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November 12, 2020

Ms. Josiane Gervais
Project Manager - Transportation Approvals
City of Ottawa
Infrastructure Approvals
Development Review Central & South Branch
110 Laurier Avenue West
Ottawa, ON
K1P 1J1

Dear Ms. Gervais:

4639 BANK STREET - TRANSPORTATION IMPACT ASSESSMENT
FINAL REPORT

Enclosed is the Transportation Impact Assessment (TIA) Final Report prepared in support of the proposed residential development at 4639 Bank Street by Glenview Homes.

This document incorporates responses to City of Ottawa circulation comments received based on the Step 4 Report submission, dated August 2020. All responses to the most recent set of comments as well as all previous comments received throughout the TIA review process have been provided in **Appendix A**. Since the previous submission, the site plan has undergone some minor revisions and the report has been updated to discuss the future eastbound bus stop on Rotary Way as well as TDM measures that are currently under consideration. The Synchro analysis files associated with this report have been provided, but have not been modified since the previous submission.

Please note that the overall conclusions of the TIA report remain unchanged from the previous submission.

Regards,

David Hook, P.Eng.

cc. Jillian Normand – Glenview Homes

Transportation Impact Assessment – Final Report

4639 Bank Street

Prepared for Glenview Homes
by IBI Group
November 12, 2020

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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 12th day of November, 2020.

Name: David Hook

Professional Title: Project Engineer

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

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Executive Summary

IBI Group (IBI) was retained by Glenview Homes to undertake a Transportation Impact Assessment (TIA) in support of a combined Zoning By-law Amendment and Site Plan Control application for the proposed residential development located at 4639 Bank Street in Ottawa. The proposed development is located east of Bank Street and south of Rotary Way and will include 112 terrace townhome units. The proposed development is expected to be fully built out in a single phase by 2024. The horizon year of the study was therefore taken as 2029, representing 5 years beyond the expected full build-out of the site. Access to the site will be provided via a full-movement connection (or intersection) on Rotary Way.

The proposed development will provide 143 vehicle parking spaces, including 18 visitor parking spaces, which is 13 spaces below Zoning Bylaw requirements. However, based on ITE parking generation rates, it is expected that no spillover parking demand will occur. Additionally, 58 bicycle parking spaces will be provided of which 36 will be sheltered spaces within a bicycle enclosure.

It is anticipated that the proposed development will generate up to 111 and 130 two-way person-trips during the weekday morning and afternoon peak hours, respectively. Based on the 2011 TRANS Origin-Destination (O-D) Survey and the Leitrim Master Transportation Study (MTS), it is expected that the majority of person-trips will be via private vehicle, however, as transit service improves in the area it is anticipated that the number of vehicle trips will decline. In 2024, up to 75 two-way vehicle trips are anticipated to be generated by the site, reducing to 72 trips by 2029.

Intersection capacity analysis was completed for all study area intersections which demonstrated that the planned improvements to Bank Street prior to the 2024 build-out year of the proposed development are expected to address existing capacity issues. By 2029, the Bank Street & Leitrim Road intersection is anticipated to exceed its theoretical capacity under background traffic conditions which is consistent with the conclusions of the Leitrim Master Transportation Study.

In 2029, the addition of site generated traffic is expected to result in the southbound left-turn movement at the Bank Street & Rotary Way / Barrett Farm Drive intersection to be over capacity in the weekday morning peak hour. As such, it is recommended that the City implement appropriate signal infrastructure at this intersection during the four-lane widening of Bank Street to provision for the eventual need for a protected-permitted left-turn phase which the analysis has shown would address this capacity issue.

Multi-Modal Level of Service (MMLOS) analysis was completed for all signalized study area intersections which demonstrated that they are currently not meeting their Pedestrian and Bicycle Level of Service (PLOS and BLOS) targets. As part of the Bank Street widening, all signalized study area intersections will be reconstructed as protected intersections thereby improving their BLOS to ‘C’. PLOS, however, is expected to deteriorate due to longer crossing distances with few reasonable options available for improving the PLOS once Bank Street is widened to four lanes.

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 recommended actions and modifications in place.

1 Introduction

IBI Group (IBI) was retained by Glenview Homes to undertake a Transportation Impact Assessment (TIA) in support of a combined Zoning By-law Amendment and Site Plan Control application for a proposed residential development to be located at 4639 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 analysis 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 that are 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, targets and policies.

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. All technical comments and responses throughout this process 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 proposed number of stacked townhome units, the minimum development size threshold has been exceeded and therefore the Trip Generation trigger is satisfied.
- **Location**: The proposed development is located adjacent to Bank Street which is a spine bicycle route and, as such, the Location trigger is satisfied.
- **Safety**: Boundary street conditions were reviewed to determine if there is an elevated potential for safety concerns adjacent the site. Based on this review, there may be an elevated potential for safety concerns adjacent to the site due to the location of the proposed Rotary Way access 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 within the Leitrim Community and is approximately 1.2 hectares in size. It is bound by Bank Street to the west, Rotary Way to the north, the Ottawa Rotary Home to the east and residential dwellings to the south.

The site location is illustrated in **Exhibit 1.**

3.1.2 Land Use Details

Table 1 summarizes the proposed land uses included in this development.

Table 1 - Land Use Statistics

LAND USE	SIZE
Stacked Townhomes	112 units

The site will provide 143 vehicle parking spaces and 58 bicycle parking spaces. The configuration of the proposed development is illustrated in **Exhibit 2**. Access to the site will be provided via a full-movement access on Rotary Way.

The subject site is currently an undeveloped greenfield site and is zoned DR – Development Reserve, based on geoOttawa.

3.1.3 Development Phasing & Date of Occupancy

It has been assumed that the proposed development will be fully built out and occupied in a single phase by the end of 2024.

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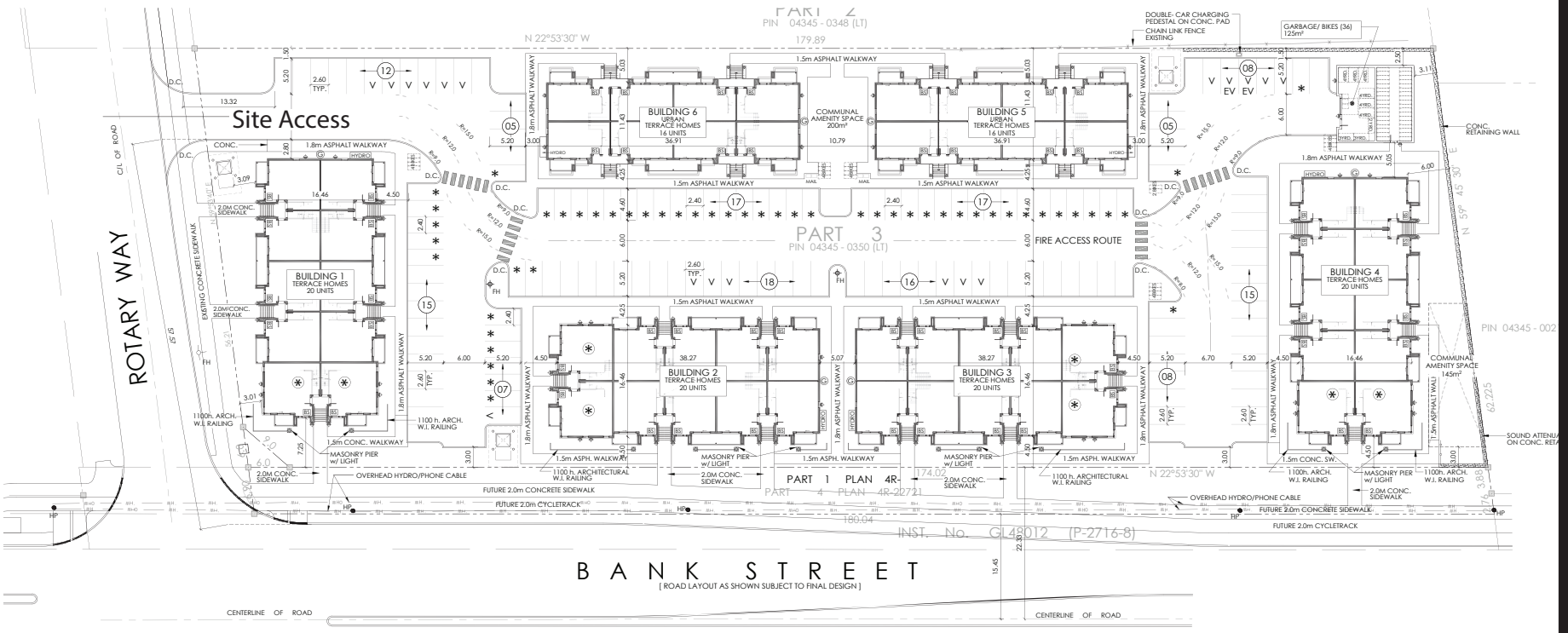
4639 Bank Street
Transportation Impact Assessment

Exhibit 1:
Site Location

PROJECT No. 125600
DATE: November 2020
SCALE: 0m 125m 250m



PROJECT No. 125600
DATE: November 2020
SCALE: 0m 10m 20m

Exhibit 2:
Proposed Development

4639 Bank Street
Transportation Impact Assessment

IBI

3.2 Existing Conditions

3.2.1 Existing Road Network

3.2.1.1 Roadways

The proposed development is bound by the following street(s):

- **Bank Street** is an arterial road under the jurisdiction of the City of Ottawa that extends north-south through Ottawa from Wellington Street in the north to the urban boundary, where it becomes County Road 31. In the vicinity of the proposed development, Bank Street has a 2-lane rural cross-section with a posted speed limit of 70 km/h and a right-of-way protection of 44.5m.
- **Rotary Way** is an urban collector road under the jurisdiction of the City of Ottawa that extends from Bank Street to Fernside Street. It has a 26m right-of-way and an unposted speed limit of 50 km/h.

Other streets within the context area of the proposed development are as follows:

- **Leitrim Road** is an arterial road under the jurisdiction of the City of Ottawa that extends east-west from River Road to east of Hall Road. Leitrim Road has a 2-lane rural cross-section with a posted speed limit of 60 km/h and a right-of-way protection of 35.5m with an additional 5.0m reserved on the rural side to accommodate a rural cross-section.
- **Analdea Drive** is identified in the Official Plan as urban collector road under the jurisdiction of the City of Ottawa that extends east from Bank Street to a dead-end at Fernside Street. Although designated an urban collector road with a right-of-way protection of 24m, Analdea Drive is currently configured as a two-lane rural road with a 20m right-of-way and a posted speed limit of 50 km/h.
- **White Alder Avenue** is an urban local road under the jurisdiction of the City of Ottawa that extends from Bank Street to Findlay Creek Drive. It has 24m right-of-way and an unposted speed limit of 50 km/h.
- **Findlay Creek Drive** is an urban collector road under the jurisdiction of the City of Ottawa that runs east-west from Albion Road to Bank Street. It has a 30m right-of-way and a posted speed limit of 50 km/h.

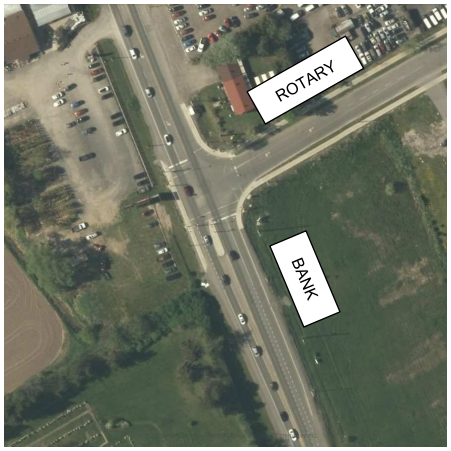
3.2.1.2 Driveways Adjacent to Development Access

The only driveway within 200m of the proposed Rotary Way access is the driveway for the Ottawa Rotary Home, located approximately 20 metres east of the subject property.

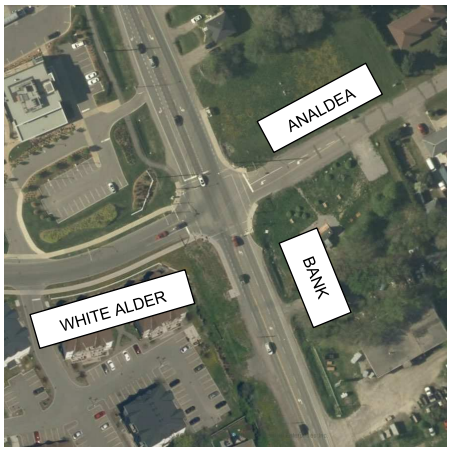
3.2.1.3 Intersections

The following intersections have the greatest potential to be impacted by the proposed development:

- **Bank Street & Leitrim Road** is a four-legged signalized intersection with left-turn lanes on the northbound, southbound and westbound approaches and right-turn lanes on the southbound and westbound approaches. The intersection is located 520m north of the proposed development and has documented capacity issues during weekday peak periods.



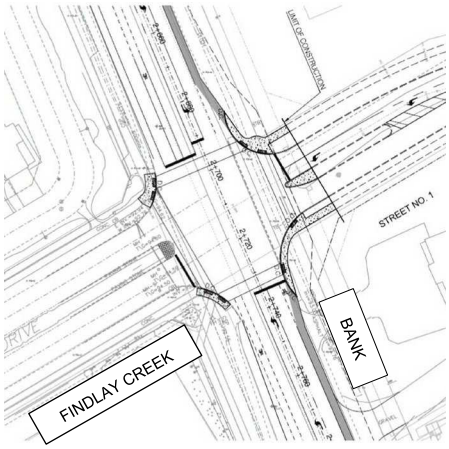
- **Bank Street & Rotary Way** is a 3-legged signalized intersection with auxiliary left-turn lanes on the southbound and westbound approaches, and an auxiliary right-turn lane on the northbound approach. The intersection is located immediately adjacent to the subject site and will be most impacted by the addition of site-generated traffic. The intersection will ultimately be reconfigured as a 4-legged intersection with the planned extension of Barrett Farm Drive.



- **Bank Street & Analdea Drive / White Alder Avenue** is a 4-legged signalized intersection with auxiliary left-turn lanes on all approaches and an auxiliary right-turn lane on the southbound approach. The intersection is located approximately 350m south of the proposed development and may only experience a nominal increase in traffic associated with the proposed development.

The intersection control and lane configurations for the intersections described above are shown in **Exhibit 3**.

One other intersection of significance is located within the context area of the proposed development:



- **Bank Street & Findlay Creek Drive** has recently been reconstructed to accommodate the Lilythorne subdivision via a new road on the east approach which was opened to the public as a signalized intersection in fall 2019. The intersection has auxiliary left-turn lanes on all approaches and an auxiliary right-turn lane on the southbound approach. The intersection is located 730m south of the proposed development.

3.2.1.4 Traffic Management Measures

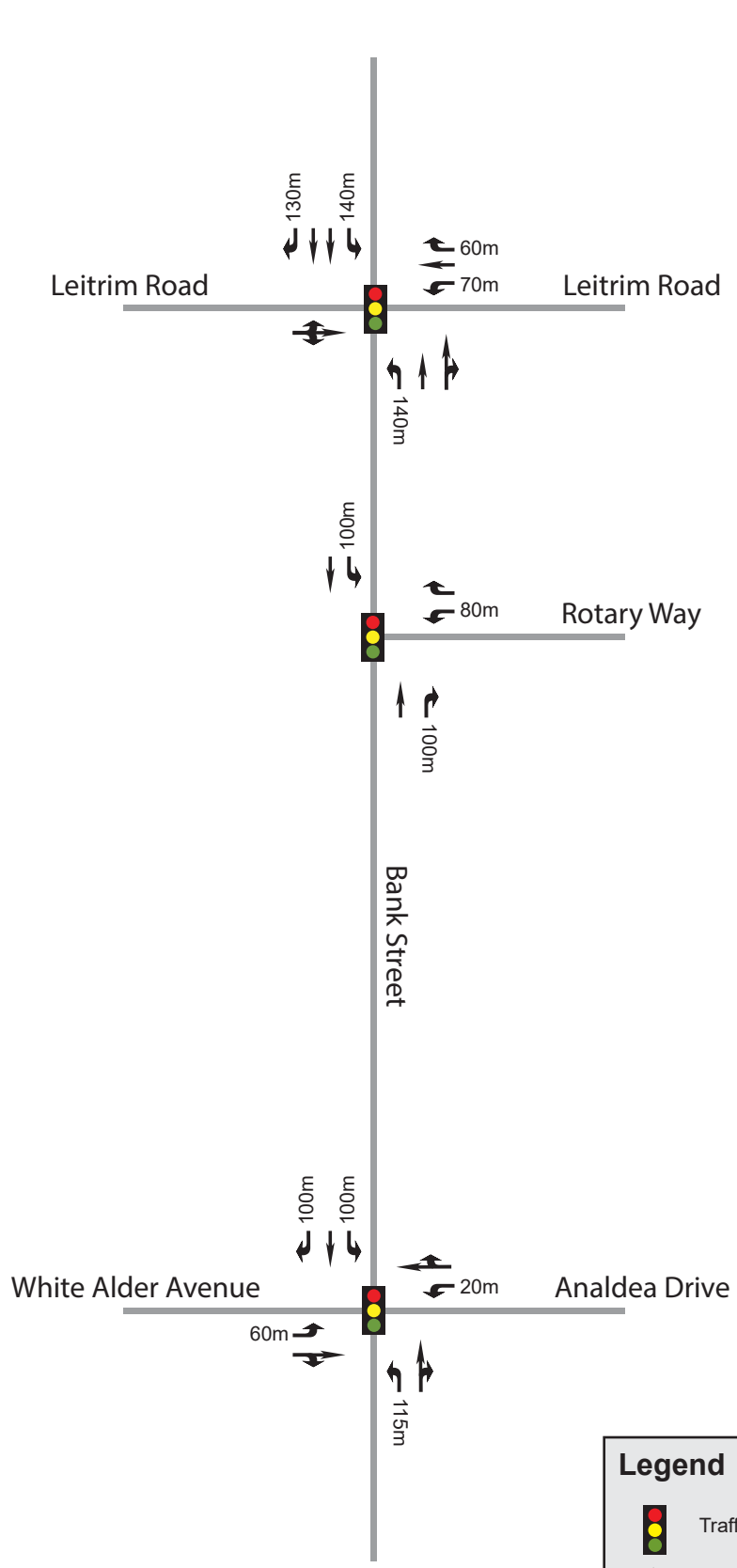
On-road speed limit pavement markings and flexible centreline signs are currently installed on Rotary Way. These traffic management measures are located east of Fairweather Private, 240m east of Bank Street. There are currently no existing traffic management or traffic calming measures located on Bank Street or at any of the intersections within the context area.

3.2.1.5 Existing Traffic Volumes

As the proposed development will consist of residential land uses, the weekday peak hour traffic conditions will be most affected by any associated increase in traffic. Weekday morning and afternoon peak hour turning movement counts were therefore obtained from the City of Ottawa at the following intersections:

- Bank Street & Leitrim Road (City of Ottawa, December 2019)
- Bank Street & Rotary Way (City of Ottawa, December 2019)
- Bank Street & Analdea Drive / White Alder Avenue (City of Ottawa, December 2019)

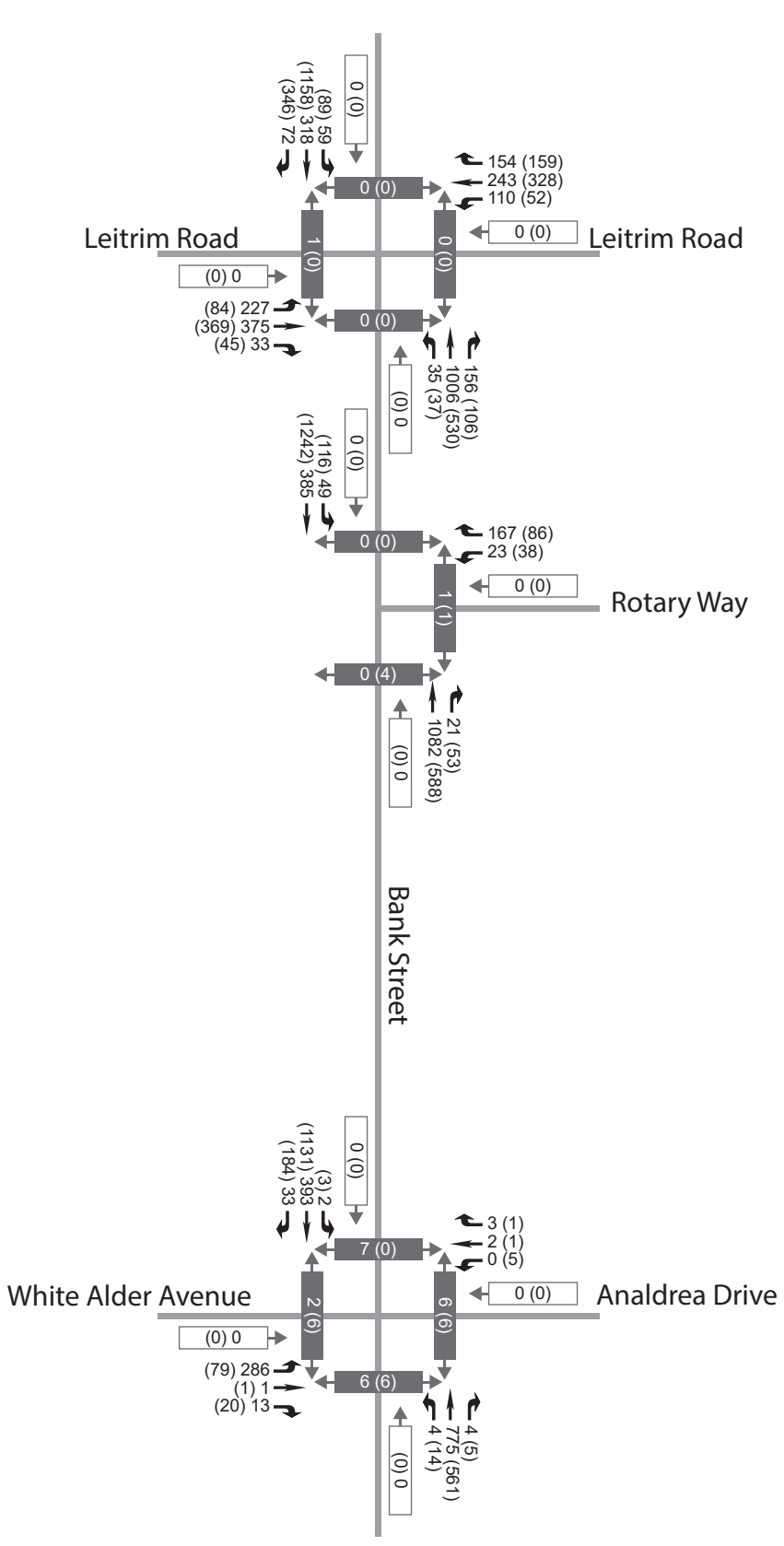
Peak hour traffic volumes representative of existing conditions are shown in **Exhibit 4**. Weekday morning and afternoon peak hour turning movement counts have been provided in **Appendix C**.



4639 Bank Street
Transportation Impact Assessment

Exhibit 4:
Existing (2020) Lane Configurations and Intersection Control

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.



4639 Bank Street
Transportation Impact Assessment

Exhibit 4:
Existing (2020)
Traffic

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.

3.2.2 Existing Bicycle and Pedestrian Facilities

Pedestrian facilities are presently limited to concrete sidewalks on both sides of Rotary Way, White Alder Avenue and Findlay Creek Drive. Along Bank Street, pedestrian facilities are only present at signalized intersections.

Cycling facilities along Bank Street are also limited, with paved shoulders on both sides of Bank Street and pocket bike lanes at the following locations:

- Northbound approach of the Bank Street & Rotary Way intersection;
- Southbound approach of the Bank Street & Analdea Drive / White Alder Avenue intersection; and
- Southbound approach of the Bank Street & Findlay Creek Drive intersection.

3.2.3 Existing Transit Facilities and Service

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

- **Route #93** provides regular, all-day service between Leitrim Station and Greenboro Station and operates on 15- to 30-minute headways during peak periods. On weekends service is reduced to 30-minute headways.
- **Route #294** provides weekday peak period service between Hurdman Station and the Findlay Creek community and operates on 30-minute headways.
- **Route #304** provides Thursday-only service between Metcalfe, Greely and Osgoode, and Billing's Bridge shopping centre.

Transit service maps for the individual routes above are provided in **Appendix D**. The bus stops located within the vicinity of the proposed development are shown below in **Figure 1**. The nearest bus stops are presently located immediately adjacent to the proposed development near the Hope Cemetery and at the Bank Street & Rotary Way intersection.

Figure 1 - Bus Stops

Source: OC Transpo

3.2.4 Collision History

A review of historical collision data has been undertaken for the boundary streets with the vicinity of 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 2** summarizes all reported collisions between January 1, 2014 and December 31, 2018.

Table 2 – Reported Collisions within Vicinity of Proposed Development

LOCATION	# OF REPORTED COLLISIONS
INTERSECTIONS	
Bank Street & Leitrim Road	58
Bank Street & Rotary Way	9
Bank Street & Analdea Drive / White Alder Avenue	23
SEGMENTS	
Bank Street – Leitrim Road to Rotary Way	35
Bank Street – Rotary Way to Analdea Drive / White Alder Avenue	1

Based on a preliminary review of the collision history noted above, intersection and road segments with more than six collisions over the five-year period may require further review.

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

Another method of evaluating the relative magnitude of collision frequency at one intersection compared to another is to quantify the average historical number of collisions against the daily volume of traffic entering the intersection. This is commonly expressed in terms of Million Vehicles Entering (MVE) and a rate of greater than 1.0 is considered significant.

The above noted intersections are therefore calculated as having average collision frequencies per MVE values:

- Bank Street & Leitrim Road – 0.94
- Bank Street & Rotary Way – 0.22
- Bank Street & Analdea Drive / White Alder Avenue – 0.60

Of the three intersections evaluated above, none have a collision frequency in excess of 1.0 and therefore are not considered significant. The road segment of Bank Street between Leitrim Road and Rotary Way has experienced a significant amount of collisions and therefore will require further review.

3.3 Planned Conditions

3.3.1 Transportation Network

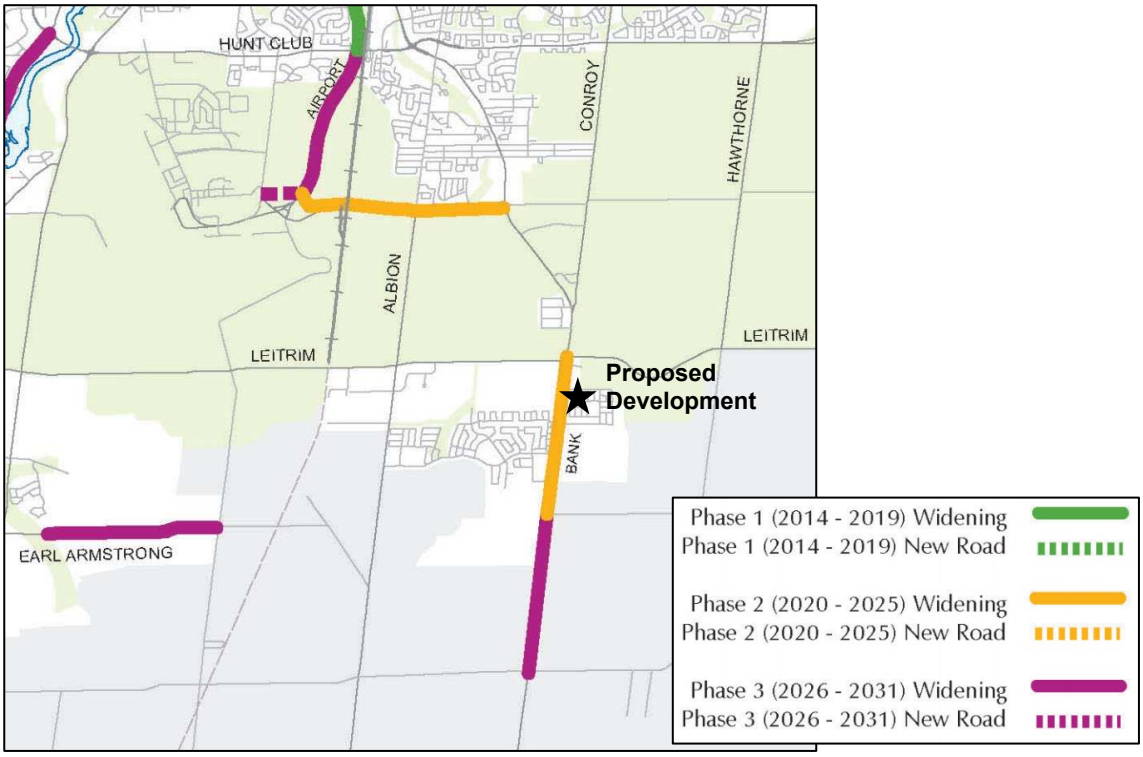
3.3.1.1 Future Road Network Projects

The 2013 Transportation Master Plan (TMP) outlines future road network modifications required in the 2031 'Affordable Network'. The following project was noted that may have an impact on area traffic within the vicinity of the site:

- **Bank Street** – Planned widening from two to four lanes between Leitrim Road and Blais Road by 2025 (Phase 2: 2020-2025) and from two to four lanes between Blais Road and Rideau Road by 2031 (Phase 3: 2026-2031).

Figure 2 illustrates the planned changes to the arterial road network in the broader area, as per the TMP Affordable Plan, however it should be noted that the timelines and phasing limits indicated in the TMP have since been refined.

Figure 2 - Future Road Network Projects



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

The Bank Street widening project timeline and extents have been updated several times since the TMP was published. Based on recent discussions with City of Ottawa staff, the current staging plan for the Bank Street widening in the vicinity of the proposed development is as follows:

- Widening of Bank Street from two to four lanes from south of Leitrim Road to Dun Skipper Drive is scheduled to be completed by end of 2022.
- The reconstruction of the Bank Street & Leitrim Road intersection is scheduled to be completed by end of 2023.

It is understood that the Bank Street widening and the reconstruction of the Bank Street & Leitrim Road intersection will be completed in accordance with the complete streets philosophy to accommodate all travel modes within the vicinity of the proposed development.

3.3.1.2 Future Transit Facilities and Services

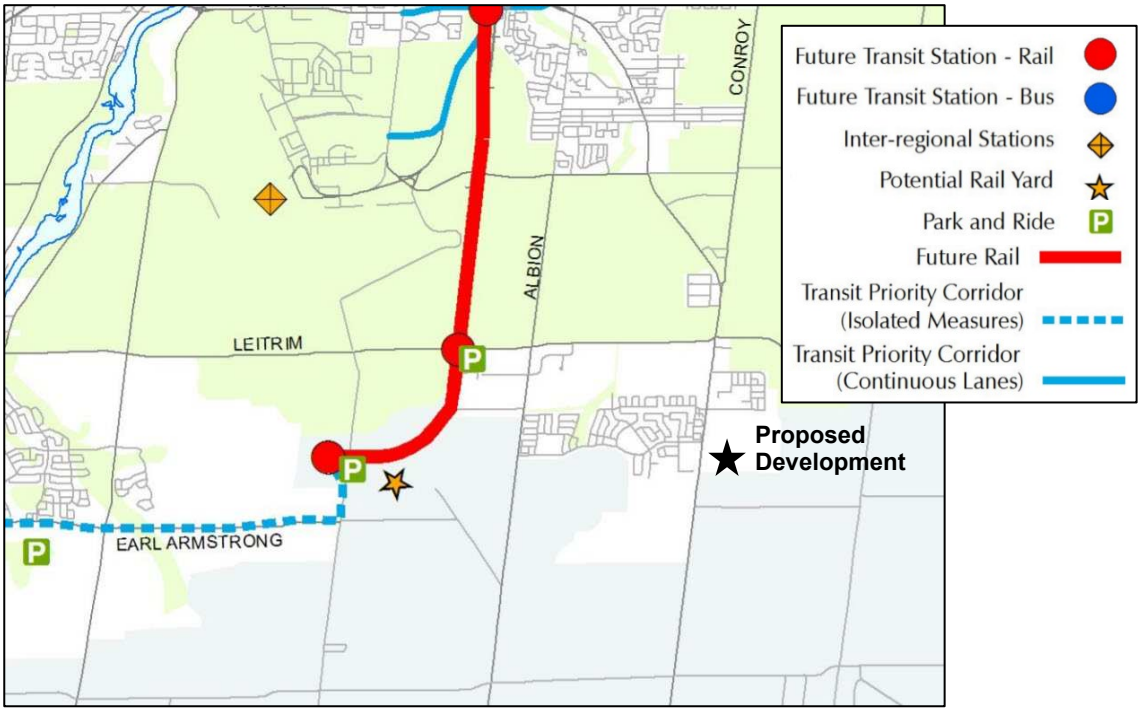
The 2013 TMP outlines the future rapid transit and transit priority (RTTP) network. The following projects were noted in the 'Affordable RTTP Network' that may have a future impact on study area traffic:

- **Trillium Line Extension** – Extension of the Trillium Line from its current terminus at Greenboro Station to Bowesville Station. The *Trillium Line Extension Planning and Environmental Assessment (EA) Study (January 2016)* and the *Trillium Line Light Rail Transit Extension Addendum (September 2018)* both expand upon the TMP. The Trillium Line will now extend to Limebank Road with a spur line to the Ottawa International Airport. Based on the official City of Ottawa Stage 2 LRT website, the Trillium Line extension is expected to begin revenue service by the end of 2022.

Figure 3 shows the transit infrastructure projects in the vicinity of the proposed development that are part of the TMP's 2031 Affordable Network. **Figure 4** below illustrates the proposed Trillium Line extension, including the recommendations from the EA study and the Addendum.

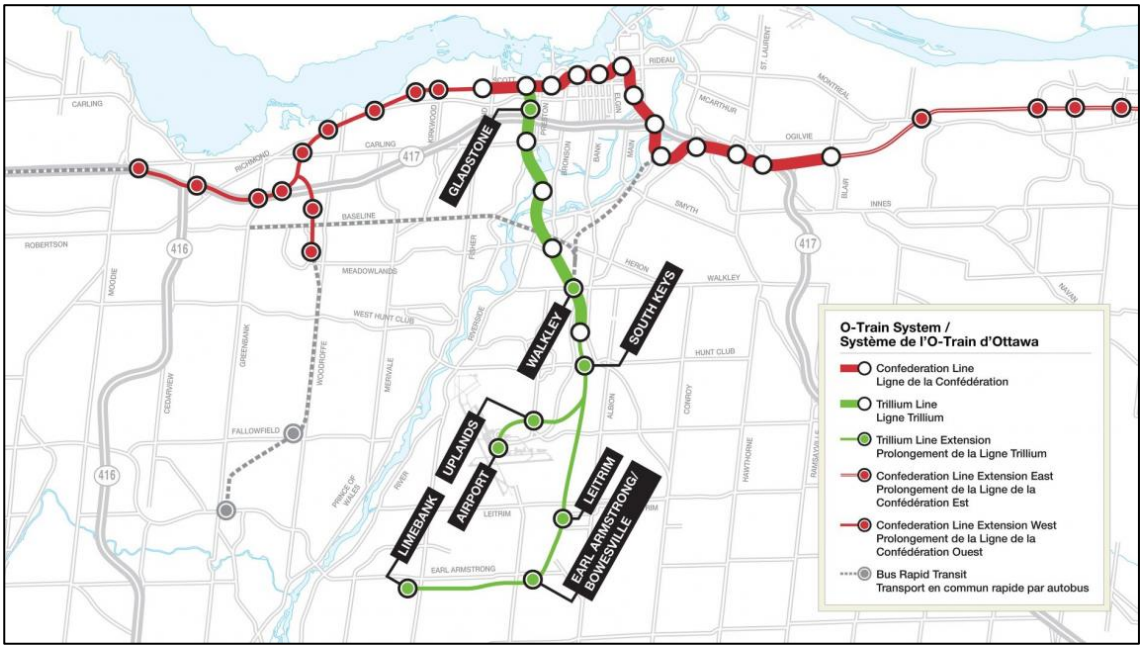
In addition to the future Trillium Line Extension discussed above, Rotary Way has also been identified as a transit street and it is anticipated that bus service will be added in the future. A new eastbound bus stop is planned on the south side of Rotary Way near Building 1, however, based on discussions with OC Transpo, the bus stop could be located anywhere between Bank Street and the proposed site access. It is therefore recommended that the future eastbound bus stop be located near the proposed private approach in order to improve access to this facility from the proposed development.

Figure 3 - Future 'Affordable RTTP Network Projects'



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

Figure 4 - Stage 2 LRT - Trillium Line Extension



Source: City of Ottawa Stage 2 LRT Project Website – Trillium Line South Extension

3.3.1.3 Future Cycling and Pedestrian Facilities

The 2013 Ottawa Cycling Plan (OCP) designates Bank Street and Leitrim Road as 'Spine Routes'. Spine Routes form the primarily cycling network, linking the commercial, employment, institutional, residential and educational nodes throughout the City of Ottawa. Additionally, the OCP designates Findlay Creek Drive as a 'Local Route'. Local Routes are implemented at a neighbourhood level to connect residential and commercial areas to Spine routes.

The Bank Street EA recommended the implementation of sidewalks and cycle tracks on both sides of Bank Street within the urban area, multi-use pathways (MUP) within the Greenbelt and paved shoulders separated from the travel lane by a rumble strip within the rural area. The preliminary design for the four-lane widening of Bank Street includes concrete sidewalks and cycle tracks on both sides of Bank Street as well as protected intersections.

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.

All current development applications within the context area of the proposed development have been identified. With the exception of the Cowan's Grove Mid-Density Residential Block (4791 Bank Street), all of these developments were either accounted for explicitly in the Leitrim Master Transportation Study (MTS), undertaken by IBI Group in March 2017, or would contribute a negligible volume of traffic to the adjacent road network. **Table 3** summarizes all developments noted in the MTS.

Table 3 - Leitrim Master Transportation Study Developments

DEVELOPMENT	LAND USE	SIZE
Remaining Findlay Creek	Residential	152 units
Remaining Lemay and Sundance	Residential	158 units
Barrett Lands	Residential	797 units
Barrett Extension Lands	Residential	150 units
OPA Areas 9A & 9B	Residential	1,319 units
	Commercial	15,450 m^2
Findlay Creek Stage 2 Phase 4C	Residential	240
Transport Canada Lands	Residential	231
Remer and Idone	Residential	1,155
	Commercial	24,187 m^2

In addition to the developments in the Leitrim MTS, IBI Group recently completed a Transportation Impact Assessment for the Cowan's Grove Mid-Density residential development at 4791 Bank Street, located approximately 870m south of the subject site and consisting of 102 stacked townhome dwellings.

3.3.3 Network Concept Screenline

A network screenline analysis is not expected to be necessary for this development, as it does not trigger the threshold prescribed by the TIA of 200 person-trips during the peak hour beyond what is otherwise permitted by the current zoning. Detailed trip generation will be provided in the Forecasting section of this report.

3.4 Study Area

With consideration of the information presented thus far, the following intersections have been identified as being most impacted by the proposed development and will be assessed for vehicular capacity as part of this study:

- Bank Street & Leitrim Road
- Bank Street & Rotary Way
- Rotary Way & Site Access
- Bank Street & Analdea Drive / White Alder Avenue

Multi-Modal Level of Service (MMLOS) will be conducted for all intersections listed above with the exception of the stop-controlled intersections as no methodology currently exists for evaluating MMLOS at unsignalized intersections. The need to provide alternative means of traffic control (i.e. signals) at stop-controlled intersections will be reviewed in the Analysis component of this study to determine whether traffic signals are warranted or required operationally within the study horizon year.

Segment-based MMLOS analysis is required for boundary roadways which do not currently have a 'Complete Street' design concept. A preliminary design following the 'Complete Street' philosophy has been prepared for the segment of Bank Street adjacent to the subject site therefore a review of the proposed development's impact on the design will be completed instead. Segment-

based MMLOS analysis will therefore be limited to the segment of Rotary Way adjacent to the proposed development.

3.5 Time Periods

Based on the proposed residential land use, 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 in terms of combined development-generated and background traffic. These two time periods will therefore be considered for operational analysis in this study.

3.6 Study Horizon Year

Based on the anticipated build-out year of the proposed development, the following two analysis years will be considered in this TIA:

- Year 2024 – Full Build-Out of the Proposed Development
- Year 2029 – 5 Years Beyond Full Build-out / Occupancy

3.7 Exemptions Review

The TIA Guidelines provide exemption considerations for elements of the Design Review and Network Impact components. **Table 4** summarizes the TIA modules that are not applicable to this study.

Table 4 - 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 Development Generated Traffic

4.1.1 Trip Generation Methodology

Peak hour site-generated traffic volumes were developed using the 2009 TRANS Trip Generation Residential Trip Rates Study Report. The TRANS trip generation rates are based on a blended rate derived from 17 trip generation studies undertaken in 2008, the ITE Trip Generation Manual and the 2005 TRANS Origin-Destination (O-D) Travel Survey. Separate trip generation rates exist for each of the four general geographic areas in Ottawa: Core, Urban (Inside the Greenbelt), Suburban (Outside the Greenbelt) and Rural. These trip generation rates reflect existing travel behavior by dwelling type and geographic area. The TIA Guidelines recommends that the TRANS trip generation rates be converted to person-trips based on the vehicular mode share proportions detailed in the TRANS Trip Generation study.

The person-trips were then subdivided based on representative mode share percentages applicable to the study area to determine the number of vehicle, transit, pedestrian, cycling and other trip types.

Target mode shares were developed based on the local mode shares from the O-D Survey and the Leitrim Community Master Transportation Study (MTS).

4.1.2 Trip Generation Results

4.1.2.1 Vehicle Trip Generation

Peak hour vehicular traffic volumes associated with the 4639 Bank Street development were determined using the peak hour trip generation rates in the TRANS Trip Generation study.

The vehicular trip generation results for the proposed development have been summarized in **Table 5**.

Table 5 - Base Vehicular Trip Generation Results

LAND USE	SIZE	PERIOD	GENERATED TRIPS (VPH)		
			IN	OUT	TOTAL
Townhomes	112 units	AM	22	39	61
		PM	42	37	81

Notes: vph = Vehicles Per Hour

4.1.2.2 Person Trip Generation

The person-trip to vehicle-trip conversion factors for TRANS trip generation rates vary depending on the peak hour, geographic location and land use considered. The vehicular trip generation results for the residential land uses from the previous section were divided by the vehicle mode shares to determine the number of person-trips generated.

The results after applying the appropriate conversion factors have been summarized in **Table 6**.

Table 6 - Person-Trip Results

LAND USE	VEH MODE SHARE	PERIOD	PERSON TRIPS (PPH)		
			IN	OUT	TOTAL
Townhomes	55%	AM	41	70	111
	61%	PM	69	61	130

Notes: pph = persons per hour

4.1.2.3 Mode Share Proportions

The 2011 TRANS Origin-Destination (O-D) Survey provides approximations of the existing modal share within the South Gloucester / Leitrim Traffic Assessment Zone (TAZ). Relevant extracts from the 2011 O-D Survey are provided in **Appendix F**.

A weighted average of 'AM From', 'AM Within', 'PM To' and 'PM Within' mode share distributions from 2011 was used to estimate the existing weekday morning and afternoon mode share. Based on the Leitrim MTS, the transit mode share from the Riverside South / Leitrim area was indicated as being 10% in 2016 and projected to increase to 16% by 2031. The relevant extract from the Leitrim MTS is provided in **Appendix G**. The MTS assumed that the transit mode share would not begin to increase until 2022, in conjunction with the Trillium Line South Extension, and would then increase linearly until 2031. Recognizing that some 'transit' trips may be apparent within the study as vehicular trips en-route to the Leitrim Park & Ride, the 'other' mode share has been proportionally-reduced to increase the existing transit mode share to 10%. Consistent with the MTS, it is anticipated that the transit mode share will remain at 10% until 2022 then increase linearly to 11% and 15% in 2024 and 2029, respectively. This increase in transit mode share is expected to result in a corresponding decrease in the automobile mode share.

Table 7 summarizes the 2011 O-D Survey mode share as well as the 2024 and 2029 mode share targets.

Table 7 - 2011 O-D Survey Mode Shares and Proposed Mode Share Targets

TRAVEL MODE	2011 MODE SHARE[1]	ADJUSTED MODE SHARE	2024 MODE SHARE TARGETS	2029 MODE SHARE TARGETS
Auto Driver	58%	59%	58%	55%
Auto Passenger	20%	21%	21%	20%
Transit	8%	10%	11%	15%
Cycling	1%	1%	1%	1%
Walking	7%	7%	7%	7%
Other	6%	2%	2%	2%

Notes:

[1] – Weighted average of 'AM From', 'AM Within', 'PM To' and 'PM Within' mode share distributions from the 2011 O-D Survey.

4.1.2.4 Trip Reduction Factors

Deduction of Existing Development Trips

Not Applicable: The proposed development lands are currently undeveloped, and do not generate any traffic volumes.

Pass-by Traffic

Not Applicable: The proposed development will not generate pass-by traffic.

Synergy/ Internalization

Not Applicable: The proposed development will include only residential land uses; therefore, internalization reduction factors are not required for this study.

4.1.2.5 Trip Generation by Mode

The 2024 and 2029 mode share targets (Table 7) were applied to the number of development-generated person-trips to determine the number of trips per travel mode, as summarized in **Table 8**.

Table 8 - Peak Hour Person Trips by Mode

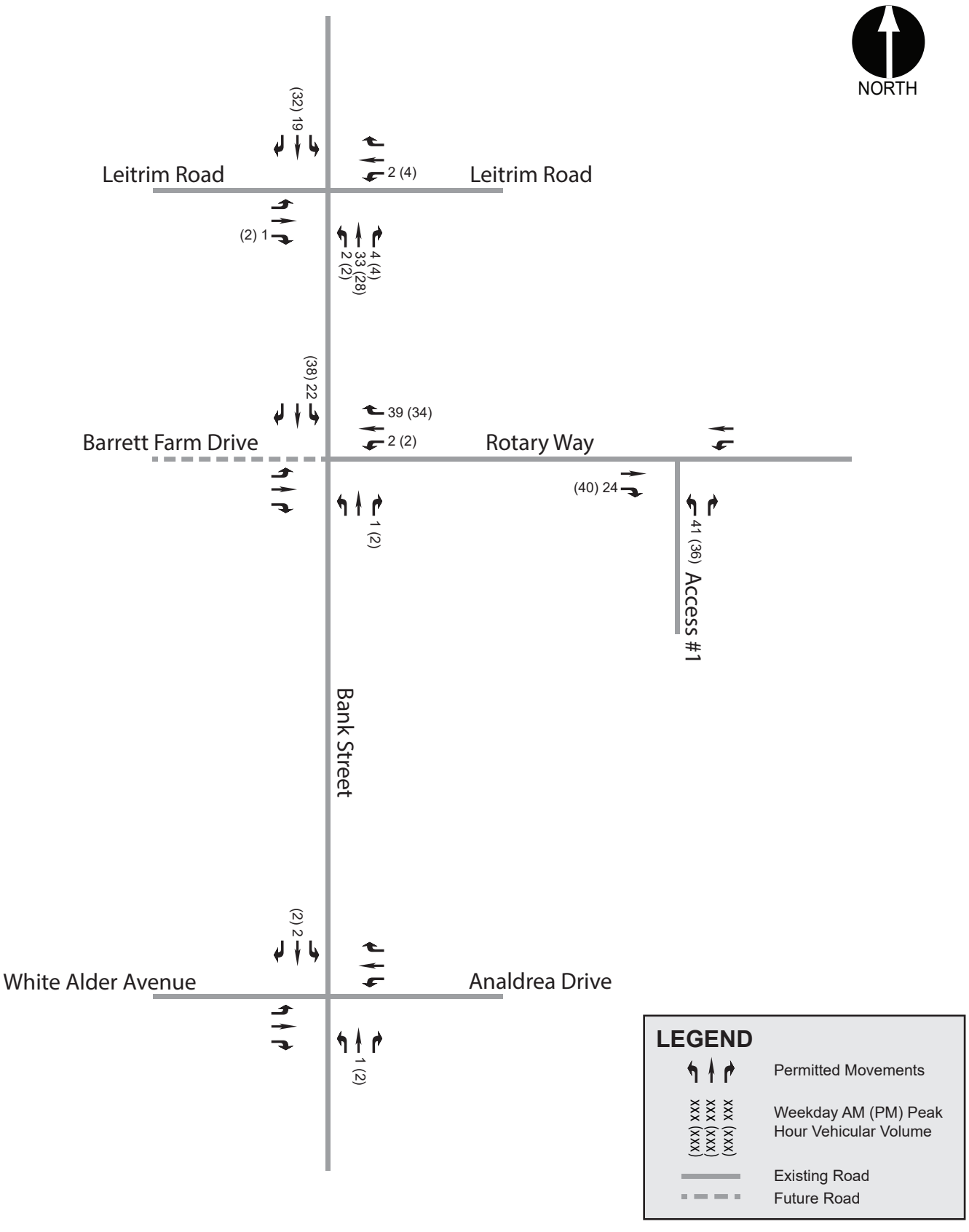
MODE	2024				2029			
	AM		PM		AM		PM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Auto Driver	24	41	40	35	23	39	38	34
Auto Passenger	8	14	14	13	8	14	14	12
Transit	5	8	8	7	6	10	10	9
Cycling	0	1	1	1	0	1	1	1
Walking	3	5	5	4	3	5	5	4
Other	1	1	1	1	1	1	1	1
Total	**111**		**130**		**111**		**130**	

4.1.3 Trip Distribution and Assignment

Consistent with the Leitrim MTS and proportions derived from existing traffic count data, trips generated by the proposed development were distributed to the adjacent road network as follows:

- 90% to/from the North
    - 80% on Bank Street
    - 10% on Hawthorne Road via Leitrim Road
- 5% to/from the West
    - 5% west on Leitrim Road to Leitrim Park and Ride
- 5% to/from the South
    - 5% on Bank Street

Utilizing the estimated number of new auto trips and applying the above distribution, future site-generated traffic volumes for the 2024 and 2029 analysis years are illustrated for each of the study area intersections in **Exhibit 5** and **Exhibit 6**, respectively.



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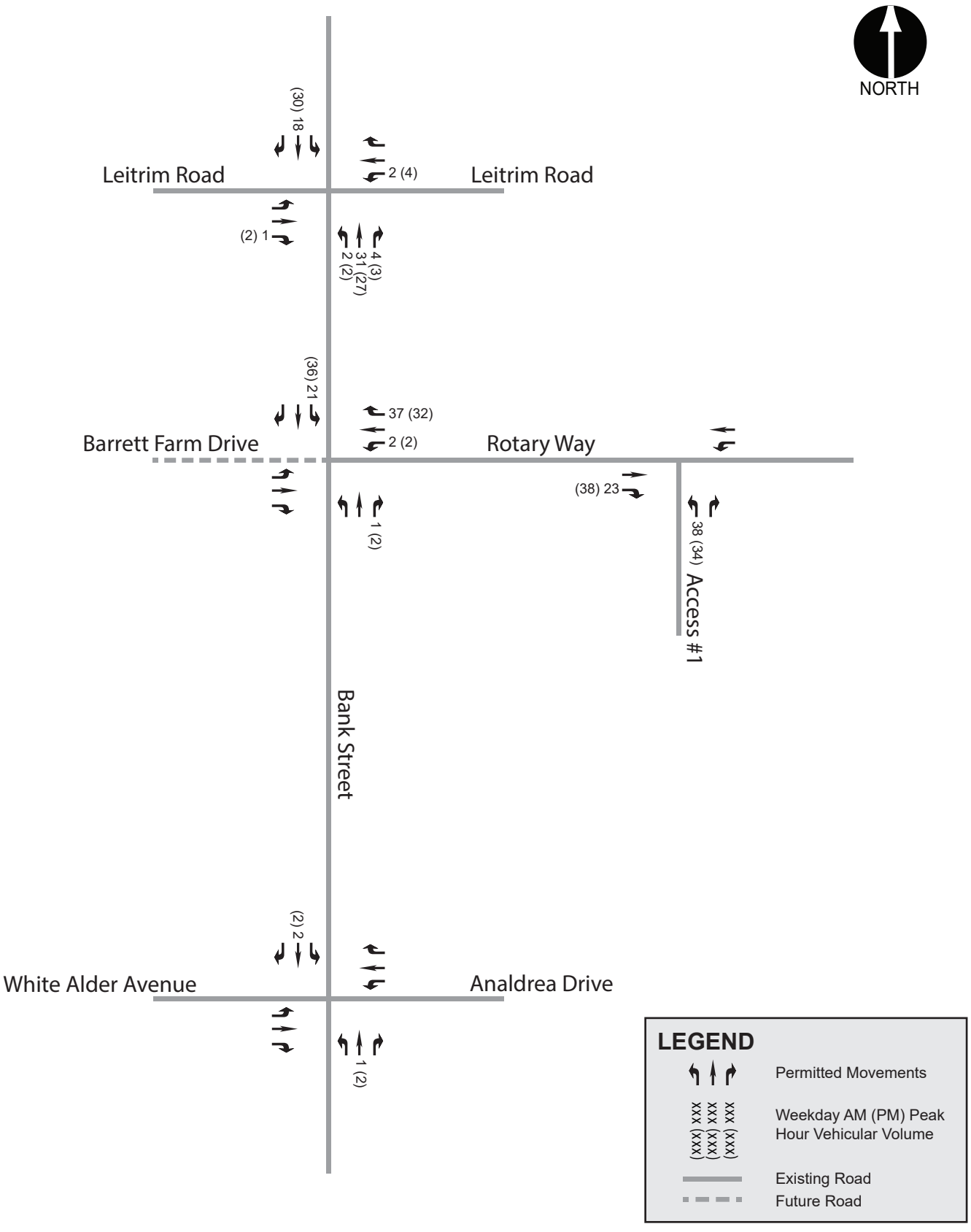
4639 Bank Street
Transportation Impact Assessment

Exhibit 5:
2024 Site Generated Traffic

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.



4639 Bank Street
Transportation Impact Assessment

Exhibit 6:
2029 Site Generated Traffic

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.

4.2 Background Network Traffic

4.2.1 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 have been considered. The Scoping section of this report reviewed the anticipated changes to the study area transportation network based on the Transportation Master Plan (TMP) as well as recent discussions with City of Ottawa staff.

Based on discussions with City staff, it is understood that the implementation timing of the Bank Street widening is as follows:

- Widening of Bank Street from two to four lanes from south of Leitrim Road to Dun Skipper Drive is slated for completion by the end of 2022.
- The reconstruction of the Bank Street & Leitrim Road intersection is scheduled for completion by the end of 2023.

This study therefore assumes that by the 2024 buildout of the proposed development, both the Bank Street widening and the reconstruction of the Bank Street & Leitrim Road intersection will have been completed. Light rail transit (LRT) service to the Leitrim community is also expected to be in place by the 2024 build-out year with service to the Leitrim Park and Ride.

4.2.2 General Background Growth Rates

The background growth rate is intended to represent regional growth from outside the study area that will travel along the adjacent road network. Consistent with the Leitrim Master Transportation Study (MTS), a 1.0% rate of linear growth per annum was applied to through movements on Bank Street, as well as all movements at the intersection of Bank Street & Leitrim Road, for the calculation of future background traffic.

4.2.3 Other Area Development

As discussed previously, all current adjacent development applications within the study area that would potentially impact travel demand during the weekday morning and afternoon peak hours were previously accounted for in the development of background traffic volume projections for the Leitrim MTS. These volumes were accounted for explicitly in the development of future background traffic volumes for this study.

4.3 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 accommodate the additional demand generated by a new development.

4.3.1 Description of Capacity Issues

4.3.1.1 Bank Street & Leitrim Road

The Leitrim Master Transportation Study (MTS) noted that the Bank Street and Leitrim Road intersection was exceeding its theoretical capacity during the weekday morning peak hour in 2016. The MTS recommended reconstructing the intersection per the Interim Design from the Bank Street Environmental Assessment (EA) by 2019 to address this capacity issue. The Interim Design from the Bank Street EA proposed the following geometrical changes to the Bank and Leitrim intersection:

- Widen Leitrim Road to four lanes through the intersection;
- Double eastbound and westbound left-turn lanes;
- Single northbound and southbound left-turn lanes;
- Northbound and southbound right-turn lanes; and
- Channelized right-turns on all approaches.

The above intersection configuration is expected to be implemented in 2023.

4.3.1.2 Bank Street & Rotary Way

The MTS identified that, in 2016, the intersection of Bank Street & Rotary Way was beginning to approach its theoretical capacity during the weekday afternoon peak hour. Once Bank Street is widened to four lanes in 2022, however, the intersection is anticipated to operate at an acceptable Level of Service (LOS 'D' or better) during both the weekday morning and afternoon peak hour.

4.3.1.3 Bank Street & Analdea Drive / White Alder Avenue

The MTS indicated that by 2022 this intersection would exceed its theoretical capacity during both the weekday morning and afternoon peak hour without the four-lane widening of Bank Street. Once Bank Street is widened to four lanes, however, no capacity issues are expected through to 2031. As Bank Street is anticipated to be widened to four lanes by 2022, no capacity issues are foreseen at this intersection within the horizon year of this study.

4.3.2 Adjustment to Development Generated Demands

As discussed previously, the mode share targets for the proposed development were derived from a blend of the mode shares from the O-D Survey and adjusted to align with the mode shares assumed in the Leitrim MTS. Consistent with the Leitrim MTS, it was assumed that the transit mode share would remain at 10% until 2022 then increase linearly to 11% and 15% by 2024 and 2029, respectively.

As noted above, the MTS indicated that all existing study area intersections are not expected to experience any capacity issues between 2024 and the horizon year of this study. As such, no adjustments have been made to the trip generation or distribution of site-generated traffic.

4.3.3 Adjustment to Background Network Demands

Similar to the development-generated demands, adjustments to transit mode share were applied to the background network demands. These adjustments however were previously accounted for in the development of the traffic volumes projections for the Leitrim MTS, therefore no further adjustments were necessary for this study.

4.4 Traffic Volume Summary

4.4.1 Future Background Traffic Volumes

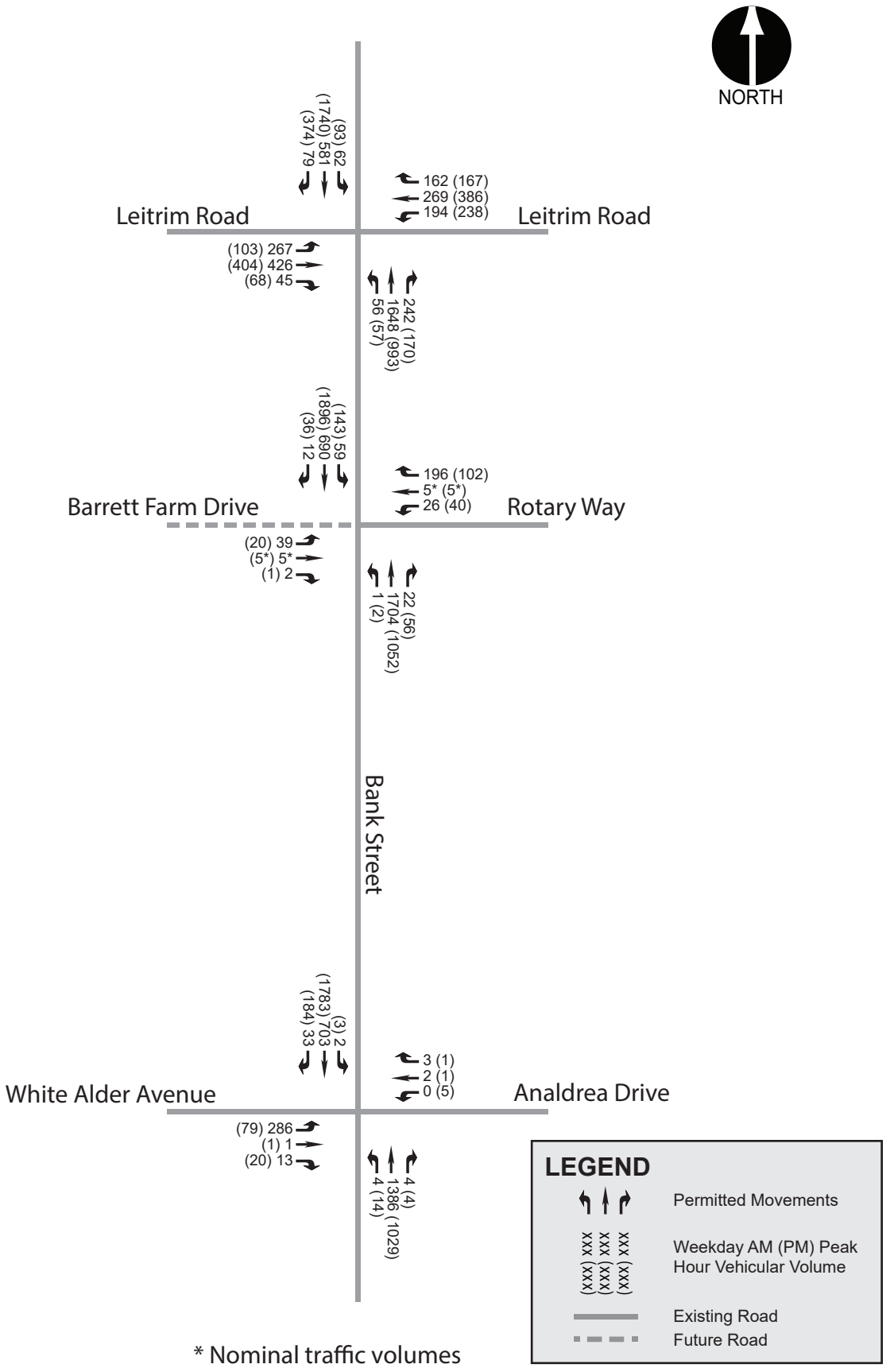
Future background traffic volumes have been established through the application of growth rates to through movements on Bank Street as well as all movements at the intersection of Bank Street & Leitrim Road, and by superimposing these adjusted traffic volumes with future adjacent development traffic volumes.

Exhibit 7 and **Exhibit 8** present the future background traffic volumes anticipated for the 2024 and 2029 analysis years, respectively.

4.4.2 Future Total Traffic Volumes

Future total traffic volumes have been established by combining the site-generated traffic volumes with future background traffic volumes.

Exhibit 9 and **Exhibit 10** present the future total traffic volumes anticipated for the 2024 and 2029 analysis years, respectively.



* Nominal traffic volumes

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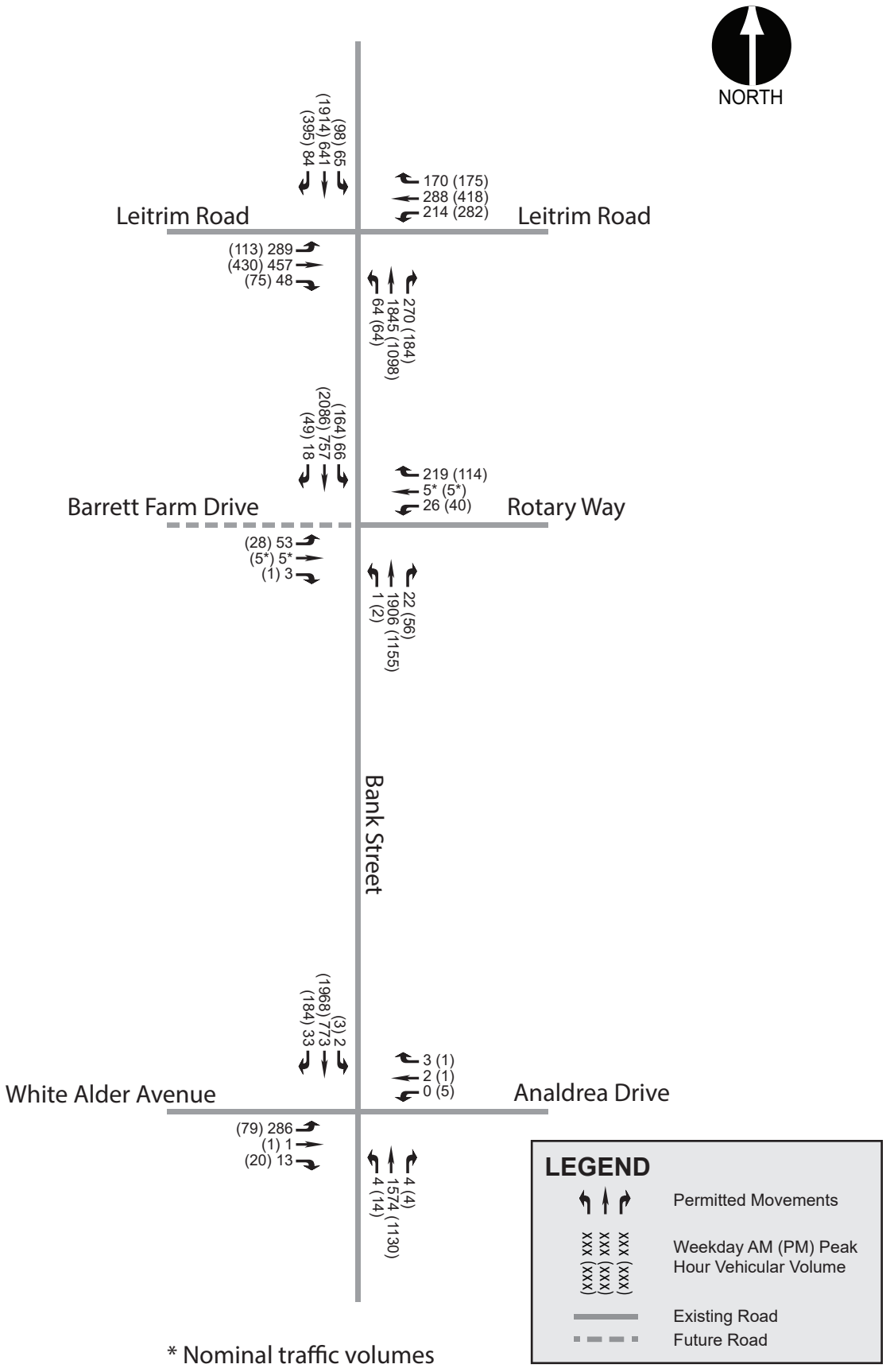
4639 Bank Street
Transportation Impact Assessment

Exhibit 7:
Future (2024)
Background Traffic

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.



* Nominal traffic volumes

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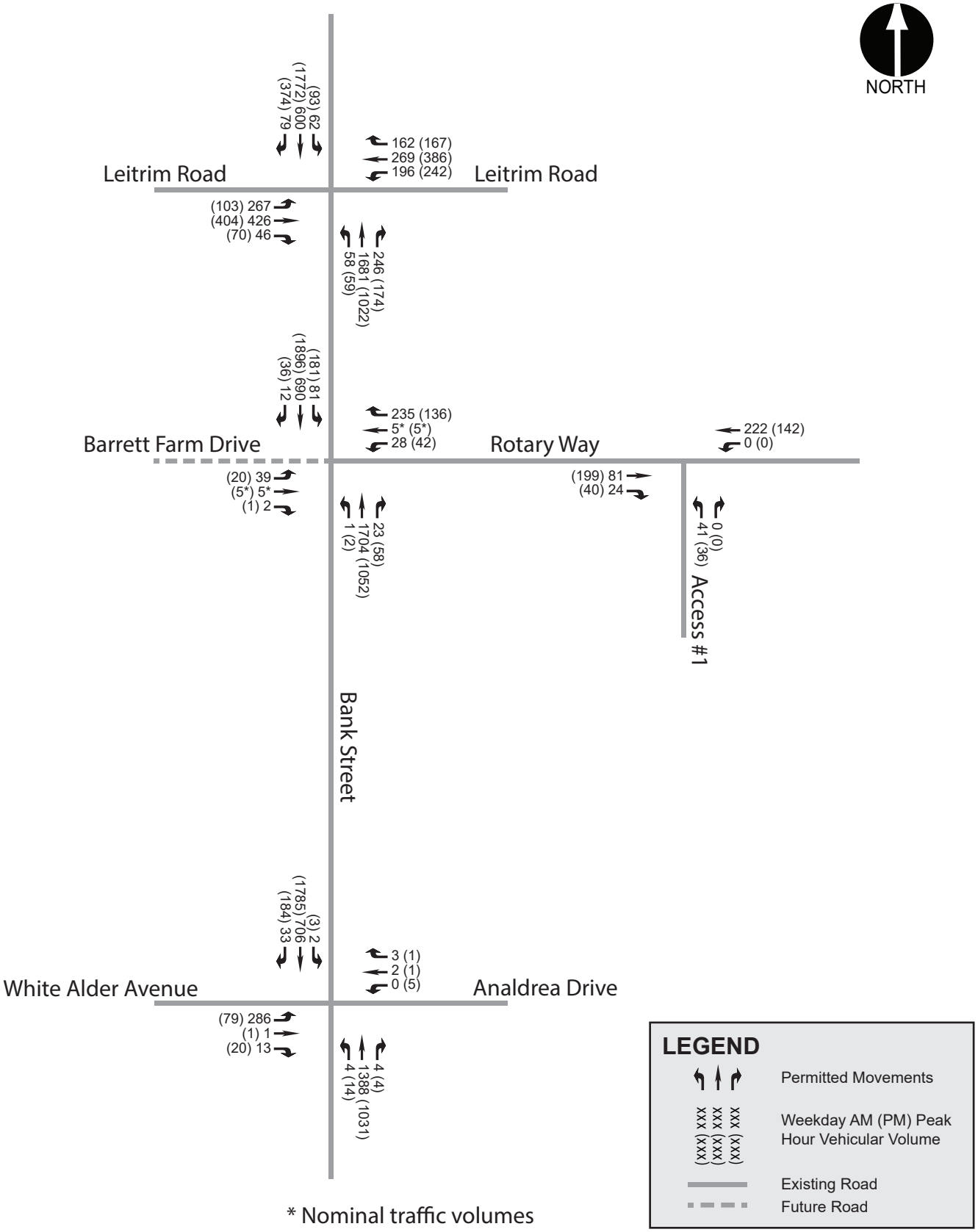
4639 Bank Street
Transportation Impact Assessment

Exhibit 8:
Future (2029)
Background Traffic

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.



* Nominal traffic volumes

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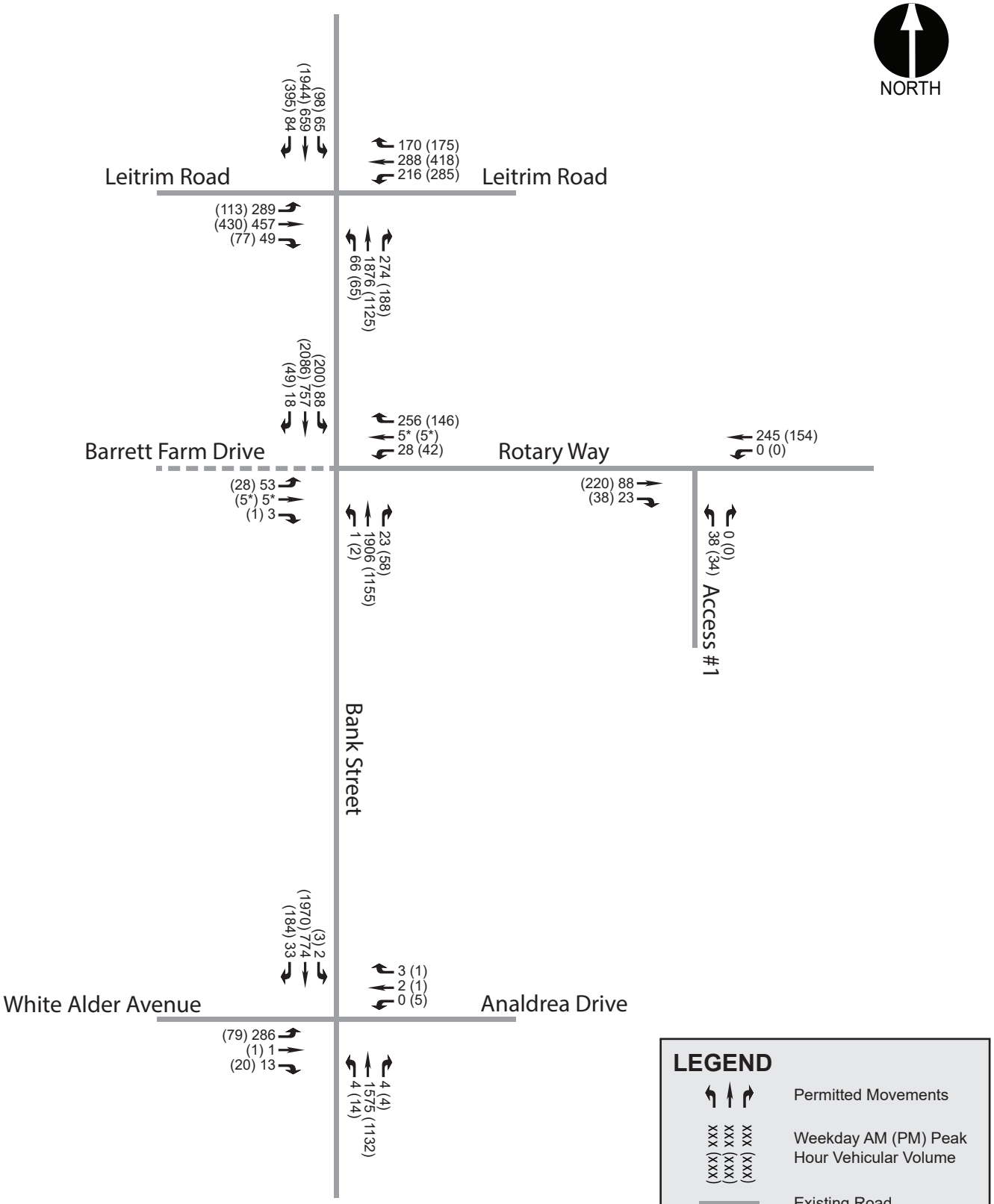
4639 Bank Street
Transportation Impact Assessment

Exhibit 9:
Future (2024)
Total Traffic

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.



* Nominal traffic volumes

4639 Bank Street
Transportation Impact Assessment

Exhibit 10:
Future (2029)
Total Traffic

PROJECT No. 125600
DATE: November 2020
SCALE: N.T.S.

5 Analysis

5.1 Development Design

5.1.1 Design for Sustainable Modes

The proposed development aligns with the objectives of the Building Better and Smarter Suburbs (BBSS) policy document which promotes compact growth and sustainable development. All of the proposed stacked townhome units are within 400m of the existing bus stops at the intersection of Bank Street & Rotary Way in accordance with OC Transpo design service guidelines. Furthermore, a future eastbound bus stop will be provided on Rotary Way directly adjacent to the proposed development. As indicated in **Exhibit 2**, an internal sidewalk network will be provided with connections to the adjacent boundary streets and integration with the proposed Bank Street configuration.

The TDM-Supportive Development Design and Infrastructure Checklist was completed and is provided in **Appendix H**. This checklist identifies measures that are being considered in association with the proposed development to offset the vehicular impact on the adjacent road network.

Notable TDM infrastructure and design measures that will be implemented are:

- Buildings are located next to the street where possible, with parking at the back and not between building entrances and the street to provide more direct connections to the adjacent pedestrian network and minimize walking distances to transit stops;
- On-site pathways will be provided with direct connections to City cycling and pedestrian infrastructure on the boundary streets, including access to nearby transit stops; and
- The majority of bicycle parking will be located within a bicycle enclosure at the southeast corner of the site to shelter bicycle parking from weather and improve security.

Furthermore, the following TDM infrastructure and design measures are currently under consideration but cannot be committed to at this time:

- Wayfinding signage may be provided with directions to nearby transit stops or stations, trails or other similar destinations;
- A bicycle repair station, including commonly used tools and an air pump, may be provided on site; and
- Some vehicle and bicycle parking spaces may be reserved for carshare and bikeshare programs.

5.1.2 Circulation and Access

Waste collection will occur on site at the southeast corner of the development, as indicated in **Exhibit 2**. The proposed garbage enclosure has been designed for safe and convenient pedestrian access, as residents will be expected to bring their waste to this area.

The drive aisles have generally been designed with a 6.7m width, except for the central section which reduces to the minimum permissible width of 6.0 metres for a Planned Unit Development and Fire Route. The vehicle swept paths for waste disposal vehicles and emergency vehicles have provided in **Appendix I**.

5.1.3 New Street Networks

Not Applicable: The New Street Networks element is exempt from this TIA, as defined in the study scope. This element is not required for Site Plan applications.

5.2 Parking

5.2.1 Vehicular Parking Supply

Based on the size of the proposed development, a minimum of 134 resident parking spaces and 22 visitor parking spaces are required to meet the Zoning Bylaw requirements. The proposed site plan indicates that 125 resident parking spaces and 18 visitor parking spaces will be provided, therefore the minimum parking supply requirement has not been met. However, based on the parking generation rate from the ITE Parking Generation Manual (5th Edition) for Multifamily Housing (Low-Rise), a townhome development of this size is expected to generate a peak parking demand of 124 spaces, including both resident and visitor parking demand. As the site is deficient by only 13 spaces, this reduced parking supply can be further justified through the incorporation of TDM measures aimed at reducing the automobile-dependence of the development and taking advantage of the planned pedestrian and cycling infrastructure on Bank Street as well as the introduction of Light Rail Transit service to the Leitrim Community prior to build-out.

Based on the Zoning Bylaw, a maximum of 40% of parking stalls can be reduced-size parking stalls. The proposed development will include a total of 51 reduced-size parking stalls which represents only 35.7% of the provided parking stalls, therefore meeting the Zoning Bylaw requirements.

5.2.2 Bicycle Parking Supply

According to the Zoning Bylaw, the proposed development must provide 56 bicycle parking spaces. A total of 58 bicycle parking spaces will be provided, including 36 sheltered parking spaces within the bicycle enclosure. As such, the minimum bicycle parking requirement has been met.

5.2.3 Spillover Parking

Based on ITE parking generation rates described above, no spillover parking is expected to occur, therefore no analysis of off-site parking will be necessary for the purposes of this study. It should be noted, however, that on-street parking along the site's frontage will be prohibited due to the presence of an auxiliary turning lane on Rotary Way, but approximately 10 vehicles can be accommodated on-street along Rotary Way between the site access and Fairweather Street.

5.3 Boundary Streets

As discussed previously, since a Complete Street design has been prepared for Bank Street through the study area, segment-based MMLOS analysis is only required for Rotary Way. The impact of the proposed development on the design of Bank Street will be reviewed however.

5.3.1 Mobility

5.3.1.1 Bank Street

The preliminary design for the widening of Bank Street indicates that this roadway will be upgraded from its current two-lane rural cross-section to an urban four-lane cross-section with concrete sidewalks and cycle tracks on both sides. At the intersection of Bank Street & Rotary Way, left-

turn lanes will be provided on all approaches and right-turn lanes are under consideration for the northbound and southbound directions.

As there is no direct vehicular access on Bank Street proposed, the site will not have any impact on its design.

5.3.1.2 Rotary Way

Segment-based Multi-Modal Level of Service (MMLOS) results for Rotary Way along the proposed development frontage are provided in **Table 9** below.

Details of the Multi-Modal Level of Service (MMLOS) analysis are provided in **Appendix K**.

Table 9 - Segment MMLOS Results

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
Existing & Future Conditions				
Rotary Way	A (Target: C)	F (Target: D)	D (Target: N/A)	B (Target: N/A)

Based on a posted speed of 60km/h, the results of the Segment-based MMLOS analysis indicates that Rotary Way is currently not meeting its BLOS target due to operating speeds which are estimated to be in the order of 60 km/h. The target BLOS could be achieved by either reducing operating speeds on Rotary Way through the use of traffic calming measures or by providing bike lanes in both directions.

5.3.2 Road Safety

A summary of all reported collisions within the study period over the past five years was presented in the Scoping section of this TIA. The City requires a safety review if at least six collisions for any one movement or of a discernible pattern have occurred over a five-year period. Preliminary analysis identified some intersections and road segments of potential concern, therefore further review was conducted, as summarized below:

Bank Street & Leitrim Road

The intersection of Bank Street & Leitrim Road experienced 58 collisions over the past five years. Relative to the overall traffic volumes at the intersection, however, the collision rate is not considered significant. In the past five years, there have been six angle collisions, 29 rear-end collisions, five sideswipe collisions, 14 turning movement collisions, three single motor vehicle (SMV) collisions and one rear-end collision due to a vehicle reversing into another vehicle. No clear collision patterns were observed for the angle collisions. For rear-end collisions, most occurred in the northbound and southbound directions and many involved vehicles either following too closely, driving too fast or losing control. Environmental conditions may have been a factor in some of these collisions, however, driving behavior might have been a larger contributing factor. Based on the above, it is indicative that traffic congestion during peak periods has led to aggressive driving behavior and is expected to be addressed by the planed reconstruction of the intersection in 2023.

Bank Street & Rotary Way

Over the past five years, a total of nine collisions occurred at this intersection: one angle collision, five rear-end collisions, one turning movement collision and two SMV collisions. With the four-lane

widening of Bank Street in 2022, increased roadway capacity through this intersection is expected to mitigate historical collision patterns.

Bank Street & Analdea Drive / White Alder Avenue

A total of 23 collisions were recorded at this intersection. Of the 23 collisions recorded over the past 5 years, two were angle collisions, 18 were rear-end collisions, two were sideswipe collisions and one was a SMV collision. Almost all rear-end collisions occurred in the northbound and southbound directions. Based on an analysis of potential contributing factors, it appears that although environmental conditions may have had an impact, improper driving behaviour (e.g. following too closely, driving too fast, etc.) was a contributing factor in nearly all the reported collisions. As mentioned previously, it is expected that the planned widening of Bank Street in 2022 will reduce congestion at the intersection and result in improved driver behaviour.

Bank Street – Leitrim Road to Rotary Way

Over the past five years, a total of 35 collisions were recorded between Leitrim Road and Rotary Way: one head-on collision, nine angle collisions, 15 rear-end collisions, three sideswipe collisions, two turning movement collisions, four SMV collisions and one collision classified as 'other'. Most of the angle collisions involved vehicles turning left onto Bank Street from a private driveway. Once Bank Street is widened to four lanes there will be a centre median preventing left-turns from driveways and therefore it is expected that this collision pattern will be addressed. As observed at all intersection, almost all rear-end collisions were caused by inappropriate driving behaviour which is expected to diminish once Bank Street is widened.

5.4 Access Intersections

5.4.1 Location and Design of Access

The proposed development will provide a new private approach on Rotary Way. This private approach is in conformance with the City of Ottawa Private Approach By-law 2003-447, with particular confirmation of the following items:

- Width: A private approach will have a minimum width of 2.4m and a maximum width of 9.0m.
    - The proposed access will be 6.7m wide. ✓
- Distance from Intersecting Road: For a residential development with between 100 and 199 parking spaces, the proposed private approach must be at least 30 metres from the nearest intersecting street line.
    - The proposed access on Rotary Way is approximately 57m from the nearest intersecting street line at Bank Street and is therefore in conformance with the by-law. This distance is also in conformance with the Transportation Association of Canada (TAC) guidelines which recommends a minimum distance of 55m to a signalized intersection with an arterial road. ✓
- Quantity and Spacing of Private Approaches: For sites with frontage between 46 and 150 metres, one (1) two-way and two (2) one-way, or two (2) two-way private approaches are permitted. On lots that abut more than one roadway, such as the proposed development, these provisions apply to each frontage separately.
    - The frontage on Rotary Way is 61m and therefore the single proposed two-way private approach is compliant with the by-law. ✓
- Distance from Property Line: Private approaches must be at least 3.0m from the abutting property line, however this requirement can be reduced to 0.3m provided that the access

is a safe distance from the access serving the adjacent property, sight lines are adequate and that it does not create a traffic hazard.

  - The proposed private approach is 6.7m from the property line and therefore exceeds the minimum distance required. ✓

- Grade of Private Approach: The grade of a private approach serving a parking area of more than 50 spaces must not exceed 2% within the private property for a distance of 9m from the highway/curb line.

  - The grade of the private approach will not exceed 2% within 9m of the curb line. ✓

Based on the Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads (June 2017), for a residential development of 100 to 200 units a minimum clear throat length of 15m is suggested for site access intersections proposed on collector roads. The clear throat length is provided to ensure that any queues that form due to on-site circulation blockages do not spillback onto the collector road. A clear throat length of 13.3m is proposed for the Rotary Way access, as measured from the inside limit of the curb return to the nearest point of vehicular conflict (i.e. parking stall). Despite this distance being slightly less than the 15m required, the total distance between this point of conflict and the intersecting street line is in excess of this minimum requirement, and therefore queue spillback onto Rotary Way is highly unlikely. It is the opinion of IBI Group that the throat length, as proposed, will be sufficient.

5.4.2 Intersection Control

Not Applicable – The proposed private approach will be unsignalized, given the low site-generated traffic projections indicated in the Forecasting section of this report.

5.4.3 Intersection Design (MMLOS)

The proposed private approach will be constructed with a depressed and continuous sidewalk across the access. As the proposed site access will be unsignalized, MMLOS analysis is not required.

5.5 Transportation Demand Management (TDM)

The City of Ottawa is committed to implementing Transportation Demand Management (TDM) measures on a City-wide basis in an effort to reduce automobile dependence, particularly during the weekday peak travel periods. TDM initiatives are aimed at encouraging individuals to use non-auto modes of travel during the peak periods.

5.5.1 Context for TDM

The proposed development is not located within a Design Priority Area (DPA) or within a Transit-Oriented Development (TOD) zone. As described in the Forecasting section of this report, mode shares used to estimate future development traffic were based on the 2011 TRANS Origin-Destination (O-D) Survey for the South Gloucester/Leitrim Traffic Assessment Zone (TAZ) as well as the Leitrim Master Transportation Study (MTS). These mode share targets represent an average of the commuter peak period mode share distributions reported in the O-D Survey and were adjusted to account for the expected increase in transit use in the area. The site is, however, situated in a community that will have access to Light Rail Transit and will be directly adjacent a major multi-modal corridor (Bank Street).

5.5.2 Need and Opportunity

The Leitrim community is presently auto-oriented with limited transit access. It is expected, however, that as development in the surrounding community progresses that expanded transit service will be provided and gaps in the pedestrian and cyclist network will be filled in. The implementation of the Complete Street concept in the future widening of Bank Street and extension of LRT service to Leitrim will facilitate travel by non-auto modes.

In order to effectively accommodate the expected future travel demand within the surrounding community, it is important that the City continues to expand the transit service network as the road network evolves in order to capture local trips and provide direct connections to major transit hubs such as the future Leitrim Station. Providing high quality transit service within the community will help promote the use of transit as a convenient and efficient alternative mode of transportation, thereby reducing auto-dependency.

5.5.3 TDM Program

As previously mentioned, the proposed development has been designed with an internal network of pedestrian facilities with direct connections to existing pedestrian and cycling facilities adjacent to the site. Furthermore, an enclosure for secure bike storage will be provided on the site. The proposed development thereby conforms to the City's TDM principles by providing convenient and direct connections to active transportation and transit facilities where available.

The following measures are being considered as part of the proposed development's TDM program, however, cannot be committed to at this time:

- A multi-modal travel information package may be provided to new residents;
- Relevant transit route schedules and maps may be displayed at building entrances; and
- Carshare or bikeshare programs may be implemented on site.

The City of Ottawa's TDM Measures Checklist was completed for the proposed development, and the results are provided in **Appendix H**.

5.6 Neighbourhood Traffic Management

5.6.1 Adjacent Neighbourhoods

As discussed previously, the proposed development will have one all-movement access onto Rotary Way, which is classified by the City of Ottawa as a Collector Road. The TIA Guidelines indicate that the targeted livability threshold for a collector road is 300 vehicles per hour. During the weekday morning and afternoon peak hours, it is anticipated that two-way traffic volumes on Rotary Way between the site access and Bank Street will approach approximately 395 vehicles per hour in 2029. Although this is in excess of the livability threshold of a collector road, it is not anticipated that a neighbourhood traffic management plan will be required as there are no private residences along this segment of the roadway which would be impacted by the increased traffic demand. Further, it is not unreasonable for traffic volumes to exceed this threshold near the approaches to the arterial road network. The proposed development is unlikely to result in an increase in traffic within the adjacent residential subdivision.

5.7 Transit

5.7.1 Route Capacity

The estimated future total transit passenger demand of the proposed development was provided in Section 4.1.2.5. The results have been summarized in **Table 10**.

Table 10 - Development Generated Transit Demand

PERIOD	2024 PEAK PERIOD DEMAND		2029 PEAK PERIOD DEMAND	
	IN	OUT	IN	OUT
AM	4	6	5	8
PM	6	5	7	7

As the projected transit demand is minor, it is expected that the existing transit routes that operate in the vicinity of the proposed development will be able to accommodate the additional demand. The proposed development is expected to generate approximately 14 two-way transit trips during the weekday morning and afternoon peak hours, which represents a small fraction of the 104-person capacity indicated by OC Transpo for a regular bus.

5.7.1 Transit Priority Measures

Given the minimal increase in demand the proposed development will have on the overall transit system, no transit priority measures are deemed necessary as a consequence of this development.

5.8 Review of Network Concept

Not Applicable: The Network Concept element is exempt from this TIA, as defined in the study scope. This element is not required for proposed developments expected to generate less than 200 person-trips beyond what is otherwise permitted by zoning during the weekday morning and afternoon peak hours.

5.9 Intersection Design

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

5.9.1 Intersection Control

Traffic signal warrant analysis and roundabout analysis is not be required for this TIA as all study area intersections, with the exception of the site access, are presently signalized. As discussed in Section 5.4.2, the site access intersection will remain unsignalized.

5.9.1.1 Traffic Signal Warrants

Not Applicable – Traffic signal warrant analysis is not required for this TIA.

5.9.1.2 Roundabout Analysis

Not Applicable – Roundabout analysis is not required for this TIA.

5.9.2 Intersection Analysis Criteria (Automobile)

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

5.9.2.1 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 11 - 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 as described in the TIA Guidelines and incorporates existing signal timing plans obtained from the City of Ottawa. The analysis existing conditions utilized a Peak Hour Factor (PHF) of 0.90, while future conditions considers optimized signal timing plans and use of a Peak Hour Factor (PHF) of 1.0 to recognize peak spreading beyond a 15-minute period in congested conditions.

5.9.2.2 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 described in terms of the average movement delays at the intersection. This is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this includes the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position. The average delay for any particular minor movement at the un-signalized intersection is a function of the capacity of the approach and the degree of saturation.

The Highway Capacity Manual 2010 (HCM), prepared by the Transportation Research Board, includes the following Levels of Service criteria for un-signalized intersections, related to average movement delays at the intersection, as indicated in **Table 12**.

Table 12 - 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.

5.9.3 Intersection Capacity Analysis

Following the established intersection capacity analysis criteria described above, existing and future conditions are analyzed using the weekday peak hour traffic volumes derived in this study.

The following section presents the results of the intersection capacity analysis. All tables summarize study area intersection LOS results during the weekday morning and afternoon peak hour periods. The analyses below are largely based on the assumptions of the Leitrim Master Transportation Study (MTS). Relevant extracts of the MTS are provided in **Appendix G**.

The Synchro output files have been provided in **Appendix J**.

5.9.3.1 Existing (2020) Traffic

An intersection capacity analysis has been undertaken using the Existing (2020) Traffic volumes presented in **Exhibit 4. Table 13** summarizes the results of the intersection capacity analysis.

Table 13 - Intersection Capacity Analysis: Existing (2020) 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 Street & Leitrim Road	Signalized	**F (1.14)**	**EBTRL (1.44)**	D (0.90)	**EBTRL (1.06)**
Bank Street & Rotary Way	Signalized	D (0.89)	NBT (0.89)	**E (0.95)**	**SBT (0.95)**
Bank Street & White Alder Avenue/Analdea Drive	Signalized	D (0.82)	EBL (0.90)	D (0.87)	SBT (0.87)

Based on the results of the intersection capacity analysis, the intersection of Bank Street & Leitrim Road is presently exceeding its theoretical capacity during the weekday morning peak hour. During the afternoon peak hour, the intersection as a whole is operating at an acceptable Level of Service (i.e. LOS 'D' or better), however, some movements are currently exceeding their theoretical capacity. The intersection of Bank Street & Rotary Way is currently approaching its theoretical capacity during the afternoon peak hour but is operating an acceptable Level of Service (i.e. LOS 'D' or better) in the morning peak hour.

5.9.3.2 Future (2024) Background Traffic

An intersection capacity analysis has been undertaken using the Future (2024) Background Traffic volumes presented in **Exhibit 7**, yielding the following results:

Table 14 - Intersection Capacity Analysis: Future (2024) 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 Street & Leitrim Road	Signalized	**E (0.95)**	**WBL (1.01)**	**E (0.96)**	**SBT (0.96)**
Bank Street & Rotary Way / Barrett Farm Drive	Signalized	B (0.70)	WBTR (0.75)	B (0.69)	SBT (0.69)
Bank Street & White Alder Avenue/Analdea Drive	Signalized	B (0.68)	EBL (0.82)	B (0.64)	SBT (0.64)

In 2024, the reconstructed Bank Street & Leitrim Road intersection is expected to begin approaching its theoretical capacity (LOS ‘E’ or worse) under background traffic conditions, with some movements exceeding their theoretical capacity. These results are consistent with the findings of the Leitrim Master Transportation Study (MTS). It should be noted that the planned intersection improvements serve only as an interim solution to the existing congestion along the Bank Street corridor until the 'ultimate' intersection configuration is implemented by the City. The remaining intersections, however, are expected to operate at an acceptable Level of Service (LOS ‘D’ or better) with Bank Street widened to four lanes. None of the study area intersections as a whole are expected to be operating in excess of their theoretical capacity (i.e. overall LOS of ‘F’) therefore no road network modifications are recommended.

5.9.3.3 Future (2029) Background Traffic

An intersection capacity analysis has been undertaken using the Future (2029) Background Traffic volumes presented in **Exhibit 8**, yielding the following results:

Table 15 - Intersection Capacity Analysis: Future (2029) 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 Street & Leitrim Road	Signalized	**F (1.17)**	**NBT (1.18)**	**F (1.07)**	**WBL (1.07)**
	Signalized[1]	D (0.83)	EBL (0.89)	**E (0.98)**	**SBT (0.98)**
Bank Street & Rotary Way / Barrett Farm Drive	Signalized	C (0.79)	NBT (0.79)	C (0.76)	SBT (0.76)
Bank Street & White Alder Avenue/Analdea Drive	Signalized	C (0.76)	EBL (0.82)	C (0.71)	SBT (0.71)

Notes:

[1] – Bank Street widened to six lanes, eastbound and westbound right-turn lanes added, and a protected-permitted phase added for the northbound left-turn movement during the weekday afternoon peak hour.

By 2029, it is anticipated that the Bank Street & Leitrim Road intersection will once again begin to approach its theoretical capacity (LOS 'E' or worse) under background traffic conditions, as previously indicated in the Leitrim MTS. The analysis undertaken during the MTS suggested that, upon the widening of Bank Street to six lanes, right-turn lanes would be required on the eastbound and westbound approaches as well as a permitted-protected phase on the northbound left-turn movement during the weekday afternoon peak hour in order for the intersection to operate at an acceptable Level of Service. It is therefore recommended that the City consider implementing these measures by 2029 to address background traffic growth. It should be noted that even with these measures implemented, the intersection will be close to its maximum capacity during the afternoon peak hour.

5.9.3.4 Future (2024) Total Traffic

An intersection capacity analysis has been undertaken using the Future (2024) Total Traffic volumes presented in **Exhibit 9**, yielding the following results:

Table 16 - Intersection Capacity Analysis: Future (2024) 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 Street & Leitrim Road	Signalized	**E (0.97)**	**NBT (1.04)**	**E (0.98)**	**SBT (0.98)**
Bank Street & Rotary Way / Barrett Farm Drive	Signalized	C (0.71)	WBTR (0.79)	B (0.69)	SBT (0.69)
Bank Street & White Alder Avenue/Analdea Drive	Signalized	B (0.68)	EBL (0.82)	B (0.64)	SBT (0.64)
Rotary Way & Site Access	Unsignalized	B (10.7s)	NBRL (10.7s)	B (11.0s)	NBRL (11.0s)

As illustrated above, the addition of site-generated traffic is expected to have a negligible impact on the operation of the study area intersections relative to Future (2024) Background Traffic conditions. As such, no further intersection modifications will be required as a direct consequence of the proposed development.

5.9.3.5 Future (2029) Total Traffic

An intersection capacity analysis has been undertaken using the Future (2029) Total Traffic volumes presented in **Exhibit 10**, yielding the following results:

Table 17 - Intersection Capacity Analysis: Future (2029) 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 Street & Leitrim Road	Signalized[1]	D (0.83)	EBL (0.89)	**E (0.98)**	**SBT (0.98)**
Bank Street & Rotary Way / Barrett Farm Drive	Signalized	**F (1.19)**	**SBL (1.19)**	C (0.77)	SBT (0.77)
	Signalized[2]	D (0.87)	EBL (0.90)	N/A	
Bank Street & White Alder Avenue/Analdea Drive	Signalized	C (0.76)	EBL (0.82)	C (0.71)	SBT (0.71)
Rotary Way & Site Access	Unsignalized	B (10.9s)	NBRL (10.9s)	B (11.2s)	NBRL (11.2s)

Notes:

[1] – Bank Street widened to six lanes, eastbound and westbound right-turn lanes added, and a protected-permitted phase added for the northbound left-turn movement during the weekday afternoon peak hour.

[2] – Protected-permitted phase added for the southbound left-turn movement during the weekday morning peak hour.

As observed in 2024, the addition of site-generated traffic in 2029 is anticipated to have a negligible impact on the study area intersections relative to Future (2029) Background Traffic conditions. The exception, however, is the southbound left-turn movement at the Bank Street & Rotary Way / Barrett Farm Drive which is expected to exceed its theoretical capacity during the weekday morning peak hour. This is due to increased southbound left-turn demand generated by the proposed development coupled with heavy northbound traffic resulting in fewer gaps in traffic. As such, it is recommended that during the four-lane widening of Bank Street appropriate signal infrastructure be provided to provision for the eventual need for a protected-permitted southbound left-turn phase. A protected-permitted southbound left-turn phase is not expected to be required during the afternoon peak hour in order for the intersection to operate at an acceptable Level of Service.

5.9.4 Intersection Design (MMLOS)

Analysis criteria for each of the four non-auto modes are briefly described as follows:

Intersection Pedestrian Level of Service (PLOS)

The PLOS at intersections is based on several factors including the number of traffic lanes that pedestrians must cross, corner radii, and whether the crossing allows for permissive or protective right or left turns, among others. The City of Ottawa target for PLOS along an arterial in the General Urban Area is 'C'.

Intersection Bicycle Level of Service (BLOS)

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 an arterial spine route is 'C'.

Intersection Transit Level of Service (TLOS)

Intersection TLOS is based on the average signal delay experienced by transit vehicles at each intersection. As this segment of Bank Street is not designated as a transit priority corridor, there is no City target for TLOS.

Intersection Truck Level of Service (TkLOS)

The Truck LOS (TkLOS) is based on the right-turn radii, as well as the number of receiving lanes for vehicles making a right-turn from the traffic lane being analyzed. The City of Ottawa target for TkLOS along an arterial roadway is 'D' for truck routes or 'E' for non-truck routes.

5.9.4.1 Intersection MMLOS Results

An analysis of the existing and future conditions for each mode has been conducted based on the methodology prescribed in the City of Ottawa Multi-Modal Level of Service (MMLOS) Guidelines. The Level of Service (LOS) for each mode has been calculated for each intersection where signals exist or are anticipated under both existing and future conditions.

The intersection MMLOS results have been summarized in **Table 18**. Detailed intersection MMLOS analysis results are provided in **Appendix K**.

Table 18 - Intersection MMLOS

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
Existing Conditions				
Bank Street & Leitrim Road	**F** (Target: C)	**F** (Target: C)	F (Target: N/A)	**E** (Target: D)
Bank Street & Rotary Way	**E** (Target: C)	**F** (Target: C)	C (Target: N/A)	N/A (Target: D)
Bank Street & Analdea Drive / White Alder Avenue	**E** (Target: C)	**F** (Target: C)	C (Target: N/A)	N/A (Target: D)
Future Conditions				
Bank Street & Leitrim Road	**F** (Target: C)	C (Target: C)	E (Target: N/A)	A (Target: D)
Bank Street & Rotary Way / Barrett Farm Drive	**F** (Target: C)	C (Target: C)	C (Target: N/A)	N/A (Target: D)
Bank Street & Analdea Drive / White Alder Avenue	**F** (Target: C)	C (Target: C)	C (Target: N/A)	N/A (Target: D)

5.9.4.2 Summary of Potential Improvements

Based on the MMLOS results outlined in **Table 18**, the following measures have been identified that could improve conditions for each travel mode:

Pedestrians

- The analysis indicates that all study area intersections are failing to meet the City's PLOS target of 'C' under both existing and future conditions. Under existing conditions, the intersections are performing poorly primarily due to long pedestrian delays. Under future conditions, the widening of Bank Street results in substantially increased crossing distances which worsens the PLOS relative to existing conditions. Any reasonable measures to improve PLOS may not be appropriate given the relative proportion of vehicular to pedestrian travel demand.

Cyclists

- Based on the analysis, all study area intersections are currently failing to meet the City's BLOS target of 'C', however, with the Bank Street widening all study area intersections will be reconstructed as protected intersections which will result in all intersections achieving a BLOS of 'C'. As such, no further modifications are recommended.

Transit

- The results of the analysis indicate that the Bank Street & Rotary Way / Barrett Lands and Bank Street & Analdea Drive / White Alder Avenue intersections are presently operating at a TLOS of 'C' while the intersection of Bank Street & Leitrim Road is operating at TLOS 'F'. Under Future (2029) Total Traffic conditions, conditions at the Bank Street & Leitrim Road intersection are expected to improve to TLOS 'E' due to decreased delays while the other two intersections remain at a TLOS of 'C'. As none of the study area intersection are part of a transit priority corridor, no modifications are recommended to improve TLOS.

Truck

- The intersection of Bank Street & Leitrim Road is the only intersection for which TkLOS can be evaluated. All other intersections do not need to accommodate right-turning truck traffic. Under existing conditions, the Bank Street & Leitrim Road intersection is not meeting its TkLOS target due to tight turning radii and/or insufficient receiving lanes. With the widening of Bank Street and Leitrim Road to four lanes and the provision of smart channels on all approaches, both of these deficiencies will be addressed resulting in a TkLOS of 'A'. As such, no further modifications are recommended.

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 MMLOS analysis identifies existing / background deficiencies that will not be exacerbated by the proposed development or required to safely accommodate the travel demands generated by the site.

5.10 Geometric Review

The following section reviews all geometric requirements for the study area intersections.

5.10.1 Sight Distance and Corner Clearances

The proposed site access on Rotary Way is approximately 61m east of Bank Street. Rotary Way is relatively flat and straight at this location therefore sight distance and corner clearances are not expected to be a concern.

5.10.2 Auxiliary Lane Analysis

Auxiliary turning lane requirements for all intersections within the study area were reviewed using the Future (2029) Total Traffic volumes and compared to the storage lengths proposed as part of the four-lane widening of Bank Street. Auxiliary turning lane requirements for all intersections within the study area are described as follows:

5.10.2.1 Unsignalized Auxiliary Left-Turn Lane Requirements

Not Applicable – The volume of left-turning inbound traffic at the site access intersection is anticipated to be negligible, therefore, an auxiliary left-turn lane at this location is not required.

5.10.2.2 Signalized Auxiliary Left-Turn Requirements

A review of auxiliary left-turn lane storage requirements was completed at all signalized intersections within the study area. 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 = 3600s / cycle length

The results of the auxiliary left-turn lane analysis are summarized below in **Table 19**.

Table 19 - Auxiliary Left-Turn Storage Analysis at Signalized Intersections

INTERSECTION	APPROACH	95TH %ILE QUEUE LENGTH (m)	CALCULATED QUEUE LENGTH (m)	EXISTING PARALLEL LANE LENGTH (m)	STORAGE DEFICIENCY (m)
Bank Street & Leitrim Road	NB	15	25	65	-
	SB	20	35	80	-
	EB	#55	50	60 x2	-
	WB	#60	55	80 x2	-
Bank Street & Rotary Way / Barrett Farm Drive	NB	0	0	50	-
	SB	45	70	130	-
	EB	20	15	30	-
	WB	20	15	15	5
Bank Street & Analdea Drive / White Alder Avenue	NB	5	5	50	-
	SB	0	0	50	-
	EB	80	90	85	5
	WB	5	0	15	-

Left-turn lane deficiencies were identified at the Bank Street & Rotary Way / Barrett Farm Drive intersection and the Bank Street & Analdea Drive / White Alder Avenue intersection. These deficiencies, however, are relatively minor therefore no intersection modifications are recommended.

5.10.2.3 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.

Based on the trip generation estimate, it is not anticipated that right-turning volumes at the site access will exceed 60 vehicles per hour. As such, an auxiliary right-turn lane is not required at this location.

5.10.2.4 Signalized Auxiliary Right-Turn Lane Requirements

For signalized intersections, TAC suggests that auxiliary right-turn lanes shall 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 such as Bank Street through the study area and may not be applicable in all circumstances.

The results of the auxiliary right-turn lane analysis are summarized below in **Table 20** below:

Table 20 - Auxiliary Right-Turn Lane Storage Analysis at Signalized Intersections

INTERSECTION	APPROACH	RIGHT TURN VOLUME	APPROACH VEHICLES TURNING RIGHT (%)	95TH %ILE QUEUE LENGTH (m)	EXISTING PARALLEL LANE LENGTH (m)	STORAGE DEFICIENCY (m)
Bank Street & Leitrim Road	NB	274	14%	15	140	-
	SB	395	16%	20	200	-
	EB	77	12%	0	-	0
	WB	175	25%	20	-	20
Bank Street & Rotary Way / Barrett Farm Drive	NB	58	5%	5	45	-
	SB	49	2%	5	60	-
	EB	3	5%	-	-	-
	WB	256	90%	-	-	-
Bank Street & Analdea Drive / White Alder Avenue	NB	4	0%	-	-	-
	SB	184	9%	5	100	-
	EB	20	20%	-	-	-
	WB	3	60%	-	-	-

Based on the above results, it is possible that in 2029 an eastbound right-turn taper and westbound right-turn lane with 20m of storage may be required at the Bank Street & Leitrim Road intersection as a result of background travel demands. This is consistent with the recommendations made in the Leitrim MTS.

Although the criteria for a right turn lane on the westbound approach to the Bank Street & Rotary Way intersection may be satisfied, such a lane is not recommended as through-volumes are expected to be minimal.

5.11 Summary of Recommendations

Overall, the proposed development is expected to have a negligible impact on the study area intersections. With the exception of consideration for a southbound permitted-protected phasing at the Bank Street & Rotary Way intersection in the 2029 horizon, there are no additional recommendations to study area intersections that have not already been discussed in the Leitrim MTS or already planned for implementation in 2022/2023 by the City.

Multi-Modal Level of Service (MMLOS) analysis was completed for all signalized study area intersections, as well as the segment of Rotary Way along the site's frontage. The analysis identified that all signalized study area intersections are currently not meeting their Pedestrian and Bicycle Level of Service (PLOS and BLOS) targets under existing conditions. Once Bank Street is widened to four lanes, all study area intersections will be reconstructed as protected intersections thereby improving the BLOS to 'C'. The increased crossing distances, however, will decrease pedestrian comfort, resulting in a PLOS of 'F' at all signalized intersections.

6 Conclusion

The proposed residential development at 4639 Bank Street will be composed of 112 townhome units. A total of 143 vehicle parking spaces will be provided (including 18 visitor parking spaces), which is below the 156 vehicle parking spaces required by the Zoning Bylaw. Based on ITE parking generation rates, however, no parking spillover is expected to occur. As required by the Zoning Bylaw, a total of 58 bicycle parking spaces will also be provided, including 36 sheltered parking spaces.

It is anticipated that the proposed development will generate up to 75 two-way vehicle-trips in 2024. By 2029, as a result of projected increases in transit use, the vehicular trip generation of the proposed development is expected to decrease marginally. It is anticipated that the majority of site-generated traffic will be distributed towards the north, with the remainder towards the west and south.

Intersection capacity analyses were completed for all study area intersections under 2020, 2024 and 2029 traffic conditions and concluded that the proposed development will have a negligible impact on study area intersections. Planned improvements to Bank Street prior to the 2024 build-out year are expected to address existing capacity issues. Consistent with the Leitrim MTS, it remains expected that the Bank Street & Leitrim Road intersection may exceed its theoretical capacity by 2029 under background traffic conditions. All recommendations stated in Leitrim MTS remain valid.

Under Future (2029) Total Traffic conditions, the southbound left-turn lane at the Bank Street & Rotary Way / Barrett Farm Drive intersection is shown to operate over-capacity due to high southbound left-turn demand coupled with heavy northbound traffic. A protected-permitted phase is shown to resolve this issue while maintaining an overall acceptable Level of Service. It is recommended that appropriate signal infrastructure be provided during the Bank Street four-lane widening to provision for the future need for a southbound left-turn protected-permitted phase at its intersection with Rotary Way.

Multi-Modal Level of Service analysis was also completed for all signalized intersections as well as a segment of Rotary Way along the development frontage. The analyses indicated that all signalized intersections are unlikely to meet Pedestrian Level of Service targets as a result of the increased crossing distance on Bank Street post-widening, with limited reasonable options to improve this result. Bicycle Level of Service is expected to meet the prescribed targets once Bank Street and its intersections are reconstructed in 2022/2023.

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 recommended actions and modifications in place.

Appendix A – City Circulation Comments

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

Report Submitted: May 20, 2020
Comments Received: May 25, 2020
Transportation Project Manager: Josiane Gervais

- Element 2.1.1 - Proposed Development
  - Indicate the number of bicycle spaces.
    - IBI Response: Section 3.1.2 has been updated and now includes the number of proposed bike parking spaces.
- Element 2.1.2 - Existing Conditions
  - The cycling network within the area includes paved shoulders along Bank St.
    - IBI Response: Section 3.2.2 has been updated and now mentions the presence of paved shoulders along Bank Street.
  - The review of collision history must include identification of relevant patterns, this can be provided within Scoping or Strategy.
    - IBI Response: Further review of historical collisions will be provided in Step 4: Analysis.

Step 3 Submission (Forecasting) – Circulation Comments & Response

Report Submitted: August 10, 2020
Comments Received: August 21, 2020
Transportation Project Manager: Josiane Gervais

Transportation Engineering Services

- Consider including a snapshot of the Leitrim Master Transportation Study trip generation in the report appendix for easy reference.
  - **IBI Response:** The trip generation pages from the Leitrim Master Transportation Study have been included in **Appendix G**.

Traffic Signal Operations

- No comments.

Development Review – Transportation

- No comments on the TIA.
- The following notes apply to the Site Plan:
  - The drive aisle width does not meet the Parking bylaw, it should be 6.7m as it leads to greater-than 20 parking stalls.
    - **IBI Response:** This has been discussed in Section 5.1.2.
  - Ensure the number of reduced-sized parking stalls does not represent more than 40% of provided stalls.
    - **IBI Response:** This has been discussed in Section 5.1.2.
  - Site plan should include curb radius at site access.
    - **IBI Response:** The site plan has been updated to include the site access curb radius, see **Exhibit 2**.
  - Sidewalk should be depressed and continuous across access.
    - **IBI Response:** As discussed in Section 5.4.3, the sidewalk will be depressed and continuous across the site access.

Step 4 Submission (Analysis) – Circulation Comments & Response

Report Submitted: August 31, 2020

Comments Received: November 2, 2020

Transportation Project Manager: Josiane Gervais

Transportation Engineering Services

1. Consider implementing additional measures from the TDM Measures Checklist (in addition to 6.1.1). This is to support claims in Section 5.2.1 that a reduction in parking supply can be justified through the incorporation of TDM measures aimed at reducing the auto-dependence of the development. Additional TDM measures may also reduce the development's impact on the Bank Street and Leitrim Road intersection, which is shown to operate overcapacity by 2029 without additional widening of Bank Street.

    - IBI Response: Additional TDM measures have been identified that are under consideration for this development. As discussed in Section 5.2.1, based on the ITE Parking Generation Manual, the peak parking demand generated by the proposed development is not expected to exceed the proposed parking supply.

Transit Services

2. Note that Rotary Way is identified as a transit street and it is anticipated that bus service will be added in the future. Also note that a new bus stop location was identified on the south side of Rotary just east of Bank St (adjacent to Building 1), with an asphalt landing pad in the boulevard. This stop was identified as part of adjacent Sundance development and has yet to be constructed.

    - IBI Response: Section 3.3.1.2 and Section 5.1.1 have been updated to discuss these future changes to transit service. We have discussed the future bus stops with OC Transpo (Graham Rathwell) and it was stated that the eastbound stop on Rotary Way could be constructed anywhere between Bank Street and the proposed site access.

3. In addition to the east-west pedestrian walkway connection between Building 1 and Bank Street, suggest adding an additional walkway north-south at this location to connect to Rotary Way close to the planned bus stop.

    - IBI Response: See previous comment/response. It is recommended that the future eastbound bus stop on Rotary way (as shown on the Sundance Village CUP) be shifted east, closer to the proposed site access. Additional pathways will therefore not be required.

Traffic Signal Operations

4. No comments.

Traffic Signal Design

5. No comments.

Street Lighting

6. Comments were not provided.

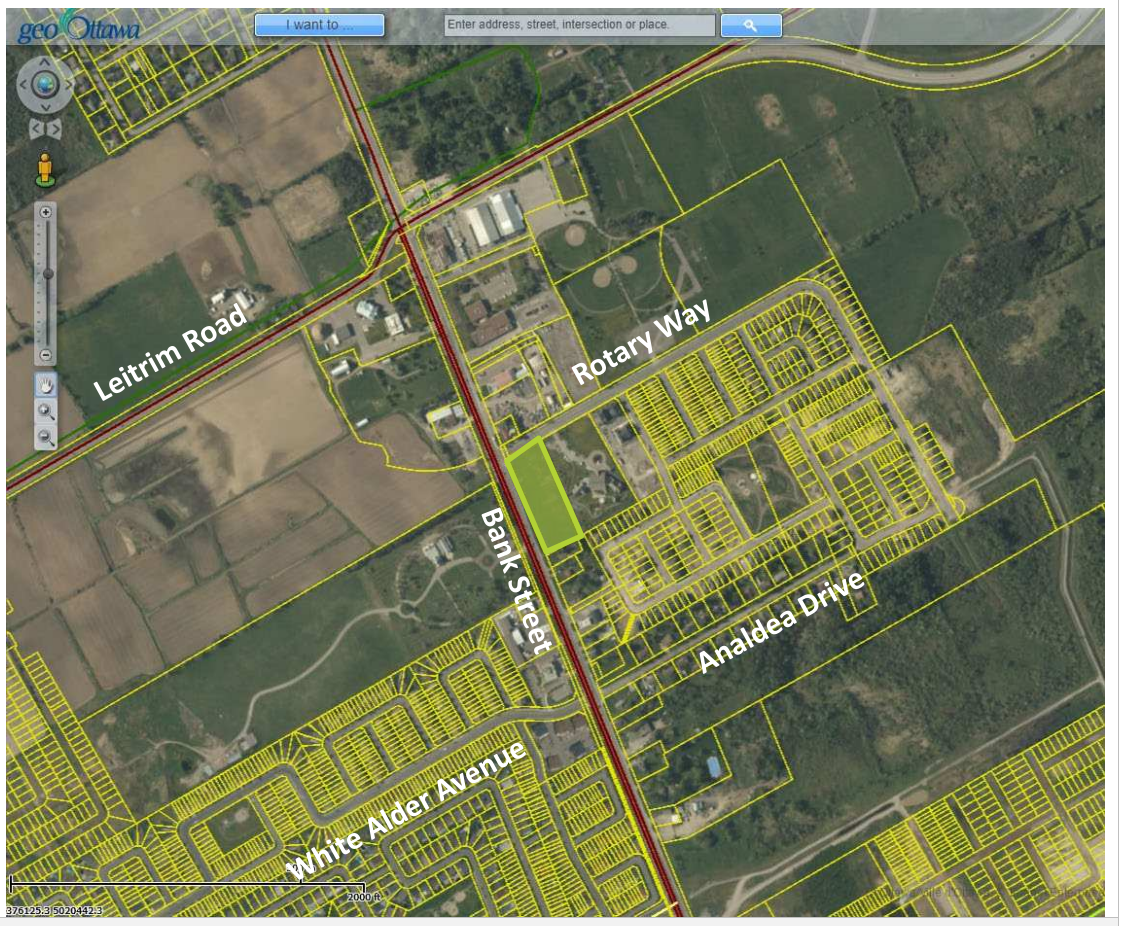
Development Review – Transportation

7. Please address the above comments and proceed to submitting the Step 5: Final TIA (remove draft watermark, sign and include Certification Form).
    - IBI Response: The final report has been signed with the draft watermark removed and the Certification Form included.

Appendix B – Screening Form

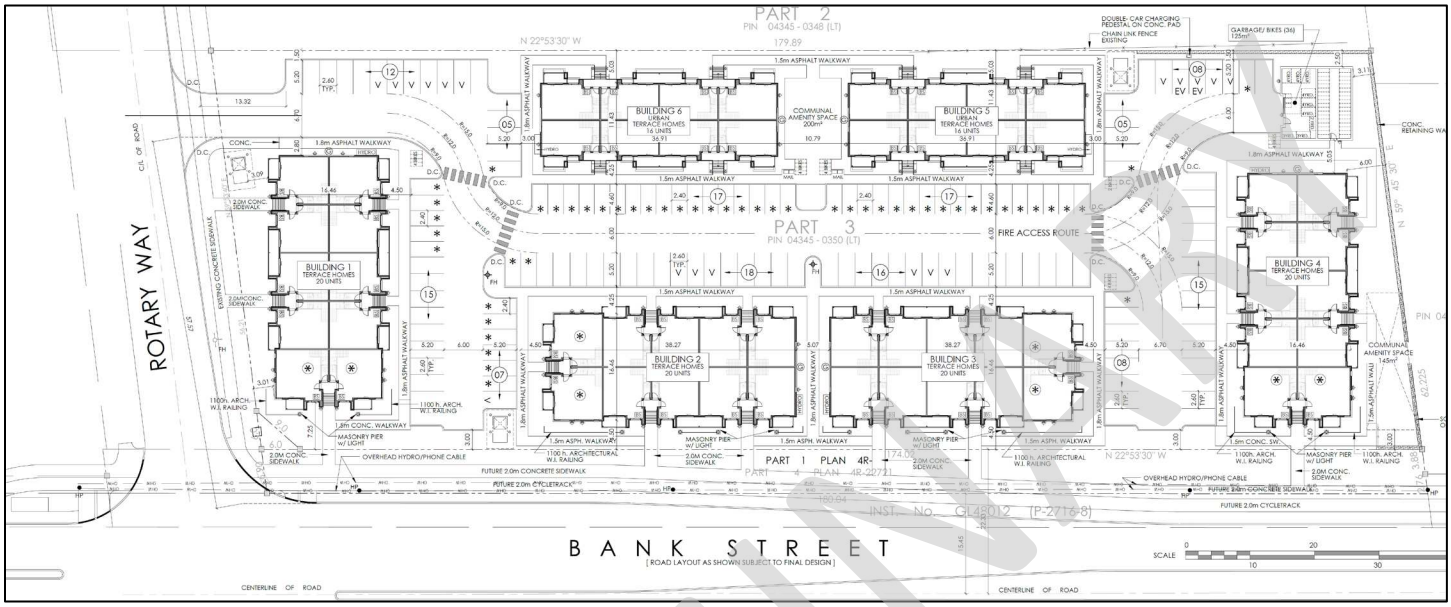
City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	4639 Bank Street
Description of Location	Leitrim – East of Bank Street and south of Rotary Way 
Land Use Classification	Residential
Development Size (units)	112 Stacked Townhouses
Development Size (m^2)	N/A
Number of Accesses and Locations	One (1) access via Rotary Way
Phase of Development	Single Phase
Buildout Year	2024

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

Proposed Development:



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: One or more of the above triggers was satisfied, therefore a TIA will be required.

Appendix C – Turning Movement Counts

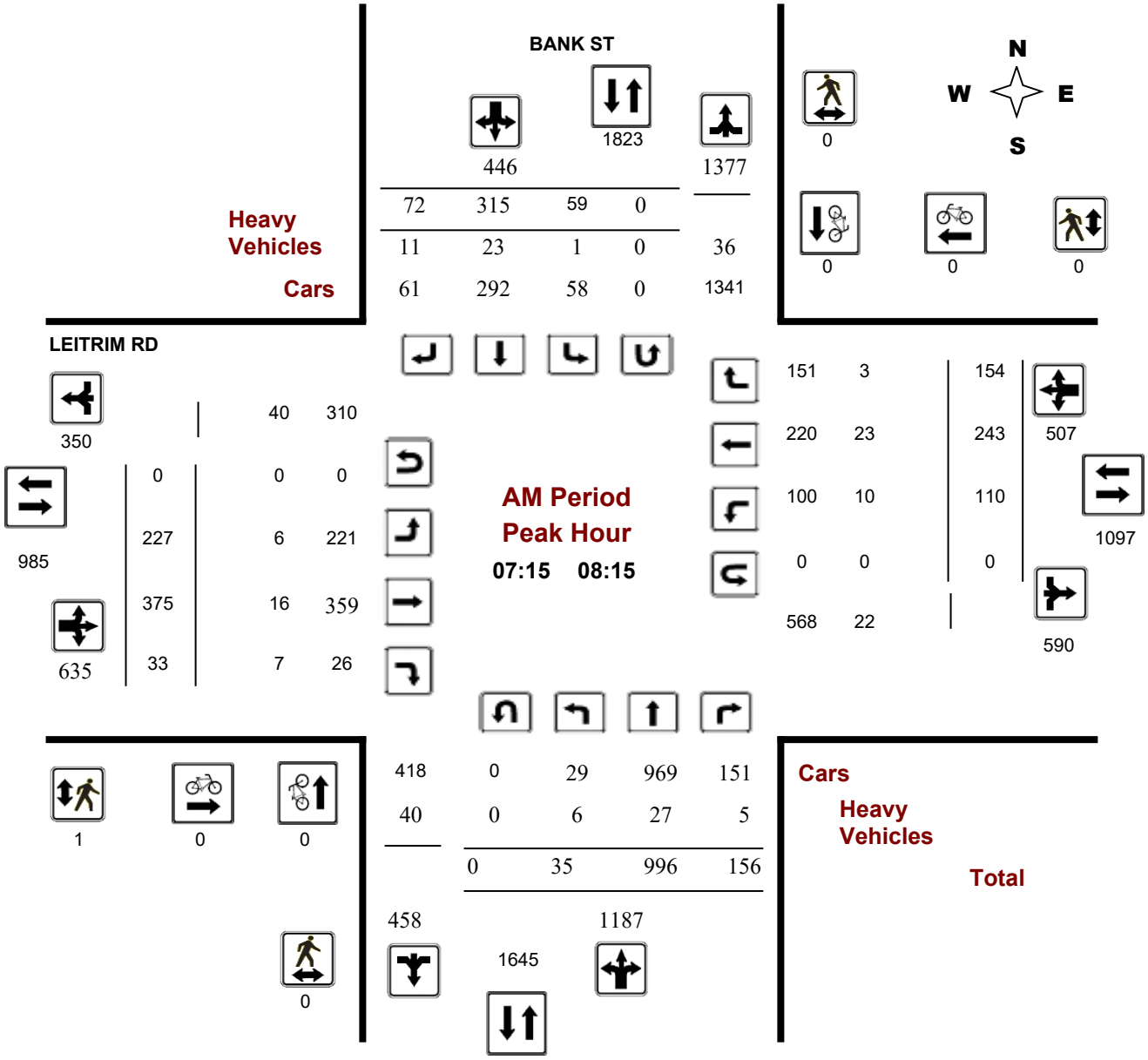
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ LEITRIM RD

Survey Date: Wednesday, December 04, 2019 **WO No:** 39159

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



Comments

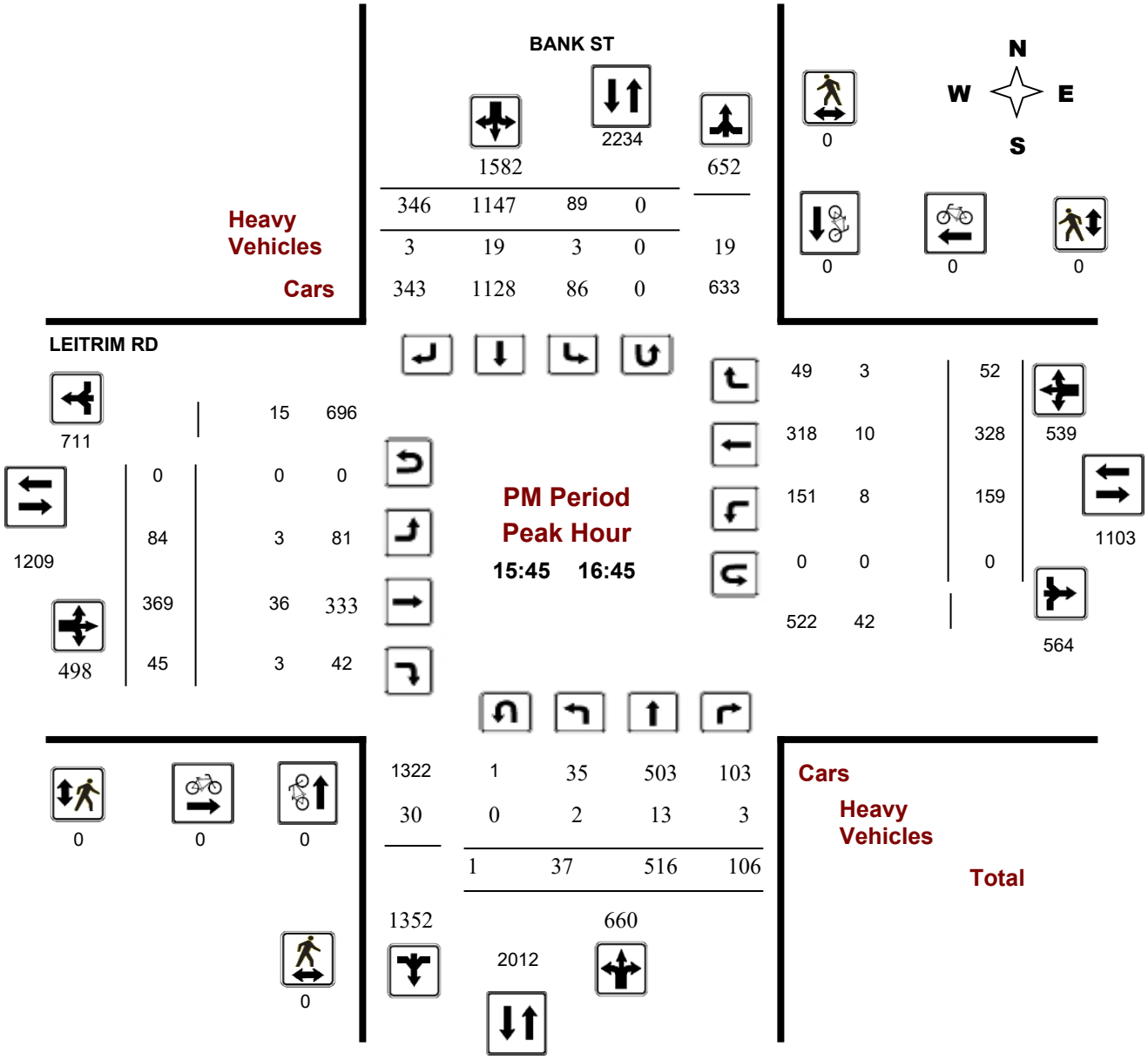
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ LEITRIM RD

Survey Date: Wednesday, December 04, 2019 **WO No:** 39159

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



Comments

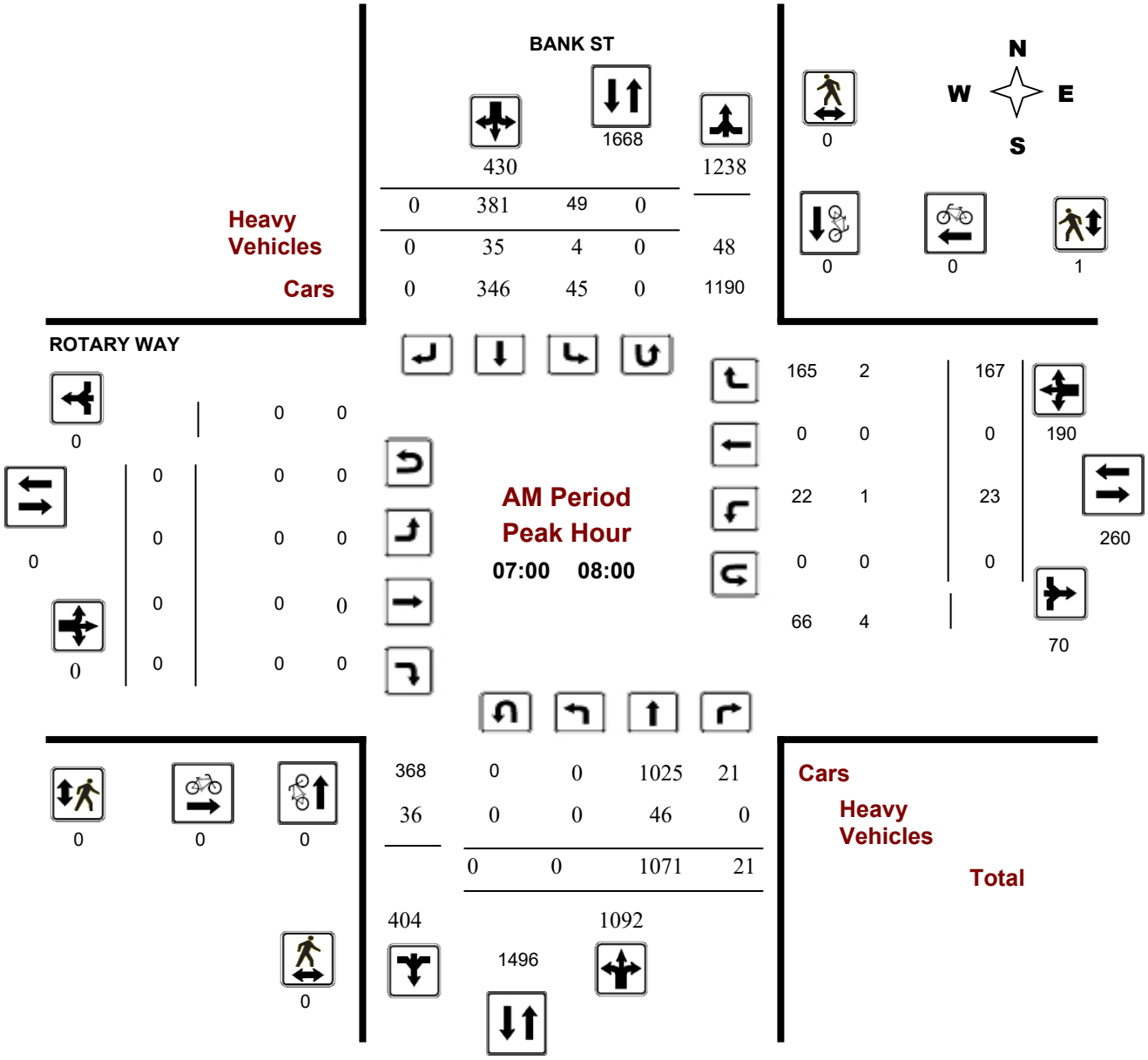
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ ROTARY WAY

Survey Date: Wednesday, December 04, 2019 **WO No:** 39158

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



Comments

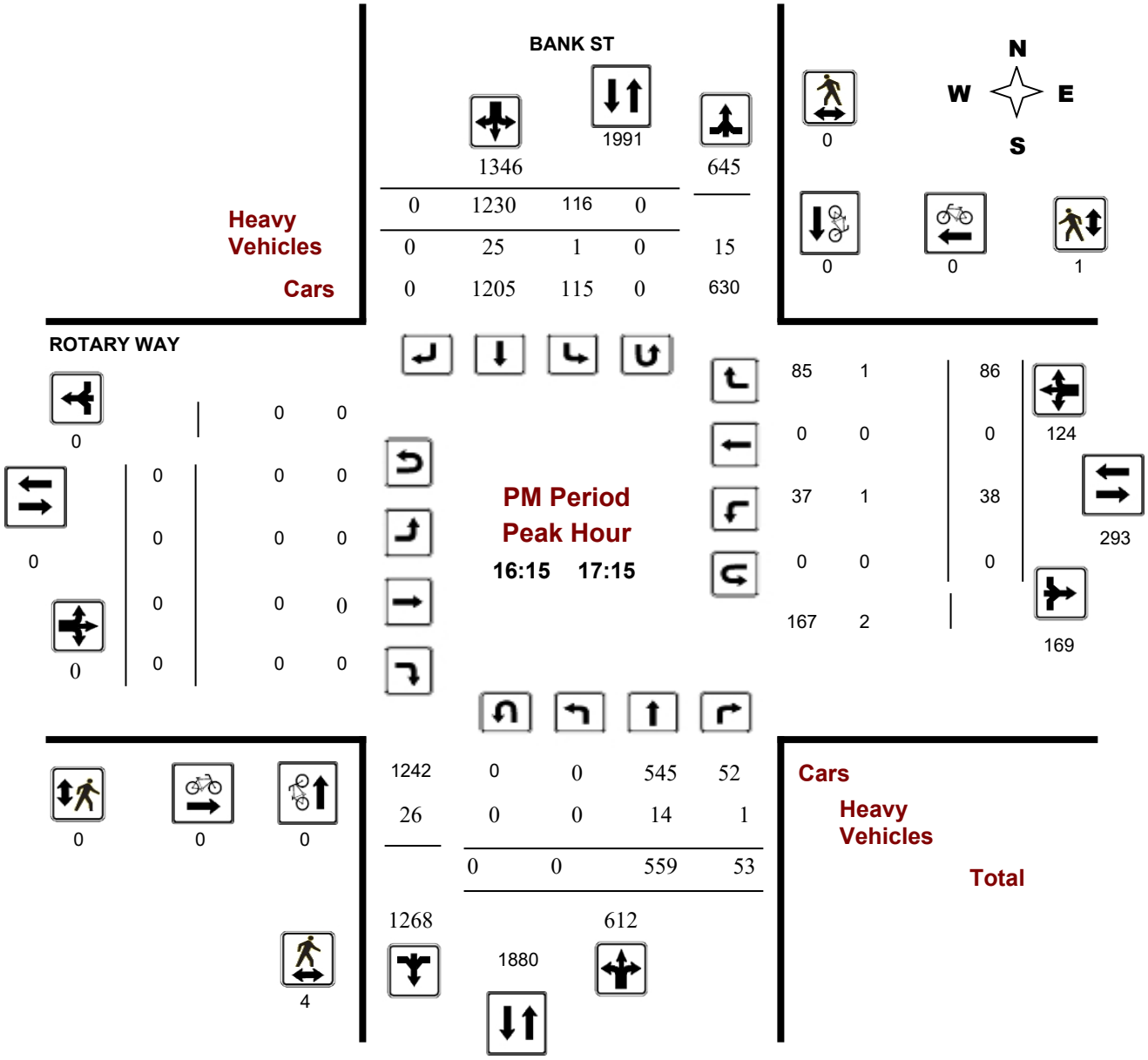
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BANK ST @ ROTARY WAY

Survey Date: Wednesday, December 04, 2019 **WO No:** 39158

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



Comments

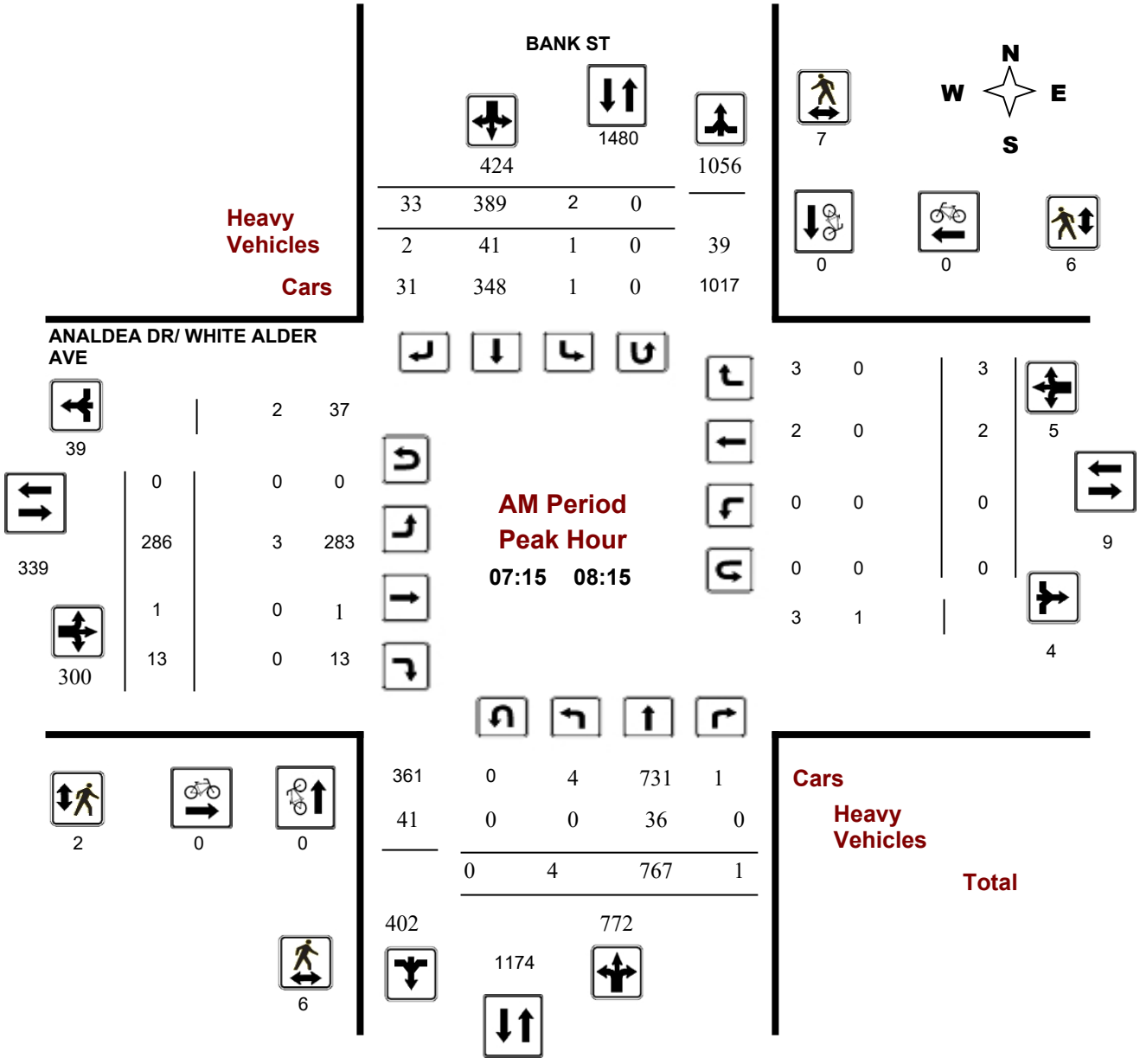
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ANALDEA DR/ WHITE ALDER AVE @ BANK ST

Survey Date: Wednesday, December 04, 2019 **WO No:** 39157

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



Comments

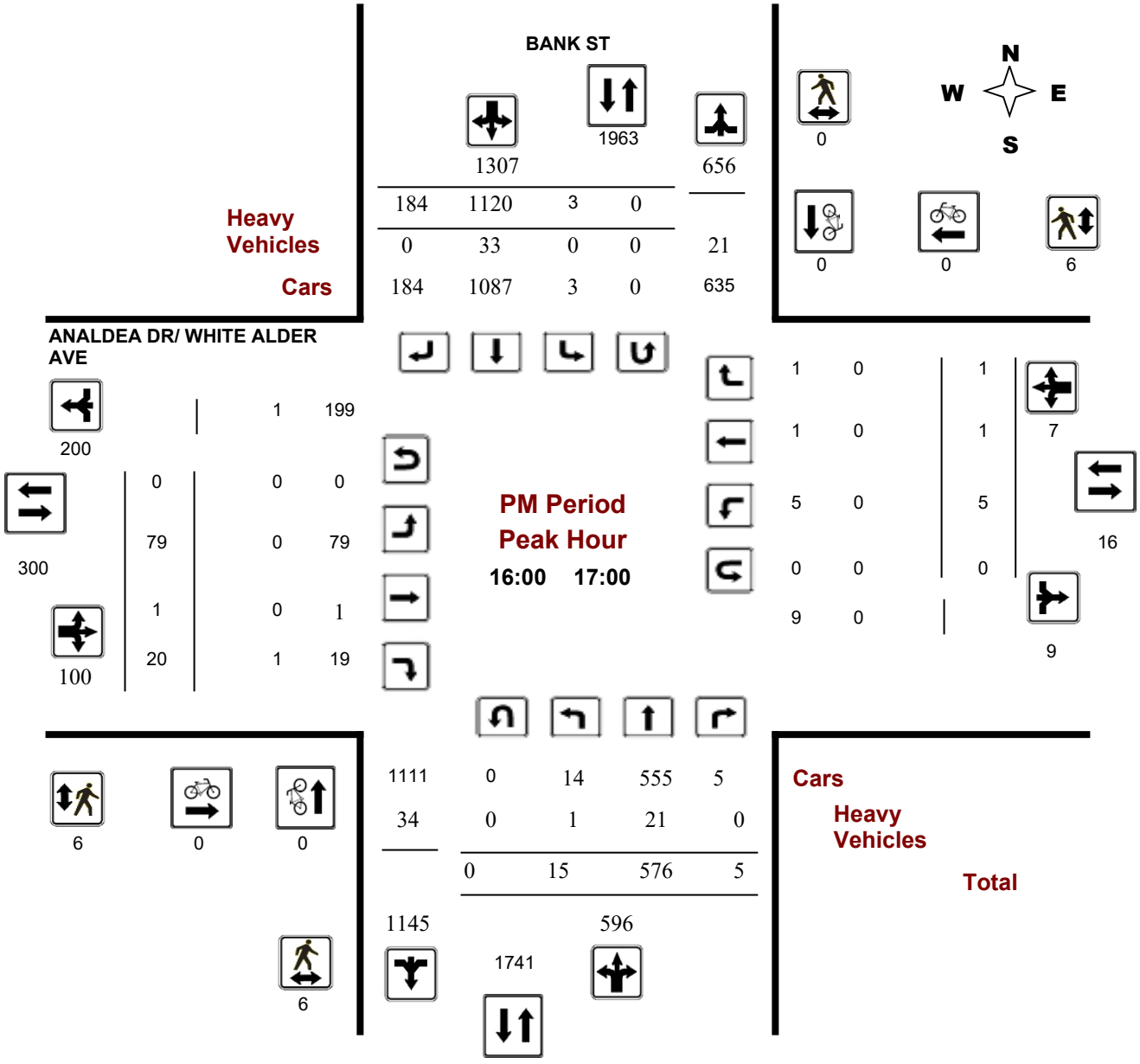
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ANALDEA DR/ WHITE ALDER AVE @ BANK ST

Survey Date: Wednesday, December 04, 2019 **WO No:** 39157

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



Comments

Appendix D – OC Transpo Routes

93

Local

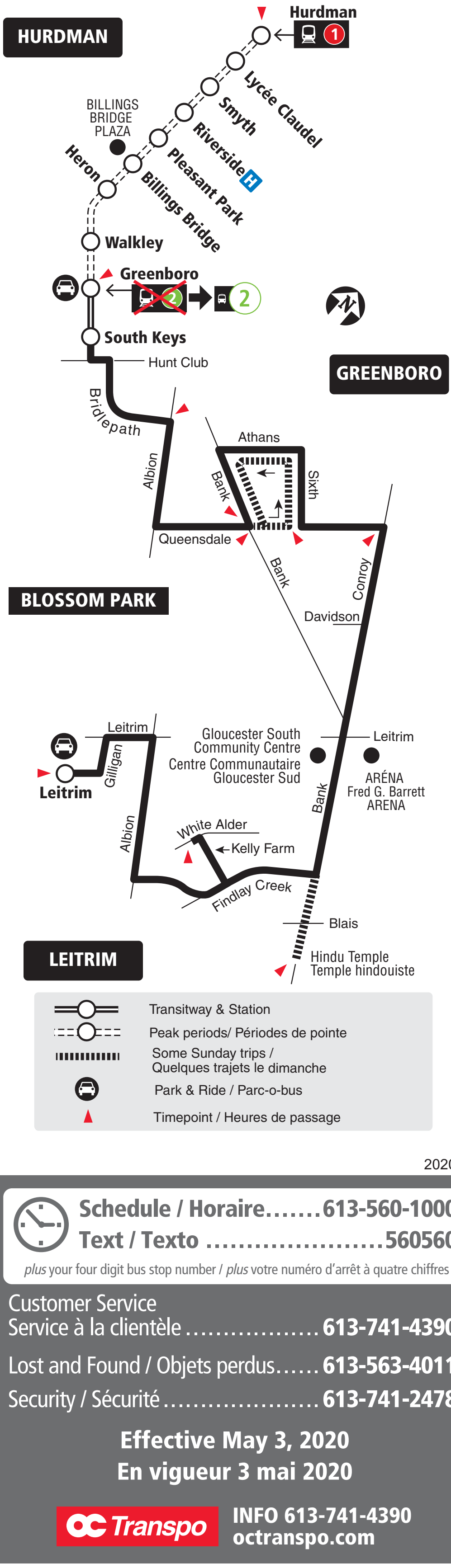
LEITRIM BLOSSOM PARK

GREENBORO HURDMAN

7 days a week / 7 jours par semaine

All day service

Service toute la journée



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

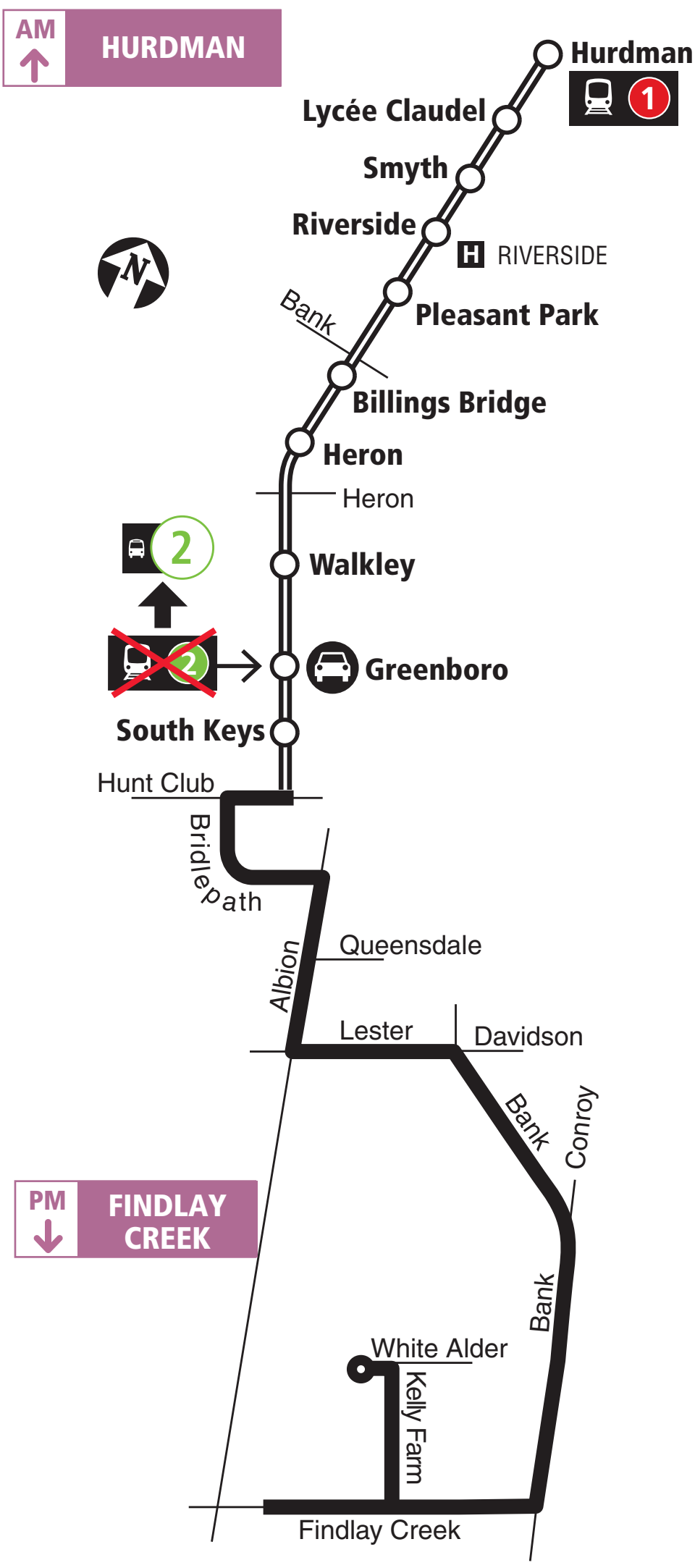
INFO 613-741-4390
octranspo.com

294 Connexion

HURDMAN
FINDLAY CREEK

Monday to Friday / Lundi au vendredi

Peak periods only
Périodes de pointe seulement



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

304

BILLINGS BRIDGE

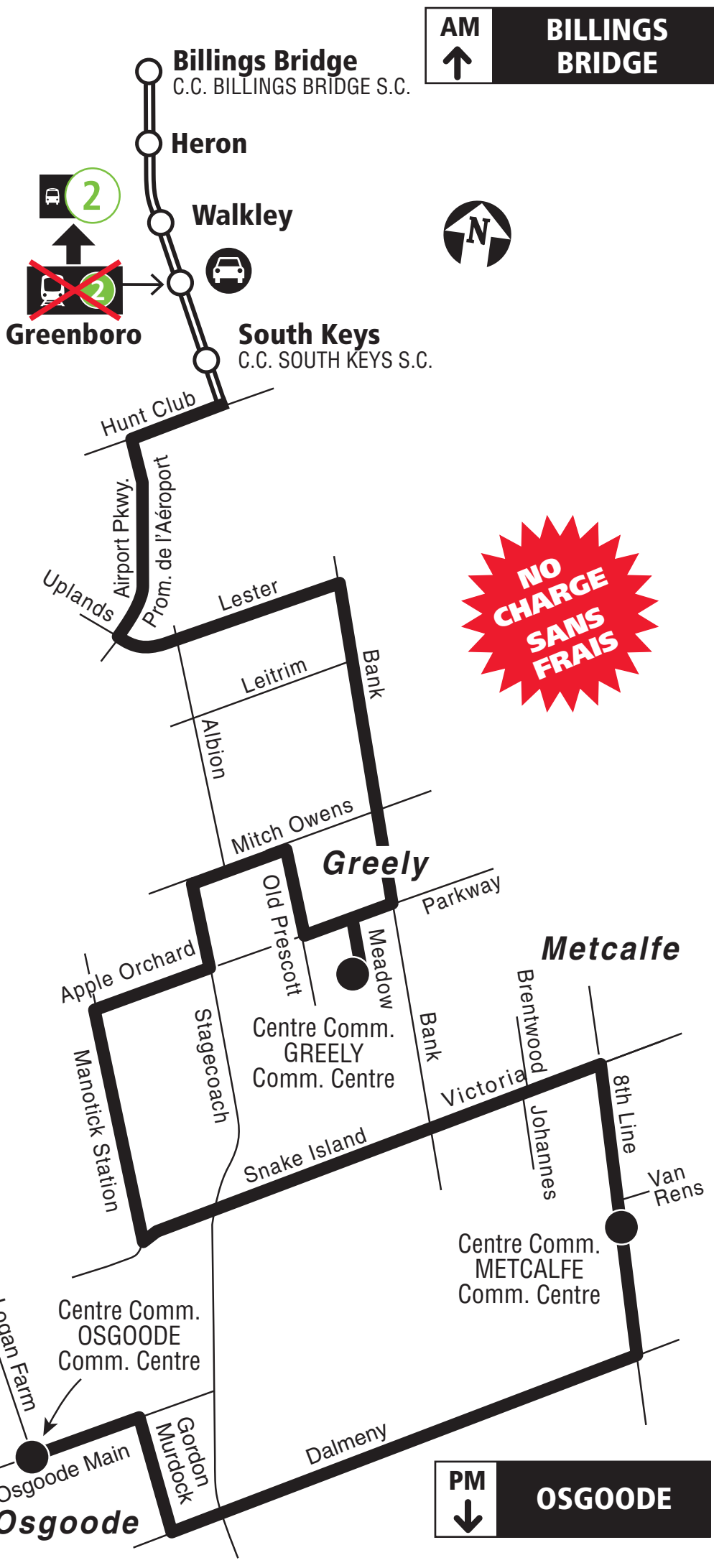
METCALFE, GREELY OSGOODE

Local

Thursday only / Jeudi seulement

Selected time periods

Périodes sélectionnées



Transitway & Station

Park & Ride / Parc-o-bus

2020.04

Schedule / Horaire.....613-560-1000

Text / Texto 560560

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

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

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

Security / Sécurité **613-741-2478**

Effective May 3, 2020

En vigueur 3 mai 2020

OC Transpo

INFO 613-741-4390
octranspo.com

Appendix E – Collision Data

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2018

Location: ANALDEA DR/ WHITE ALDER AVE @ BANK ST

Traffic Control: Stop sign **Total Collisions:** 23

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Feb-18, Tue,10:30	Clear	Angle	P.D. only	Ice	South	Turning right	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Apr-23, Wed,07:44	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2014-Oct-04, Sat,16:04	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Pick-up truck	Other motor vehicle	
2014-Sep-15, Mon,17:46	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Slowing or stopping	Pick-up truck	Other motor vehicle	
					South	Slowing or stopping	Passenger van	Other motor vehicle	
2014-Oct-07, Tue,09:58	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Delivery van	Other motor vehicle	

2014-Oct-25, Sat,18:43	Freezing Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Skidding/sliding
					South	Slowing or stopping	Pick-up truck	Other motor vehicle
2014-Sep-03, Wed,12:00	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-Dec-01, Mon,16:20	Snow	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2016-Jan-08, Fri,18:04	Clear	Sideswipe	P.D. only	Loose snow	North	Unknown	Unknown	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
2016-Oct-18, Tue,20:18	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jun-14, Sun,10:37	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Dec-02, Wed,11:20	Unknown	Rear end	Non-fatal injury	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle

					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2016-Sep-27, Tue,15:30	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2017-Aug-25, Fri,17:00	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-01, Fri,08:24	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2016-Dec-18, Sun,19:17	Clear	Rear end	Non-fatal injury	Ice	North	Slowing or stopping	Unknown	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2017-Mar-18, Sat,16:13	Clear	SMV other	P.D. only	Dry	North	Going ahead	Unknown	Ran off road
2017-Mar-18, Sat,10:31	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2017-May-27, Sat,13:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle

					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jun-23, Fri,17:53	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2017-Sep-08, Fri,17:30	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2017-Dec-12, Tue,18:34	Snow	Sideswipe	P.D. only	Loose snow	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2017-Nov-08, Wed,10:48	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle

Location: ARENA PL @ BANK ST

Traffic Control: Stop sign

Total Collisions: 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Apr-23, Wed,08:50	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Mar-10, Thu,09:10	Clear	Angle	P.D. only	Wet	West	Turning left	Delivery van	Other motor vehicle	

					North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2015-Sep-07, Mon,13:34	Clear	Angle	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Passenger van	Other motor vehicle
2017-Jan-19, Thu,07:39	Clear	Angle	P.D. only	Wet	West	Turning left	Police vehicle	Other motor vehicle
					North	Overtaking	Automobile, station wagon	Other motor vehicle
2017-Oct-11, Wed,07:00	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2016-Nov-19, Sat,16:02	Clear	SMV other	P.D. only	Dry	South	Unknown	Unknown	Other

Location: BANK ST @ LEITRIM RD

Traffic Control: Traffic signal

Total Collisions: 58

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-03, Fri,09:12	Freezing Rain	SMV other	P.D. only	Ice	North	Slowing or stopping	Automobile, station wagon	Skidding/sliding	
2014-Aug-13, Wed,21:39	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

2014-Aug-21, Thu,08:14	Rain	Rear end	P.D. only	Wet	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2014-Aug-13, Wed,07:47	Rain	Turning movement	Non-fatal injury	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Aug-22, Fri,13:00	Clear	Sideswipe	P.D. only	Dry	West	Unknown	Automobile, station wagon	Other motor vehicle
					West	Unknown	Automobile, station wagon	Other motor vehicle
2014-Oct-21, Tue,21:31	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2014-Dec-01, Mon,23:10	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Nov-04, Tue,16:30	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Oct-20, Mon,16:15	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle

2014-Nov-20, Thu,15:52	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Apr-18, Sat,09:22	Clear	Rear end	Non-fatal injury	Dry	South	Slowing or stopping	Passenger van	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Feb-18, Wed,08:37	Strong wind	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Sep-29, Tue,16:20	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Skidding/sliding
					South	Stopped	Pick-up truck	Other motor vehicle
2015-Jan-06, Tue,18:00	Clear	Rear end	Non-fatal injury	Wet	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Feb-12, Thu,06:50	Snow	SMV other	P.D. only	Loose snow	South	Going ahead	Pick-up truck	Curb
2015-Jan-09, Fri,10:51	Clear	Angle	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
					East	Turning left	Truck - closed	Other motor vehicle

2015-Jan-06, Tue,05:46	Other	Turning movement	Non-fatal injury	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Feb-21, Sat,14:19	Snow	Rear end	P.D. only	Loose snow	North	Unknown	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2015-Aug-31, Mon,17:30	Clear	Turning movement	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Jun-09, Tue,18:29	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2015-Aug-26, Wed,17:15	Rain	Rear end	Non-fatal injury	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jun-30, Tue,11:19	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2015-Jun-26, Fri,15:41	Clear	Rear end	P.D. only	Dry	East	Going ahead	Truck - dump	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle

2015-Jan-13, Tue,16:20	Clear	Rear end	P.D. only	Ice	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Passenger van	Other motor vehicle
2016-Mar-09, Wed,10:46	Clear	Turning movement	Non-fatal injury	Wet	North	Turning left	Delivery van	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Sep-22, Thu,10:44	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Passenger van	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2016-Jun-15, Wed,08:22	Clear	Turning movement	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2015-Dec-14, Mon,07:08	Rain	Rear end	P.D. only	Wet	West	Turning left	Passenger van	Skidding/sliding
					West	Turning left	Automobile, station wagon	Other motor vehicle
2015-Nov-20, Fri,17:10	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2016-Jan-20, Wed,16:15	Clear	Rear end	P.D. only	Dry	North	Turning left	Unknown	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle

2016-Jan-07, Thu,14:17	Clear	Rear end	P.D. only	Ice	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Dec-22, Tue,17:52	Rain	Turning movement	P.D. only	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Jun-28, Tue,21:31	Rain	Angle	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Pick-up truck	Other motor vehicle
2016-May-29, Sun,18:48	Clear	Turning movement	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle
2017-Jan-09, Mon,07:15	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2017-Jan-11, Wed,09:37	Clear	Angle	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Dec-30, Fri,17:03	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle

2017-Jan-06, Fri,07:55	Clear	Turning movement	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Turning left	Pick-up truck	Other motor vehicle
					West	Stopped	Passenger van	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-31, Mon,21:19	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Pick-up truck	Other motor vehicle
2016-Nov-25, Fri,05:20	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Animal - wild
2016-Dec-05, Mon,07:54	Snow	Turning movement	P.D. only	Packed snow	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Turning left	Truck - tractor	Other motor vehicle
2017-Mar-14, Tue,12:36	Snow	Sideswipe	P.D. only	Loose snow	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jul-12, Wed,21:09	Rain	Sideswipe	P.D. only	Wet	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-May-05, Fri,15:54	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle

2017-May-18, Thu,20:30	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Oct-04, Wed,12:25	Rain	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2018-Apr-05, Thu,09:38	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-27, Wed,16:07	Clear	Turning movement	P.D. only	Wet	North	Turning left	Truck - tractor	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Feb-07, Wed,15:21	Snow	Rear end	P.D. only	Slush	South	Going ahead	Passenger van	Other motor vehicle
					South	Stopped	School bus	Other motor vehicle
2018-May-07, Mon,08:25	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2018-May-04, Fri,16:12	Clear	Rear end	P.D. only	Wet	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle

2018-May-11, Fri,22:47	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Jun-01, Fri,16:26	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Bicycle	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2018-Jul-10, Tue,14:50	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Passenger van	Other motor vehicle
2018-Oct-18, Thu,16:40	Clear	Other	P.D. only	Dry	North	Reversing	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Sep-15, Sat,18:27	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Oct-30, Tue,14:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Aug-16, Thu,21:00	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

Location: BANK ST @ ROTARY WAY

Traffic Control: Traffic signal

Total Collisions: 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-22, Thu,04:13	Clear	SMV other	P.D. only	Ice	South	Going ahead	Automobile, station wagon	Pole (sign, parking meter)	
2015-Apr-09, Thu,09:16	Clear	Angle	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Municipal transit bus	Other motor vehicle	
2015-Jul-29, Wed,17:22	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2016-Sep-14, Wed,07:25	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	School bus	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Dec-09, Fri,08:43	Snow	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	School bus	Other motor vehicle	
2017-Nov-17, Fri,07:45	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Dec-11, Mon,16:40	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

					North	Stopped	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Unknown	Other motor vehicle
2018-May-16, Wed,15:23	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jul-05, Thu,00:18	Clear	SMV other	P.D. only	Dry	North	Turning left	Passenger van	Curb

Location: BANK ST btwn ANALDEA DR/ WHITE ALDER AVE & ROTARY WAY

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

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-26, Thu,17:41	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	

Location: BANK ST btwn ARENA PL & WHITE ALDER AVE

Traffic Control: No control **Total Collisions:** 28

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Mar-29, Sat,03:12	Clear	SMV other	P.D. only	Dry	South	Going ahead	Pick-up truck	Ran off road	
2014-Aug-12, Tue,17:35	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

2014-Sep-18, Thu,12:25	Clear	Approaching	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Truck - dump	Other motor vehicle
2015-Feb-19, Thu,16:42	Clear	Turning movement	Non-fatal injury	Dry	South	Overtaking	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2014-Nov-10, Mon,07:34	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Delivery van	Other motor vehicle
					North	Slowing or stopping	Pick-up truck	Other motor vehicle
2014-Oct-03, Fri,11:33	Clear	Other	P.D. only	Dry	North	Going ahead	Pick-up truck	Other
					South	Going ahead	Automobile, station wagon	Debris falling off vehicle
2015-Apr-13, Mon,08:12	Clear	Turning movement	P.D. only	Dry	South	Making "U" turn	Automobile, station wagon	Other motor vehicle
					North	Going ahead	School bus	Other motor vehicle
2015-May-14, Thu,14:05	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-May-23, Sat,15:01	Clear	Angle	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle

2016-Oct-29, Sat,16:08	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Oct-19, Mon,06:24	Clear	Angle	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle
2015-Oct-10, Sat,15:55	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2016-Jan-06, Wed,17:24	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2016-Nov-11, Fri,13:18	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Truck-other	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Sep-30, Fri,07:42	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2017-Feb-02, Thu,18:03	Clear	Angle	P.D. only	Dry	South	Overtaking	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle

2017-Mar-08, Wed,16:03	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2017-Apr-27, Thu,16:25	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jun-07, Wed,15:44	Clear	Angle	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-10, Sun,00:58	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Ran off road
2017-Sep-18, Mon,16:10	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2017-Dec-24, Sun,13:16	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2017-Nov-25, Sat,00:46	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Animal - wild
2018-Jan-06, Sat,14:25	Clear	Angle	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Other motor vehicle

					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Feb-03, Sat,14:05	Clear	Angle	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jun-19, Tue,15:35	Clear	Rear end	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Jun-15, Fri,16:08	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jul-27, Fri,16:25	Rain	SMV other	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Curb	

Location: BANK ST btwn LEITRIM RD & ARENA PL

Traffic Control: No control

Total Collisions: 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-08, Wed,16:09	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Skidding/sliding	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

2014-May-16, Fri,16:37	Rain	Rear end	Non-fatal injury	Wet	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2014-Aug-25, Mon,15:15	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2015-Apr-02, Thu,17:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-21, Fri,16:00	Rain	Sideswipe	P.D. only	Wet	South	Changing lanes	Pick-up truck	Other motor vehicle
					South	Changing lanes	Automobile, station wagon	Other motor vehicle
2017-Oct-25, Wed,16:12	Clear	Angle	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2018-May-15, Tue,17:29	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Pick-up truck	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle

Appendix F – Trip Generation Data

Orleans

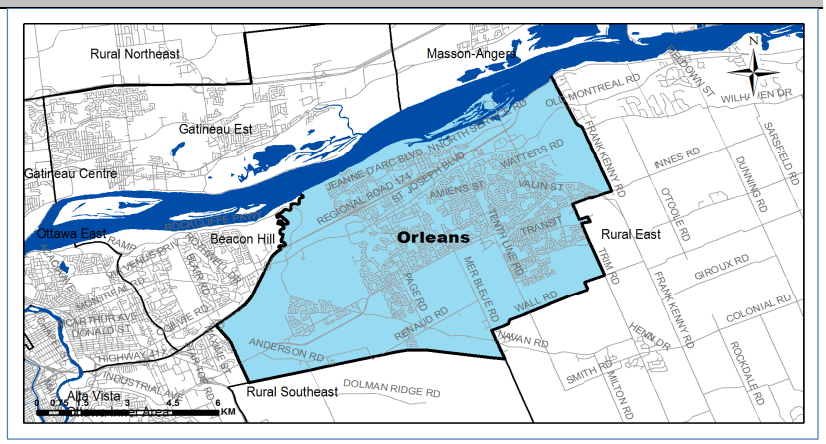
Demographic Characteristics

Population	117,440	Actively Travelled	95,100
Employed Population	57,400	Number of Vehicles	70,160
Households	42,950	Area (km^2)	88.6

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	27,630	24,540	52,170
Part Time Employed	2,040	3,200	5,240
Student	14,100	14,710	28,800
Retiree	8,240	9,820	18,060
Unemployed	890	790	1,670
Homemaker	110	2,990	3,090
Other	630	1,030	1,660
Total:	53,630	57,060	110,690

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	11,690	13,440	25,130
Licensed Drivers	41,780	42,490	84,270
Telecommuters	270	260	530
Trips made by residents	147,960	163,290	311,250

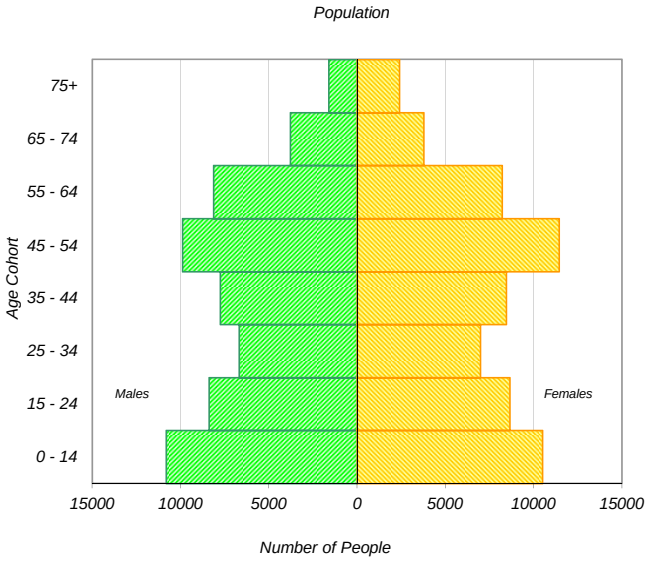
Selected Indicators	
Daily Trips per Person (age 5+)	2.81
Vehicles per Person	0.60
Number of Persons per Household	2.73
Daily Trips per Household	7.25
Vehicles per Household	1.63
Workers per Household	1.34
Population Density (Pop/km2)	1330

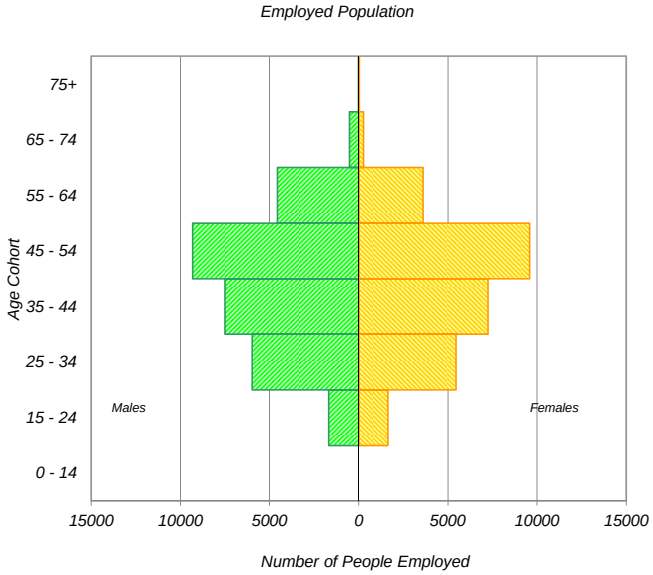


Household Size		
1 person	6,490	15%
2 persons	14,600	34%
3 persons	8,630	20%
4 persons	9,090	21%
5+ persons	4,130	10%
Total:	42,950	100%

Households by Vehicle Availability		
0 vehicles	1,390	3%
1 vehicle	18,250	42%
2 vehicles	19,080	44%
3 vehicles	3,330	8%
4+ vehicles	890	2%
Total:	42,950	100%

Households by Dwelling Type		
Single-detached	25,970	60%
Semi-detached	3,250	8%
Townhouse	10,730	25%
Apartment/Condo	3,010	7%
Total:	42,950	100%



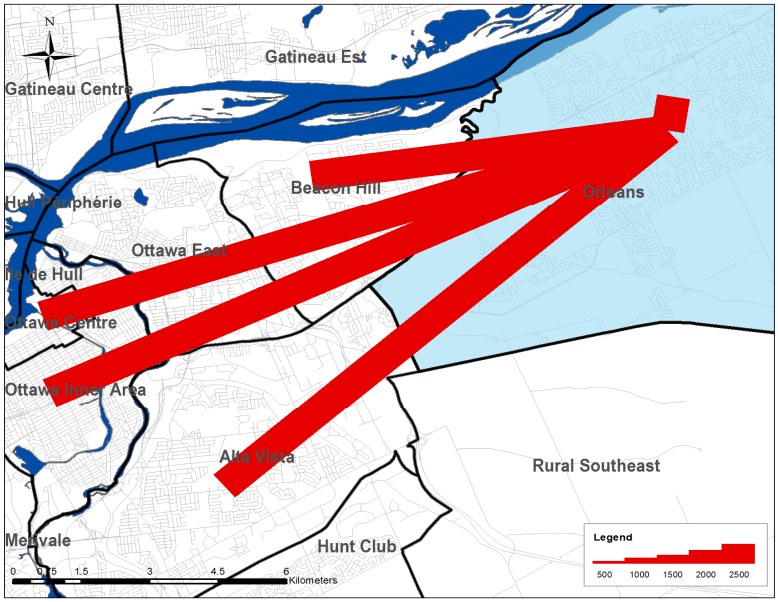


* In 2005 data was only collected for household members aged 11$^+$ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Destinations of Trips from Orleans

AM Peak Period



Summary of Trips to and from Orleans

AM Peak Period (6:30 - 8:59)	Destinations of Trips From District	% Total	Origins of Trips To District	% Total
Districts				
Ottawa Centre	7,330	11%	130	0%
Ottawa Inner Area	4,800	7%	630	2%
Ottawa East	2,840	4%	600	2%
Beacon Hill	4,180	6%	760	2%
Alta Vista	5,890	9%	1,050	3%
Hunt Club	950	1%	630	2%
Merivale	1,940	3%	460	1%
Ottawa West	1,460	2%	220	1%
Bayshore / Cedarview	1,210	2%	310	1%
Orléans	29,900	46%	29,900	78%
Rural East	1,000	2%	1,970	5%
Rural Southeast	70	0%	290	1%
South Gloucester / Leitrim	170	0%	50	0%
South Nepean	200	0%	330	1%
Rural Southwest	70	0%	70	0%
Kanata / Stittsvile	500	1%	290	1%
Rural West	70	0%	0	0%
Île de Hull	1,530	2%	80	0%
Hull Périphérie	460	1%	200	1%
Plateau	10	0%	80	0%
Aylmer	60	0%	90	0%
Rural Northwest	50	0%	40	0%
Pointe Gatineau	200	0%	70	0%
Gatineau Est	40	0%	60	0%
Rural Northeast	10	0%	20	0%
Buckingham / Masson-Angers	0	0%	30	0%
Ontario Sub-Total:	62,580	96%	37,690	98%
Québec Sub-Total:	2,360	4%	670	2%
Total:	64,940	100%	38,360	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	38,220	40%	7,250	8%	9,470	6%
School	9,890	10%	2,120	2%	15,080	10%
Shopping	7,210	8%	7,770	8%	23,480	16%
Leisure	8,640	9%	6,050	6%	15,650	10%
Medical	2,450	3%	1,950	2%	2,610	2%
Pick-up / drive passenger	6,060	6%	5,730	6%	12,910	9%
Return Home	18,630	20%	60,820	64%	65,050	43%
Other	3,880	4%	2,890	3%	6,970	5%
Total:	94,980	100%	94,580	100%	151,220	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	25,310	72%	3,910	46%	4,740	16%
School	5,870	17%	1,940	23%	13,930	47%
Shopping	240	1%	240	3%	840	3%
Leisure	470	1%	400	5%	1,190	4%
Medical	560	2%	310	4%	230	1%
Pick-up / drive passenger	1,780	5%	550	7%	4,540	15%
Return Home	210	1%	710	8%	2,160	7%
Other	630	2%	400	5%	2,280	8%
Total:	35,070	100%	8,460	100%	29,910	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	970	8%	370	1%	660	2%
School	420	3%	10	0%	30	0%
Shopping	1,090	9%	1,910	5%	4,480	13%
Leisure	2,110	17%	1,300	4%	3,470	10%
Medical	250	2%	520	1%	470	1%
Pick-up / drive passenger	1,220	10%	2,850	8%	3,080	9%
Return Home	5,530	46%	26,920	77%	20,320	60%
Other	470	4%	870	3%	1,190	4%
Total:	12,060	100%	34,750	100%	33,700	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	340,780		44%
AM Peak Period	73,440	22%	41%
PM Peak Period	80,510	24%	42%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	57,110	60%	57,360	61%	82,890	55%
Auto Passenger	14,260	15%	13,790	15%	30,320	20%
Transit	21,040	22%	20,690	22%	6,650	4%
Bicycle	400	0%	400	0%	1,600	1%
Walk	70	0%	30	0%	18,160	12%
Other	2,110	2%	2,320	2%	11,590	8%
Total:	94,990	100%	94,590	100%	151,210	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	19,140	55%	5,160	61%	11,450	38%
Auto Passenger	2,970	8%	1,080	13%	5,840	20%
Transit	12,140	35%	870	10%	2,170	7%
Bicycle	230	1%	0	0%	490	2%
Walk	30	0%	10	0%	4,780	16%
Other	550	2%	1,340	16%	5,170	17%
Total:	35,060	100%	8,460	100%	29,900	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	7,680	64%	19,440	56%	18,250	54%
Auto Passenger	2,580	21%	3,680	11%	7,810	23%
Transit	1,420	12%	11,050	32%	1,130	3%
Bicycle	0	0%	230	1%	380	1%
Walk	0	0%	20	0%	3,660	11%
Other	380	3%	320	1%	2,460	7%
Total:	12,060	100%	34,740	100%	33,690	100%

Avg Vehicle Occupancy	From District	To District	Within District
24 Hours	1.25	1.24	1.37
AM Peak Period	1.16	1.21	1.51
PM Peak Period	1.34	1.19	1.43

Transit Modal Split	From District	To District	Within District
24 Hours	23%	23%	6%
AM Peak Period	35%	12%	11%
PM Peak Period	12%	32%	4%

Table 3.12: Person Trip Generation Rates – (all households with residents not older than 55 years of age)

Person Trip Generation Rates
All Households with persons 55 years of age or less
AM and PM Peak Hours

Dwelling Unit Types \ Geographic Areas		Core Area Person Trip Rate	Core Area %▽	Urban Area (Inside the greenbelt) Person Trip Rate	Urban Area %▽	Suburban (Outside the greenbelt) Person Trip Rate	Suburban %▽	Rural Person Trip Rate	Rural %▽	All Areas Person Trip Rate
Single detached:	AM	0.85	- 7%	0.99	+ 9%	0.94	+ 3%	0.78	- 14%	0.91
	PM	0.74	- 3%	0.75	- 1%	0.79	+ 4%	0.71	- 7%	0.76
Semi-detached:	AM	0.79	- 10%	0.97	10%	0.89	+ 1%	0.64	- 27%	0.88
	PM	0.74	- 1%	0.68	- 9%	0.82	+ 9%	0.60	- 20%	0.75
Row Townhouse:	AM	0.71	- 3%	0.78	+ 7%	0.67	- 8%	0.74	+ 1%	0.73
	PM	0.62	- 3%	0.60	- 6%	0.69	+ 8%	0.56	- 13%	0.64
Apartment:	AM	0.48	- 4%	0.51	+ 2%	0.53	+ 6%	0.36	- 28%	0.50
	PM	0.45	0%	0.42	- 7%	0.52	+ 16%	0.52	+ 16%	0.45
All Types:	AM	0.62	- 23%	0.82	+ 2%	0.86	+ 8%	0.76	- 5%	0.80
	PM	0.57	- 16%	0.63	- 7%	0.75	+ 10%	0.69	+ 1%	0.68

Note: 5 % (+ or -) represents the percentage delta change in trip rate when compared against the average trip rate across all geographic areas

Table 3.13: Mode Shares - (all households with residents not older than 55 years of age)

Reported Mode Shares
All Households with persons 55 years of age or less
AM and PM Peak Hours

Dwelling Unit Types \ Geographic Areas		Core Area Vehicle Trips	Core Area Transit Share	Core Area Non-Motorised	Urban Area (Inside the greenbelt) Vehicle Trips	Urban Area Transit Share	Urban Area Non-Motorised	Suburban (Outside the greenbelt) Vehicle Trips	Suburban Transit Share	Suburban Non-Motorised	Rural * Vehicle Trips	Rural * Transit Share	Rural * Non-Motorised	All Areas Vehicle Trips	All Areas Transit Share	All Areas Non-Motorised
Single - Detached:	AM	35%	20%	33%	51%	26%	11%	55%	25%	9%	60%	27%	4%	54%	25%	10%
	PM	45%	11%	32%	58%	19%	13%	64%	19%	6%	73%	13%	2%	63%	17%	8%
Semi-Detached:	AM	38%	30%	26%	44%	35%	10%	52%	24%	12%	64%	27%	5%	49%	28%	12%
	PM	36%	20%	34%	51%	27%	13%	62%	17%	7%	77%	12%	1%	58%	20%	10%
Row / Townhouse:	AM	33%	22%	40%	45%	34%	10%	55%	27%	8%	73%	15%	3%	49%	30%	11%
	PM	39%	15%	42%	53%	28%	8%	61%	22%	6%	74%	15%	1%	57%	24%	9%
Apartment:	AM	27%	27%	43%	37%	41%	14%	44%	34%	13%	76%	8%	16%	36%	35%	23%
	PM	23%	29%	42%	40%	37%	14%	44%	33%	9%	48%	4%	17%	35%	33%	23%
All Types:	AM	32%	24%	38%	47%	31%	11%	54%	26%	9%	61%	26%	4%	51%	27%	11%
	PM	34%	21%	38%	53%	24%	12%	62%	20%	6%	73%	13%	2%	59%	20%	10%

Note: Percentages do not necessarily sum to 100% as the proportion of automobile passengers have not been tabulated. Vehicle trips reflect the percentage of vehicle drivers.
* - Rural area sample size is extremely low and mode shares are highly influenced by school types where public transportation levels are high during the AM versus the PM peaks.

Table 6.1: Vehicle Trip Generation Rates

Vehicle Trip Generation Rates AM and PM Peak Hours						
ITE Land Use Code	Dwelling Unit Type / Data Source		Vehicle Trip Generation Rate			
			2008 Count Data	ITE	OD Survey	Blended Rate
210	Single-detached dwellings	AM	0.66	0.75	0.56	0.66
		PM	0.89	1.01	0.53	0.81
224	Semi-detached dwellings, townhouses, rowhouses	AM	0.40	0.70	0.46	0.52
		PM	0.64	0.72	0.46	0.61
231	Low-rise condominiums (1 or 2 floors)	AM	0.53	0.67	0.21	0.47
		PM	0.41	0.78	0.18	0.46
232	High-rise condominiums (3+ floors)	AM	0.53	0.34	0.21	0.36
		PM	0.41	0.38	0.18	0.32
233	Luxury condominiums	AM	0.53	0.56	0.21	0.43
		PM	0.41	0.55	0.18	0.38
221	Low-rise apartments (2 floors)	AM	0.19	0.46	0.21	0.29
		PM	0.21	0.58	0.18	0.32
223	Mid-rise apartments (3-10 floors)	AM	0.19	0.30	0.21	0.23
		PM	0.21	0.39	0.18	0.26
222	High-rise apartments (10+ floors)	AM	0.19	0.30	0.21	0.23
		PM	0.21	0.35	0.18	0.25

Table 6.2: Recommended Vehicle Trip Directional Splits

Comparison of Directional Splits (Inbound/Outbound) AM and PM Peak Hours								
ITE Land Use Code	Area Dwelling Unit Type / Data Source		2008 Count Data		ITE		Blended Rate	
			Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
210	Single-detached dwellings	AM	33%	67%	25%	75%	29%	71%
		PM	60%	40%	63%	37%	62%	39%
224	Semi-detached dwellings, townhouses, rowhouses	AM	40%	60%	33%	67%	37%	64%
		PM	55%	45%	51%	49%	53%	47%
231	Low-rise condominiums (1 or 2 floors)	AM	36%	64%	25%	75%	31%	70%
		PM	54%	46%	58%	42%	56%	44%
232	High-rise condominiums (3+ floors)	AM	36%	64%	19%	81%	28%	73%
		PM	54%	46%	62%	38%	58%	42%
233	Luxury condominiums	AM	36%	64%	23%	77%	30%	71%
		PM	54%	46%	63%	37%	59%	42%
221	Low-rise apartments (2 floors)	AM	22%	78%	21%	79%	22%	79%
		PM	62%	38%	65%	35%	64%	37%
223	Mid-rise apartments (3-10 floors)	AM	22%	78%	25%	75%	24%	77%
		PM	62%	38%	61%	39%	62%	39%
222	High-rise apartments (10+ floors)	AM	22%	78%	25%	75%	24%	77%
		PM	62%	38%	61%	39%	62%	39%

Table 6.3: Recommended Vehicle Trip Generation Rates for Residential Land Uses with Transit Bonus

Recommended Vehicle Trip Generation Rates with Transit Bonus AM and PM Peak Hours									
ITE Land Use Code	Dwelling Unit Type / Geographic Area		Vehicle Trip Rate						
			Core		Urban (Inside the Greenbelt)		Suburban (Outside the Greenbelt)		Rural
			Base Rate	< 600m to Rapid Transit	Base Rate	< 600m to Rapid Transit	Base Rate	< 600m to Rapid Transit	Base Rate
210	Single-detached dwellings	AM	0.40	0.31	0.67	0.50	0.70	0.49	0.62
		PM	0.60	0.33	0.76	0.57	0.90	0.63	0.92
224	Semi-detached dwellings, townhouses, rowhouses	AM	0.34	0.34	0.51	0.50	0.54	0.39	0.62
		PM	0.39	0.38	0.51	0.51	0.71	0.51	0.67
231	Low-rise condominiums (1 or 2 floors)	AM	0.34	0.34	0.50	0.50	0.60	0.60	0.71
		PM	0.29	0.29	0.49	0.49	0.66	0.66	0.72
232	High-rise condominiums (3+ floors)	AM	0.26	0.26	0.38	0.38	0.46	0.46	0.54
		PM	0.20	0.20	0.34	0.34	0.46	0.46	0.50
233	Luxury condominiums	AM	0.31	0.31	0.45	0.45	0.55	0.55	0.65
		PM	0.24	0.24	0.40	0.40	0.55	0.55	0.59
221	Low-rise apartments (2 floors)	AM	0.21	0.21	0.31	0.31	0.37	0.37	0.44
		PM	0.20	0.20	0.34	0.34	0.46	0.46	0.50
223	Mid-rise apartments (3-10 floors)	AM	0.17	0.17	0.24	0.24	0.29	0.29	0.35
		PM	0.16	0.16	0.28	0.28	0.37	0.37	0.41
222	High-rise apartments (10+ floors)	AM	0.17	0.17	0.24	0.24	0.29	0.29	0.35
		PM	0.16	0.16	0.27	0.27	0.36	0.36	0.39

Note: The transit bonus was only applied to geographic areas and dwelling unit types where the reported transit mode shares were less than the transit mode share reported for residential development located within the 600m proximity to a rapid transit station. It is noted that condominium and apartment housing categories reported similar levels of transit mode shares independent of location to rapid transit stations.

6.5 Future Data Collection

While the rates presented in were prepared by blending the vehicle trip rates from ITE, the OD Survey and the 2008 local trip generation studies, it is important to stress the importance and need for ongoing local trip generation surveys to monitor changes in travel behaviour. The 2008 trip generation studies undertaken to support this study provide insight into local travel patterns and a well organized ongoing annual data collection program aimed at trip generation surveys of key land uses or requirement for data collection by local developers will continue to provide recent and accurate local trip generation rates. For example the high-rise apartment category of dwelling units reported the lowest peak hour vehicle trip rates.

Appendix G – Leitrim Master Transportation Study Extracts

EXECUTIVE SUMMARY

IBI Group (IBI) was retained by the Leitrim Owners Group (LOG), which includes Tartan Land Consultants, The Regional Group, Claridge Homes and Urbandale Corporation, to complete a Master Transportation Study (MTS) in support of the following developments:

- Barrett Lands Development (3100 Leitrim Road);
- Barrett Extension Lands Development (4660 Bank Street);
- Findlay Creek Stage 2 Phase 4C development (4798 Bank Street);
- OPA 76 Areas 9a and 9b development (4791, 4789 and 4771 Bank Street);
- OPA 76 Area 8a - Idone Lands (4840 Bank Street); and,
- Remer Lands (4800 Bank Street).

The LOG intends to develop approximately 4,000 residential units and 40 acres of commercial lands. The subject area is currently undeveloped and is expected to develop at a rate of approximately 300 units per year between 2017 and 2031.

The general methodology used in this study was based on the City of Ottawa Transportation Impact Assessment Guidelines (2006). The Bank Street Environmental Assessment (EA) that was completed in 2014 was used as a basis for all future recommended modifications. Multiple future analysis horizons were developed based on the Ottawa Transportation Master Plan (TMP) phasing horizons, to help identify specific trigger points for EA recommended modifications based on traffic capacity along the Bank Street corridor.

The overall conclusion of this study is that the Leitrim Community Development can be accommodated by the adjacent road network with the appropriate modifications in place. The Leitrim Community Owners Group shall be responsible for constructing the Bank Street and Leitrim Road intersection based on the interim design plan in the Bank Street EA, as well as all proposed access intersections and internal transportation facilities as dictated by each individual draft plan. These modifications are expected to provide temporary relief along the Bank Street corridor until the City planned widening (from Leitrim Road to Findlay Creek Drive) can be completed by 2025.

It is expected that the Leitrim Community Owners Group will be fully reimbursed by the City of Ottawa for the cost of the Bank Street and Leitrim Road intersection in accordance with the City of Ottawa Development Charges By-Law.

The key findings and recommendations from the MTS are as follows:

Leitrim Development Lands Characteristics

- The Leitrim Community Development Lands are comprised of the following developments:
    - Barrett Lands Development (3100 Leitrim Road);
    - Barrett Extension Lands Development (4660 Bank Street);
    - Findlay Creek Stage 2 Phase 4C development (4798 Bank Street);
    - OPA 76 Areas 9a and 9b development (4791, 4789 and 4771 Bank Street);
    - Idone Lands (4840 Bank Street); and
    - Remer Lands (4800 Bank Street)
- The proposed rights-of-way for internal roads within the Leitrim Community will be as follows:
    - Local Roads – 14.0m, 16.5m or 18.0m
    - Internal Collector Roads – 20.0m
        - Cedar Creek Drive
        - Sora Way

  - Major Collector Roads – 24m or 26m
    - Kelly Farm Drive
    - Barrett Street 1 (Barrett Farm Drive)
    - OPA Street 1
    - OPA Street 2
    - Remer Street 14
    - Remer Street 6

- Proposed collector roads within the development lands can support transit, which will be necessary to ensure all residents are within 400m of daily service.
- Existing transit service can be extended along Bank Street, Findlay Creek Drive and Kelly Farm Drive to serve all proposed developments on the west side of Bank Street. A new service route can be added for proposed developments on the east side of Bank Street via the OPA Street 1 access and OPA Street 12 that circulates to Rotary Way. The details of the implementation of transit service to the area will be developed with OC Transpo staff during the approvals process for each proposed development.
- Internal collector roadways and some local roadways will have sidewalks to provide connections to local parks and pathways. No dedicated cycling facilities have been proposed within the development lands.
- TDM and non-auto mode provisions will be reinforced. Appropriate connections, both internal and to the regional network, have been provided to accommodate active transportation.
- Full buildout of the Leitrim Community Development, as defined in this study, was assumed by 2031.

Existing Conditions Analysis

- The study area included the following existing intersections:
  - Bank Street and Leitrim Road
  - Bank Street and Rotary Way
  - Bank Street and White Alder Avenue/ Analdea Avenue
  - Bank Street and Findlay Creek Drive
  - Bank Street and Findlay Creek Shopping Centre Access
  - Bank Street and Blais Road
- A review of the reported collisions show the majority of collisions occurring at three intersections in the entire corridor (Leitrim Road, White Alder Avenue and Findlay Creek Drive). It is expected that the planned Bank Street widening and corresponding intersection modifications outlined in the Bank Street EA will reduce the number of reported collisions by increasing the capacity of Bank Street, which will improve operational performance along the corridor.
- There are three existing transit service routes operating within the study area: 99, 144 and 204. The 99 and 144 provide daily service while the 204 operates weekly.
- There are small pockets of pedestrian and cycling facilities along Bank Street. It is expected these gaps will be filled as development progresses within the study area.
- All existing study area intersections with the exception of Bank Street and Leitrim Road, and Bank Street and Rotary Way intersections were shown to operate within City standards in 2016. These results coincided with field observations showing significant traffic queues during the morning and afternoon peak periods at the Bank Street and Leitrim Road intersection.

Future Background Traffic

- Future traffic volumes were estimated using an annual traffic growth rate combined with the proposed Leitrim Community developments layered on top for each horizon year.

- A 1.0% background traffic growth rate was applied to existing traffic counts along Bank Street to represent regional traffic growth from outside the Leitrim Community (e.g. Greely and Metcalfe). The rate was derived from the Bank Street EA. Side street traffic was accounted for separately in the Leitrim Community development traffic generation.
- Future background traffic volumes were adjusted to account for the impact of the Kelly Farm Drive extension. It is expected that the extension will trigger a redistribution of a portion of the existing traffic volumes from the Findlay Creek Village development to the new Kelly Farm extension, bypassing Bank Street. A 20% redirection of existing traffic was assumed.
- Four future analysis horizons were established based on the phases established in the City of Ottawa TMP: 2019, 2022, 2025 and 2031. The 2022 horizon was added to further refine the analysis to determine more precisely trigger points for required roadway modifications.

Leitrim Community Trip Generation

- Local trip generation rates for commercial and residential land uses were developed by IBI using traffic counts completed in the existing Findlay Creek Community.
- The local rates were adjusted for expected growth in transit mode share between 2016 and 2031.
- The proposed Leitrim Community developments are expected to generate the following peak hour trips at each future horizon:
    - 2019 - Residential: 500 morning peak hour trips; 550 afternoon peak hour trips
      Commercial: 100 morning peak hour trips; 190 afternoon peak hour trips
    - 2022 - Residential: 1,000 morning peak hour trips; 1,050 afternoon peak hour trips
      Commercial: 260 morning peak hour trips; 500 afternoon peak hour trips
    - 2025- Residential: 1,450 morning peak hour trips; 1,550 afternoon peak hour trips
      Commercial: 255 morning peak hour trips; 480 afternoon peak hour trips
    - 2031 - Residential: 2,200 morning peak hour trips; 2,400 afternoon peak hour trips
      Commercial: 250 morning peak hour trips; 450 afternoon peak hour trips

Bank Street Widening

- The City of Ottawa completed the Bank Street EA in 2014. City staff confirmed the first phase, widening Bank Street from 2 to 4 lanes from Leitrim Road to Findlay Creek Drive, is scheduled to be completed by 2025.
- The second phase, widening of Bank Street from 2 to 4 lanes from Findlay Creek Drive to the Urban Boundary, was anticipated between 2026 and 2031 in the Bank Street EA. City staff has yet confirm the timing for the second phase.
- The recommended modifications in the Bank Street EA include full pedestrian and cycling facilities, including sidewalks, exclusive bike lanes and crossing facilities.

Future Traffic Analysis

- In the Future (2019) horizon year:
    - By 2019, new access approaches will be constructed at Rotary Way, Findlay Creek Drive, Findlay Creek Centre and Blais Road. The recommended lane configurations at these locations will be confirmed during detailed design for each individual development.
    - It is recommended that the Bank Street and Leitrim Road intersection be constructed as per the Bank Street EA Interim Design by the future 2019 horizon – ahead of the year 2025 schedule. With the proposed modifications, the Bank Street and Leitrim Road intersection is expected to operate within City standards in 2019.

  - The Bank Street and Rotary Way intersection continues to operate within City standards during the morning peak hour but slightly above its theoretical capacity in the afternoon peak period. It is recommended that the intersection be monitored post-construction of the Bank Street and Leitrim intersection interim design to confirm future capacity requirements.
  - Both the Bank Street and Street 6, and Bank Street and Blais Road intersections did not operate within City standards as unsignalized intersections. Additional capacity in the form of traffic control signals or a roundabout would be required. Both modifications meet City operating standards under 2019 traffic condition, but traffic control signals were shown to provide more capacity and better levels of service, which makes it the preferred modification.
  - All remaining study area intersections operate within City standards in both morning and afternoon peak periods.

- In the Future (2022) horizon year:
  - The Bank Street and Leitrim Road intersection was shown to operate within City standards under 2022 traffic conditions with the recommended Bank Street EA interim design.
  - By 2022, both the Bank Street and Rotary Way, and Bank Street and White Alder intersections were projected to operate beyond capacity during the peak periods. The Bank Street and Findlay Creek Drive intersection will continue to operate within its theoretical capacity, but does not meet City standards under these conditions. At this point, the first section of the Bank Street widening, between Leitrim Road and Findlay Creek Drive, should be constructed. With the widening in place, both intersections are expected to operate at an acceptable level of service.
  - The Bank Street and Street 14 intersection was shown to operate below City standards as a single lane roundabout. It is recommended that a traffic signal be proposed at this intersection to provide a longer lifespan for interim modifications.
  - All remaining study area intersections operate within City standards in both morning and afternoon peak periods with only minor modifications.
- In the Future (2025) horizon year:
  - The upgraded Bank and Leitrim intersection is expected to operate near its theoretical capacity by 2025, which is similar to levels experienced at the intersection in 2016.
  - The Bank Street and Blais Road, and Bank Street and Street 6 intersection were shown to operate above City standards in the afternoon peak hour, indicating that this section of Bank Street is beginning to approach its capacity as a two-lane road by this horizon year and that widening to four lanes should be investigated.
  - All remaining intersections within the study area were projected to operate within City standards in both morning and afternoon peak periods at the 2025 horizon year.
- In the Future (2031) horizon year:
  - The Bank and Leitrim intersection operates above its theoretical capacity in both morning and afternoon peak periods with four lanes on Bank Street. The ultimate plan from the Bank Street EA Study recommends six lanes on Bank Street from Conroy Road to just south of Leitrim Road, which would make levels-of-service similar to existing conditions.
  - The remaining intersections within the study area are expected to operate at acceptable levels of service under 2031 traffic conditions assuming the Bank Street widening from 2 to 4-lanes has been extended to Street 6, with traffic signals at each intersection.

Geometric Analysis Results

- Geometric evaluations revealed no sight distance or corner clearance issues. Proper care should be taken to ensure no obstructions are placed in the line-of-sight in the vicinity of the proposed access points. The future access locations to the commercial blocks are expected to follow these guidelines, and will be assessed during the site plan application when more details are available.
- All auxiliary lane and storage length requirements at signalized intersections were in Section 7.3 of this study. New access intersections should be constructed as per City standards with required turning lanes.
- The Bank Street EA did not recommend any northbound right-turn lanes except at the Bank Street and Leitrim Road intersection. The operational results confirmed these designs were sufficient. No further modifications were necessary.
- All geometric recommendations should be reviewed and confirmed during detailed design for each individual development.

SUMMARY OF RECOMMENDATIONS

The following table outlines the staging of modifications for each intersection by horizon year up to 2031. The responsibility for modifications at each intersection will be as follows:

Interim Design Modifications (2019-2025)

- Bank Street and Leitrim Road Interim Design – Leitrim Community Owners Group
- Bank Street and Rotary Way – Tartan Land Consultants
- Bank Street and Findlay Creek Drive – Urbandale Corporation and Claridge Homes
- Bank Street and Findlay Creek Centre – Urbandale Corporation and Claridge Homes
- Bank Street and Blais Road – The Regional Group and Tartan Land Consultants
- Bank Street and Street 6 – The Regional Group

Ultimate Design Modifications (2025-2031)

- Bank Street widening from 2 to 4 lanes from south of Leitrim Road to Street 6 – City of Ottawa

TABLE ES-1 – Summary of Recommended Actions/ Modifications

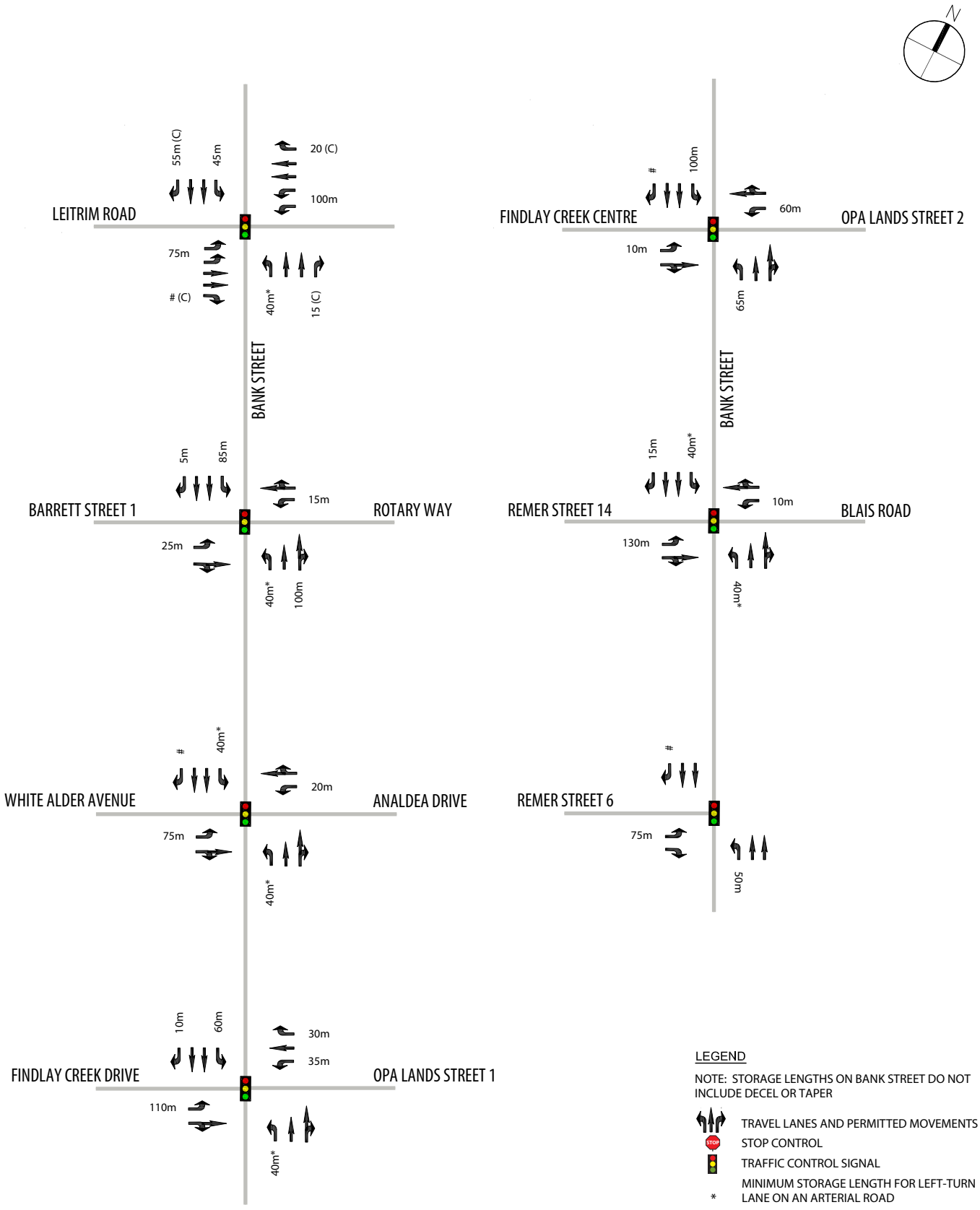
HORIZON	RECOMMENDED ACTIONS/ MODIFICATIONS
Existing (2016)	Begin design of Bank Street and Leitrim Road Interim Intersection Design for implementation by 2019.
Total Traffic Future (2019)	Optimize and coordinate all traffic signal timings. Bank Street & Leitrim Road • Summary of Bank Street EA Interim Plan intersection configuration: o Widening Bank Street and Leitrim Road from 2 to 4 lanes through the intersection o Double eastbound and westbound left-turn lanes o Single northbound and southbound left-turn lanes o Northbound and southbound right-turn lanes o Channelized right-turns at each approach o Recommended storage lengths defined in Section 7.3 Bank Street & Rotary Way: • New Access intersection to Barrett Lands Street 1 (Barrett Farm Drive) by Tartan: o Northbound and eastbound left-turn lane o Southbound right-turn lane with channelization o Recommended storage lengths defined in Section 7.3 Bank Street & Findlay Creek Drive: • New Access intersection to OPA Lands Street 1 by Urbandale and Claridge: o Southbound and westbound left-turn lane o Recommended storage lengths defined in Section 7.3

HORIZON	RECOMMENDED ACTIONS/ MODIFICATIONS

	Bank Street & Findlay Creek Centre:
	• New Access intersection to OPA Lands Street 2 by Urbandale and Claridge:
	  o Southbound and westbound left-turn lane
	  o Recommended storage lengths defined in Section 7.3
	
	Bank Street & Blais Road:
	• New Access intersection to Remer/ Findlay Creek Street 14 by Regional and Tartan:
	• Single Lane Roundabout or Traffic Control Signals
	• If Signals
	  o Left-turn lane on all approaches
	  o Southbound right-turn lane
	  o Eastbound left-turn lane
	  o Recommended storage lengths defined in Section 7.3
	
	Bank Street & Remer Street 6:
	• New Access intersection to Remer/ Idone Lands Street 6 by Regional:
	• Single Lane Roundabout or Traffic Control Signals
	• If Signals
	  o Northbound and eastbound left-turn lane
	  o Southbound right-turn lane
	  o Recommended storage lengths defined in Section 7.3

Total Traffic Future (2022)	Bank Street & Rotary Way; Bank Street & White Alder Avenue/ Analdea Drive • Both intersections operate below City standards with interim modifications • Bank Street widening to Findlay Creek should begin implementation to ensure completion by 2025 Bank Street & Blais Road • Single Lane Roundabout operates below City standards. Recommend signals at this intersection to extend lifespan of interim modifications
Total Traffic Future (2025)	Bank Street EA modifications implemented down to Findlay Creek Drive. Optimize and coordinate all signal timing plans. Bank Street & Leitrim Road • Add eastbound and westbound right-turn lanes as per Bank Street EA Ultimate Plan Bank Street & Blais Road; Bank Street & Remer Street 6 • Single Lane Roundabout operates below City standards. Recommend signals at this intersection to extend lifespan of interim modifications
Total Traffic Future (2031)	Bank Street EA modifications implemented down to Urban Boundary. Optimize and coordinate all signal timing plans. Investigate potential widening of Bank Street from 4 to 6 lanes, as per the Bank Street EA Ultimate Plan.

The recommended design of Bank Street in the future (2031) horizon year based on the results of the Leitirm Community MTS has been provided in Exhibit ES-1.



LEGEND

NOTE: STORAGE LENGTHS ON BANK STREET DO NOT INCLUDE DECEL OR TAPER

- TRAVEL LANES AND PERMITTED MOVEMENTS
- STOP CONTROL
- TRAFFIC CONTROL SIGNAL
- * MINIMUM STORAGE LENGTH FOR LEFT-TURN LANE ON AN ARTERIAL ROAD
- # NO STORAGE REQUIRED, ONLY DECEL AND/OR TAPER AS PER CITY STANDARDS

IBI

Leitrim Community
Master Transportation Study

EXHIBIT ES-1
Recommended Ultimate Lane Configurations
and Intersection Control

PROJECT No. 103500
DATE: MARCH 2017
SCALE: NTS

traffic would then access Bank Street via the Bank Street and Leitrim Road intersection, and Albion Road via the Leitrim Road and Albion Road intersection.

The resulting existing (2016) peak hour traffic volumes accounting for a 1% background growth rate and the Kelly Farm Drive extension, are shown in Exhibit 9. Raw traffic count sheets and existing signal timing plans have been provided Appendix D.

5.3 Background Traffic Growth Rate

A 1.0% background traffic growth rate was applied to existing traffic counts along Bank Street to estimate future peak hour traffic volumes. This rate represents background traffic growth along Bank Street originating outside the Leitrim Community, such as the existing communities of Metcalfe and Greely to the south. The growth rate was based on the Bank Street EA model projections at the Leitrim Screenline. The 2031 model forecasts anticipated a 1.5% annual growth rate on Bank Street north of Leitrim Road, which included developments from the Leitrim Community.

The approach of this study was to add future Leitrim Community developments separately, which would reduce the overall growth rate along Bank Street. A 1.0% background traffic growth rate was considered reasonable. The rate was only applied to through movements on Bank Street, since side street traffic in the Leitrim Community would be accounted for separately.

5.4 Leitrim Community Traffic Generation

The peak hour traffic volumes from residential and commercial developments in the Leitrim Community were estimated using local trip generation rates that were developed from traffic counts completed in the existing Findlay Creek Community. The Findlay Creek Community was an ideal candidate to develop local rates since the community is surrounded by undeveloped lands and currently has only three accesses to the adjacent road network. Local

A separate traffic count was completed for the Findlay Creek Commercial Centre, which provided the local commercial trip generation rate. The residential and commercial trip generation rate raw data have been provided in Appendix E.

5.4.1 Residential Trip Generation Rate

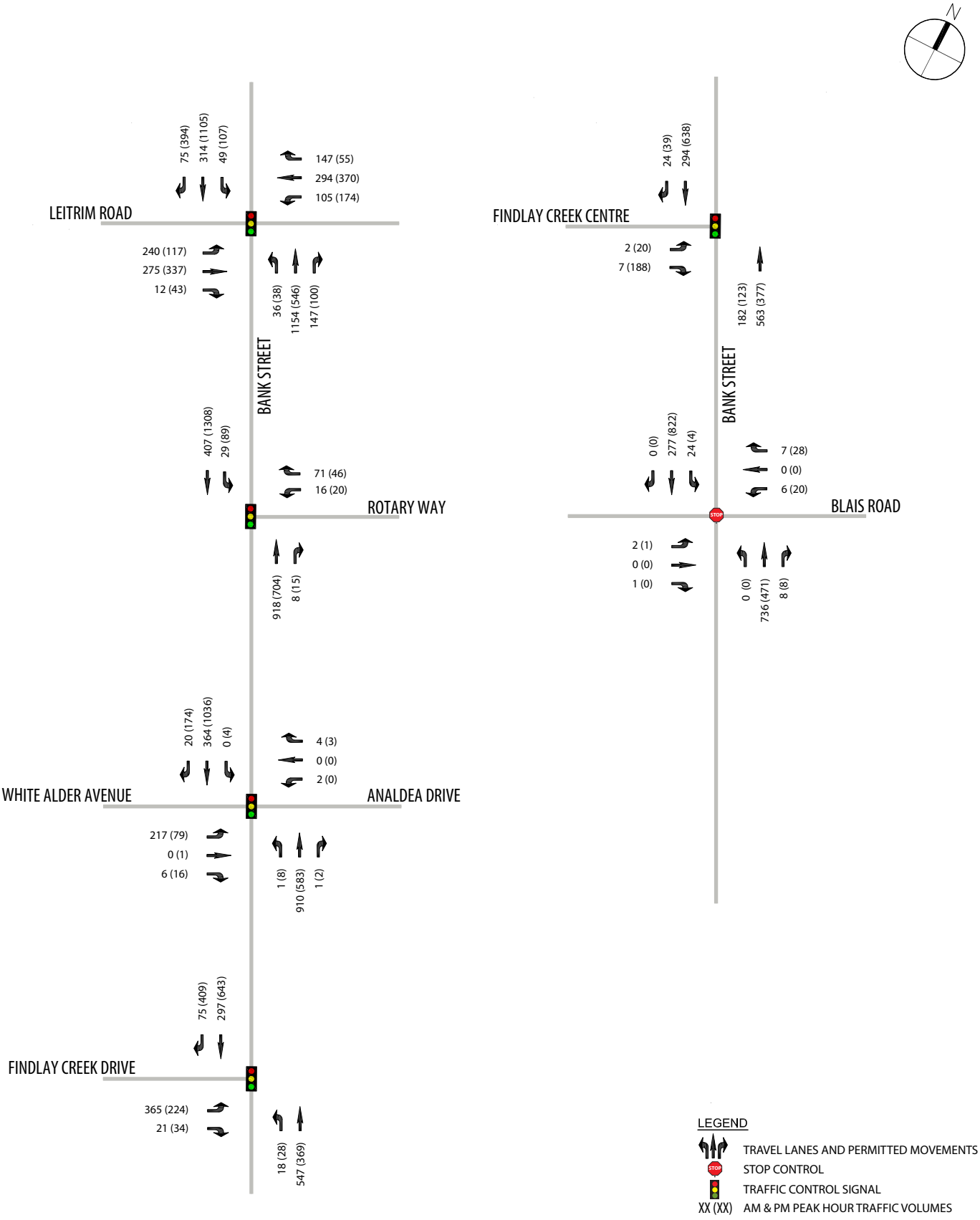
All trips generated by residential areas in the Leitrim Community were estimated using a blended trip generation rate that was derived from local traffic counts. The existing Findlay Creek subdivision contains approximately 2,600 units split between single family, semi-detached, townhome and apartment units. It was assumed that this housing blend would be similar throughout the Leitrim Community; meaning the residential trip rate would be applied to the total number of units per development, regardless of housing type. The residential trip generation traffic count was completed on Friday December 9, 2016 at the following access points:

- Bank Street and Findlay Creek Drive
- Albion Road and Findlay Creek Drive
- Bank Street and White Alder Avenue

The traffic counts were recorded during the weekday morning and afternoon peak 3-hour periods. From these 3-hour periods, the morning and afternoon peak hours were established. To verify the accuracy of the local count, the results at the Bank Street and Findlay Creek Drive and the Bank Street and White Alder Avenue intersections were compared with 2015 City traffic counts at these intersections. The comparison showed that the 2016 traffic counts were higher than the 2015 City counts. Therefore, the local traffic counts were considered acceptable for developing a trip rate.

A 5% adjustment was made to the local counts to account for potential cut-through and non-residential traffic that may have inflated the counts. The final inbound and outbound peak hour traffic volumes were divided by the total number of existing units to determine the following average residential trip generation rate in the morning and afternoon peak hours:

- AM – 0.55 vehicles per unit
- PM – 0.60 vehicles per unit



IBI

Leitrim Community
Master Transportation Study

EXHIBIT 9
Existing (2016)
AM & PM Peak Hour Traffic Volumes

PROJECT No. 103500
DATE: MARCH 2017
SCALE: NTS

5.4.2 Commercial Trip Generation Rate

All trips generated by commercial blocks in the Leitrim Community were also estimated using a blended trip generation rate. The Findlay Creek Centre was the chosen local mixed-use commercial site. It is comprised of approximately 150,000 square feet of gross floor area (GFA) spread among two main buildings located to the rear of the site and smaller buildings along the Bank Street and Findlay Creek Drive frontages. Land uses consist of retail and specialty retail stores (e.g. supermarket, automotive store, and pharmacy) together with service outlets (e.g. banks, medical offices, day care and restaurants). It is anticipated that the proposed mixed-use blocks in other developments, e.g. Remer Lands and the OPA Lands, will include a similar mix of uses.

The commercial trip generation count was completed on Tuesday January 21, 2014 at the only three access driveways to the development. The traffic counts were recorded during the weekday morning and afternoon peak periods, from which a peak hour was derived.

Based on the peak hour volumes recorded, average commercial trip generation rates derived for the morning and afternoon peak hours were as follows:

- AM – 3.07 veh/h/1,000 sq.ft. GFA
- PM – 5.83 veh/h/1,000 sq.ft. GFA

The floor-area-ratio (FAR) of the Findlay Creek Centre was approximately 23%, which represents the amount of commercial floor area there is compared to the total site area. For this analysis, it was assumed this ratio would apply to all future commercial blocks in the Leitrim Community.

5.4.3 Unadjusted Trip Generation Results

The historical build out rates in the Leitrim Community ranged between 200 and 250 units per year. For this study, future build out was assumed to occur at a rate of 300 units per year between 2017 and 2031. Table 5 outlines the expected buildout timings for each Leitrim Community development; all developments were expected to reach full buildout by 2031.

TABLE 5 – Leitrim Community Buildout Assumptions

DEVELOMENT	LAND USE	SIZE (DU or '000 sf)			
		2019	2022	2025	2031
Remaining Findlay Creek	Residential	152			
Remaining Lemay and Sundance	Residential	158			
Transport Canada	Residential	0	140	231	
Findlay Creek Stage 2 Phase 4C	Residential	185	240		
Remer and Idone	Residential	93	417	645	1,155
	Commercial	158.733	260.351		
Barrett Lands	Residential	0	169	445	797
Barrett Lands Extension	Residential	116	150		
OPA 76 Area 9a and 9b	Residential	196	374	360	1,319
	Commercial	166.303			
TOTAL DWELLING UNITS		900	1,800	2,700	4,202

The local residential and commercial trip generation rates were applied to the buildout assumptions in Table 5 to determine the unadjusted peak hour trip generation for each development. The results for residential and commercial uses have been shown in Tables 6 and 7 respectively.

TABLE 6 – Unadjusted Residential Trip Generation Results

DEVELOPMENT	BUILDOUT YEAR	SIZE (DU)	PERIOD	GENERATED TRAFFIC (VPH)		
				IN	OUT	TOTAL
Remaining Existing Findlay Creek	2019	152	AM	21	63	84
			PM	58	33	91
Remaining Existing Lemay	2019	158	AM	22	65	87
			PM	60	35	95
Transport Canada Lands	2022	140	AM	19	58	77
			PM	53	31	84
	2025	231	AM	32	95	127
			PM	88	51	139
Findlay Creek Stage 2 Phase 4C	2019	185	AM	26	76	102
			PM	71	41	111
	2022	240	AM	33	99	132
			PM	91	53	144
Remer and Idone	2019	93	AM	13	38	51
			PM	35	20	56
	2022	417	AM	58	172	230
			PM	159	91	250
	2025	645	AM	89	267	356
			PM	246	141	387
	2031	1,155	AM	159	477	637
			PM	440	253	693
Barrett Lands Extension	2019	116	AM	16	48	64
			PM	44	25	70
	2022	150	AM	21	62	83
			PM	57	33	90
Barrett Lands	2022	169	AM	16	77	93
			PM	68	33	101
	2025	445	AM	61	184	245
			PM	170	97	267
	2031	797	AM	110	329	439
			PM	304	175	478
OPA 76 Areas 9a and 9b	2019	196	AM	27	81	108
			PM	75	43	118
	2022	374	AM	52	155	206
			PM	143	82	224
	2025	680	AM	94	281	375
			PM	259	149	408
	2031	1,319	AM	182	545	727
			PM	503	289	792
TOTAL	2019	900	AM	125	371	496
			PM	343	197	541
	2022	1800	AM	242	751	992
			PM	689	391	1,079
	2025	2700	AM	373	1,116	1,489
			PM	1,029	592	1,621
	2031	4202	AM	580	1,735	2,316
			PM	1,601	922	2,522

Notes:
vph = vehicles per hour; DU = Dwelling Units
Formula Rate and Splits for Residential Land Use:
AM T= 0.55(X) IN: 25%; OUT: 75%
PM T= 0.60(X) IN: 64%; OUT: 36%

TABLE 7 – Unadjusted Commercial Trip Generation Results

DEVELOPMENT	BUILDOUT YEAR	SIZE ('000 SF)	PERIOD	GENERATED TRAFFIC (VPH)		
				IN	OUT	TOTAL
Remer and Idone	2019	158.733	AM	283	205	487
			PM	444	481	925
	2022	260.351	AM	464	336	799
			PM	729	789	1,518
OPA 76 Areas 9a and 9b	2022	166.303	AM	296	214	511
			PM	465	504	970
Passby Trips (80%)						
Remer and Idone	2019	-	AM	195	195	390
			PM	370	370	740
	2022	-	AM	320	320	639
			PM	607	607	1,214
OPA 76 Areas 9a and 9b	2022	-	AM	204	204	408
			PM	388	388	776
Primary Trips (20%)						
Remer and Idone	2019	-	AM	57	41	97
			PM	89	96	185
	2022	-	AM	93	67	160
			PM	146	158	304
OPA 76 Areas 9a and 9b	2022	-	AM	59	43	102
			PM	93	101	194

Notes:
vph = vehicles per hour; SF = square feet
Formula Rate and Splits for Commercial Retail Land Use:
AM T= 3.07(X) IN: 58%; OUT: 42%
PM T= 5.83(X) IN: 48%; OUT: 52%

The commercial trips were separated into new trips and pass-by trips by the application of a pass-by proportion. Pass-by trips are trips made as an intermediate stop on the way from an origin to a primary destination (e.g. retail, service, fast-food restaurant). They are assumed to enter the site and then resume travel in the same direction. Therefore, pass-by trips are not new trips, but existing trips that have made a temporary detour.

The ITE manual indicates that pass-by proportions of approximately 80% are typical for highway commercial uses/ high-turnover uses. The Leitrim Community is located near the Urban Boundary and surrounded by primarily undeveloped lands. The commercial uses in this area are quite isolated. Bank Street is a heavily utilized commuter route, and any commercial uses along Bank Street are expected to generate a high proportion of pass-by trips during these peaks, rather than new trips. Therefore, a pass-by proportion of 80% was considered reasonable for all commercial areas in the Leitrim Community.

5.4.4 Adjusted Trip Generation Results

The trip generation results in Tables 6 and 7 were subsequently adjusted to account for future increases in transit mode share (TMS). The City noted the observed transit mode share from the Riverside South/ Leitrim area to all other areas in the City to be approximately 10% in 2016 during the morning peak hour. The TMP projected this target transit mode share to reach 16% by 2031. To be conservative, it was assumed that the transit mode share would not start to increase until 2022 and that the transit mode share would remain at 10% in 2019. The rate of transit mode share growth was assumed to be linear and would be applied to both morning and afternoon peak hour traffic results up to the 2031 horizon.

No reductions for mixed-use/ synergistic effects were applied since these factors would be accounted for in the local rates. The adjusted trip generation results for residential and commercial uses have been summarized in Tables 8 and 9 respectively.

The proposed Leitrim Community developments are expected to generate the following number of new trips:

- 2019
  - Residential: 500 morning peak hour trips; 550 afternoon peak hour trips
  - Commercial: 100 morning peak hour trips; 190 afternoon peak hour trips
- 2022
  - Residential: 1,000 morning peak hour trips; 1,050 afternoon peak hour trips
  - Commercial: 260 morning peak hour trips; 500 afternoon peak hour trips
- 2025
  - Residential: 1,450 morning peak hour trips; 1,550 afternoon peak hour trips
  - Commercial: 255 morning peak hour trips; 480 afternoon peak hour trips
- 2031
  - Residential: 2,200 morning peak hour trips; 2,400 afternoon peak hour trips
  - Commercial: 250 morning peak hour trips; 450 afternoon peak hour trips

TABLE 8 – Residential Trip Generation Results with TMS Adjustments

DEVELOPMENT	BUILDOUT YEAR	GENERATED TRAFFIC (VPH)					
		AM			PM		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Remaining Findlay Creek	2019	21	63	84	58	33	91
	2022	21	62	83	57	33	90
	2026	20	61	81	56	32	88
	2031	20	59	79	54	31	86
Remaining Lemay and Sundance	2019	22	65	87	60	35	95
	2022	21	64	86	59	34	93
	2026	21	63	84	58	34	92
	2031	20	61	82	57	33	89
Transport Canada Lands	2019	-	-	-	-	-	-
	2022	19	57	76	53	30	83
	2026	31	93	124	85	49	134
	2031	30	90	120	83	48	130
Findlay Creek Stage 2 Phase 4C	2019	26	76	102	71	41	111
	2022	33	98	130	90	52	142
	2026	32	96	128	89	51	140
	2031	31	93	124	86	49	135
Remer and Idone	2019	13	38	51	35	20	56
	2022	57	170	226	157	90	247
	2026	86	259	345	239	137	376
	2031	150	449	599	414	238	652
Barrett Lands Extension	2019	16	48	64	44	25	70
	2022	20	61	81	56	32	89
	2026	20	60	80	55	32	87
	2031	19	58	78	54	31	85
Barrett Lands	2019	-	-	-	-	-	-
	2022	16	76	92	67	33	100
	2026	60	178	238	165	95	259
	2031	103	310	413	286	164	450
OPA 76 Areas 9a and 9b	2019	27	81	108	75	43	118
	2022	51	152	203	140	81	221
	2026	91	273	364	251	144	396
	2031	171	513	684	473	272	744

TABLE 9 – Commercial Primary Trip Generation Results with TMS Adjustments

DEVELOPMENT	BUILDOUT YEAR	PERIOD	GENERATED TRAFFIC (VPH)		
			IN	OUT	TOTAL
Remer and Idone	2019	AM	57	41	97
		PM	89	96	185
	2022	AM	91	66	157
		PM	144	155	299
	2026	AM	90	65	155
		PM	141	153	294
	2031	AM	87	63	150
		PM	137	148	285
OPA 76 Areas 9a and 9b	2022	AM	58	42	101
		PM	92	99	191
	2026	AM	57	42	99
		PM	90	98	188
	2031	AM	56	40	96
		PM	87	95	182

Notes:
vph = vehicles per hour; SF = square feet

5.5 Trip Distribution and Assignment

Traffic generated by proposed residential and commercial areas, outlined in Tables 8 and 9, were distributed to the adjacent road network according to the proportions outlined in Table 10.

TABLE 10 – Residential Trip Distribution

DEVELOPMENT	DISTRIBUTION OF TRAFFIC BY ROADWAY IN/ OUT OF STUDY AREA			
	BANK STREET [1]	LEITRIM ROAD [2]	FINDLAY CREEK DRIVE [3]	OUTSIDE STUDY AREA [4]
Remaining Findlay Creek; Transport Canada Lands; and Findlay Creek Stage 2 Phase 4C	65%	-	10%	25%
Remaining Lemay and Sundance	100%	-	-	-
Remer and Idone	75%	-	-	25%
Barrett Lands Extension; and Barrett Lands	20%	30%	-	50%
OPA 76 Areas 9a and 9b	90%	-	10%	-

Notes:
1 - Directional distribution on Bank Street for all developments = 95% North; 5% South
2 - Accounts for all traffic entering/ exiting via Leitrim Road, but crosses/ uses Bank Street
3 - Accounts for all traffic entering/ exiting via Findlay Creek Drive to the west, but crosses/ uses Bank Street
4 - Accounts for all traffic entering/ exiting that does not cross/ use Bank Street.

The specific turning movement distributions at study area intersections were based on existing traffic patterns. The pass-by distributions for the commercial areas were distributed as follows:

TABLE 11 – Pass-by Trip Distribution

DEVELOPMENT	ACCESS INTERSECTION	NORTHBOUND	SOUTHBOUND
Remer and Idone	Street 14/ Blais Road	10%	-
	Street 6	15%	-
OPA 76 Areas 9a and 9b	Street 1/ Findlay Creek Drive	-	25%
	Street 2/ Findlay Creek Centre	-	40%

Notes:
Pass-by distributions do not add up to 100% due to right-in right-outs; pass-by trips at RIRO intersections do not affect intersection turning movements

Appendix H – TDM Checklist

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)*	☐
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)	☑ Under consideration

	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)*	☑ Enclosure proposed
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)	☑ Under consideration
	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)*	☑ Under consideration
	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	☑ Under consideration
	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	☑ ZBA to reduce parking sought.
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	☑ long term resident parking + visitor (short & potential longer-term)
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

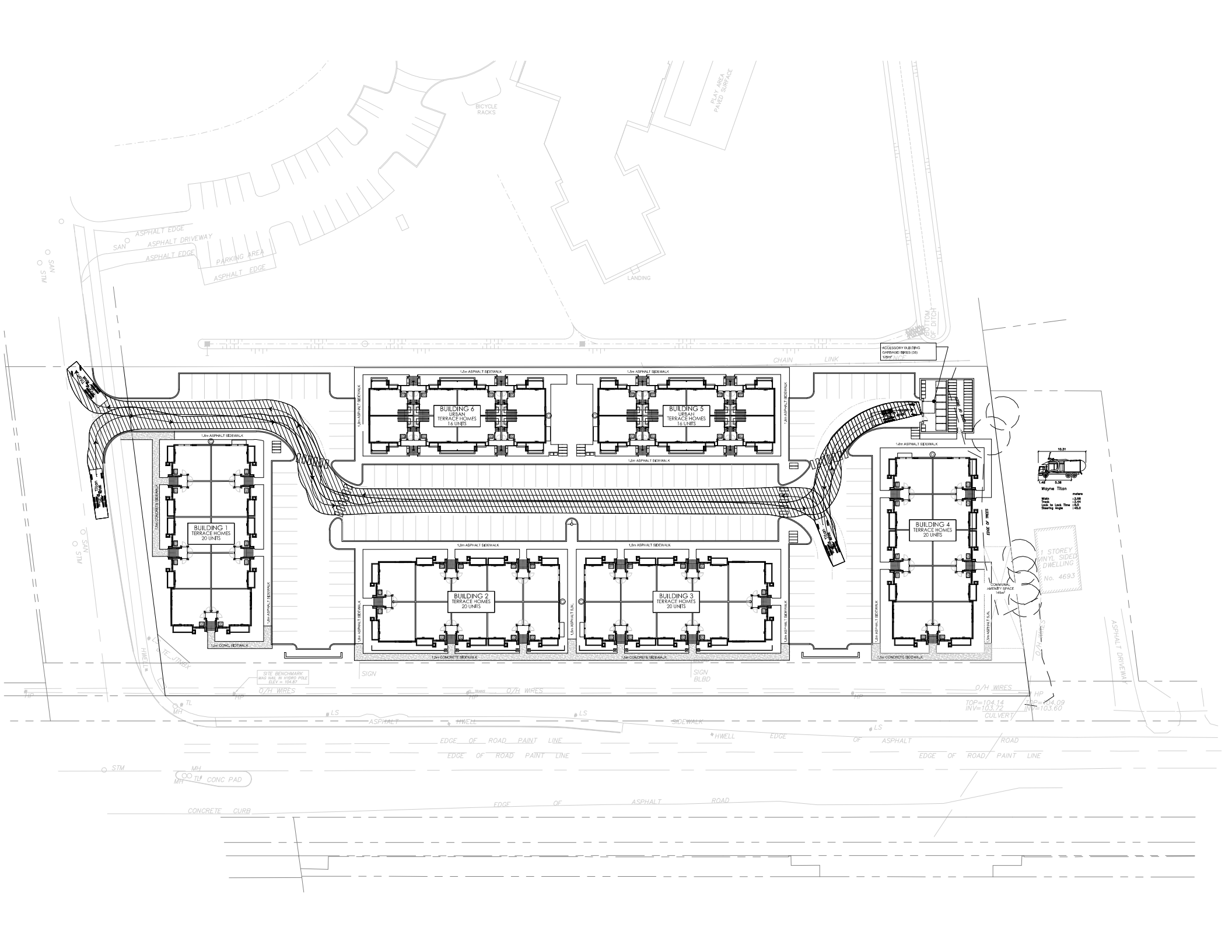
★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		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)*	☑ Under consideration
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)*	☑ Under consideration
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	☑ Under consideration
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 I – Vehicle Swept Path Analysis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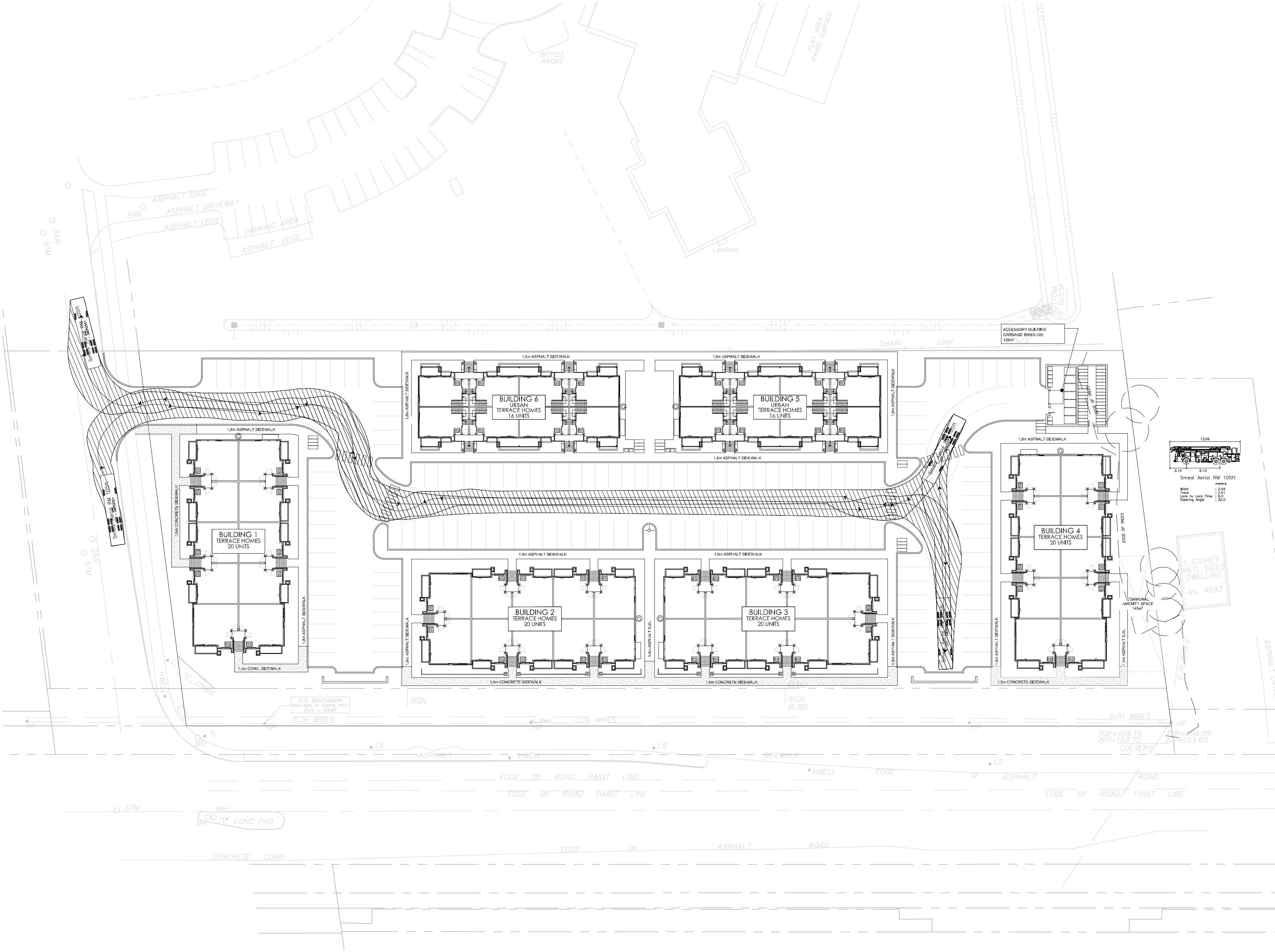
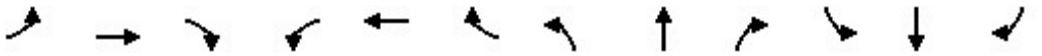
TERRACE HOMES
20 UNITS
BUILDING 2
TERRACE HOMES
20 UNITS
BUILDING 3
TERRACE HOMES
20 UNITS
BUILDING 4
TERRACE HOMES
20 UNITS
BUILDING 5
URBAN
TERRACE HOMES
16 UNITS
BUILDING 6
URBAN
TERRACE HOMES
16 UNITS
ACCESSORY BUILDING
GARBAGE/ BIKES (36)
125m²
1.5m ASPHALT SIDEWALK
1.2m ASPHALT SIDEWALK
1.2m CONCRETE SIDEWALK
1.2m CONC. SIDEWALK
COMMUNAL AMENITY SPACE
145m²
1 STOREY VINYL SIDED DWELLING No. 4693
Wayne Titan
ASPHALT DRIVEWAY
PARKING AREA
BICYCLE RACKS
PLAY AREA PAVED SURFACE
LANDING
CHAIN LINK
BOTTOM OF DITCH
SITE BENCHMARK MAG NAIL IN HYDRO POLE ELEV. = 104.87
O/H WIRES
SIGN
SIGN BLBD
CULVERT
TOP=104.14
INV=103.72
TOP=104.09
INV=103.60
ASPHALT
SIDEWALK
EDGE OF ROAD PAINT LINE
EDGE OF ASPHALT ROAD
CONCRETE CURB
CONC PAD
HWELL
STM
SAN
MH
TL
HP
LS


BUILDING 6
URBAN
TERRACE HOMES
16 UNITS
BUILDING 5
URBAN
TERRACE HOMES
16 UNITS
BUILDING 1
TERRACE HOMES
20 UNITS
BUILDING 2
TERRACE HOMES
20 UNITS
BUILDING 3
TERRACE HOMES
20 UNITS
BUILDING 4
TERRACE HOMES
20 UNITS
ACCESSORY BUILDING
GARBAGE/ BIKES (30)
125m²
COMMUNAL AMENITY SPACE
145m²
1.5m ASPHALT SIDEWALK
1.8m ASPHALT SIDEWALK
1.5m CONCRETE SIDEWALK
1.5m CONC. SIDEWALK
1.5m CONCRETE SIDEWALK
Smeal Aerial RM 105ft
1 STOREY
VINYL SIDED
DWELLING
No. 4693
BICYCLE
RACKS
PLAY AREA
PAVED SURFACE
LANDING
ASPHALT EDGE
ASPHALT DRIVEWAY
PARKING AREA
CHAIN LINK
BOTTOM OF DITCH
EDGE OF TREES
SITE BENCHMARK
O/H WIRES
CULVERT
EDGE OF ROAD PAINT LINE
EDGE OF ASPHALT ROAD
CONCRETE CURB
CONC PAD
ASPHALT DRIVEWAY

Appendix J – Intersection Capacity Analysis

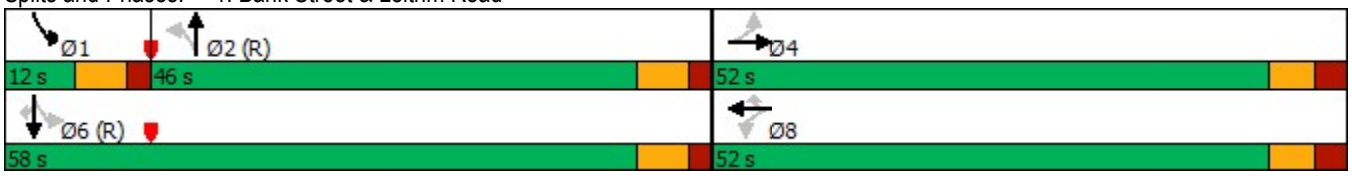


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	379	33	111	245	156	35	1006	158	60	318	73
Future Volume (vph)	229	379	33	111	245	156	35	1006	158	60	318	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		60.0	140.0		0.0	140.0		130.0
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor							1.00					0.98
Frt		0.993				0.850		0.980				0.850
Flt Protected		0.982		0.950			0.950			0.950		
Satd. Flow (prot)	0	1698	0	1586	1670	1517	1478	3290	0	1695	3232	1345
Flt Permitted		0.687		0.377			0.540			0.085		
Satd. Flow (perm)	0	1188	0	629	1670	1517	839	3290	0	152	3232	1315
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				153		18				81
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	4%	21%	9%	9%	2%	17%	3%	3%	2%	7%	15%
Adj. Flow (vph)	254	421	37	123	272	173	39	1118	176	67	353	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	712	0	123	272	173	39	1294	0	67	353	81
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	38.5	38.5		38.5	38.5	38.5	29.2	29.2		11.2	29.2	29.2
Total Split (s)	52.0	52.0		52.0	52.0	52.0	46.0	46.0		12.0	58.0	58.0
Total Split (%)	47.3%	47.3%		47.3%	47.3%	47.3%	41.8%	41.8%		10.9%	52.7%	52.7%
Maximum Green (s)	45.5	45.5		45.5	45.5	45.5	39.8	39.8		5.8	51.8	51.8
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.2	4.2		4.2	4.2	4.2
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5		6.5	6.5	6.5	6.2	6.2		6.2	6.2	6.2
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min	Min	C-Min	C-Min		None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	25.0	25.0		25.0	25.0	25.0	16.0	16.0			16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	0
Act Effct Green (s)		45.5		45.5	45.5	45.5	42.2	42.2		51.8	51.8	51.8
Actuated g/C Ratio		0.41		0.41	0.41	0.41	0.38	0.38		0.47	0.47	0.47
v/c Ratio		1.44		0.47	0.39	0.24	0.12	1.02		0.44	0.23	0.12

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		239.3		31.0	24.8	5.4	29.0	58.5		25.3	17.8	4.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		239.3		31.0	24.8	5.4	29.0	58.5		25.3	17.8	4.1
LOS		F		C	C	A	C	E		C	B	A
Approach Delay		239.3			20.2			57.6			16.6	
Approach LOS		F			C			E			B	
Queue Length 50th (m)		~193.3		17.4	37.0	2.3	5.3	~150.1		7.1	21.2	0.0
Queue Length 95th (m)		#258.4		34.3	56.7	14.0	m7.3	m#184.7		14.3	29.8	7.3
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)				70.0		60.0	140.0			140.0		130.0
Base Capacity (vph)		493		260	690	717	321	1272		152	1521	662
Starvation Cap Reductn		0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		1.44		0.47	0.39	0.24	0.12	1.02		0.44	0.23	0.12

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 52 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.44			
Intersection Signal Delay: 85.7		Intersection LOS: F	
Intersection Capacity Utilization 110.2%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank Street & Leitrim Road



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	23	167	1082	21	49	385
Future Volume (vph)	23	167	1082	21	49	385
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	80.0	0.0		100.0	100.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1662	1532	1750	1547	1601	1670
Flt Permitted	0.950				0.119	
Satd. Flow (perm)	1662	1532	1750	1512	201	1670
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		105		23		
Link Speed (k/h)	50		70			70
Link Distance (m)	378.8		450.1			148.6
Travel Time (s)	27.3		23.1			7.6
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	1%	4%	0%	8%	9%
Adj. Flow (vph)	26	186	1202	23	54	428
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	186	1202	23	54	428
Turn Type	Perm	Perm	NA	Perm	Perm	NA
Protected Phases			2			6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	29.0	29.0	25.9	25.9	15.9	15.9
Total Split (s)	29.0	29.0	81.0	81.0	81.0	81.0
Total Split (%)	26.4%	26.4%	73.6%	73.6%	73.6%	73.6%
Maximum Green (s)	23.0	23.0	75.1	75.1	75.1	75.1
Yellow Time (s)	3.3	3.3	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	1.7	1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.9	5.9	5.9	5.9
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		
Flash Dont Walk (s)	16.0	16.0	13.0	13.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	13.1	13.1	85.0	85.0	85.0	85.0
Actuated g/C Ratio	0.12	0.12	0.77	0.77	0.77	0.77
v/c Ratio	0.13	0.68	0.89	0.02	0.35	0.33

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	42.9	33.1	15.1	1.9	13.3	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	33.1	15.1	1.9	13.3	5.9
LOS	D	C	B	A	B	A
Approach Delay	34.3		14.8			6.7
Approach LOS	C		B			A
Queue Length 50th (m)	4.8	15.4	84.5	0.0	2.6	20.7
Queue Length 95th (m)	11.5	34.6	#307.5	m0.4	m7.6	m30.8
Internal Link Dist (m)	354.8		426.1			124.6
Turn Bay Length (m)	80.0			100.0	100.0	
Base Capacity (vph)	347	403	1352	1173	155	1290
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	0.07	0.46	0.89	0.02	0.35	0.33

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 50 (45%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

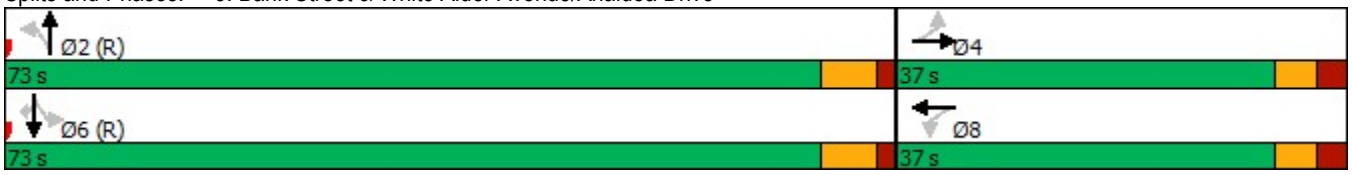
Splits and Phases: 2: Bank Street & Rotary Way

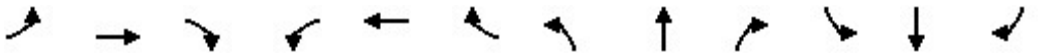
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1	13	0	2	3	4	775	4	2	393	33
Future Volume (vph)	286	1	13	0	2	3	4	775	4	2	393	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	20.0		0.0	115.0		0.0	100.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97			0.98		1.00	1.00				0.97
Frt		0.860			0.910			0.999				0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1712	1486	0	1784	1588	0	1695	1732	0	1153	1640	1459
Flt Permitted	0.754						0.456			0.182		
Satd. Flow (perm)	1336	1486	0	1784	1588	0	812	1732	0	221	1640	1422
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			3							37
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			450.1	
Travel Time (s)		26.1			28.3			21.6			23.1	
Confl. Peds. (#/hr)	7		6	6		7	2		6	6		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%	2%	5%	2%	50%	11%	6%
Adj. Flow (vph)	318	1	14	0	2	3	4	861	4	2	437	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	318	15	0	0	5	0	4	865	0	2	437	37
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	29.0	29.0		29.0	29.0		25.2	25.2		25.2	25.2	25.2
Total Split (s)	37.0	37.0		37.0	37.0		73.0	73.0		73.0	73.0	73.0
Total Split (%)	33.6%	33.6%		33.6%	33.6%		66.4%	66.4%		66.4%	66.4%	66.4%
Maximum Green (s)	31.0	31.0		31.0	31.0		66.8	66.8		66.8	66.8	66.8
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.7	2.7		2.7	2.7		1.6	1.6		1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		12.0	12.0		12.0	12.0	12.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	29.2	29.2			29.2		68.6	68.6		68.6	68.6	68.6
Actuated g/C Ratio	0.27	0.27			0.27		0.62	0.62		0.62	0.62	0.62
v/c Ratio	0.90	0.04			0.01		0.01	0.80		0.01	0.43	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	67.5	14.2			21.8		8.8	23.5		5.5	8.5	0.5
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	67.5	14.2			21.8		8.8	23.5		5.5	8.5	0.5
LOS	E	B			C		A	C		A	A	A
Approach Delay		65.1			21.8			23.4			7.9	
Approach LOS		E			C			C			A	
Queue Length 50th (m)	58.0	0.1			0.3		0.3	130.4		0.1	22.5	0.0
Queue Length 95th (m)	#102.6	4.7			2.9		1.6	183.0		m0.2	21.6	0.5
Internal Link Dist (m)		339.0			369.1			395.3			426.1	
Turn Bay Length (m)	60.0						115.0			100.0		100.0
Base Capacity (vph)	380	432			454		509	1085		138	1027	905
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.84	0.03			0.01		0.01	0.80		0.01	0.43	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 58 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 27.3		Intersection LOS: C	
Intersection Capacity Utilization 76.9%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	373	45	53	331	161	37	530	107	90	1158	349
Future Volume (vph)	85	373	45	53	331	161	37	530	107	90	1158	349
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		60.0	140.0		0.0	140.0		130.0
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.988				0.850		0.975				0.850
Flt Protected		0.992		0.950			0.950			0.950		
Satd. Flow (prot)	0	1641	0	1503	1767	1517	1647	3273	0	1679	3390	1532
Flt Permitted		0.734		0.367			0.119			0.211		
Satd. Flow (perm)	0	1214	0	581	1767	1517	206	3273	0	373	3390	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				179		23				317
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	10%	7%	15%	3%	2%	5%	3%	3%	3%	2%	1%
Adj. Flow (vph)	94	414	50	59	368	179	41	589	119	100	1287	388
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	558	0	59	368	179	41	708	0	100	1287	388
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	38.5	38.5		38.5	38.5	38.5	29.2	29.2		11.2	29.2	29.2
Total Split (s)	51.0	51.0		51.0	51.0	51.0	49.0	49.0		15.0	64.0	64.0
Total Split (%)	44.3%	44.3%		44.3%	44.3%	44.3%	42.6%	42.6%		13.0%	55.7%	55.7%
Maximum Green (s)	44.5	44.5		44.5	44.5	44.5	42.8	42.8		8.8	57.8	57.8
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.2	4.2		4.2	4.2	4.2
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5		6.5	6.5	6.5	6.2	6.2		6.2	6.2	6.2
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min	Min	Min	Min		None	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	25.0	25.0		25.0	25.0	25.0	16.0	16.0			16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	0
Act Effct Green (s)		44.8		44.8	44.8	44.8	34.8	34.8		46.4	46.4	46.4
Actuated g/C Ratio		0.43		0.43	0.43	0.43	0.33	0.33		0.45	0.45	0.45
v/c Ratio		1.06		0.24	0.48	0.24	0.59	0.64		0.37	0.85	0.45
Control Delay		87.9		25.0	25.6	4.2	67.8	31.6		20.3	31.7	5.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		87.9		25.0	25.6	4.2	67.8	31.6		20.3	31.7	5.4
LOS		F		C	C	A	E	C		C	C	A
Approach Delay		87.9			19.2			33.6			25.3	
Approach LOS		F			B			C			C	
Queue Length 50th (m)		~115.6		6.9	48.6	0.0	6.6	59.0		10.6	108.7	7.4
Queue Length 95th (m)		#200.4		18.4	85.3	12.4	#22.3	76.4		19.2	133.6	23.6
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)				70.0		60.0	140.0			140.0		130.0
Base Capacity (vph)		525		250	761	755	85	1369		277	1897	996
Starvation Cap Reductn		0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		1.06		0.24	0.48	0.24	0.48	0.52		0.36	0.68	0.39

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 103.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 35.5		Intersection LOS: D	
Intersection Capacity Utilization 110.2%		ICU Level of Service H	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

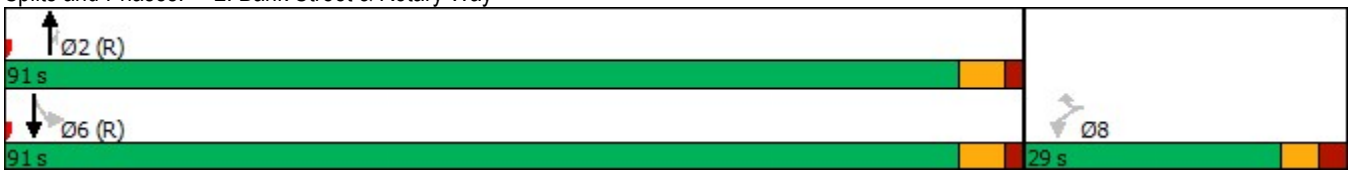
Splits and Phases: 1: Bank Street & Leitrim Road

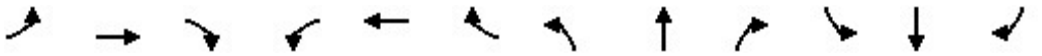
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	38	86	588	53	116	1242
Future Volume (vph)	38	86	588	53	116	1242
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	80.0	0.0		100.0	100.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.98	1.00	
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1679	1532	1767	1517	1712	1784
Flt Permitted	0.950				0.388	
Satd. Flow (perm)	1661	1532	1767	1482	699	1784
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		96		59		
Link Speed (k/h)	50		70			70
Link Distance (m)	378.8		450.1			148.6
Travel Time (s)	27.3		23.1			7.6
Confl. Peds. (#/hr)	4			1	1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	1%	3%	2%	1%	2%
Adj. Flow (vph)	42	96	653	59	129	1380
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	96	653	59	129	1380
Turn Type	Perm	Perm	NA	Perm	Perm	NA
Protected Phases			2			6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	29.0	29.0	25.9	25.9	15.9	15.9
Total Split (s)	29.0	29.0	91.0	91.0	91.0	91.0
Total Split (%)	24.2%	24.2%	75.8%	75.8%	75.8%	75.8%
Maximum Green (s)	23.0	23.0	85.1	85.1	85.1	85.1
Yellow Time (s)	3.3	3.3	4.2	4.2	4.2	4.2
All-Red Time (s)	2.7	2.7	1.7	1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.9	5.9	5.9	5.9
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		
Flash Dont Walk (s)	16.0	16.0	13.0	13.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	10.3	10.3	97.8	97.8	97.8	97.8
Actuated g/C Ratio	0.09	0.09	0.82	0.82	0.82	0.82
v/c Ratio	0.29	0.44	0.45	0.05	0.23	0.95

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	56.9	16.6	3.9	0.6	3.6	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	16.6	3.9	0.6	3.6	25.1
LOS	E	B	A	A	A	C
Approach Delay	28.9		3.6			23.2
Approach LOS	C		A			C
Queue Length 50th (m)	8.7	0.0	26.2	0.0	4.9	189.1
Queue Length 95th (m)	18.9	14.6	43.2	1.8	10.1	#373.4
Internal Link Dist (m)	354.8		426.1			124.6
Turn Bay Length (m)	80.0			100.0	100.0	
Base Capacity (vph)	318	371	1439	1218	569	1453
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	0.26	0.45	0.05	0.23	0.95

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 79 (66%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 87.3%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Bank Street & Rotary Way



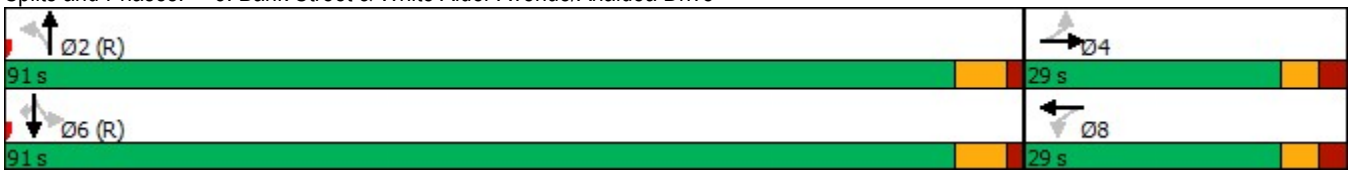


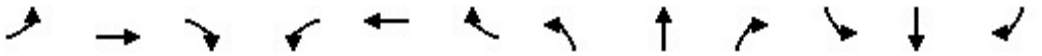
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	1	20	5	1	1	14	561	5	3	1131	184
Future Volume (vph)	79	1	20	5	1	1	14	561	5	3	1131	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	20.0		0.0	115.0		0.0	100.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.98				1.00		0.99		0.96
Frt		0.857			0.925			0.999				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1437	0	1695	1650	0	1616	1748	0	1695	1767	1517
Flt Permitted	0.757			0.742			0.115			0.397		
Satd. Flow (perm)	1351	1437	0	1304	1650	0	196	1748	0	705	1767	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			1				204
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			450.1	
Travel Time (s)		26.1			28.3			21.6			23.1	
Confl. Peds. (#/hr)			6	6			6		6	6		6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	5%	2%	2%	2%	7%	4%	2%	2%	3%	2%
Adj. Flow (vph)	88	1	22	6	1	1	16	623	6	3	1257	204
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	23	0	6	2	0	16	629	0	3	1257	204
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	29.0	29.0		29.0	29.0		25.2	25.2		25.2	25.2	25.2
Total Split (s)	29.0	29.0		29.0	29.0		91.0	91.0		91.0	91.0	91.0
Total Split (%)	24.2%	24.2%		24.2%	24.2%		75.8%	75.8%		75.8%	75.8%	75.8%
Maximum Green (s)	23.0	23.0		23.0	23.0		84.8	84.8		84.8	84.8	84.8
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.7	2.7		2.7	2.7		1.6	1.6		1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		12.0	12.0		12.0	12.0	12.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	13.7	13.7		13.7	13.7		98.6	98.6		98.6	98.6	98.6
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.82	0.82		0.82	0.82	0.82
v/c Ratio	0.58	0.13		0.04	0.01		0.10	0.44		0.01	0.87	0.17

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	64.5	19.4		45.2	37.5		5.4	5.5		3.3	18.2	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.5	19.4		45.2	37.5		5.4	5.5		3.3	18.2	0.9
LOS	E	B		D	D		A	A		A	B	A
Approach Delay		55.1			43.3			5.5			15.8	
Approach LOS		E			D			A			B	
Queue Length 50th (m)	18.5	0.2		1.2	0.2		0.7	36.8		0.1	280.4	1.5
Queue Length 95th (m)	32.6	7.0		4.7	2.4		3.0	67.1		m0.2	m#314.6	m2.4
Internal Link Dist (m)		339.0			369.1			395.3			426.1	
Turn Bay Length (m)	60.0			20.0			115.0			100.0		100.0
Base Capacity (vph)	258	293		249	317		161	1436		579	1451	1234
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.34	0.08		0.02	0.01		0.10	0.44		0.01	0.87	0.17

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 85.7%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	426	45	194	269	162	56	1648	242	62	581	79
Future Volume (vph)	267	426	45	194	269	162	56	1648	242	62	581	79
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		0	2		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.986			0.944				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3257	3228	0	3077	3069	0	1478	3357	1502	1695	3232	1345
Flt Permitted	0.950			0.950			0.433			0.063		
Satd. Flow (perm)	3257	3228	0	3077	3069	0	673	3357	1502	112	3232	1328
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			97				242			93
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	21%	9%	9%	2%	17%	3%	3%	2%	7%	15%
Adj. Flow (vph)	267	426	45	194	269	162	56	1648	242	62	581	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	471	0	194	431	0	56	1648	242	62	581	79
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	35.6		11.6	35.6		37.9	37.9	37.9	11.9	37.9	37.9
Total Split (s)	17.4	38.9		14.1	35.6		55.0	55.0	55.0	12.0	67.0	67.0
Total Split (%)	14.5%	32.4%		11.8%	29.7%		45.8%	45.8%	45.8%	10.0%	55.8%	55.8%
Maximum Green (s)	10.8	32.3		7.5	29.0		48.1	48.1	48.1	5.1	60.1	60.1
Yellow Time (s)	4.1	4.1		4.1	4.1		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.9	6.9	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min		C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0			22.0		24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0			0		0	0	0		0	0
Act Effct Green (s)	10.8	22.5		7.5	19.2		58.1	58.1	58.1	69.9	69.9	69.9
Actuated g/C Ratio	0.09	0.19		0.06	0.16		0.48	0.48	0.48	0.58	0.58	0.58
v/c Ratio	0.91	0.77		1.01	0.75		0.17	1.01	0.28	0.38	0.31	0.10

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	88.5	54.0		123.6	45.5		21.9	55.0	4.1	19.4	13.8	2.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.5	54.0		123.6	45.5		21.9	55.0	4.1	19.4	13.8	2.2
LOS	F	D		F	D		C	D	A	B	B	A
Approach Delay		66.5			69.7			47.7			13.0	
Approach LOS		E			E			D			B	
Queue Length 50th (m)	30.1	50.6		~22.3	37.0		7.2	~207.5	8.6	5.5	31.9	0.0
Queue Length 95th (m)	#52.6	63.7		#44.3	50.5		m10.8	#275.1	8.4	13.4	46.8	5.0
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	293	875		192	815		325	1624	851	163	1883	812
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.54		1.01	0.53		0.17	1.01	0.28	0.38	0.31	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 48.4		Intersection LOS: D	
Intersection Capacity Utilization 92.5%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

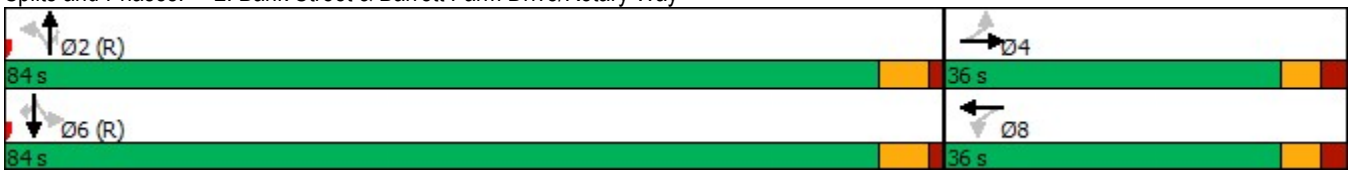
Splits and Phases: 1: Bank Street & Leitrim Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	0	2	26	0	196	1	1704	22	59	690	12
Future Volume (vph)	39	0	2	26	0	196	1	1704	22	59	690	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.98			
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1517	0	1662	1532	0	1695	3325	1547	1601	3172	1517
Flt Permitted	0.417			0.757			0.382			0.103		
Satd. Flow (perm)	744	1517	0	1325	1532	0	682	3325	1512	174	3172	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		274			31				28			28
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	1%	2%	4%	0%	8%	9%	2%
Adj. Flow (vph)	39	0	2	26	0	196	1	1704	22	59	690	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	2	0	26	196	0	1	1704	22	59	690	12
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	36.0	36.0		36.0	36.0		84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.9	29.9		29.9	29.9		78.0	78.0	78.0	78.0	78.0	78.0
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	18.4	18.4		18.4	18.4		89.5	89.5	89.5	89.5	89.5	89.5
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.75	0.75	0.75	0.75	0.75	0.75
v/c Ratio	0.34	0.00		0.13	0.75		0.00	0.69	0.02	0.46	0.29	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	51.4	0.0		42.3	57.6		9.0	12.3	3.7	26.5	6.6	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	0.0		42.3	57.6		9.0	12.3	3.7	26.5	6.6	0.2
LOS	D	A		D	E		A	B	A	C	A	A
Approach Delay		48.9			55.8			12.1			8.0	
Approach LOS		D			E			B			A	
Queue Length 50th (m)	7.7	0.0		4.9	34.7		0.1	93.5	0.3	7.4	39.3	0.1
Queue Length 95th (m)	16.6	0.0		11.7	54.1		m0.1	164.8	m1.9	m14.9	m22.7	m0.0
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	185	583		330	404		508	2478	1134	129	2364	1138
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.00		0.08	0.49		0.00	0.69	0.02	0.46	0.29	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 79 (66%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 15.1		Intersection LOS: B	
Intersection Capacity Utilization 88.1%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way

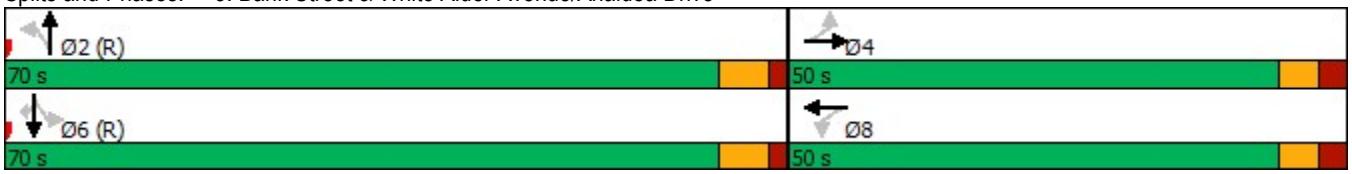


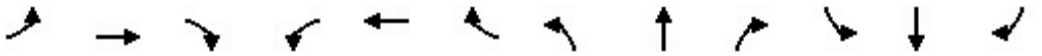
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1	13	0	2	3	4	1386	4	2	703	33
Future Volume (vph)	286	1	13	0	2	3	4	1386	4	2	703	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.99	0.98			0.99		1.00	1.00				0.97
Frt		0.861			0.910							0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1712	1509	0	1784	1604	0	1695	3293	0	1153	3115	1459
Flt Permitted	0.754						0.359			0.134		
Satd. Flow (perm)	1347	1509	0	1784	1604	0	639	3293	0	163	3115	1422
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3							33
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)	7		6	6		7	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%	2%	5%	2%	50%	11%	6%
Adj. Flow (vph)	286	1	13	0	2	3	4	1386	4	2	703	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	286	14	0	0	5	0	4	1390	0	2	703	33
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	50.0	50.0		50.0	50.0		70.0	70.0		70.0	70.0	70.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	43.7	43.7		43.7	43.7		63.8	63.8		63.8	63.8	63.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	31.1	31.1			31.1		76.4	76.4		76.4	76.4	76.4
Actuated g/C Ratio	0.26	0.26			0.26		0.64	0.64		0.64	0.64	0.64
v/c Ratio	0.82	0.04			0.01		0.01	0.66		0.02	0.35	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	60.1	13.6			21.0		11.0	17.0		7.5	10.9	3.5
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	60.1	13.6			21.0		11.0	17.0		7.5	10.9	3.5
LOS	E	B			C		B	B		A	B	A
Approach Delay		57.9			21.0			17.0			10.6	
Approach LOS		E			C			B			B	
Queue Length 50th (m)	58.4	0.2			0.3		0.3	93.1		0.2	51.8	1.7
Queue Length 95th (m)	78.9	4.3			2.9		1.9	143.5		m0.6	52.7	2.5
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0						50.0			50.0		100.0
Base Capacity (vph)	490	557			586		406	2097		103	1984	918
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.03			0.01		0.01	0.66		0.02	0.35	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 20.1		Intersection LOS: C	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	404	68	238	386	167	57	993	170	93	1740	374
Future Volume (vph)	103	404	68	238	386	167	57	993	170	93	1740	374
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		0	2		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.978			0.955				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3225	3087	0	2917	3216	0	1647	3357	1502	1679	3390	1532
Flt Permitted	0.950			0.950			0.082			0.153		
Satd. Flow (perm)	3225	3087	0	2917	3216	0	142	3357	1502	270	3390	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			54				170			374
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	10%	7%	15%	3%	2%	5%	3%	3%	3%	2%	1%
Adj. Flow (vph)	103	404	68	238	386	167	57	993	170	93	1740	374
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	472	0	238	553	0	57	993	170	93	1740	374
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	16.6	35.6		16.6	35.6		37.9	37.9	37.9	11.6	37.9	37.9
Total Split (s)	16.6	35.6		17.0	36.0		55.8	55.8	55.8	11.6	67.4	67.4
Total Split (%)	13.8%	29.7%		14.2%	30.0%		46.5%	46.5%	46.5%	9.7%	56.2%	56.2%
Maximum Green (s)	10.0	29.0		10.4	29.4		48.9	48.9	48.9	5.0	60.5	60.5
Yellow Time (s)	4.1	4.1		4.1	4.1		4.5	4.5	4.5	4.2	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.9	6.9	6.9	6.6	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	Min	Min	None	Min	Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0			22.0		24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0			0		0	0	0		0	0
Act Effct Green (s)	10.0	22.4		10.4	22.8		49.0	49.0	49.0	60.9	60.6	60.6
Actuated g/C Ratio	0.09	0.20		0.09	0.20		0.43	0.43	0.43	0.54	0.53	0.53
v/c Ratio	0.36	0.76		0.89	0.80		0.93	0.69	0.23	0.45	0.96	0.38
Control Delay	53.8	50.5		85.1	48.4		138.3	29.7	4.1	21.4	40.3	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	53.8	50.5		85.1	48.4		138.3	29.7	4.1	21.4	40.3	2.7
LOS	D	D		F	D		F	C	A	C	D	A
Approach Delay		51.1			59.5			31.2			33.2	
Approach LOS		D			E			C			C	
Queue Length 50th (m)	10.4	47.1		25.2	51.7		10.9	84.5	0.0	8.9	172.1	0.0
Queue Length 95th (m)	19.3	63.5		#49.4	69.5		#37.9	116.3	11.8	18.6	#249.2	13.4
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	284	798		267	874		61	1448	744	206	1809	991
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.59		0.89	0.63		0.93	0.69	0.23	0.45	0.96	0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 113.5			
Natural Cycle: 115			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 39.2		Intersection LOS: D	
Intersection Capacity Utilization 106.8%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

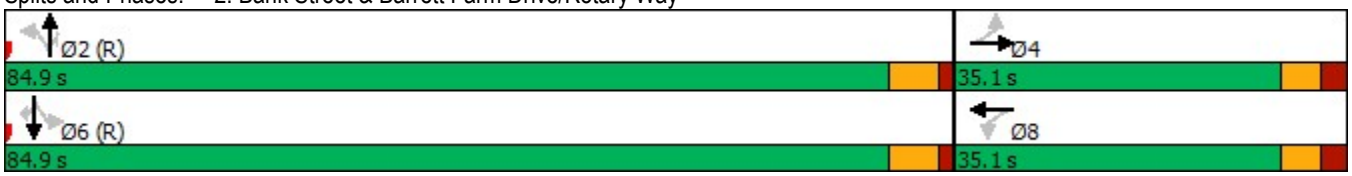
Splits and Phases: 1: Bank Street & Leitrim Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	1	40	0	102	2	1052	56	143	1896	36
Future Volume (vph)	20	0	1	40	0	102	2	1052	56	143	1896	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.98		1.00					0.98	1.00		
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1491	0	1679	1532	0	1695	3357	1517	1712	3390	1517
Flt Permitted	0.661			0.757			0.089			0.261		
Satd. Flow (perm)	1179	1491	0	1331	1532	0	159	3357	1482	470	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			131				56			30
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)			4	4					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	3%	2%	1%	2%	2%
Adj. Flow (vph)	20	0	1	40	0	102	2	1052	56	143	1896	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	1	0	40	102	0	2	1052	56	143	1896	36
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	35.1	35.1		35.1	35.1		84.9	84.9	84.9	84.9	84.9	84.9
Total Split (%)	29.3%	29.3%		29.3%	29.3%		70.8%	70.8%	70.8%	70.8%	70.8%	70.8%
Maximum Green (s)	29.0	29.0		29.0	29.0		78.9	78.9	78.9	78.9	78.9	78.9
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	10.7	10.7		10.7	10.7		97.2	97.2	97.2	97.2	97.2	97.2
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.19	0.01		0.34	0.40		0.02	0.39	0.05	0.38	0.69	0.03

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	54.6	0.0		59.1	8.7		3.0	3.7	0.8	6.4	6.7	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	0.0		59.1	8.7		3.0	3.7	0.8	6.4	6.7	1.1
LOS	D	A		E	A		A	A	A	A	A	A
Approach Delay		52.0			22.9			3.5			6.6	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	4.1	0.0		8.4	0.0		0.1	25.2	0.0	6.4	71.1	0.3
Queue Length 95th (m)	11.1	0.0		18.3	8.7		0.6	36.8	2.1	16.1	102.3	2.0
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	284	380		321	469		128	2718	1211	380	2745	1234
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.00		0.12	0.22		0.02	0.39	0.05	0.38	0.69	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 89.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way

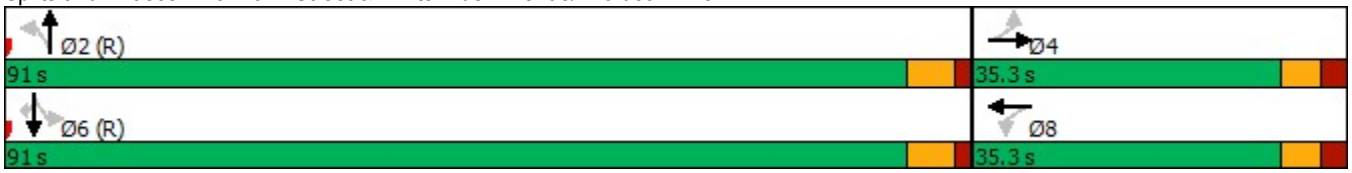


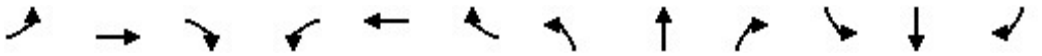
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	1	20	5	1	1	14	1029	4	3	1783	184
Future Volume (vph)	79	1	20	5	1	1	14	1029	4	3	1783	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98		0.99				1.00		1.00		0.96
Frt		0.857			0.925			0.999				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1460	0	1695	1650	0	1616	3321	0	1695	3357	1517
Flt Permitted	0.757			0.744			0.105			0.266		
Satd. Flow (perm)	1351	1460	0	1317	1650	0	179	3321	0	473	3357	1460
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			1			1				184
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)			6	6			6		6	6		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	5%	2%	2%	2%	7%	4%	2%	2%	3%	2%
Adj. Flow (vph)	79	1	20	5	1	1	14	1029	4	3	1783	184
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	21	0	5	2	0	14	1033	0	3	1783	184
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	35.3	35.3		35.3	35.3		91.0	91.0		91.0	91.0	91.0
Total Split (%)	27.9%	27.9%		27.9%	27.9%		72.1%	72.1%		72.1%	72.1%	72.1%
Maximum Green (s)	29.0	29.0		29.0	29.0		84.8	84.8		84.8	84.8	84.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	13.3	13.3		13.3	13.3		105.0	105.0		105.0	105.0	105.0
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.83	0.83		0.83	0.83	0.83
v/c Ratio	0.56	0.12		0.04	0.01		0.09	0.37		0.01	0.64	0.15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	68.0	21.0		48.6	40.5		5.2	4.1		3.7	6.7	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.0	21.0		48.6	40.5		5.2	4.1		3.7	6.7	0.8
LOS	E	C		D	D		A	A		A	A	A
Approach Delay		58.1			46.3			4.1			6.2	
Approach LOS		E			D			A			A	
Queue Length 50th (m)	17.6	0.2		1.1	0.2		0.6	29.4		0.1	74.8	0.0
Queue Length 95th (m)	31.2	7.1		4.7	2.4		2.7	46.9		0.8	117.0	4.6
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0			15.0			50.0			50.0		100.0
Base Capacity (vph)	310	350		302	379		149	2761		393	2791	1244
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.06		0.02	0.01		0.09	0.37		0.01	0.64	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 126.3			
Actuated Cycle Length: 126.3			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 76.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive



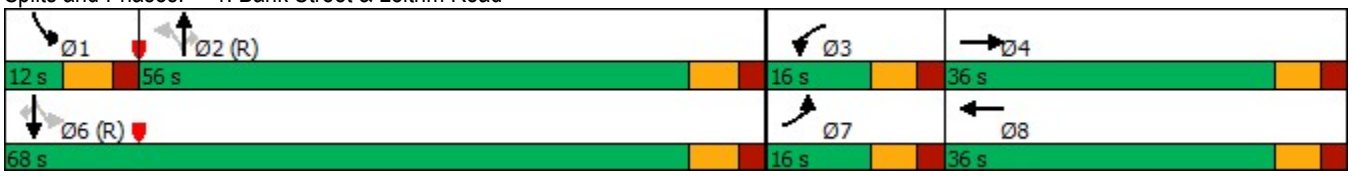


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	289	457	48	214	288	170	64	1845	270	65	641	84
Future Volume (vph)	289	457	48	214	288	170	64	1845	270	65	641	84
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		0	2		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.986			0.944				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3257	3228	0	3077	3068	0	1478	3357	1502	1695	3232	1345
Flt Permitted	0.950			0.950			0.408			0.065		
Satd. Flow (perm)	3257	3228	0	3077	3068	0	634	3357	1502	116	3232	1328
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			90				270			93
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	21%	9%	9%	2%	17%	3%	3%	2%	7%	15%
Adj. Flow (vph)	289	457	48	214	288	170	64	1845	270	65	641	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	289	505	0	214	458	0	64	1845	270	65	641	84
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	35.6		11.6	35.6		37.9	37.9	37.9	11.9	37.9	37.9
Total Split (s)	16.0	36.0		16.0	36.0		56.0	56.0	56.0	12.0	68.0	68.0
Total Split (%)	13.3%	30.0%		13.3%	30.0%		46.7%	46.7%	46.7%	10.0%	56.7%	56.7%
Maximum Green (s)	9.4	29.4		9.4	29.4		49.1	49.1	49.1	5.1	61.1	61.1
Yellow Time (s)	4.1	4.1		4.1	4.1		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.9	6.9	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min		C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0			22.0		24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0			0		0	0	0		0	0
Act Effct Green (s)	9.4	23.6		9.4	23.6		55.7	55.7	55.7	66.9	66.9	66.9
Actuated g/C Ratio	0.08	0.20		0.08	0.20		0.46	0.46	0.46	0.56	0.56	0.56
v/c Ratio	1.13	0.79		0.89	0.68		0.22	1.18	0.32	0.42	0.36	0.11

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	146.4	53.9		90.1	40.5		20.0	114.8	2.5	22.7	16.0	2.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	146.4	53.9		90.1	40.5		20.0	114.8	2.5	22.7	16.0	2.8
LOS	F	D		F	D		B	F	A	C	B	A
Approach Delay		87.6			56.3			98.1			15.1	
Approach LOS		F			E			F			B	
Queue Length 50th (m)	~37.5	54.2		24.1	39.3		8.7	~262.4	4.9	6.2	38.6	0.0
Queue Length 95th (m)	#62.9	67.6		#44.3	52.5		m9.5	#314.2	m4.7	14.7	55.6	6.1
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	255	797		241	819		294	1559	842	153	1801	781
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.63		0.89	0.56		0.22	1.18	0.32	0.42	0.36	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 75.1		Intersection LOS: E	
Intersection Capacity Utilization 96.6%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank Street & Leitrim Road

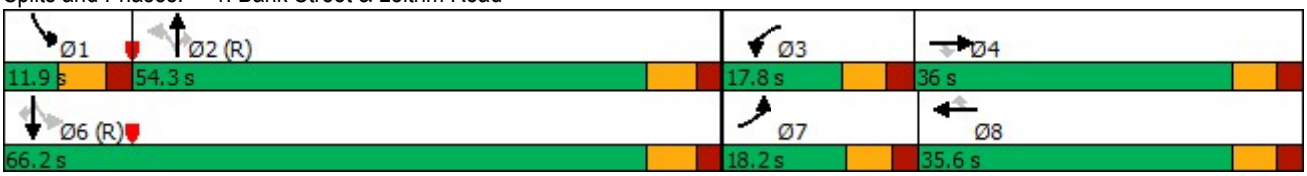


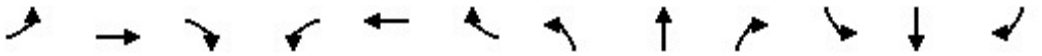
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	289	457	48	214	288	170	64	1845	270	65	641	84
Future Volume (vph)	289	457	48	214	288	170	64	1845	270	65	641	84
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor							1.00					0.99
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3257	3325	1279	3077	3172	1517	1478	4824	1502	1695	4644	1345
Flt Permitted	0.950			0.950			0.397			0.065		
Satd. Flow (perm)	3257	3325	1279	3077	3172	1517	617	4824	1502	116	4644	1328
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			158			270			93
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	21%	9%	9%	2%	17%	3%	3%	2%	7%	15%
Adj. Flow (vph)	289	457	48	214	288	170	64	1845	270	65	641	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	289	457	48	214	288	170	64	1845	270	65	641	84
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	35.6	35.6	11.6	35.6	35.6	37.9	37.9	37.9	11.9	37.9	37.9
Total Split (s)	18.2	36.0	36.0	17.8	35.6	35.6	54.3	54.3	54.3	11.9	66.2	66.2
Total Split (%)	15.2%	30.0%	30.0%	14.8%	29.7%	29.7%	45.3%	45.3%	45.3%	9.9%	55.2%	55.2%
Maximum Green (s)	11.6	29.4	29.4	11.2	29.0	29.0	47.4	47.4	47.4	5.0	59.3	59.3
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.9	6.9	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0	22.0		22.0	22.0	24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0		0	0
Act Effct Green (s)	12.0	21.9	21.9	11.0	20.9	20.9	55.7	55.7	55.7	67.1	67.1	67.1
Actuated g/C Ratio	0.10	0.18	0.18	0.09	0.17	0.17	0.46	0.46	0.46	0.56	0.56	0.56
v/c Ratio	0.89	0.76	0.13	0.76	0.52	0.43	0.22	0.82	0.32	0.41	0.25	0.11
Control Delay	82.7	54.6	0.8	71.2	47.7	11.1	20.9	27.6	2.6	22.2	14.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.7	54.6	0.8	71.2	47.7	11.1	20.9	27.6	2.6	22.2	14.4	2.8
LOS	F	D	A	E	D	B	C	C	A	C	B	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		61.6			45.9			24.3			13.8	
Approach LOS		E			D			C			B	
Queue Length 50th (m)	32.5	50.0	0.0	23.7	30.0	2.2	8.7	108.8	4.3	6.2	24.9	0.0
Queue Length 95th (m)	#55.9	62.7	0.0	#38.9	40.3	18.1	m10.1	#173.2	m4.7	14.7	35.4	6.2
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	324	814	432	287	766	486	285	2237	841	157	2595	783
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.56	0.11	0.75	0.38	0.35	0.22	0.82	0.32	0.41	0.25	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 32.4		Intersection LOS: C	
Intersection Capacity Utilization 84.1%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank Street & Leitrim Road



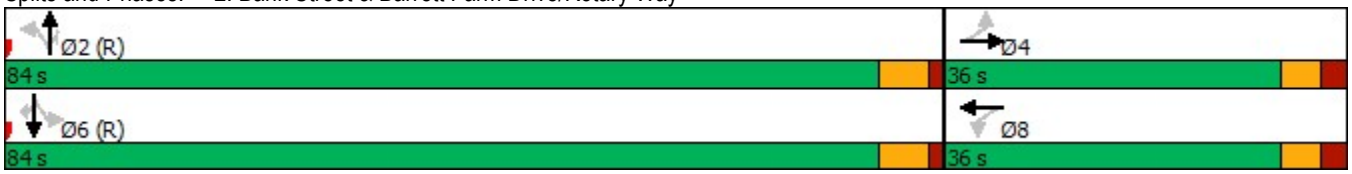


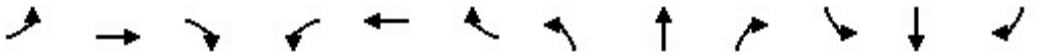
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	0	3	26	0	219	1	1906	22	66	757	18
Future Volume (vph)	53	0	3	26	0	219	1	1906	22	66	757	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.98			
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1517	0	1662	1532	0	1695	3325	1547	1601	3172	1517
Flt Permitted	0.388			0.756			0.351			0.069		
Satd. Flow (perm)	692	1517	0	1323	1532	0	626	3325	1512	116	3172	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		239			27				28			28
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	1%	2%	4%	0%	8%	9%	2%
Adj. Flow (vph)	53	0	3	26	0	219	1	1906	22	66	757	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	3	0	26	219	0	1	1906	22	66	757	18
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	36.0	36.0		36.0	36.0		84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.9	29.9		29.9	29.9		78.0	78.0	78.0	78.0	78.0	78.0
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	20.5	20.5		20.5	20.5		87.4	87.4	87.4	87.4	87.4	87.4
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.73	0.73	0.73	0.73	0.73	0.73
v/c Ratio	0.45	0.01		0.12	0.77		0.00	0.79	0.02	0.79	0.33	0.02

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	54.9	0.0		40.1	58.7		11.0	15.7	4.6	75.5	4.6	0.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	0.0		40.1	58.7		11.0	15.7	4.6	75.5	4.6	0.4
LOS	D	A		D	E		B	B	A	E	A	A
Approach Delay		51.9			56.7			15.5			10.0	
Approach LOS		D			E			B			B	
Queue Length 50th (m)	10.4	0.0		4.8	40.3		0.1	69.1	0.0	8.8	17.8	0.0
Queue Length 95th (m)	21.0	0.0		11.4	60.4		m0.1	199.8	m1.4	m#32.7	m26.4	m0.2
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	172	557		329	401		455	2420	1108	84	2309	1111
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.01		0.08	0.55		0.00	0.79	0.02	0.79	0.33	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 79 (66%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 95.7%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way



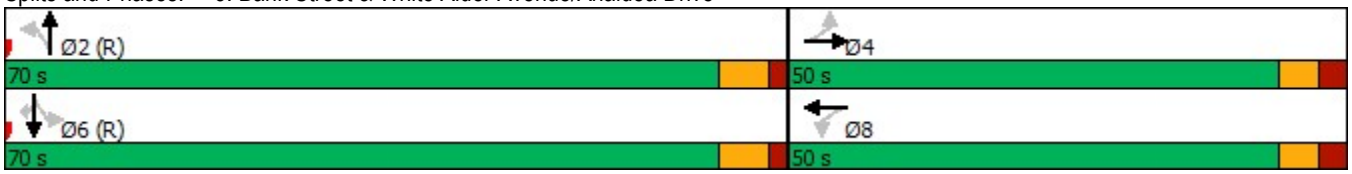


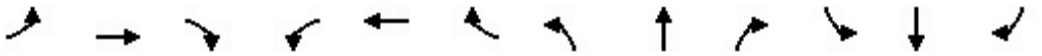
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1	13	0	2	3	4	1574	4	2	773	33
Future Volume (vph)	286	1	13	0	2	3	4	1574	4	2	773	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.99	0.98			0.99		1.00	1.00				0.97
Frt		0.861			0.910							0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1712	1509	0	1784	1604	0	1695	3293	0	1153	3115	1459
Flt Permitted	0.754						0.328			0.095		
Satd. Flow (perm)	1347	1509	0	1784	1604	0	584	3293	0	115	3115	1422
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3							33
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)	7		6	6		7	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%	2%	5%	2%	50%	11%	6%
Adj. Flow (vph)	286	1	13	0	2	3	4	1574	4	2	773	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	286	14	0	0	5	0	4	1578	0	2	773	33
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	50.0	50.0		50.0	50.0		70.0	70.0		70.0	70.0	70.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	43.7	43.7		43.7	43.7		63.8	63.8		63.8	63.8	63.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	31.1	31.1			31.1		76.4	76.4		76.4	76.4	76.4
Actuated g/C Ratio	0.26	0.26			0.26		0.64	0.64		0.64	0.64	0.64
v/c Ratio	0.82	0.04			0.01		0.01	0.75		0.03	0.39	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	60.1	13.6			21.0		11.0	19.7		6.5	8.1	2.2
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	60.1	13.6			21.0		11.0	19.7		6.5	8.1	2.2
LOS	E	B			C		B	B		A	A	A
Approach Delay		57.9			21.0			19.7			7.9	
Approach LOS		E			C			B			A	
Queue Length 50th (m)	58.4	0.2			0.3		0.3	117.3		0.0	9.2	0.0
Queue Length 95th (m)	78.9	4.3			2.9		1.9	180.6		m0.5	57.6	5.0
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0						50.0			50.0		100.0
Base Capacity (vph)	490	557			586		371	2097		73	1984	918
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.03			0.01		0.01	0.75		0.03	0.39	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 80.0%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive



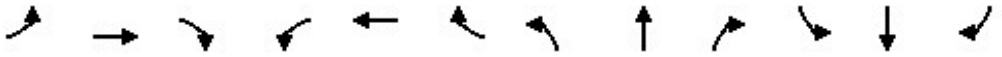


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	430	75	282	418	175	64	1098	184	98	1914	395
Future Volume (vph)	113	430	75	282	418	175	64	1098	184	98	1914	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		0	2		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.978			0.956				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3225	3087	0	2917	3219	0	1647	3357	1502	1679	3390	1532
Flt Permitted	0.950			0.950			0.082			0.116		
Satd. Flow (perm)	3225	3087	0	2917	3219	0	142	3357	1502	205	3390	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			51				184			364
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	10%	7%	15%	3%	2%	5%	3%	3%	3%	2%	1%
Adj. Flow (vph)	113	430	75	282	418	175	64	1098	184	98	1914	395
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	505	0	282	593	0	64	1098	184	98	1914	395
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	16.6	35.6		16.6	35.6		37.9	37.9	37.9	11.6	37.9	37.9
Total Split (s)	16.6	35.6		17.0	36.0		55.8	55.8	55.8	11.6	67.4	67.4
Total Split (%)	13.8%	29.7%		14.2%	30.0%		46.5%	46.5%	46.5%	9.7%	56.2%	56.2%
Maximum Green (s)	10.0	29.0		10.4	29.4		48.9	48.9	48.9	5.0	60.5	60.5
Yellow Time (s)	4.1	4.1		4.1	4.1		4.5	4.5	4.5	4.2	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.9	6.9	6.9	6.6	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	Min	Min	None	Min	Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0			22.0		24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0			0		0	0	0		0	0
Act Effct Green (s)	10.0	23.7		10.4	24.1		49.0	49.0	49.0	60.9	60.6	60.6
Actuated g/C Ratio	0.09	0.21		0.09	0.21		0.43	0.43	0.43	0.53	0.53	0.53
v/c Ratio	0.40	0.79		1.07	0.83		1.07	0.77	0.25	0.57	1.07	0.40
Control Delay	55.3	51.8		124.6	50.1		174.0	33.1	4.0	28.7	70.8	3.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	55.3	51.8		124.6	50.1		174.0	33.1	4.0	28.7	70.8	3.6
LOS	E	D		F	D		F	C	A	C	E	A
Approach Delay		52.4			74.1			35.8			58.1	
Approach LOS		D			E			D			E	
Queue Length 50th (m)	11.6	51.7		~33.6	57.1		~14.7	100.8	0.0	9.8	~233.5	3.0
Queue Length 95th (m)	20.8	68.8		#61.3	75.7		#42.0	133.8	12.3	#20.0	#290.3	17.7
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	281	785		264	863		60	1430	745	172	1788	979
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.64		1.07	0.69		1.07	0.77	0.25	0.57	1.07	0.40

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 114.9			
Natural Cycle: 115			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 54.4		Intersection LOS: D	
Intersection Capacity Utilization 113.1%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Bank Street & Leitrim Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	430	75	282	418	175	64	1098	184	98	1914	395
Future Volume (vph)	113	430	75	282	418	175	64	1098	184	98	1914	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3225	3144	1446	2917	3357	1517	1647	4824	1502	1679	4871	1532
Flt Permitted	0.950			0.950			0.091			0.184		
Satd. Flow (perm)	3225	3144	1446	2917	3357	1517	158	4824	1502	325	4871	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			155			175			184			395
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	10%	7%	15%	3%	2%	5%	3%	3%	3%	2%	1%
Adj. Flow (vph)	113	430	75	282	418	175	64	1098	184	98	1914	395
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	430	75	282	418	175	64	1098	184	98	1914	395
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	16.6	35.6	35.6	16.6	35.6	35.6	16.6	37.9	37.9	11.6	37.9	37.9
Total Split (s)	17.0	35.6	35.6	18.2	36.8	36.8	16.6	50.0	50.0	16.2	49.6	49.6
Total Split (%)	14.2%	29.7%	29.7%	15.2%	30.7%	30.7%	13.8%	41.7%	41.7%	13.5%	41.3%	41.3%
Maximum Green (s)	10.4	29.0	29.0	11.6	30.2	30.2	10.0	43.1	43.1	9.6	42.7	42.7
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.2	4.5	4.5	4.2	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.9	6.9	6.6	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0	22.0		22.0	22.0		24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	10.3	20.0	20.0	11.7	21.5	21.5	52.0	44.1	44.1	50.3	43.2	43.2
Actuated g/C Ratio	0.10	0.19	0.19	0.11	0.20	0.20	0.48	0.41	0.41	0.47	0.40	0.40
v/c Ratio	0.37	0.74	0.19	0.89	0.63	0.40	0.30	0.56	0.26	0.38	0.98	0.47
Control Delay	52.2	50.1	1.1	79.0	44.4	8.3	17.9	27.3	4.6	18.8	50.5	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	50.1	1.1	79.0	44.4	8.3	17.9	27.3	4.6	18.8	50.5	4.5
LOS	D	D	A	E	D	A	B	C	A	B	D	A
Approach Delay		44.5			48.4			23.8			41.6	
Approach LOS		D			D			C			D	

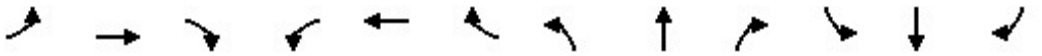
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (m)	11.1	43.3	0.0	29.3	40.7	0.0	5.9	62.1	0.0	9.3	~149.8	0.0
Queue Length 95th (m)	20.4	58.7	0.0	#56.9	55.5	15.8	13.6	84.0	13.2	19.3	#195.8	18.3
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	314	854	505	316	949	554	215	1973	723	274	1948	849
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.50	0.15	0.89	0.44	0.32	0.30	0.56	0.25	0.36	0.98	0.47

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 108
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 38.5 Intersection LOS: D
Intersection Capacity Utilization 90.7% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Bank Street & Leitrim Road

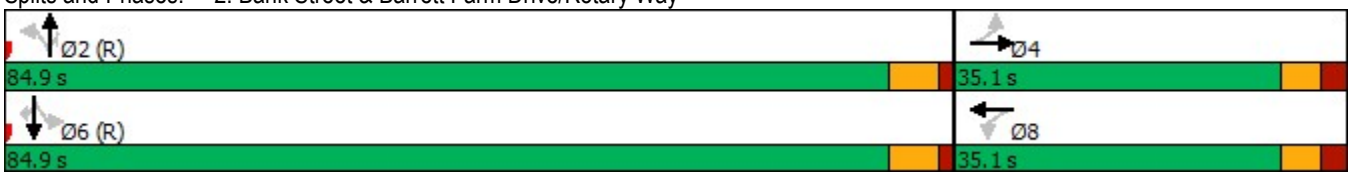


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	0	1	40	0	114	2	1155	56	164	2086	49
Future Volume (vph)	28	0	1	40	0	114	2	1155	56	164	2086	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.98		1.00					0.98	1.00		
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1491	0	1679	1532	0	1695	3357	1517	1712	3390	1517
Flt Permitted	0.601			0.757			0.066			0.231		
Satd. Flow (perm)	1072	1491	0	1331	1532	0	118	3357	1482	416	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			106				56			37
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)			4	4					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	3%	2%	1%	2%	2%
Adj. Flow (vph)	28	0	1	40	0	114	2	1155	56	164	2086	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	1	0	40	114	0	2	1155	56	164	2086	49
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	35.1	35.1		35.1	35.1		84.9	84.9	84.9	84.9	84.9	84.9
Total Split (%)	29.3%	29.3%		29.3%	29.3%		70.8%	70.8%	70.8%	70.8%	70.8%	70.8%
Maximum Green (s)	29.0	29.0		29.0	29.0		78.9	78.9	78.9	78.9	78.9	78.9
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	10.7	10.7		10.7	10.7		97.2	97.2	97.2	97.2	97.2	97.2
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.29	0.01		0.34	0.49		0.02	0.42	0.05	0.49	0.76	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	59.0	0.0		59.1	18.8		3.0	3.9	0.8	9.4	8.1	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	0.0		59.1	18.8		3.0	3.9	0.8	9.4	8.1	1.1
LOS	E	A		E	B		A	A	A	A	A	A
Approach Delay		57.0			29.3			3.8			8.0	
Approach LOS		E			C			A			A	
Queue Length 50th (m)	5.8	0.0		8.4	1.6		0.1	29.0	0.0	8.5	89.3	0.4
Queue Length 95th (m)	14.3	0.0		18.3	17.3		0.6	42.0	2.1	23.5	130.1	2.5
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	259	380		321	450		95	2718	1211	337	2745	1235
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.00		0.12	0.25		0.02	0.42	0.05	0.49	0.76	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 94.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way

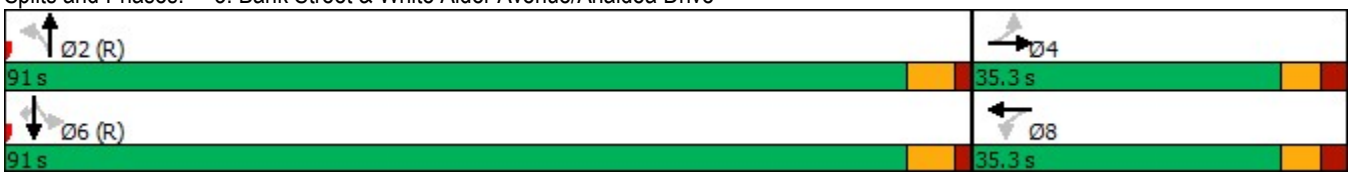


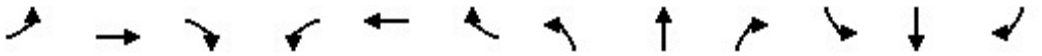
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	1	20	5	1	1	14	1130	4	3	1968	184
Future Volume (vph)	79	1	20	5	1	1	14	1130	4	3	1968	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98		0.99				1.00		1.00		0.96
Frt		0.857			0.925			0.999				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1460	0	1695	1650	0	1616	3321	0	1695	3357	1517
Flt Permitted	0.757			0.744			0.080			0.237		
Satd. Flow (perm)	1351	1460	0	1317	1650	0	136	3321	0	422	3357	1460
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			1			1				184
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)			6	6			6		6	6		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	5%	2%	2%	2%	7%	4%	2%	2%	3%	2%
Adj. Flow (vph)	79	1	20	5	1	1	14	1130	4	3	1968	184
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	21	0	5	2	0	14	1134	0	3	1968	184
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	35.3	35.3		35.3	35.3		91.0	91.0		91.0	91.0	91.0
Total Split (%)	27.9%	27.9%		27.9%	27.9%		72.1%	72.1%		72.1%	72.1%	72.1%
Maximum Green (s)	29.0	29.0		29.0	29.0		84.8	84.8		84.8	84.8	84.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	13.3	13.3		13.3	13.3		105.0	105.0		105.0	105.0	105.0
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.83	0.83		0.83	0.83	0.83
v/c Ratio	0.56	0.12		0.04	0.01		0.12	0.41		0.01	0.71	0.15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	68.0	21.0		48.6	40.5		6.5	4.3		3.7	8.0	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.0	21.0		48.6	40.5		6.5	4.3		3.7	8.0	0.8
LOS	E	C		D	D		A	A		A	A	A
Approach Delay		58.1			46.3			4.4			7.4	
Approach LOS		E			D			A			A	
Queue Length 50th (m)	17.6	0.2		1.1	0.2		0.6	33.7		0.1	93.5	0.0
Queue Length 95th (m)	31.2	7.1		4.7	2.4		3.0	53.6		0.8	147.1	4.6
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0			15.0			50.0			50.0		100.0
Base Capacity (vph)	310	350		302	379		113	2761		350	2791	1244
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.06		0.02	0.01		0.12	0.41		0.01	0.71	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 126.3			
Actuated Cycle Length: 126.3			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 81.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive



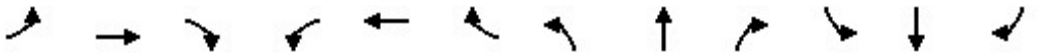


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	426	46	196	269	162	58	1681	246	62	600	79
Future Volume (vph)	267	426	46	196	269	162	58	1681	246	62	600	79
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		0	2		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.985			0.944				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3257	3224	0	3077	3069	0	1478	3357	1502	1695	3232	1345
Flt Permitted	0.950			0.950			0.425			0.063		
Satd. Flow (perm)	3257	3224	0	3077	3069	0	661	3357	1502	112	3232	1328
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			96				246			93
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	21%	9%	9%	2%	17%	3%	3%	2%	7%	15%
Adj. Flow (vph)	267	426	46	196	269	162	58	1681	246	62	600	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	472	0	196	431	0	58	1681	246	62	600	79
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	35.6		11.6	35.6		37.9	37.9	37.9	11.9	37.9	37.9
Total Split (s)	17.4	38.9		14.1	35.6		55.0	55.0	55.0	12.0	67.0	67.0
Total Split (%)	14.5%	32.4%		11.8%	29.7%		45.8%	45.8%	45.8%	10.0%	55.8%	55.8%
Maximum Green (s)	10.8	32.3		7.5	29.0		48.1	48.1	48.1	5.1	60.1	60.1
Yellow Time (s)	4.1	4.1		4.1	4.1		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.9	6.9	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min		C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0			22.0		24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0			0		0	0	0		0	0
Act Effct Green (s)	10.8	22.5		7.5	19.2		58.0	58.0	58.0	69.9	69.9	69.9
Actuated g/C Ratio	0.09	0.19		0.06	0.16		0.48	0.48	0.48	0.58	0.58	0.58
v/c Ratio	0.91	0.77		1.02	0.75		0.18	1.04	0.29	0.38	0.32	0.10

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	88.5	54.0		125.8	45.5		18.8	56.4	2.6	19.5	14.0	2.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.5	54.0		125.8	45.5		18.8	56.4	2.6	19.5	14.0	2.2
LOS	F	D		F	D		B	E	A	B	B	A
Approach Delay		66.5			70.6			48.6			13.2	
Approach LOS		E			E			D			B	
Queue Length 50th (m)	30.1	50.6		~23.2	37.0		5.8	~217.4	3.9	5.5	33.3	0.0
Queue Length 95th (m)	#52.6	63.8		#45.1	50.5		m10.1	#282.5	m5.7	13.4	48.7	5.0
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	293	874		192	814		319	1623	853	163	1881	812
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.54		1.02	0.53		0.18	1.04	0.29	0.38	0.32	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 48.8		Intersection LOS: D	
Intersection Capacity Utilization 92.5%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank Street & Leitrim Road

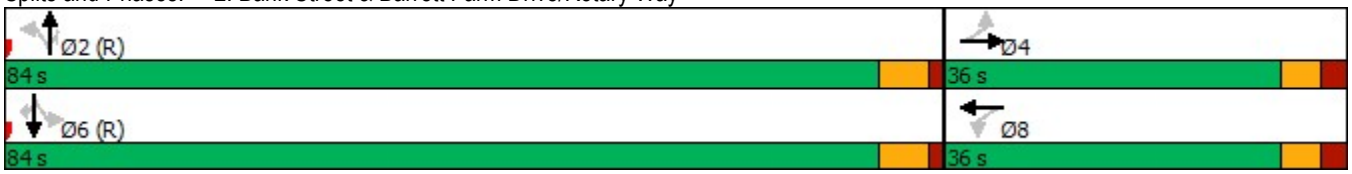


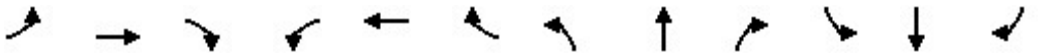
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	0	2	28	0	235	1	1704	23	81	690	12
Future Volume (vph)	39	0	2	28	0	235	1	1704	23	81	690	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.98			
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1517	0	1662	1532	0	1695	3325	1547	1601	3172	1517
Flt Permitted	0.365			0.757			0.378			0.096		
Satd. Flow (perm)	651	1517	0	1325	1532	0	674	3325	1512	162	3172	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		274			31				28			28
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	1%	2%	4%	0%	8%	9%	2%
Adj. Flow (vph)	39	0	2	28	0	235	1	1704	23	81	690	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	2	0	28	235	0	1	1704	23	81	690	12
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	36.0	36.0		36.0	36.0		84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.9	29.9		29.9	29.9		78.0	78.0	78.0	78.0	78.0	78.0
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	21.5	21.5		21.5	21.5		86.4	86.4	86.4	86.4	86.4	86.4
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.72	0.72	0.72	0.72	0.72	0.72
v/c Ratio	0.34	0.00		0.12	0.79		0.00	0.71	0.02	0.70	0.30	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	48.5	0.0		39.3	58.1		11.0	12.2	4.4	48.8	4.8	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	0.0		39.3	58.1		11.0	12.2	4.4	48.8	4.8	0.0
LOS	D	A		D	E		B	B	A	D	A	A
Approach Delay		46.2			56.1			12.1			9.3	
Approach LOS		D			E			B			A	
Queue Length 50th (m)	7.5	0.0		5.2	42.9		0.1	54.5	0.0	8.9	16.5	0.0
Queue Length 95th (m)	16.2	0.0		11.7	63.5		m0.2	171.1	m2.3	m#35.5	m23.1	m0.0
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	162	583		330	404		485	2394	1096	116	2283	1100
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.00		0.08	0.58		0.00	0.71	0.02	0.70	0.30	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 79 (66%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 101.9%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way



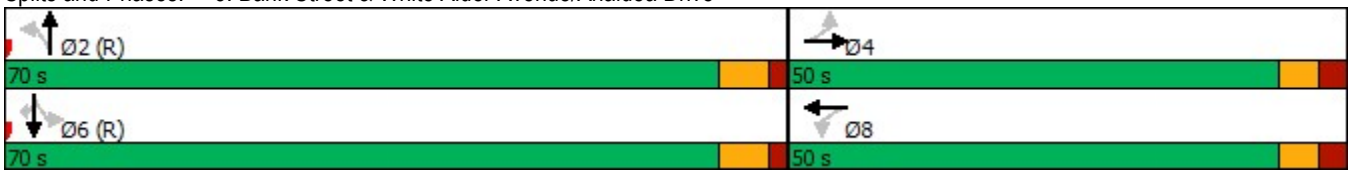


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1	13	0	2	3	4	1388	4	2	706	33
Future Volume (vph)	286	1	13	0	2	3	4	1388	4	2	706	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.99	0.98			0.99		1.00	1.00				0.97
Frt		0.861			0.910							0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1712	1509	0	1784	1604	0	1695	3293	0	1153	3115	1459
Flt Permitted	0.754						0.357			0.133		
Satd. Flow (perm)	1347	1509	0	1784	1604	0	636	3293	0	161	3115	1422
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3							33
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)	7		6	6		7	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%	2%	5%	2%	50%	11%	6%
Adj. Flow (vph)	286	1	13	0	2	3	4	1388	4	2	706	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	286	14	0	0	5	0	4	1392	0	2	706	33
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	50.0	50.0		50.0	50.0		70.0	70.0		70.0	70.0	70.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	43.7	43.7		43.7	43.7		63.8	63.8		63.8	63.8	63.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	31.1	31.1			31.1		76.4	76.4		76.4	76.4	76.4
Actuated g/C Ratio	0.26	0.26			0.26		0.64	0.64		0.64	0.64	0.64
v/c Ratio	0.82	0.04			0.01		0.01	0.66		0.02	0.36	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	60.1	13.6			21.0		11.0	17.0		6.5	9.3	1.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	60.1	13.6			21.0		11.0	17.0		6.5	9.3	1.8
LOS	E	B			C		B	B		A	A	A
Approach Delay		57.9			21.0			17.0			9.0	
Approach LOS		E			C			B			A	
Queue Length 50th (m)	58.4	0.2			0.3		0.3	93.2		0.1	19.7	0.1
Queue Length 95th (m)	78.9	4.3			2.9		1.9	143.9		m0.6	53.0	5.0
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0						50.0			50.0		100.0
Base Capacity (vph)	490	557			586		405	2097		102	1984	918
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.03			0.01		0.01	0.66		0.02	0.36	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 74.6%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive



Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	81	24	0	222	41	0
Future Vol, veh/h	81	24	0	222	41	0
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, %	2	2	2	2	2	2
Mvmt Flow	81	24	0	222	41	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	105	0	315	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	222	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1486	-	678	964
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	815	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1486	-	678	964
Mov Cap-2 Maneuver	-	-	-	-	678	-
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	815	-

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

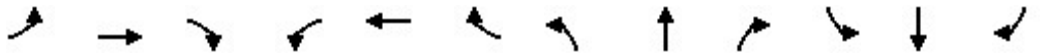
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	678	-	-	1486	-
HCM Lane V/C Ratio	0.06	-	-	-	-
HCM Control Delay (s)	10.7	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	404	70	242	386	167	59	1022	174	93	1772	374
Future Volume (vph)	103	404	70	242	386	167	59	1022	174	93	1772	374
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		0	2		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.978			0.955				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3225	3087	0	2917	3216	0	1647	3357	1502	1679	3390	1532
Flt Permitted	0.950			0.950			0.082			0.143		
Satd. Flow (perm)	3225	3087	0	2917	3216	0	142	3357	1502	253	3390	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			54				174			374
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	10%	7%	15%	3%	2%	5%	3%	3%	3%	2%	1%
Adj. Flow (vph)	103	404	70	242	386	167	59	1022	174	93	1772	374
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	474	0	242	553	0	59	1022	174	93	1772	374
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	16.6	35.6		16.6	35.6		37.9	37.9	37.9	11.6	37.9	37.9
Total Split (s)	16.6	35.6		17.0	36.0		55.8	55.8	55.8	11.6	67.4	67.4
Total Split (%)	13.8%	29.7%		14.2%	30.0%		46.5%	46.5%	46.5%	9.7%	56.2%	56.2%
Maximum Green (s)	10.0	29.0		10.4	29.4		48.9	48.9	48.9	5.0	60.5	60.5
Yellow Time (s)	4.1	4.1		4.1	4.1		4.5	4.5	4.5	4.2	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		6.6	6.6		6.9	6.9	6.9	6.6	6.9	6.9
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	Min	Min	None	Min	Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0			22.0		24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0			0		0	0	0		0	0
Act Effct Green (s)	10.0	22.4		10.4	22.8		49.0	49.0	49.0	60.9	60.6	60.6
Actuated g/C Ratio	0.09	0.20		0.09	0.20		0.43	0.43	0.43	0.54	0.53	0.53
v/c Ratio	0.36	0.77		0.91	0.80		0.97	0.71	0.23	0.47	0.98	0.38
Control Delay	53.8	50.9		87.5	48.4		147.4	30.3	4.1	22.2	43.7	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	53.8	50.9		87.5	48.4		147.4	30.3	4.1	22.2	43.7	2.7
LOS	D	D		F	D		F	C	A	C	D	A
Approach Delay		51.4			60.3			32.2			36.0	
Approach LOS		D			E			C			D	
Queue Length 50th (m)	10.4	47.5		25.7	51.7		11.5	88.1	0.0	8.9	178.7	0.0
Queue Length 95th (m)	19.3	63.9		#50.6	69.5		#38.9	121.1	12.1	18.6	#256.8	13.4
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	284	797		267	874		61	1448	746	198	1809	991
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.59		0.91	0.63		0.97	0.71	0.23	0.47	0.98	0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 113.5			
Natural Cycle: 115			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 40.8		Intersection LOS: D	
Intersection Capacity Utilization 107.8%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Bank Street & Leitrim Road

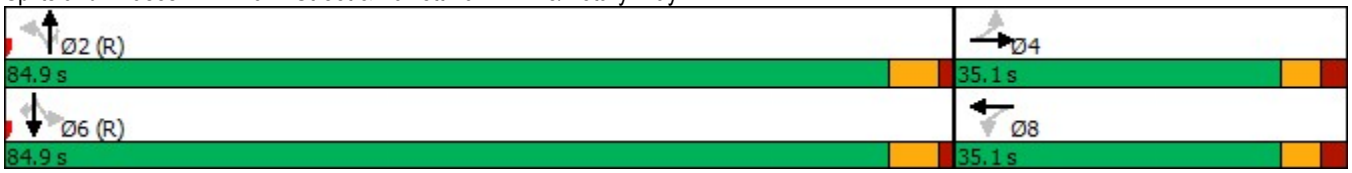


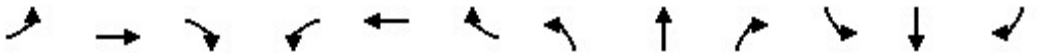
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	1	42	0	136	2	1052	58	181	1896	36
Future Volume (vph)	20	0	1	42	0	136	2	1052	58	181	1896	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.98		1.00					0.98	1.00		
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1491	0	1679	1532	0	1695	3357	1517	1712	3390	1517
Flt Permitted	0.495			0.757			0.089			0.260		
Satd. Flow (perm)	883	1491	0	1331	1532	0	159	3357	1482	468	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			131				58			30
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)			4	4					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	3%	2%	1%	2%	2%
Adj. Flow (vph)	20	0	1	42	0	136	2	1052	58	181	1896	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	1	0	42	136	0	2	1052	58	181	1896	36
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	35.1	35.1		35.1	35.1		84.9	84.9	84.9	84.9	84.9	84.9
Total Split (%)	29.3%	29.3%		29.3%	29.3%		70.8%	70.8%	70.8%	70.8%	70.8%	70.8%
Maximum Green (s)	29.0	29.0		29.0	29.0		78.9	78.9	78.9	78.9	78.9	78.9
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	10.8	10.8		10.8	10.8		97.1	97.1	97.1	97.1	97.1	97.1
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.81	0.81	0.81	0.81	0.81	0.81
v/c Ratio	0.25	0.01		0.35	0.53		0.02	0.39	0.05	0.48	0.69	0.03

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	58.5	0.0		59.4	17.4		3.0	3.7	0.8	8.7	6.8	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	0.0		59.4	17.4		3.0	3.7	0.8	8.7	6.8	1.1
LOS	E	A		E	B		A	A	A	A	A	A
Approach Delay		55.7			27.3			3.6			6.8	
Approach LOS		E			C			A			A	
Queue Length 50th (m)	4.1	0.0		8.8	1.0		0.1	25.2	0.0	9.3	71.1	0.3
Queue Length 95th (m)	11.3	0.0		18.9	17.8		0.6	37.6	2.2	24.6	104.4	2.0
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	213	380		321	469		128	2715	1209	378	2741	1232
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.00		0.13	0.29		0.02	0.39	0.05	0.48	0.69	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 97.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way



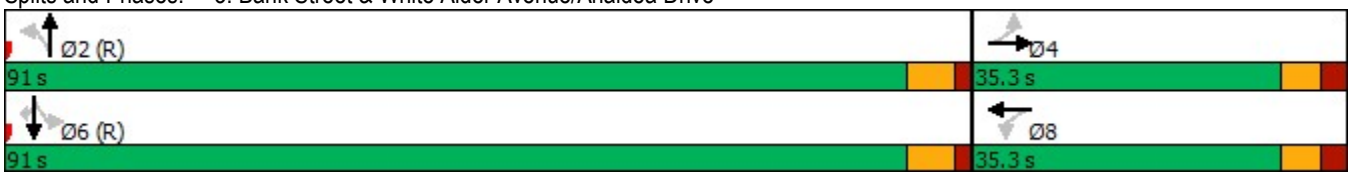


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	1	20	5	1	1	14	1031	4	3	1785	184
Future Volume (vph)	79	1	20	5	1	1	14	1031	4	3	1785	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98		0.99				1.00		1.00		0.96
Frt		0.857			0.925			0.999				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1460	0	1695	1650	0	1616	3321	0	1695	3357	1517
Flt Permitted	0.757			0.744			0.105			0.266		
Satd. Flow (perm)	1351	1460	0	1317	1650	0	179	3321	0	473	3357	1460
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			1			1				184
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)			6	6			6		6	6		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	5%	2%	2%	2%	7%	4%	2%	2%	3%	2%
Adj. Flow (vph)	79	1	20	5	1	1	14	1031	4	3	1785	184
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	21	0	5	2	0	14	1035	0	3	1785	184
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	35.3	35.3		35.3	35.3		91.0	91.0		91.0	91.0	91.0
Total Split (%)	27.9%	27.9%		27.9%	27.9%		72.1%	72.1%		72.1%	72.1%	72.1%
Maximum Green (s)	29.0	29.0		29.0	29.0		84.8	84.8		84.8	84.8	84.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	13.3	13.3		13.3	13.3		105.0	105.0		105.0	105.0	105.0
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.83	0.83		0.83	0.83	0.83
v/c Ratio	0.56	0.12		0.04	0.01		0.09	0.37		0.01	0.64	0.15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	68.0	21.0		48.6	40.5		5.2	4.1		3.7	6.7	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.0	21.0		48.6	40.5		5.2	4.1		3.7	6.7	0.8
LOS	E	C		D	D		A	A		A	A	A
Approach Delay		58.1			46.3			4.1			6.2	
Approach LOS		E			D			A			A	
Queue Length 50th (m)	17.6	0.2		1.1	0.2		0.6	29.5		0.1	75.1	0.0
Queue Length 95th (m)	31.2	7.1		4.7	2.4		2.7	47.0		0.8	117.2	4.6
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0			15.0			50.0			50.0		100.0
Base Capacity (vph)	310	350		302	379		149	2761		393	2791	1244
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.06		0.02	0.01		0.09	0.37		0.01	0.64	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 126.3			
Actuated Cycle Length: 126.3			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 76.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive



Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	199	40	0	142	36	0
Future Vol, veh/h	199	40	0	142	36	0
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, %	2	2	2	2	2	2
Mvmt Flow	199	40	0	142	36	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	239	0	361	219
Stage 1	-	-	-	-	219	-
Stage 2	-	-	-	-	142	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1328	-	638	821
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	885	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1328	-	638	821
Mov Cap-2 Maneuver	-	-	-	-	638	-
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	885	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11
HCM LOS			B

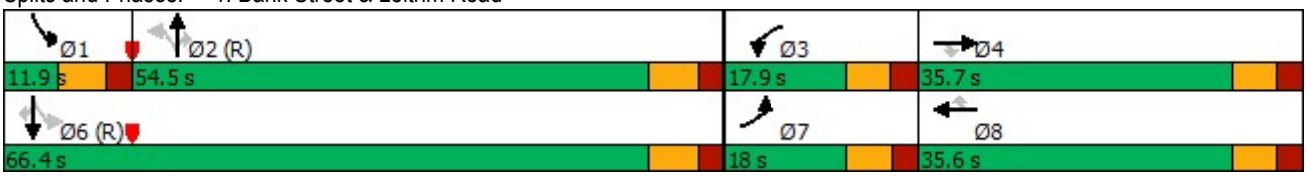
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	638	-	-	1328	-
HCM Lane V/C Ratio	0.056	-	-	-	-
HCM Control Delay (s)	11	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	289	457	49	216	288	170	66	1876	274	65	659	84
Future Volume (vph)	289	457	49	216	288	170	66	1876	274	65	659	84
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor							1.00					0.99
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3257	3325	1279	3077	3172	1517	1478	4824	1502	1695	4644	1345
Flt Permitted	0.950			0.950			0.390			0.065		
Satd. Flow (perm)	3257	3325	1279	3077	3172	1517	606	4824	1502	116	4644	1328
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			158			274			93
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	21%	9%	9%	2%	17%	3%	3%	2%	7%	15%
Adj. Flow (vph)	289	457	49	216	288	170	66	1876	274	65	659	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	289	457	49	216	288	170	66	1876	274	65	659	84
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	35.6	35.6	11.6	35.6	35.6	37.9	37.9	37.9	11.9	37.9	37.9
Total Split (s)	18.0	35.7	35.7	17.9	35.6	35.6	54.5	54.5	54.5	11.9	66.4	66.4
Total Split (%)	15.0%	29.8%	29.8%	14.9%	29.7%	29.7%	45.4%	45.4%	45.4%	9.9%	55.3%	55.3%
Maximum Green (s)	11.4	29.1	29.1	11.3	29.0	29.0	47.6	47.6	47.6	5.0	59.5	59.5
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.9	6.9	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0	22.0		22.0	22.0	24.0	24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0		0	0
Act Effct Green (s)	11.9	21.9	21.9	11.0	21.0	21.0	55.6	55.6	55.6	67.0	67.0	67.0
Actuated g/C Ratio	0.10	0.18	0.18	0.09	0.18	0.18	0.46	0.46	0.46	0.56	0.56	0.56
v/c Ratio	0.90	0.76	0.14	0.77	0.52	0.43	0.24	0.84	0.33	0.42	0.25	0.11
Control Delay	84.0	54.6	0.8	71.2	47.4	11.0	20.7	27.5	2.3	22.4	14.5	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.0	54.6	0.8	71.2	47.4	11.0	20.7	27.5	2.3	22.4	14.5	2.8
LOS	F	D	A	E	D	B	C	C	A	C	B	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		62.0			45.9			24.2			13.9	
Approach LOS		E			D			C			B	
Queue Length 50th (m)	32.6	50.0	0.0	23.9	29.9	2.2	8.5	111.5	3.4	6.2	25.7	0.0
Queue Length 95th (m)	#56.5	62.7	0.0	#39.1	40.1	18.1	m9.9	#177.6	m3.9	14.7	36.6	6.2
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	321	806	429	289	766	486	280	2236	843	156	2592	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.57	0.11	0.75	0.38	0.35	0.24	0.84	0.33	0.42	0.25	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 32.3		Intersection LOS: C	
Intersection Capacity Utilization 84.8%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Bank Street & Leitrim Road

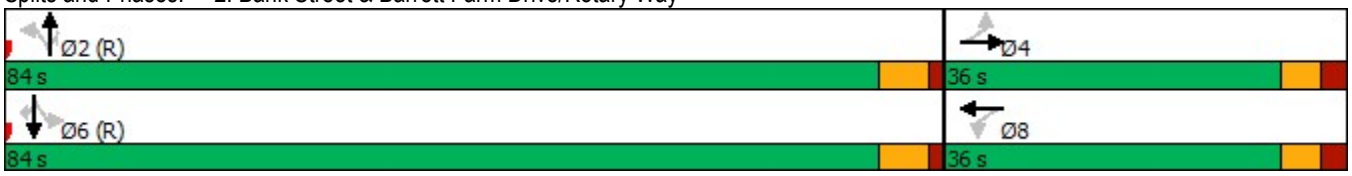


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	0	3	28	0	256	1	1906	23	88	757	18
Future Volume (vph)	53	0	3	28	0	256	1	1906	23	88	757	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.98			
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1517	0	1662	1532	0	1695	3325	1547	1601	3172	1517
Flt Permitted	0.340			0.756			0.347			0.063		
Satd. Flow (perm)	607	1517	0	1323	1532	0	619	3325	1512	106	3172	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		239			27				28			28
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	1%	2%	4%	0%	8%	9%	2%
Adj. Flow (vph)	53	0	3	28	0	256	1	1906	23	88	757	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	3	0	28	256	0	1	1906	23	88	757	18
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	36.0	36.0		36.0	36.0		84.0	84.0	84.0	84.0	84.0	84.0
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.9	29.9		29.9	29.9		78.0	78.0	78.0	78.0	78.0	78.0
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	23.0	23.0		23.0	23.0		84.9	84.9	84.9	84.9	84.9	84.9
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.71	0.71	0.71	0.71	0.71	0.71
v/c Ratio	0.46	0.01		0.11	0.81		0.00	0.81	0.02	1.19	0.34	0.02

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	54.1	0.0		38.2	60.8		12.0	17.2	5.2	185.6	5.3	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	0.0		38.2	60.8		12.0	17.2	5.2	185.6	5.3	0.5
LOS	D	A		D	E		B	B	A	F	A	A
Approach Delay		51.2			58.5			17.1			23.6	
Approach LOS		D			E			B			C	
Queue Length 50th (m)	10.2	0.0		5.1	48.0		0.1	76.8	0.0	~23.3	19.8	0.0
Queue Length 95th (m)	21.2	0.0		11.7	70.8		m0.1	200.5	m1.6	m#46.8	m26.7	m0.2
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	151	557		329	401		437	2352	1077	74	2244	1081
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.01		0.09	0.64		0.00	0.81	0.02	1.19	0.34	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 79 (66%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 109.2%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way

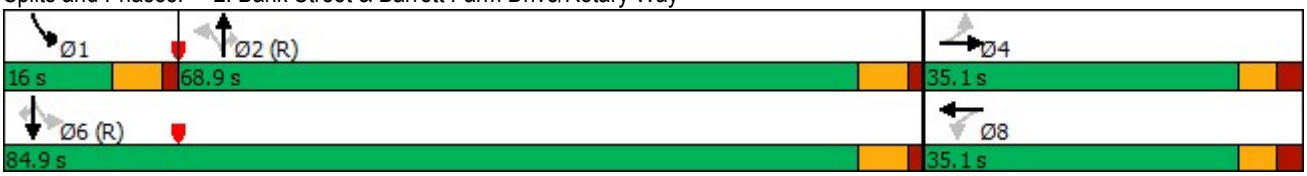


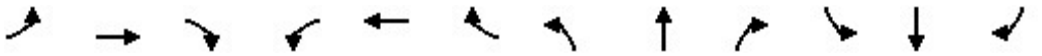
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	0	3	28	0	256	1	1906	23	88	757	18
Future Volume (vph)	53	0	3	28	0	256	1	1906	23	88	757	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.98			
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1517	0	1662	1532	0	1695	3325	1547	1601	3172	1517
Flt Permitted	0.263			0.756			0.364			0.047		
Satd. Flow (perm)	469	1517	0	1323	1532	0	649	3325	1512	79	3172	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		243			156				83			28
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	1%	2%	4%	0%	8%	9%	2%
Adj. Flow (vph)	53	0	3	28	0	256	1	1906	23	88	757	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	3	0	28	256	0	1	1906	23	88	757	18
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	16.0	29.0	29.0
Total Split (s)	35.1	35.1		35.1	35.1		68.9	68.9	68.9	16.0	84.9	84.9
Total Split (%)	29.3%	29.3%		29.3%	29.3%		57.4%	57.4%	57.4%	13.3%	70.8%	70.8%
Maximum Green (s)	29.0	29.0		29.0	29.0		62.9	62.9	62.9	10.0	78.9	78.9
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	0
Act Effct Green (s)	15.2	15.2		15.2	15.2		79.4	79.4	79.4	92.7	92.7	92.7
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.66	0.66	0.66	0.77	0.77	0.77
v/c Ratio	0.90	0.01		0.17	0.78		0.00	0.87	0.02	0.46	0.31	0.02
Control Delay	140.8	0.0		46.1	35.4		19.0	28.0	0.3	25.7	7.8	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	140.8	0.0		46.1	35.4		19.0	28.0	0.3	25.7	7.8	4.9
LOS	F	A		D	D		B	C	A	C	A	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		133.2			36.5			27.6			9.5	
Approach LOS		F			D			C			A	
Queue Length 50th (m)	11.6	0.0		5.6	21.2		0.1	144.0	0.0	9.0	20.2	0.2
Queue Length 95th (m)	#27.4	0.0		12.6	44.5		m0.1	#279.5	m0.0	m20.3	m59.6	m2.7
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	113	550		319	488		429	2201	1029	193	2449	1177
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.01		0.09	0.52		0.00	0.87	0.02	0.46	0.31	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 79 (66%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 109.2%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way



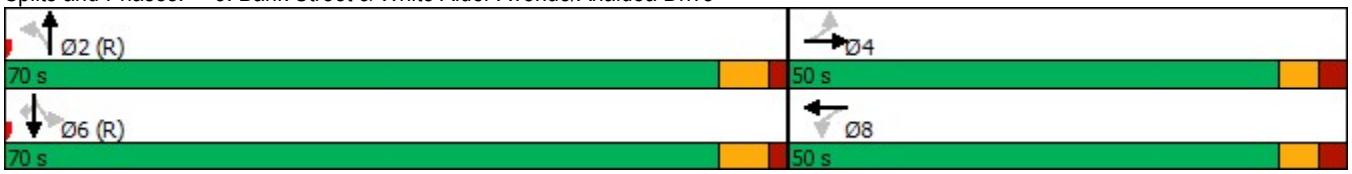


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1	13	0	2	3	4	1575	4	2	774	33
Future Volume (vph)	286	1	13	0	2	3	4	1575	4	2	774	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.99	0.98			0.99		1.00	1.00				0.97
Frt		0.861			0.910							0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1712	1509	0	1784	1604	0	1695	3293	0	1153	3115	1459
Flt Permitted	0.754						0.328			0.095		
Satd. Flow (perm)	1347	1509	0	1784	1604	0	584	3293	0	115	3115	1422
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3							33
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)	7		6	6		7	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%	2%	5%	2%	50%	11%	6%
Adj. Flow (vph)	286	1	13	0	2	3	4	1575	4	2	774	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	286	14	0	0	5	0	4	1579	0	2	774	33
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	50.0	50.0		50.0	50.0		70.0	70.0		70.0	70.0	70.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	43.7	43.7		43.7	43.7		63.8	63.8		63.8	63.8	63.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	31.1	31.1			31.1		76.4	76.4		76.4	76.4	76.4
Actuated g/C Ratio	0.26	0.26			0.26		0.64	0.64		0.64	0.64	0.64
v/c Ratio	0.82	0.04			0.01		0.01	0.75		0.03	0.39	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	60.1	13.6			21.0		11.0	19.7		6.0	7.9	1.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	60.1	13.6			21.0		11.0	19.7		6.0	7.9	1.8
LOS	E	B			C		B	B		A	A	A
Approach Delay		57.9			21.0			19.7			7.6	
Approach LOS		E			C			B			A	
Queue Length 50th (m)	58.4	0.2			0.3		0.3	117.4		0.0	9.2	0.1
Queue Length 95th (m)	78.9	4.3			2.9		1.9	180.7		m0.5	57.7	4.5
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0						50.0			50.0		100.0
Base Capacity (vph)	490	557			586		371	2097		73	1984	918
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.58	0.03			0.01		0.01	0.75		0.03	0.39	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 20.3		Intersection LOS: C	
Intersection Capacity Utilization 80.0%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive



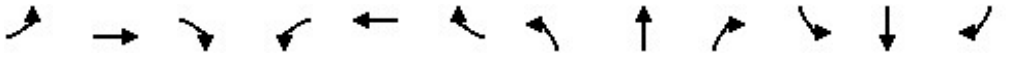
Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	88	23	0	245	38	0
Future Vol, veh/h	88	23	0	245	38	0
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, %	2	2	2	2	2	2
Mvmt Flow	88	23	0	245	38	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	111	0	345	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1479	-	652	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1479	-	652	956
Mov Cap-2 Maneuver	-	-	-	-	652	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	652	-	-	1479	-
HCM Lane V/C Ratio	0.058	-	-	-	-
HCM Control Delay (s)	10.9	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	430	77	285	418	175	65	1125	188	98	1944	395
Future Volume (vph)	113	430	77	285	418	175	65	1125	188	98	1944	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	80.0		0.0	65.0		140.0	80.0		200.0
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3225	3144	1446	2917	3357	1517	1647	4824	1502	1679	4871	1532
Flt Permitted	0.950			0.950			0.090			0.176		
Satd. Flow (perm)	3225	3144	1446	2917	3357	1517	156	4824	1502	311	4871	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			155			175			188			395
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		354.7			331.5			280.6			590.1	
Travel Time (s)		21.3			19.9			14.4			30.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	10%	7%	15%	3%	2%	5%	3%	3%	3%	2%	1%
Adj. Flow (vph)	113	430	77	285	418	175	65	1125	188	98	1944	395
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	430	77	285	418	175	65	1125	188	98	1944	395
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	16.6	35.6	35.6	16.6	35.6	35.6	16.6	37.9	37.9	11.6	37.9	37.9
Total Split (s)	16.6	35.6	35.6	18.0	37.0	37.0	16.6	50.0	50.0	16.4	49.8	49.8
Total Split (%)	13.8%	29.7%	29.7%	15.0%	30.8%	30.8%	13.8%	41.7%	41.7%	13.7%	41.5%	41.5%
Maximum Green (s)	10.0	29.0	29.0	11.4	30.4	30.4	10.0	43.1	43.1	9.8	42.9	42.9
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.2	4.5	4.5	4.2	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.9	6.9	6.6	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min	Min	None	Min	Min	None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		22.0	22.0		22.0	22.0		24.0	24.0		24.0	24.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	10.1	20.0	20.0	11.5	21.5	21.5	52.2	44.2	44.2	50.5	43.4	43.4
Actuated g/C Ratio	0.09	0.19	0.19	0.11	0.20	0.20	0.48	0.41	0.41	0.47	0.40	0.40
v/c Ratio	0.37	0.74	0.20	0.92	0.63	0.40	0.30	0.57	0.26	0.39	0.99	0.46
Control Delay	52.5	50.1	1.1	83.6	44.5	8.3	17.9	27.5	4.6	18.9	52.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	50.1	1.1	83.6	44.5	8.3	17.9	27.5	4.6	18.9	52.8	4.5
LOS	D	D	A	F	D	A	B	C	A	B	D	A
Approach Delay		44.5			50.0			23.9			43.6	
Approach LOS		D			D			C			D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (m)	11.1	43.3	0.0	29.7	40.8	0.0	6.0	63.7	0.0	9.2	~153.7	0.0
Queue Length 95th (m)	20.5	58.7	0.0	#58.1	55.4	15.8	13.7	86.5	13.4	19.2	#200.1	18.2
Internal Link Dist (m)		330.7			307.5			256.6			566.1	
Turn Bay Length (m)	60.0			80.0			65.0		140.0	80.0		200.0
Base Capacity (vph)	302	854	505	311	955	557	215	1977	726	272	1957	851
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.50	0.15	0.92	0.44	0.31	0.30	0.57	0.26	0.36	0.99	0.46

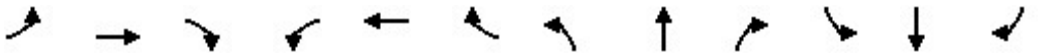
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 108
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 39.6 Intersection LOS: D
Intersection Capacity Utilization 91.4% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Bank Street & Leitrim Road

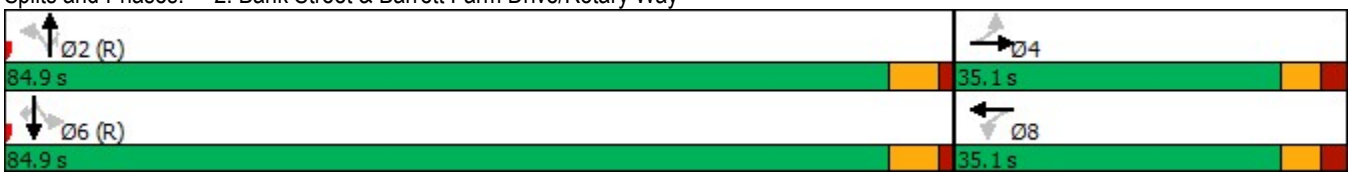


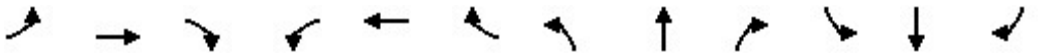
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	0	1	42	0	146	2	1155	58	200	2086	49
Future Volume (vph)	28	0	1	42	0	146	2	1155	58	200	2086	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	15.0		0.0	50.0		45.0	130.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.98		1.00					0.98	1.00		
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1491	0	1679	1532	0	1695	3357	1517	1712	3390	1517
Flt Permitted	0.463			0.757			0.064			0.230		
Satd. Flow (perm)	826	1491	0	1331	1532	0	114	3357	1482	414	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			106				58			37
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		391.4			92.8			149.0			148.6	
Travel Time (s)		29.4			6.7			7.7			7.6	
Confl. Peds. (#/hr)			4	4					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	3%	2%	1%	2%	2%
Adj. Flow (vph)	28	0	1	42	0	146	2	1155	58	200	2086	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	1	0	42	146	0	2	1155	58	200	2086	49
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.1	35.1		35.1	35.1		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	35.1	35.1		35.1	35.1		84.9	84.9	84.9	84.9	84.9	84.9
Total Split (%)	29.3%	29.3%		29.3%	29.3%		70.8%	70.8%	70.8%	70.8%	70.8%	70.8%
Maximum Green (s)	29.0	29.0		29.0	29.0		78.9	78.9	78.9	78.9	78.9	78.9
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.5	2.5		2.5	2.5		1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	11.5	11.5		11.5	11.5		96.4	96.4	96.4	96.4	96.4	96.4
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.80	0.80	0.80	0.80	0.80	0.80
v/c Ratio	0.36	0.01		0.33	0.60		0.02	0.43	0.05	0.60	0.77	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	62.8	0.0		57.1	27.7		3.5	4.3	0.9	14.3	8.8	1.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	0.0		57.1	27.7		3.5	4.3	0.9	14.3	8.8	1.3
LOS	E	A		E	C		A	A	A	B	A	A
Approach Delay		60.6			34.2			4.1			9.1	
Approach LOS		E			C			A			A	
Queue Length 50th (m)	5.9	0.0		8.8	8.3		0.1	29.0	0.0	12.2	89.3	0.4
Queue Length 95th (m)	14.2	0.0		18.4	26.5		0.7	48.5	2.5	43.3	149.8	2.9
Internal Link Dist (m)		367.4			68.8			125.0			124.6	
Turn Bay Length (m)	30.0			15.0			50.0		45.0	130.0		60.0
Base Capacity (vph)	199	380		321	450		91	2696	1201	332	2723	1225
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.00		0.13	0.32		0.02	0.43	0.05	0.60	0.77	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 9.2		Intersection LOS: A	
Intersection Capacity Utilization 108.0%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Bank Street & Barrett Farm Drive/Rotary Way



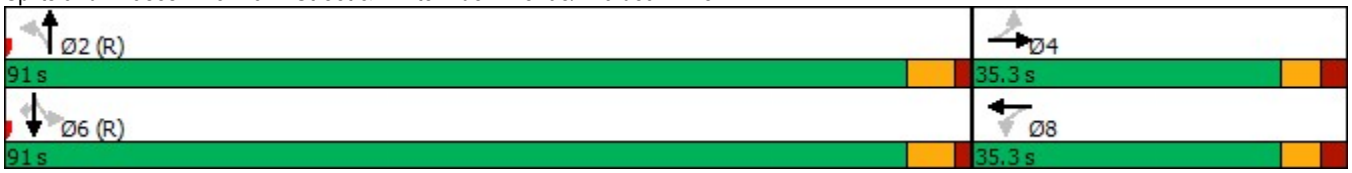


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	1	20	5	1	1	14	1132	4	3	1970	184
Future Volume (vph)	79	1	20	5	1	1	14	1132	4	3	1970	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	15.0		0.0	50.0		0.0	50.0		100.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98		0.99				1.00		1.00		0.96
Frt		0.857			0.925			0.999				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1460	0	1695	1650	0	1616	3321	0	1695	3357	1517
Flt Permitted	0.757			0.744			0.080			0.236		
Satd. Flow (perm)	1351	1460	0	1317	1650	0	136	3321	0	420	3357	1460
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			1			1				184
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		363.0			393.1			419.3			301.1	
Travel Time (s)		26.1			28.3			21.6			15.5	
Confl. Peds. (#/hr)			6	6			6		6	6		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	5%	2%	2%	2%	7%	4%	2%	2%	3%	2%
Adj. Flow (vph)	79	1	20	5	1	1	14	1132	4	3	1970	184
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	21	0	5	2	0	14	1136	0	3	1970	184
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	35.3	35.3		35.3	35.3		27.2	27.2		27.2	27.2	27.2
Total Split (s)	35.3	35.3		35.3	35.3		91.0	91.0		91.0	91.0	91.0
Total Split (%)	27.9%	27.9%		27.9%	27.9%		72.1%	72.1%		72.1%	72.1%	72.1%
Maximum Green (s)	29.0	29.0		29.0	29.0		84.8	84.8		84.8	84.8	84.8
Yellow Time (s)	3.6	3.6		3.6	3.6		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.7	2.7		2.7	2.7		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.2	6.2		6.2	6.2	6.2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0		14.0	14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	13.3	13.3		13.3	13.3		105.0	105.0		105.0	105.0	105.0
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.83	0.83		0.83	0.83	0.83
v/c Ratio	0.56	0.12		0.04	0.01		0.12	0.41		0.01	0.71	0.15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	68.0	21.0		48.6	40.5		6.5	4.3		3.7	8.0	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.0	21.0		48.6	40.5		6.5	4.3		3.7	8.0	0.8
LOS	E	C		D	D		A	A		A	A	A
Approach Delay		58.1			46.3			4.4			7.4	
Approach LOS		E			D			A			A	
Queue Length 50th (m)	17.6	0.2		1.1	0.2		0.6	33.8		0.1	93.6	0.0
Queue Length 95th (m)	31.2	7.1		4.7	2.4		3.0	53.7		0.8	147.6	4.6
Internal Link Dist (m)		339.0			369.1			395.3			277.1	
Turn Bay Length (m)	85.0			15.0			50.0			50.0		100.0
Base Capacity (vph)	310	350		302	379		113	2761		349	2791	1244
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.06		0.02	0.01		0.12	0.41		0.01	0.71	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 126.3			
Actuated Cycle Length: 126.3			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 81.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Bank Street & White Alder Avenue/Analdea Drive



Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	220	38	0	154	34	0
Future Vol, veh/h	220	38	0	154	34	0
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, %	2	2	2	2	2	2
Mvmt Flow	220	38	0	154	34	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	258	0	393	239
Stage 1	-	-	-	-	239	-
Stage 2	-	-	-	-	154	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1307	-	611	800
Stage 1	-	-	-	-	801	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1307	-	611	800
Mov Cap-2 Maneuver	-	-	-	-	611	-
Stage 1	-	-	-	-	801	-
Stage 2	-	-	-	-	874	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	611	-	-	1307	-
HCM Lane V/C Ratio	0.056	-	-	-	-
HCM Control Delay (s)	11.2	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Appendix K – MMLOS Analysis

Multi-Modal Level of Service
4639 Bank Street
Scenario: Existing Conditions

August 19, 2020

IBI

INTERSECTIONS		Bank Street & Leitrim Road				Bank Street & Rotary Way				Bank Street & Analdea Dr / White Alder Ave			
		NORTH leg	SOUTH leg	EAST leg	WEST leg	NORTH leg	SOUTH leg	EAST leg	WEST leg	NORTH leg	SOUTH leg	EAST leg	WEST leg
Pedestrian	Lanes (do NOT include lanes protected by bulb-outs)	6	5	4	2	3	3	3		4	3	3	3
	Median	Median (>2.4m)	Median (>2.4m)	No Median	No Median	No Median	No Median	No Median		No Median	No Median	No Median	No Median
	Island Refuge												
	Conflicting Left Turns (from street to right)	Permissive	Permissive	Protected/permissive	Permissive	No left turn/prohibited	Permissive	Permissive		Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns (from street to left)	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control		Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	RTOR? (from street to left)	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed		RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Leading Interval? (on cross street)	No	No	No	No	No	No	No		No	No	No	No
	Corner Radius	> 10m to 15m	> 10m to 15m	> 5m to 10m	> 5m to 10m	No right turn	> 10m to 15m	> 10m to 15m		> 5m to 10m	> 5m to 10m	> 5m to 10m	> 5m to 10m
	Right Turn Channel	No right turn channel	No right turn channel	No right turn channel	No right turn channel	No right turn	No right turn channel	No right turn channel		No right turn channel	No right turn channel	No right turn channel	No right turn channel
	Crosswalk Type	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings		Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings
	LOS (PETSI)	25 F	40 E	54 D	86 B	88 B	78 B	70 C		54 D	71 C	71 C	71 C
	Cycle Length (sec)	130	130	130	130		130	130		130	130	130	130
	Pedestrian Walk Time (solid white symbol) (sec)	7	7	7	7		7	7		7	7	7	7
	LOS (Delay,seconds)	59.3 E	59.3 E	59.3 E	59.3 E		59.3 E	59.3 E		59.3 E	59.3 E	59.3 E	59.3 E
	Overall Level of Service	F				E				E			
Cyclist	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Bike Pocket at Intersection	Mixed Traffic		Bike Pocket at Intersection	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed (based on corner radius & angle)	Slow		Slow			Slow			Slow			
	Right Turn Storage Length	> 50m		> 50m			> 50m			> 50m			
	Dual Right Turn?	No		No			No			No			
	Shared Through-Right?	No	Yes	No	Yes		No	Yes		No	Yes	Yes	Yes
	Bike Box / Two-Stage Left-Turn?	No	No	No	No	No		No		No	No	No	No
	Number of Lanes Crossed for Left Turns	2+ Lanes Crossed	2+ Lanes Crossed	2+ Lanes Crossed	No Lanes Crossed	1 Lane Crossed		1 Lane Crossed		1 Lane Crossed	1 Lane Crossed	1 Lane Crossed	1 Lane Crossed
	Operating Speed on Approach	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h		≥ 60km/h		≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h
	Dual Left Turn Lanes?	No	No	No	No	No		No		No	No	No	No
	Level of Service	F	F	F	D	F	D	F		E	F	F	F
		F				F				F			
Transit	Average Signal Delay	≤20 sec	>40 sec			≤20 sec	≤10 sec			≤20 sec	≤20 sec		
	Level of Service	C	F			C	B			C	C		
		F				C				C			
Truck	Turning Radius (Right Turn)	10 to 15m	10 to 15m	< 10m	< 10m								
	Number of Receiving Lanes	1	1	2+	2+								
		E	E	D	D								
		E											

SEGMENTS		Rotary Way - Development Frontage			Section			Section		
		1	2	3	1	2	3	1	2	3
Pedestrian	Sidewalk Width	2.0 or more								
	Boulevard Width	0.5 to 2								
	AADT	< 3000								
	On-Street Parking	N/A								
	Operating Speed	51 to 60 km/h								
	Level of Service	A								
		A								
Cyclist	Type of Bikeway	Mixed Traffic								
	Number of Travel Lanes (per direction)	1 Travel Lane Per Direction								
	Raised Median?									
	Bike Lane Width									
	Bike Lane Plus Parking Lane Width									
	Operating Speed	60 km/h								
	Bike Lane Blockages (Commercial Areas)									
	Median Refuge									
	Number of Travel Lanes on Sidestreet									
	Sidestreet Operating Speed									
	Level of Service	F								
Transit	Facility Type	Mixed Traffic								
	Friction	Limited parking/driveway friction								
	Level of Service	D								
Truck	Curb Lane Width	>3.7								
	Number of Travel Lanes	2								
		B								
		B								

Multi-Modal Level of Service
4639 Bank Street
Scenario: Future Conditions

August 19, 2020

IBI

INTERSECTIONS		Bank Street & Leitrim Road				Bank Street & Rotary Way / Barrett Lands				Bank Street & Analdea Dr / White Alder Ave			
		NORTH leg	SOUTH leg	EAST leg	WEST leg	NORTH leg	SOUTH leg	EAST leg	WEST leg	NORTH leg	SOUTH leg	EAST leg	WEST leg
Pedestrian	Lanes (do NOT include lanes protected by bulb-outs)	7	7	8	8	6	6	3	3	6	5	3	3
	Median	Median (>2.4m)	Median (>2.4m)	Median (>2.4m)	Median (>2.4m)	Median (>2.4m)	Median (>2.4m)	No Median	No Median	No Median	Median (>2.4m)	No Median	No Median
	Island Refuge												
	Conflicting Left Turns (from street to right)	Protected	Protected	Protected/permissive	Permissive	Permissive	Permissive	Protected/permissive	Permissive	Permissive	Permissive	Protected/permissive	Permissive
	Conflicting Right Turns (from street to left)	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	RTOR? (from street to left)	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Leading Interval? (on cross street)	No	No	No	No	No	No	No	No	No	No	No	No
	Corner Radius	Right turn 'smart channel'	Right turn 'smart channel'	Right turn 'smart channel'	Right turn 'smart channel'	> 10m to 15m	> 10m to 15m	> 10m to 15m	> 10m to 15m	> 10m to 15m	> 10m to 15m	> 5m to 10m	> 10m to 15m
	Right Turn Channel	Right turn 'smart channel'	Right turn 'smart channel'	Right turn 'smart channel'	Right turn 'smart channel'	No right turn channel	No right turn channel	No right turn channel	No right turn channel	No right turn channel	No right turn channel	No right turn channel	No right turn channel
	Crosswalk Type	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings
	LOS (PETSI)	35 E	35 E	12 F	12 F	28 F	28 F	73 C	73 C	23 F	43 E	74 C	73 C
	Cycle Length (sec)	130	130	130	130	130	130	130	130	130	130	130	130
	Pedestrian Walk Time (solid white symbol) (sec)	7	7	7	7	7	7	7	7	7	7	7	7
	LOS (Delay,seconds)	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E	59.3 E
	Overall Level of Service	F				F				F			
Cyclist	Type of Bikeway	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track	Bike Lanes/Cycle Track
	Turning Speed (based on corner radius & angle)												
	Right Turn Storage Length												
	Dual Right Turn?												
	Shared Through-Right?												
	Bike Box / Two-Stage Left-Turn?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Number of Lanes Crossed for Left Turns	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed	No Lanes Crossed
	Operating Speed on Approach	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h
	Dual Left Turn Lanes?	No	No	Yes	Yes	No	No	No	No	No	No	No	No
	Level of Service	C	C	C	C	C	C	C	C	C	C	C	C
		C				C				C			
Transit	Average Signal Delay	≤40 sec	≤30 sec			≤10 sec	≤20 sec			≤10 sec	≤20 sec		
	Level of Service	E	D			B	C			B	C		
		E				C				C			
Truck	Turning Radius (Right Turn)	> 15m	> 15m	> 15m	> 15m								
	Number of Receiving Lanes	2+	2+	2+	2+								
		A	A	A	A								
		A											

SEGMENTS			Rotary Way - Development Frontage				Section				Section		
			1	2	3		1	2	3		1	2	3
Pedestrian	Sidewalk Width		2.0 or more										
	Boulevard Width		0.5 to 2										
	AADT		< 3000										
	On-Street Parking		N/A										
	Operating Speed		51 to 60 km/h										
	Level of Service		A										
			A										
Cyclist	Type of Bikeway		Mixed Traffic										
	Number of Travel Lanes (per direction)		1 Travel Lane Per Direction										
	Raised Median?												
	Bike Lane Width												
	Bike Lane Plus Parking Lane Width												
	Operating Speed		60 km/h										
	Bike Lane Blockages (Commercial Areas)												
	Median Refuge												
	Number of Travel Lanes on Sidestreet												
	Sidestreet Operating Speed												
	Level of Service		F										
Transit	Facility Type		Mixed Traffic										
	Friction		Limited parking/driveway friction										
	Level of Service		D										
Truck	Curb Lane Width		>3.7										
	Number of Travel Lanes		2										
			B										
			B										