Transportation Impact Assessment – Step 3 & 4: Forecasting & Analysis

4840 Bank Street

Prepared for Regional Group
by IBI Group
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TIA Plan Reports - Certification

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

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

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

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;

2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;

3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and

4. I am either a licensed[1] or registered[1] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering □ or transportation planning □.

[1] **License or 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.**

Dated at Ottawa this 25th day of May 2022.
(City)

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Executive Summary

IBI Group (IBI) was retained by Regional Group to undertake a Transportation Impact Assessment (TIA) in support of a Site Plan Control application for a proposed residential development located at 4840 Bank Street in the community of Leitrim. The proposed development will consist of three four-storey, 60-unit apartment buildings. Access to the site will be provided via two existing private approaches: a full-movement access on Dun Skipper Drive associated with the adjacent 4836 Bank Street (Home Hardware) development and a right-in/right-out access on Bank Street shared with the same development.

Based on the trip generation rates from the 2020 TRANS Trip Generation Manual Summary Report, it is anticipated that the proposed development will generate 72 two-way person-trips during the weekday morning and afternoon peak hours. Based on the blended mode share distributions provided in the 2020 TRANS Trip Generation Manual, mode share targets were developed for the site which took into account the unique context of the site and planned improvements to the surrounding transportation network. Overall, by 2030 the site is anticipated to generate approximately 39 and 41 two-way vehicle-trips during the weekday morning and afternoon peak hours, respectively. Consistent with other TIAs prepared in support of adjacent developments, site-generated traffic was distributed and assigned primarily to/from the north, with a relatively small volume to/from the south.

The proposed development has been designed to integrate well with the adjacent transportation network. Pedestrian connections will be provided to connect the three buildings to the future adjacent pedestrian network on Bank Street as well as to the pedestrian facilities of the adjacent 4836 Bank Street development. Half of the bicycle parking spaces will be provided indoors in a secure and sheltered location, while the remaining spaces will be located around the buildings. Two pick-up/drop-off areas have also been provided to support pick-up/drop-off of residents/visitors, waste collection and move in/move out. Bus stops at the Dun Skipper & Cedar Creek intersection to the north will provide residents access to regular transit service and are located within a 400-metre (5-minute) walking distance of the building entrances.

Intersection capacity analysis and auxiliary lane analysis has been completed for the Bank & Dun Skipper intersection and the two site access intersections. The results of the analysis indicate that all study area intersections are expected to operate at an acceptable level of service (i.e. LOS ‘D’ or better) and the existing/planned auxiliary lanes have sufficient capacity to accommodate the projected queues.

Multi-Modal Level of Service (MMLOS) analysis has also been completed under existing and future conditions for the segment of Bank Street adjacent to the site as well as the signalized intersection of Bank & Dun Skipper. The results of the analysis indicate that there are existing deficiencies which will be partially addressed following the four-lane widening of Bank Street. Recommendations were made to address future deficiencies with regards to Pedestrian Level of Service (PLOS) at the reconstructed Bank & Dun Skipper that the City could consider to improve mobility and comfort for pedestrians at the intersection. Additionally, as the current phase of the Bank Street widening is expected to terminate at the northern boundary of the site, Pedestrian and Bicycle Level of Service (PLOS and BLOS) along the segment of Bank Street adjacent to the site is anticipated to remain poor within the timeframe of this study but is expected to improve in the future as Bank Street is widened further south to Rideau Road.

Based on the findings of this study, it is the overall opinion of IBI Group that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network with the appropriate actions and modifications in place.

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1 Introduction

IBI Group (IBI) was retained by Regional Group to undertake a Transportation Impact Assessment (TIA) in support of a Site Plan Control application for 4840 Bank Street, Ottawa.

In accordance with the City of Ottawa's Transportation Impact Assessment Guidelines, published in June 2017, the following report is divided into four major components:

- **Screening** – Prior to the commencement of a TIA, an initial assessment of the proposed development is undertaken to establish the need for a comprehensive review of the site based on three triggers: Trip Generation, Location and Safety.
- **Scoping** – This component of the TIA report describes both the existing and planned conditions in the vicinity of the development and defines study parameters such as the study area, analysis periods and horizon years of the development. It also provides an opportunity to identify any scope exemptions that would eliminate elements of scope described in the TIA Guidelines but not relevant to the development proposal, based on consultation with City staff.
- **Forecasting** – The Forecasting component of the TIA is intended to review both the development-generated travel demand and the background network travel demand, and provides an opportunity to rationalize this demand to ensure projections are within the capacity constraints of the transportation network.
- **Analysis** – This component documents the results of any analyses undertaken to ensure that the transportation related features of the proposed development are in conformance with prescribed technical standards and that its impacts on the transportation network are both sustainable and effectively managed. It also identifies a development strategy to ensure that what is being proposed is aligned with the City of Ottawa's city-building objectives.

Throughout the development of a TIA report, each of the four study components above are submitted in draft form to the City of Ottawa and undergo a review by a designated Transportation Project Manager. Any comments received are addressed to the satisfaction of the City's Transportation Project Manager before proceeding with subsequent components of the study. Technical comments and responses are included in **Appendix A**.

Dependent on the findings of this report, the complete submission of this Transportation Impact Assessment may also require Functional Design Drawings of recommended roadway improvements to support a Roadway Modification Application (RMA). The submission may also require a post-development Monitoring Plan to track performance of the planned TIA Strategy. The need for these two elements will be confirmed through the analysis undertaken for this report.

2 TIA Screening

An initial screening was completed to confirm the need for a Transportation Impact Assessment by reviewing the following three triggers:

- **Trip Generation**: Based on the magnitude of the proposed development, the minimum development size threshold for apartment units has been met and therefore the Trip Generation trigger is satisfied.
- **Location**: The proposed development will not be located in a Design Priority Area or Transit Oriented Development; however, it will be accessed from a boundary street that is a Spine Bicycle route. The Location trigger is therefore satisfied.
- **Safety**: Boundary street conditions were reviewed to determine if there is an elevated potential for safety concerns adjacent the site. As the proposed development will access Bank Street, an arterial roadway with a posted speed limit of 80 km/h, there may be potential for safety concerns and therefore the Safety trigger is satisfied.

As the proposed development meets the Trip Generation, Location and Safety triggers, the need to undertake a Transportation Impact Assessment is confirmed.

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

3 Project Scoping

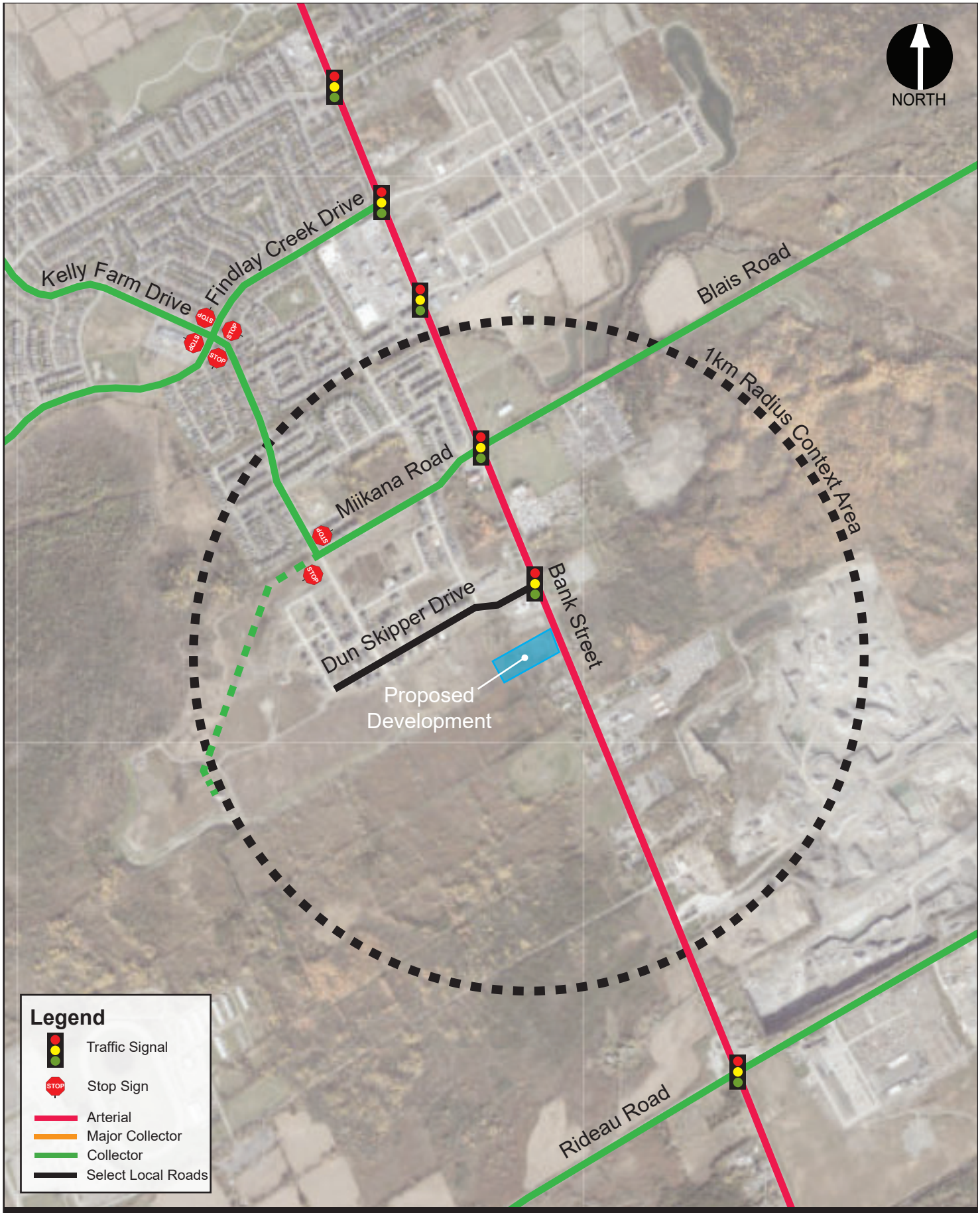
3.1 Description of Proposed Development

3.1.1 **Site Location**

The proposed development is located at 4840 Bank Street within the Leitrim Community, approximately 175 metres south of Dun Skipper Drive. The property is approximately 1.5 hectares in size, and is bound by Bank Street to the east, the 4836 Bank Street commercial development to the north, and undeveloped greenfield lands to the west and south.

Based on GeoOttawa, the subject site is currently zoned GM – General Mixed-Use Zone.

The site location and its surrounding context is illustrated in **Exhibit 1**.



IBI

4840 Bank Street
Transportation Impact Assessment

Exhibit 1:
Site Location

PROJECT No. 137175

SCALE: 0m 125m 250m

3.1.2 Land Use Details

The proposed development is indicated in **Exhibit 2**. The proposed development will consist of three, four-storey mid-rise apartment buildings, as shown in **Table 1**.

Table 1 – Land Use Statistics

LAND USE	NUMBER OF BUILDINGS	UNITS PER BUILDING	TOTAL UNITS
Mid-Rise Apartment	3	60	180

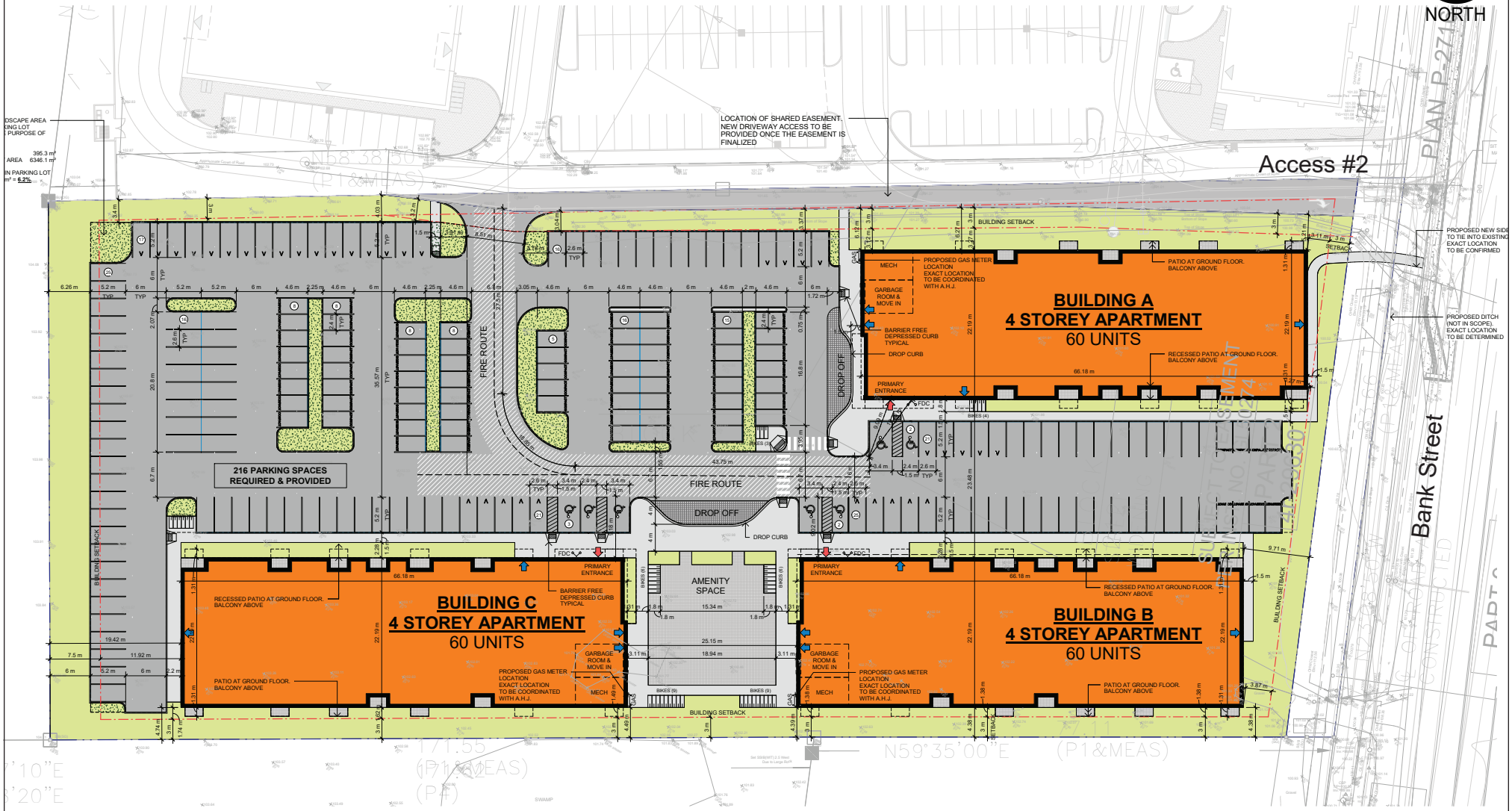
The proposed development is expected to be fully built-out and occupied by the end of 2025.

3.1.3 Site Layout

The proposed development will provide a total of 216 surface parking stalls, 45 indoor vertical bicycle parking spaces and 45 outdoor bicycle parking spaces.

The development will be served by two private approaches: an existing all-movements access on Dun Skipper Drive associated with the adjacent 4836 Bank Street site as well as an existing right-in/right-out access on Bank Street which will be shared with the adjacent 4836 Bank Street site.

The proposed development is illustrated in **Exhibit 2**.



IBI

4840 Bank Street
Transportation Impact Assessment

Exhibit 2:
Proposed Development

PROJECT No. 137175

SCALE: 0m 10m 20m

3.2 Existing Conditions

3.2.1 Existing Road Network

3.2.1.1 Roadways

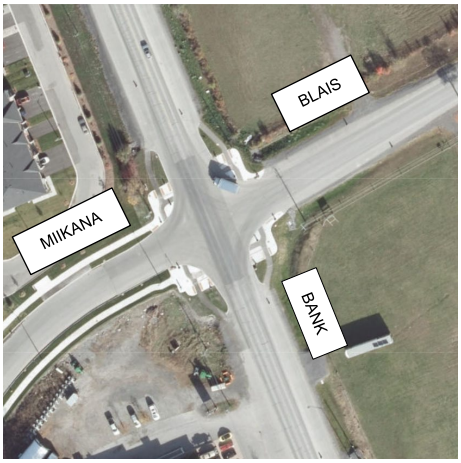
Table 2 below summarizes the details of the boundary roadways as well as other streets within the context area of the proposed development. All roadways are under the jurisdiction of the City of Ottawa.

Table 2 - Existing Roadways

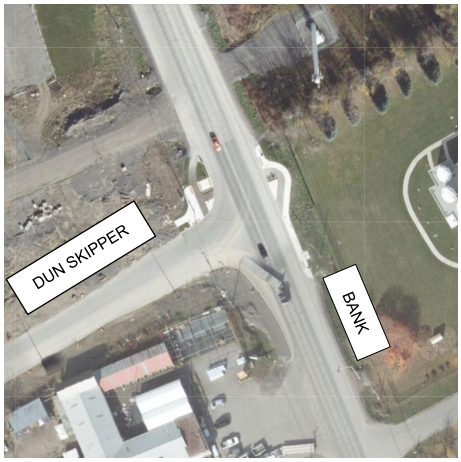
NAME	CLASS	ORIENTATION & EXTENTS	CROSS-SECTION	ROW (m)	SPEED LIMIT (km/h)
Bank Street	Arterial	North-South, Wellington to Ottawa City limits	2-Lane, Rural, Undivided	44.5	80
Blais Road	Collector	East-West, Bank to Hawthorne	2-Lane, Rural, Undivided	26	50
Miikana Road	Collector	East-West, west of Kelly Farm to Bank	2-Lane, Urban, Undivided	24	50
Dun Skipper Drive	Local	East-West, Miikana to Bank	2-Lane, Urban, Undivided	24	50

3.2.1.2 Intersections

The following existing intersections have been identified as having the greatest potential to be impacted by the proposed development:



- **Bank & Blais/Miikana** is a recently constructed four-legged signalized intersection with auxiliary left-turn lanes on all approaches, a southbound right-turn lane, as well as pedestrian crosswalks and bicycle cross-rides on all approaches. It should be noted that the bicycle cross-rides connect to cycle tracks on Bank Street which terminate a short distance from the intersection. The bicycle cross-rides do not connect to any cycling facilities on Blais Road or Miikana Road.



- **Bank & Dun Skipper** is a recently constructed three-legged signalized intersection with auxiliary left-turn lanes on the northbound and eastbound approaches, a southbound right-turn lane. In terms of active transportation facilities, pedestrian crosswalks exist on all approaches, while bicycle cross-rides exist on the south- and eastbound approaches. A cycle track exists on Bank Street on the west side of the intersection which terminates a short distance from the intersection, while a short segment of cycle track has been provided on the east side of the intersection which only connects to the cross-ride on the southbound approach. The bicycle cross-rides do not connect to any cycling facilities on Dun Skipper Drive.

In addition to the above intersections, site-generated traffic will contribute to the following two private approaches:

- The recently-constructed right-in/right-out driveway on Bank Street which straddles the shared property boundary between the subject site and 4836 Bank Street (Home Hardware) immediately to the north.
- The full-movement driveway on Dun Skipper Drive which is also associated with the adjacent 4836 Bank Street development. This access will be entirely within the property of 4836 Bank Street but will be utilized by site-generated traffic to access the site.

3.2.1.3 Traffic Management Measures

There are currently no existing traffic management or traffic calming measures on the boundary streets within the vicinity of the proposed development.

3.2.1.4 Nearby Driveways

Within 200m of the site access on Bank Street, there are a number of private driveways associated with commercial or light industrial developments. Along Dun Skipper Drive there are numerous low-volume private residential driveways adjacent to the site. **Figure 1** delineates all driveways in orange within 200m of the site access on Bank Street.

Figure 1 - Nearby Driveways

3.2.2 Existing Bicycle and Pedestrian Facilities

With the exception of the pedestrian and cycling facilities provided at intersections, paved shoulders exist along both sides of Bank Street within the context area in lieu of more formal facilities. Additionally, concrete sidewalks have been provided on both sides of Miikana Road and Dun Skipper Drive.

3.2.3 Existing Transit Facilities and Service

The following transit routes, operated by OC Transpo, exist within the vicinity of the site:

Table 3 - Existing Transit Routes

ROUTE	ROUTE TYPE	TERMINUSES	PEAK PERIOD FREQUENCY
#93	Regular, all-day	Leitrim to Greenboro/Hurdman	30 minutes
#294	Weekday, peak period	Dun Skipper/Cedar Creek to Hurdman	30 minutes
#304	Thursday-only service	Osgoode/Greely/Metcalfe to Billings Bridge/South Keys	One outbound trip in the morning and one return trip in the afternoon
#699	Weekday, peak period	Bank/Rotary to Pierre-de-Blois	Two outbound trips in the morning and two return trips in the afternoon

It should be noted that Route #93 only provides service within the study area once per week on Sundays to coincide with the peak hour of worship for the existing Hindu Temple of Ottawa Carleton. At all other times Route #93 is only accessible via bus stops at the Bank & Findlay Creek intersection, approximately 1.4km north of the site.

The nearest bus stop to the proposed development which provides access to weekday service is located at the Dun Skipper & Cedar Creek intersection, approximately 200m north of the proposed development. The bus stop next to the Hindu Temple of Ottawa Carleton is approximately 150m northeast of the site, however as discussed above, only has transit service once per week.

The existing transit network within the vicinity of the proposed development is illustrated in **Figure 2**. Transit service maps for the individual routes above are provided in **Appendix C**.

Figure 2 – Existing Transit Service

3.2.4 **Collision History**

A review of historical collision data has been reviewed for the road network surrounding the proposed development. The TIA Guidelines require a safety review if at least six collisions for any one movement or of a discernible pattern, over a five-year period have occurred. **Table 4** summarizes all reported collisions between January 1, 2016 and December 31, 2020.

Table 4 – Reported Collisions within Vicinity of Proposed Development

LOCATION	# OF REPORTED COLLISIONS
Bank & Blais	13
Bank & Dun Skipper	1

Based on the collision history summarized above, the Bank & Blais intersection may warrant further review.

Detailed collision records are provided in **Appendix D**.

3.3 Planned Conditions

3.3.1 Transportation Network

3.3.1.1 Future Road Network Projects

The 2013 Transportation Master Plan (TMP) has established a Road Network Concept Plan for Ottawa which includes future road infrastructure projects that will be required to support the City's growth projections and travel behaviour targets by 2031.

The TMP has also identified an Affordable Network, as shown in **Figure 3**, which is a made up of a subset of projects in the Network Concept Plan that can be realistically constructed by 2031, given restrictions of funds that are expected during this period.

Figure 3 - Future Road Network Projects

Source: 2013 Transportation Master Plan – Map 11 '2031 Affordable Network'

According to the TMP, Phase 2 involves widening Bank Street from 2 lanes to 4 lanes from Leitrim Road to Blais Road/Urban Boundary and Phase 3 will widen Bank Street from 2 lanes to 4 lanes further south to Rideau Road. The Bank Street Widening aims to provide additional vehicular capacity for future travel, as well as integrate formal pedestrian and cycling facilities into the urban cross-section. Pedestrian infrastructure will be in the form of sidewalks, while cyclists will be accommodated through a set of multi-use pathways within the Greenbelt and paved shoulder that will be separate from the travel lane by use of a rumble strip within the rural area.

The Bank Street Widening Class Environmental Assessment Study (Bank Street EA) triggered an update to the staging of recommended modifications in the TMP. These changes have been summarized in **Table 5**.

Table 5 - Staging of Recommended Modifications in the Bank Street EA

PROJECT DETAILS
Phase 2: 2020–2025
Widen Bank Street from 2 to 4 lanes from Leitrim Road to Findlay Creek Drive including widening Leitrim Road to 4-lanes through the intersection.
Phase 3: 2026–2031
Widen Bank Street from Findlay Creek Drive to south of Blais Road/ the Urban Boundary from 2 to 4 lanes.
Beyond 2031
Widen Bank Street from south of the Urban Boundary to Rideau Road from 2 to 4 lanes, including a two-way left turn lane within the rural area. Widen Bank Street to 6 lanes through the Leitrim Road intersection.

The 2019 City-Wide Development Charges (DC) Background Study (Hemson, March 2019) identified that funds would be available for widening Bank Street between Leitrim Road and Shuttleworth Drive in 2020-2024 and funds for widening between Shuttleworth Drive and Dun Skipper Drive would be available in 2030-2031.

Based on recent discussions with City staff, however, it is understood that the Bank Street widening from Leitrim Road to Dun Skipper Drive is tentatively scheduled to begin in 2023. Draft design drawings provided by the City for the Bank Street widening indicate that Bank Street will have an urban four-lane divided cross-section with concrete sidewalks and cycle tracks on both sides of the road up to the site access on Bank Street before transitioning to a rural two-lane cross-section south of the site access. As the four-lane widening only extends up to the site access on Bank Street, the cross-section immediately adjacent to the site is rural with no sidewalks or cycle tracks.

In addition to the Bank Street widening, the 2013 TMP identified the need to extend Earl Armstrong Road east from its current terminus at High Road up to Hawthorne Road as part of the 2031 Network Concept. The timing for this extension is planned for beyond 2031. An Environmental Assessment (EA) Study was completed in June 2019 for this extension which identified that the proposed extension would intersect with Bank Street approximately 175m south of the proposed development at a new multi-lane roundabout. **Figure 4** and **Figure 5** illustrate the planned roadway cross-section of the Earl Armstrong Road extension.

Figure 4 - Earl Armstrong Road Extension Cross-Section: Albion Road to Bank Street

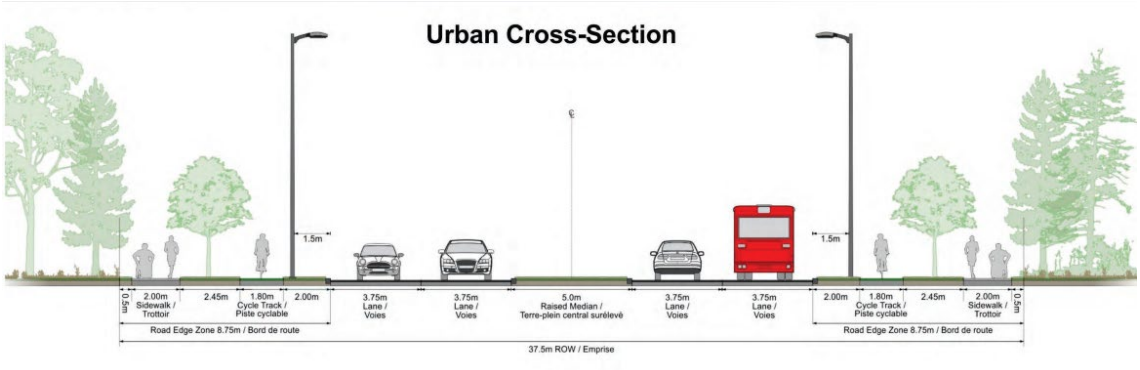
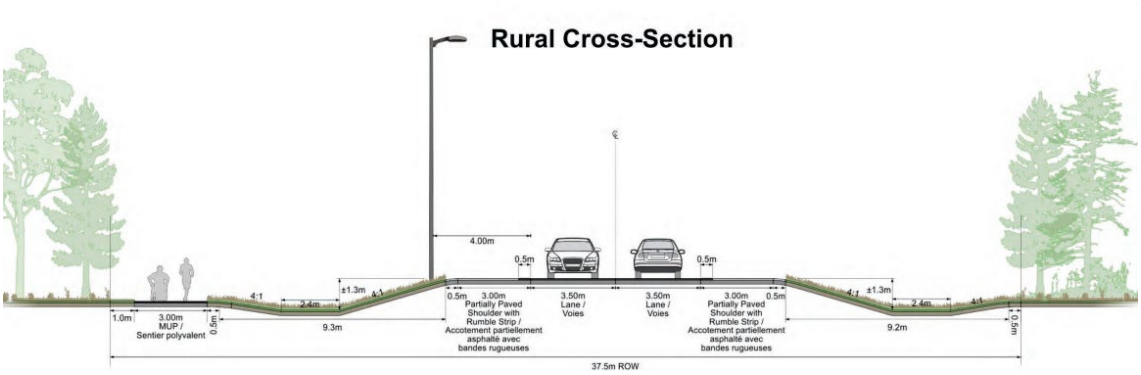


Figure 5 - Earl Armstrong Road Extension Cross-Section: Bank Street to Hawthorne Road



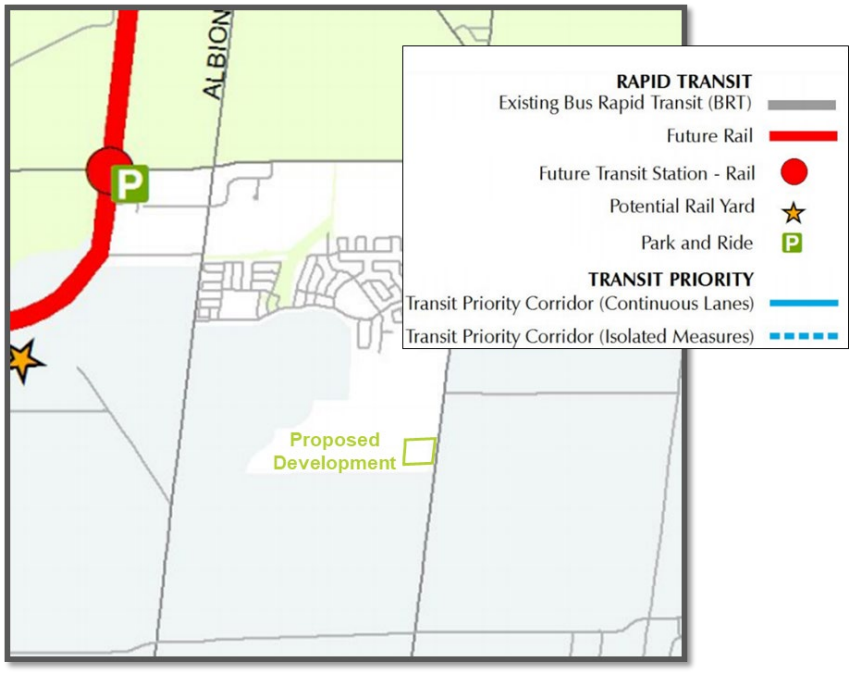
3.3.1.2 Future Transit Facilities and Services

As indicated in the TMP's 2031 Affordable Network there are no additional transit facilities proposed within the vicinity of the subject property.

It is expected that existing transit routes will be modified and extended south along Bank Street to better serve residential development along Miikana Road and Dun Skipper Drive. Both roads include the typical 24m ROW protection that is the minimum requirement for OC Transpo transit service.

Figure 6 shows the transit infrastructure projects in the vicinity of the proposed development that are part of the 2031 Affordable Network.

Figure 6 - Future 'Affordable RTTP Network Projects'



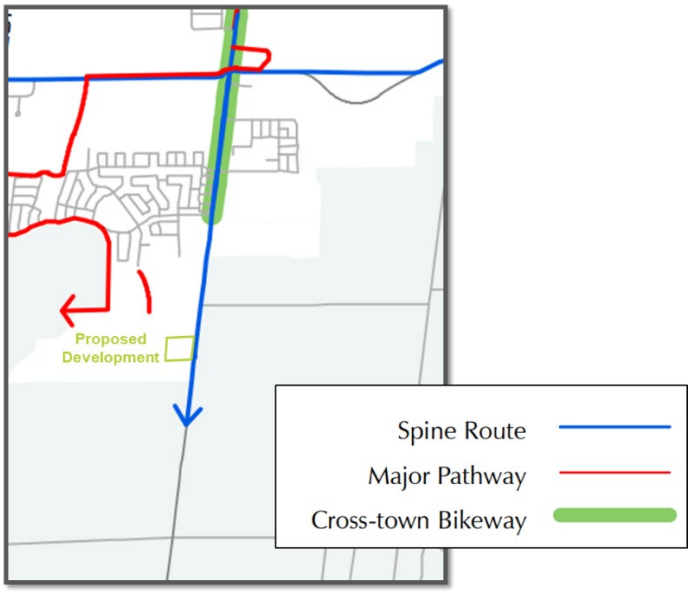
Source: 2013 Transportation Master Plan – Map 5 '2031 Affordable Network'

3.3.1.3 Future Cycling and Pedestrian Facilities

The Bank Street EA addresses active transportation needs through the implementation of formal cycling and pedestrian facilities. Accommodations for pedestrians will be in the form of sidewalks. For cyclists, paved shoulders along Bank Street have been recently implemented as part of the interim design and grade-separated cycle tracks are planned as part of the ultimate redesign of Bank Street.

Figure 7 shows the future cycling connections within the vicinity of the subject site.

Figure 7 – Cycling Connections



Source: 2013 Transportation Master Plan – Map 1 'Primary Urban'

3.3.2 Future Adjacent Developments

The City of Ottawa Transportation Impact Assessment (TIA) Guidelines specify that all significant developments proposed within the surrounding area which are likely to occur within the study's horizon year must be identified and taken into consideration in the development of future background traffic projections.

In 2017, a Master Transportation Study was undertaken by IBI Group for the Leitrim Community (Leitrim MTS), which considered the cumulative impact of all development lands within the Bank Street corridor.

Future adjacent developments included in the Leitrim MTS are shown in **Exhibit 3** and are described in **Table 6**. The buildout dates have been adjusted to reflect development that has occurred since the completion of the MTS.

Table 6 – Adjacent Developments: Leitrim MTS

DEVELOPMENT NAME	LAND USE	GLA (m^2)/ DWELLING UNITS	EXPECTED BUILD-OUT/ OCCUPANCY DATE
Transport Canada	Residential	231 units	2029
Pathways (Remer and Idone)	Residential	1,155 units	2029
	Commercial[1]	24,188 m^2	2022
Barrett Lands	Residential	797 units	2029
Barrett Lands Extension	Residential	150 units	2022
Cowan's Grove and Lilythorne (OPA 76 Area 9a and 9b)	Residential	1,319 units	2029
	Commercial	15,450 m^2	2022

Notes:

[1] – The commercial land use considered in the Leitrim MTS has been replaced with the subject development.

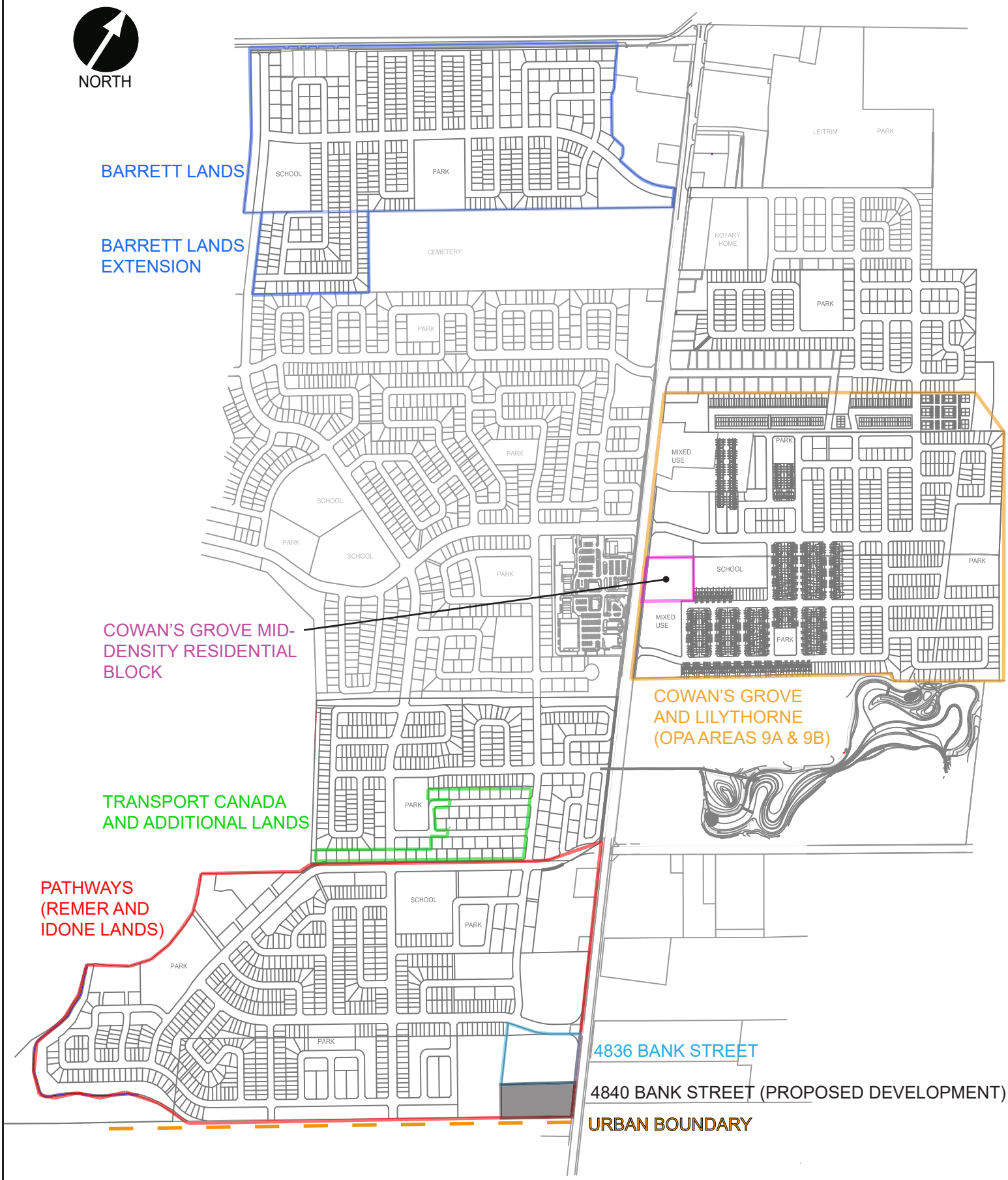
Further to the above developments that were considered in the Leitrim MTS, two additional adjacent developments were identified within the site's context area, as outlined in **Table 7** below.

Table 7 – Adjacent Developments since Leitrim MTS

DEVELOPMENT NAME	LAND USE	GLA/ DWELLING UNITS	EXPECTED BUILD-OUT/ OCCUPANCY DATE
Cowan's Grove Mid-Density Residential Block – 4791 Bank Street	Residential	102	2022
4836 Bank Street	Hardware Store[1]	2,997 m^2	2021
	Hotel	125	2023
	Restaurant	502 m^2	
	Commercial	987 m^2	

Notes:

[1] – At of the time of this study, the hardware store component of the 4836 Bank Street development has been built and is fully operational.



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4840 Bank Street
Transportation Impact Assessment

Exhibit 3:
Adjacent Developments

Project No. 137175

Scale: -100m 0 200m

3.4 Study Area

Based on a review of the information presented thus far, a study area bound by Dun Skipper Drive to the north, Bank Street to the east and the southern limit of the proposed development will provide a sufficient assessment of the development's impact on the adjacent transportation network. Although the Bank & Blais intersection is within the context area, site-generated traffic will only contribute to northbound and southbound through traffic and is therefore expected to have a negligible impact on overall traffic operations, particularly given that Bank Street is expected to be widened to four lanes prior to full buildout of the proposed development.

The following intersections will therefore be assessed for vehicular capacity as part of this study:

- Bank & Dun Skipper
- Dun Skipper & Access #1
- Bank & Access #2 (right-in/right-out)

A Multi-Modal Level of Service (MMLOS) analysis will be conducted for all existing and future signalized intersections within the study area, while segment-based MMLOS analysis will be conducted for the segment of Bank Street adjacent to the proposed development.

3.5 Time Periods

As the proposed development will consist of residential land uses, traffic generated during the weekday morning and afternoon peak hours is expected to result in the most significant impact to traffic operations on the adjacent road network.

3.6 Existing Lane Configurations and Traffic Volumes

The following weekday morning and afternoon peak hour turning movement counts were obtained from the City of Ottawa:

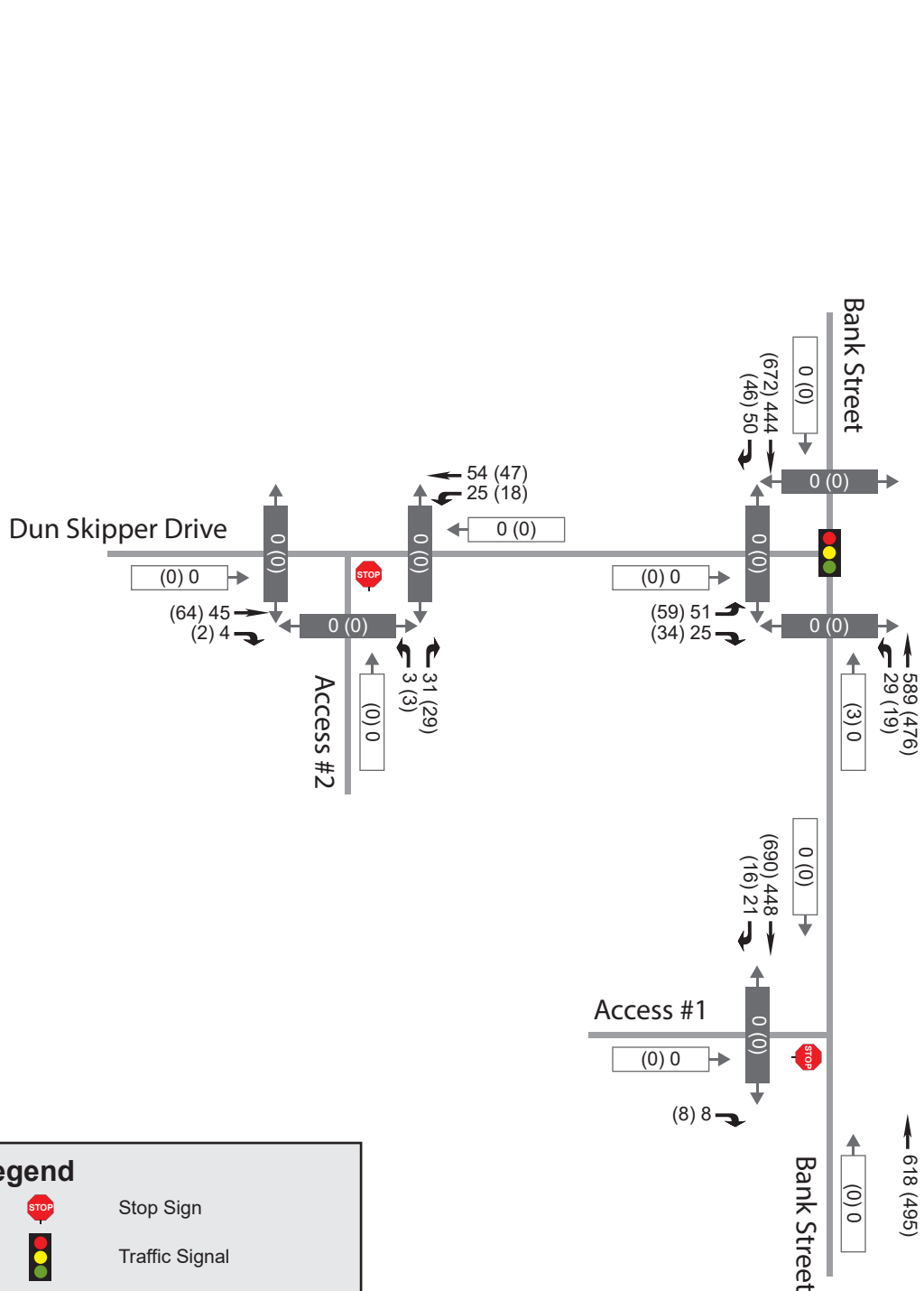
- Bank & Dun Skipper (City of Ottawa, October 19, 2021)

The above turning movement count was collected in the midst of the COVID-19 pandemic which has had a significant impact on commuter traffic patterns. As the intersection was only recently constructed, however, this is the only traffic count available for this location and therefore represents the best data available.

In order to account for the impact of the pandemic, the turning movement count was adjusted using data from the *COVID-19 Traffic Volume Monitoring at Intersections* data provided by the City of Ottawa through Open Ottawa. The nearest intersection for which data is available is the Airport Parkway & Hunt Club intersection. In October 2021, the data indicates that weekday morning peak hour traffic volumes were 16% lower than expected but that weekday afternoon peak hour traffic volumes were not significantly affected by the pandemic. The weekday morning peak hour traffic volumes were therefore increased in order to account for the impact of the pandemic.

Traffic volumes at the existing site access driveways on Bank Street and Dun Skipper Drive were estimated based on the traffic volume projections from the 4836 Bank Street TIA (IBI Group, October 2019) and the through volumes on Bank Street and Dun Skipper Drive were balanced with the Bank & Dun Skipper intersection volumes.

Weekday peak hour vehicular, pedestrian and cyclist traffic volumes representative of existing conditions are shown in **Exhibit 4** below. Traffic count data is provided in **Appendix E**. The lane configurations and intersection controls for the study area intersections are illustrated in **Exhibit 5**.



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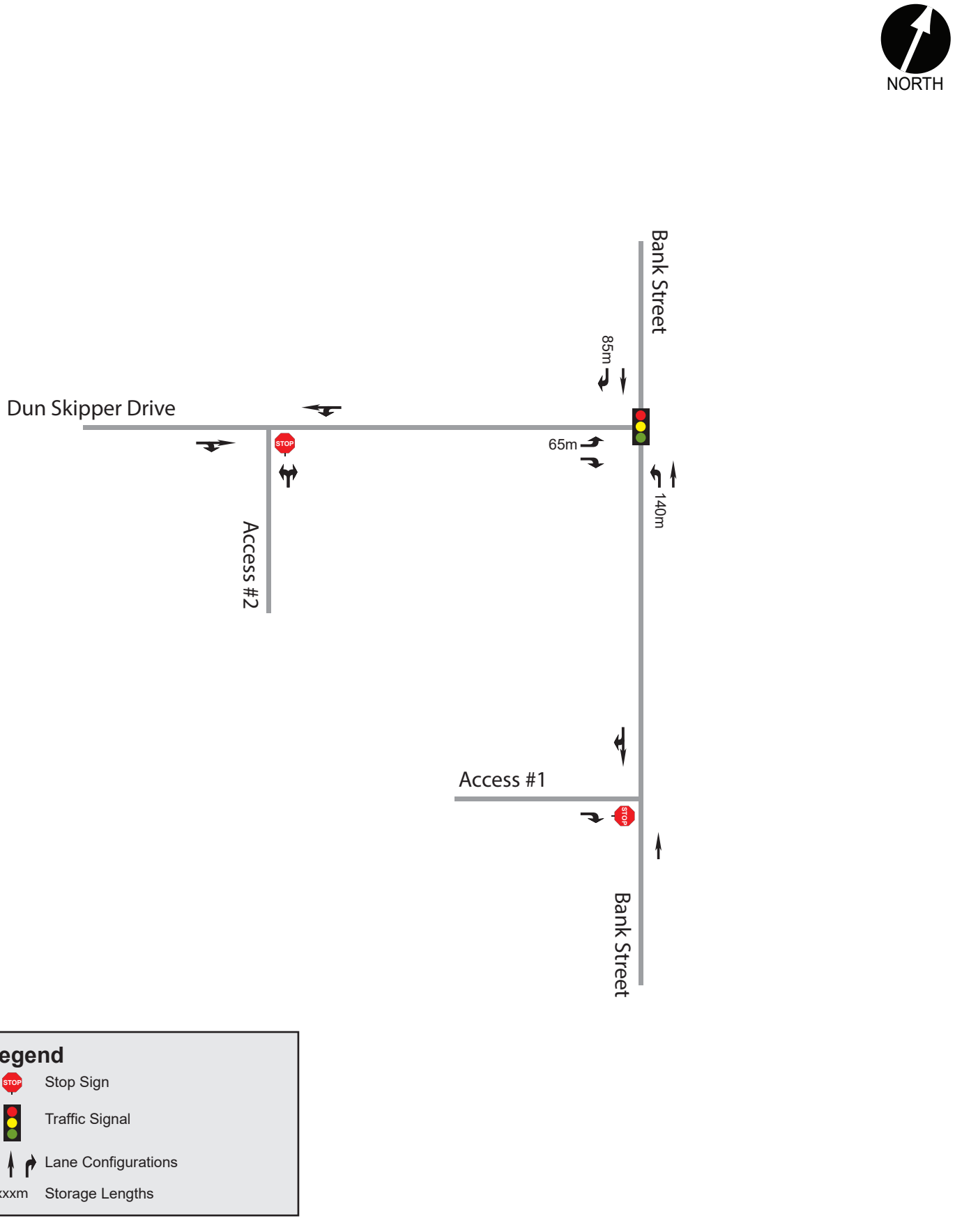
Transportation Impact Assessment

Exhibit 4:
Existing Traffic

PROJECT No. 137175

SCALE: N.T.S.



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4840 Bank Street
Transportation Impact Assessment

Exhibit 5:
Existing Intersection Controls & Lane Configurations

PROJECT No. 137175

SCALE: N.T.S.

3.7 Analysis Years

The following analysis years will be assessed in this study:

- Year 2025 – Full Build-out/Occupancy of the Proposed Development
- Year 2030 – Full Build-out/Occupancy plus 5 years

3.8 Exemptions Review

The TIA Guidelines provide exemption considerations for elements of the Design Review and Network Impact components. **Table 8** summarizes the TIA modules that are not applicable to this study.

Table 8 - Exemptions Review

TIA MODULE	ELEMENT	EXEMPTION CONISDERATIONS	REQUIRED
DESIGN REVIEW COMPONENT			
4.1 Development Design	4.1.2 Circulation and Access	• Only required for site plans	✓
	4.1.3 New Street Networks	• Only required for plans of subdivision	✗
4.2 Parking	4.2.1 Parking Supply	• Only required for site plans	✓
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	✗
NETWORK IMPACT COMPONENT			
4.5 Transportation Demand Management	All Elements	• Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	✓
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	✓
4.8 Network Concept	n/a	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	✗

4 Forecasting

4.1 Demand Rationalization

The purpose of this section is to rationalize future travel demands within the study area to account for potential capacity limitations in the transportation network and its ability to effectively absorb the additional demand generated by a new development.

4.1.1 Description of Capacity Issues

Table 9 below summarizes the existing traffic operational performance at the study area intersections under Existing Traffic volumes, as presented previously in **Exhibit 4**. The intersection capacity analysis is based on locally-specific parameters as described in the TIA Guidelines and incorporates existing signal timing plans obtained from the City of Ottawa. As prescribed in the TIA Guidelines, a peak hour factor (PHF) of 0.90 has been considered in the analysis of existing conditions. The Synchro output files have been provided in **Appendix J**.

Table 9 - Intersection Capacity Analysis: Existing Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Bank & Dun Skipper	Signalized	A (0.46)	NBT (0.47)	A (0.52)	SBT (0.53)
Dun Skipper & Access #2	Unsignalized	A (8.7s)	NBRL (8.7s)	A (8.8s)	NBRL (8.8s)
Bank & Access #1	Unsignalized	B (11.5s)	EBR (11.5s)	B (14.2s)	EBR (14.2s)

As indicated above, the study area intersections are presenting operating at an acceptable overall Level of Service (i.e. LOS 'D' or better). Future Background and Total Traffic volume projections will be developed and presented in subsequent sections of this study.

4.1.2 Adjustment to Development Generated Demands

Given that all study area intersections are operating at an acceptable Level of Service (LOS), it is not expected that adjustments to development-generated traffic will be required.

4.1.3 Adjustment to Background Network Demands

As noted above, given the lack of capacity constraints at the study area intersections, background network demand has not been adjusted.

4.2 Development Generated Traffic

4.2.1 Trip Generation Methodology

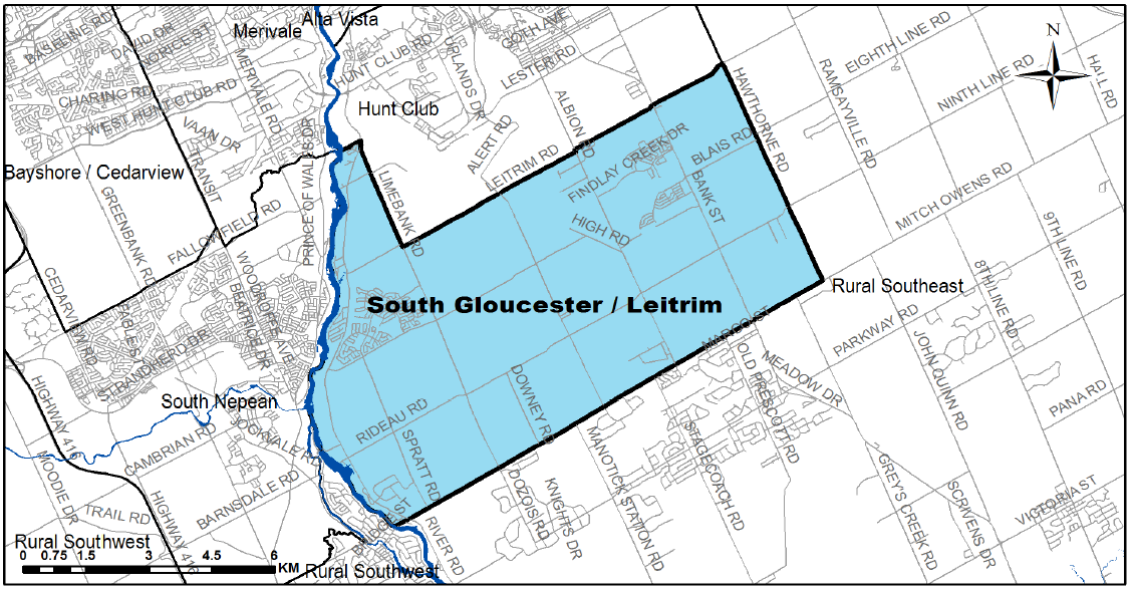
Peak hour residential site-generated traffic volumes were developed using the 2020 TRANS Trip Generation Summary Report. The TRANS trip generation rates are based on blended rates derived from the 49 trip generation studies undertaken between 2008 and 2012, the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) and the 2011 TRANS O-D

Travel Survey. Separate peak period person-trip generation rates were developed for single-detached housing, low-rise multifamily housing (i.e. two storeys or less) and high-rise multifamily housing (i.e. three storeys or more). Site-generated peak period person-trips were estimated using these rates and subsequently subdivided based on representative mode share percentages applicable to the study area. Mode-specific adjustment factors were then applied to these peak period person-trips to determine the number of peak hour vehicle, passenger, transit, cycling and pedestrian trips.

Local mode share targets were based on the 2020 TRANS Trip Generation Summary Report which provides blended mode shares based on the 2011 TRANS Origin-Destination (O-D) Survey for select land uses for each of the Traffic Assessment Zones (TAZs) in the O-D Survey. These mode share targets were adjusted to reflect the context of the site. The proposed development is located within the South Gloucester/Leitrim TAZ.

The extents of the South Gloucester/Leitrim TAZ are illustrated in **Figure 8**.

Figure 8 - South Gloucester/Leitrim TAZ



Source: 2011 O-D Survey

Appendix F contains relevant 2020 TRANS and 2011 Origin-Destination (O-D) Survey extracts utilized for this study.

4.2.2 Peak Period Trip Generation

Peak period person-trips associated with the proposed development were determined using the trip generation rates from the 2020 TRANS Trip Generation Summary Report. The peak period person-trip generation results for the proposed development have been summarized in **Table 10** below.

Table 10 - Peak Period Person-Trip Generation

LAND USE	SIZE (UNITS)	PERIOD	PEAK PERIOD PERSON-TRIPS		
			IN	OUT	TOTAL
Multi-Unit (High-Rise)[1]	180	AM	45	99	144
		PM	94	68	162

Notes:

[1] - 2020 TRANS defines 'Multi-Unit High-Rise' as 3 storeys or taller.

4.2.3 Mode Share

The TRANS Trip Generation Manual (October 2020) provides blended mode shares based on the 2011 TRANS Origin-Destination (O-D) Survey for select land uses for each of the Traffic Assessment Zones (TAZs) in the O-D Survey. The proposed development is located within the South Gloucester/Leitrim TAZ, as illustrated in **Figure 8**. Given the proposed height of the buildings, the mode share distribution for 'multi-unit (high-rise)' has been considered in the development of the mode share targets.

Based on the 2020 TRANS Trip Generation Summary Report, the current transit mode share for a mid-rise residential building within the TAZ is on average 23% during the weekday morning and afternoon peak hour. Given the site's location on the edge of the existing transit network, however, it is not expected that that level of transit utilization can be locally achieved. Other residential developments within the study area have assumed transit mode share targets ranging from 11% in 2022 to 16% in 2031. A transit mode share target consistent with other developments within the study area has therefore been assumed for this analysis, with the remainder reallocated to auto driver.

The existing mode shares for the TAZ and the proposed mode share targets for the proposed development are identified in **Table 11** below.

Table 11 - Existing and Target Mode Share Distributions

MODE	EXISTING MODE SHARE WITHIN TAZ		MODE SHARE TARGETS	
	AM	PM	2025	2030
Auto Driver	50%	53%	59%	57%
Auto Passenger	15%	17%	18%	18%
Transit	25%	21%	13%	15%
Cycling	1%	1%	1%	1%
Walking	9%	9%	9%	9%
Total	**100%**	**101%**	**100%**	**100%**

4.2.4 Trip Generation by Mode

The mode share targets from **Table 11** were applied to the number of development generated peak period person-trips to determine the number of trips per travel mode. The peak period to peak hour adjustment factors from Table 4 of the 2020 TRANS Trip Generation Summary Report were subsequently applied in order to convert to peak hour trips.

The results after applying the mode share targets and adjustment factors are summarized in **Table 12** and **Table 13**.

Table 12 – 2025 Development-Generated Peak Hour Person Trips by Mode

MODE (MODE SHARE)	AM			PM		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver (59%)	13	28	41	24	18	42
Auto Passenger (18%)	4	9	13	8	5	13
Transit (13%)	3	7	10	6	4	10
Cycling (1%)	0	1	1	0	0	0
Walking (9%)	2	5	7	4	3	7
Total Person Trips	**22**	**50**	**72**	**42**	**30**	**72**

Table 13 – 2030 Development-Generated Peak Hour Person Trips by Mode

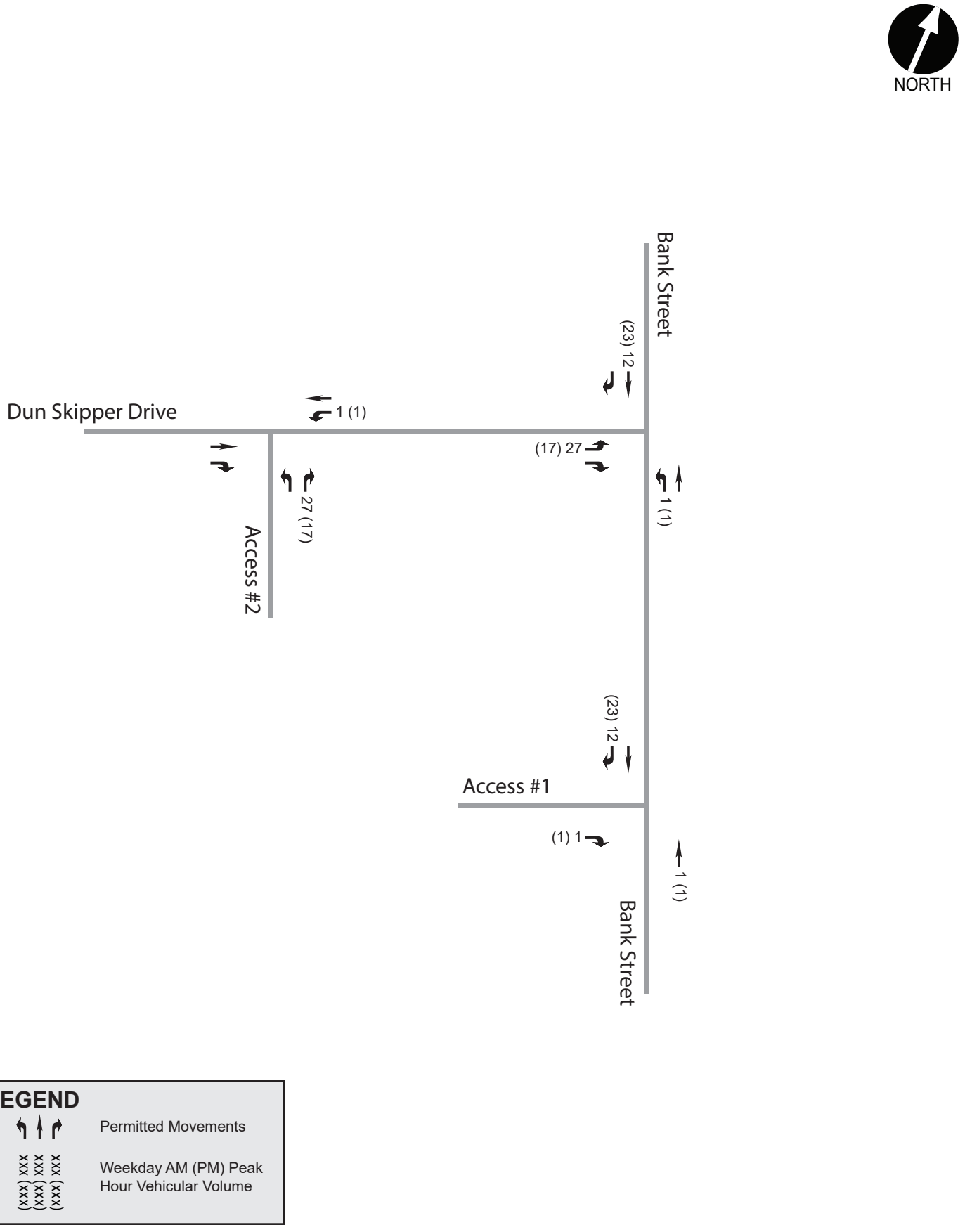
MODE (MODE SHARE)	AM			PM		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver (57%)	12	27	39	24	17	41
Auto Passenger (18%)	4	8	12	7	5	12
Transit (15%)	4	9	13	7	5	12
Cycling (1%)	0	1	1	0	0	0
Walking (9%)	2	5	7	4	3	7
Total Person Trips	**22**	**50**	**72**	**42**	**30**	**72**

4.2.5 Trip Distribution and Assignment

Consistent with other TIAs prepared in support of adjacent developments, site-generated trips were distributed to the adjacent road network as shown below:

- 95% to/from the North via Bank Street
- 5% to/from the South via Bank Street

Utilizing the estimated number of new auto trips and applying the above distribution, future site-generated traffic volumes at each of the study area intersections are illustrated in **Exhibit 6** and **Exhibit 7**.



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4840 Bank Street
Transportation Impact Assessment

Exhibit 6:
2025 Site-Generated Traffic

PROJECT No. 137175

SCALE: N.T.S.

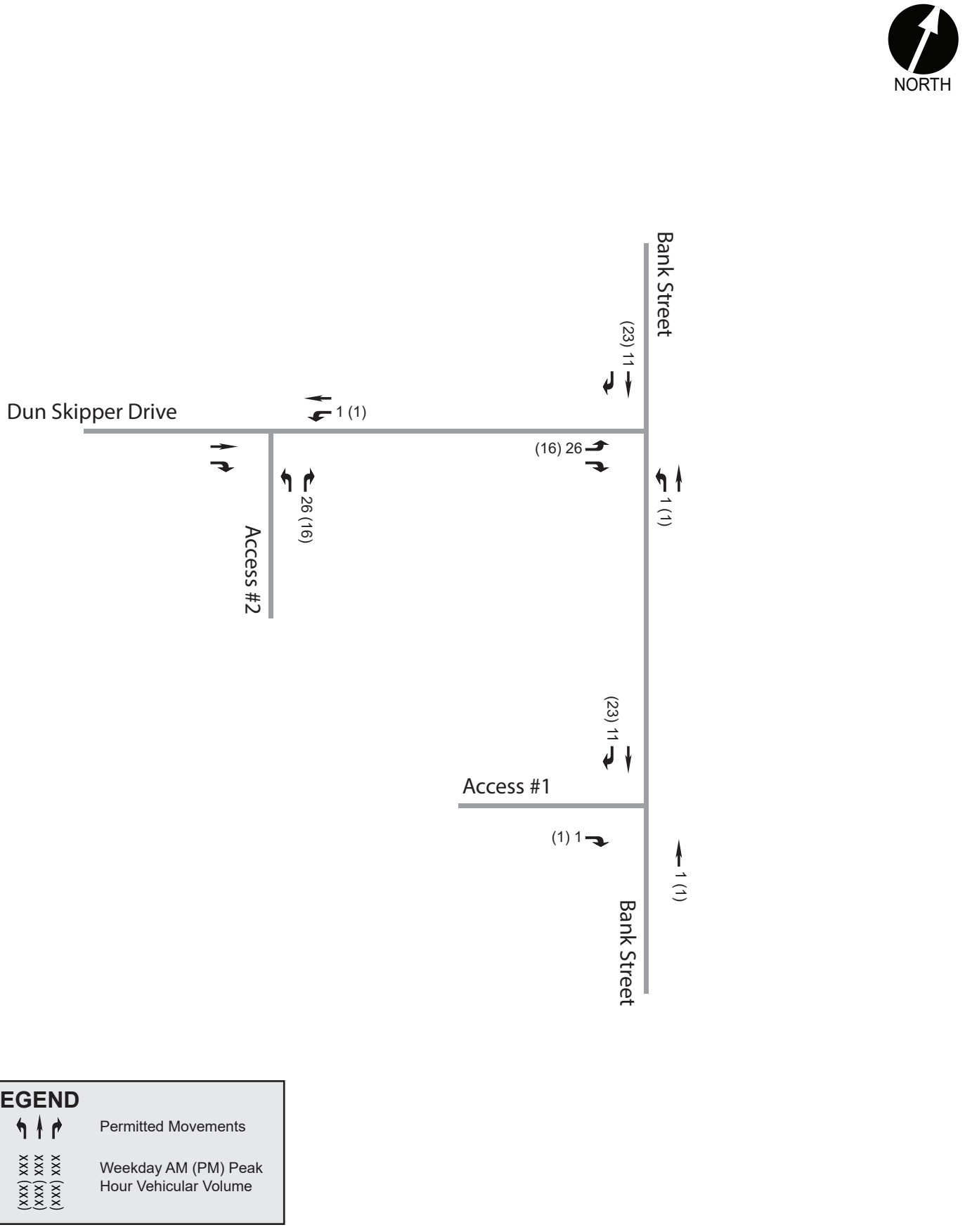

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Exhibit 7:
2030 Site-Generated Traffic

PROJECT No. 137175

SCALE: N.T.S.

4.3 Background Network Traffic

4.3.1 Changes to the Background Transportation Network

To properly assess future traffic conditions, planned modifications to the transportation network that may impact travel patterns or demand within the study area must be considered. These changes are then reflected in the future background demand volumes to develop an appropriate foundation for the TIA.

As discussed in Section 3.3.1, prior to full buildout and occupancy of the proposed development, it is anticipated that Bank Street will be widened to four lanes up to the site access on Bank Street. As part of this widening, concrete sidewalks and cycle tracks will be provided on both sides of Bank Street.

4.3.2 General Background Growth Rates

The background growth rate is intended to represent regional growth from outside the study area expected to utilize the adjacent road network. Future travel demand was based on the Leitrim MTS, which accounted for all adjacent developments separately and applied a 1.0% growth rate for regional traffic passing through the Leitrim Community.

A general background growth rate has not been applied to local/collector roads within the study area, as traffic generation relating to all known future developments has been accounted for separately in the analysis.

4.3.3 Other Area Development

All current adjacent development applications and future potential developments within the study area were previously identified in **Table 6** and **Table 7** and have been accounted for in the development of future background volume projections. The developments represent specific areas of growth within the study area and are therefore considered in addition to the general background growth rate discussed previously.

4.4 Traffic Volume Summary

4.4.1 Future Background Traffic Volumes

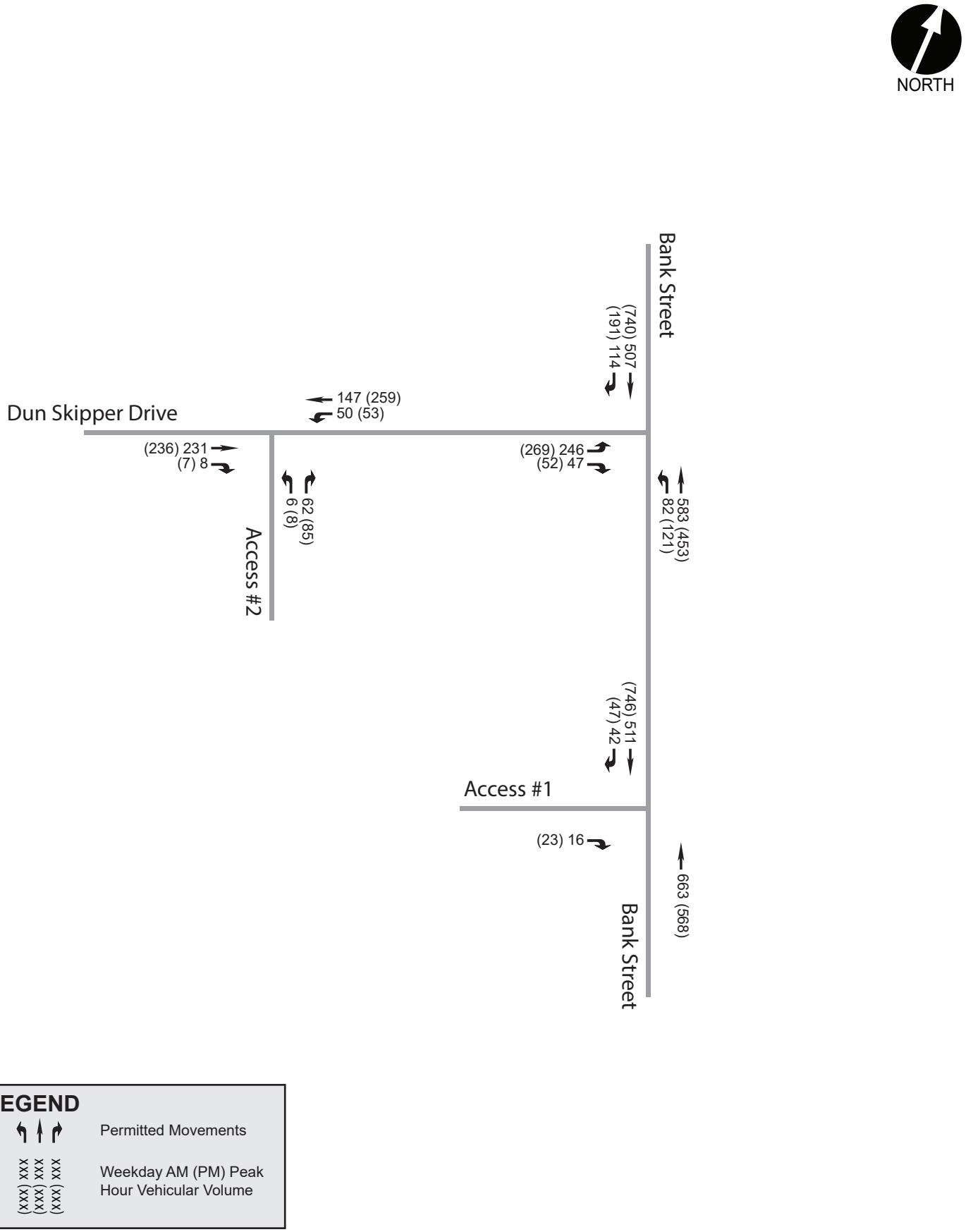
Future background traffic volumes have been developed by combining the adjacent development traffic and background traffic derived through the application of a growth rate as discussed previously.

Exhibit 8 and **Exhibit 9** present the future background traffic volumes anticipated for the 2025 build-out year and 2030 study horizon, respectively.

4.4.2 Future Total Traffic Volumes

Future total volumes have been derived by combining the site-generated traffic in **Exhibit 6** and **Exhibit 7** with the future background volumes in **Exhibit 8** and **Exhibit 9**.

Exhibit 10 and **Exhibit 11** present the future total traffic volumes anticipated for 2025 and 2030, respectively.



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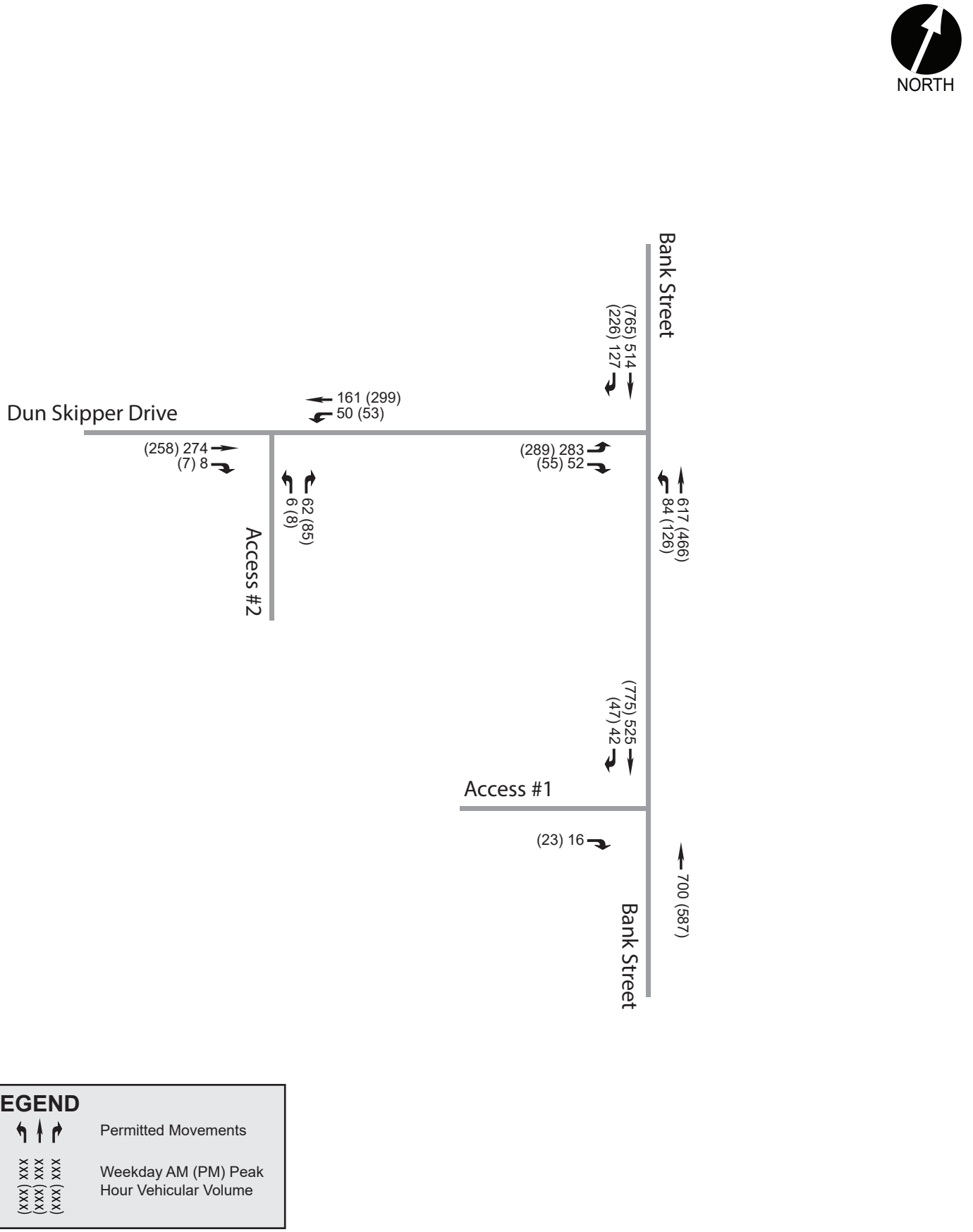
Transportation Impact Assessment

Exhibit 8:
Future (2025)
Background Traffic

PROJECT No. 137175

SCALE: N.T.S.



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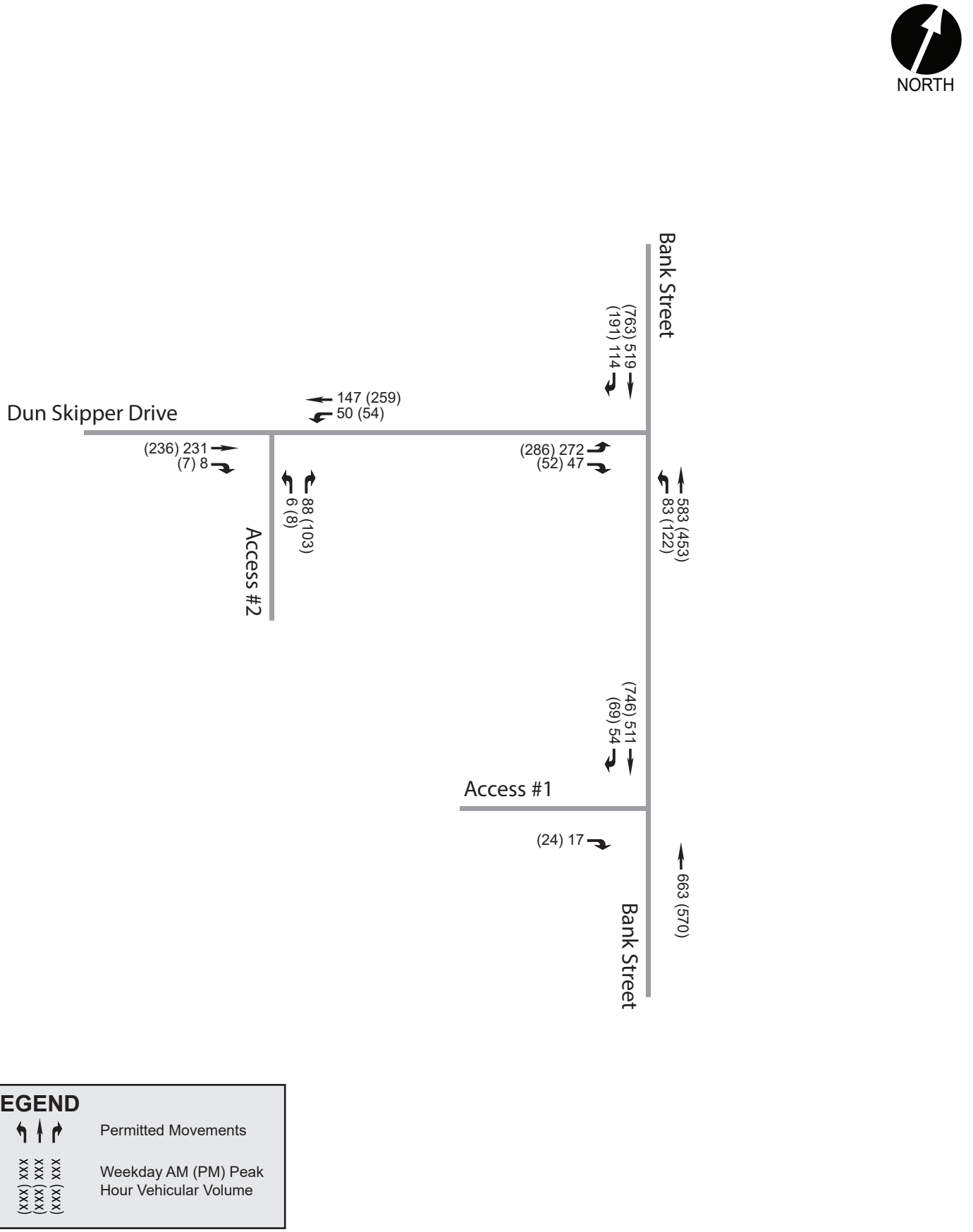
4840 Bank Street
Transportation Impact Assessment

Exhibit 9:
Future (2030)
Background Traffic

PROJECT No. 137175

SCALE: N.T.S.



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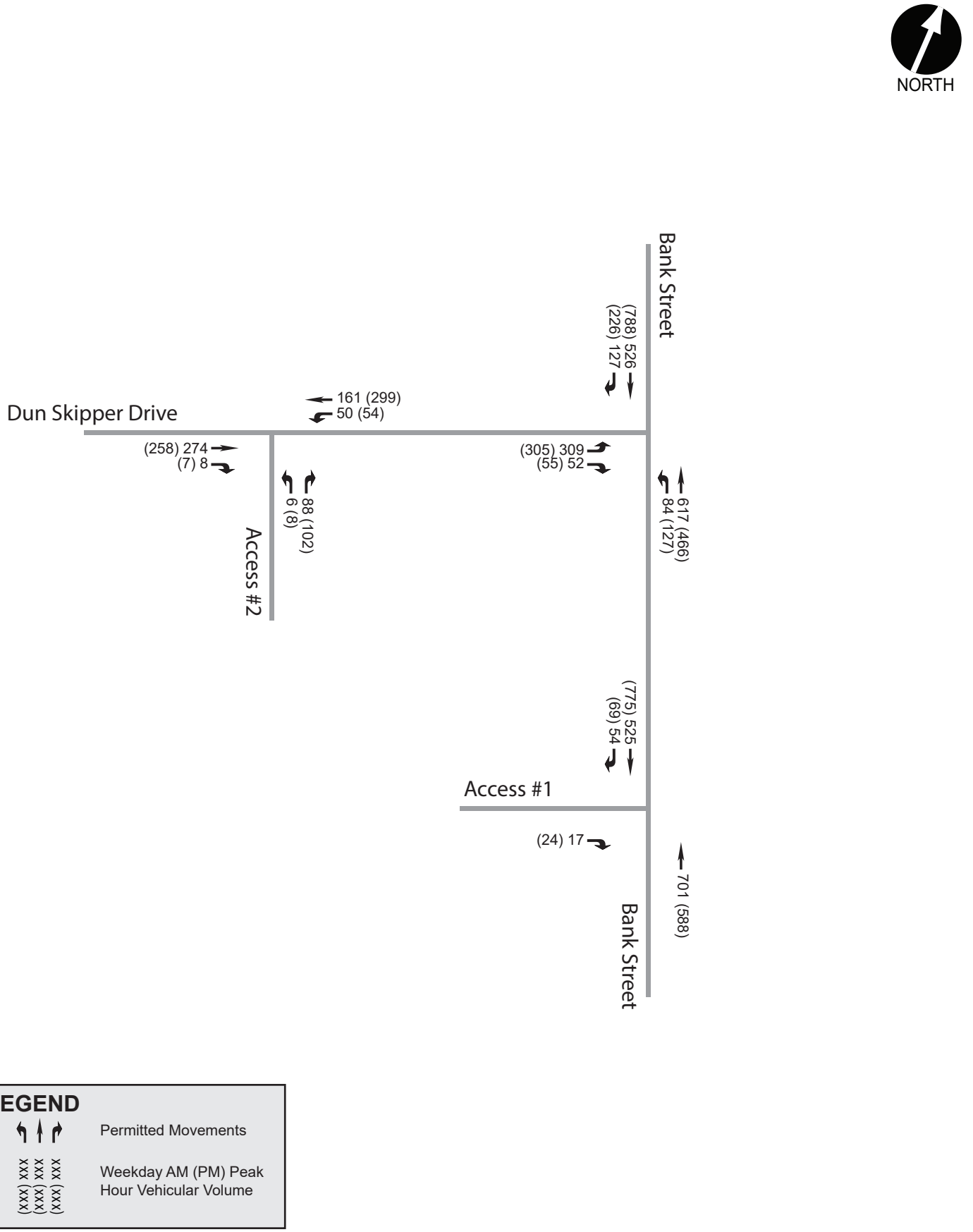
4840 Bank Street
Transportation Impact Assessment

Exhibit 10:
Future (2025)
Total Traffic

PROJECT No. 137175

SCALE: N.T.S.



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4840 Bank Street
Transportation Impact Assessment

Exhibit 11:
Future (2030)
Total Traffic

PROJECT No. 137175

SCALE: N.T.S.

5 Analysis

5.1 Development Design

5.1.1 **Design for Sustainable Modes**

For consistency with the City of Ottawa's Urban Design Guidelines and transportation policies, new developments shall provide safe and efficient access for all users while creating an environment that encourages walking, cycling and transit use.

In addition to being located within the rapidly growing Leitrim Community, the site integrates well with the adjacent road network by providing convenient access to planned active transportation facilities. Further, the proposed development is within a 400-metre walking distance of transit stops on Dun Skipper Drive.

Concrete sidewalks are proposed within the site to facilitate safe and convenient access between buildings. Direct pedestrian connections have also been provided between the site and the adjacent 4836 Bank Street development as well as future pedestrian facilities on Bank Street. Half of the bicycle parking spaces are located inside the buildings, thereby providing secure and sheltered bicycle parking for residents, while an equal number of bicycle parking spaces will be located around the buildings which will be suitable for visitors.

Pick-up/drop off areas have been provided near the primary entrances which will be used for pick-up/drop-off activities, waste collection and move in/move out.

The TDM-Supportive Development Design and Infrastructure Checklist was completed and is provided in **Appendix G**. This checklist identifies measures that have been considered in the development's design to minimize vehicular demands of the site and encourage alternative modes of transportation. Notable measures that are being considered are:

- Locating the buildings near the street with doors and windows located to ensure visibility of pedestrians from the buildings;
- Providing convenient and direct connections to adjacent pedestrian and transit facilities;
- Providing bicycle parking in highly visible and well light locations as well as providing 50% of bicycle parking indoors in a sheltered and secure location;
- Providing pick-up/drop-off facilities near the building entrances; and
- Only providing sufficient vehicle parking to meet the minimum Zoning By-law requirements.

5.1.2 **Circulation and Access**

As discussed previously, access the to the site will be provided via the full-movement access associated with the adjacent 4836 Bank Street development as well as the shared right-in/right-out access.

A geometric analysis of the proposed site plan was undertaken utilizing truck templates for the following two design vehicles: Waste Collection and Fire Truck. The templates confirm the ability of each of these vehicles to access/ egress the site. Access to the site by Fire Truck is expected to be rare while access by Waste Collection and Delivery Trucks will be infrequent and occur only a few times per week.

The vehicle swept path analysis confirms that the site layout and access configuration is sufficient to accommodate each of the design vehicles listed above, including the curb requirements for the

designated Fire Route. No off-site roadway modifications are required to accommodate the design vehicles.

The vehicle turning templates described above have been provided in **Appendix H**.

5.2 Parking

5.2.1 Parking Supply

Vehicular Parking

The proposed development will include a total of 216 surface parking spaces. The Zoning By-law indicates that, within Area 'D' (Rural), a minimum of 1.0 spaces and 0.2 spaces per unit are required for resident and visitor parking, respectively. Based on these requirements, a total of 216 parking spaces are required. The proposed parking supply is therefore sufficient for the size and location of the proposed development.

Bicycle Parking

The proposed development will include a total of 90 bicycle parking spaces, meeting the minimum Zoning By-law parking requirements of 0.5 spaces per unit for mid-rise apartment buildings.

5.3 Boundary Streets

5.3.1 Mobility

Based on discussions with City of Ottawa staff, it is anticipated that Bank Street will be widened to its ultimate configuration prior to full buildout and occupancy of the proposed development, however, the proposed four-lane cross-section will terminate at the Bank Street access and south of the access the roadway will transition back to a rural two-lane cross-section. Segment-based Multi-Modal Level of Service (MMLOS) analysis was undertaken under both existing and future conditions to identify gaps and deficiencies in the City's transportation network.

The results of the segment-based MMLOS are shown in **Table 14**. Detailed results are provided in **Appendix I**.

Table 14 – Segment-based MMLOS

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
Existing Conditions				
Bank Street	**F** (Target: C)	**F** (Target: C)	D (Target: N/A[1])	B (Target: D)
Future Conditions				
Bank Street	**F** (Target: C)	**F** (Target: C)	D (Target: N/A[1])	C (Target: D)

Notes:

[1] – Not identified as a rapid transit or transit priority corridor in the TMP.

The results of the segment-based MMLOS analysis indicate that Bank Street does not currently meet its PLOS or BLOS target, primarily due to a lack of facilities, high operating speeds and high traffic volumes. As the Bank Street widening is expected to terminate at the Bank Street access, future conditions remain relatively unchanged, however, it is expected that lane widths on Bank

Street adjacent to the site will be reduced to 3.5m wide and therefore TkLOS will change from 'B' to 'C'.

It is expected that the PLOS and BLOS along the segment adjacent to the site will improve once the four-lane widening of Bank Street is extended further south to Rideau Road as identified in the TMP.

5.3.2 Road Safety

A summary of all reported collisions within the study period over the past 5 years was presented in the Scoping section of this report. The City requires a safety review if at least six collisions for any one movement or a discernible pattern, over a five-year period have occurred. Based on a review of re-occurring events identified in the Scoping section of this report only the Bank & Blais intersection potentially required review, however, as the intersection has not been included in the study area no further review is required.

5.4 Access Intersections

5.4.1 Location and Design of Access

Both private approaches have already been constructed and have previously been assessed for conformance with the City of Ottawa Private Approach By-law 2003-447 in the 4836 Bank Street TIA (IBI Group, October 2019).

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads indicates that a minimum clear throat length of 25m is required for accesses on arterial roadways that provide access to apartment buildings with 100 to 200 units. There is approximately 33m of clear throat length available at Access #2 and therefore this requirement has been met.

5.4.2 Intersection Control

Both site access intersections are expected to operate at an acceptable Level of Service (i.e. LOS 'D' or better) as unsignalized intersections within the timeframe of this study. As such, traffic signal warrant analysis or roundabout analysis is not required.

5.4.3 Intersection Design (MMLOS)

Not Applicable: Intersection MMLOS is not applicable to the site access intersections as this methodology only applies to signalized intersections.

5.5 Transportation Demand Management (TDM)

The City of Ottawa is committed to requiring all new developments to include Transportation Demand Management (TDM) measures in an effort to reduce automobile dependence, particularly during the weekday peak travel periods.

5.5.1.1 Context for TDM

The proposed mode share targets for the subject development were calculated based on a blended mode share distribution of the South Gloucester/Leitrim Traffic Assessment Zone (TAZ) in which the development is located. The development is well located with access to transit within a short walking distance and access to future sidewalks along Bank Street. It should be noted that the proposed development is not located within a Design Priority Area (DPA) or Transit-Oriented Development (TOD) zone.

5.5.1.2 Need and Opportunity

As site-generated traffic will be accessing the site through the adjacent 4836 Bank Street development, a lack of TDM measures would result in an increase in traffic volumes through the adjacent development site.

Bank Street is expected to be widened to four-lanes prior to full buildout of the proposed development which will introduce pedestrian and cycling facilities on Bank Street within close proximity to the proposed development. The proposed development is also within a short walking distance of transit stops on Dun Skipper Drive. The presence of the adjacent commercial development will provide nearby amenities for residents including a restaurant and retail stores. As such, attaining the proposed mode share targets is likely to be easily achieved.

5.5.1.3 TDM Program

The proposed development conforms to the City's TDM principles by providing convenient and direct connections to adjacent pedestrian and transit facilities. The City of Ottawa's TDM Measures Checklist was completed for the proposed development and provided in **Appendix G**. This checklist indicates measures that are being contemplated as part of this development. Notable measures that are being considered include:

- Displaying local area maps of walking/cycling routes and key destinations;
- Displaying relevant transit schedules and route maps at entrances; and
- Providing a multimodal travel information package to new residents.

5.6 Neighbourhood Traffic Management

5.6.1 Adjacent Neighbourhoods

The proposed development relies on Dun Skipper Drive, a local road, for access to the arterial road network. To determine if neighbourhood traffic management measures are required, traffic volumes projected in the study horizon year are compared against the appropriate liveability threshold, as prescribed in the TIA Guidelines.

The livability threshold for a local road is 120 vehicles per hour per lane. Based on existing traffic volumes, Dun Skipper Drive is already on the verge of exceeding this threshold during the weekday morning and afternoon peak hours. Although the addition of background and site-generated traffic will result in traffic volumes exceeding this threshold, Dun Skipper Drive represents the only means for site-generated traffic to turn left onto Bank Street to go north therefore it is not possible to mitigate the proposed development's impact on the roadway. In addition to this, it is not uncommon for volumes to locally-exceed this threshold on an approach to an intersection with an arterial road. Given that Dun Skipper Drive functions as a collector road and the proposed development will not contribute traffic to the residential areas to the west of the site, this condition is deemed acceptable.

5.7 Transit

5.7.1 Route Capacity

The estimated future 2030 total transit passenger demand within the study area was provided in Section 3.1.2.4: Trip Generation by Mode. The results have been summarized in **Table 15**.

Table 15 - 2030 Development-Generated Transit Demand

PERIOD	PEAK PERIOD DEMAND	
	IN	OUT
AM	4	9
PM	7	5

Based on these projections, the proposed development is expected to generate up to 13 two-way transit trips during the weekday peak hours and therefore will not significantly impact the capacity of nearby transit routes.

5.7.2 Transit Priority

As identified in **Table 15** above, the proposed development will have a marginal impact on the capacity of nearby transit routes. Additional capacity and service improvements via transit priority measures are not necessary nor are they included as part of the 2031 TMP Affordable Network within the adjacent community.

5.8 Intersection Design

The following sections summarize the methodology and results of the multi-modal intersection capacity analysis conducted within the study area.

5.8.1 Intersection Analysis Criteria (Automobiles)

The following section outlines the City of Ottawa's methodology for determining motor vehicle Level of Service (LOS) at signalized and unsignalized intersections.

5.8.1.1 Signalized Intersections

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

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

Table 16 - LOS Criteria for Signalized Intersections

LOS	VOLUME TO CAPACITY RATIO (v/c)
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

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

The Level of Service calculation is based on locally-specific parameters described in the TIA Guidelines. The analysis of future conditions considers the use of a Peak Hour Factor (PHF) of 1.0 to recognize peak spreading beyond a 15-minute period in congested conditions.

5.8.1.2 Unsignalized Intersections

The capacity of an unsignalized intersection can also be expressed in terms of the LOS it provides. For an unsignalized intersection, the Level of Service is defined in terms of the average movement delays at the intersection. This is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this includes the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position. The average delay for any particular minor movement at the unsignalized intersection is a function of the capacity of the approach and the degree of saturation.

The Highway Capacity Manual 2010 (HCM), prepared by the Transportation Research Board, includes the following Levels of Service criteria for unsignalized intersections, related to average movement delays at the intersection, as indicated in **Table 17**.

Table 17 - LOS Criteria for Unsignalized Intersections

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

The unsignalized intersection capacity analysis technique included in the HCM and used in the current study provides an indication of the Level of Service for each movement of the intersection under consideration. By this technique, the performance of the unsignalized intersection can be

compared under varying traffic scenarios, using the Level of Service concept in a qualitative sense. One unsignalized intersection can be compared with another unsignalized intersection using this concept. Level of Service 'E' represents the capacity of the movement under consideration and generally, in large urban areas, Level of Service 'D' is considered to represent an acceptable operating condition (Level of Service 'E' is considered an acceptable operating condition for planning purposes for intersections located within Ottawa's Urban Core the downtown and its vicinity). Level of Service 'F' indicates that the movement is operating beyond its design capacity.

5.8.2 Intersection Design (Vehicles)

Using the established intersection capacity analysis criteria described above, the existing and future conditions are analyzed during the weekday peak hour traffic volumes derived in the previous sections of this report.

Tables Table 18 to **Table** 21 present the intersection capacity analysis results under Future (2025 & 2030) Background & Total Traffic conditions. The Synchro output files have been provided in **Appendix J**.

Table 18 - Intersection Capacity Analysis: Future (2025) Background Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Bank & Dun Skipper	Signalized	A (0.33)	EBL (0.76)	A (0.41)	EBL (0.77)
Dun Skipper & Access #1	Unsignalized	B (10.1s)	NBRL (10.1s)	B (10.5s)	NBRL (10.5s)
Bank & Access #2	Unsignalized	B (10.1s)	EBR (10.1s)	B (11.2s)	EBR (11.2s)

Table 19 - Intersection Capacity Analysis: Future (2030) Background Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Bank & Dun Skipper	Signalized	A (0.36)	EBL (0.78)	A (0.43)	EBL (0.78)
Dun Skipper & Access #1	Unsignalized	B (10.4s)	NBRL (10.4s)	B (10.7s)	NBRL (10.7s)
Bank & Access #2	Unsignalized	B (10.1s)	EBR (10.1s)	B (11.3s)	EBR (11.3s)

Table 20 - Intersection Capacity Analysis: Future (2025) Total Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Bank & Dun Skipper	Signalized	A (0.34)	EBL (0.77)	A (0.43)	EBL (0.78)
Dun Skipper & Access #1	Unsignalized	B (10.2s)	NBRL (10.2s)	B (10.6s)	NBRL (10.6s)
Bank & Access #2	Unsignalized	B (10.1s)	EBR (10.1s)	B (11.3s)	EBR (11.3s)

Table 21 - Intersection Capacity Analysis: Future (2030) Total Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Bank & Dun Skipper	Signalized	A (0.38)	EBL (0.79)	A (0.45)	EBL (0.79)
Dun Skipper & Access #1	Unsignalized	B (10.6s)	NBRL (10.6s)	B (10.8s)	NBRL (10.8s)
Bank & Access #2	Unsignalized	B (10.2s)	EBR (10.2s)	B (11.4s)	EBR (11.4s)

Based on the above, all intersections within the study area are expected to operate at acceptable levels of service (LOS 'D' or better) within the timeframe of this study.

5.8.3 Intersection Design (MMLOS)

Analysis of signalized intersections for each analysis year has been conducted based on the methodology prescribed in the City of Ottawa Multi-Modal Level of Service (MMLOS) Guidelines.

The existing and future conditions MMLOS analysis results have been summarized in **Table 22**. Detailed analysis results are provided in **Appendix I**.

Table 22 - Intersection-based MMLOS Results

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
Existing Conditions				
Bank & Dun Skipper	**E** (Target: C)	C (Target: C)	B (Target: N/A[1])	**F**[2] (Target: D)
Future Conditions				
Bank & Dun Skipper	**E** (Target: C)	A (Target: C)	C (Target: N/A[1])	D[2] (Target: D)

Notes:

[1] – Not identified as a rapid transit or transit priority corridor in the TMP.

[2] – Dun Skipper Drive is not classified as a truck route therefore trucks are not expected to turn right at the intersection. Due to the configuration of the adjacent 4836 Bank Street development, however, it is expected that trucks will enter the site via the right-in/right-out access on Bank Street and exit via the Dun Skipper Drive access and may therefore make eastbound right-turns at the intersection.

5.8.3.1.1.1 Summary of Potential Improvements

Based on the MMLOS results outlined in **Table 23** above, the following measures have been identified which could improve conditions for each travel mode:

Pedestrians

The PLOS at intersections is based on several factors including the crossing distance, corner radii, and whether the crossing allows for permissive or protective right or left turns, among others. The City of Ottawa target for PLOS in the General Urban Area is 'C'.

The results of the analysis indicate that the intersection is expected to operate at PLOS 'E' under both existing and future conditions. Although pedestrian crossing demand is not expected to be significant, future consideration should be given to implementing right-turn-on-red prohibitions and leading pedestrian intervals to improve pedestrian comfort at this intersection. It should be noted, however, that although these measures would improve pedestrian comfort, they would not be sufficient to improve the PLOS above 'E'.

Cyclists

The BLOS at intersections is dependent on several factors: the number of lanes that the cyclist is required to cross to make a left-turn; the presence of a dedicated right-turn lane on the approach; and the operating speed of each approach. The City target for BLOS along Spine Routes in the General Urban Area is 'C'.

The results of the analysis indicate that the BLOS target is met under both existing and future conditions.

Transit

None of the study area roadways are part of the rapid transit or transit priority network and therefore there is no TLOS target applicable to the study area intersections.

Trucks

TkLOS is only evaluated for right-turn movements which are expected to experience truck traffic and is based on the effective turn radius and the number of receiving lanes available.

Bank Street is designated as a truck route but Dun Skipper Drive as a local road is not a truck route. Although Dun Skipper Drive is not a truck route, due to the configuration of the 4836 Bank

Street development it is expected that trucks will enter the site via the right-in/right-out access on Bank Street and exit via the access on Dun Skipper Drive. As such, although trucks are not expected to make southbound right-turn movements at the Bank & Dun Skipper intersection, it is expected that there will be trucks making the eastbound right-turn at the intersection. Currently the TkLOS for that movement is 'F' due to the tight turning radius and the single receiving lane, however, following the Bank Street widening the turn radius will increase and the number of receiving lanes will increase to two resulting in a TkLOS of 'D' and therefore meets the TkLOS target.

The recommended measures listed above are intended only as suggestions to the City on how the MMLOS within the study area could be improved and do not identify measures to be implemented as a direct consequence of this development. The remediation measures described above would improve mobility and comfort for pedestrians and cyclists but are not required to accommodate the proposed development.

5.9 Geometric Review

The following section reviews all geometric requirements for the study area intersections. All relevant excerpts from referenced technical standards have been provided in **Appendix K**.

5.9.1 Sight Distance and Corner Clearances

Both private approaches have already been constructed and have previously been assessed for conformance with sight distance and corner clearance requirements in the 4836 Bank Street TIA (IBI Group, October 2019).

5.9.2 Auxiliary Lane Analysis

Auxiliary turning lane lengths for all intersections within the study area have been reviewed.

5.9.2.1 Unsignalized Auxiliary Left-Turn Lane Requirements

An auxiliary left-turn lane analysis for all applicable unsignalized intersections within the study area was completed under Future (2030) Total Traffic conditions. The Bank & Access #2 intersection is restricted to right-in/right-out movements, therefore no left-turn warrant analyses was completed for this access.

The MTO Geometric Design Standards for Ontario Highways left-turn warrant was applied to main street approaches using the highest left-turn volume from either the morning or afternoon peak hour. The results have been summarized below in **Table 23**.

Table 23 - Auxiliary Left-Turn Lane Analysis at Unsignalized Intersections

INTERSECTION	MVMT	POSTED SPEED (KM/H)	DESIGN SPEED (KM/H)	PERIOD	LEFT-TURN VOLUME (VPH)	APPROACH VOLUME (VPH)	OPPO-SING VOLUME (VPH)	LEFT-TURN STORAGE REQUIRED (m)
Dun Skipper & Proposed Access #1	WBL	50	60	AM	50	211	281	Not Warranted
				PM	54	353	264	Not Warranted

Note: Recommended storage lengths do not account for deceleration lane and taper lane lengths.

Based on the results of the auxiliary left-turn lane analysis, left-turn lanes are not warranted at any of the unsignalized study area intersections.

5.9.2.2 Signalized Auxiliary Left-Turn Requirements

A review of auxiliary left-turn lane storage requirements was completed at all signalized intersections within the study area under 2030 Total Traffic conditions. The review compared the projected 95th percentile queue lengths from Synchro operational results, and the standard queue length calculation based on the following equation:

$$Storage\ Length = \frac{NL}{C} \times 1.5$$

Where:
N = number of vehicles per hour
L = Length occupied by a vehicle in the queue = 7 m
C = number of traffic signal cycles per hour (3600 seconds per hour/cycle length)

The proposed storage length was obtained from the latest detailed design configuration for the intersection at the time of preparing this report. The results of the auxiliary left-turn lane analysis are summarized below in **Table 24**.

Table 24 - Recommended Auxiliary Left-Turn Storage Lengths at Signalized Intersections

INTERSECTION	APPROACH	95TH %ILE QUEUE LENGTH (M)	CALCULATED QUEUE LENGTH (M)	PROPOSED STORAGE LENGTH (M)	STORAGE DEFICIENCY (m)
Bank & Dun Skipper	NB	30	45	140	Proposed Storage Adequate
	EB	90	105	90	15

Recommended storage lengths do not include deceleration lane and taper lengths. Units rounded to nearest 5m.
 # - Synchro extrapolated queue length at congested intersections. From Synchro 9 User Guide "In practice, 95th percentile queue shown will rarely be exceeded and the queues shown with the # footnote are acceptable for the design of storage bays."

As shown in **Table 25** above, the proposed northbound left-turn lane is anticipated to have sufficient storage length to accommodate the projected queues while the eastbound left-turn lane is expected to be 15m deficient relative to the calculated queue length. It is not recommended that this auxiliary lane be extended, however, as the 95th percentile queue is not expected to exceed the available storage length and the calculated queue is not expected to block the site access. Furthermore, some queue spillback is acceptable given that Dun Skipper Drive is only a local road and there is a relatively small volume of right-turn traffic that might be impacted by any queue spillback that occurs.

5.9.2.3 Unsignalized Auxiliary Right-Turn Lane Requirements

The Transportation Association of Canada (TAC) suggests that auxiliary right-turn lanes be considered "when the volume of decelerating or accelerating vehicles compared with through vehicles causes undue hazard." Consideration for auxiliary right-turn lanes is typically given when the right-turning traffic exceeds 10% of the through volume and is at least 60 vehicles per hour.

As this condition is not expected at either Access #1 or Access #2, no auxiliary right-turn lanes are required. Furthermore, the results of the intersection capacity analysis indicate that both site access intersections operate at acceptable levels of service under Future (2030) Total Traffic conditions with shared through-right lanes.

5.9.2.4 Signalized Auxiliary Right-Turn Lane Requirements

Similarly, for signalized intersections Section 9.14 of TAC suggests that auxiliary right-turn lanes should be considered when more than 10% of vehicles on an approach are turning right and when the peak hour demand exceeds 60 vehicles. The purpose of this guideline is to mitigate operational impacts to through traffic, particularly on high-speed arterial roadways and may not be applicable in all circumstances.

Right-turn lane requirements were reviewed for main street approaches using the highest right-turn volume from either the morning or afternoon peak hour under 2030 Total Traffic conditions.

The results of the auxiliary right-turn lane analysis are summarized below in **Table 25**.

Table 25 – Auxiliary Right-Turn Lane Storage Analysis at Signalized Intersections

INTERSECTION	APPROACH	RIGHT TURN VOLUME	APPROACH VEHICLES TURNING RIGHT (%)	95TH %ILE QUEUE LENGTH (m)	PROPOSED STORAGE LENGTH (m)	STORAGE DEFICIENCY (m)[1]
Bank & Dun Skipper	SB	226	22%	<10	75	Proposed Storage Adequate

Notes:
[1] - Recommended storage lengths do not include deceleration lane and taper lengths. Units rounded to nearest 5m.

Based on the results of **Table 25** above, and confirmed through intersection capacity analyses, no modifications to the proposed storage lengths are required as a result of right-turning traffic at the Bank & Dun Skipper intersection.

5.10 Summary of Recommended Improvements

Based on the results of the intersection capacity analysis, Multi-Modal Level of Service analysis and auxiliary lane analysis, the study area intersections are expected to operate well and the only recommendation is that the City consider implementing right-turn-on-red restrictions and leading pedestrian intervals at the Bank & Dun Skipper intersection as a means of improving pedestrian comfort.

6 Conclusion

The proposed residential development at 4840 Bank Street is expected to generate approximately 72 two-way person-trips during both the weekday morning and afternoon peak hours. Mode share targets were developed for the proposed development based on the existing mode share distribution identified in the 2020 TRANS Trip Generation Manual Summary Report as well as consideration of the local context. By 2030, the proposed development is anticipated to generate approximately 39 and 41 two-way vehicle-trips during the weekday morning and afternoon peak hours, respectively. All study area intersections are expected to operate at acceptable level of service (LOS 'D' or better) within the timeframe of this study. As such, a post-occupancy Monitoring Plan is not required as part of this TIA.

Overall, the proposed development is expected to integrate well with adjacent road network. As the transportation network in the Leitrim Community is built to its ultimate configuration with the four-lane widening of Bank Street, including enhanced facilities for pedestrians and cyclists, this corridor is expected to have sufficient capacity to accommodate multi-modal travel demands associated with both background and site-generated traffic. The extents of the current phase of the Bank Street widening terminate immediately north of the proposed development, however, it is expected that Bank Street will ultimate be widened up to Rideau Road which will improve conditions immediately adjacent to the site.

An analysis of the access configuration concludes that there are no operational issues to be expected and that no off-site improvements to the adjacent transportation network will be required to accommodate the multi-modal demands of the proposed development. As such, the TIA does not include an RMA component.

Based on the findings of this study, it is the overall opinion of IBI Group that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network with the appropriate actions and modifications in place.

Appendix A – City Technical Comments

4840 Bank Street
Meeting Summary Notes
Jan 12, 2022, Online Teams Meeting

Attendees:

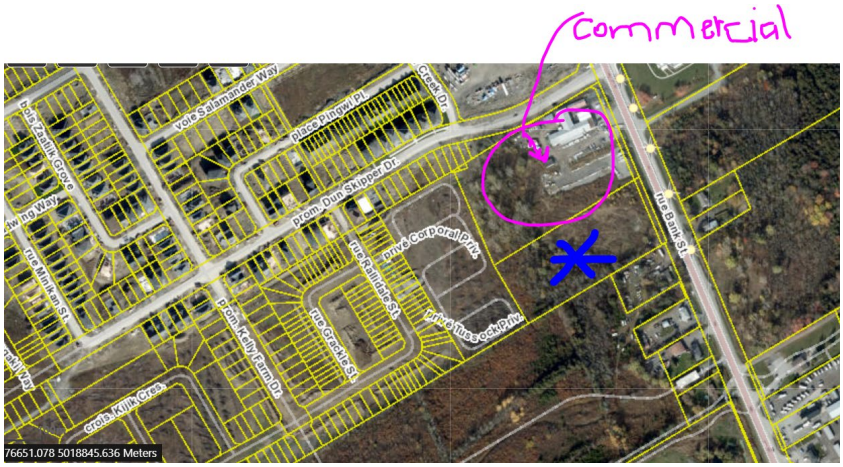
- Kelly Rhodenizer, Regional Group
- Nikita Jariwala, Regional Group
- Erin O'Connor – Regional Group;
- James Ireland (Novatech)
- David Hook – IBI, traffic
- Doug Cave (Jim Moffat) IBI, Civic
- Tyler Cassidy, Kelsey Charie (Project Manager, EIT, City of Ottawa)
- Christopher Moise (Urban Designer, Architect, City of Ottawa)
- Mark Richardson, Planning Forester
- James Holland, SNCA
- Burl Walker, Parks
- Tracey Scaramozzino (File Lead, Planner, City of Ottawa)

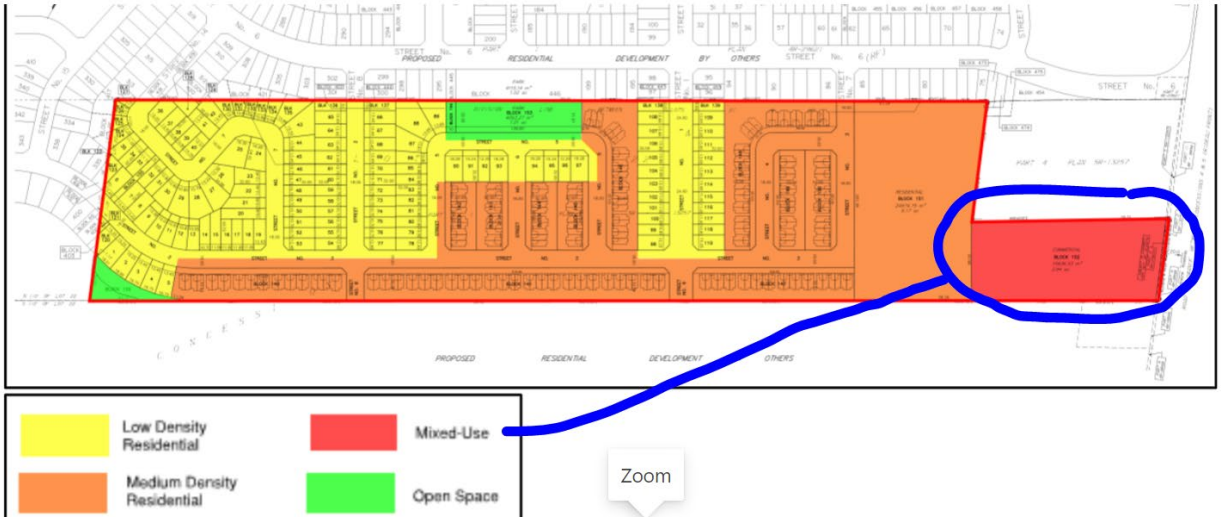
Not in Attendance:

- Matthew Hayley, Environmental Planner
- Mike Giampa (Transportation Project Manager, City of Ottawa)

Issue of Discussion:

- PUD Site Plan for 3, 6-storey rental apts, 92-units each; Total of 276 d/u; 173 parking at grade and 158 parking u/g
- Similar Product to a recently approved site plan at 2045, 2055, 2065 Portobello Blvd, Orleans.
- Within Idone Plan of Subdivision D07-16-17-0006





Planning Rationale from the Ione Draft Plan of Subdivision

Proposal

Elevations from 2045, 2055, 2065 Portobello Blvd, Orleans – similar to current proposal

1. **Current Official Plan**
    1. General urban, Developing Community/Expansion Area

2. **Draft Official Plan**
    1. Suburban Transect, Hub and Evolving n'hood designation

3. **Zoning Information**
    1. GM (with R5 to west, GM to north and rural to the south)
    2. Clarification that this site falls is in Area D of the parking schedule and <u>tenant</u> parking is required at 1 space/du.

Table 101- Minimum parking space rates R12 to R21 (By-law 2016-249)

Row	I Land Use	II Area X and Y on Schedule 1A	III Area B on Schedule 1A	IV Area C on Schedule 1A	V Area D on Schedule 1A
R12	Dwelli Mid-high Rise Apartme	0.5 per dwelling unit	0.5 per dwelling unit	1.2 per dwelling unit	1 per dwelling unit
R13	[reserved]				

4. **Infrastructure/Servicing (Tyler Cassidy):**

1. The Servicing Study Guidelines for Development Applications are available at the following address:
https://ottawa.ca/en/city-hall/planning-and-development/how-developproperty/development-application-review-process-2/guide-preparing-studies-and-plans
2. Servicing and site works shall be in accordance with the following documents:

- Ottawa Sewer Design Guidelines (October 2012) and all the Technical Bulletins including, Technical Bulletin PIEDTB-2016-01 and ISTB-2018-01
- Ottawa Design Guidelines – Water Distribution (2010) and Technical Bulletins ISD-2010-2, ISDTB-2014-02 and ISTB-2018-02
- Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
- City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- City of Ottawa Environmental Noise Control Guidelines (January, 2016)
- City of Ottawa Park and Pathway Development Manual (2012)
- City of Ottawa Accessibility Design Standards (2012)
- Ottawa Standard Tender Documents (latest version)
- Ontario Provincial Standards for Roads & Public Works (2013)

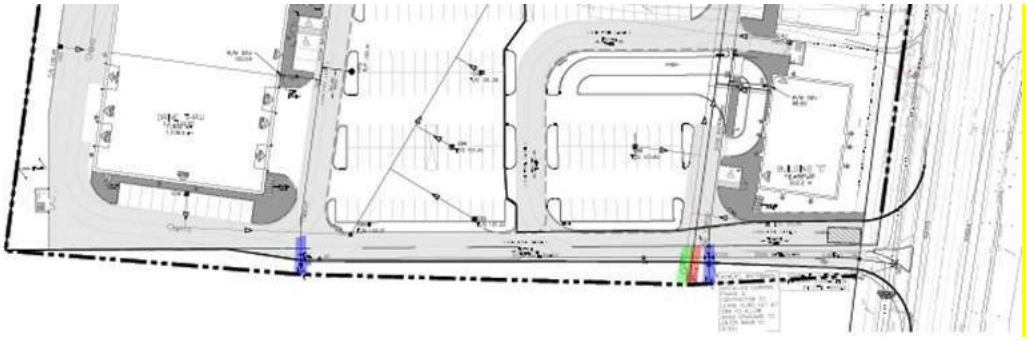
3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x 44455
4. The Stormwater Management Criteria, for the subject site, is to be based on the following background studies"

- 2016 Updated Servicability Report (Class EA OPA 76 Areas 8a, 9a & 9b) Leitrim Development Area (IBI Group, September 2016)
- Design Brief, Pathways at Findlay Creek, 4800 Bank Street (Remer Lands) Phase 1 (IBI Group July 2017)
- Design Brief, Bank Street Development, 4836 Bank Street (IBI Group April 2019).

<u>The Stormwater Management Criteria is as follows</u>:

a. Allowable release rate of 291.58 L/s for the site.
b. Flows to the storm sewer in excess of the 2-year storm release rate, up to and including
c. the 100-year storm event, must be detained on site
d. Ensure no overland flow for all storms up to and including the 100-year event.
e. The 2-yr storm or 5-yr storm event using the IDF information derived from the
f. Meteorological Services of Canada rainfall data, taken from the Ottawa Macdonald Cartier International Airport, collected 1966 to 1997.
g. A calculated time of concentration (Cannot be less than 10 minutes).
h. Quality control requirements to be provided by Rideau Valley Conservation Authority (RVCA). Note that Quality Control for the site is provided by the Findlay Creek Stormwater Management Facility.

5. Deep Services



i. A plan view of the approximate services may be seen above. Services should ideally be grouped in a common trench to minimize the number of road cuts. The sizing of available future services is:

a. Connections (4836 Bank Street):

i. MH1 w/ 600 mm dia. STM (Conc.)
ii. 203 mm dia. Watermain (PVC)
iii. MH1A 200 mm dia. SAN (PVC)

ii. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.

iii. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).

iv. Provide information on the type of connection permitted

Sewer connections to be made above the springline of the sewermain as per:

a. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.
b. Std Dwg S11 (For rigid main sewers) – lateral must be less that 50% the diameter of the sewermain,
c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,
d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.
e. No submerged outlet connections

v. Please note that coordination for servicing is required with the Owner of 4836 Bank Street to ensure that planned services are available for the site's designated outlet once development begins.

6. Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission. Water Boundary condition requests must include the

location of the service and the expected loads required by the proposed development. Please provide the following information:

i. Location of service(s)
ii. Type of development and the amount of fire flow required (as per FUS, 1999).
iii. Average daily demand: ___ l/s.
iv. Maximum daily demand: ___l/s.
v. Maximum hourly daily demand: ___ l/s.
vi. Hydrant location and spacing to meet City's Water Design guidelines.
vii. Water supply redundancy will be required for more than 50 m3/day water demand.

7. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
8. If applicable, MECP ECA Requirements –

All development applications should be considered for an Environmental Compliance Approval (ECA) by the Ministry of the Environment, Conservation, and Parks (MECP);

a. Consultant determines if an approval for sewage works under Section 53 of OWRA is required. Consultant then determines what type of application is required and the City's project manager confirms. (If the consultant is not clear if an ECA is required, they will work with the City to determine what is required. If the consultant it is still unclear or there is a difference of opinion only then will the City PM approach the MECP.

b. **In our opinion, the stormwater works for 4840 Bank Street are covered under existing ECA NUMBER 7857-BQ3J3V dated June 17, 2020 for 4836 Bank Street. However, please have your consultant review the ECA requirements and determine if one if required.**

6. Initial Planning Comments

1. This site was intended to be mixed-use as per the draft plan of subdivision. Why is it now being developed for residential only?
2. Provide street trees at ROW and ample landscaping around property line
3. What is view like on north side of site – abutting the commercial site?
4. Show elevations vis a vis the current and future development on abutting properties.
5. Show some uses in the amenity area – to give an idea of how they might be used and to give us a better understanding of their sizes.
6. Show surrounding uses in grey-ed out lines – especially the full access to the site.
7. Glad to see garbage is inside
8. Appreciate that a lot of the parking is u/g
9. Where is bike parking?
10. Will the site be fenced?
11. Ensure ped access to and through the site. – How does it interact with abutting sites?

12. Keep bird-safe principles in mind – in terms of glazing on corners, use of decals etc.
13. Please consider using a variety of Local, Native, Non-invasive species;
14. Speak to Councillor Darouze and relevant community associations.

7. Urban Design Comments (Christopher Moise):

Comments

- This proposal is not within the City's Design Priority Areas and does not need to attend the City's UDRP. Staff will be responsible for evaluating the proposal and providing design direction;
- If the decision has been made not to develop a mixed use project what are some of the intents that are being left out of the proposal and how can this project accommodate them?
    - Access from Bank street: Vehicles and pedestrians;
    - Buildings that support the public right of way: Buildings that provide a frontage and entrances facing Bank;
        - Create an urban street edge. Landscaping and primary entrances facing Bank Street;
        - Can the Bank Street treatment be designed to act as building front and not side yard condition?
    - Can surface parking be screened and separated from Bank Street with strategic landscaping?
    - We recommend a sidewalk on the Bank Street frontage that would help provide pedestrian connectivity to parks and commercial sites to the north on Bank Street;
    - Would a pedestrian connection to the properties to the west be beneficial?
    - How does the massing relate to the surrounding properties? Please illustrate the massing on the site with dimensions and illustrating transition if necessary;
    - Since there will be residents without cars will there be additional pedestrian connection to Bank street (bus network, etc.);
    - Trees: Are there trees on the site that can be preserved? Ie in the amenity space or around the perimeter of the site?
    - Landscaping: We recommend consideration for trees and screening elements be illustrated on the landscaping plan, detailing amenity spaces and public street frontages;
- We recommend the buildings fronting Bank street provide additional ground floor height to accommodate future commercial uses if possible;
- A scoped Design Brief is a required submittal (and separate from any UDRP submission) for all Site Plan/Re-zoning applications and can be combined with the Planning Rationale. Please see the Design Brief Terms of Reference provided.
    - We would like to see the massing on the site as well as the elevations for the buildings;

8. Parks (Burl Walker):

1. The applicant is proposing to develop three 6-storey rental apartment buildings with a total of 276 apartment dwelling units. The total site area is shown as 15,344 sq. m on the Site Plan. The property is described as Block 204 on Plan 4M-1653 within the Pathways at Findlay Creek South subdivision.

2. Condition C.13(a) to Schedule "H" of the Pathways at Findlay Creek South Phase 1 subdivision agreement describes the parkland dedication calculations for the subdivision. The calculations were based on the development of 100% commercial uses on Block 204. A combination of parkland conveyance and cash-in-lieu of parkland dedication was provided at the time of registration of the subdivision agreement. As per subsection 13(1)(b) of the Parkland Dedication By-law, parkland dedication will be required for the proposed development since land that was originally proposed for commercial purposes is now proposed for residential use.

3. This area of Leitrim is serviced by three parks – Salamander Park, Miikana Park and Dun Skipper Park. Salamander Park is currently under construction. Miikana Park is in the detail design phase with construction anticipated to commence this year. The Dun Skipper Park project was recently initiated. Salamander Park and Dun Skipper Park are located approximately 400m from the site, while Miikana Park is about 900m from the site. Additional parkland conveyance is not needed for this area. Cash-in-lieu of parkland dedication will be required as a condition of site plan approval.

4. The following is a draft cash-in-lieu of parkland dedication condition based on the provisions of the current Parkland Dedication By-law:

   The Owner agrees to provide cash-in-lieu of parkland dedication on the subject lands within Ward 20 such value of the land to be determined by the City's Realty Services Branch, to the satisfaction of the General Manager, Recreation, Cultural and Facility Services. The Owner further agrees to pay for the cost of the appraisal inclusive of HST. In accordance with the Planning Act and the City of Ottawa Parkland Dedication By-law, a land area of 0.121 ha has been calculated for the cash-in-lieu of parkland dedication requirement has been calculated as follows:

/ Land Use	Proposed Dwelling Units	Land Area	Cash-in-lieu of Parkland Dedication Rate	Parkland Dedication Requirement
Apartment	276	1.534 ha (area of site being developed)	1 ha per 500 dwelling units to a maximum of 10% of the area of the site being developed	0.153 ha
Commercial (credit for previous parkland dedication at the time of registration of the Phase 1 subdivision agreement)		1.594 ha (gross land area including Street Widening Block 212 on Plan 4M-1653 adjacent to Block 204)	2% of gross land area	(0.032 ha)
Net Parkland Dedication Requirement				0.121 ha

The cash-in-lieu of parkland dedication shall be directed 60% towards the Ward 20 cash-in-lieu of parkland reserve (Account 830309) and 40% towards the City-wide cash-in-lieu of parkland reserve (Account 830015).

5. The City will be replacing the Parkland Dedication By-law prior to September 18, 2022. If the new Parkland Dedication By-law comes into force during the Site Plan Control application process, the final cash-in-lieu of parkland dedication requirement will be determined based on the provisions of the new Parkland Dedication By-law and the applicable subsections of the Planning Act.

6. Consider how residents from the development will access the parks in the neighbourhood. Provide for connections to the future sidewalk on the west side of Bank Street adjacent to the site. Pedestrian linkages to the abutting commercial site to the north should also be provided to support pedestrian access through the commercial site to reach the sidewalks on Dun Skipper Drive, which connect to Dun Skipper Park and Miikana Park.

9. Trees (Mark Richardson):

TCR requirements:

1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
    a. an approved TCR is a requirement of Site Plan approval.
    b. The TCR may be combined with the LP or EIS provided all information is supplied
2. Any removal of privately-owned trees 10cm or larger in diameter, or City-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
3. The TCR must document all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition
4. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
5. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
6. All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
7. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
8. For more information on the TCR requirements or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

LP tree planting requirements:

For additional information on the following please contact tracy.smith@Ottawa.ca

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
- Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please ensure adequate soil volumes are met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18

Conifer	25	15

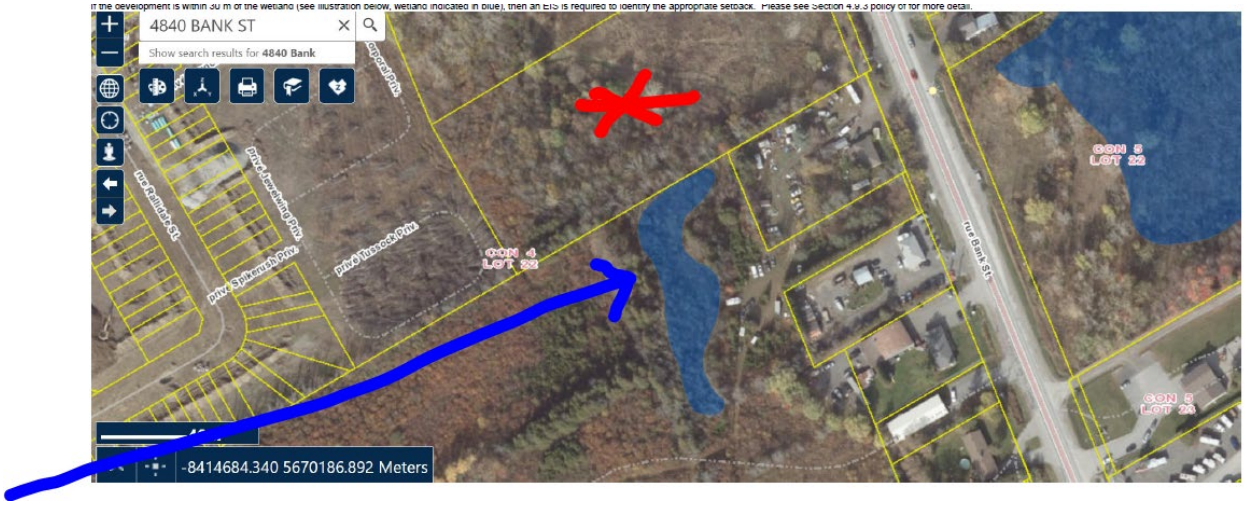
Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

10. Environment (Matthew Hayley):

1. Urban Heat Island
   Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building differently.
2. Bird Safe
   Given the height of the proposal (mid to high rise) the proposal will need to review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans .
3. Surface Water
   Setback may be required for the wetlands as per the OP and an EIS is required to determine appropriate setback. See OPs. 4.9.3, 6f for more details.



11. Conservation Authority (James Holland, SNCA)

Natural Heritage

- The CA's mapping does not identify natural heritage features for the site.

Stormwater Design

- If stormwater management is being directed to approved municipal infrastructure, the Conservation Authority does not complete a technical review of the design. If there is uncontrolled drainage or flows to a watercourse, a technical review may be completed. This will be determined during the first review.
- The stormwater quality control should achieve an 80% TSS removal. The design should include best management practices for sediment and erosion control.

CA Regulations

- Any interference with a watercourse may require a permit under O. Reg. 170/06, and restrictions may apply. This will be determined during the first review.

12. Transportation (Mike Giampa)

1. A TIA is warranted, please proceed to scoping.
2. The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
3. Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
4. Synchro files are required at Step 4.
5. ROW protection on Bank Street is 44.5 m (to be confirmed with the approved Bank Street EA).
6. A Road Noise Impact Study is required
7. Clear throat requirements as per TAC guidelines- this applies to existing and proposed accesses.
8. Bank Street widening (Leitrim to Dunskipper) is tentatively scheduled to begin in 2023.

13. Waste Collection

1. Please see City's Waste Management Guidelines for multi-unit residential: http://ottawa.ca/calendar/ottawa/citycouncil/pec/2012/11-13/Solid%20Waste%20Collection%20Guidelines%20-%20Doc%201.pdf

14. General Information

1. Ensure that all plans and studies are prepared as per City guidelines – as available online:

https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans

Step 1 & 2 Submission (Screening & Scoping) – Circulation Comments & Response

Report Submitted: April 22, 2022
Comments Received: May 4, 2022
Transportation Project Manager: Mike Giampa

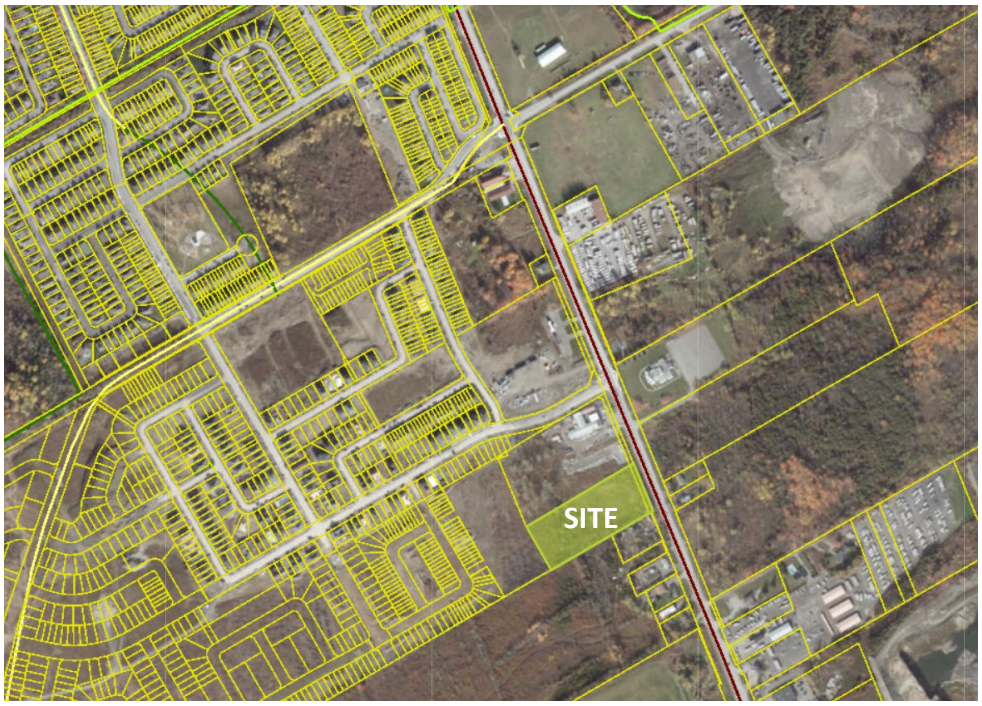
I don't have any issues with your scoping. Combing steps 3 and 4 is fine considering the size.

- IBI Response: Noted.

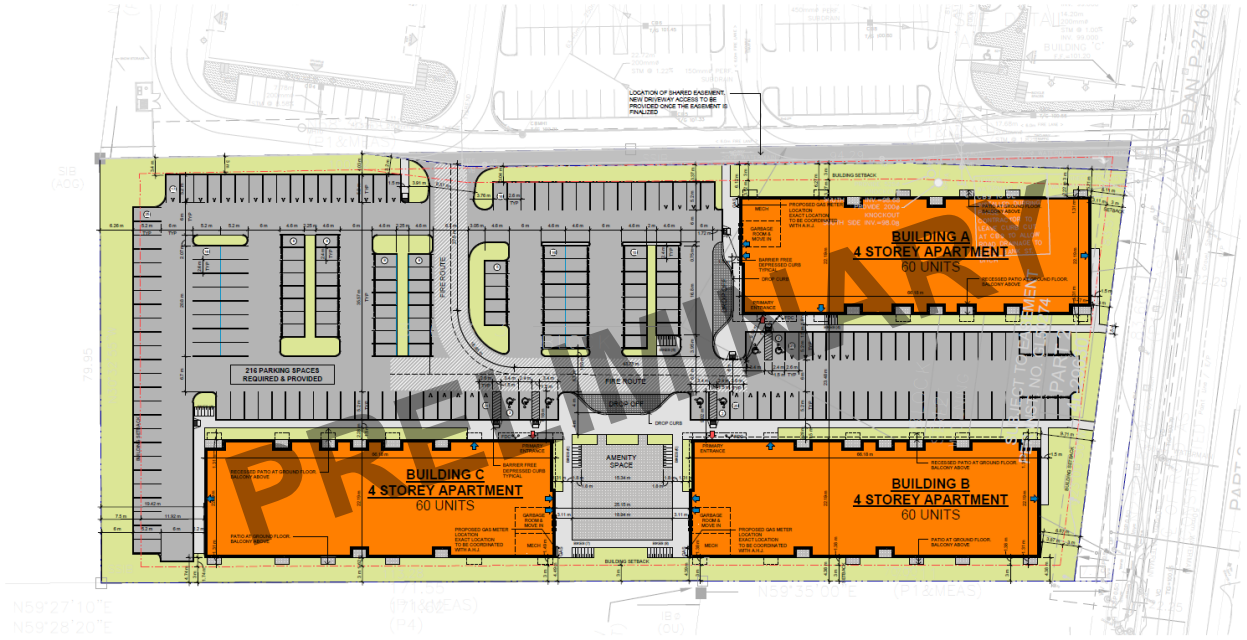
Appendix B – Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	4840 Bank Street
Description of Location	Leitrim Community – West of Bank Street and approx. 122 metres south of Dun Skipper Drive 
Land Use Classification	Residential
Development Size (units or m^2)	180 apartment units
Development Lot Size (m^2)	N/A
Number of Accesses and Locations	One existing right-in/right-out access on Bank Street, shared with the adjacent 4836 Bank St commercial development. One existing all movements access on Dun Skipper Drive, accessed through the adjacent 4836 Bank St commercial development.
Phase of Development	Single Phase
Buildout Year	2024-2025

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



2. Trip Generation Trigger

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

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

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

- **Based on the results above, the Trip Generation Trigger is satisfied.**

3. Location Triggers

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

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

➢ **Based on the results above, the Location Trigger is satisfied.**

4. Safety Triggers

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

➢ **Based on the results above, the Safety Trigger is satisfied.**

5. Summary

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

CONCLUSION: The Trip Generation and Safety Triggers are satisfied; therefore a TIA is required.

Heading	Include	Rationale
Introduction	✓	
TIA Screening	✓	
Project Scoping	✓	
Description of Proposed Development	✓	
Site Location	✓	
Land Use Details	✓	
Development Phasing & Date of Occupancy	✓	
Existing Conditions	✓	
Existing Road Network	✓	
Roadways	✓	
Driveways Adjacent to Development Access	✓	
Intersections	✓	
Traffic Management Measures	✓	
Existing Bicycle and Pedestrian Facilities	✓	
Existing Transit Facilities and Service	✓	
Collision History	✓	
Planned Conditions	✓	
Transportation Network	✓	
Future Road Network Projects	✓	
Future Transit Facilities and Services	✓	
Future Cycling and Pedestrian Facilities	✓	
Future Adjacent Developments	✓	
Network Concept Screenline		N/A - Development is not expected to generate over 200 person trips.
Study Area	✓	
Time Periods	✓	
Existing Traffic Volumes	✓	
Analysis Years	✓	
Exemptions Review	✓	
Forecasting	✓	
Development Generated Traffic	✓	
Trip Generation Methodology	✓	
Trip Generation Results (Residential)	✓	
Peak Period Person-Trip Generation	✓	
Mode Share Proportions	✓	
Trip Generation by Mode	✓	
Peak Hour Generation	✓	
Trip Reduction Factors		only residential uses on a greenfield site
Trip Generation Results (Non-Residential)		development is entirely residential
Base Vehicle Trip Generation		
Person Trip Generation		
Mode Share Proportions		
Trip Reduction Factors		
Trip Generation by Mode		
Trip Distribution and Assignment	✓	

Background Network Traffic	✓	
Changes to Background Traffic Network	✓	
General Background Growth Rates	✓	
Other Area Development	✓	
Demand Rationalization	✓	
Description of Capacity Issues	✓	
Adjustment to Development Generated Demands	✓	
Adjustment to Background Network Demands	✓	
Traffic Volume Summary	✓	
Future Background Traffic Volumes	✓	
Future Total Traffic Volumes	✓	
Analysis	✓	
Development Design	✓	
Design for Sustainable Modes	✓	
Circulation and Access	✓	
New Street Networks		Not required for site plan applications.
Parking	✓	
Parking Supply	✓	
Spillover Parking	✓	
Boundary Streets	✓	
Mobility	✓	
Road Safety	✓	
Intersections	✓	
Roadway Segments	✓	
Access Intersections	✓	
Location and Design of Access	✓	
Access Intersection Control		Site access already exists
Access Intersection Design		
Transportation Demand Management (TDM)	✓	
Context for TDM	✓	
Need and Opportunity	✓	
TDM program	✓	
Neighborhood Traffic Managament	✓	
Adjacent Neighborhoods	✓	
Transit	✓	
Route Capacity	✓	
Transit Priority Measures	✓	
Review of Network Concept		Development is not expected to generate over 200 person trips.
Intersection Design	✓	
Intersection Control		Not required, Bank & Dun Skipper intersection will retain signalized traffic control.
All-Way Stop Warrants		
Traffic Signal Warrants		
Roundabout Analysis		
Intersection Analysis Criteria (Automobile)	✓	
Signalized Intersections	✓	

Unsignalized Intersections	✓	
Intersection Capacity Analysis	✓	
Multi-Modal Level of Service	✓	
Intersection Pedestrian Level of Service (PLOS)	✓	
Intersection Bicycle Level of Service (BLOS)	✓	
Intersection Transit Level of Service (TLOS)	✓	
Intersection Truck Level of Service (TkLOS)	✓	
Geometric Review	✓	
Sight Distance and Corner Clearances		Not required, sight distance and corner clearances were assessed as part of the 4836 Bank St TIA.
Auxiliary Lane Analysis	✓	
Unsignalized Auxiliary Left-Turn Lane Requirements	✓	
Signalized Auxiliary Left-Turn Lane Requirements	✓	
Unsignalized Auxiliary Right-Turn Lane Requirements	✓	
Signalized Auxiliary Right-Turn Lane Requirements	✓	
Summary of Improvements Indicated and Modification Options	✓	
Conclusion	✓	

Appendix C – OC Transpo Routes

93

Local

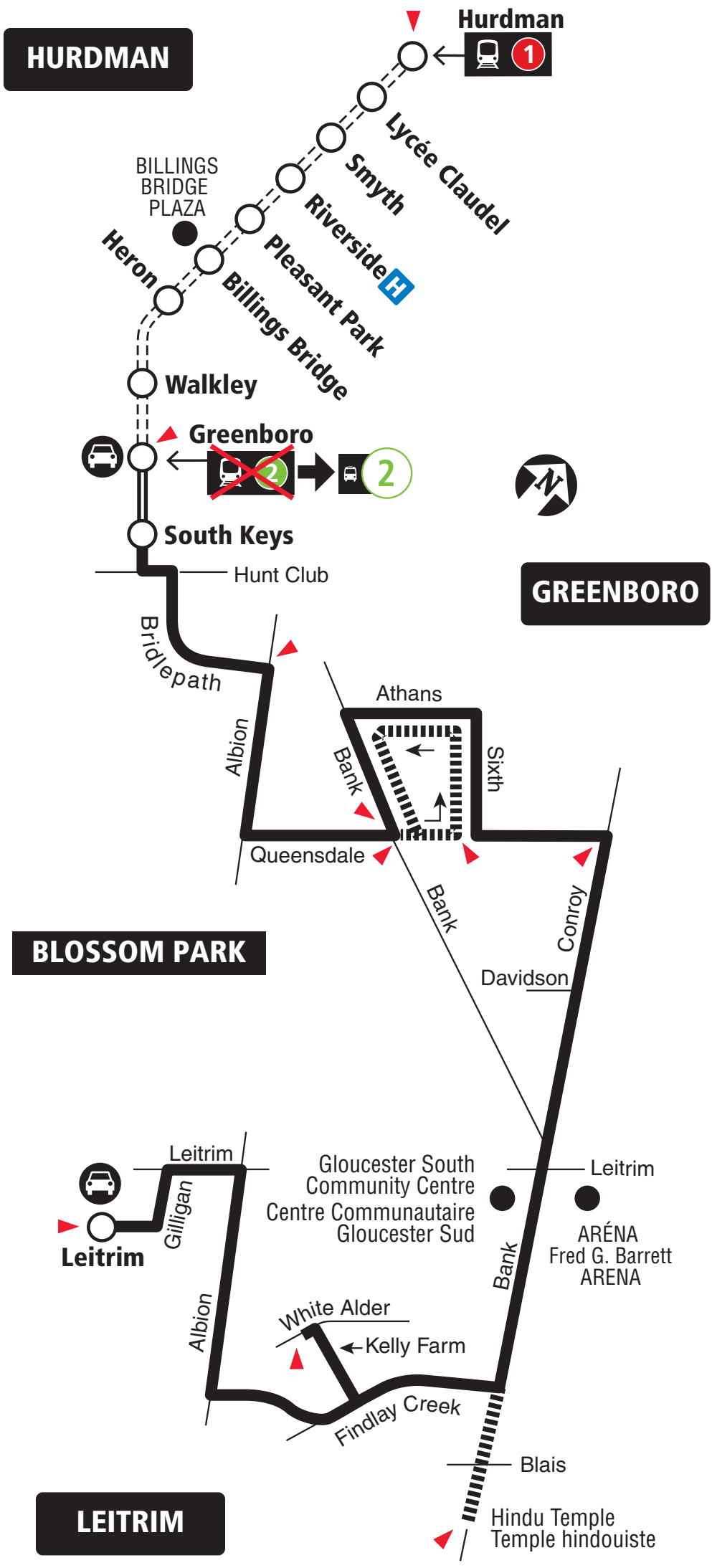
LEITRIM BLOSSOM PARK

GREENBORO HURDMAN

7 days a week / 7 jours par semaine

All day service

Service toute la journée



Transitway & Station

Peak periods/ Périodes de pointe

Some Sunday trips / Quelques trajets le dimanche

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

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

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

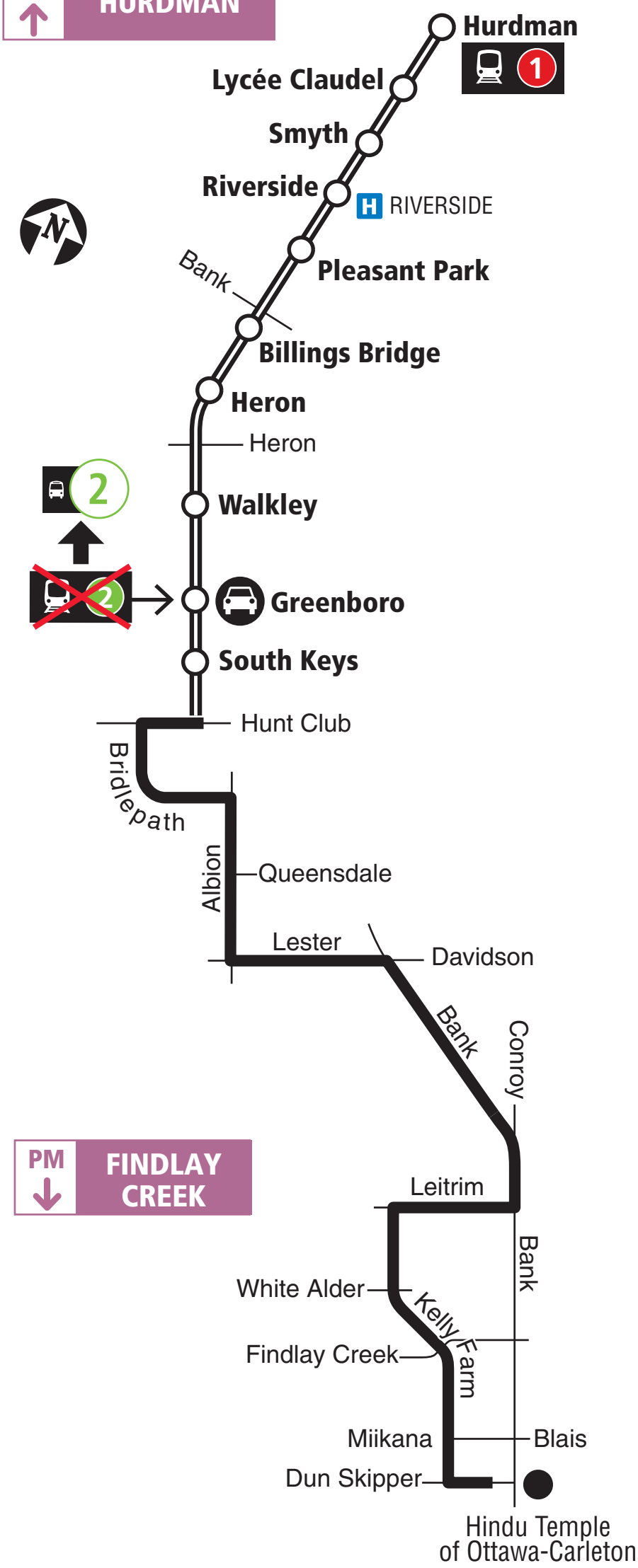
294 Connexion

HURDMAN
FINDLAY CREEK

Monday to Friday / Lundi au vendredi

Peak periods only
Périodes de pointe seulement

AM ↑ HURDMAN



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

Local

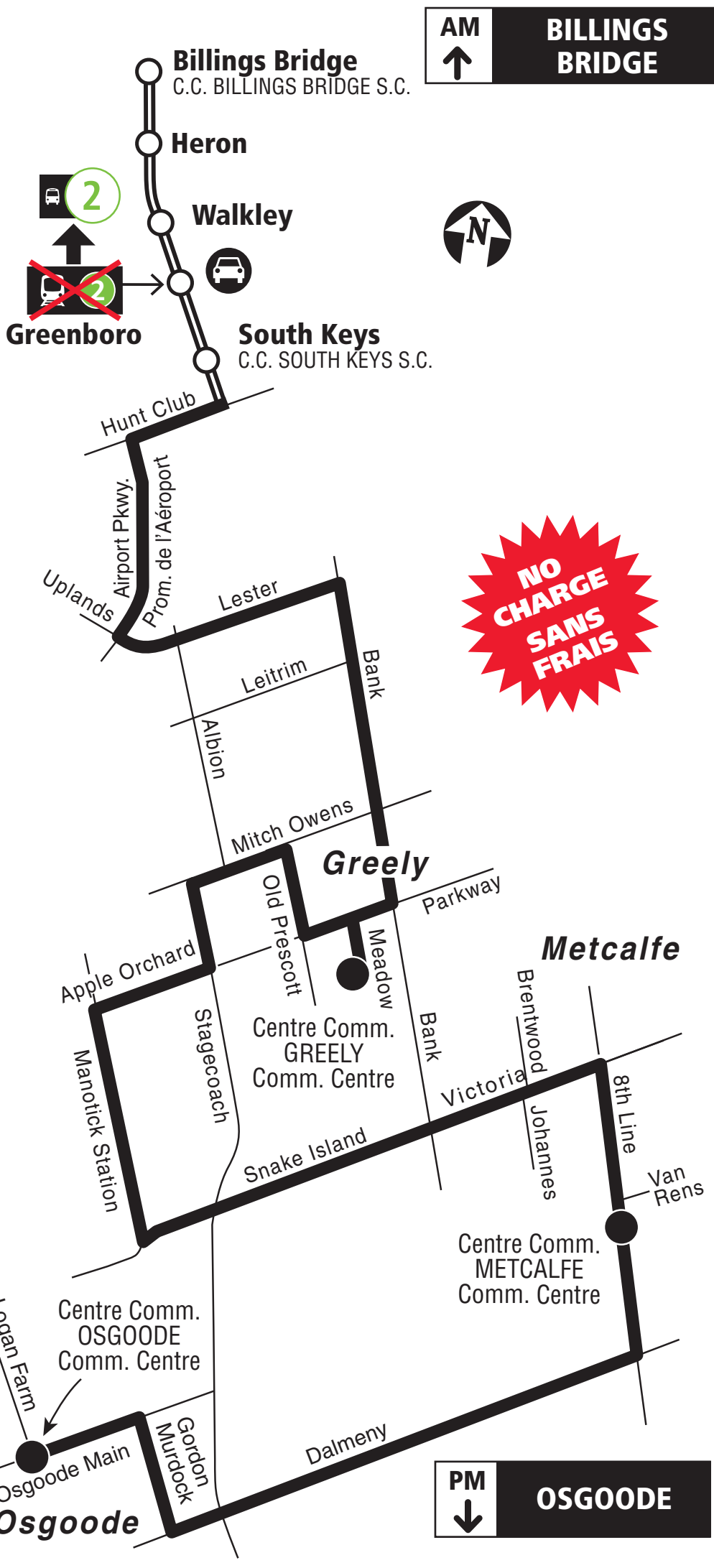
BILLINGS BRIDGE

METCALFE, GREELY OSGOODE

Thursday only / Jeudi seulement

Selected time periods

Périodes sélectionnées



NO CHARGE
SANS FRAIS

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**

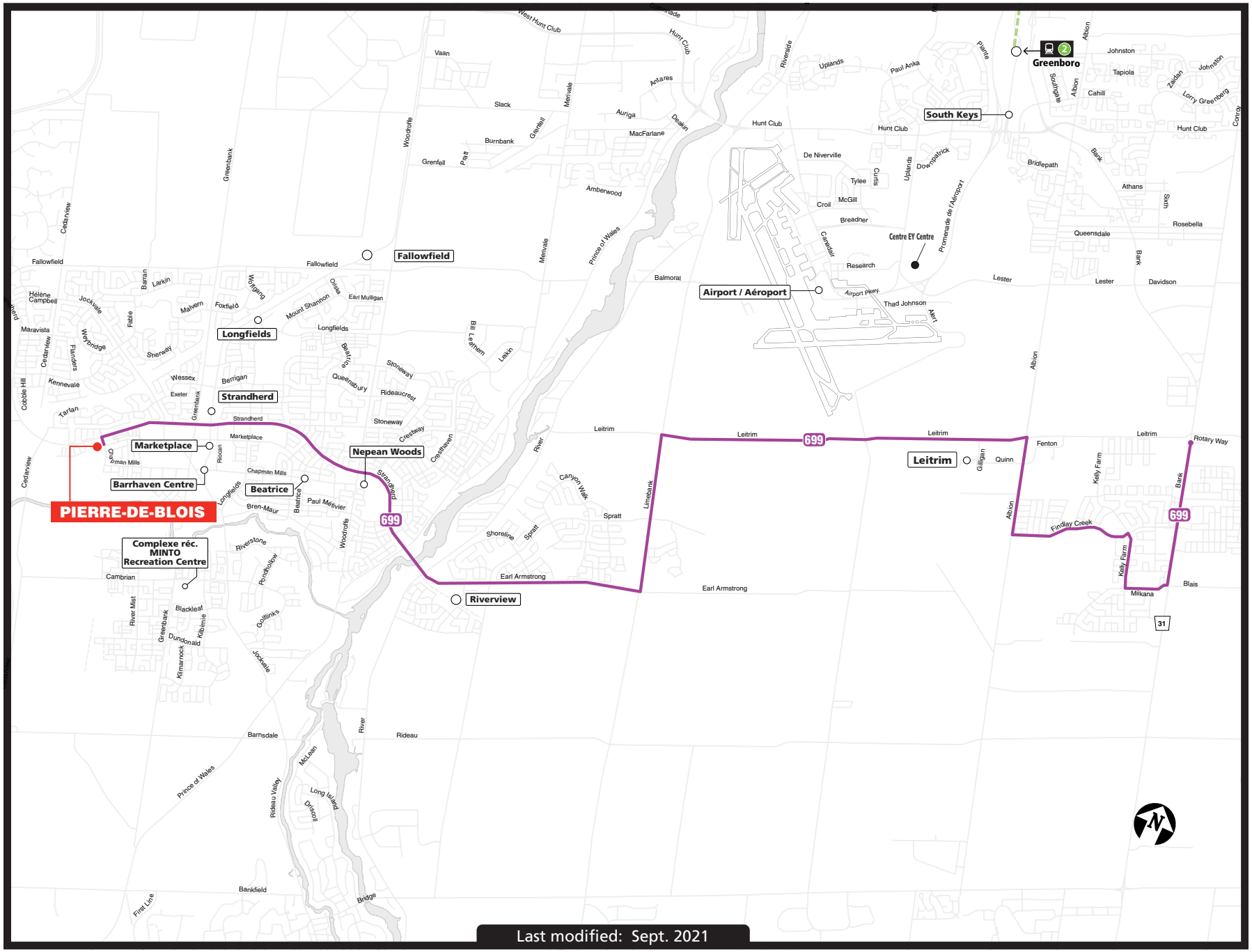
Security / Sécurité **613-741-2478**

Effective May 3, 2020

En vigueur 3 mai 2020

OC Transpo

INFO 613-741-4390
octranspo.com


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

Appendix D – Collision Data

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: BANK ST @ BLAIS RD

Traffic Control: Stop sign

Total Collisions: 13

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

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: BANK ST @ BLAIS RD

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

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

Location: BANK ST @ DUN SKIPPER DR

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

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

Appendix E – Traffic Data

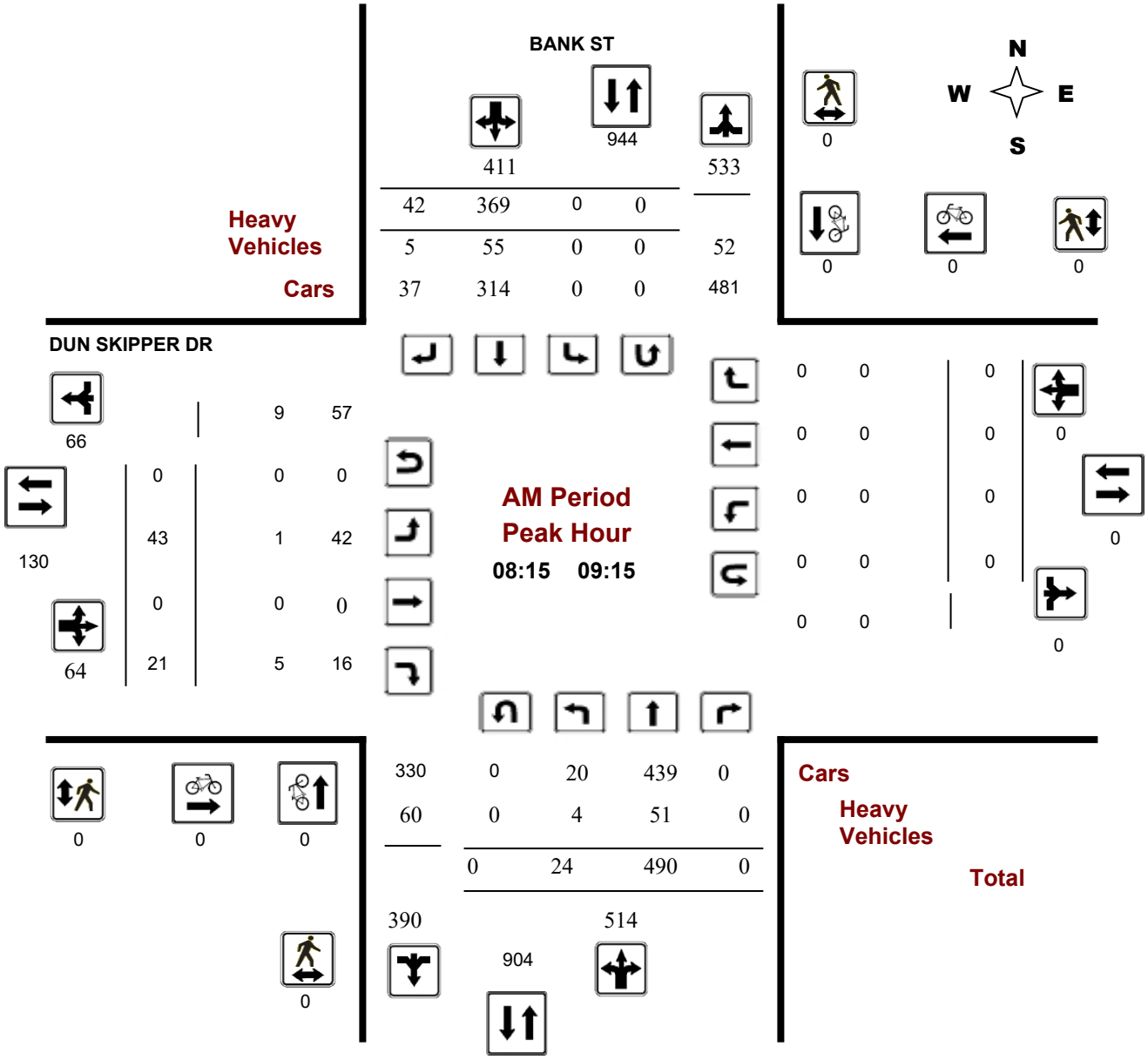
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ DUN SKIPPER DR

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

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



Comments

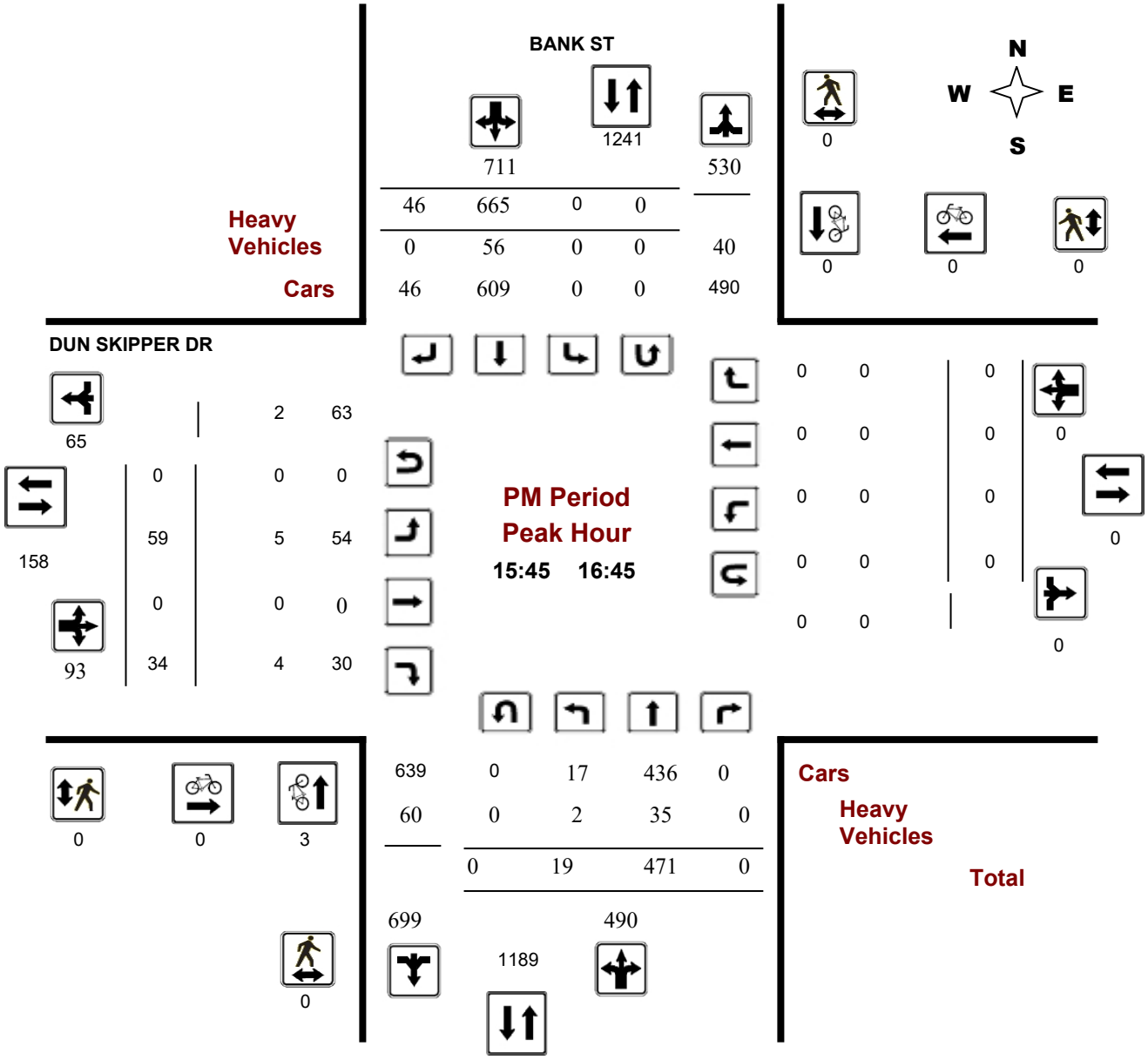
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ DUN SKIPPER DR

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

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



Comments

Appendix F – Trip Generation Data

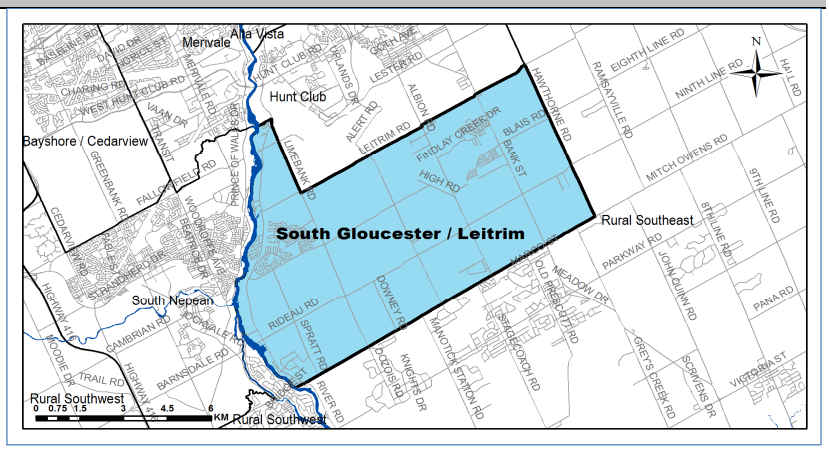
South Gloucester / Leitrim

Demographic Characteristics

Population	17,600	Actively Travelled	14,190
Employed Population	8,910	Number of Vehicles	11,080
Households	6,240	Area (km^2)	78.9

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	4,550	3,630	8,180
Part Time Employed	130	590	730
Student	2,160	2,130	4,290
Retiree	720	770	1,490
Unemployed	90	220	320
Homemaker	20	540	560
Other	80	120	200
Total:	7,750	8,010	15,760

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	790	1,070	1,850
Licensed Drivers	5,790	5,940	11,730
Telecommuters	60	10	70
Trips made by residents	20,810	24,430	45,240



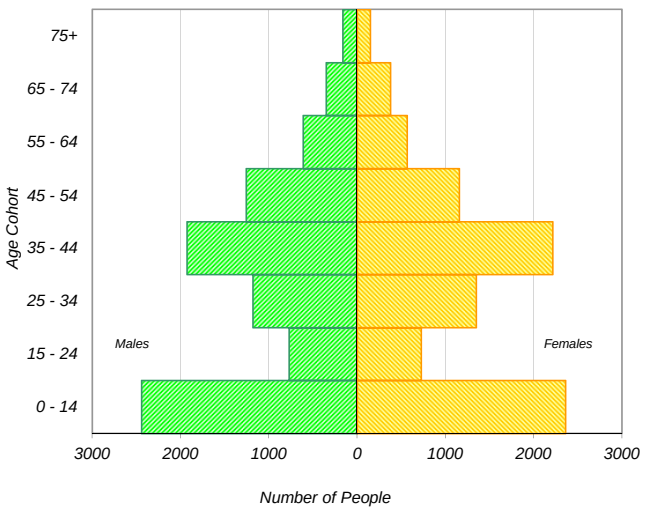
Household Size		
1 person	880	14%
2 persons	1,870	30%
3 persons	1,170	19%
4 persons	1,630	26%
5+ persons	690	11%
Total:	6,240	100%

Households by Vehicle Availability		
0 vehicles	40	1%
1 vehicle	2,080	33%
2 vehicles	3,510	56%
3 vehicles	510	8%
4+ vehicles	100	2%
Total:	6,240	100%

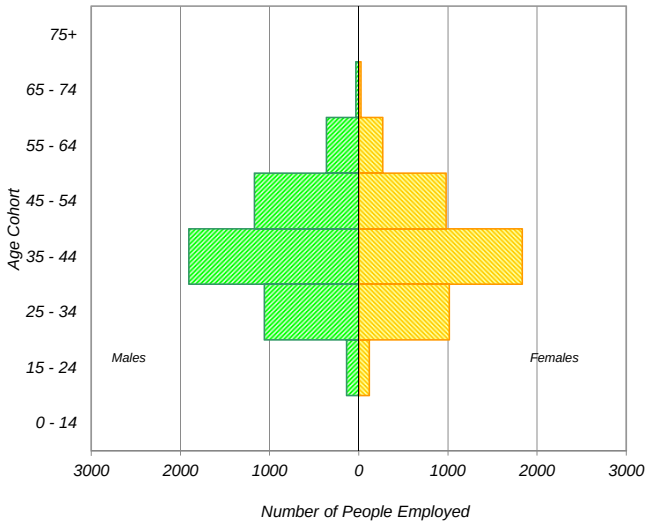
Selected Indicators	
Daily Trips per Person (age 5+)	2.87
Vehicles per Person	0.63
Number of Persons per Household	2.82
Daily Trips per Household	7.25
Vehicles per Household	1.78
Workers per Household	1.43
Population Density (Pop/km2)	220

Households by Dwelling Type		
Single-detached	3,300	53%
Semi-detached	770	12%
Townhouse	2,010	32%
Apartment/Condo	150	2%
Total:	6,240	100%

Population



Employed Population

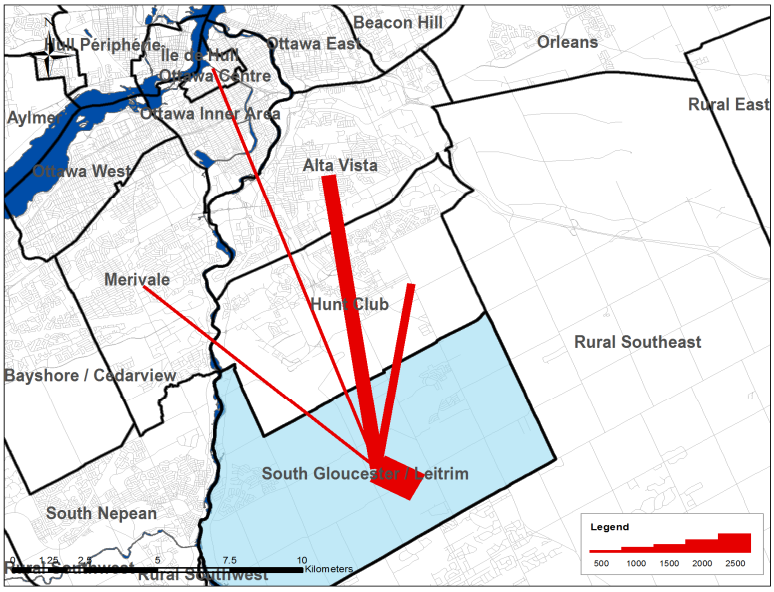


* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Destinations of Trips from South Gloucester / Leitrim

AM Peak Period



Summary of Trips to and from South Gloucester / Leitrim

AM Peak Period (6:30 - 8:59) Districts	Destinations of Trips From District	% Total	Origins of Trips To District	% Total
Ottawa Centre	930	9%	0	0%
Ottawa Inner Area	530	5%	250	4%
Ottawa East	240	2%	40	1%
Beacon Hill	240	2%	30	0%
Alta Vista	1,970	18%	160	2%
Hunt Club	1,100	10%	870	13%
Merivale	770	7%	340	5%
Ottawa West	290	3%	0	0%
Bayshore / Cedarview	170	2%	70	1%
Orléans	50	0%	170	3%
Rural East	0	0%	10	0%
Rural Southeast	210	2%	570	8%
South Gloucester / Leitrim	3,680	34%	3,680	55%
South Nepean	310	3%	100	1%
Rural Southwest	120	1%	220	3%
Kanata / Stittsvile	140	1%	60	1%
Rural West	40	0%	60	1%
Île de Hull	90	1%	0	0%
Hull Périphérie	10	0%	20	0%
Plateau	0	0%	20	0%
Aylmer	0	0%	0	0%
Rural Northwest	20	0%	10	0%
Pointe Gatineau	10	0%	30	0%
Gatineau Est	0	0%	0	0%
Rural Northeast	20	0%	0	0%
Buckingham / Masson-Angers	0	0%	20	0%
Ontario Sub-Total:	10,790	99%	6,630	99%
Québec Sub-Total:	150	1%	100	1%
Total:	10,940	100%	6,730	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	6,300	29%	3,270	15%	700	6%
School	1,640	8%	840	4%	1,930	16%
Shopping	1,830	8%	720	3%	700	6%
Leisure	2,730	13%	1,990	9%	660	6%
Medical	440	2%	120	1%	120	1%
Pick-up / drive passenger	1,610	7%	970	4%	1,720	14%
Return Home	6,020	28%	13,110	60%	5,320	44%
Other	1,160	5%	680	3%	850	7%
Total:	21,730	100%	21,700	100%	12,000	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	4,650	64%	1,740	57%	420	11%
School	1,310	18%	810	27%	1,580	43%
Shopping	60	1%	40	1%	10	0%
Leisure	140	2%	50	2%	0	0%
Medical	80	1%	0	0%	0	0%
Pick-up / drive passenger	780	11%	180	6%	900	25%
Return Home	100	1%	120	4%	330	9%
Other	150	2%	110	4%	430	12%
Total:	7,270	100%	3,050	100%	3,670	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	140	3%	150	2%	40	1%
School	30	1%	0	0%	80	2%
Shopping	270	6%	170	2%	210	6%
Leisure	840	19%	420	6%	140	4%
Medical	50	1%	0	0%	30	1%
Pick-up / drive passenger	310	7%	360	5%	400	12%
Return Home	2,400	54%	5,990	82%	2,350	69%
Other	400	9%	200	3%	150	4%
Total:	4,440	100%	7,290	100%	3,400	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	55,430		22%
AM Peak Period	13,990	25%	26%
PM Peak Period	15,130	27%	22%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	14,990	69%	14,970	69%	5,210	43%
Auto Passenger	3,870	18%	3,650	17%	3,120	26%
Transit	1,630	8%	1,740	8%	200	2%
Bicycle	90	0%	100	0%	20	0%
Walk	40	0%	40	0%	2,680	22%
Other	1,110	5%	1,200	6%	770	6%
Total:	21,730	100%	21,700	100%	12,000	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	4,640	64%	2,070	68%	1,540	42%
Auto Passenger	1,260	17%	210	7%	1,140	31%
Transit	860	12%	100	3%	60	2%
Bicycle	70	1%	20	1%	10	0%
Walk	20	0%	0	0%	620	17%
Other	420	6%	640	21%	300	8%
Total:	7,270	100%	3,040	100%	3,670	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	3,100	70%	4,920	67%	1,510	44%
Auto Passenger	1,020	23%	1,120	15%	860	25%
Transit	150	3%	790	11%	50	1%
Bicycle	20	0%	80	1%	0	0%
Walk	10	0%	0	0%	850	25%
Other	130	3%	390	5%	130	4%
Total:	4,430	100%	7,300	100%	3,400	100%

Avg Vehicle Occupancy	From District	To District	Within District
24 Hours	1.26	1.24	1.60
AM Peak Period	1.27	1.10	1.74
PM Peak Period	1.33	1.23	1.57

Transit Modal Split	From District	To District	Within District
24 Hours	8%	9%	2%
AM Peak Period	13%	4%	2%
PM Peak Period	4%	12%	2%

3.2 Recommended Residential Trip Generation Rates

A blended trip rate was developed from the three data sources through application of a rank-sum weighting process, considering the strengths and weaknesses of each dataset for the dwelling type in question. The recommended blended **residential person-trip rates** are presented in **Table 3**. All rates represent person-trips per dwelling unit and are to be applied to the **AM or PM peak period.**

Table 3: Recommended Residential Person-trip Rates

ITE Land Use Code	Dwelling Unit Type	Period	Person-Trip Rate
210	Single-detached	AM	2.05
		PM	2.48
220	Multi-Unit (Low-Rise)	AM	1.35
		PM	1.58
221 & 222	Multi-Unit (High-Rise)	AM	0.80
		PM	0.90

3.3 Adjustment Factors – Peak Period to Peak Hour

The various trip generation data sources require some adjustment to standardize the data for developing robust blended trip rates. The peak period conversion factor in **Table 4** may be used where applicable to develop trip generation rate estimates in the desired format.

Table 4: Adjustment Factors for Residential Trip Generation Rates

Factor	Application	Apply To	Period	Value
Peak Period Conversion Factor	**Peak period to peak hour conversion.** Because the 2020 TRANS Trip Generation Study reports trip generation rates by peak period, factors must be applied if the practitioner requires peak hour rates. In practice, the conversion to peak hour trip rates should occur **after** the application of modal shares.	Person-trip rates per peak period	AM	0.50
			PM	0.44
		Vehicle trip rates per peak period	AM	0.48
			PM	0.44
		Transit trip rates per peak period	AM	0.55
			PM	0.47
		Cycling trip rates per peak period	AM	0.58
			PM	0.48
		Walking trip rates per peak period	AM	0.58
			PM	0.52

Table 8: Residential Mode Share for High-Rise Multifamily Housing

District	Period	Mode				
		Auto Driver	Auto Pass.	Transit	Cycling	Walking
Ottawa Centre	AM	18%	2%	26%	1%	52%
	PM	17%	9%	21%	1%	52%
Ottawa Inner Area	AM	26%	6%	28%	5%	34%
	PM	25%	8%	21%	6%	39%
Île de Hull	AM	27%	3%	37%	12%	21%
	PM	26%	8%	27%	11%	28%
Ottawa East	AM	39%	7%	38%	2%	13%
	PM	40%	14%	28%	3%	15%
Beacon Hill	AM	48%	9%	30%	3%	10%
	PM	52%	16%	28%	0%	4%
Alta Vista	AM	38%	12%	42%	2%	7%
	PM	45%	16%	28%	2%	9%
Hunt Club	AM	39%	6%	44%	1%	9%
	PM	44%	11%	35%	2%	9%
Merivale	AM	41%	6%	42%	2%	8%
	PM	41%	11%	33%	2%	13%
Ottawa West	AM	28%	11%	41%	3%	16%
	PM	33%	11%	26%	7%	23%
Bayshore/Cedarview	AM	40%	12%	38%	2%	8%
	PM	40%	15%	33%	1%	11%
Hull Périphérie	AM	48%	11%	30%	1%	10%
	PM	47%	15%	23%	3%	13%
Orleans	AM	54%	7%	29%	0%	10%
	PM	61%	13%	21%	0%	6%
South Gloucester / Leitrim	AM	50%	15%	25%	1%	9%
	PM	53%	17%	21%	1%	9%
South Nepean	AM	58%	6%	30%	2%	4%
	PM	54%	15%	25%	0%	7%
Kanata - Stittsville	AM	43%	26%	28%	0%	4%
	PM	55%	19%	21%	0%	5%
Plateau	AM	53%	9%	35%	3%	1%
	PM	65%	7%	25%	2%	1%
Aylmer	AM	45%	17%	25%	0%	13%
	PM	31%	21%	23%	4%	20%
Pointe Gatineau	AM	44%	15%	24%	3%	14%
	PM	52%	15%	20%	2%	11%
Gatineau Est	AM	53%	10%	25%	0%	12%
	PM	61%	10%	25%	0%	4%
Masson-Angers	AM	63%	15%	19%	0%	3%
	PM	64%	18%	16%	0%	1%
Other Rural Districts	AM	63%	15%	19%	0%	3%
	PM	64%	18%	16%	0%	1%

5 RESIDENTIAL DIRECTIONAL SPLITS

After calculating the total person trips generated by the development and applying the appropriate modal shares, directional factors can be applied to estimate the number of inbound and outbound trips by vehicle. The vehicle trip directional splits were developed for both the AM and PM peak periods[2]. The vehicle trip directional splits, as shown in **Table 9**, have been developed for the NCR based on a review of the local trip generator surveys as well as the latest published data in the ITE *Trip Generation Manual* (10th Edition).

Table 9: Recommended Vehicle Trip Directional Splits (Peak Period)

ITE Land Use Code	Dwelling Unit Type	Period	Inbound	Outbound
210	Single-detached	AM	30%	70%
		PM	62%	38%
220	Multi-Unit (Low-Rise)	AM	30%	70%
		PM	56%	44%
221 & 222	Multi-Unit (High-Rise)	AM	31%	69%
		PM	58%	42%

6 NON-RESIDENTIAL MODE SHARE

Mode shares were developed for three types of non-residential development: schools (elementary and high school); employment generators; and commercial (retail) generators. These mode shares were developed through data provided by the Ville de Gatineau from local school surveys as well as the TRANS Origin-Destination Survey. The non-residential mode shares presented below are limited and do not capture all development types. For data on the travel characteristics associated with colleges and universities, transportation terminals, and sports and entertainment venues in the National Capital Region, practitioners should refer to the various reports for the TRANS *Special Generators Survey* (2013), which are posted on the TRANS website. For other development types, practitioners may need to carry out their own local generator data collection where necessary.

[2] A directional split for active transportation was calculated based on the local generator surveys for low-rise and mid-rise land uses. The splits are mostly in-line with the vehicle directional splits, which could be used as a rough assumption for areas with lower vehicle mode share.

Appendix G – TDM Measures

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

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

		TDM-supportive design & infrastructure measures: *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)*	☐ - no existing rapid transit within 600m
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: *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: *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 resident-owned bicycles, plus the expected peak number of visitor cyclists	☑
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑ - at least 25% of spaces are provided indoors, even though more than 50 spaces are not required for any single building
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	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	☐

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see 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	☐
	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	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

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

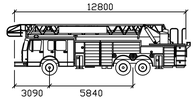
			TDM measures: *Residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to 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 *(multi-family, condominium)*	☑
		2.2	**Bicycle skills training**	
BETTER		2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

			TDM measures: *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 *(multi-family, condominium)*	☑
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☐
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☐
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☐
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☐

TDM measures: *Residential developments*				Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☑
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

Appendix H – Truck Templates


Aerial Fire
Width 2540
Track 2540
Lock to Lock Time 6.0
Steering Angle 37.0
LOCATION OF SHARED EASEMENT. NEW DRIVEWAY ACCESS TO BE PROVIDED ONCE THE EASEMENT IS FINALIZED
SEE DETAIL 'A'
BUILDING 'C' F.F.=101.20
PLAN P-2716-8
BUILDING A
4 STOREY APARTMENT
60 UNITS
BUILDING B
4 STOREY APARTMENT
60 UNITS
BUILDING C
4 STOREY APARTMENT
60 UNITS
AMENITY SPACE
216 PARKING SPACES REQUIRED & PROVIDED
FIRE ROUTE
DROP OFF
BLOCK 204
SUBJECT TO EASEMENT PER INST. NO. GL50274
PART 2 4R-29630
PART 9
PRIMARY ENTRANCE
GARBAGE ROOM & MOVE IN
MECH
PROPOSED GAS METER LOCATION EXACT LOCATION TO BE COORDINATED WITH A.H.J.
BARRIER FREE DEPRESSED CURB TYPICAL
DROP CURB
RECESSED PATIO AT GROUND FLOOR. BALCONY ABOVE
PATIO AT GROUND FLOOR. BALCONY ABOVE
BUILDING SETBACK
SSIB
SIB (AOG)
N58°38'50"E (P1&MEAS)
N59°35'00"E (P1&MEAS)
N30°32'55"W
N23°08'50"W
201.22 (P1&MEAS)
83.66 (P1&MEAS)



Aerial Fire

	mm
Width	: 2540
Track	: 2540
Lock to Lock Time	: 6.0
Steering Angle	: 37.0

SNOW STORAGE

EXIT ONLY DOOR

ENTRANCE MAN DOOR

BICYCLE SPACES

T/G 102.50

CB4

7.78m 200mmø STM @ 8.58%

N58°38'50"E 57.70 (P1&MEAS)

MH10

250mmø STM @ 0.60%

CBMH1 T/G 102.21

CB6 T/G 101.45

22.72m 200mmø STM @ 1.22%

150mmø PERF. SUBDRAIN

CB5 T/G 101.33

LOCATION OF SHARED EASEMENT. NEW DRIVEWAY ACCESS TO BE PROVIDED ONCE THE EASEMENT IS FINALIZED

6.0m (TOTAL) 450mmø PERF. SUBDRAIN

CB8 T/G 100.60

SEE DETAIL 'A'

14.20m 200mmø STM @ 1.00% INV. 99.000

BUILDING 'C' F.F.=101.20

CB9 T/G 100.66

17.68m 200mmø STM @ 1.62%

201.22 (P1&MEAS)

94.29

200ø WATERMAIN

CROSS

11¼BEND

SSIB

SIB (AOG)

TWO-WAY TRAFFIC

< 6.0m FIRE LANE >

R=9.0m

R=9.0m

R=9.0m

BUILDING SETBACK

PROVIDE 525ø KNOCKOUT

PROVIDE 200ø KNOCKOUT

SOUTH SIDE INV.=98.08

SEWERS, WATERMAIN AND SERVICES TO BE CONSTRUCTED

CONNECT TO EXISTING WATERMAIN

CONNECTIONS

PATIO AT GROUND FLOOR. BALCONY ABOVE

CONTRACTOR TO LEAVE CURB CUT AT CB9 TO ALLOW ROAD DRAINAGE TO BANK ST. DITCH

BUILDING A
4 STOREY APARTMENT
60 UNITS

PROPOSED GAS METER LOCATION EXACT LOCATION TO BE COORDINATED WITH A.H.J.

MECH

GARBAGE ROOM & MOVE IN

BARRIER FREE DEPRESSED CURB TYPICAL

DROP CURB

PRIMARY ENTRANCE

FDC

RECESSED PATIO AT GROUND FLOOR. BALCONY ABOVE

66.18 m

BIKES (4)

DROP OFF

FIRE ROUTE

R 9704 mm

105.85 m

43.75 m

BLOCK 204

216 PARKING SPACES REQUIRED & PROVIDED

BIKES (6)

BIKES (7)

BIKES (8)

AMENITY SPACE

BUILDING C
4 STOREY APARTMENT
60 UNITS

BUILDING B
4 STOREY APARTMENT
60 UNITS

RECESSED PATIO AT GROUND FLOOR. BALCONY ABOVE

PATIO AT GROUND FLOOR. BALCONY ABOVE

BUILDING SETBACK

GAS

N30°32'55"W 79.95

N59°35'00"E 113.28 (P1&MEAS)

N27°10"E 171.55 (P1&MEAS)

N23°08'50"W 83.66 (P1&MEAS)

N23°30'30"W 70.70 (P1&MEAS)

SUBJECT TO EASEMENT PER INST NO. GL50274

PART 2 4R-29630

PART 9

PLAN P-2716-8

400mm WATERMAIN

CSP 0.50 Inv=

VC TIG=100.79

VC TIG=100.95

CL OF ROAD AS CONSTRUCTED

Gravel Shoulder

Ditch

Point Line / E/P

IBø

10312

1483 5385

Wayne Titan

	mm
Width	: 2578
Track	: 2438
Lock to Lock Time	6.0
Steering Angle	: 45.0

SNOW STORAGE

ENTRANCE MAN DOOR

EXIT ONLY DOOR

BICYCLE SPACES

T/G 102.50

CB4

7.78m
200mmø
STM @ 8.58%

N58°38'50"E
(P1&MEAS)

MH10

100.82

SIB
(AOG)

CB6
T/G 101.45

22.72m
200mmø
STM @ 1.22%

150mmø PERF. SUBDRAIN

CBMH1
T/G 102.21

CB5
T/G 101.33

LOCATION OF SHARED EASEMENT. NEW DRIVEWAY ACCESS TO BE PROVIDED ONCE THE EASEMENT IS FINALIZED

6.0m (TOTAL)
450mmø PERF. SUBDRAIN

CB8
T/G 100.60

SEE DETAIL 'A'

14.20m
200mmø
STM @ 1.00%
INV. 99.000

BUILDING 'C'
F.F.=101.20

CB9
T/G 100.66

17.68m
200mmø
STM @ 1.62%

201.22
(P1&MEAS)

94.29

SSIB

200ø WATERMAIN

CROSS

200ø WATERMAIN

11½BEND

6.11

PLAN P-2716-8

SEWERS, WATERMAIN AND ROAD TO BE CONSTRUCTED

CONNECT TO EXISTING WATERMAIN CONNECTION

PROVIDE 525ø KNOCKOUT

SOUTH SIDE INV.=98.08

PROVIDE 200ø KNOCKOUT

PROPOSED GAS METER LOCATION EXACT LOCATION TO BE COORDINATED WITH A.H.J.

PATIO AT GROUND FLOOR. BALCONY ABOVE

CONTRACTOR TO LEAVE CURB CUT AT CB9 TO ALLOW ROAD DRAINAGE TO BANK ST. DITCH

BUILDING SETBACK

MECH

GARBAGE ROOM & MOVE IN

BARRIER FREE DEPRESSED CURB TYPICAL

DROP CURB

PRIMARY ENTRANCE

FDC

RECESSED PATIO AT GROUND FLOOR. BALCONY ABOVE

66.18 m

BUILDING A
4 STOREY APARTMENT
60 UNITS

BIKES (4)

216 PARKING SPACES REQUIRED & PROVIDED

FIRE ROUTE

DROP OFF

BLOCK 204

BIKES (6)

BIKES (8)

BIKES (7)

AMENITY SPACE

25.15 m

18.94 m

15.34 m

BUILDING C
4 STOREY APARTMENT
60 UNITS

BUILDING B
4 STOREY APARTMENT
60 UNITS

SUBJECT TO EASEMENT AS IN INST. NO. GL50274

PART 2
4R-29630

PART 9

83.57

83.66
(P1&MEAS)

N23°08'50"W

N23°30'30"W

79.95

N30°32'55"W

27'10"E

N59°35'00"E

113.28
171.55
(P1&MEAS)

70.70
(P1&MEAS)

22.25

7.1

IBø


Wayne Titan
Width : 2578
Track : 2438
Lock to Lock Time 6.0
Steering Angle : 45.0
LOCATION OF SHARED EASEMENT. NEW DRIVEWAY ACCESS TO BE PROVIDED ONCE THE EASEMENT IS FINALIZED
SEE DETAIL 'A'
BUILDING 'C' F.F.=101.20
PLAN P-2716-8
N58°38'50"E (P1&MEAS)
201.22 (P1&MEAS)
SIB (AOG)
N30°32'55"W
79.95
FIRE ROUTE
DROP OFF
216 PARKING SPACES REQUIRED & PROVIDED
BLOCK 204
BUILDING A
4 STOREY APARTMENT
60 UNITS
BUILDING B
4 STOREY APARTMENT
60 UNITS
BUILDING C
4 STOREY APARTMENT
60 UNITS
AMENITY SPACE
PRIMARY ENTRANCE
GARBAGE ROOM & MOVE IN
MECH
PROPOSED GAS METER LOCATION EXACT LOCATION TO BE COORDINATED WITH A.H.J.
BARRIER FREE DEPRESSED CURB TYPICAL
RECESSED PATIO AT GROUND FLOOR. BALCONY ABOVE
PATIO AT GROUND FLOOR. BALCONY ABOVE
BUILDING SETBACK
SUBJECT TO EASEMENT PER INST. NO. GL50274
PART 2 4r-29630
PART 9
BLOCK 212 STREET WIDENING
N59°35'00"E (P1&MEAS)
SSIB
IBØ

Appendix I – MMLOS Analysis

Multi-Modal Level of Service - Segments Form

Consultant	**IBI Group**	**Project**	**137175**
Scenario	**Existing Conditions**	**Date**	**2022-05-11**
Comments			

SEGMENTS		Bank	Section 1	Section 2	Section 3
Pedestrian	Sidewalk Width Boulevard Width	-	no sidewalk n/a		
	Avg Daily Curb Lane Traffic Volume		> 3000		
	Operating Speed On-Street Parking		> 60 km/h no		
	Exposure to Traffic PLoS		**F**	-	-
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		-	-	-
	Level of Service		**-**	**-**	**-**
Bicycle	Type of Cycling Facility	-	Mixed Traffic		
	Number of Travel Lanes		2-3 lanes total		
	Operating Speed		≥ 60 km/h		
	# of Lanes & Operating Speed LoS		**F**	-	-
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS		-	-	-
	Bike Lane Blockages				
	Blockage LoS		-	-	-
	Median Refuge Width (no median = < 1.8 m)				
	No. of Lanes at Unsignalized Crossing				
	Sidestreet Operating Speed				
	Unsignalized Crossing - Lowest LoS		-	-	-
	Level of Service		**-**	**-**	**-**
Transit	Facility Type	D	Mixed Traffic		
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8		
	Level of Service		**D**	**-**	**-**
Truck	Truck Lane Width	B	> 3.7 m		
	Travel Lanes per Direction		1		
	Level of Service		**B**	**-**	**-**

Multi-Modal Level of Service - Segments Form

Consultant	**IBI Group**	**Project**	**137175**
Scenario	**Future Conditions**	**Date**	**2022-05-25**
Comments			

SEGMENTS		Bank	Section 1	Section 2	Section 3
Pedestrian	Sidewalk Width Boulevard Width	-	no sidewalk n/a		
	Avg Daily Curb Lane Traffic Volume		> 3000		
	Operating Speed On-Street Parking		> 60 km/h no		
	Exposure to Traffic PLoS		**F**	**-**	**-**
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**
Bicycle	Type of Cycling Facility	-	Mixed Traffic		
	Number of Travel Lanes		2-3 lanes total		
	Operating Speed		≥ 60 km/h		
	# of Lanes & Operating Speed LoS		**F**	**-**	**-**
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS		**-**	**-**	**-**
	Bike Lane Blockages				
	Blockage LoS		**-**	**-**	**-**
	Median Refuge Width (no median = < 1.8 m)				
	No. of Lanes at Unsignalized Crossing				
	Sidestreet Operating Speed				
	Unsignalized Crossing - Lowest LoS		**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**
Transit	Facility Type	D	Mixed Traffic		
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8		
	Level of Service		**D**	**-**	**-**
Truck	Truck Lane Width	C	≤ 3.5 m		
	Travel Lanes per Direction		1		
	Level of Service		**C**	**-**	**-**

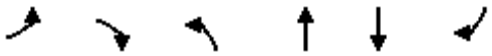
Multi-Modal Level of Service - Intersections Form

Consultant	**IBI Group**	**Project**	**137175**
Scenario	**Existing/Future Conditions**	**Date**	**2022-05-11**
Comments			

INTERSECTIONS		Bank & Dun Skipper (Existing)				Bank & Dun Skipper (Future)			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	5	5		5	6	5		4
	Median	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m
	Conflicting Left Turns	Permissive	No left turn / Prohib.		Permissive	Permissive	No left turn / Prohib.		Permissive
	Conflicting Right Turns	No right turn	Permissive or yield control		Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR prohibited		RTOR allowed	RTOR allowed	RTOR prohibited		RTOR allowed
	Ped Signal Leading Interval?	No	No		No	No	No		No
	Right Turn Channel	No Channel	No Right Turn		No Channel	No Channel	No Right Turn		No Channel
	Corner Radius	5-10m	No Right Turn		5-10m	3-5m	No Right Turn		5-10m
	Crosswalk Type	Zebra stripe hi-vis markings	Std transverse markings		Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings		Zebra stripe hi-vis markings
	PETSI Score	**46**	**58**		**38**	**30**	**61**		**57**
	Ped. Exposure to Traffic LoS	**D**	**D**	**-**	**E**	**E**	**C**	**-**	**D**
	Cycle Length	130	130		130	130	130		130
	Effective Walk Time	75	75		24	37	37		36
	Average Pedestrian Delay	**12**	**12**		**43**	**33**	**33**		**34**
	Pedestrian Delay LoS	**B**	**B**	**-**	**E**	**D**	**D**	**-**	**D**
	Level of Service	**D**	**D**	**-**	**E**	**E**	**D**	**-**	**D**
		E				**E**			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank> Dedicated Right Turning Speed	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP		Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP		Curb Bike Lane, Cycletrack or MUP
	Cyclist Through Movement	**Not Applicable**	**Not Applicable**	**-**		**Not Applicable**	**Not Applicable**	**-**	**Not Applicable**
	Separated or Mixed Traffic	**Separated**	**Separated**	**-**	**Mixed Traffic**	**Separated**	**Separated**	**-**	**Separated**
	Left Turn Approach		2-stage, LT box		No lane crossed		2-stage, LT box		2-stage, LT box
	Operating Speed		≥ 60 km/h		≥ 60 km/h		≥ 60 km/h		≥ 60 km/h
	Left Turning Cyclist	**-**	**A**	**-**	**C**	**-**	**A**	**-**	**A**
	Level of Service	**-**	**A**	**-**	**C**	**-**	**A**	**-**	**A**
		C				**A**			
Transit	Average Signal Delay	≤ 10 sec	≤ 10 sec			≤ 20 sec	≤ 20 sec		
	Level of Service	**B**	**B**	**-**	**-**	**C**	**C**	**-**	**-**
		B				**C**			
Truck	Effective Corner Radius				< 10 m				< 10 m
	Number of Receiving Lanes on Departure from Intersection				1				≥ 2
	Level of Service	**-**	**-**	**-**	**F**	**-**	**-**	**-**	**D**
		F				**D**			
Auto	Volume to Capacity Ratio								
	Level of Service	**-**				**-**			

Appendix J – Intersection Capacity Analysis

Existing Traffic



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	51	25	29	589	444	50
Future Volume (vph)	51	25	29	589	444	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0	0.0	140.0			85.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
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)	1695	1248	1478	1655	1583	1381
Flt Permitted	0.950		0.476			
Satd. Flow (perm)	1695	1248	740	1655	1583	1381
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		28				56
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	24%	17%	10%	15%	12%
Adj. Flow (vph)	57	28	32	654	493	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	28	32	654	493	56
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	21.7	21.7	21.7	21.7
Total Split (s)	40.0	40.0	90.0	90.0	90.0	90.0
Total Split (%)	30.8%	30.8%	69.2%	69.2%	69.2%	69.2%
Maximum Green (s)	33.4	33.4	83.3	83.3	83.3	83.3
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1
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
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	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
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	11.0	11.0	110.4	110.4	110.4	110.4
Actuated g/C Ratio	0.08	0.08	0.85	0.85	0.85	0.85
v/c Ratio	0.40	0.22	0.05	0.47	0.37	0.05
Control Delay	64.5	22.4	2.8	4.7	3.9	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	64.5	22.4	2.8	4.7	3.9	0.8
LOS	E	C	A	A	A	A
Approach Delay	50.6			4.6	3.6	
Approach LOS	D			A	A	
Queue Length 50th (m)	13.1	0.0	1.1	36.4	24.1	0.0
Queue Length 95th (m)	25.3	8.7	3.3	61.2	41.1	2.2
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	65.0		140.0			85.0
Base Capacity (vph)	435	341	628	1405	1344	1181
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	0.13	0.08	0.05	0.47	0.37	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 52.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	45	4	25	54	3	31
Future Vol, veh/h	45	4	25	54	3	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	9	0	0	14	0	0
Mvmt Flow	50	4	28	60	3	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	54	0	168	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	116	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1564	-	827	1021
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	914	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1564	-	811	1021
Mov Cap-2 Maneuver	-	-	-	-	811	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	897	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	998	-	-	1564	-
HCM Lane V/C Ratio	0.038	-	-	0.018	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

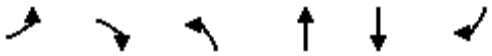
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	8	0	618	448	21
Future Vol, veh/h	0	8	0	618	448	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	11	15	0
Mvmt Flow	0	9	0	687	498	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	510	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	567	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	567	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	567	-	-
HCM Lane V/C Ratio	-	0.016	-	-
HCM Control Delay (s)	-	11.5	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	59	34	19	476	672	46
Future Volume (vph)	59	34	19	476	672	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0	0.0	140.0			85.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
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)	1601	1381	1558	1701	1685	1547
Flt Permitted	0.950		0.345			
Satd. Flow (perm)	1601	1381	566	1701	1685	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		38				51
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	8%	12%	11%	7%	8%	0%
Adj. Flow (vph)	66	38	21	529	747	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	38	21	529	747	51
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	21.7	21.7	21.7	21.7
Total Split (s)	30.0	30.0	90.0	90.0	90.0	90.0
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%
Maximum Green (s)	23.4	23.4	83.3	83.3	83.3	83.3
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.3	3.3	2.1	2.1	2.1	2.1
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
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	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
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	11.4	11.4	100.0	100.0	100.0	100.0
Actuated g/C Ratio	0.10	0.10	0.83	0.83	0.83	0.83
v/c Ratio	0.44	0.23	0.04	0.37	0.53	0.04
Control Delay	60.1	18.4	3.2	4.3	5.9	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	60.1	18.4	3.2	4.3	5.9	0.9
LOS	E	B	A	A	A	A
Approach Delay	44.8			4.3	5.6	
Approach LOS	D			A	A	
Queue Length 50th (m)	13.9	0.0	0.8	26.3	46.0	0.0
Queue Length 95th (m)	26.2	9.4	2.7	46.0	80.9	2.3
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	65.0		140.0			85.0
Base Capacity (vph)	312	299	471	1417	1404	1297
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	0.21	0.13	0.04	0.37	0.53	0.04

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: 0.53			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 56.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	64	2	18	47	3	29
Future Vol, veh/h	64	2	18	47	3	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	10	0	0	3	0	0
Mvmt Flow	71	2	20	52	3	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	73	0	164	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	92	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1540	-	831	996
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	937	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1540	-	820	996
Mov Cap-2 Maneuver	-	-	-	-	820	-
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	925	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	976	-	-	1540	-
HCM Lane V/C Ratio	0.036	-	-	0.013	-
HCM Control Delay (s)	8.8	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

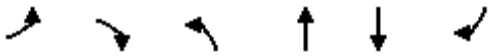
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	8	0	495	690	16
Future Vol, veh/h	0	8	0	495	690	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	8	9	0
Mvmt Flow	0	9	0	550	767	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	776	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	401	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	401	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	401	-	-
HCM Lane V/C Ratio	-	0.022	-	-
HCM Control Delay (s)	-	14.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Future (2025) Background Traffic

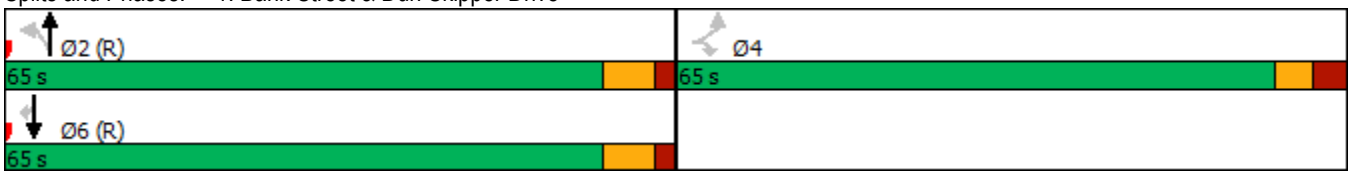


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	246	47	82	583	507	114
Future Volume (vph)	246	47	82	583	507	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1695	1248	1478	3144	3007	1381
Flt Permitted	0.950		0.465			
Satd. Flow (perm)	1695	1248	723	3144	3007	1381
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		47				114
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	24%	17%	10%	15%	12%
Adj. Flow (vph)	246	47	82	583	507	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	246	47	82	583	507	114
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	65.0	65.0	65.0	65.0	65.0	65.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	57.9	57.9	57.8	57.8	57.8	57.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	24.9	24.9	90.8	90.8	90.8	90.8
Actuated g/C Ratio	0.19	0.19	0.70	0.70	0.70	0.70
v/c Ratio	0.76	0.17	0.16	0.27	0.24	0.11
Control Delay	64.0	11.9	8.9	8.3	8.1	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	64.0	11.9	8.9	8.3	8.1	1.8
LOS	E	B	A	A	A	A
Approach Delay	55.6			8.4	7.0	
Approach LOS	E			A	A	
Queue Length 50th (m)	55.5	0.0	6.0	24.3	20.7	0.0
Queue Length 95th (m)	75.9	8.8	14.7	39.5	34.3	6.1
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	754	581	504	2195	2100	998
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	0.33	0.08	0.16	0.27	0.24	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 55.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	231	8	50	147	6	62
Future Vol, veh/h	231	8	50	147	6	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	9	0	0	14	0	0
Mvmt Flow	231	8	50	147	6	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	239	0	482	235
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1340	-	547	809
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	799	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1340	-	525	809
Mov Cap-2 Maneuver	-	-	-	-	525	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	766	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	772	-	-	1340	-
HCM Lane V/C Ratio	0.088	-	-	0.037	-
HCM Control Delay (s)	10.1	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

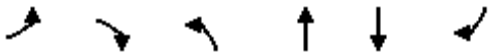
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	16	0	663	511	42
Future Vol, veh/h	0	16	0	663	511	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	11	15	0
Mvmt Flow	0	16	0	663	511	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	277	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	726	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	726	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	726	-	-
HCM Lane V/C Ratio	-	0.022	-	-
HCM Control Delay (s)	-	10.1	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

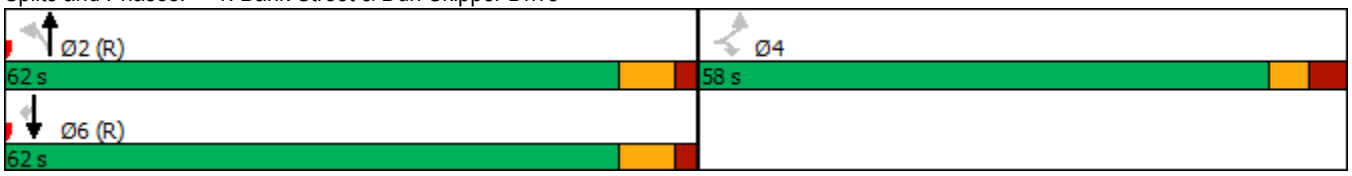


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	269	52	121	453	740	191
Future Volume (vph)	269	52	121	453	740	191
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1601	1381	1558	3232	3202	1547
Flt Permitted	0.950		0.352			
Satd. Flow (perm)	1601	1381	577	3232	3202	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		52				191
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	12%	11%	7%	8%	0%
Adj. Flow (vph)	269	52	121	453	740	191
Shared Lane Traffic (%)						
Lane Group Flow (vph)	269	52	121	453	740	191
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	58.0	58.0	62.0	62.0	62.0	62.0
Total Split (%)	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
Maximum Green (s)	50.9	50.9	54.8	54.8	54.8	54.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	26.2	26.2	79.5	79.5	79.5	79.5
Actuated g/C Ratio	0.22	0.22	0.66	0.66	0.66	0.66
v/c Ratio	0.77	0.15	0.32	0.21	0.35	0.18
Control Delay	58.3	9.8	13.1	9.1	5.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	58.3	9.8	13.1	9.1	5.0	1.5
LOS	E	A	B	A	A	A
Approach Delay	50.5			9.9	4.3	
Approach LOS	D			A	A	
Queue Length 50th (m)	55.2	0.0	10.3	18.6	31.6	4.6
Queue Length 95th (m)	75.0	8.5	25.6	31.5	8.6	1.6
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	679	615	382	2141	2121	1089
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	0.40	0.08	0.32	0.21	0.35	0.18

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: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	236	7	53	259	8	85
Future Vol, veh/h	236	7	53	259	8	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	0	0	3	0	0
Mvmt Flow	236	7	53	259	8	85

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	243	0	605	240
Stage 1	-	-	-	-	240	-
Stage 2	-	-	-	-	365	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1335	-	464	804
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1335	-	443	804
Mov Cap-2 Maneuver	-	-	-	-	443	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	751	-	-	1335	-
HCM Lane V/C Ratio	0.124	-	-	0.04	-
HCM Control Delay (s)	10.5	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

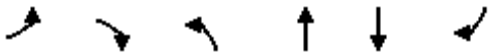
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	568	746	47
Future Vol, veh/h	0	23	0	568	746	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	8	9	0
Mvmt Flow	0	23	0	568	746	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	397	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	608	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	608	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	608	-	-
HCM Lane V/C Ratio	-	0.038	-	-
HCM Control Delay (s)	-	11.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Future (2030) Background Traffic

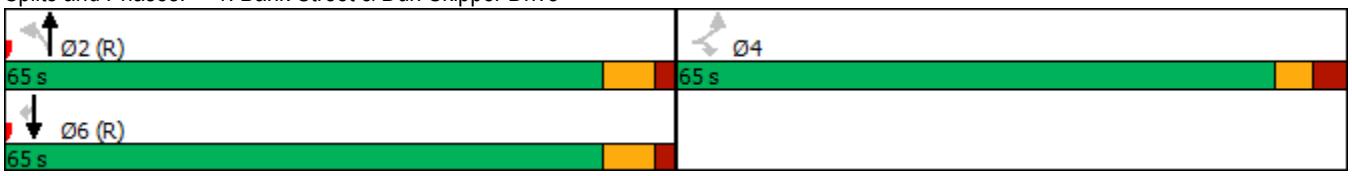


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	283	52	84	617	514	127
Future Volume (vph)	283	52	84	617	514	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1695	1248	1478	3144	3007	1381
Flt Permitted	0.950		0.461			
Satd. Flow (perm)	1695	1248	717	3144	3007	1381
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		52				127
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	24%	17%	10%	15%	12%
Adj. Flow (vph)	283	52	84	617	514	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	283	52	84	617	514	127
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	65.0	65.0	65.0	65.0	65.0	65.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	57.9	57.9	57.8	57.8	57.8	57.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	27.9	27.9	87.8	87.8	87.8	87.8
Actuated g/C Ratio	0.21	0.21	0.68	0.68	0.68	0.68
v/c Ratio	0.78	0.17	0.17	0.29	0.25	0.13
Control Delay	62.3	10.6	10.4	9.8	9.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	62.3	10.6	10.4	9.8	9.4	2.0
LOS	E	B	B	A	A	A
Approach Delay	54.3			9.8	8.0	
Approach LOS	D			A	A	
Queue Length 50th (m)	63.5	0.0	6.7	28.5	23.0	0.0
Queue Length 95th (m)	84.4	9.0	16.4	45.7	37.7	7.1
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	754	584	484	2122	2030	973
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	0.38	0.09	0.17	0.29	0.25	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	274	8	50	161	6	62
Future Vol, veh/h	274	8	50	161	6	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	9	0	0	14	0	0
Mvmt Flow	274	8	50	161	6	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	282	0	539	278
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1292	-	507	766
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	787	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1292	-	485	766
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	753	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	729	-	-	1292	-
HCM Lane V/C Ratio	0.093	-	-	0.039	-
HCM Control Delay (s)	10.4	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

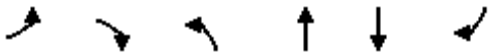
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	16	0	700	525	42
Future Vol, veh/h	0	16	0	700	525	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	11	15	0
Mvmt Flow	0	16	0	700	525	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	284	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	719	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	719	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	719	-	-
HCM Lane V/C Ratio	-	0.022	-	-
HCM Control Delay (s)	-	10.1	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

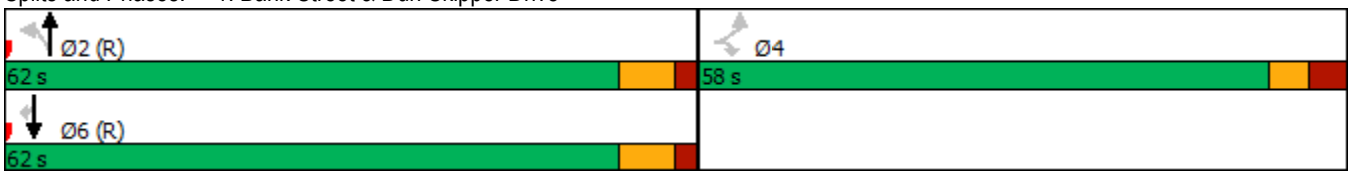


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	289	55	126	466	765	226
Future Volume (vph)	289	55	126	466	765	226
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1601	1381	1558	3232	3202	1547
Flt Permitted	0.950		0.339			
Satd. Flow (perm)	1601	1381	556	3232	3202	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55				226
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	12%	11%	7%	8%	0%
Adj. Flow (vph)	289	55	126	466	765	226
Shared Lane Traffic (%)						
Lane Group Flow (vph)	289	55	126	466	765	226
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	58.0	58.0	62.0	62.0	62.0	62.0
Total Split (%)	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
Maximum Green (s)	50.9	50.9	54.8	54.8	54.8	54.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	27.7	27.7	78.0	78.0	78.0	78.0
Actuated g/C Ratio	0.23	0.23	0.65	0.65	0.65	0.65
v/c Ratio	0.78	0.15	0.35	0.22	0.37	0.21
Control Delay	57.5	9.1	14.8	9.8	7.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	57.5	9.1	14.8	9.8	7.9	2.8
LOS	E	A	B	A	A	A
Approach Delay	49.7			10.9	6.7	
Approach LOS	D			B	A	
Queue Length 50th (m)	59.2	0.0	11.5	20.1	54.4	9.1
Queue Length 95th (m)	79.2	8.6	28.5	33.8	52.1	12.8
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	679	617	361	2099	2080	1084
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	0.43	0.09	0.35	0.22	0.37	0.21

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: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 65.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	258	7	53	299	8	85
Future Vol, veh/h	258	7	53	299	8	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	0	0	3	0	0
Mvmt Flow	258	7	53	299	8	85

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	265	0	667	262
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1311	-	427	782
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	678	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	407	782
Mov Cap-2 Maneuver	-	-	-	-	407	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	645	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	725	-	-	1311	-
HCM Lane V/C Ratio	0.128	-	-	0.04	-
HCM Control Delay (s)	10.7	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

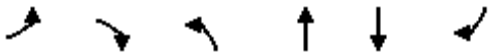
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	587	775	47
Future Vol, veh/h	0	23	0	587	775	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	8	9	0
Mvmt Flow	0	23	0	587	775	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	411	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	596	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	596	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	596	-	-
HCM Lane V/C Ratio	-	0.039	-	-
HCM Control Delay (s)	-	11.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Future (2025) Total Traffic

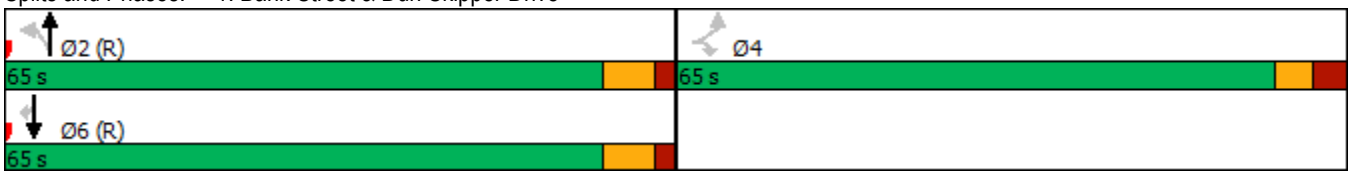


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	272	47	83	583	519	114
Future Volume (vph)	272	47	83	583	519	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1695	1248	1478	3144	3007	1381
Flt Permitted	0.950		0.459			
Satd. Flow (perm)	1695	1248	714	3144	3007	1381
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		47				114
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	24%	17%	10%	15%	12%
Adj. Flow (vph)	272	47	83	583	519	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	272	47	83	583	519	114
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	65.0	65.0	65.0	65.0	65.0	65.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	57.9	57.9	57.8	57.8	57.8	57.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	27.0	27.0	88.7	88.7	88.7	88.7
Actuated g/C Ratio	0.21	0.21	0.68	0.68	0.68	0.68
v/c Ratio	0.77	0.16	0.17	0.27	0.25	0.12
Control Delay	62.8	11.1	9.9	9.2	9.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	62.8	11.1	9.9	9.2	9.1	2.0
LOS	E	B	A	A	A	A
Approach Delay	55.2			9.3	7.8	
Approach LOS	E			A	A	
Queue Length 50th (m)	61.1	0.0	6.4	25.8	22.6	0.0
Queue Length 95th (m)	81.9	8.5	15.9	42.0	37.3	6.5
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	754	581	487	2144	2050	978
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	0.36	0.08	0.17	0.27	0.25	0.12

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	231	8	50	147	6	88
Future Vol, veh/h	231	8	50	147	6	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	9	0	0	14	0	0
Mvmt Flow	231	8	50	147	6	88

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	239	0	482	235
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1340	-	547	809
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	799	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1340	-	525	809
Mov Cap-2 Maneuver	-	-	-	-	525	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	766	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	782	-	-	1340	-
HCM Lane V/C Ratio	0.12	-	-	0.037	-
HCM Control Delay (s)	10.2	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

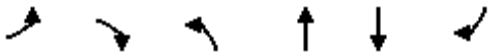
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	0	663	511	54
Future Vol, veh/h	0	17	0	663	511	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	11	15	0
Mvmt Flow	0	17	0	663	511	54

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	283	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	720	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	720	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	720	-	-
HCM Lane V/C Ratio	-	0.024	-	-
HCM Control Delay (s)	-	10.1	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

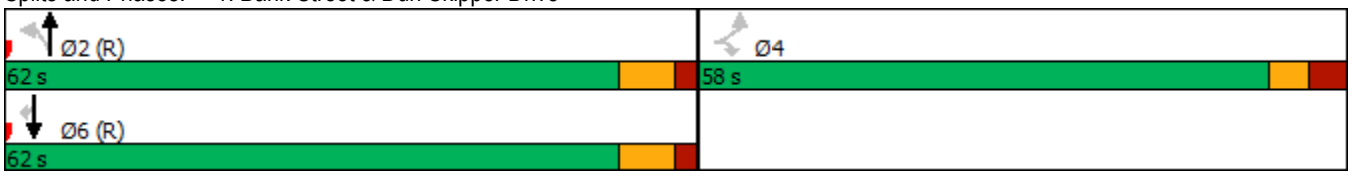


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	286	52	122	453	763	191
Future Volume (vph)	286	52	122	453	763	191
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1601	1381	1558	3232	3202	1547
Flt Permitted	0.950		0.340			
Satd. Flow (perm)	1601	1381	557	3232	3202	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		52				191
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	12%	11%	7%	8%	0%
Adj. Flow (vph)	286	52	122	453	763	191
Shared Lane Traffic (%)						
Lane Group Flow (vph)	286	52	122	453	763	191
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	58.0	58.0	62.0	62.0	62.0	62.0
Total Split (%)	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
Maximum Green (s)	50.9	50.9	54.8	54.8	54.8	54.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	27.5	27.5	78.2	78.2	78.2	78.2
Actuated g/C Ratio	0.23	0.23	0.65	0.65	0.65	0.65
v/c Ratio	0.78	0.15	0.34	0.22	0.37	0.18
Control Delay	57.6	9.4	14.4	9.7	7.1	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	57.6	9.4	14.4	9.7	7.1	2.2
LOS	E	A	B	A	A	A
Approach Delay	50.2			10.7	6.1	
Approach LOS	D			B	A	
Queue Length 50th (m)	58.6	0.0	10.9	19.3	51.4	7.0
Queue Length 95th (m)	78.4	8.3	27.4	32.7	39.7	8.2
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	679	615	362	2106	2086	1074
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	0.42	0.08	0.34	0.22	0.37	0.18

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: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 15.5		Intersection LOS: B	
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	236	7	54	259	8	103
Future Vol, veh/h	236	7	54	259	8	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	0	0	3	0	0
Mvmt Flow	236	7	54	259	8	103

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	243	0	607	240
Stage 1	-	-	-	-	240	-
Stage 2	-	-	-	-	367	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1335	-	463	804
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1335	-	441	804
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	759	-	-	1335	-
HCM Lane V/C Ratio	0.146	-	-	0.04	-
HCM Control Delay (s)	10.6	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

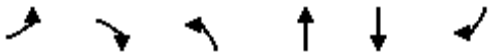
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	24	0	570	746	69
Future Vol, veh/h	0	24	0	570	746	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	8	9	0
Mvmt Flow	0	24	0	570	746	69

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	408	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	598	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	598	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	598	-	-
HCM Lane V/C Ratio	-	0.04	-	-
HCM Control Delay (s)	-	11.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Future (2030) Total Traffic

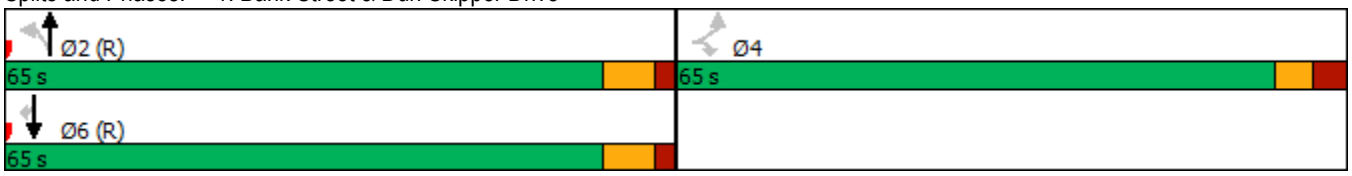


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	309	52	84	617	526	127
Future Volume (vph)	309	52	84	617	526	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1695	1248	1478	3144	3007	1381
Flt Permitted	0.950		0.452			
Satd. Flow (perm)	1695	1248	703	3144	3007	1381
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		52				127
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	24%	17%	10%	15%	12%
Adj. Flow (vph)	309	52	84	617	526	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	309	52	84	617	526	127
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	65.0	65.0	65.0	65.0	65.0	65.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	57.9	57.9	57.8	57.8	57.8	57.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	30.1	30.1	85.6	85.6	85.6	85.6
Actuated g/C Ratio	0.23	0.23	0.66	0.66	0.66	0.66
v/c Ratio	0.79	0.16	0.18	0.30	0.27	0.13
Control Delay	60.9	9.9	11.5	10.8	10.5	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	60.9	9.9	11.5	10.8	10.5	2.2
LOS	E	A	B	B	B	A
Approach Delay	53.6			10.8	8.9	
Approach LOS	D			B	A	
Queue Length 50th (m)	69.0	0.0	7.1	30.2	25.0	0.0
Queue Length 95th (m)	90.0	8.7	17.4	48.4	41.1	7.5
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	754	584	463	2071	1980	953
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	0.41	0.09	0.18	0.30	0.27	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	274	8	50	161	6	88
Future Vol, veh/h	274	8	50	161	6	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	9	0	0	14	0	0
Mvmt Flow	274	8	50	161	6	88

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	282	0	539	278
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1292	-	507	766
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	787	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1292	-	485	766
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	753	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	739	-	-	1292	-
HCM Lane V/C Ratio	0.127	-	-	0.039	-
HCM Control Delay (s)	10.6	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

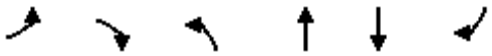
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	0	701	525	54
Future Vol, veh/h	0	17	0	701	525	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	11	15	0
Mvmt Flow	0	17	0	701	525	54

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	290	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	713	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	713	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	713	-	-
HCM Lane V/C Ratio	-	0.024	-	-
HCM Control Delay (s)	-	10.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

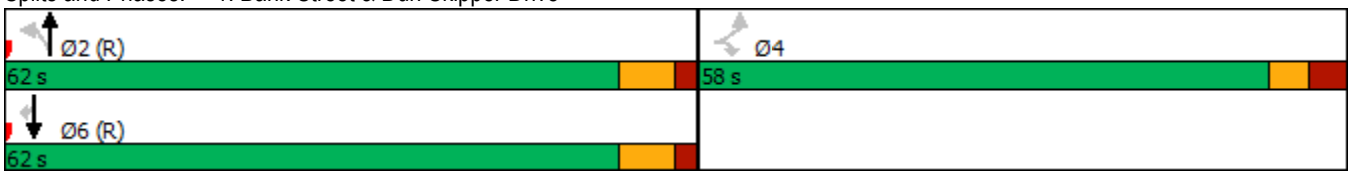


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	305	55	127	466	788	226
Future Volume (vph)	305	55	127	466	788	226
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0	0.0	140.0			75.0
Storage Lanes	1	1	1			1
Taper Length (m)	20.0		20.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1601	1381	1558	3232	3202	1547
Flt Permitted	0.950		0.327			
Satd. Flow (perm)	1601	1381	536	3232	3202	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55				226
Link Speed (k/h)	50			80	80	
Link Distance (m)	133.8			129.9	449.4	
Travel Time (s)	9.6			5.8	20.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	12%	11%	7%	8%	0%
Adj. Flow (vph)	305	55	127	466	788	226
Shared Lane Traffic (%)						
Lane Group Flow (vph)	305	55	127	466	788	226
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	44.6	44.6	35.2	35.2	35.2	35.2
Total Split (s)	58.0	58.0	62.0	62.0	62.0	62.0
Total Split (%)	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
Maximum Green (s)	50.9	50.9	54.8	54.8	54.8	54.8
Yellow Time (s)	3.6	3.6	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.2	7.2	7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0	21.0	21.0	21.0	21.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	29.0	29.0	76.7	76.7	76.7	76.7
Actuated g/C Ratio	0.24	0.24	0.64	0.64	0.64	0.64
v/c Ratio	0.79	0.15	0.37	0.23	0.39	0.21
Control Delay	56.8	8.7	16.1	10.4	10.7	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	56.8	8.7	16.1	10.4	10.7	4.0
LOS	E	A	B	B	B	A
Approach Delay	49.4			11.6	9.2	
Approach LOS	D			B	A	
Queue Length 50th (m)	62.3	0.0	12.1	20.7	61.3	11.6
Queue Length 95th (m)	82.4	8.4	30.6	35.0	90.5	22.0
Internal Link Dist (m)	109.8			105.9	425.4	
Turn Bay Length (m)	90.0		140.0			75.0
Base Capacity (vph)	679	617	342	2065	2046	1070
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	0.45	0.09	0.37	0.23	0.39	0.21

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: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 67.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bank Street & Dun Skipper Drive



Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	258	7	54	299	8	102
Future Vol, veh/h	258	7	54	299	8	102
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	0	0	3	0	0
Mvmt Flow	258	7	54	299	8	102

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	265	0	669	262
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	407	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1311	-	426	782
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	676	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	405	782
Mov Cap-2 Maneuver	-	-	-	-	405	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	643	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	732	-	-	1311	-
HCM Lane V/C Ratio	0.15	-	-	0.041	-
HCM Control Delay (s)	10.8	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

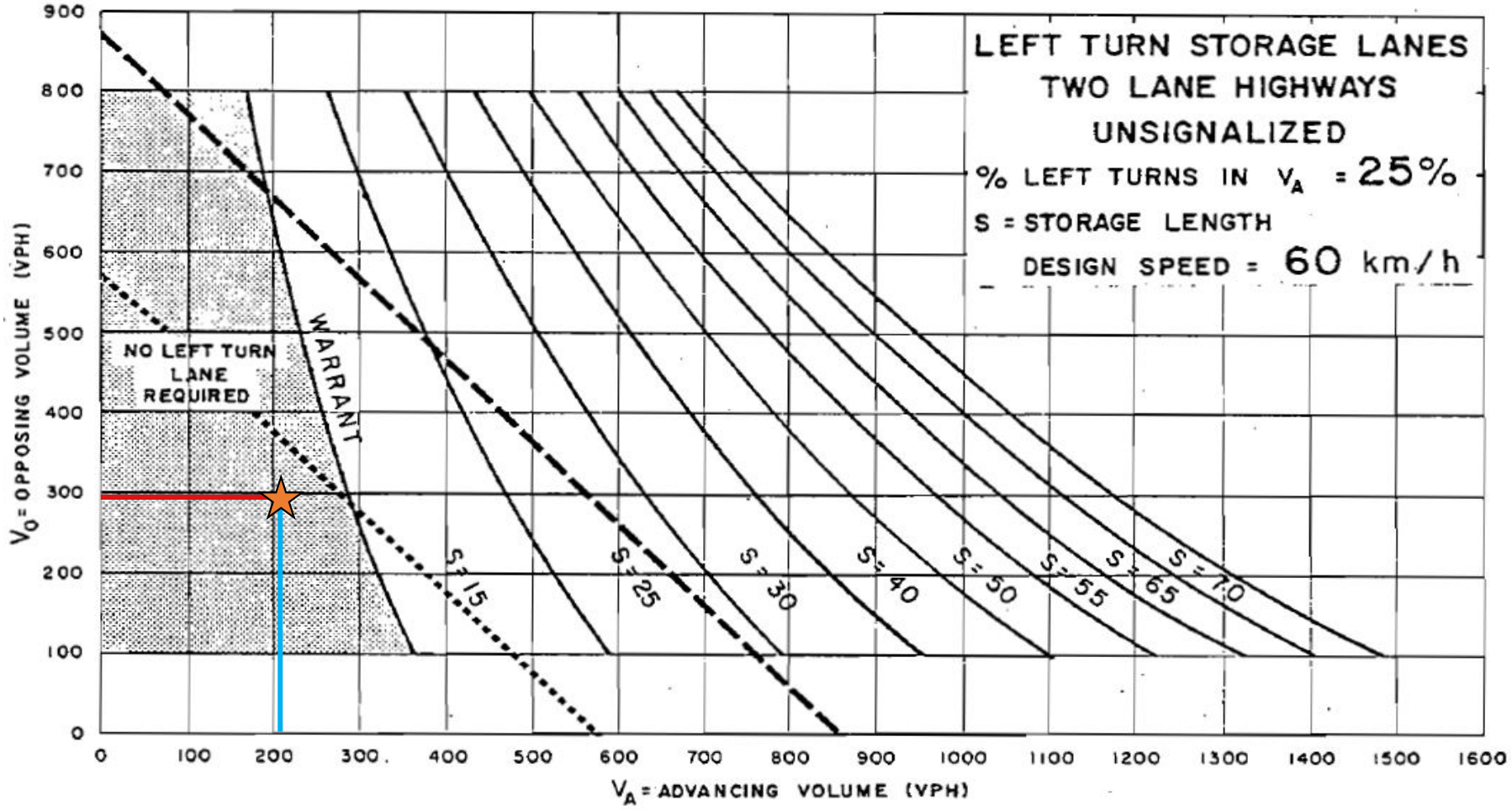
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	24	0	588	775	69
Future Vol, veh/h	0	24	0	588	775	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	8	9	0
Mvmt Flow	0	24	0	588	775	69

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	422	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	586	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	586	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	586	-	-
HCM Lane V/C Ratio	-	0.041	-	-
HCM Control Delay (s)	-	11.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Appendix K – Auxiliary Lane Analysis



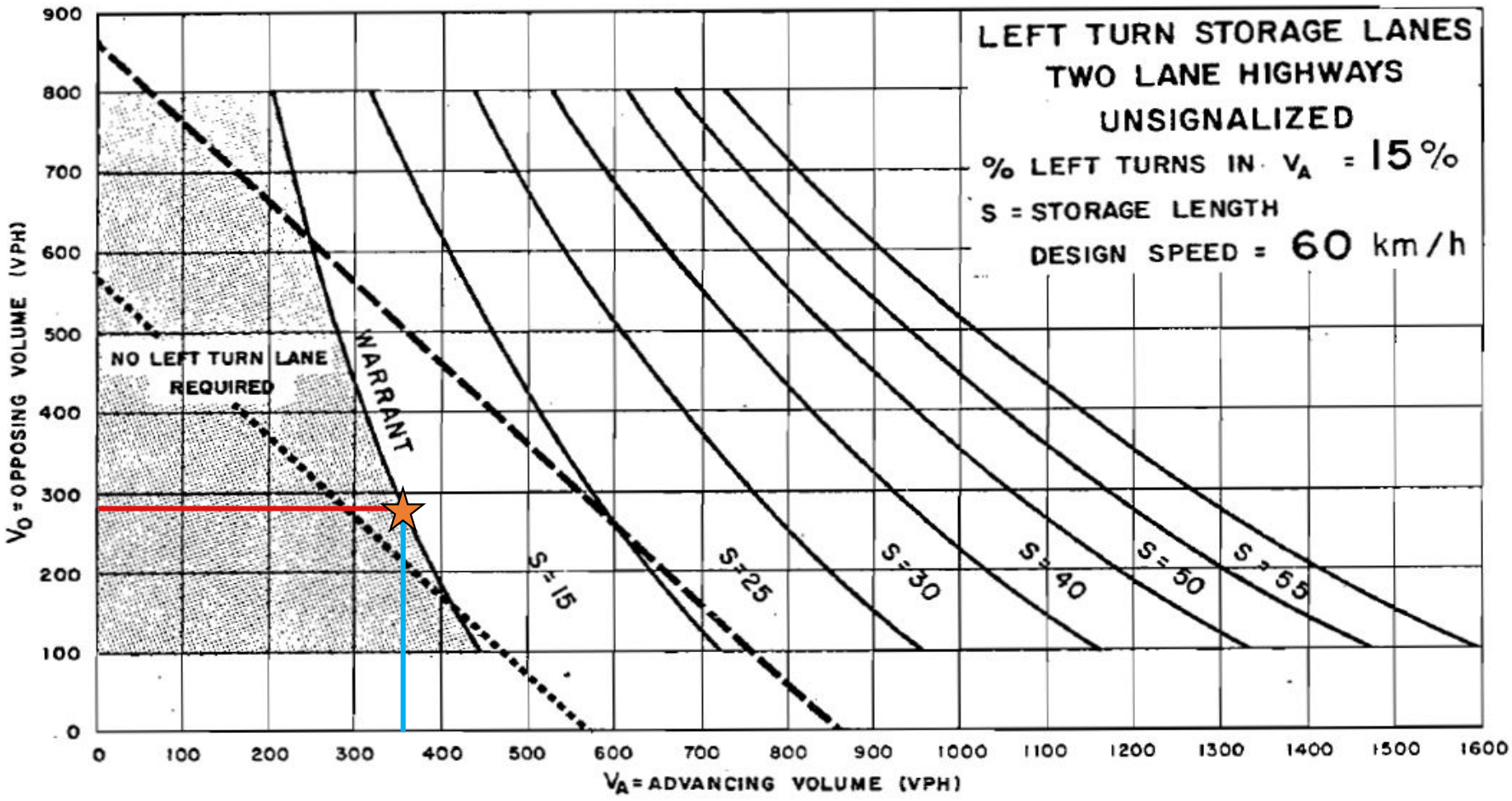
TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

Opposing Volume

Advancing Volume

Dun Skipper Dr & Access 1 | Westbound Left-Turn | AM Peak Hour



TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

Opposing Volume

Advancing Volume

Dun Skipper Dr & Access 1 | Westbound Left-Turn | PM Peak Hour