307	0	**5579**	0	7304	1009	**6345**	**11925**	783	0	388	**1170**	0	0	0	**0**	**1170**	**13095**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	356	6952	0	**7308**	0	9568	1322	**8312**	**15622**	1026	0	508	**1533**	0	0	0	**0**	**1533**	**17154**
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.

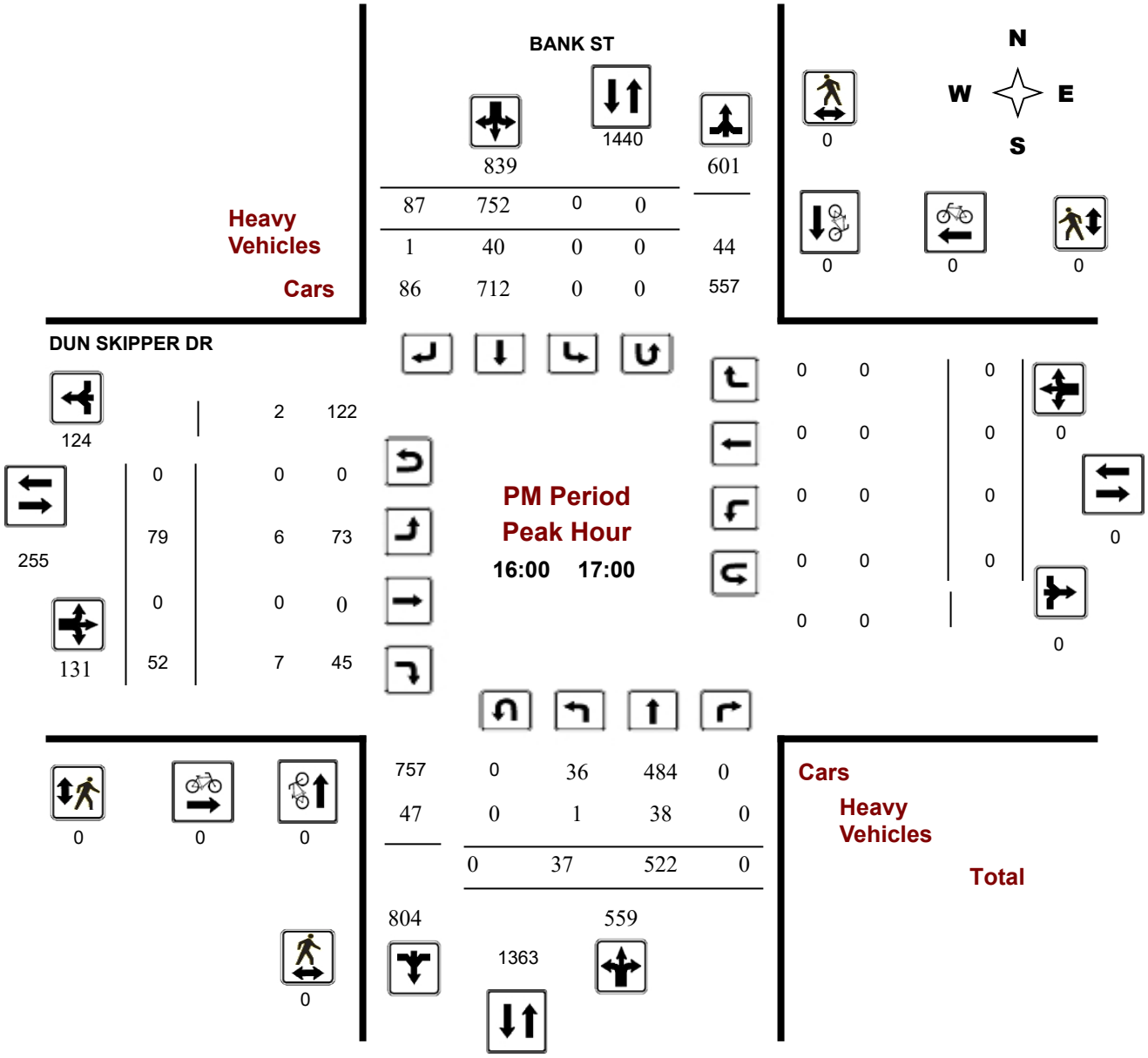
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ DUN SKIPPER DR

Survey Date: Thursday, September 14, 2023 **WO No:** 41167

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



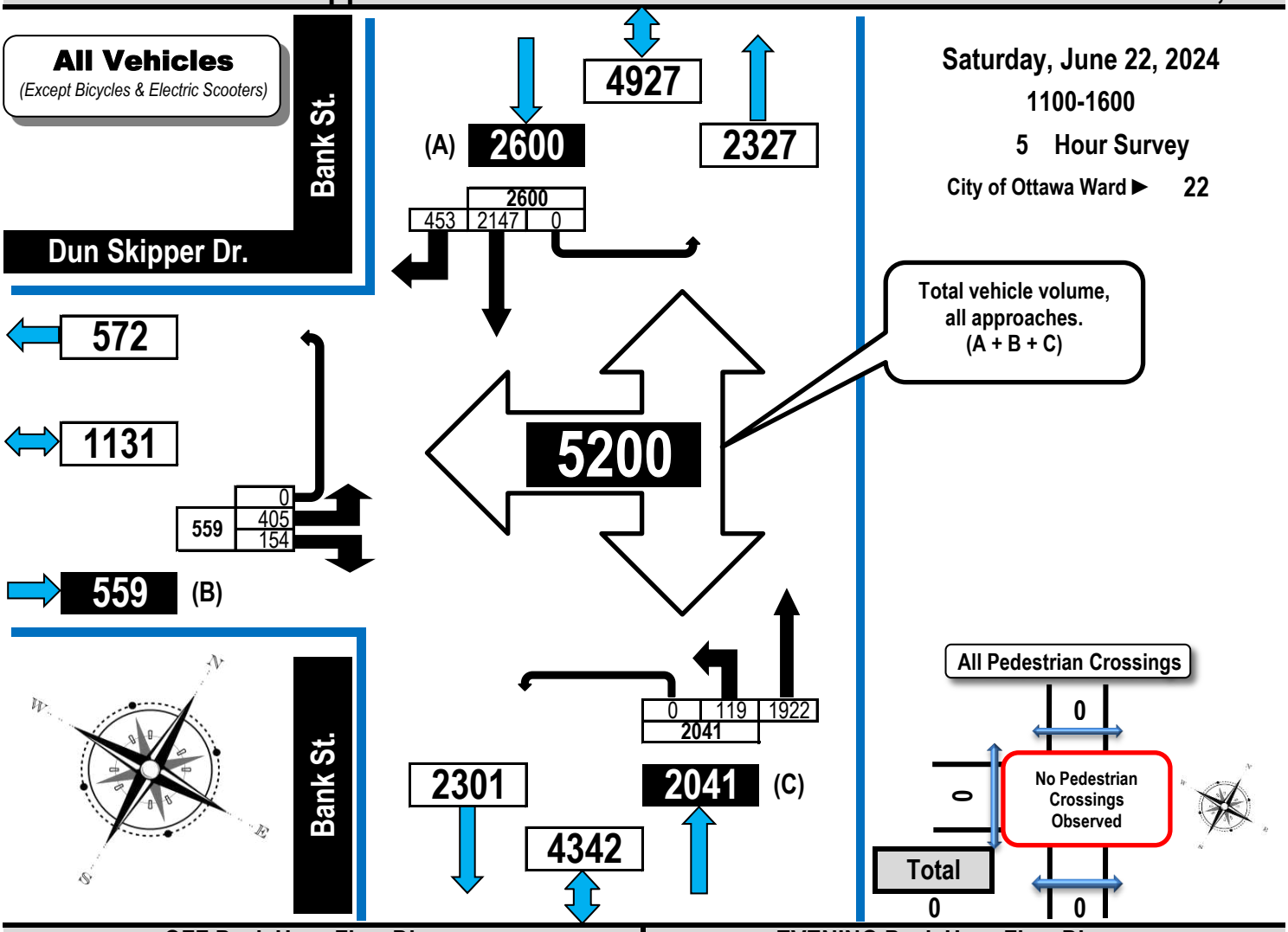
Comments

Turning Movement Count
Summary, OFF and EVGN Peak Hour Flow Diagrams
All Vehicles Except Bicycles

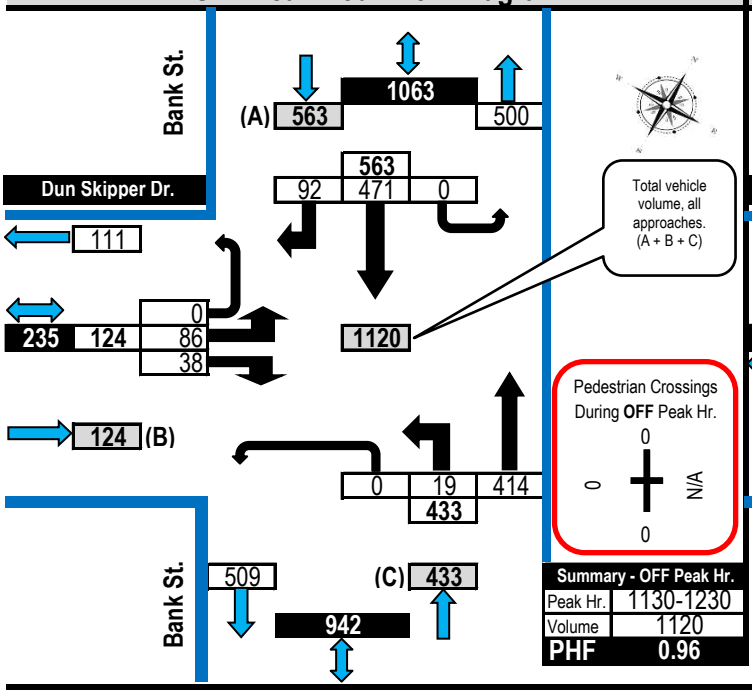
Bank Street & Dun Skipper Drive — Gloucester, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Saturday, June 22, 2024
1100-1600
5 Hour Survey
City of Ottawa Ward ▶ 22

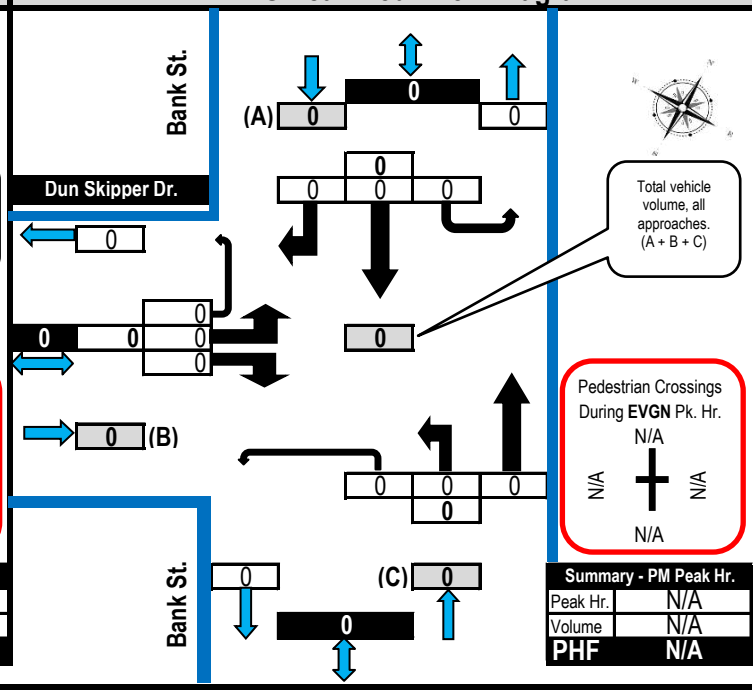


OFF Peak Hour Flow Diagram



Summary - OFF Peak Hr.	
Peak Hr.	1130-1230
Volume	1120
PHF	0.96

EVENING Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	N/A
Volume	N/A
PHF	N/A

APPENDIX E

Collision Records

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: BANK ST @ DUN SKIPPER DR

Traffic Control: Traffic signal **Total Collisions:** 3

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	
2021-Jan-02, Sat,10:11	Snow	SMV other	P.D. only	Slush	North	Going ahead	Automobile, station wagon	Skidding/sliding	0
2021-Oct-05, Tue,15:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Location: BANK ST btwn BLAIS RD & DUN SKIPPER DR

Traffic Control: No control **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Feb-14, Thu,15:20	Clear	Rear end	P.D. only	Loose snow	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jul-07, Tue,08:36	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Passenger van	Other motor vehicle	0
					South	Stopped	Passenger van	Other motor vehicle	

Location: BLAIS RD @ BANK ST

Traffic Control: Stop sign **Total Collisions:** 12

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: BLAIS RD @ BANK ST

Traffic Control: Stop sign

Total Collisions: 12

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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	
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	
2021-Feb-22, Mon,11:22	Snow	Angle	P.D. only	Packed snow	South	Going ahead	Passenger van	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2021-Nov-12, Fri,12:40	Clear	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Provisional Version

The Provisional Data report is subject to change at anytime. No business decisions are to be made using this data, it is only for internal discussion purposes. This data, in some cases, has not been fully validated.

From: January 1, 2022 **To:** December 31, 2022

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
2022-Nov-05, Sat,16:15	Clear	Rear end	P.D. only	Dry	North	Stopped	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	

Location ..... BLAIS RD @ BANK ST

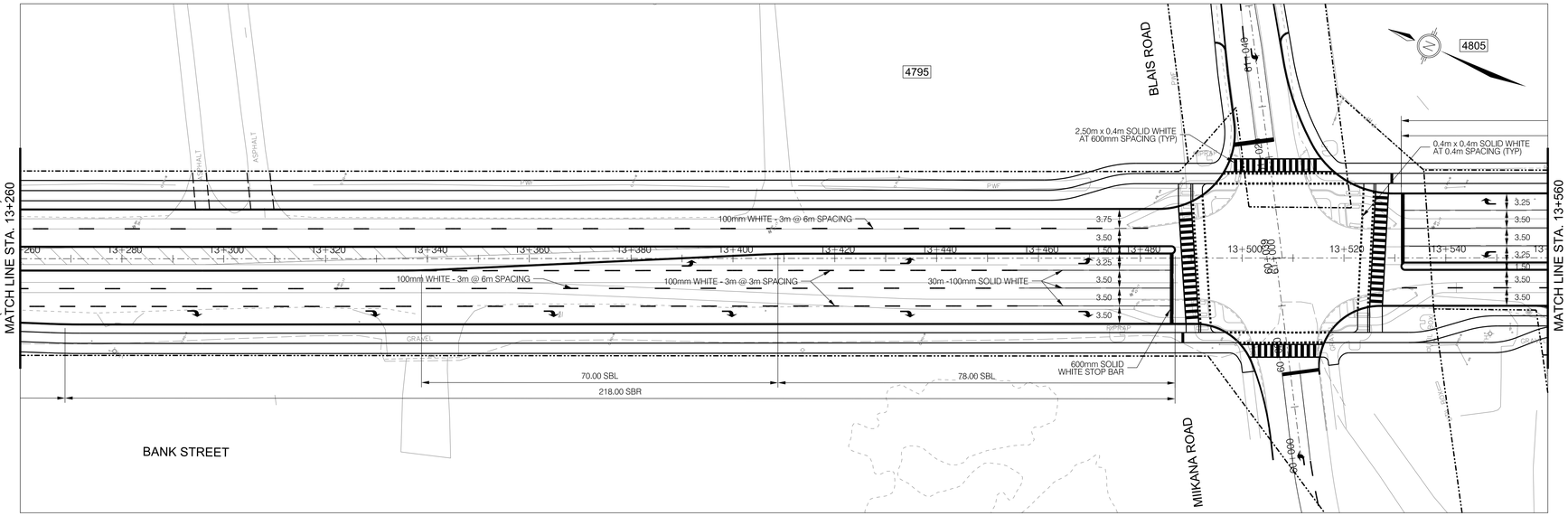
Traffic Control.... Traffic signal **Total Collisions....** 3

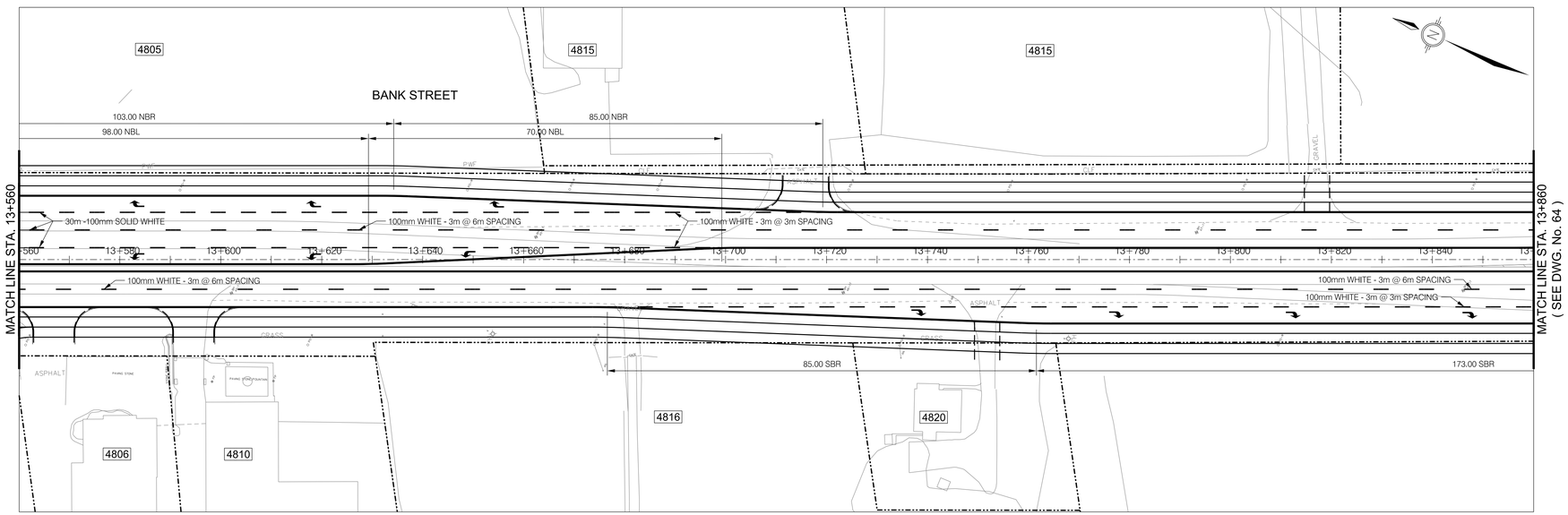
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2022-Mar-29, Tue,09:35	Clear	Turning movement	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2022-Apr-02, Sat,17:30	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2022-Jun-16, Thu,19:28	Clear	Turning movement	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	

APPENDIX F

Excerpts from Bank Street Widening EA

DRAWING FRAME: 796mm x 534mm City of Ottawa 2008





BANK STREET WIDENING

LEITRIM RD. TO DUN SKIPPER DR.

PAVEMENT MARKINGS AND SIGNS IV

STA. 13+260 TO 13+560
STA. 13+560 TO 13+860

ALAIN GONTHIER, P.ENG.	MIKE GIAMPA, P. ENG.
Director	*Project Manager*

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

IBI Project No.	Dwg. No.
106262	63

Sheet 63 of 71

Asset No.	----------
Asset Group	----
Des. S.L.	Chk'd. J.D.
Dwn. C.R.	Chk'd. S.L.
Utility Circ. No. ------	Index No. ------
Const. Inspector	----------

Scale:
HORIZONTAL
0m 5 10 20
0m 1 2
VERTICAL

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

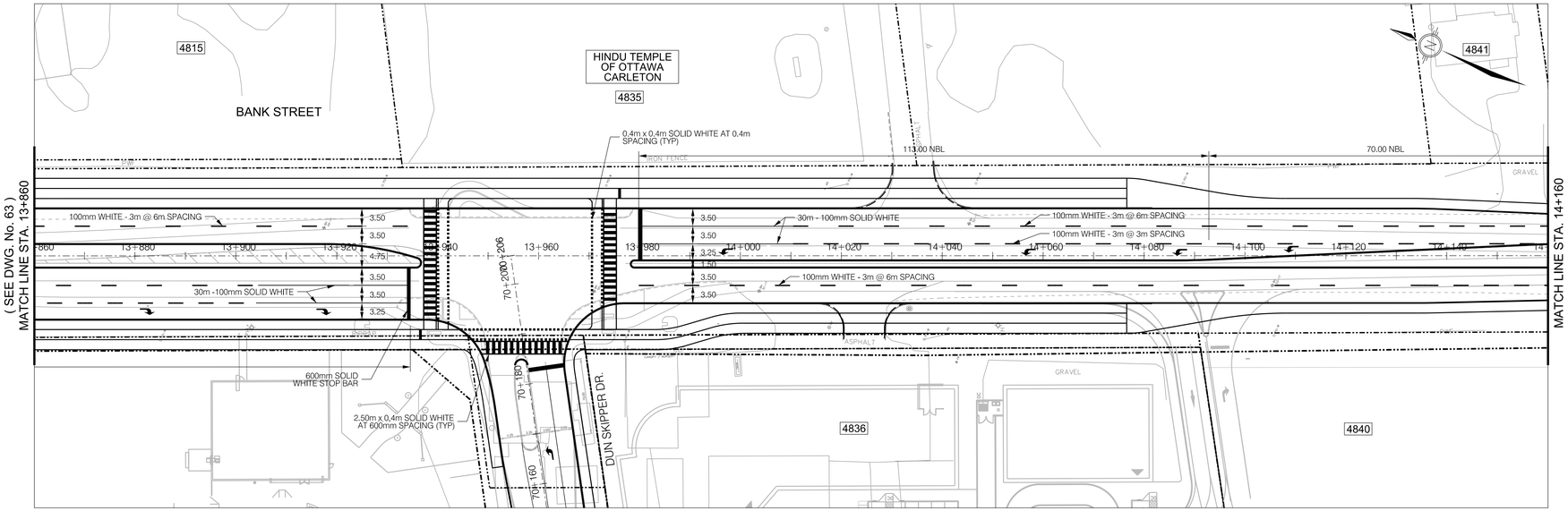
REVISIONS

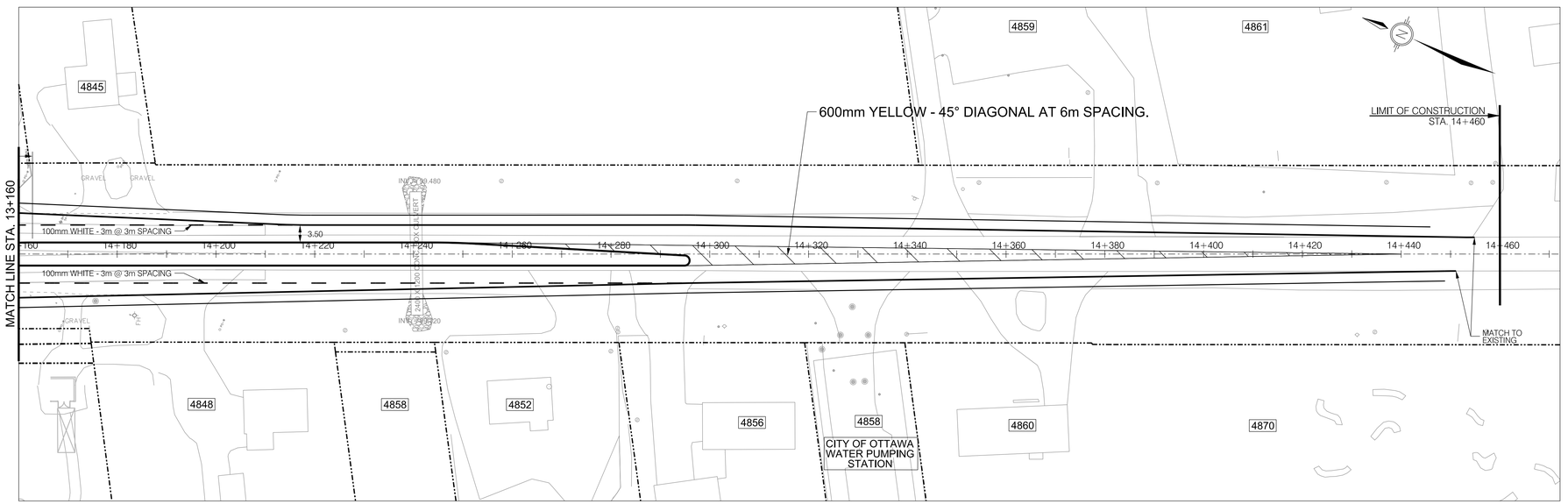
No.	Description	By	Date (dd/mm/yy)
1.	ISSUED FOR PRELIMINARY DESIGN	S.L.	30/04/19

Consultant Drawing Number

DRAWING FRAME: 796mm x 534mm City of Ottawa 2008

Consultant Drawing Number





BANK STREET WIDENING

LEITRIM RD. TO DUN SKIPPER DR.

PAVEMENT MARKINGS AND SIGNS V

STA. 13+860 TO 14+160
STA. 14+160 TO 14+450

ALAIN GONTHIER, P.ENG.	MIKE GIAMPA, P.ENG.
Director	*Project Manager*

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Ottawa

IBI Project No.	Dwg. No.
106262	64

Sheet 64 of 71

Asset No. ---------

Asset Group ---

Des.	Chk'd.
S.L.	J.D.
Dwn.	Chk'd.
C.R.	S.L.
Utility Circ. No. ------	Index No. ------

Const. Inspector ----------

Scale:
HORIZONTAL
0m 5 10 20
0m 1 2
VERTICAL

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

No.	Description	By	Date (dd/mm/yy)
1.	ISSUED FOR PRELIMINARY DESIGN	S.L.	30/04/19

May 6, 2019 08:39:29 J:\106262.2_BankStWideng\5.9 Drawings\59civil\layouts\64-PM 5.dgn

APPENDIX G

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

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

500 1000 1500 2000

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.

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 H

Other Area Developments

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

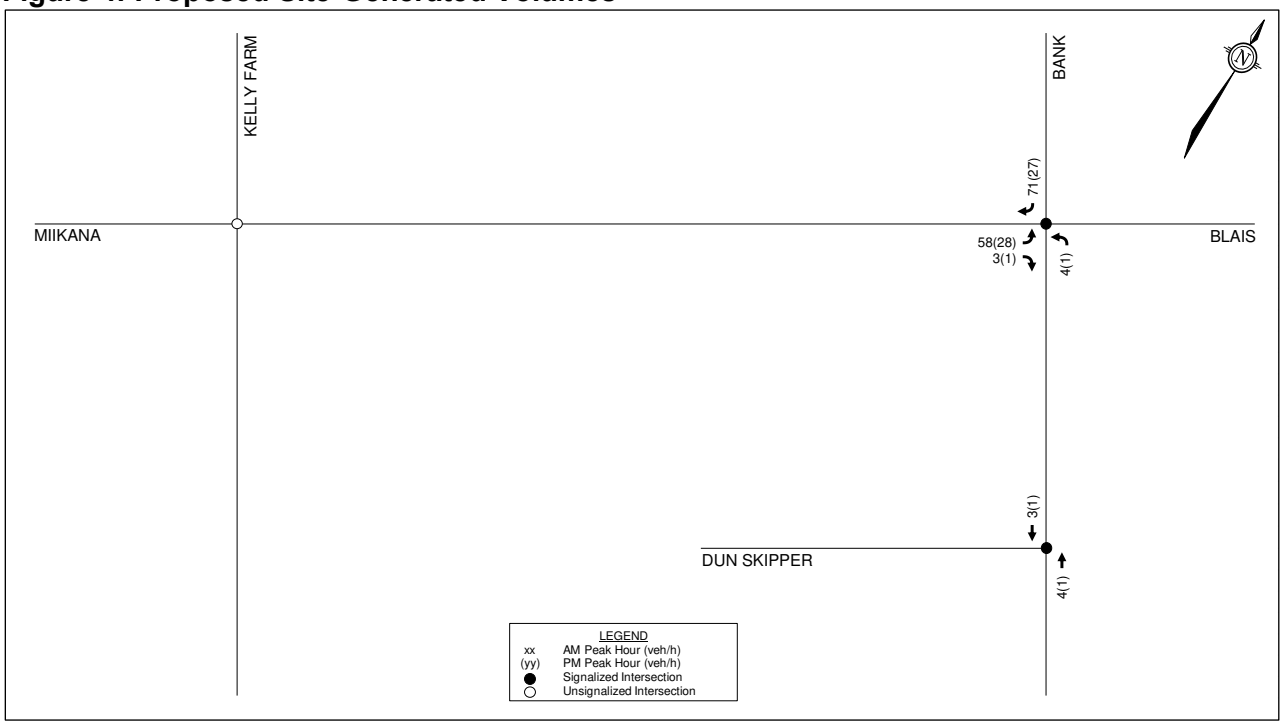
The 2016 Remer Lands CTS included trip distribution assumptions for all trips generated by the subdivision, which can be summarized as 95% to/from the north via Bank Street and 5% to/from the south via Bank Street.

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**.

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

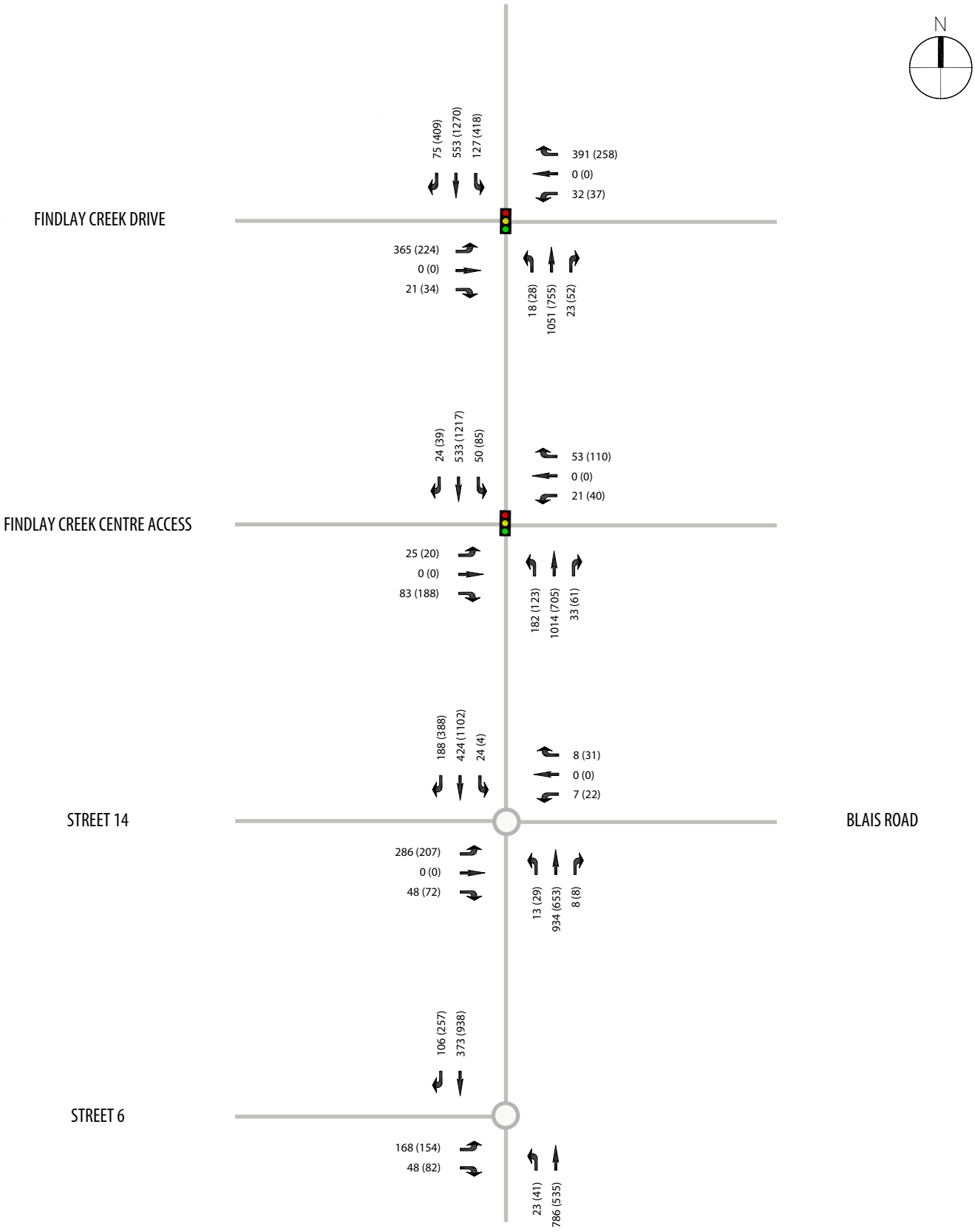
Notes:
vph = vehicles per hour; DU = Dwelling Units
1 - Formula Rate for Single Family Detached Land Use:
AM T= 0.70(X) + 9,74
PM T= e^(0.90Ln(X) + 0.51)
2 - Formula Rate for Apartment Land Use:
AM T= 0.49*(X) + 3.73
PM T= 0.55*(X) + 17.65
3 - Formula Rate for Condo/ Townhouse Land Use:
AM T= e^(0.80Ln(X) + 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 15
Future (2025) Total AM & PM Peak
Hour Traffic Volumes

PROJECT No. 33956
DATE: MAY 2016
SCALE: NTS

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

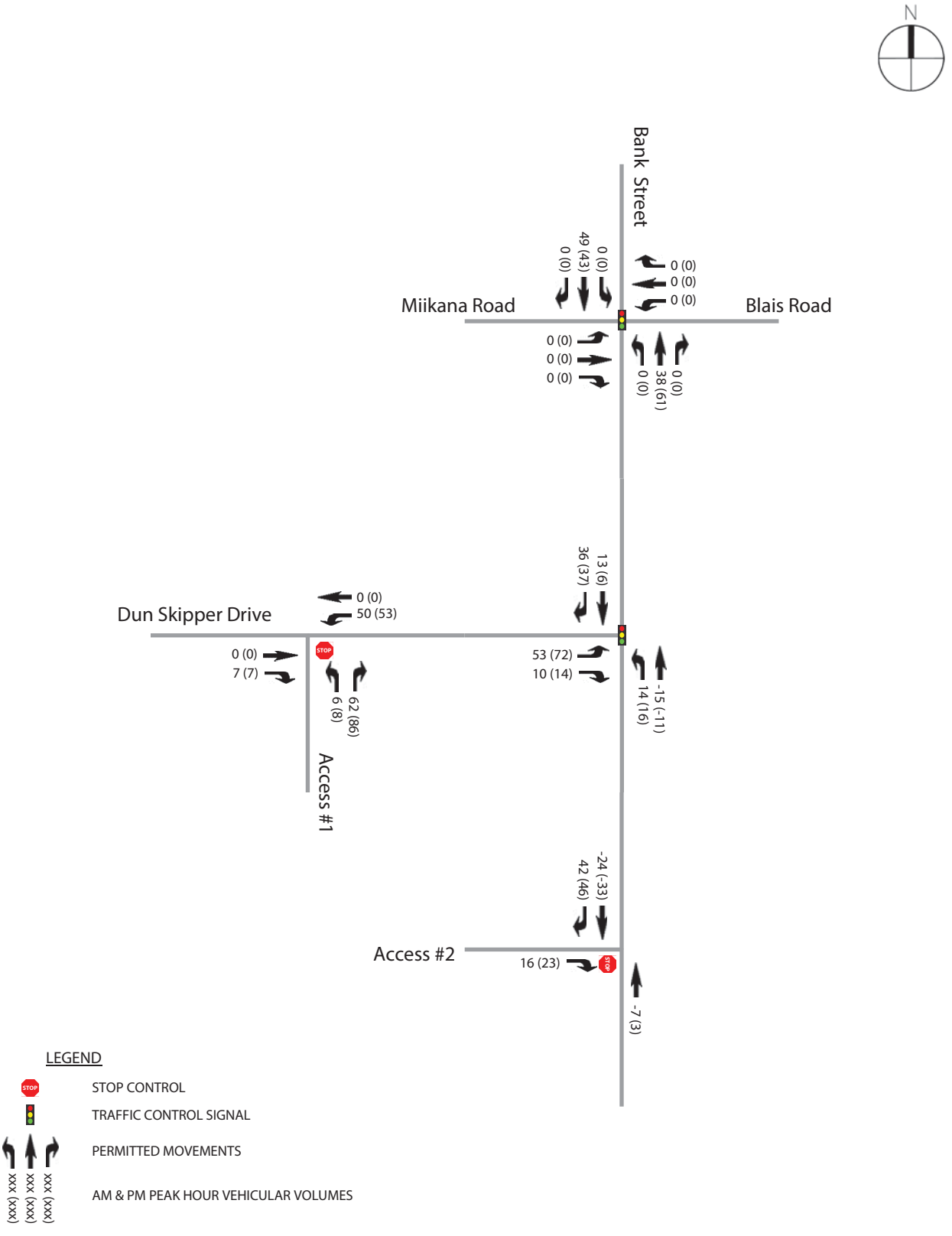
The Home Hardware is expected to be built and occupied by 2021, while the remainder of the site is expected to be built and occupied by 2023.

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**.



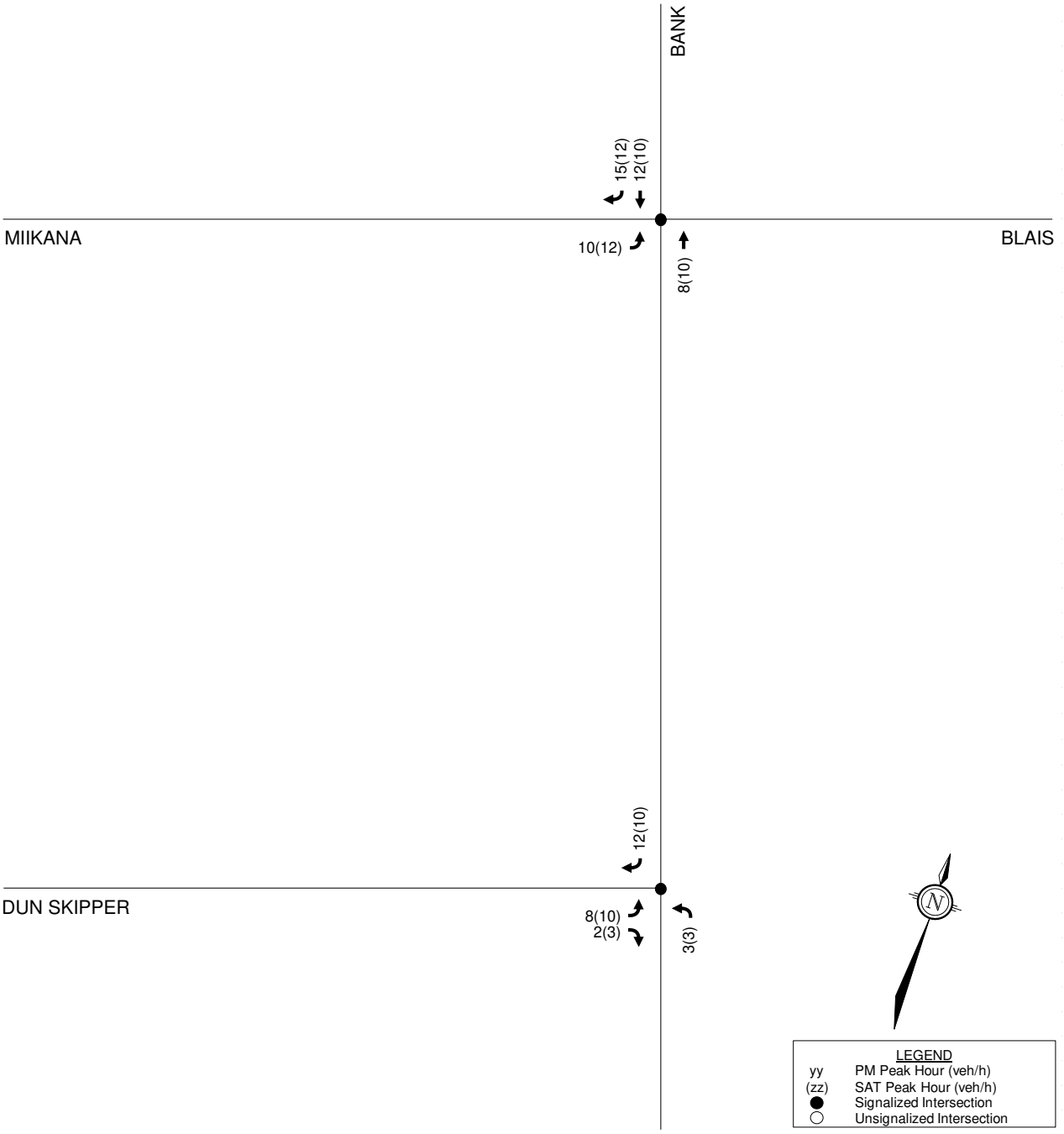
IBI

4836 Bank Street
Transportation Impact Assessment

Exhibit 6:
Net Site-Generated Traffic

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

Figure 1: Projected Residential Traffic Volumes



APPENDIX I

Signal Timing Plans

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

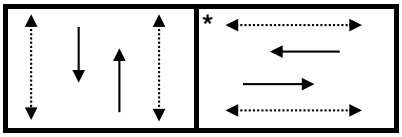
Intersection:	***Main:*** Bank	***Side:***	Blais / Miikana
Controller:	**MS 3200**	**TSD:**	**5866**
Author:	Matthew Anderson	**Date:**	29-Mar-2022

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

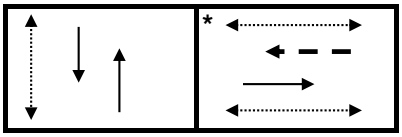
Intersection:	***Main:*** Bank	***Side:***	Dun Skipper
Controller:	**MS 3200**	**TSD:**	**5869**
Author:	Matthew Anderson	**Date:**	29-Mar-2022

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 J

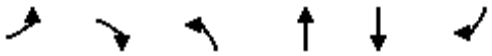
Existing and Background Synchro Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	23	29	45	32	62	17	504	36	50	684	112
Future Volume (vph)	87	23	29	45	32	62	17	504	36	50	684	112
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.97
Frt		0.917			0.901			0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1768	1498	0	1595	1655	0	1768	1777	0	1654	1825	1567
Flt Permitted	0.689			0.719			0.300			0.387		
Satd. Flow (perm)	1282	1498	0	1207	1655	0	558	1777	0	674	1825	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			69			7				124
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			282.9			425.7	
Travel Time (s)		24.7			21.3			12.7			19.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	9%	20%	12%	3%	2%	1%	4%	15%	8%	3%	2%
Adj. Flow (vph)	97	26	32	50	36	69	19	560	40	56	760	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	58	0	50	105	0	19	600	0	56	760	124
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

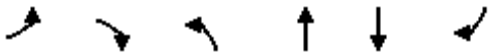
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		90.0	90.0		90.0	90.0	90.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Maximum Green (s)	23.4	23.4		23.4	23.4		83.4	83.4		83.4	83.4	83.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	20.1	20.1		20.1	20.1		86.7	86.7		86.7	86.7	86.7
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.72	0.72		0.72	0.72	0.72
v/c Ratio	0.45	0.21		0.25	0.31		0.05	0.47		0.12	0.58	0.11
Control Delay	52.5	25.0		47.0	20.4		4.3	6.5		5.8	10.1	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	52.5	25.0		47.0	20.4		4.3	6.5		5.8	10.1	1.1
LOS	D	C		D	C		A	A		A	B	A
Approach Delay		42.2			29.0			6.4			8.7	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	19.2	4.8		9.5	6.7		0.8	38.7		3.2	68.9	0.0
Queue Length 95th (m)	34.8	15.7		20.4	21.1		m1.9	47.4		7.2	97.8	4.5
Internal Link Dist (m)		318.5			450.3			258.9			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	249	317		235	378		402	1285		486	1318	1132
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.39	0.18		0.21	0.28		0.05	0.47		0.12	0.58	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank & Miikana/Blais



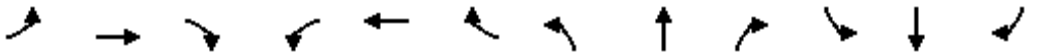
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	79	52	37	522	752	87	
Future Volume (vph)	79	52	37	522	752	87	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			75.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1669	1402	1734	1757	1774	1567	
Flt Permitted	0.950		0.294				
Satd. Flow (perm)	1669	1402	537	1757	1774	1567	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		58				97	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	7%	14%	3%	7%	6%	2%	
Adj. Flow (vph)	88	58	41	580	836	97	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	88	58	41	580	836	97	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	90.0	90.0	90.0	90.0	30.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%	25%
Maximum Green (s)	23.4	23.4	83.3	83.3	83.3	83.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	12.3	12.3	94.4	94.4	94.4	94.4	
Actuated g/C Ratio	0.10	0.10	0.79	0.79	0.79	0.79	
v/c Ratio	0.51	0.30	0.10	0.42	0.60	0.08	
Control Delay	61.3	16.0	4.0	5.4	5.6	0.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	61.3	16.0	4.0	5.4	5.6	0.5	
LOS	E	B	A	A	A	A	
Approach Delay	43.3			5.3	5.1		
Approach LOS	D			A	A		
Queue Length 50th (m)	18.5	0.0	1.6	32.1	45.3	0.0	
Queue Length 95th (m)	32.7	11.1	4.9	55.7	57.2	1.7	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			75.0	
Base Capacity (vph)	325	320	422	1381	1395	1253	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.27	0.18	0.10	0.42	0.60	0.08	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 8.5		Intersection LOS: A	
Intersection Capacity Utilization 61.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Bank & Dun Skipper

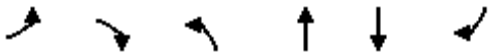


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	35	11	25	30	38	12	469	23	47	536	85
Future Volume (vph)	70	35	11	25	30	38	12	469	23	47	536	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					0.98
Frt		0.965			0.916			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1751	1796	0	1717	1705	0	1654	1830	0	1768	1843	1582
Flt Permitted	0.708			0.724			0.355			0.390		
Satd. Flow (perm)	1305	1796	0	1309	1705	0	618	1830	0	726	1843	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			42			5				94
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			282.9			425.7	
Travel Time (s)		24.7			21.3			12.7			19.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	4%	1%	1%	8%	2%	2%	1%	2%	1%
Adj. Flow (vph)	78	39	12	28	33	42	13	521	26	52	596	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	51	0	28	75	0	13	547	0	52	596	94
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	57.1%
Maximum Green (s)	23.4	23.4		23.4	23.4		33.4	33.4		33.4	33.4	33.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.0	18.0		20.0	20.0		43.4	43.4		43.4	43.4	43.4
Actuated g/C Ratio	0.26	0.26		0.29	0.29		0.62	0.62		0.62	0.62	0.62
v/c Ratio	0.23	0.11		0.07	0.15		0.03	0.48		0.12	0.52	0.09
Control Delay	21.2	15.8		19.0	11.1		6.7	8.5		9.4	12.7	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.2	15.8		19.0	11.1		6.7	8.5		9.4	12.7	2.4
LOS	C	B		B	B		A	A		A	B	A
Approach Delay		19.1			13.2			8.5			11.1	
Approach LOS		B			B			A			B	
Queue Length 50th (m)	7.1	3.4		2.5	2.9		0.5	30.2		3.0	46.7	0.0
Queue Length 95th (m)	16.1	10.0		7.4	10.8		m1.5	41.3		7.8	74.2	5.2
Internal Link Dist (m)		318.5			450.3			258.9			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	436	608		437	597		383	1137		450	1143	995
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.18	0.08		0.06	0.13		0.03	0.48		0.12	0.52	0.09

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 68.9%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank & Miikana/Blais

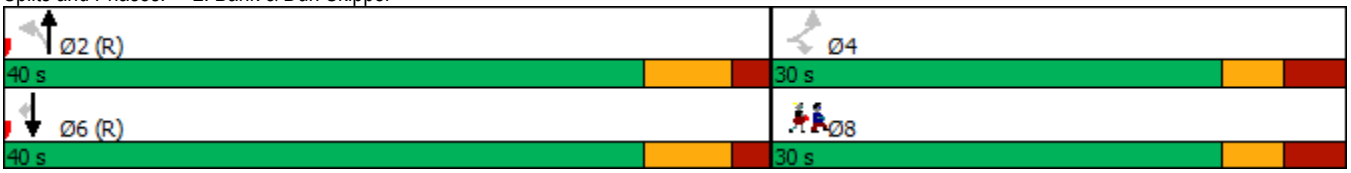


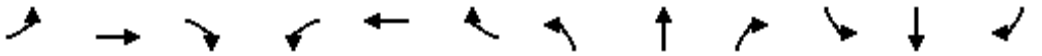
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	86	38	19	414	471	92	
Future Volume (vph)	86	38	19	414	471	92	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			75.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1751	1508	1624	1843	1843	1551	
Flt Permitted	0.950		0.447				
Satd. Flow (perm)	1751	1508	764	1843	1843	1551	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		42				102	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	2%	6%	10%	2%	2%	3%	
Adj. Flow (vph)	96	42	21	460	523	102	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	96	42	21	460	523	102	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	40.0	40.0	40.0	40.0	30.0
Total Split (%)	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%	43%
Maximum Green (s)	23.4	23.4	33.3	33.3	33.3	33.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	10.7	10.7	50.7	50.7	50.7	50.7	
Actuated g/C Ratio	0.15	0.15	0.72	0.72	0.72	0.72	
v/c Ratio	0.36	0.16	0.04	0.34	0.39	0.09	
Control Delay	30.5	10.4	4.8	6.0	7.2	3.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	30.5	10.4	4.8	6.0	7.2	3.0	
LOS	C	B	A	A	A	A	
Approach Delay	24.4			6.0	6.5		
Approach LOS	C			A	A		
Queue Length 50th (m)	10.7	0.0	0.7	20.6	19.7	0.0	
Queue Length 95th (m)	21.4	6.7	2.9	38.3	48.2	m7.3	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			75.0	
Base Capacity (vph)	585	532	553	1334	1334	1151	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.08	0.04	0.34	0.39	0.09	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 45.6%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank & Dun Skipper



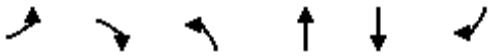


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	23	37	46	32	63	21	574	37	51	751	193
Future Volume (vph)	146	23	37	46	32	63	21	574	37	51	751	193
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.97
Frt		0.907			0.901			0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1768	1473	0	1595	1655	0	1768	1780	0	1654	1825	1567
Flt Permitted	0.695			0.718			0.301			0.378		
Satd. Flow (perm)	1294	1473	0	1205	1655	0	560	1780	0	658	1825	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			63			6				193
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			282.9			425.7	
Travel Time (s)		24.7			21.3			12.7			19.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	9%	20%	12%	3%	2%	1%	4%	15%	8%	3%	2%
Adj. Flow (vph)	146	23	37	46	32	63	21	574	37	51	751	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	60	0	46	95	0	21	611	0	51	751	193
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		90.0	90.0		90.0	90.0	90.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Maximum Green (s)	23.4	23.4		23.4	23.4		83.4	83.4		83.4	83.4	83.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	21.1	21.1		21.1	21.1		85.7	85.7		85.7	85.7	85.7
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.64	0.21		0.22	0.28		0.05	0.48		0.11	0.58	0.17
Control Delay	59.8	21.8		44.9	19.2		4.5	7.4		6.3	10.7	1.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	59.8	21.8		44.9	19.2		4.5	7.4		6.3	10.7	1.2
LOS	E	C		D	B		A	A		A	B	A
Approach Delay		48.7			27.6			7.3			8.6	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	30.1	4.3		8.7	6.0		0.7	49.8		2.9	67.5	0.0
Queue Length 95th (m)	49.3	14.9		18.4	19.2		m2.5	61.6		7.4	105.4	5.9
Internal Link Dist (m)		318.5			450.3			258.9			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	252	317		234	373		400	1273		469	1304	1141
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.19		0.20	0.25		0.05	0.48		0.11	0.58	0.17

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 13.7		Intersection LOS: B	
Intersection Capacity Utilization 72.4%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank & Miikana/Blais

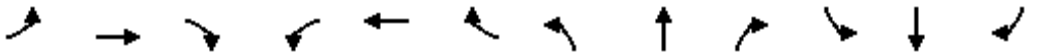


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	150	71	55	524	765	150	
Future Volume (vph)	150	71	55	524	765	150	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			75.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1669	1402	1734	1757	1774	1567	
Flt Permitted	0.950		0.314				
Satd. Flow (perm)	1669	1402	573	1757	1774	1567	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		71				150	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	7%	14%	3%	7%	6%	2%	
Adj. Flow (vph)	150	71	55	524	765	150	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	150	71	55	524	765	150	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	90.0	90.0	90.0	90.0	30.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%	25%
Maximum Green (s)	23.4	23.4	83.3	83.3	83.3	83.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	16.0	16.0	90.7	90.7	90.7	90.7	
Actuated g/C Ratio	0.13	0.13	0.76	0.76	0.76	0.76	
v/c Ratio	0.68	0.29	0.13	0.39	0.57	0.12	
Control Delay	63.9	12.8	5.6	6.7	6.3	0.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.9	12.8	5.6	6.7	6.3	0.6	
LOS	E	B	A	A	A	A	
Approach Delay	47.5			6.6	5.4		
Approach LOS	D			A	A		
Queue Length 50th (m)	31.4	0.0	2.8	33.9	41.7	0.0	
Queue Length 95th (m)	48.7	11.4	7.8	59.9	53.8	1.9	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			75.0	
Base Capacity (vph)	325	330	433	1327	1340	1220	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.46	0.22	0.13	0.39	0.57	0.12	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Bank & Dun Skipper



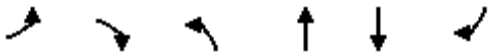
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	35	18	26	30	39	15	551	23	48	605	136
Future Volume (vph)	103	35	18	26	30	39	15	551	23	48	605	136
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					0.98
Frt		0.949			0.915			0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1751	1766	0	1717	1703	0	1654	1832	0	1768	1843	1582
Flt Permitted	0.712			0.722			0.348			0.371		
Satd. Flow (perm)	1312	1766	0	1305	1703	0	605	1832	0	691	1843	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			39			4				136
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			282.9			425.7	
Travel Time (s)		24.7			21.3			12.7			19.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	1%	4%	1%	1%	8%	2%	2%	1%	2%	1%
Adj. Flow (vph)	103	35	18	26	30	39	15	551	23	48	605	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	53	0	26	69	0	15	574	0	48	605	136
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	57.1%
Maximum Green (s)	23.4	23.4		23.4	23.4		33.4	33.4		33.4	33.4	33.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.0	18.0		20.0	20.0		43.4	43.4		43.4	43.4	43.4
Actuated g/C Ratio	0.26	0.26		0.29	0.29		0.62	0.62		0.62	0.62	0.62
v/c Ratio	0.31	0.11		0.07	0.13		0.04	0.50		0.11	0.53	0.13
Control Delay	22.5	14.3		19.0	11.0		6.1	8.9		9.5	12.8	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.5	14.3		19.0	11.0		6.1	8.9		9.5	12.8	2.1
LOS	C	B		B	B		A	A		A	B	A
Approach Delay		19.8			13.2			8.8			10.8	
Approach LOS		B			B			A			B	
Queue Length 50th (m)	9.6	3.1		2.3	2.6		0.5	38.5		2.7	47.7	0.0
Queue Length 95th (m)	20.3	9.8		7.0	10.2		m1.6	51.3		7.5	75.9	6.4
Internal Link Dist (m)		318.5			450.3			258.9			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	438	602		436	595		375	1138		429	1143	1011
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.24	0.09		0.06	0.12		0.04	0.50		0.11	0.53	0.13

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 11.0 Intersection LOS: B
Intersection Capacity Utilization 69.8% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Bank & Miikana/Blais



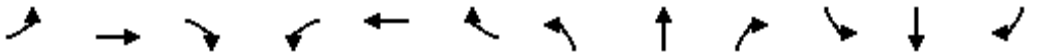
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	171	60	40	411	478	159	
Future Volume (vph)	171	60	40	411	478	159	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			75.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1751	1508	1624	1843	1843	1551	
Flt Permitted	0.950		0.460				
Satd. Flow (perm)	1751	1508	786	1843	1843	1551	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		60				159	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	6%	10%	2%	2%	3%	
Adj. Flow (vph)	171	60	40	411	478	159	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	171	60	40	411	478	159	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	40.0	40.0	40.0	40.0	30.0
Total Split (%)	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%	43%
Maximum Green (s)	23.4	23.4	33.3	33.3	33.3	33.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	12.6	12.6	44.1	44.1	44.1	44.1	
Actuated g/C Ratio	0.18	0.18	0.63	0.63	0.63	0.63	
v/c Ratio	0.54	0.19	0.08	0.35	0.41	0.15	
Control Delay	32.1	8.2	6.5	7.8	9.0	3.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	32.1	8.2	6.5	7.8	9.0	3.3	
LOS	C	A	A	A	A	A	
Approach Delay	25.9			7.7	7.6		
Approach LOS	C			A	A		
Queue Length 50th (m)	19.2	0.0	1.6	19.9	18.0	0.0	
Queue Length 95th (m)	32.2	7.3	5.7	40.3	45.7	10.2	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			75.0	
Base Capacity (vph)	585	544	494	1159	1159	1035	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.29	0.11	0.08	0.35	0.41	0.15	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 10.8 Intersection LOS: B
Intersection Capacity Utilization 56.2% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Bank & Dun Skipper

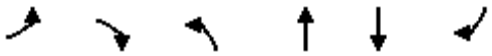


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	23	37	48	32	66	21	599	39	54	785	193
Future Volume (vph)	146	23	37	48	32	66	21	599	39	54	785	193
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.97
Frt		0.907			0.899			0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1768	1473	0	1595	1652	0	1768	1780	0	1654	1825	1567
Flt Permitted	0.694			0.718			0.283			0.362		
Satd. Flow (perm)	1292	1473	0	1205	1652	0	527	1780	0	630	1825	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			66			6				193
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			282.9			425.7	
Travel Time (s)		24.7			21.3			12.7			19.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	9%	20%	12%	3%	2%	1%	4%	15%	8%	3%	2%
Adj. Flow (vph)	146	23	37	48	32	66	21	599	39	54	785	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	60	0	48	98	0	21	638	0	54	785	193
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		90.0	90.0		90.0	90.0	90.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Maximum Green (s)	23.4	23.4		23.4	23.4		83.4	83.4		83.4	83.4	83.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	21.1	21.1		21.1	21.1		85.7	85.7		85.7	85.7	85.7
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.65	0.21		0.23	0.28		0.06	0.50		0.12	0.60	0.17
Control Delay	59.9	21.8		45.1	18.9		4.5	7.5		6.4	11.2	1.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	59.9	21.8		45.1	18.9		4.5	7.5		6.4	11.2	1.2
LOS	E	C		D	B		A	A		A	B	A
Approach Delay		48.8			27.5			7.4			9.1	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	30.1	4.3		9.2	6.0		0.8	51.0		3.1	72.9	0.0
Queue Length 95th (m)	49.3	14.9		19.0	19.2		m2.4	62.7		7.8	113.7	5.9
Internal Link Dist (m)		318.5			450.3			258.9			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	251	317		234	375		376	1273		449	1304	1141
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.19		0.21	0.26		0.06	0.50		0.12	0.60	0.17

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank & Miikana/Blais

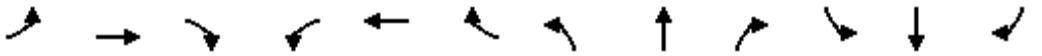


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	150	71	55	551	803	150	
Future Volume (vph)	150	71	55	551	803	150	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			75.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1669	1402	1734	1757	1774	1567	
Flt Permitted	0.950		0.295				
Satd. Flow (perm)	1669	1402	538	1757	1774	1567	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		71				150	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	7%	14%	3%	7%	6%	2%	
Adj. Flow (vph)	150	71	55	551	803	150	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	150	71	55	551	803	150	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	90.0	90.0	90.0	90.0	30.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%	25%
Maximum Green (s)	23.4	23.4	83.3	83.3	83.3	83.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	16.0	16.0	90.7	90.7	90.7	90.7	
Actuated g/C Ratio	0.13	0.13	0.76	0.76	0.76	0.76	
v/c Ratio	0.68	0.29	0.14	0.42	0.60	0.12	
Control Delay	63.9	12.8	5.8	6.9	6.6	0.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.9	12.8	5.8	6.9	6.6	0.6	
LOS	E	B	A	A	A	A	
Approach Delay	47.5			6.8	5.6		
Approach LOS	D			A	A		
Queue Length 50th (m)	31.4	0.0	2.8	36.4	43.9	0.0	
Queue Length 95th (m)	48.7	11.4	7.9	64.2	56.0	1.9	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			75.0	
Base Capacity (vph)	325	330	406	1327	1340	1220	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.46	0.22	0.14	0.42	0.60	0.12	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Bank & Dun Skipper



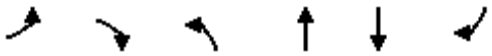
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	35	18	27	30	41	15	575	25	50	632	136
Future Volume (vph)	103	35	18	27	30	41	15	575	25	50	632	136
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt		0.949			0.913			0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1751	1766	0	1717	1699	0	1654	1832	0	1768	1843	1582
Flt Permitted	0.711			0.722			0.329			0.352		
Satd. Flow (perm)	1310	1766	0	1305	1699	0	573	1832	0	655	1843	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			41			4				136
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			282.9			425.7	
Travel Time (s)		24.7			21.3			12.7			19.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	1%	4%	1%	1%	8%	2%	2%	1%	2%	1%
Adj. Flow (vph)	103	35	18	27	30	41	15	575	25	50	632	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	53	0	27	71	0	15	600	0	50	632	136
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	57.1%
Maximum Green (s)	23.4	23.4		23.4	23.4		33.4	33.4		33.4	33.4	33.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.0	18.0		20.0	20.0		43.4	43.4		43.4	43.4	43.4
Actuated g/C Ratio	0.26	0.26		0.29	0.29		0.62	0.62		0.62	0.62	0.62
v/c Ratio	0.31	0.11		0.07	0.14		0.04	0.53		0.12	0.55	0.13
Control Delay	22.5	14.3		19.0	10.9		6.1	9.1		9.7	13.2	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.5	14.3		19.0	10.9		6.1	9.1		9.7	13.2	2.1
LOS	C	B		B	B		A	A		A	B	A
Approach Delay		19.8			13.1			9.0			11.2	
Approach LOS		B			B			A			B	
Queue Length 50th (m)	9.6	3.1		2.4	2.6		0.5	39.9		2.9	51.0	0.0
Queue Length 95th (m)	20.3	9.8		7.2	10.3		m1.5	52.7		7.8	81.0	6.4
Internal Link Dist (m)		318.5			450.3			258.9			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	437	602		436	595		355	1138		406	1143	1011
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.24	0.09		0.06	0.12		0.04	0.53		0.12	0.55	0.13

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 11.3 Intersection LOS: B
Intersection Capacity Utilization 71.5% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Bank & Miikana/Blais



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	171	60	40	432	502	159	
Future Volume (vph)	171	60	40	432	502	159	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			75.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1751	1508	1624	1843	1843	1551	
Flt Permitted	0.950		0.443				
Satd. Flow (perm)	1751	1508	757	1843	1843	1551	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		60				159	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	6%	10%	2%	2%	3%	
Adj. Flow (vph)	171	60	40	432	502	159	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	171	60	40	432	502	159	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	40.0	40.0	40.0	40.0	30.0
Total Split (%)	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%	43%
Maximum Green (s)	23.4	23.4	33.3	33.3	33.3	33.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	12.6	12.6	44.1	44.1	44.1	44.1	
Actuated g/C Ratio	0.18	0.18	0.63	0.63	0.63	0.63	
v/c Ratio	0.54	0.19	0.08	0.37	0.43	0.15	
Control Delay	32.1	8.2	6.6	8.0	9.6	3.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	32.1	8.2	6.6	8.0	9.6	3.6	
LOS	C	A	A	A	A	A	
Approach Delay	25.9			7.9	8.1		
Approach LOS	C			A	A		
Queue Length 50th (m)	19.2	0.0	1.6	21.3	20.7	0.0	
Queue Length 95th (m)	32.2	7.3	5.7	42.9	49.3	10.9	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			75.0	
Base Capacity (vph)	585	544	476	1159	1159	1035	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.29	0.11	0.08	0.37	0.43	0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 56.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Bank & Dun Skipper

APPENDIX K

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	☐
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	☐
		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	☐
			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)	☐
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	☐
			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	☐
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 L

MMLOS Analysis

Segment MMLOS Analysis

This section provides a review of the boundary streets Bank Street and Dun Skipper 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 on the boundary streets, based on the targets for the General Urban Area.

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 suggest a target PLOS C for all roadways in the General Urban Area. 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* suggest a target BLOS C for roadways with a spine cycling route designation (Bank Street), and a target BLOS D for roadways with no cycling route designation (Dun Skipper 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. Neither boundary street has a TLOS target, but have been evaluated based on existing/planned transit service. 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* suggest a target TkLOS D for arterial roadways with a truck route designation (Bank Street) and no target for local roadways without a truck route designation (Dun Skipper Drive). 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
Bank Street (Blais Road to Dun Skipper Drive, east side)					
No sidewalk (paved shoulder)		> 3,000 vpd	No	90 km/h	**F**
Bank Street (Miikana Road to Dun Skipper Drive, west side)					
No sidewalk (paved shoulder)		> 3,000 vpd	No	90 km/h	**F**
Dun Skipper Drive (Bank Street to Cedar Creek Drive, north side)					
2.0m	0.5m to 2.0m	≤ 3,000 vpd	N/A	60 km/h	A
Dun Skipper Drive (Bank Street to Cedar Creek Drive, south side)					
2.0m	0.5m to 2.0m	≤ 3,000 vpd	N/A	60 km/h	A

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

Table 2: BLOS Segment Analysis

Road Class	Type of Route	Type of Bikeway	Travel Lanes	Operating Speed	BLOS
Bank Street (Blais Road/Miikana Road to Dun Skipper Drive)					
Arterial	Spine Route	Paved Shoulder	2	90 km/h	**E**
Dun Skipper Drive (Bank Street to Cedar Creek Drive)					
Local	No Route	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	
Bank Street (Blais Road/Miikana Road to Dun Skipper Drive)				
Mixed Traffic; Limited Parking/Driveway Friction	Yes	Low	Medium	D
Dun Skipper Drive (Bank Street to Cedar Creek Drive)				
Mixed Traffic; Limited Parking/Driveway Friction	Yes	Low	Medium	D

Table 4: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	TkLOS
Bank Street (Blais Road/Miikana Road to Dun Skipper Drive)		
> 3.7m	1	B
Dun Skipper Drive (Bank Street to Cedar Creek Drive)		
> 3.7m	1	B

Intersection MMLOS Analysis

The following is a review of the MMLOS of the signalized intersections within the study area (Bank Street/Blais Road/Miikana Road and Bank Street/Dun Skipper Drive), using complete streets principles. Both intersections have been evaluated using the MMLOS targets for intersections in the General Urban Area, and are 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* suggests a target PLOS C for all roadways within the General Urban Area. The results of the intersection PLOS analysis are summarized in **Table 5** and **Table 6**.

Exhibit 12 of the *MMLOS Guidelines* has been used to evaluate the existing BLOS at the intersections listed above. For roadways in the General Urban Area, Exhibit 22 of the *MMLOS Guidelines* suggests a target BLOS C for Spine Routes (Bank Street) and BLOS D for roadways without a cycling route designation (Blais Road, Miikana Road, Dun Skipper Drive). The results of the intersection BLOS analysis are summarized in **Table 7**.

Exhibit 16 of the *MMLOS Guidelines* has been used to evaluate the existing TLOS at the intersections listed above. Exhibit 22 of the *MMLOS Guidelines* does not identify a target TLOS for either study area intersection. The TLOS has been evaluated for every approach that is currently used by transit. The results of the intersection TLOS analysis are summarized in **Table 8**.

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 truck routes (Bank Street) and no target TkLOS for collector or local roadways without a truck route designation (Blais Road, Miikana Road, Dun Skipper Drive). The results of the intersection TkLOS analysis are summarized in **Table 9**.

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: TLOS Intersection Analysis

Approach	Delay[1]		TLOS
	PM Peak	SAT Peak	
Bank Street/Blais Road/Miikana Road			
North Approach	9 sec	11 sec	C
South Approach	6 sec	9 sec	B
Bank Street/Dun Skipper Drive			
North Approach	5 sec	7 sec	B
South Approach	5 sec	6 sec	B

1. Delay based on outputs from Synchro analysis of existing conditions

Table 9: 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**

APPENDIX M

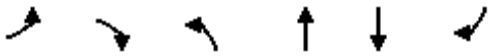
Total Synchro Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	23	45	54	32	63	21	656	46	51	824	193
Future Volume (vph)	146	23	45	54	32	63	21	656	46	51	824	193
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.97
Frt		0.901			0.901			0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1768	1457	0	1595	1655	0	1768	1777	0	1654	1825	1567
Flt Permitted	0.695			0.713			0.263			0.327		
Satd. Flow (perm)	1294	1457	0	1197	1655	0	490	1777	0	569	1825	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			63			7				193
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			189.1			425.7	
Travel Time (s)		24.7			21.3			8.5			19.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	9%	20%	12%	3%	2%	1%	4%	15%	8%	3%	2%
Adj. Flow (vph)	146	23	45	54	32	63	21	656	46	51	824	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	68	0	54	95	0	21	702	0	51	824	193
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		90.0	90.0		90.0	90.0	90.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Maximum Green (s)	23.4	23.4		23.4	23.4		83.4	83.4		83.4	83.4	83.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	21.1	21.1		21.1	21.1		85.7	85.7		85.7	85.7	85.7
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.64	0.23		0.26	0.28		0.06	0.55		0.13	0.63	0.17
Control Delay	59.8	20.3		45.8	19.2		4.1	9.2		6.6	11.9	1.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	59.8	20.3		45.8	19.2		4.1	9.2		6.6	11.9	1.2
LOS	E	C		D	B		A	A		A	B	A
Approach Delay		47.2			28.9			9.0			9.7	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	30.1	4.3		10.4	6.0		0.6	74.8		3.0	79.5	0.0
Queue Length 95th (m)	49.3	15.5		20.9	19.2		m2.1	m93.6		7.6	124.7	5.9
Internal Link Dist (m)		318.5			450.3			165.1			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	252	320		233	373		350	1271		406	1304	1141
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.21		0.23	0.25		0.06	0.55		0.13	0.63	0.17

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 73.4%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank & Miikana/Blais



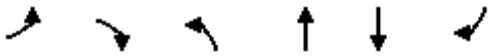
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	273	98	136	492	792	150	
Future Volume (vph)	273	98	136	492	792	150	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			30.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1669	1402	1734	1757	1774	1567	
Flt Permitted	0.950		0.274				
Satd. Flow (perm)	1669	1402	500	1757	1774	1567	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		98				98	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	7%	14%	3%	7%	6%	2%	
Adj. Flow (vph)	273	98	136	492	792	150	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	273	98	136	492	792	150	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	90.0	90.0	90.0	90.0	30.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%	25%
Maximum Green (s)	23.4	23.4	83.3	83.3	83.3	83.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	22.2	22.2	84.5	84.5	84.5	84.5	
Actuated g/C Ratio	0.18	0.18	0.70	0.70	0.70	0.70	
v/c Ratio	0.89	0.29	0.39	0.40	0.63	0.13	
Control Delay	77.0	10.3	11.4	8.6	8.6	1.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	77.0	10.3	11.4	8.6	8.6	1.8	
LOS	E	B	B	A	A	A	
Approach Delay	59.4			9.2	7.5		
Approach LOS	E			A	A		
Queue Length 50th (m)	57.5	0.0	11.2	40.8	48.0	1.2	
Queue Length 95th (m)	#98.1	13.0	22.9	57.6	59.6	5.3	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			30.0	
Base Capacity (vph)	325	352	352	1237	1249	1132	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.28	0.39	0.40	0.63	0.13	

Intersection Summary

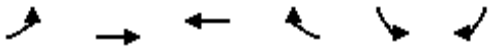
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 93.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Bank & Dun Skipper



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	76	0	677	868	138
Future Volume (vph)	0	76	0	677	868	138
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			50.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1594	0	1843	1843	1567
Flt Permitted						
Satd. Flow (perm)	0	1594	0	1843	1843	1567
Link Speed (k/h)	50			80	80	
Link Distance (m)	113.7			125.5	141.0	
Travel Time (s)	8.2			5.6	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	76	0	677	868	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	76	0	677	868	138
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			4.0	4.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			5.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.9%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	24	221	205	81	150	36
Future Volume (vph)	24	221	205	81	150	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Flt Protected		0.995			0.950	
Satd. Flow (prot)	0	1834	1773	0	1751	1567
Flt Permitted		0.995			0.950	
Satd. Flow (perm)	0	1834	1773	0	1751	1567
Link Speed (k/h)		50	50		50	
Link Distance (m)		82.6	115.9		106.3	
Travel Time (s)		5.9	8.3		7.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	221	205	81	150	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	245	286	0	150	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		2.0	4.0		4.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

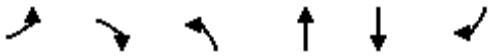
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	35	28	35	30	39	15	633	32	48	694	136
Future Volume (vph)	103	35	28	35	30	39	15	633	32	48	694	136
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt		0.933			0.915			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1751	1737	0	1717	1703	0	1654	1830	0	1768	1843	1582
Flt Permitted	0.712			0.716			0.286			0.306		
Satd. Flow (perm)	1312	1737	0	1294	1703	0	498	1830	0	570	1843	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			39			5				136
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			189.1			425.7	
Travel Time (s)		24.7			21.3			8.5			19.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	1%	4%	1%	1%	8%	2%	2%	1%	2%	1%
Adj. Flow (vph)	103	35	28	35	30	39	15	633	32	48	694	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	63	0	35	69	0	15	665	0	48	694	136
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	57.1%
Maximum Green (s)	23.4	23.4		23.4	23.4		33.4	33.4		33.4	33.4	33.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.0	18.0		20.0	20.0		43.4	43.4		43.4	43.4	43.4
Actuated g/C Ratio	0.26	0.26		0.29	0.29		0.62	0.62		0.62	0.62	0.62
v/c Ratio	0.31	0.13		0.09	0.13		0.05	0.58		0.14	0.61	0.13
Control Delay	22.5	12.9		19.3	11.0		6.3	10.4		10.0	14.4	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.5	12.9		19.3	11.0		6.3	10.4		10.0	14.4	2.1
LOS	C	B		B	B		A	B		B	B	A
Approach Delay		18.9			13.8			10.3			12.2	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	9.6	3.1		3.1	2.6		0.4	52.8		2.8	58.9	0.0
Queue Length 95th (m)	20.3	10.4		8.8	10.2		m1.4	74.6		7.8	94.2	6.4
Internal Link Dist (m)		318.5			450.3			165.1			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	438	599		432	595		308	1137		353	1143	1011
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.24	0.11		0.08	0.12		0.05	0.58		0.14	0.61	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 69.8%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank & Miikana/Blais

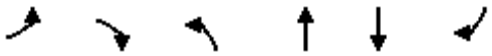


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	287	87	124	386	505	159	
Future Volume (vph)	287	87	124	386	505	159	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			30.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1751	1508	1624	1843	1843	1551	
Flt Permitted	0.950		0.419				
Satd. Flow (perm)	1751	1508	716	1843	1843	1551	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		87				159	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	6%	10%	2%	2%	3%	
Adj. Flow (vph)	287	87	124	386	505	159	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	287	87	124	386	505	159	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	40.0	40.0	40.0	40.0	30.0
Total Split (%)	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%	43%
Maximum Green (s)	23.4	23.4	33.3	33.3	33.3	33.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	16.6	16.6	40.1	40.1	40.1	40.1	
Actuated g/C Ratio	0.24	0.24	0.57	0.57	0.57	0.57	
v/c Ratio	0.69	0.21	0.30	0.37	0.48	0.17	
Control Delay	32.7	6.0	11.9	10.4	12.7	4.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	32.7	6.0	11.9	10.4	12.7	4.6	
LOS	C	A	B	B	B	A	
Approach Delay	26.5			10.8	10.8		
Approach LOS	C			B	B		
Queue Length 50th (m)	31.6	0.0	7.0	22.8	28.4	0.0	
Queue Length 95th (m)	47.1	7.7	19.7	46.2	54.9	m10.5	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			30.0	
Base Capacity (vph)	585	562	409	1055	1055	956	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.49	0.15	0.30	0.37	0.48	0.17	

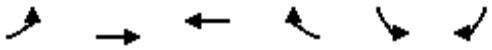
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 78.2%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank & Dun Skipper



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	65	0	586	601	146
Future Volume (vph)	0	65	0	586	601	146
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			50.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1594	0	1843	1843	1567
Flt Permitted						
Satd. Flow (perm)	0	1594	0	1843	1843	1567
Link Speed (k/h)	50			80	80	
Link Distance (m)	113.7			125.5	141.0	
Travel Time (s)	8.2			5.6	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	65	0	586	601	146
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	65	0	586	601	146
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			4.0	4.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			5.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	97	97	97			97
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	231	199	84	143	36
Future Volume (vph)	30	231	199	84	143	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.960			0.850
Flt Protected		0.994			0.950	
Satd. Flow (prot)	0	1832	1769	0	1751	1567
Flt Permitted		0.994			0.950	
Satd. Flow (perm)	0	1832	1769	0	1751	1567
Link Speed (k/h)		50	50		50	
Link Distance (m)		82.6	115.9		106.3	
Travel Time (s)		5.9	8.3		7.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	231	199	84	143	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	261	283	0	143	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		2.0	4.0		4.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	97			97	97	97
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

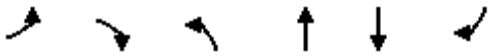
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	23	45	56	32	66	21	681	48	54	858	193
Future Volume (vph)	146	23	45	56	32	66	21	681	48	54	858	193
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.97
Frt		0.901			0.899			0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1768	1457	0	1595	1652	0	1768	1777	0	1654	1825	1567
Flt Permitted	0.694			0.713			0.245			0.312		
Satd. Flow (perm)	1292	1457	0	1197	1652	0	456	1777	0	543	1825	1521
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			66			7				193
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			189.1			425.7	
Travel Time (s)		24.7			21.3			8.5			19.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	9%	20%	12%	3%	2%	1%	4%	15%	8%	3%	2%
Adj. Flow (vph)	146	23	45	56	32	66	21	681	48	54	858	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	68	0	56	98	0	21	729	0	54	858	193
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		90.0	90.0		90.0	90.0	90.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Maximum Green (s)	23.4	23.4		23.4	23.4		83.4	83.4		83.4	83.4	83.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	21.1	21.1		21.1	21.1		85.7	85.7		85.7	85.7	85.7
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.65	0.23		0.27	0.28		0.06	0.57		0.14	0.66	0.17
Control Delay	59.9	20.3		46.1	18.9		4.2	9.4		6.8	12.5	1.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	59.9	20.3		46.1	18.9		4.2	9.4		6.8	12.5	1.2
LOS	E	C		D	B		A	A		A	B	A
Approach Delay		47.3			28.8			9.3			10.2	
Approach LOS		D			C			A			B	
Queue Length 50th (m)	30.1	4.3		10.8	6.0		0.6	76.3		3.2	85.7	0.0
Queue Length 95th (m)	49.3	15.5		21.6	19.2		m2.0	m99.0		8.0	134.8	5.9
Internal Link Dist (m)		318.5			450.3			165.1			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	251	320		233	375		325	1271		387	1304	1141
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.21		0.24	0.26		0.06	0.57		0.14	0.66	0.17

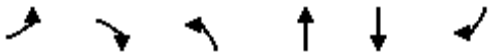
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Bank & Miikana/Blais



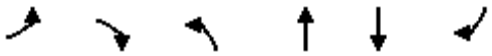
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	273	98	136	519	830	150	
Future Volume (vph)	273	98	136	519	830	150	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			30.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1669	1402	1734	1757	1774	1567	
Flt Permitted	0.950		0.254				
Satd. Flow (perm)	1669	1402	464	1757	1774	1567	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		98				94	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	7%	14%	3%	7%	6%	2%	
Adj. Flow (vph)	273	98	136	519	830	150	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	273	98	136	519	830	150	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	90.0	90.0	90.0	90.0	30.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%	25%
Maximum Green (s)	23.4	23.4	83.3	83.3	83.3	83.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	22.2	22.2	84.5	84.5	84.5	84.5	
Actuated g/C Ratio	0.18	0.18	0.70	0.70	0.70	0.70	
v/c Ratio	0.89	0.29	0.42	0.42	0.66	0.13	
Control Delay	77.0	10.3	12.5	8.9	9.0	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	77.0	10.3	12.5	8.9	9.0	1.9	
LOS	E	B	B	A	A	A	
Approach Delay	59.4			9.6	7.9		
Approach LOS	E			A	A		
Queue Length 50th (m)	57.5	0.0	11.5	44.0	50.4	1.3	
Queue Length 95th (m)	#98.1	13.0	24.4	61.9	62.3	m5.7	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			30.0	
Base Capacity (vph)	325	352	326	1237	1249	1131	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.28	0.42	0.42	0.66	0.13	

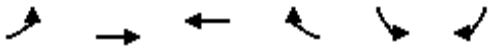
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 95.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank & Dun Skipper



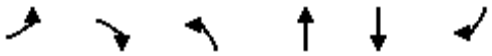
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	76	0	707	910	138
Future Volume (vph)	0	76	0	707	910	138
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			50.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1594	0	1843	1843	1567
Flt Permitted						
Satd. Flow (perm)	0	1594	0	1843	1843	1567
Link Speed (k/h)	50			80	80	
Link Distance (m)	113.7			125.5	141.0	
Travel Time (s)	8.2			5.6	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	76	0	707	910	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	76	0	707	910	138
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			4.0	4.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			5.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	97	97	97			97
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 62.2%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	24	221	205	81	150	36
Future Volume (vph)	24	221	205	81	150	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Flt Protected		0.995			0.950	
Satd. Flow (prot)	0	1834	1773	0	1751	1567
Flt Permitted		0.995			0.950	
Satd. Flow (perm)	0	1834	1773	0	1751	1567
Link Speed (k/h)		50	50		50	
Link Distance (m)		82.6	115.9		106.3	
Travel Time (s)		5.9	8.3		7.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	221	205	81	150	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	245	286	0	150	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		2.0	4.0		4.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	97			97	97	97
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

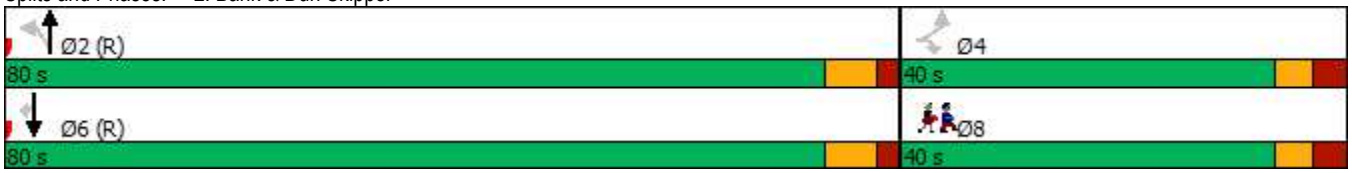


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	273	98	136	519	830	150	
Future Volume (vph)	273	98	136	519	830	150	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			30.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1669	1402	1734	1757	1774	1567	
Flt Permitted	0.950		0.242				
Satd. Flow (perm)	1669	1402	442	1757	1774	1567	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		98				74	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	7%	14%	3%	7%	6%	2%	
Adj. Flow (vph)	273	98	136	519	830	150	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	273	98	136	519	830	150	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	40.0	40.0	80.0	80.0	80.0	80.0	40.0
Total Split (%)	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	33%
Maximum Green (s)	33.4	33.4	73.3	73.3	73.3	73.3	33.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	24.8	24.8	81.9	81.9	81.9	81.9	
Actuated g/C Ratio	0.21	0.21	0.68	0.68	0.68	0.68	
v/c Ratio	0.79	0.27	0.45	0.43	0.69	0.14	
Control Delay	61.2	8.6	16.4	10.9	11.8	3.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	61.2	8.6	16.4	10.9	11.8	3.6	
LOS	E	A	B	B	B	A	
Approach Delay	47.3			12.1	10.5		
Approach LOS	D			B	B		
Queue Length 50th (m)	56.5	0.0	12.3	46.2	63.7	3.3	
Queue Length 95th (m)	77.8	11.6	33.3	80.9	81.9	m10.0	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			30.0	
Base Capacity (vph)	464	460	301	1198	1210	1092	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.59	0.21	0.45	0.43	0.69	0.14	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 18 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 95.4%		ICU Level of Service F	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank & Dun Skipper

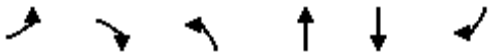


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	35	28	36	30	41	15	657	34	50	721	136
Future Volume (vph)	103	35	28	36	30	41	15	657	34	50	721	136
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	35.0		0.0	100.0		0.0	90.0		60.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	15.0			25.0			55.0			80.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt		0.933			0.913			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1751	1737	0	1717	1699	0	1654	1830	0	1768	1843	1582
Flt Permitted	0.711			0.716			0.267			0.288		
Satd. Flow (perm)	1310	1737	0	1294	1699	0	465	1830	0	536	1843	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			41			5				136
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		342.5			474.3			189.1			425.7	
Travel Time (s)		24.7			21.3			8.5			19.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	1%	4%	1%	1%	8%	2%	2%	1%	2%	1%
Adj. Flow (vph)	103	35	28	36	30	41	15	657	34	50	721	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	63	0	36	71	0	15	691	0	50	721	136
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		4.0			4.0			4.0			4.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		20.0	20.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	22.6	22.6		26.6	26.6		26.6	26.6		26.6	26.6	26.6
Total Split (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	57.1%
Maximum Green (s)	23.4	23.4		23.4	23.4		33.4	33.4		33.4	33.4	33.4
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	3.3	3.3		3.3	3.3		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.6	6.6		6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		6.0	6.0		6.0	6.0	6.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.0	18.0		20.0	20.0		43.4	43.4		43.4	43.4	43.4
Actuated g/C Ratio	0.26	0.26		0.29	0.29		0.62	0.62		0.62	0.62	0.62
v/c Ratio	0.31	0.13		0.10	0.14		0.05	0.61		0.15	0.63	0.13
Control Delay	22.5	12.9		19.3	10.9		6.6	11.0		10.3	15.0	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.5	12.9		19.3	10.9		6.6	11.0		10.3	15.0	2.1
LOS	C	B		B	B		A	B		B	B	A
Approach Delay		18.9			13.7			10.9			12.8	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	9.6	3.1		3.2	2.6		0.5	54.4		2.9	62.8	0.0
Queue Length 95th (m)	20.3	10.4		8.9	10.3		m1.5	78.7		8.2	100.3	6.4
Internal Link Dist (m)		318.5			450.3			165.1			401.7	
Turn Bay Length (m)	15.0			35.0			100.0			90.0		60.0
Base Capacity (vph)	437	599		432	595		288	1137		332	1143	1011
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.24	0.11		0.08	0.12		0.05	0.61		0.15	0.63	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 12.7		Intersection LOS: B	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank & Miikana/Blais

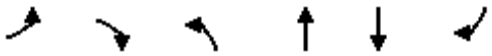


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	287	87	124	407	529	159	
Future Volume (vph)	287	87	124	407	529	159	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	30.0	0.0	100.0			30.0	
Storage Lanes	1	1	1			1	
Taper Length (m)	15.0		90.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850				0.850	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	1751	1508	1624	1843	1843	1551	
Flt Permitted	0.950		0.401				
Satd. Flow (perm)	1751	1508	685	1843	1843	1551	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		87				156	
Link Speed (k/h)	50			80	80		
Link Distance (m)	115.9			370.9	125.5		
Travel Time (s)	8.3			16.7	5.6		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	6%	10%	2%	2%	3%	
Adj. Flow (vph)	287	87	124	407	529	159	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	287	87	124	407	529	159	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	4.0			4.0	4.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	5.0			5.0	5.0		
Two way Left Turn Lane							
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	
Turning Speed (k/h)	24	14	24			14	
Number of Detectors	1	1	1	2	2	1	
Detector Template	Left	Right	Left	Thru	Thru	Right	
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4		
Detector 2 Size(m)				0.6	0.6		
Detector 2 Type				Cl+Ex	Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Perm	Perm	Perm	NA	NA	Perm	
Protected Phases				2	6		8
Permitted Phases	4	4	2			6	
Detector Phase	4	4	2	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0	10.0
Minimum Split (s)	24.6	24.6	26.7	26.7	26.7	26.7	24.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø8
Total Split (s)	30.0	30.0	40.0	40.0	40.0	40.0	30.0
Total Split (%)	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%	43%
Maximum Green (s)	23.4	23.4	33.3	33.3	33.3	33.3	23.4
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	3.3
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	6.7	6.7	6.7	6.7	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0	8.0	8.0	9.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0
Act Effct Green (s)	16.6	16.6	40.1	40.1	40.1	40.1	
Actuated g/C Ratio	0.24	0.24	0.57	0.57	0.57	0.57	
v/c Ratio	0.69	0.21	0.32	0.39	0.50	0.17	
Control Delay	32.7	6.0	12.3	10.6	13.3	4.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	32.7	6.0	12.3	10.6	13.3	4.9	
LOS	C	A	B	B	B	A	
Approach Delay	26.5			11.0	11.4		
Approach LOS	C			B	B		
Queue Length 50th (m)	31.6	0.0	7.1	24.4	31.4	0.0	
Queue Length 95th (m)	47.1	7.7	20.1	49.2	58.3	m9.6	
Internal Link Dist (m)	91.9			346.9	101.5		
Turn Bay Length (m)	30.0		100.0			30.0	
Base Capacity (vph)	585	562	392	1055	1055	954	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.49	0.15	0.32	0.39	0.50	0.17	

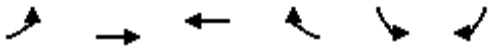
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 79.5%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank & Dun Skipper



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	65	0	611	629	146
Future Volume (vph)	0	65	0	611	629	146
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			50.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1594	0	1843	1843	1567
Flt Permitted						
Satd. Flow (perm)	0	1594	0	1843	1843	1567
Link Speed (k/h)	50			80	80	
Link Distance (m)	113.7			125.5	141.0	
Travel Time (s)	8.2			5.6	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	65	0	611	629	146
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	65	0	611	629	146
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			4.0	4.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			5.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	97	97	97			97
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	231	199	84	143	36
Future Volume (vph)	30	231	199	84	143	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.960			0.850
Flt Protected		0.994			0.950	
Satd. Flow (prot)	0	1832	1769	0	1751	1567
Flt Permitted		0.994			0.950	
Satd. Flow (perm)	0	1832	1769	0	1751	1567
Link Speed (k/h)		50	50		50	
Link Distance (m)		82.6	115.9		106.3	
Travel Time (s)		5.9	8.3		7.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	231	199	84	143	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	261	283	0	143	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		2.0	4.0		4.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	97			97	97	97
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

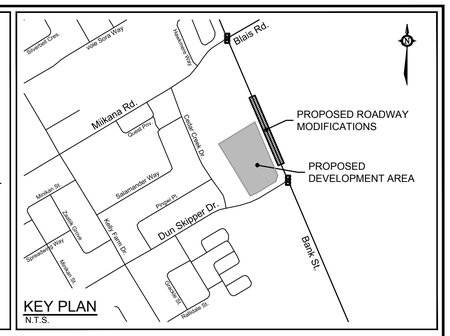
APPENDIX N

Functional Design of Road Modifications

LEGEND

- PROPOSED CONCRETE
- PROPOSED BARRIER CURB
- EXISTING STREET LIGHTING
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CATCHBASIN
- EXISTING WATERMAIN
- EXISTING TREE
- EXISTING HYDRO DUCT
- EXISTING BELL DUCT
- EXISTING ROGERS DUCT
- EXISTING GAS MAIN
- EXISTING OVERHEAD WIRES
- EXISTING TRAFFIC DUCT
- SIGNALIZED INTERSECTION

NORTH



KEY PLAN
N.T.S.

MAXIMUM 80 km/h

Rb-1A (80km)

Wa-33LR
OBJECT WARNING

85.00m
RIGHT TURN TAPER

35.00m
RIGHT TURN STORAGE

BANK STREET

Rb-12
NO LEFT TURN

60.00m
RIGHT TURN TAPER

30.00m
RIGHT TURN STORAGE

TIE INTO EXISTING

2.00m BIKE LANE

3.50m RT LANE

2.00m BIKE LANE

2.00m

TIE INTO EXISTING

600mmØ CSP
CULVERT

600mmØ CSP
CULVERT

5.50m

5.50m

STOP

Ra-1
STOP SIGN

Rb-18
(VARIANT)

Rb-12 - NO LEFT TURN
Wa-33R - OBJECT WARNING

DUN SKIPPER DRIVE

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

No.	REVISION	DATE	BY
3.	ISSUED FOR CITY REVIEW	JAN 10/25	BJB
2.	UPDATED TO INCLUDE UCC INFORMATION	NOV 11/24	BJB
1.	ISSUED FOR CITY REVIEW	OCT 24/24	BJB

SCALE
1:500
1:500
0 5 10 15 20

DESIGN RCH
CHECKED JRA
DRAWN RCH
CHECKED BJB
APPROVED BJB

FOR REVIEW ONLY

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

LOCATION
CITY of OTTAWA
150 DUN SKIPPER DRIVE

DRAWING NAME
FUNCTIONAL DESIGN

PROJECT No. 124107
REV REV # 3
DRAWING No. 124107-FD

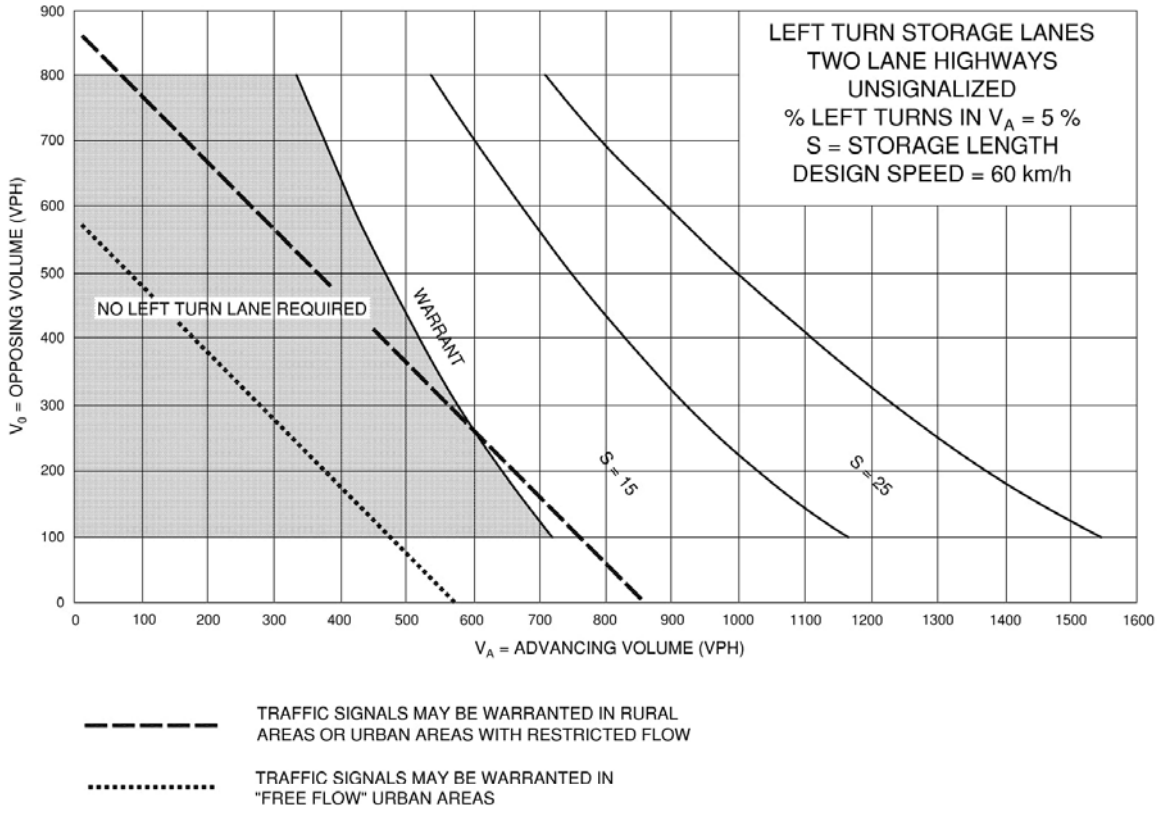
C:\temp\AcPublish_3932\124107-FD.dwg, FD, Jan 09, 2025 - 12:01pm, rhillier

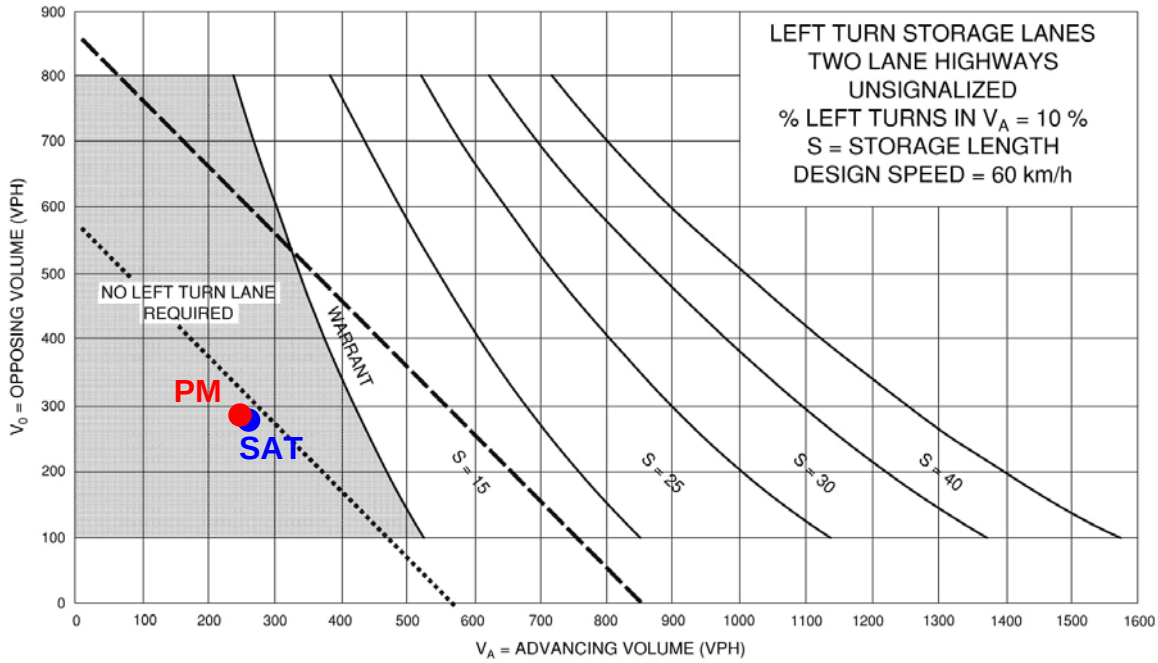
PLANAT.DWG - 84.1mmx594mm

APPENDIX O

Left Turn Lane Warrants

Exhibit 9A-6


LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN V_A = 5 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
S = 15
S = 25
V_O = OPPOSING VOLUME (VPH)
V_A = ADVANCING VOLUME (VPH)
TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW
TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS


LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN V_A = 10 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
PM
SAT
S = 15
S = 25
S = 30
S = 40
V_O = OPPOSING VOLUME (VPH)
V_A = ADVANCING VOLUME (VPH)