Groupe Montoni

4101 Limebank Road

Transportation Impact Assessment – Step 3

November 22, 2024



4101 Limebank Road

Transportation Impact Assessment

November 22, 2024

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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 22nd day of November, 2024.
(City)

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

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Stamp



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Acronyms and Abbreviations

BLOS	Bike Level of Service
BRT	Bus Rapid Transit
CDP	Community Development Plan
DC	Development Charges
DPA	Design Priority Area
EA	Environmental Assessment
ESR	Environmental Study Report
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
LRT	Light Rail Transit
MMLOS	Multi-Modal Level of Service
MVE	Million Vehicles Entering
PCE	Passenger Car Equivalent
PHF	Peak Hourly Factor
PLOS	Pedestrian Level of Service
RMA	Roadway Modification Application
RTTP	Rapid Transit and Transit Priority
SMV	Single Motor Vehicles
SPC	Site Plan Control
TAC	Transportation Association of Canada
TAZ	Traffic Assessment Zone
TDM	Transportation Demand Management
TIA	Transportation Impact Assessment
TMP	Transportation Master Plan
TOD	Transit-Oriented Development

Executive Summary

Arcadis was retained by Groupe Montoni to undertake a Transportation Impact Assessment (TIA) in support of a Site Plan Control application for a proposed warehouse development to be located at 4101 Limebank Road in the community of Riverside South. The site is located to the east of Limebank Road, adjacent to the future Riverside South Business Park development. The City of Ottawa has identified future plans for a realignment of Leitrim Road along the southern boundary of the site, however it is not expected that this will occur within the timeframe of this study.

To facilitate the development of the site, it is proposed that an interim two-lane urbanized segment of this road be provided following the planned road alignment, consistent with the development lands west of Limebank Road. This two-lane road is proposed to extend approximately 230m east of Limebank Road and provide access to the site. As this roadway is extended further east (by others), a second full-movement access is proposed at the eastern limits of the site. Access to the site will also be provided via a right-in/right-out access on Limebank Road at the northern limits of the site.

Initially, access to the site via this segment of realigned Leitrim Road will be restricted to right-in/right-out maneuvers at Limebank Road until the adjacent Riverside South Business Park generates sufficient traffic to warrant the signalization of the intersection. For the purposes of this study, it is assumed that this will not occur within the timeframe of this study.

Based on the trip generation rates from the ITE Trip Generation Manual (11th Edition), the proposed development is expected to generate up to 103 two-way auto trips and 19 two-way truck trips during the weekday peak hours of adjacent street traffic. These trips were distributed and assigned to the adjacent road network in accordance with commuter travel patterns as well as consideration of regional truck routes. The assignment of site-generated traffic considered that all site-generated traffic would be restricted to right-in/right-out movements at Limebank Road within the timeframe of this study. A supplemental analysis was also undertaken to review the potential impact of an all-movements, signalized intersection on Limebank at the future realigned Leitrim Road in the event that this intersection is signalized sooner than expected.

Intersection capacity analysis was completed for all study area intersections. The results of the analysis indicate that site-generated traffic will not trigger any capacity issues within the study area. The adjacent Riverside South Business Park, however, is anticipated to result in network capacity issues by around 85% buildout which will trigger the warrants for the signalization of the Limebank & Realigned Leitrim intersection. It is important to note, however, that the trigger for signalization may occur sooner based on specific development applications within the Employment Lands industrial subdivision.

Auxiliary right-turn lane requirements were reviewed for the site access on Limebank Road as well as the future signalized Limebank & Realigned Leitrim intersection. The results indicate that a northbound auxiliary right-turn lane will be required at the right-in/right-out site access on Limebank Road which will permit truck traffic to decelerate prior to entering the site. As the Limebank & Realigned Leitrim intersection will not be the primary truck entrance for the site, a northbound auxiliary right-turn lane is not required at that intersection initially, but should be reviewed upon any subsequent network changes by others.

Auxiliary left-turn lane requirements were also reviewed for the Limebank & Realigned Leitrim intersection. The results of the analysis indicate that a southbound and westbound left-turn lane with a minimum of 20m of storage will be required once the intersection is signalized. This is in addition to the auxiliary lane requirements previously identified for this intersection for the adjacent Riverside South Business Park development which are outlined in the Riverside South Employment Lands and Blocks 13, 14, Transportation Impact Assessment, Addendum #1 (Arcadis IBI Group, March 2023) report. It is cautioned that these minimum requirements do not take into

consideration the extension of realigned Leitrim Road east of the project limits or any other future development that may use this road.

MMLOS analysis was completed for all existing and future signalized intersections within the study area as well as the segments of Limebank Road and realigned Leitrim Road (interim two-lane, urban cross-section) adjacent to the site. The analysis indicates that the existing design of the intersections on Limebank Road, which feature conventional right-turn channels and lack protected intersection features, is contributing to poor Pedestrian and Bicycle Level of Service (PLOS & BLOS). To mitigate this condition, it is recommended that signalized intersections within the study area be reconstructed by the City to protected intersection standards in conjunction with any future network improvements to active transportation facilities along Limebank Road.

To ensure adequate transit service in the vicinity of the proposed development, transit stops will be required at the future intersection of Limebank & Realigned Leitrim, but in the absence of safe pedestrian crossings, should only be implemented once the intersection is signalized.

Based on the findings of this study, it is the overall opinion of Arcadis that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network with consideration of the recommendations outlined above.

1 Introduction

Arcadis was retained by Groupe Montoni to undertake a Transportation Impact Assessment (TIA) in support of a Site Plan Control (SPC) application for the proposed industrial site to be located at 4101 Limebank Road in Ottawa.

In accordance with the City of Ottawa's Transportation Impact Assessment Guidelines (June 2017) and the guideline revisions enacted in June 2023, the report is divided into three major components:

- **Step 1 - 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.
- **Step 2 – Scoping & Forecasting** – 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. Based on the above, the anticipated trip generation of the proposed development is estimated and takes into consideration the existing and future context of the site. This section also provides an opportunity to identify any scope exemptions that would eliminate elements of scope described in the TIA Guidelines but not relevant to the development proposal, based on consultation with City staff.
- **Step 3 – Analysis & Strategy** – This component describes the background network travel demand and 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 policies and city-building objectives.

Throughout the development of a TIA report, each of the three 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 are included in the submission package.

Dependent on the findings of this report, the complete submission of this Transportation Impact Assessment may 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 size of the development, the minimum development size threshold has been exceeded and therefore the Trip Generation trigger is satisfied.
- **Location:** The proposed development will be accessed from driveways on Limebank Road and the future realigned Leitrim Road, neither of which are designated as part of the City's Transit Priority, Rapid Transit, or Cross-Town Bikeways networks. The site is also not located within a Design Priority Area (DPA), Transit-Oriented Development (TOD) zone or Hub. As such, the Location trigger is not satisfied.
- **Safety:** Boundary street conditions were reviewed to determine if there is an elevated potential for safety concerns adjacent the site. Given the high posted speeds on Limebank Road, the documented history of traffic operations and safety concerns, as well as the proximity of one of the driveways to a future signalized intersection, the Safety trigger is satisfied.

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

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

3 Project Scoping

3.1 Proposed Development

3.1.1 Site Location

The proposed development is located at 4101 Limebank Road in the Riverside South community. The site is within the boundaries of the Riverside South Community Design Plan (CDP), the Ottawa International Airport Economic District, and is subject to the policies of the Riverside South Secondary Plan. The proposed development is located east of Limebank Road and is bound by undeveloped greenfield lands to the north, south, and east with Limebank Road to the west. The future Leitrim Road realignment will form the southern boundary of the site once completed.

According to the Official Plan (Schedule B6), shown in **Figure 3-1**, the proposed development is located within the Suburban Transect in an area designated as an Industrial and Logistics area and is within the bounds of the Ottawa International Airport Economic District.

The site location and its surrounding context is illustrated in **Exhibit 3-1**.

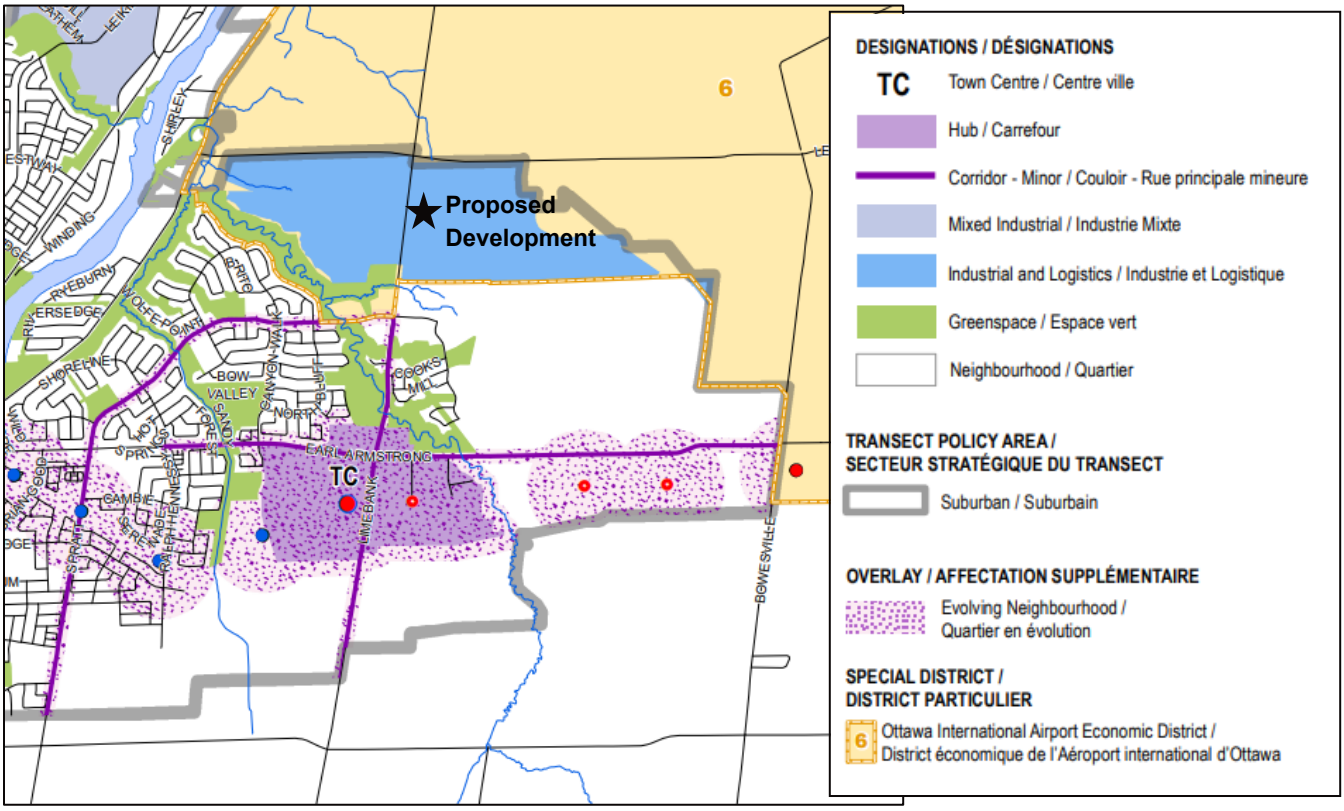
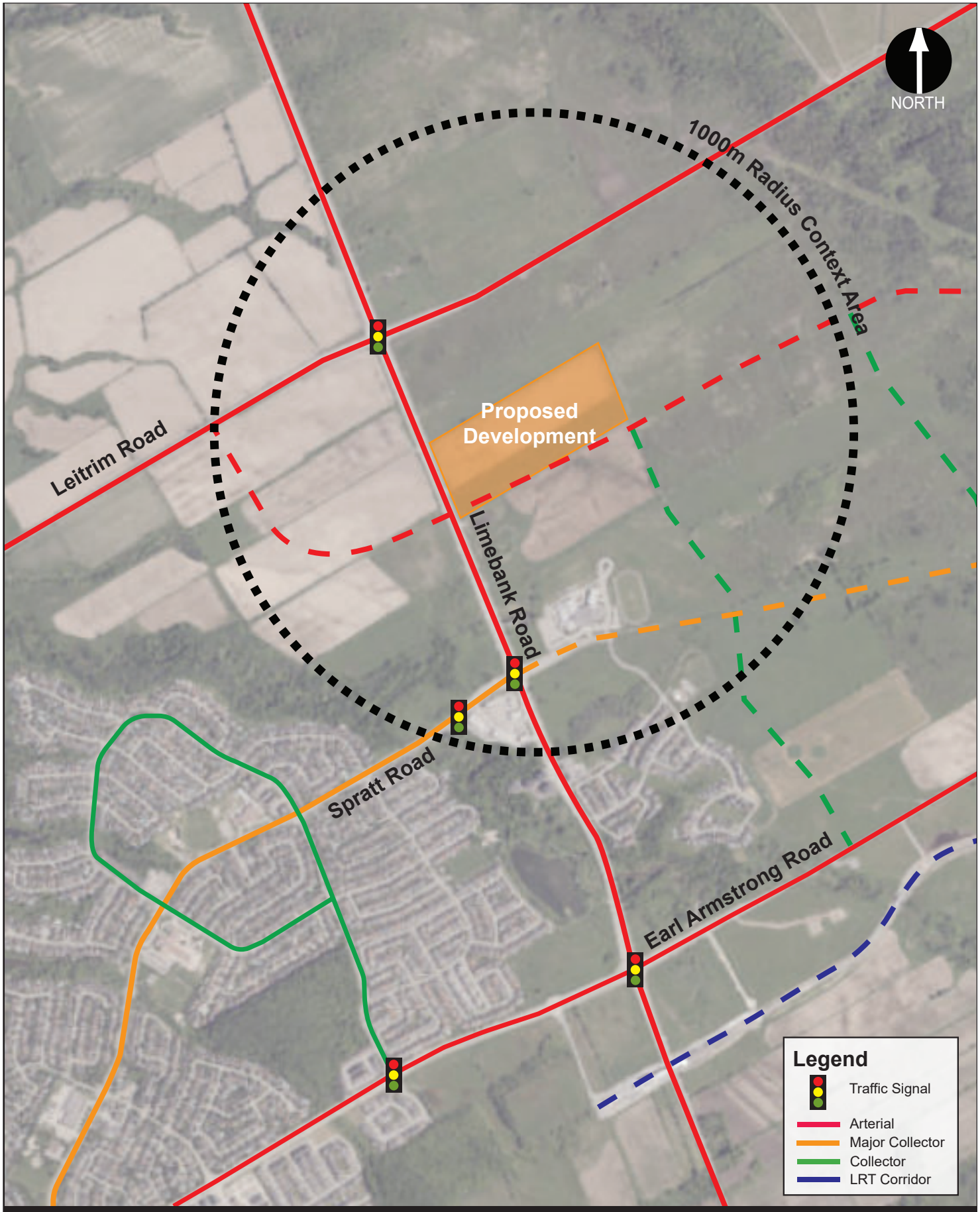


Figure 3-1 Suburban (Southwest) Transect
(Source: City of Ottawa Official Plan – Schedule B6)



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Exhibit 3-1:
Site Location

PROJECT No. 144893

SCALE: 0m 200m 400m

3.1.2 Land Use Details

Table 3-1 summarizes the proposed land uses included in this development.

Table 3-1 Land Use Statistics

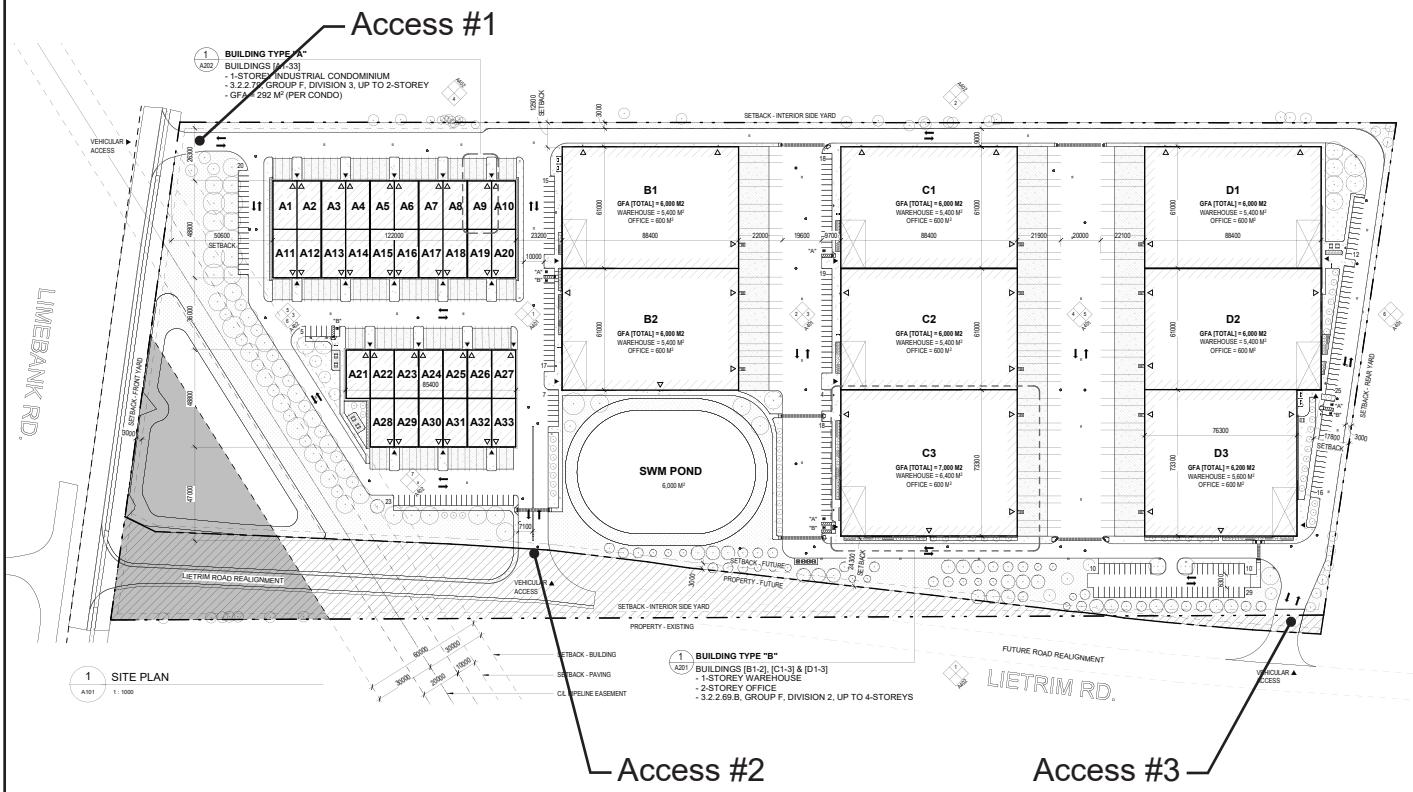
Land Use	Size
Warehouse	58,840 m^2

The draft site plan for the proposed development is illustrated in **Exhibit 3-2** and includes two industrial condominium buildings with a total of 33 units, and three warehouse buildings with a total of 8 large-scale units. Access to the site will be provided via a right-in/right-out driveway on Limebank Road and two full-movement driveways on the future realigned Leitrim Road.

The subject site is currently an undeveloped greenfield site and, according to GeoOttawa, is zoned DR – Development Reserve Zone.

3.1.3 Development Phasing

The proposed development is expected to be fully built out in a single phase and occupied in 2025.



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Exhibit 3-2:
Proposed
Development

PROJECT No. 144893

SCALE: 0m 50m 100m

3.2 Existing Transportation Network

3.2.1 Existing Road Network

All major roadways within the context area of the study are outlined in **Exhibit 3-1** above. Further details relating to the study area roads and intersections are provided in the following subsections.

There are currently no existing driveways within 200m of the site nor are there any traffic management measures along any of the roads within the 1km context area.

Within the context area, both Limebank Road and Leitrim Road are designated as full-load rural truck routes, providing access to and from urban truck routes and Provincial Highways as shown in **Figure 3-2** below.

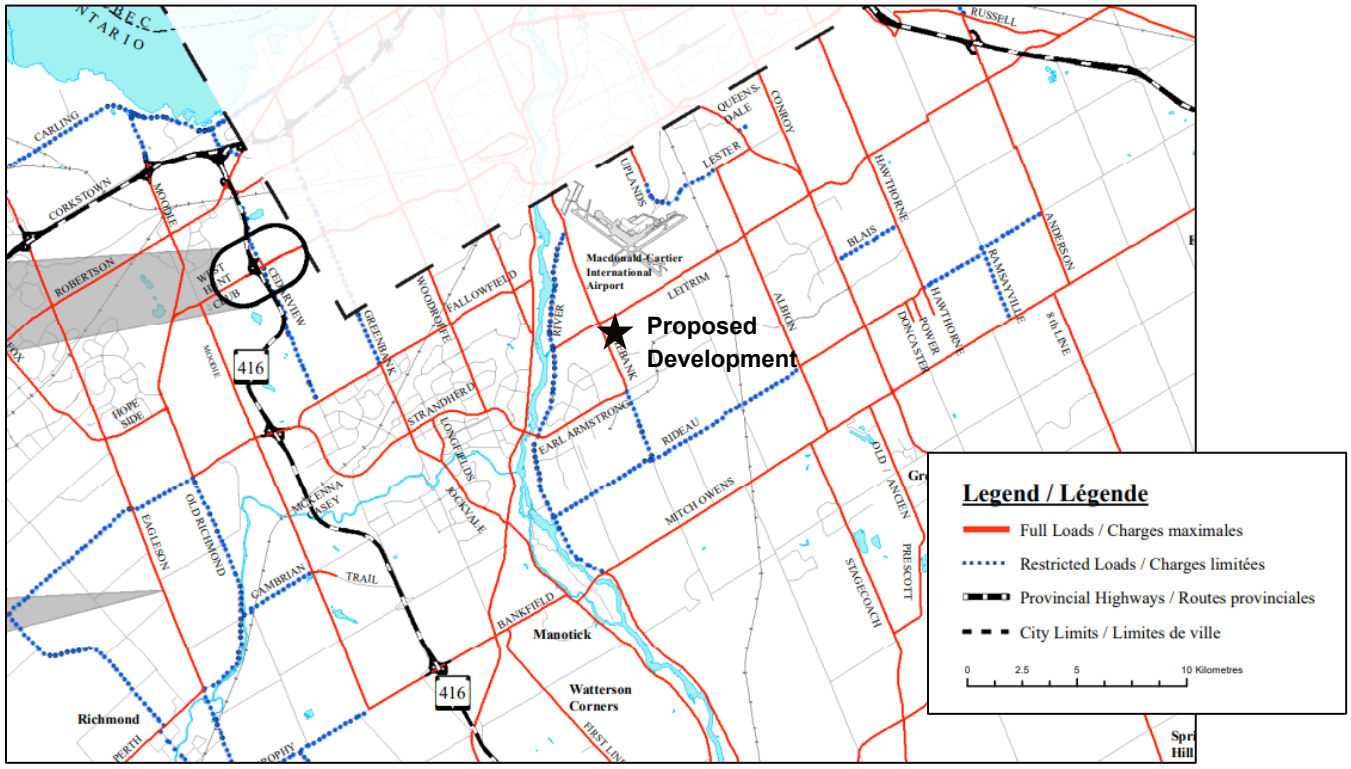


Figure 3-2 Rural Truck Routes
(Source: City of Ottawa – Rural Truck Routes)

3.2.1.1 Roadways

Table 3-4 below summarizes the details of the existing streets within the study area.

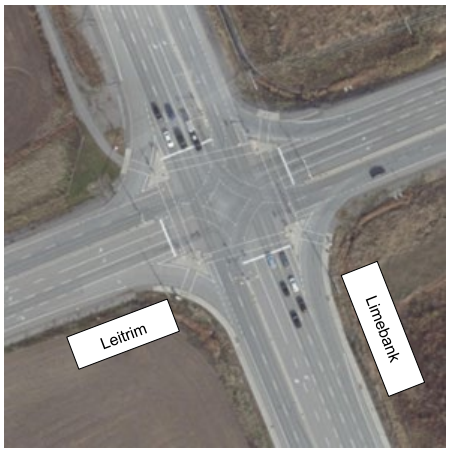
Table 3-2 Existing Roadways

Name	Class	Jurisdiction	Orientation and Extents	Cross-Section	Right-of-Way Protection[1]	Speed Limit
Limebank Road	Arterial	City of Ottawa	North-South, River Road to Mitch Owens Road	4-Lane, Urban, Divided	44.5m	80km/h
Spratt Road	Major Collector	City of Ottawa	East-West, East of Limebank Road to Mitch Owens Road in the south	4-Lane, Urban, Undivided	N/A[2]	60km/h
Leitrim Road	Arterial	City of Ottawa	East-West, River Road to east of Russel Road	2-Lane, Rural Undivided	Varies[3]	80km/h

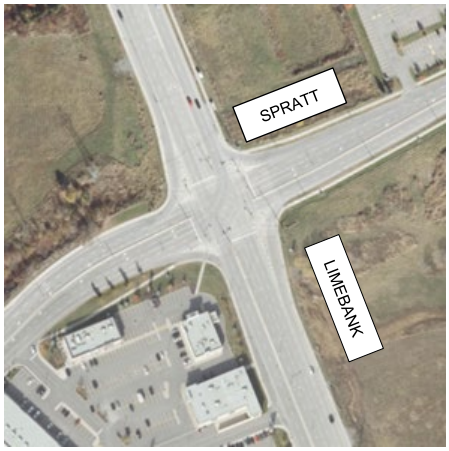
Note:
[1] Derived from Schedule C16 of the Official Plan.
[2] No right-of-way defined in Schedule C16 of the Official Plan.
[3] 27.3m to 33.4m west of Limebank Road and 37.5m east of Limebank Road.

3.2.1.2 Intersections

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



- **Leitrim Road & Limebank Road** is a four-legged signalized intersection with dual left-turn lanes, two through lanes, right-turn channels and bike lanes on all approaches. Based on the Riverside South CDP, the intersection is designated as a Community Gateway.



- **Limebank Road & Spratt Road** is a four-legged signalized intersection with dual left-turn lanes, right-turn channels and bike lanes on all approaches. There are two through lanes on the northbound and southbound approaches and one through lane on the eastbound and westbound approaches. Based on the Riverside South CDP, the intersection is designated as a Sub-Community Gateway.

3.2.1.3 Existing Lane Configurations & Traffic Volumes

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

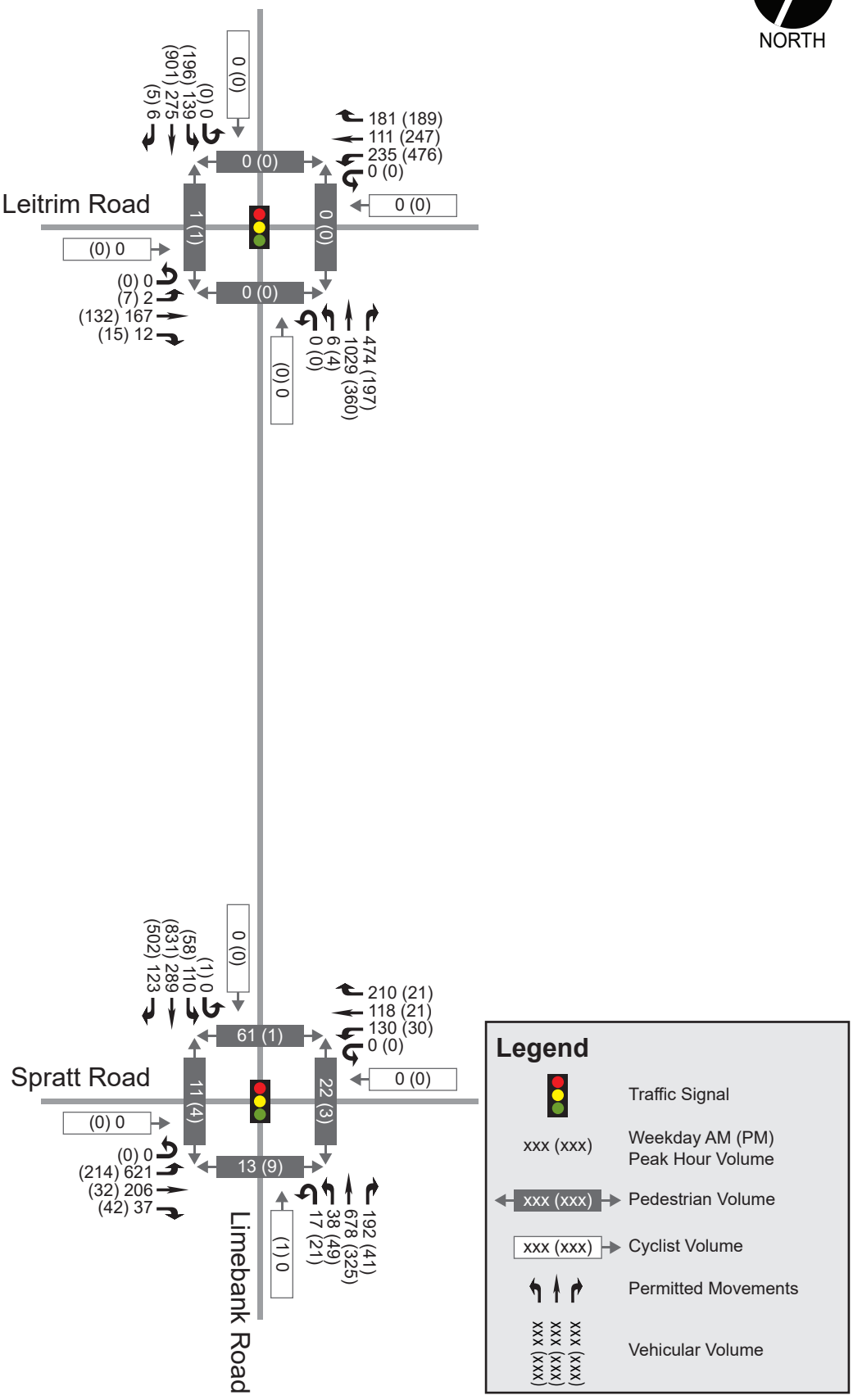
- Limebank Road & Leitrim Road (City of Ottawa, February 2022); and
- Limebank Road & Spratt Road (City of Ottawa, December 2019).

The above two traffic counts were collected during winter months, and therefore the observed volume of cyclists may be lower than the volumes during the peak cycling season (late spring, summer, and early fall)

In general, the City requires the use of traffic counts conducted within the last 3 years. Although the count at the Limebank & Spratt was conducted over 3 years ago, the northbound and southbound through volumes were balanced with the nearby Limebank & Leitrim Road intersection in order to account for changes in traffic patterns that may have occurred since the count was conducted.

To approximate existing traffic volumes, a growth rate was applied to the northbound and southbound through movements at the Limebank & Spratt intersection, as well as to all movements at the Limebank & Leitrim Road intersection. Justification of the background growth rates is discussed further in the Forecasting section of this report.

Peak hour traffic volumes representative of existing conditions are shown in **Exhibit 3-3**. Weekday morning and afternoon peak hour turning movement counts have been provided in **Appendix C**. The intersection control and lane configurations for all intersections described above are shown in **Exhibit 3-4.**



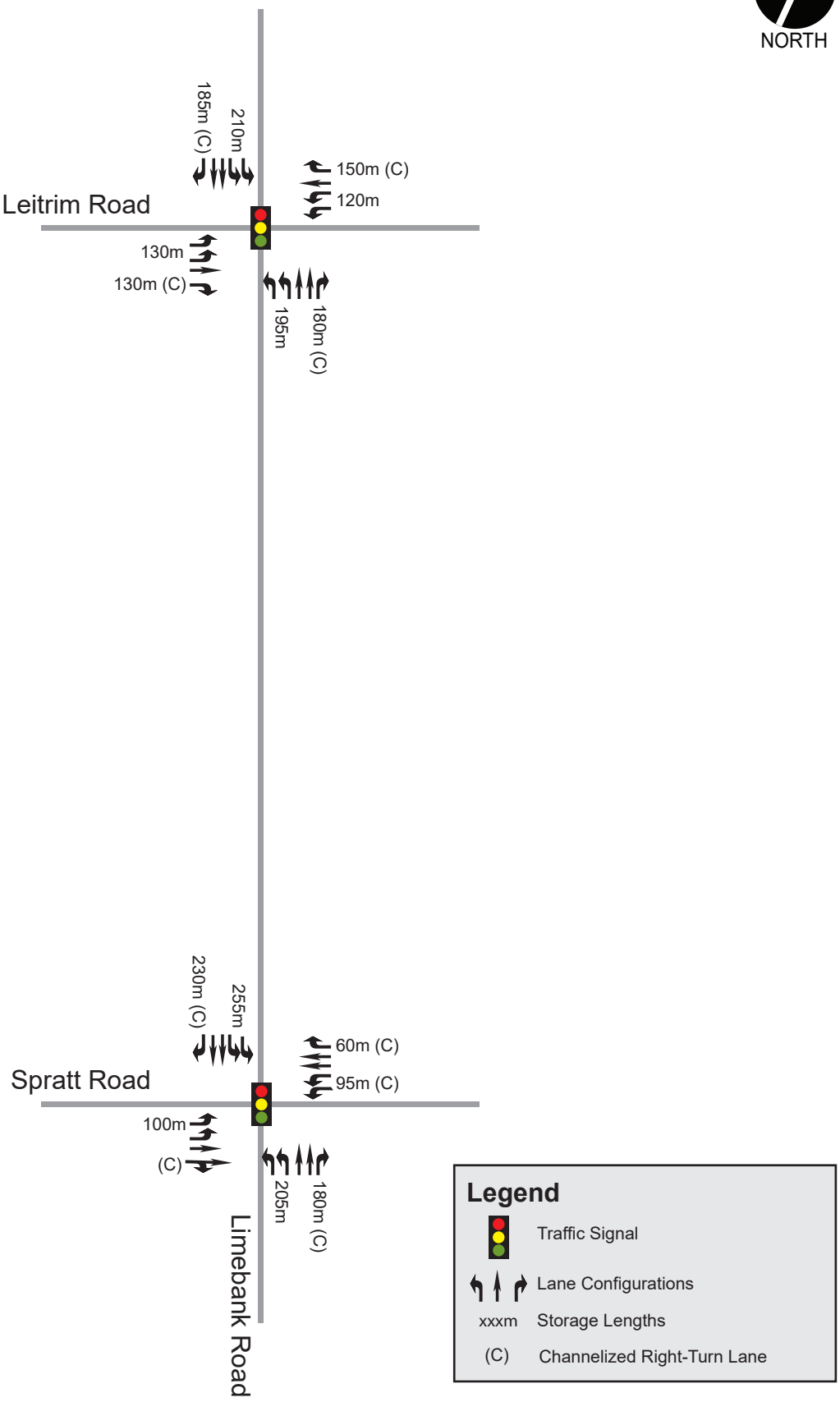
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Exhibit 3-3:
Existing Traffic

PROJECT No. 144893

SCALE: N.T.S.



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Exhibit 3-4:
Existing Lane Configuration & Intersection Controls

PROJECT No. 144893

SCALE: N.T.S.

3.2.1.4 Collision History

A review of historical collision data has been conducted for the road network surrounding the proposed development. The TIA Guidelines require a safety review if at least six collisions for any one movement or of a discernible pattern, over a five-year period have occurred. **Table 3-3** summarizes all reported collisions between January 1, 2016, and December 31, 2020. It is important to note that any available records during the COVID-19 pandemic may not be indicative of true trends and have therefore been excluded from this study.

Table 3-3 Reported Collisions within Vicinity of Proposed Development

Location	# Of Reported Collisions				
	Angle	Rear End	Single Motor Vehicle	Other	Total
INTERSECTIONS					
Limebank & Spratt	3	6	3	0	12
Limebank & Leitrim	0	0	0	0	0
Segments					
Limebank – Leitrim to Spratt	0	2	4	1	7

Based on a preliminary review of the collision history noted above, rear end collisions at the Limebank & Spratt intersection may require further review.

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 relative to the daily volume of traffic entering the intersection. This is commonly expressed in terms of average number of collisions per Million Vehicles Entering (MVE) and a rate of greater than 1.0 is considered significant.

The above noted intersections are therefore calculated as having the following average number of collisions per MVE:

- Limebank & Spratt: 0.3 collisions per MVE
- Limebank & Leitrim: 0.0 collisions per MVE

As indicated above, none of the context area intersections have experienced more than 1.0 collisions per MVE.

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

3.2.2 Existing Road Bicycle and Pedestrian Facilities

The following cycling and pedestrian facilities exist within the study area.

- On-street bike lanes and sidewalks on both sides of Limebank Road, south of Leitrim Road;
- Paved shoulders on both sides of Leitrim Road;
- Multi-use pathway on the west side of Limebank Road, north of Leitrim Road;
- On-street bike lanes and sidewalks on both sides of Spratt Road; and

- Bike pocket lanes on all approaches at the Leitrim Road & Limebank Road intersection.

Figure 3-3 and **Figure 3-4** illustrate the location of the above cycling and pedestrian facilities.



Figure 3-3 Existing Cycling Facilities
(Source: GeoOttawa)



Figure 3-4 Existing Pedestrian Facilities
(Source: GeoOttawa)

3.2.3 Existing Transit Facilities and Service

Table 3-4 summarizes the transit routes OC Transpo operates within close proximity to the proposed development.

Table 3-4 Existing Transit Routes

Route	Route Type	Terminuses	Peak Period Frequency
#99	Regular, all-day	Citigate/Barrhaven Centre to Hurdman/Greenboro	30 minutes
#299	Weekday, peak period only	Manotick to Hurdman	Two trips in morning and two return trips in the evening, 60-minute headways
#693	Weekday, peak period only	Blossom Park to St. Francis Xavier High School	Seven trips in the morning and seven trips in the evening
#699	Weekday, peak period only	Pierre-de-Blois to Findlay Creek	Two trips in the morning, two trips in the evening.

The nearest bus stops to the proposed development are presently located approximately 300m north of the site (on Limebank Road, south of Leitrim Road) providing access to Routes #99, #299, #693, and #699. The transit service maps for the above routes are provided in **Appendix B**.

Figure 3-5 illustrates the location of all bus stops within the study area.



Figure 3-5 Existing Transit Stops
(Source: OC Transpo Travel Planner, https://plan.octranspo.com/plan)

3.3 Planned Transportation Network

Phase 1 of the Transportation Master Plan (TMP) Update was approved by the Ottawa City Council in April 2023. Part 1 includes the TMP Policies, the Active Transportation Projects and Networks, and the Transit and Road Project Prioritization Frameworks that will guide Part 2 of the TMP: the Capital Infrastructure Plan. Until such time that the Capital Infrastructure Plan has been established and approved by the City, future transportation network assumptions will be based on the 2013 TMP.

3.3.1 Future Road Network

The 2013 Transportation Master Plan outlines future road network modifications required in the 2031 ‘Affordable Network’. The TMP projections have been supplemented by the more recent 2024 City-wide and Area-Specific Development Charges (DC) Background Study (July 2024), which allocates funds and assigns anticipated completion dates to specific capital projects. The Riverside South Community Design Plan (CDP) (June 2016) and Secondary Plan (2024 Update) have also been referenced as they provide specific details regarding the planned transportation network within the immediate community. Additionally, the Leitrim Road Realignment and Widening Planning and Environmental Assessment Study – Environmental Study Report (ESR) has been taken into account as it details key information regarding the potential Leitrim Road realignment.

The following projects were noted that may have an impact on area traffic within the vicinity of the site:

- **Earl Armstrong Road:** Planned widening from two to four lanes between Limebank Road and Bowesville Road. Based on the 2024 DC study, this widening is not expected to occur prior to the current planning horizon of 2031.
- **Spratt Road**: The latest CDP plans indicate that this road will eventually be extended east to Bowesville Road.
- **Leitrim Road Widening and Realignment:** The Leitrim Road ESR indicates that the road may be realigned in the future to accommodate a potential future expansion of the Ottawa Macdonald-Cartier International Airport. In the event that this expansion occurs, Leitrim Road would be realigned as follows:
  - Approximately halfway between River Road and Limebank Road, a new three-legged intersection would be constructed, and the realigned Leitrim Road would extend south from this intersection and then curve east to intersection with Limebank Road south of the existing Limebank & Leitrim intersection.
  - The segment of the existing Leitrim Road between this new intersection and Limebank Road would remain. The existing Limebank & Leitrim intersection would be converted to a three-legged intersection by closing the existing east leg.
  - East of the new Limebank & Leitrim intersection, the realigned Leitrim Road would continue east beyond the bounds of the study area before eventually curving back north to reconnect with the existing alignment of Leitrim Road.

  The ESR indicates that the realignment and widening of Leitrim Road is planned for beyond 2031 while the Airport Master Plan indicates it may be required in the 2040s. This information is provided for context only and it is assumed the full realignment of Leitrim Road will not occur within the horizon year of this study. Portions of this roadway may be constructed in the interim, however, as the adjacent lands are privately developed.

Figure 3-6 and **Figure 3-7** below illustrate the planned changes to the arterial road network projects in the broader area, as per the TMP 2031 ‘Affordable Network’ and 2031 ‘Network Concept’, respectively.

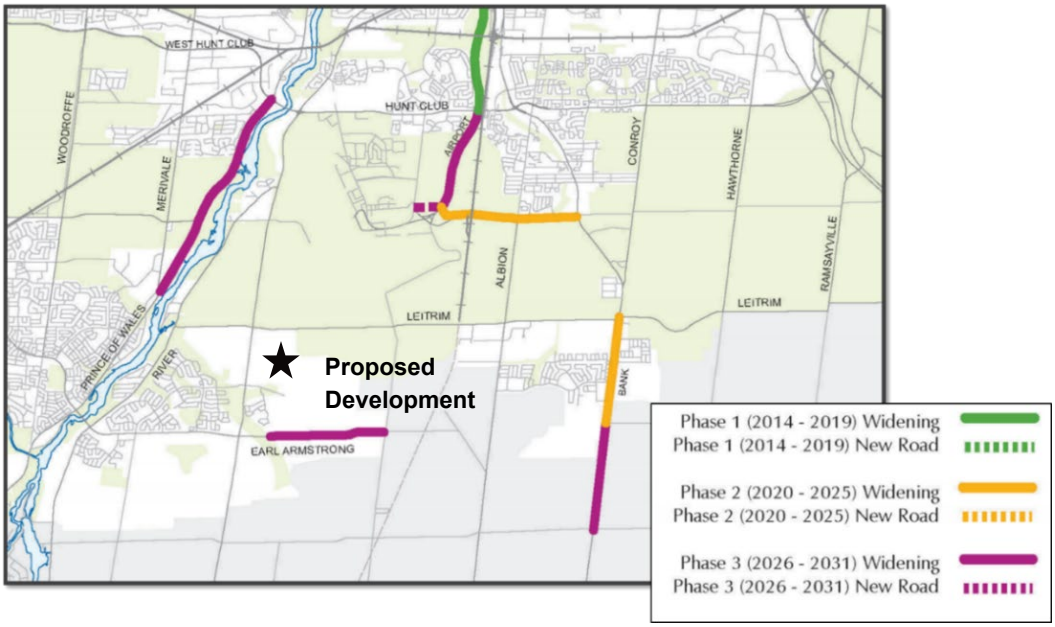


Figure 3-6 Future Road Network Projects: 2031 'Affordable Network'
(Source: 2013 Transportation Master Plan – Map 11)

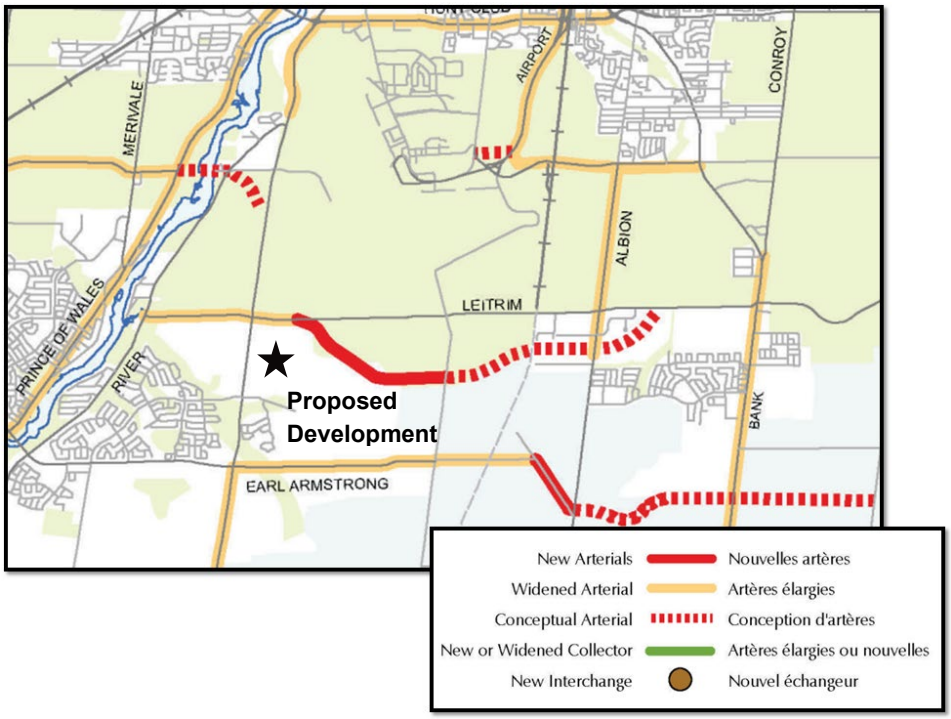


Figure 3-7 Future Road Network Projects: 2031 'Network Concept'
(Source: Source: 2013 Transportation Master Plan – Map 10)

Figure 3-8 illustrates the latest plan from the Secondary Plan.

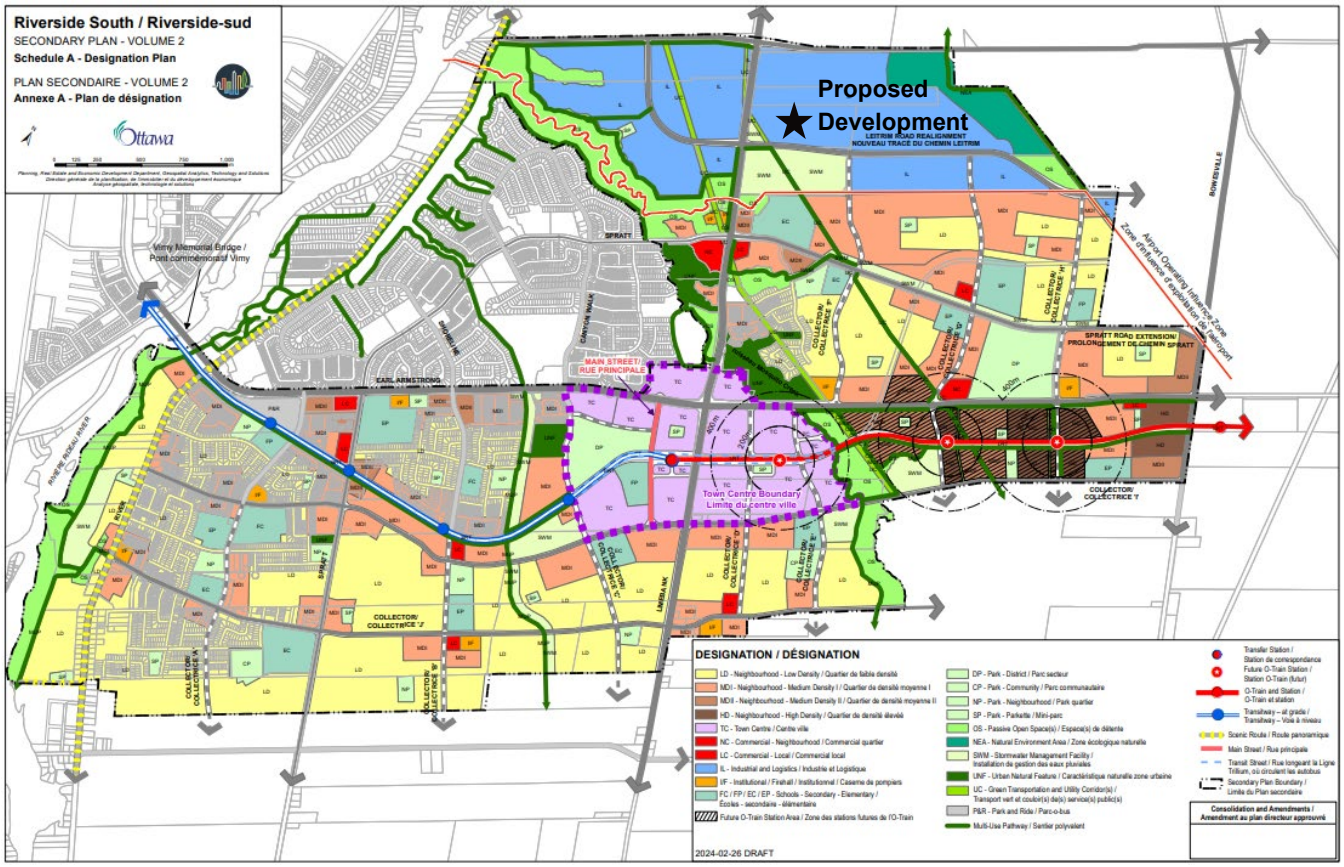


Figure 3-8 Riverside South Secondary Plan Land Use Designation Plan
(Source: Riverside South Secondary Plan – Schedule A)

Figure 3-9 and **Figure 3-10** show the planned realignment of Leitrim Road as well as the configuration of the new intersection where the realigned Leitrim Road meets Limebank Road. **Figure 3-11** illustrates the planned reconfiguration of the existing Limebank & Leitrim intersection.

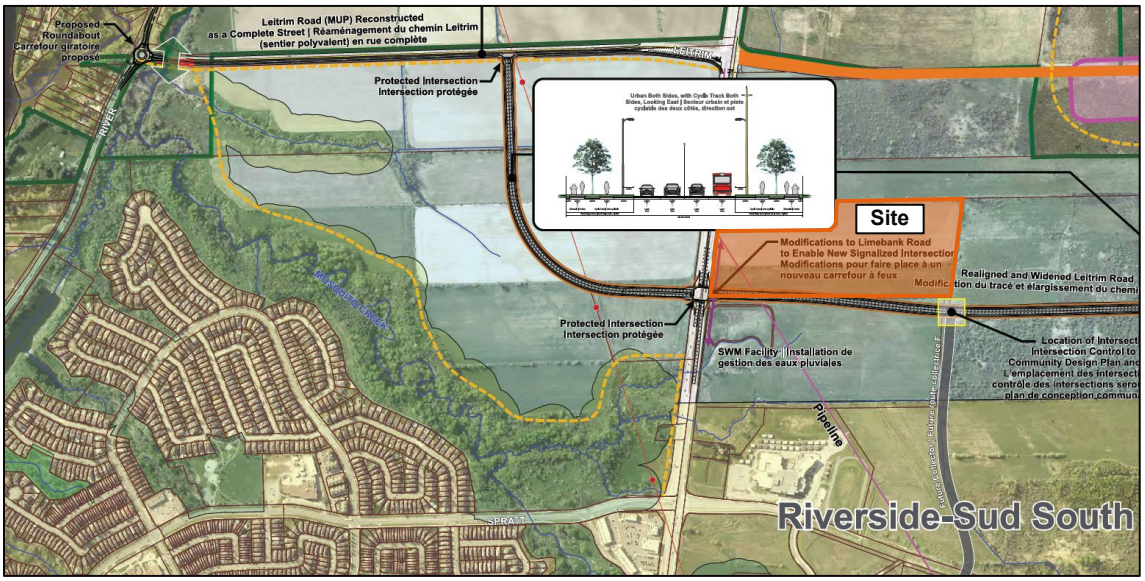


Figure 3-9 Planned Realignment of Leitrim Road (Post 2031)

(Source: Leitrim Road Realignment and Widening Planning and Environmental Assessment Study – Environmental Study Report)

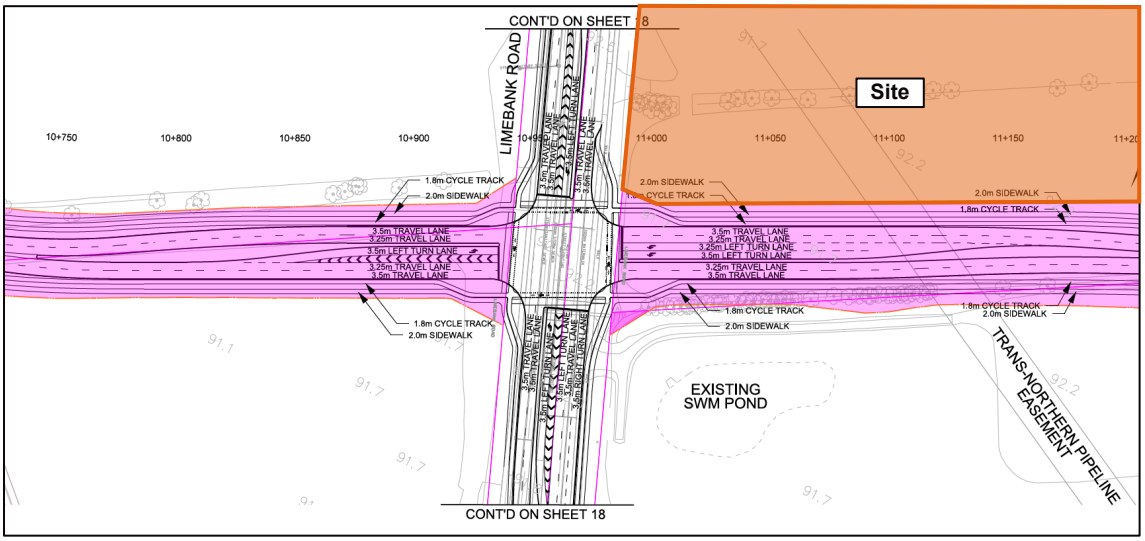


Figure 3-10 Planned Limebank Road & Realigned Leitrim Road Intersection Configuration (Post 2031)

(Source: Leitrim Road Realignment and Widening Planning and Environmental Assessment Study – Environmental Study Report)

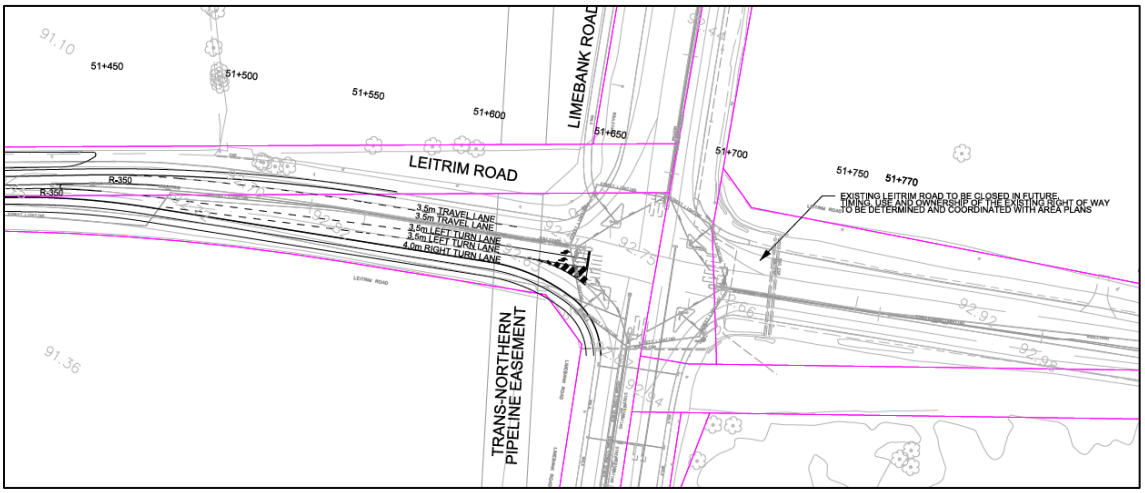


Figure 3-11 Planned Reconfiguration of Existing Limebank Road & Leitrim Road Intersection (Post 2031)

(Source: Leitrim Road Realignment and Widening Planning and Environmental Assessment Study – Environmental Study Report)

3.3.2 Future Cycling and Pedestrian Facilities

The Transportation Master Plan (TMP) designates Limebank Road and Leitrim Road as ‘Spine’ or City-wide Cycling Routes, although neither road is identified as a Crosstown Bikeway in the draft TMP update. Spine cycling routes are intended to form part of a cycling network linking the commercial, employment, institutional, residential and educational nodes throughout the City of Ottawa. Spratt Road is identified as a ‘Local Route’ in the Ultimate Cycling Network.

The Riverside South CDP provides guidance on future active transportation facilities within the area and describes Limebank Road, the existing Leitrim Road, the future realigned Leitrim Road, and Spratt Road as being part of the ‘Primary Pedestrian – Cycling Network’.

The planned cycling and pedestrian network indicated in the CDP is shown in **Figure 3-12**.

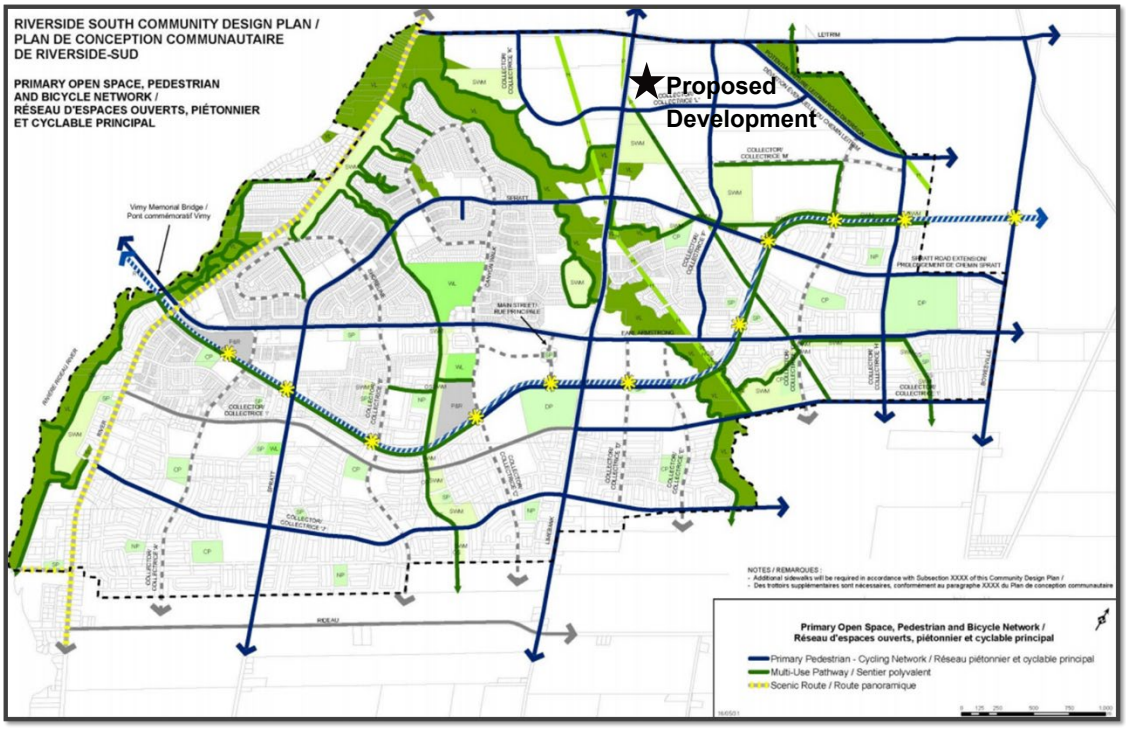


Figure 3-12 Riverside South Community Design Plan - Cycling and Pedestrian Network
(Source: Riverside South Community Design Plan – Primary Open Space: Pedestrians and Bicycle Network)

Within the context area surrounding the proposed development site, the City of Ottawa Active Transportation Project List indicates that a study is to be completed to assess the feasibility of removing one vehicle lane per direction on Spratt Road to add a buffered cycling facility. The study area for the feasibility study will extend from Earl Armstrong Road to the Urbandale Shopping Plaza entrance.

3.3.3 Future Transit Facilities and Services

The 2013 TMP outlines the future rapid transit and transit priority (RTTP) network. The plans outlined in the 2013 TMP for the Light Rail Transit (LRT) network have since been superseded with more recent studies. The following projects were identified may have an impact on future travel demand in the vicinity of the proposed development:

- **Trillium Line Extension** – The Trillium Line has been recently extended from its former terminus at Greenboro Station to Limebank Road with a spur line to the Ottawa International Airport. The Trillium Line South Extension is expected to begin revenue service in the fall/winter of 2024.
- **Chapman Mills/Strandherd Drive/Earl Armstrong Road Transit Priority Corridor** – The corridor is expected to be upgraded with transit signal priority and queue jump lanes between Barrhaven Town Centre Station and Limebank Station. Based on the 2024 DC study, the section between Limebank Station and Riverview Park & Ride is expected to be completed between 2031 and 2033.

Figure 3-13 below shows the 2013 TMP's transit infrastructure projects in the vicinity of the proposed development that were identified as being part of the 2031 Affordable Network, while the Stage 2 Light Rail Project (including the Trillium Line Extension to Limebank Road) is shown **Figure 3-14**.

As shown previously in **Figure 3-8**, the Riverside South CDP identifies the eventual construction of a BRT corridor extending west from the terminus of the Trillium Line Extension, connecting the Riverview Park and Ride with the future O-Train terminus at Limebank Road. The implementation of this corridor is expected to occur between 2031 and 2033.

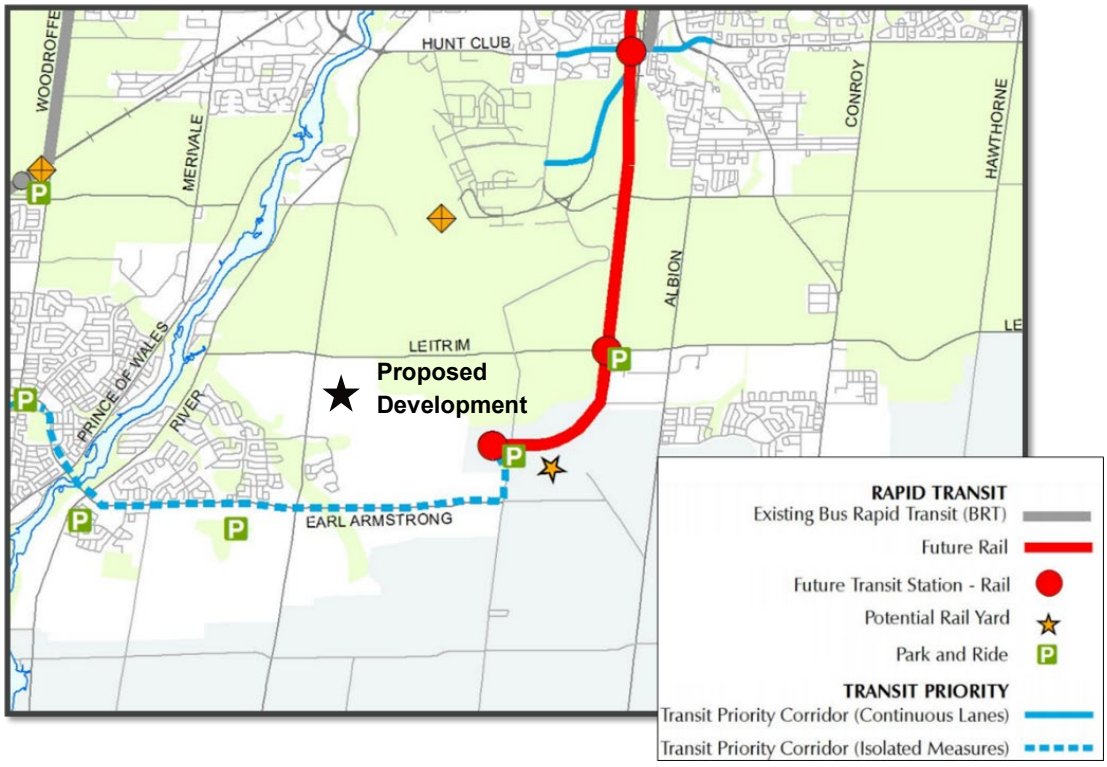


Figure 3-13 Future 'Affordable RTTP Network Projects'

(Source: 2013 Transportation Master Plan – Map 5)

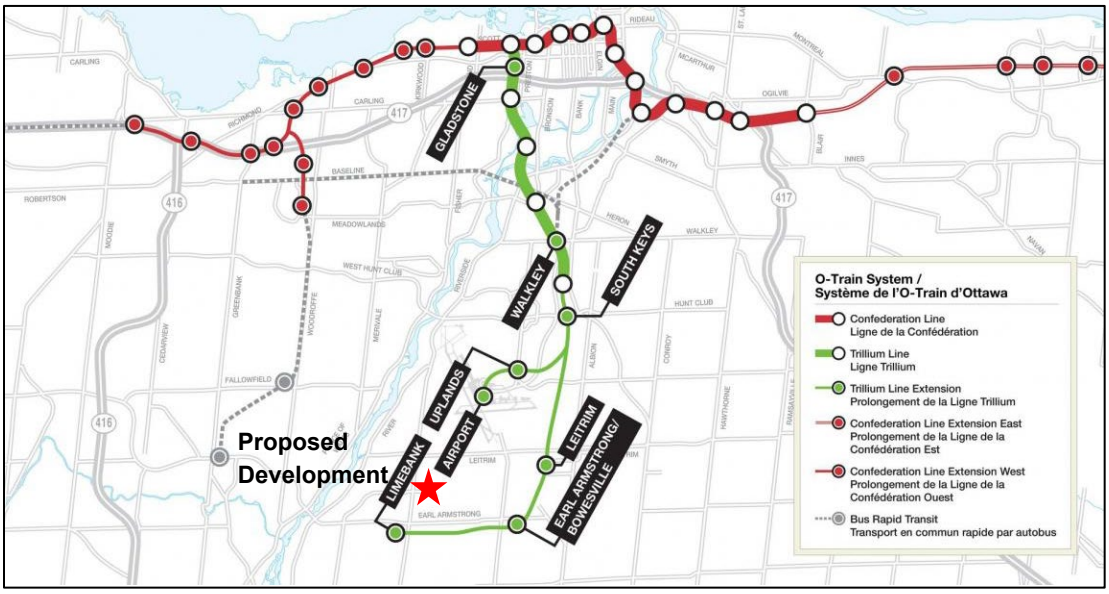


Figure 3-14 Stage 2 LRT – Trillium Line Extension

(Source: Stage 2 Light Rail Transit Project)

3.4 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.

There is currently only one development application of significance in the vicinity of the proposed development, the adjacent Riverside South Business Park at 3700 Twin Falls Place, as summarized in **Table 3-5** and shown in **Exhibit 3-5** below. This application was approved in 2023 in support of a Draft Plan of Subdivision. Site Plan Applications for individual blocks within the subdivision will be prepared independently in the future.

Table 3-5 Future Adjacent Development

Development	Expected Build-Out Year
Riverside South Business Park (3700 Twin Falls Place)	2031+



ARCADIS

4101 Limebank Road
Transportation Impact Assessment

Exhibit 3-5:
Adjacent Developments

PROJECT No. 144893

SCALE: 0m 200m 400m

3.5 Time Periods

Based on the land use of the proposed development, traffic generated during the weekday morning and afternoon peak hours are expected to result in the most significant impact to traffic operations on the adjacent network. 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 analysis periods will be considered in this TIA:

- Existing Traffic
- Year 2025 – Full Buildout
- Year 2030 – 5 Years Beyond Full Buildout

3.7 Study Area

With consideration of the information presented thus far, a study area bound by Leitrim Road to the north, Spratt Road to the south, Limebank Road to the west and the eastern boundary of the site will provide a sufficient assessment of the development's impact on the adjacent transportation network. As Spratt Road is not identified as a truck route, it is less likely to be impacted by the proposed development-generated traffic and therefore only its intersection with Limebank Road is included in the study area.

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:

- Limebank & Spratt
- Limebank & Leitrim
- Limebank & Realigned Leitrim (future)*
- Limebank & Access #1 (future)

** Note: A portion of realigned Leitrim Road will be constructed in an interim configuration to facilitate access to the site via Access #2.*

Intersection-based Multi-Modal Level of Service (MMLOS) analysis will be conducted for any existing or future signalized study area intersections listed above. Stop-controlled intersections and roundabouts are exempt from this analysis, as no methodology currently exists for evaluating MMLOS at unsignalized intersections. Segment-based MMLOS analysis will be conducted for the segment of Limebank Road between Leitrim Road and Spratt Road.

In order to provide access to the development, it is proposed that an approximately 230m long segment of the future realigned Leitrim Road be constructed with a temporary two-lane cross-section. This would be sufficient to provide connectivity to the westernmost driveway on the southern boundary of the site (Access #2). The easternmost driveway (Access #3) will be connected to the future realigned Leitrim Road when the road is extended further east (by others).

It is expected that the Limebank & Realigned Leitrim intersection will initially be constructed as part of the Riverside South Business Park as a right-in/right-out intersection and will be ultimately signalized at some point in

the future. As the timeline for the signalization of this intersection is uncertain and based on the development pace of the Business Park, this study assumes that the intersection will be configured as a right-in/right-out intersection throughout the timeframe of this study. Supplemental analysis will be completed to determine whether signalization of the intersection is required to accommodate full buildout of the proposed development.

3.8 Existing Multi-Modal Level of Service

When evaluating roads and intersections, the comfort and safety of all users needs to be assessed and weighed against performance targets. The City of Ottawa has developed the Multi-Modal Level of Service (MMLOS) analysis methodology to allow for the quantitative evaluation of Level of Service for pedestrians, cyclists, transit, and passenger vehicles. The elements considered in the MMLOS analysis for each user group are described below:

- **Pedestrian Level of Service (PLOS)** evaluates pedestrian comfort, safety, and convenience at intersections and along roadway segments. Segment-based PLOS considers the quality of pedestrian facilities, the distance between controlled crossings and the impact of adjacent traffic on pedestrian comfort and safety, while intersection-based PLOS considers delays experienced by pedestrians and the level of exposure to traffic.
- **Bicycle Level of Service (BLOS)** evaluates the level of traffic stress (LTS) experienced by cyclists travelling through intersections or along roadway segments. BLOS takes into consideration both the degree of physical separation between cyclists and motorized traffic as well as the operating speed of motorized traffic.
- **Transit Level of Service (TLOS)** evaluates the reliability of transit based on delays experienced by transit at intersections and travel times along roadway segments.
- **Auto Level of Service (ALOS)** evaluates the ease of travel for motorized traffic in terms of delays and intersection capacity.

For each travel mode, the City of Ottawa has established a set of MMLOS targets which vary based on Official Plan land use designation or policy area, as well as cycling, transit and roadway network classification. For each intersection and roadway segment, an MMLOS score is calculated for the facility as a whole as well as for the worst (critical) portion of the facility. Only the overall MMLOS score is evaluated against the targets.

The following sections summarize the results of the Multi-Modal Level of Service (MMLOS) analysis conducted within the study area. Auto Level of Service (ALOS) under existing traffic conditions is described in Section 3.9.1.

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

3.8.1 Segment-Based MMLOS

Segment-based MMLOS results for the segment of Limebank Road adjacent to the proposed development is provided in **Table 3-6**.

Table 3-6 Existing Segment-Based MMLOS Results

Segment	Travel Mode	Side	Overall LOS	Critical LOS	Target	Deviation
Limebank Road	Pedestrian	West	C	C	D	+1
		East	C	C		+1
	Bicycle	West	C	C	D	+1
		East	C	C		+1
	Transit	West	C	-	E	+2
		East	C			+2

The results of the segment-based MMLOS presented above indicate that Limebank Road currently meets all of the MMLOS targets for industrial areas.

3.8.2 Intersection-Based MMLOS

The intersection MMLOS results have been summarized in **Table 3-7**.

Table 3-7 Existing Intersection-Based MMLOS Results

Intersection	Travel Mode	Overall LOS	Critical LOS	Target	Deviation
Limebank & Leitrim	Pedestrian	**E**	**E**	D	-1
	Bicycle	**E**	**E**	D	-1
	Transit	C	D	E	+2
	Auto	B	-	E	+3
Limebank & Spratt	Pedestrian	**E**	**E**	C	-2
	Bicycle	**E**	**E**	C	-2
	Transit	D	D	E	+1
	Auto	B	-	E	+3

The results of the analysis indicate that all existing intersections are currently operating at PLOS and BLOS ‘E’. Cyclists at all intersections must cross several lanes on Limebank Road in order to make left-turns. Given the high posted speed on Limebank Road, this maneuver is hazardous to cyclists. In order to achieve the BLOS targets, it is recommended that the City redesign the intersections to protected intersection standards when these intersections are reconstructed in the future in conjunction with any future improvements to or reconstruction of Limebank Road.

3.9 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.

3.9.1 Description of Capacity Issues

Table 3-8 below summarizes the existing traffic operational performance at the study area intersections based on peak hour traffic volumes representative of existing conditions. The intersection capacity analysis is based on locally-specific parameters as described in the TIA Guidelines and incorporates existing signal timing plans obtained from the City of Ottawa. As prescribed in the TIA Guidelines, a peak hour factor (PHF) of 0.90 has been considered in the analysis of existing conditions. The Synchro output files have been provided in **Appendix F**.

Table 3-8 Intersection Capacity Analysis: Existing Traffic

Intersection	Traffic Control	Peak Hour	Overall LOS (v/c or Delay)	Critical Movements (v/c or Delay)
Limebank & Leitrim	Signalized	AM	C (0.77)	NBT (0.86)
		PM	B (0.67)	WBL (0.76)
Limebank & Spratt	Signalized	AM	C (0.73)	EBL (0.78)
		PM	A (0.56)	SBT (0.71)

Based on the above results, all intersections are currently operating at an acceptable Level of Service. There is no evidence of existing capacity issues at any of the study intersections.

3.9.2 Adjustment to Background Network Demands

The planned transit network improvements within the study area are expected to result in a shift in background transit mode share once the O-Train Trillium Line Extension is operational in late 2024. It is also expected that there will be some modest growth in the active transportation mode share given broad-based in investment in active transportation infrastructure and Transportation Demand Management (TDM) measures required for all new development.

Based on the latest evaluation of mode share targets from the Draft Riverside South CDP Transportation Update (IBI Group, March 2020), a community-wide transit mode share target of 32% is now expected for 2031. The 2013 Transportation Master Plan (TMP) also indicates that the 2031 active transportation (i.e., walking and cycling) mode share target for local trips within the community is 24%. These shifts towards non-auto travel modes have been taken into account in the development of the background traffic growth rates.

3.9.3 Adjustment to Development-Generated Demands

The mode share targets developed for the proposed development have taken into account the planned improvements to the transportation network within the Riverside South community. Based on the intersection capacity analysis, it is not anticipated that intersection operations will have any significant impact on the trip assignment of site-generated traffic.

3.10 Development Generated Traffic

3.10.1 Trip Generation Methodology

As an industrial development, the site will generate both employee and visitor trips, and truck trips (e.g., delivery vehicles and tractor-trailers). Given the inherent differences between these two types of trips, the two have been estimated, distributed, and assigned to the road network separately. The subsequent sections provide additional details on the methodology and assumptions used in this study.

3.10.2 Baseline Vehicle Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition) provides data on both automobile and truck trip generation for industrial sites, and it is assumed that the automobile trip generation data is representative of the employee/visitor trip generation of the site. Employee/visitor trips have therefore been estimated based on the automobile trip generation data from the ITE Trip Generation Manual. Truck trips, on the other hand, are estimated directly using data from the ITE Trip Generation Manual.

The baseline automobile and truck trip generation results for the proposed development have been summarized in **Table 3-9** below.

Table 3-9 Baseline Vehicle Trip Generation Results

Land Use	Size (m^2)	Period	Generated Trips (vph)		
			In	Out	Total
150 (Warehouse: Auto)[1]	58,840	AM	70	17	87
		PM	19	64	83
150 (Warehouse: Truck)	58,840	AM	7	6	13
		PM	10	9	19
Total		**AM**	**77**	**23**	**100**
		PM	**29**	**73**	**102**

Notes: vph = vehicle-trips per hour

[1] Baseline auto trips equate to employee/visitor trips.

3.10.3 Person Trip Generation

The ITE trip generation rates inherently reflect the mode share and vehicle occupancy characteristics of the survey sites used to establish these rates. In order to account for the different mode share characteristics specific to Ottawa, it is necessary to first convert these baseline vehicle trips into person trips. The TIA Guidelines indicate that a 1.28 vehicle-to-person-trip conversion rate should be utilized to convert the baseline vehicle trip generation results into person trips. This conversion factor has only been applied to the baseline automobile trips, however, as these reflect trips made by employees or customers who may travel to the site by various modes. In contrast, truck trips were not converted to person-trips as these represent deliveries to/from the site which cannot be made by any other mode.

The resulting number of site-generated person-trips is summarized in **Table 3-10** below.

Table 3-10 Person-Trip Generation

User Group	Period	Generated Trips (pph[1])		
		In	Out	Total
Employees / Visitors[2]	AM	90	22	112
	PM	24	83	107
Trucks	AM	7	6	13
	PM	10	9	19
Total	**AM**	**97**	**28**	**125**
	PM	**34**	**92**	**126**

Notes:
[1] Person trips per hour.
[2] Baseline auto trips equate to employee/visitor person-trips.

3.10.4 Mode Share Proportions

The proposed development is located within the South Gloucester/Leitrim TAZ, whose extents are shown in **Figure 3-15** below.

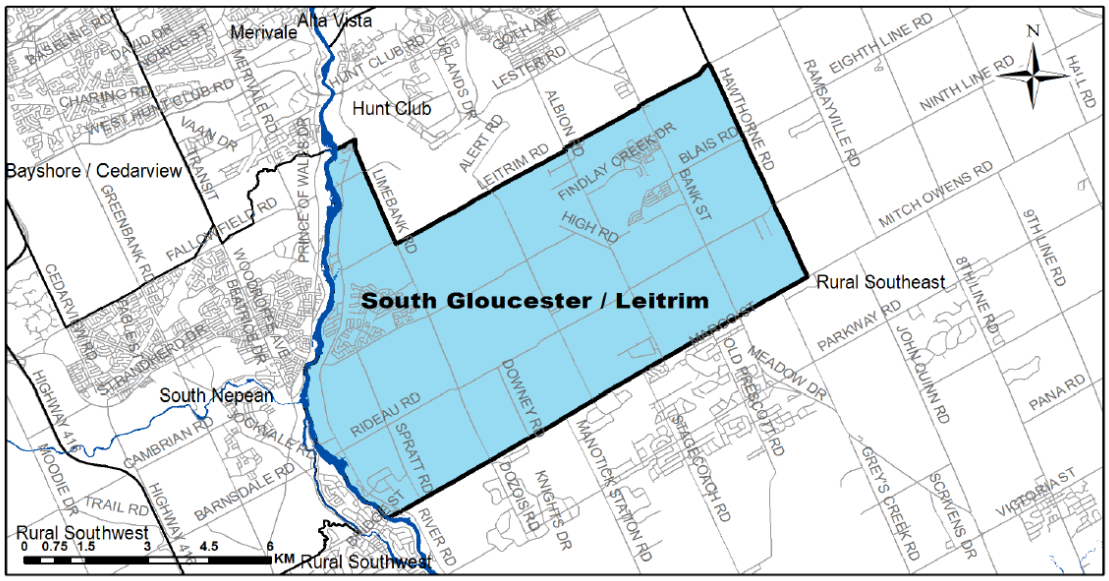


Figure 3-15 South Gloucester/Leitrim TAZ
(Source: 2011 NCR Household O-D Survey Summary of Results)

Employee and visitors will be capable of accessing the site via a number of alternative travel modes, whereas truck trips can only be made via truck. In order to account for the unique mode share characteristics of this area of Ottawa, mode share targets have been established for employee and visitor person-trips.

Considering the walking distance from the site to the existing bus stops at Limebank & Leitrim, it is expected that a negligible number of employees will choose to commute to the site by bus. Once the Limebank & Realigned Leitrim intersection is signalized, however, it is expected that bus stops would be provided at the intersection which would improve the attractiveness of transit as a travel mode. Additionally, the walking distance from the site to the nearest residential neighbourhoods is significant. As such, it is expected that the number of employees walking to work will also be negligible. Adjustments have been made to the existing mode share distribution to account for the unique characteristics and context of this site.

The existing mode shares for employment land uses within the TAZ and the proposed mode share targets for employee and visitor person-trips of the proposed development are summarized in **Table 3-11** below. The mode share targets have been developed based on the existing employment land use mode share distribution and adjusted to account for the negligible number of transit and walk trips anticipated.

Table 3-11 Existing and Target Mode Share Distributions

Mode	Existing Mode Share	Mode Share Targets
Auto Driver	89%	92%
Auto Passenger	7%	7%
Transit	2%	<1%
Bike	1%	1%
Walk	1%	<1%
Total	**100%**	**100%**

3.10.5 Trip Generation by Mode

The mode share targets from **Table 3-11** were applied to the number of development-generated peak hour employee/visitor person-trips to determine the number of person-trips per travel mode. As discussed previously, truck person-trips have not been subdivided by mode as these trips can be completed by truck only.

The resulting number of person-trips by mode is summarized in **Table 3-12**.

Table 3-12 Development-Generated Peak Hour Person Trips by Mode

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Auto Driver	83	20	103	22	76	98
Auto Passenger	6	2	8	2	6	8
Transit	0	0	0	0	0	0
Bike	1	0	1	0	1	1
Walk	0	0	0	0	0	0
Truck[1]	7	6	13	10	9	19
Total	**97**	**28**	**125**	**34**	**92**	**126**

Note:

[1] True truck volumes, not passenger car equivalents.

3.10.6 Trip Distribution and Assignment

It is anticipated that the distribution of site-generated employee/visitor traffic will align with distribution of trips **to** the district identified in the 2011 O-D Survey. With consideration of existing travel times during the weekday peak hours, site-generated employee/visitor traffic was distributed as follows:

- 20% to/from the North via Limebank Road;
- 20% to/from the South via Limebank Road;
- 35% to/from the East via Leitrim Road;
- 5% to/from the West via Leitrim Road; and
- 20% to/from the West via Spratt Road.

Trucks are anticipated to follow a different distribution. Only certain roads are designated as full-load truck routes, as shown previously in **Figure 3-2**, which limits which routes that trucks can use to travel to/from the site. Furthermore, as access to the site is assumed to be restricted to right-in/right-out only throughout the timeframe of this study and trucks cannot make U-turn movements at intersections, the distribution of truck traffic to/from the site is further restricted. **Figure 3-16** illustrates the routes that trucks are anticipated to use to travel to/from the site.

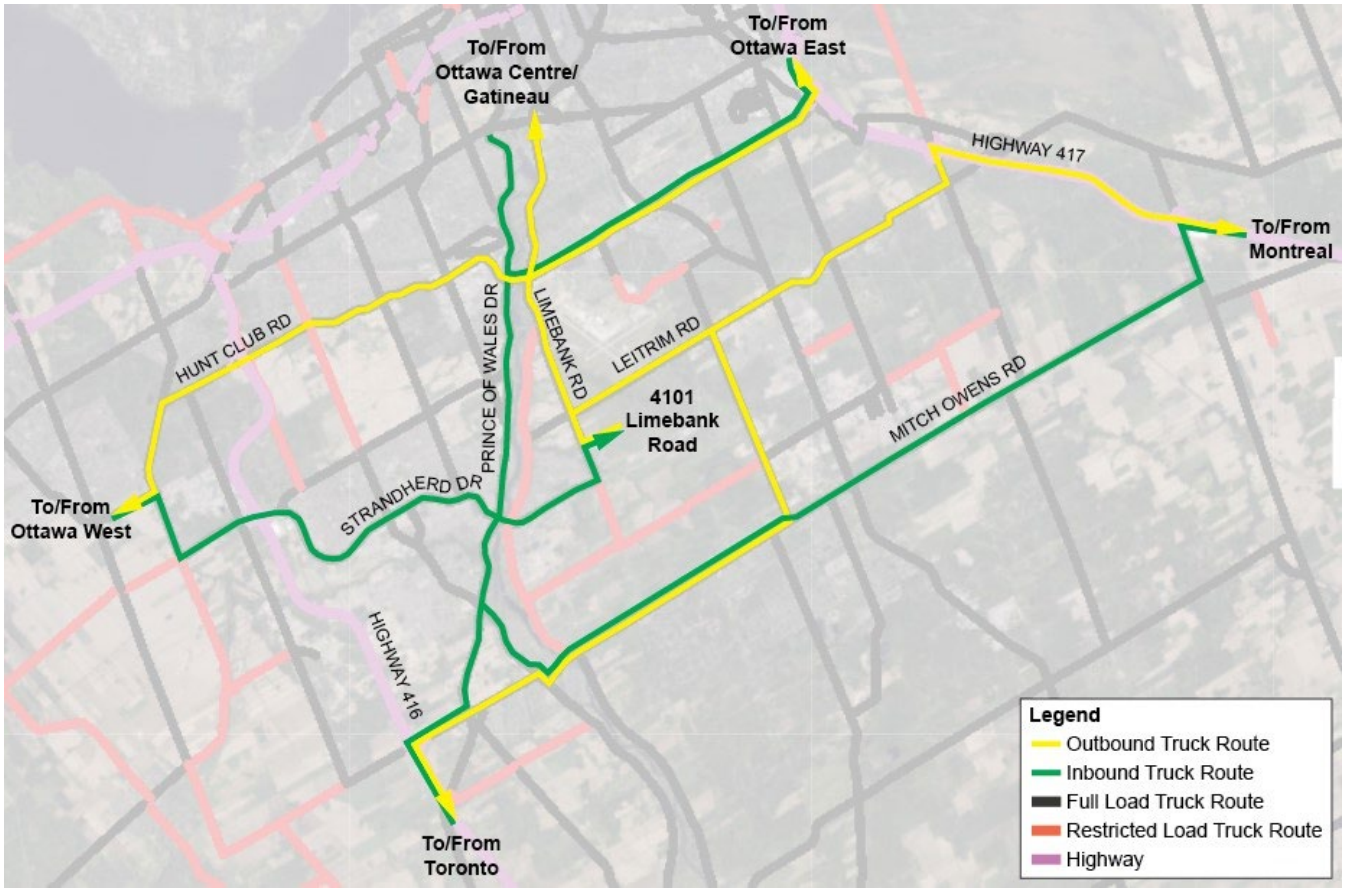
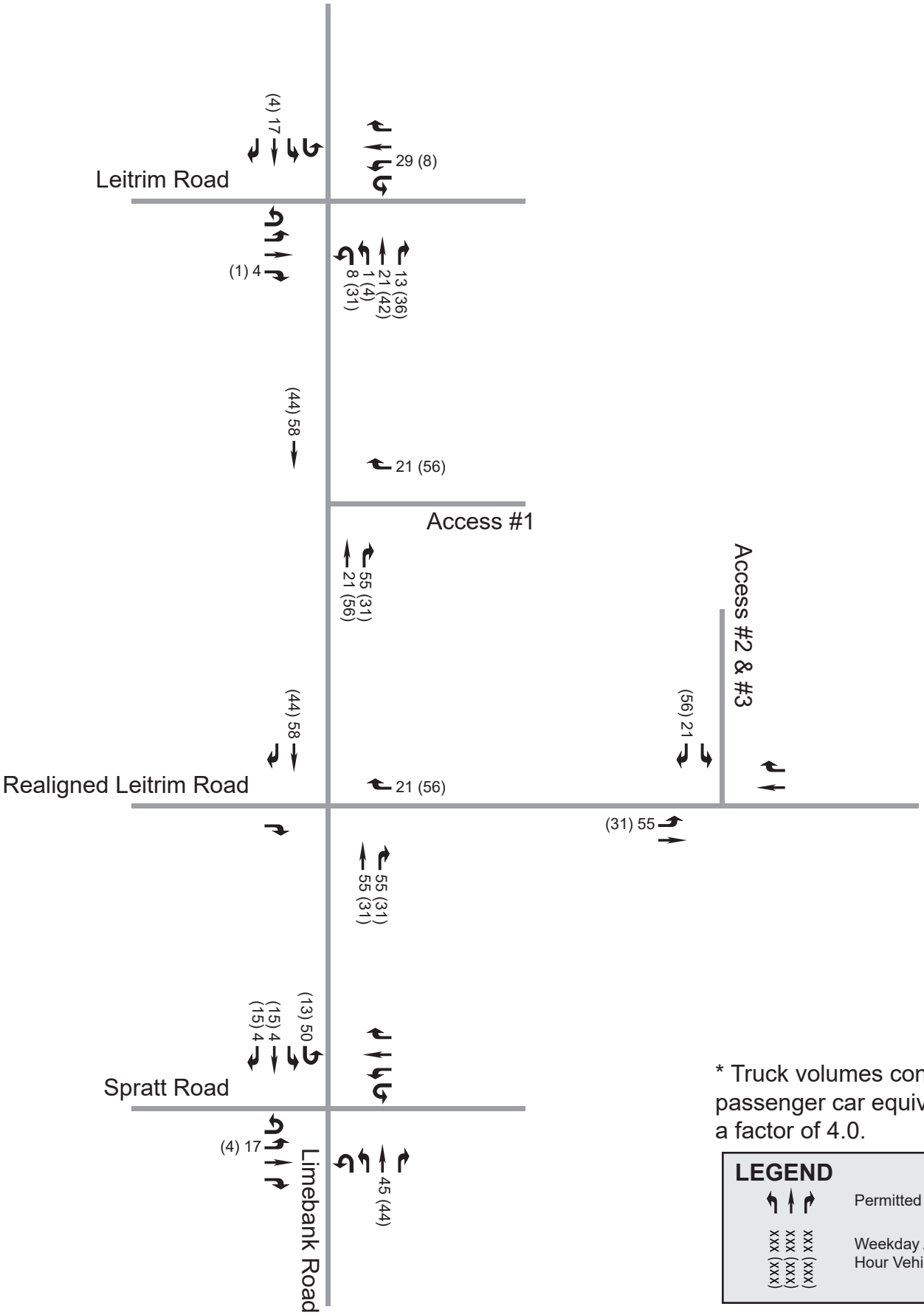


Figure 3-16 Truck Trip Assignment

With consideration of the above limitations to truck routes as well as the split between truck trips going to/from local destinations versus regional destinations, the following truck trip distribution has been established for the site:

- Inbound trips:
  - 100% from the South
- Outbound trips:
  - 50% to the East via Leitrim
  - 50% to the North via Limebank Road

Applying the estimated number of new auto and truck trips to their respective distributions, future site-generated traffic volumes were calculated and are illustrated **Exhibit 3-6**. Truck trips have been multiplied by a 4.0 truck to passenger car equivalent (PCE) adjustment factor to account for the larger size, slower acceleration, and slower deceleration of WB-20 trucks relative to passenger vehicles.



* Truck volumes converted to passenger car equivalents using a factor of 4.0.

LEGEND

Permitted Movements

xxx (xxx)
xxx (xxx)
xxx (xxx)

Weekday AM (PM) Peak Hour Vehicular Volume

ARCADIS

4101 Limebank Road
Transportation Impact Assessment

Exhibit 3-6
Site-Generated Traffic

PROJECT No. 144893

SCALE: N.T.S.

3.11 Exemptions Review

The TIA Guidelines provide exemption considerations for elements of the Design Review and Network Impact components. **Table 3-13** summarizes the TIA modules that are not applicable to this study.

Table 3-13 Exemptions Review

TIA MODULE	ELEMENT	EXEMPTION CONSIDERATIONS	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	• No longer required based on the June 2023 summary of revisions to the TIA guidelines.	✗
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 Calming	All Elements	• Only required when all of the following conditions are met: 1. Access via a collector or local road 2. Adjacent to a significant sensitive land use 3. Zoning By-Law Amendment or Draft Plan of Subdivision application 4. At least 75 vehicle-trips 5. Site-generated traffic will increase peak hour volumes by 50% or more	✗
4.7 Transit	4.7.1 Transit Route Capacity	• Only required when the proposed development generates 75 transit trips or more	✗
	4.7.2 Transit Priority Requirements	• Only required when the proposed development generates 75 vehicle trips or more	✓
4.8 Network Concept	All Elements	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	✗
4.9 Intersection Design	All Elements	• Only required when the proposed development generates 75 vehicle trips or more	✓

4 Analysis

4.1 Background Network Traffic

4.1.1 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 TIA reviewed the anticipated changes to the study area transportation network based on the Transportation Master Plan (TMP), Official Plan, and the Riverside South Secondary Plan.

Based on a review of these planning policy documents, within the study area there are no road network modifications that are expected to be completed within the timeframe of this study. The Trillium Line Extension, however, is expected to be completed in late 2024. As indicated in Section 3.8.2, it is anticipated that the community-wide transit mode share will increase to 32% by 2031 as a result of this extension.

4.1.2 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. The 1515 Earl Armstrong Road TIA (Arcadis IBI Group, March 2023) analyzed the cumulative traffic impacts of developments within the Riverside South community, as well as the projected impact of the Trillium Line Extension, and estimated that a linear background traffic growth rate of 2% would adequately account for all traffic growth along Limebank Road. For consistency, a 2% growth rate has been used for this study and has been applied to Limebank Road.

To establish the anticipated growth rate along Leitrim Road, the traffic volume projections from the Leitrim Road Realignment and Widening Planning and Environmental Assessment Study Environment Study Report (ESR) were referenced. Multiple scenarios were developed as part of the ESR, but Scenario 10 is expected to be most representative of future conditions as it includes full buildout of the Riverside South community as well as the LRT extension to Riverside South. Based on Scenario 10 traffic projections, eastbound volumes along Leitrim Road are anticipated to increase at 5.7% per year while westbound volumes are anticipated to increase at 1.5% per year.

These growth rates have only been applied to through movements on arterial roadways, as well as all movements at arterial-to-arterial intersections.

4.1.3 Other Area Developments

Major background developments (with status) that would have influence on traffic volumes within the study area were previously identified in **Table 3-5**. These developments have been accounted for in the estimation of future background volume projections. These developments represent specific areas of growth within the study area and are therefore considered in addition to the general background growth rate discussed previously.

4.2 Traffic Volume Summary

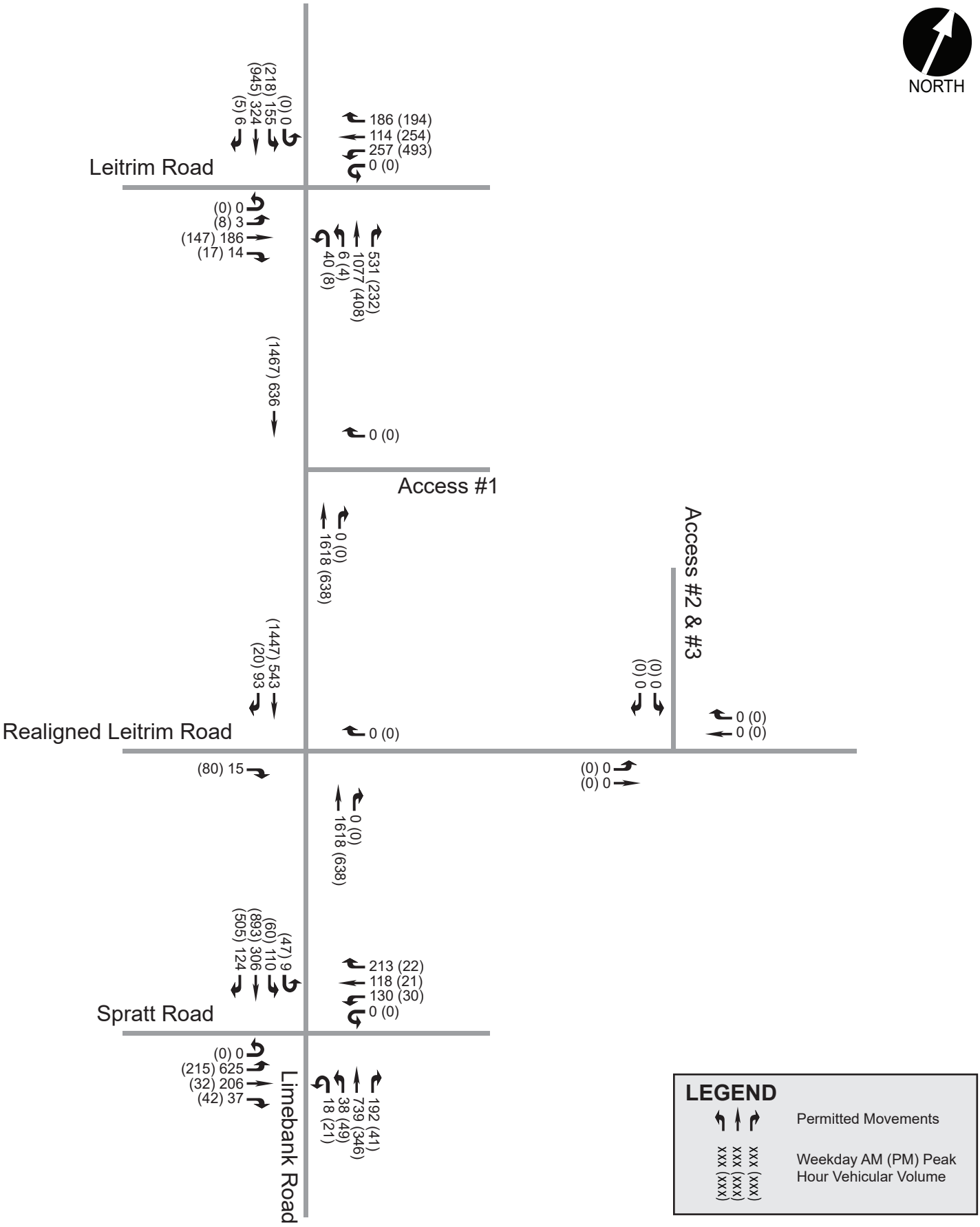
4.2.1 Future Background Traffic Volumes

Future background traffic volumes projections have been established by combining the adjacent development traffic and background traffic derived through the application of a growth rate, as discussed previously. Where necessary, the adjacent development traffic volumes were adjusted to account for the fact that this study assumes that the future Limebank & Realigned Leitrim intersection will be restricted to right-in/right-out throughout the timeframe of this study.

Exhibit 4-1 and **Exhibit 4-2** present the future background traffic volumes anticipated for the 2025 and 2030 analysis years, respectively.

4.2.2 Future Total Traffic Volumes

Future total volumes have been derived by combining the site-generated traffic volumes with future background volumes. **Exhibit 4-3** and **Exhibit 4-4** present the future total traffic volumes anticipated for the 2025 and 2030 analysis years, respectively.



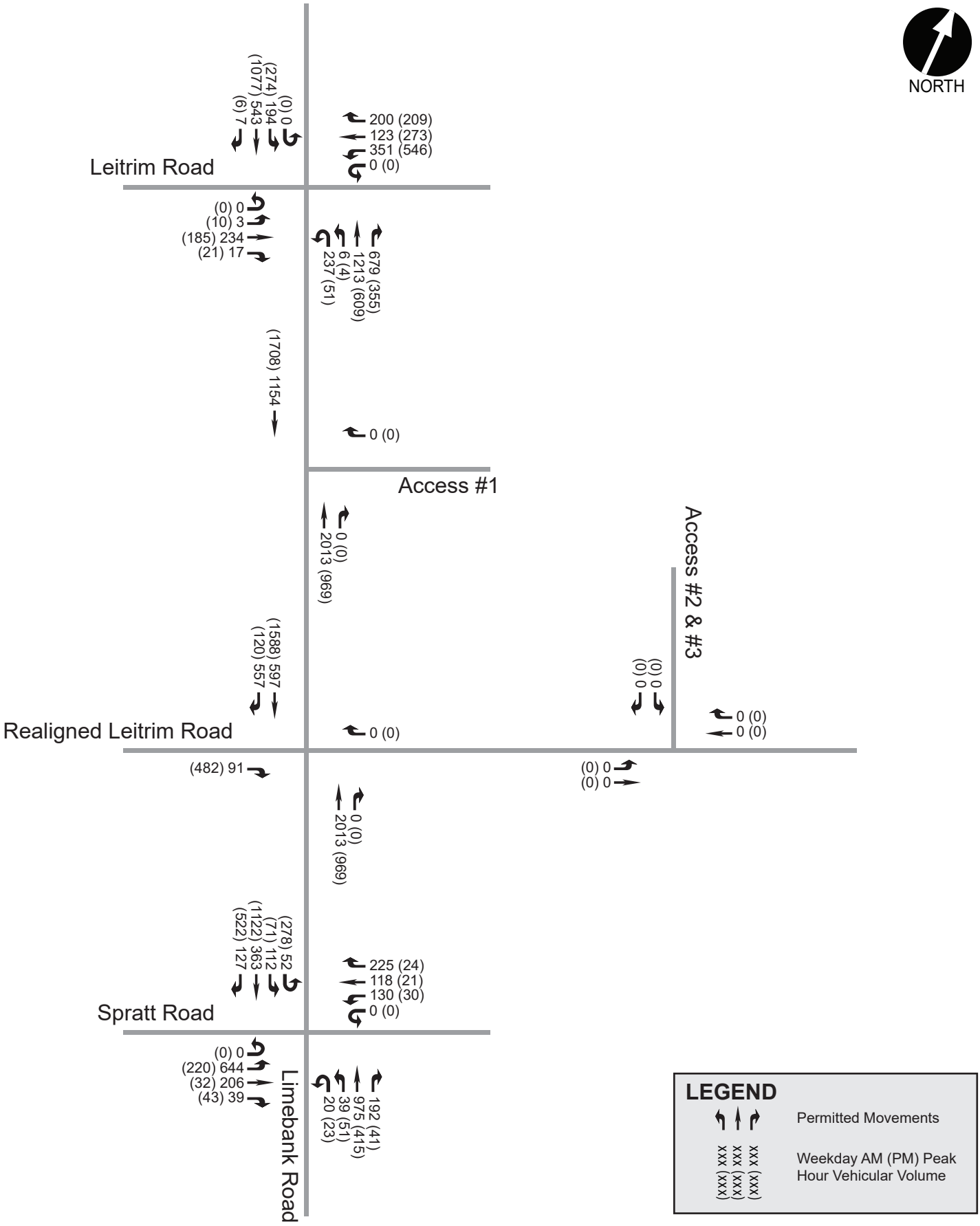
ARCADIS

4101 Limebank Road
Transportation Impact Assessment

Exhibit 4-1
Future (2025)
Background Traffic

PROJECT No. 144893

SCALE: N.T.S.



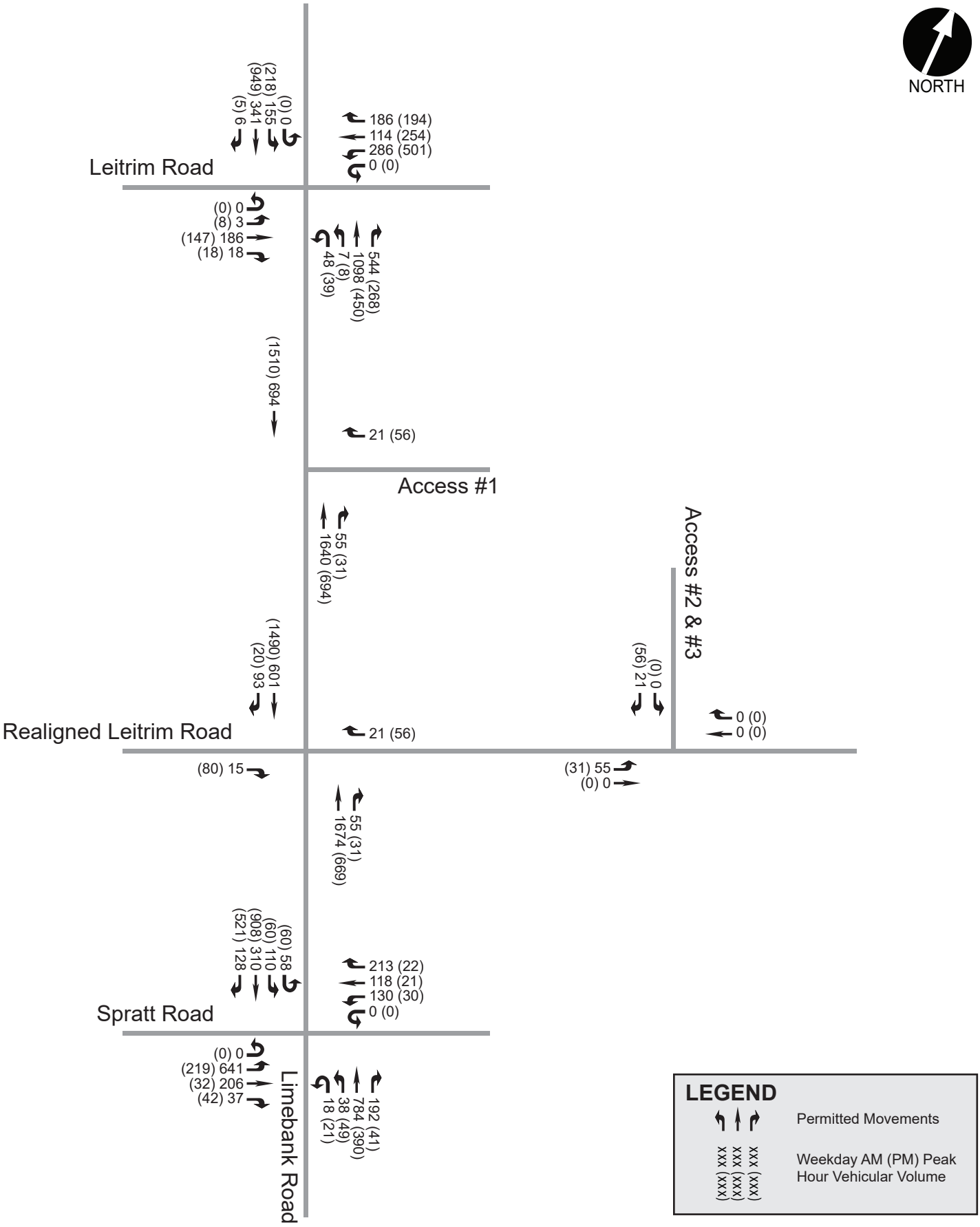
ARCADIS

4101 Limebank Road
Transportation Impact Assessment

Exhibit 4-2
Future (2030)
Background Traffic

PROJECT No. 144893

SCALE: N.T.S.



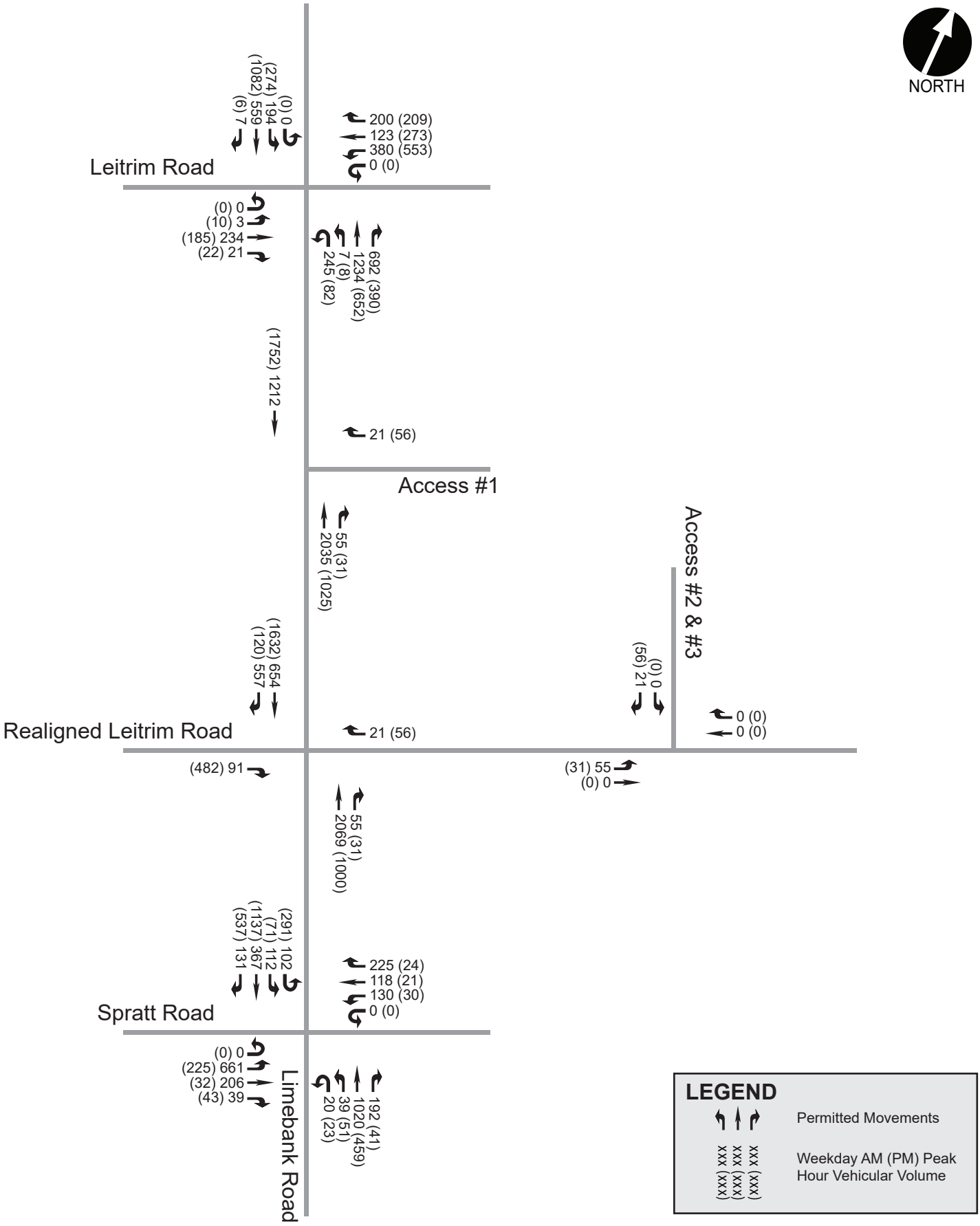
ARCADIS

4101 Limebank Road
Transportation Impact Assessment

Exhibit 4-3
Future (2025)
Total Traffic

PROJECT No. 144893

SCALE: N.T.S.



ARCADIS

4101 Limebank Road
Transportation Impact Assessment

Exhibit 4-4
Future (2030)
Total Traffic

PROJECT No. 144893

SCALE: N.T.S.

4.3 Development Design

4.3.1 Design for Sustainable Modes

Sidewalks have been provided throughout the site to ensure that employees and visitors walking, biking or taking transit to the site can safely access the various buildings with minimal interactions with trucks and passenger vehicles. Crosswalks will be provided where pedestrian paths cross drive aisles. A pedestrian connection will be provided between the on-site sidewalk network and the proposed sidewalk on Realigned Leitrim Road. This in turn will provide connectivity to the sidewalk on the east side of Limebank Road.

The segment of the future realigned Leitrim Road adjacent to the site will initially have an urban two-lane cross-section with sidewalks on both sides. Ultimately, it is expected that the realigned Leitrim Road may be upgraded to a four-lane 'complete street' with concrete sidewalks and cycle tracks on both sides, thereby further improving access to sustainable modes of transportation.

It is recommended that transit stops be provided at the intersection of Limebank & Realigned Leitrim in order to ensure that convenient transit service is fully available within a 400m walk of the site. However, in the absence of safe pedestrian crossings, these transit stops should only be implemented once the intersection is signalized.

The TDM-Supportive Development Design and Infrastructure Checklist was completed and is provided in **Appendix G**.

4.3.2 Circulation and Access

Initially, a 230m long portion of the realigned Leitrim Road will be constructed adjacent to the site with a two-lane urban cross-section. This road will exist solely to provide access to the westmost driveway on the southern boundary of the site. Vehicles will also be able to access the site via the right-in/right-out driveway on Limebank Road.

It is anticipated that future developments on the east side of Limebank Road will eventually extend this interim road cross-section further east. When the road is extended up to or beyond the eastern boundary of the site, a second full-movement driveway will be provided to the site.

Designated Fire Routes are provided throughout the site, as required, and comply with the minimum requirements (i.e., clear width of 6.0 metres and centreline radius of 12.0 metres). Swept path analyses were undertaken to confirm the functionality of the site using a fire truck, front-loading waste collection vehicle, heavy single-unit (HSU) trucks and a WB-20 tractor trailer. HSU trucks are the largest trucks that will be using the loading docks of the 33 industrial condo units while WB-20 tractor trailers are the largest trucks that will be using the loading docks of the three warehouse buildings. The results of this analysis are provided in **Appendix H**.

4.3.3 New Street Networks

Not Applicable: The New Street Networks element is exempt from this TIA, as indicated in **Table 3-13**. This element is not required for Site Plan Control (SPC) applications.

4.4 Parking

4.4.1 Parking Supply

Based on the size of the proposed development and the provisions for Area C of the Zoning By-law, a minimum of 256 vehicle parking spaces and 59 bicycle parking spaces must be provided by the proposed development. The site proposes 256 vehicle parking spaces, and 63 bicycle parking spaces. The proposed parking supply is therefore within the permissible range, as prescribed in the Zoning By-law.

The drive aisles within the site will range in width from 7.0m up to a maximum width of 20.0m adjacent the large WB-20 tractor-trailer loading docks. The Zoning By-law indicates that drive aisles adjacent to 90-degree parking spaces require a minimum adjacent drive aisle width of 6.7m, while a minimum of 6.0m is permitted for two-way drive aisles not adjacent to parking spaces. The proposed drive aisles therefore meet the Zoning By-law requirements.

The Zoning By-law and Accessibility Design Standards also specify the minimum dimensions for different parking spaces:

- Regular parking spaces: 2.6m by 5.2m
- Type ‘A’ accessible parking spaces: 3.4m by 5.2m with adjacent 1.5m wide access aisle
- Type ‘B’ accessible parking spaces: 2.4m by 5.2m with adjacent 1.5m wide access aisle

All proposed parking spaces meet the above minimum dimensions.

4.5 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.

4.5.1 Context for TDM

As described in the Scoping section of this report, the mode share targets established for this proposed development were based on the existing mode share distribution for employment land uses in the area and adjusted to account for the unique characteristics and context of this site

4.5.2 Need and Opportunity

To promote the use of transit by employees of the site, direct pedestrian connections between the existing sidewalks on Limebank Road and the on-site buildings will be provided to allow transit-users to walk from the bus stops on Limebank Road to the on-site buildings, and vice versa. A comprehensive suite of TDM measures will be required to encourage employees to use non-auto modes of transportation to travel to/from the site, though the land use, context and location of the site present a major barrier to reduction of automobile trips.

4.5.3 TDM Program

The proposed development conforms to the City's TDM principles by providing convenient and direct connections to adjacent pedestrian, cycling, and transit facilities where available.

The City of Ottawa's TDM Measures Checklist was completed for the proposed development and provided in **Appendix G**. This checklist indicates measures that are being contemplated as part of this development. Several notable TDM measures will be implemented, including:

- Designating a TDM program coordinator;
- Displaying local area maps with walking/cycling routes and key destinations;
- Displaying transit schedules and route maps at entrances; and
- Providing new employees a multimodal travel information package.

4.6 Collision Analysis

A summary of all reported collisions within the study period over the past five years was presented in Section 3.2.1.4. The City requires a safety review if at least six collisions of a discernible pattern have occurred over the study period. Based on these criteria, rear-end collisions at the Limebank & Spratt intersection warrant further review.

Limebank & Spratt Intersection

Four of the six rear-end collisions occurred under dark or dusk lighting conditions which may be a reflection of driver behaviour during nighttime conditions, particularly as the collisions that occurred under these conditions involved drivers travelling too fast for the conditions, failing to yield the right of way and following too closely. Half of the rear-end collisions involved right-turning traffic as a result of the significant speed differential of this turning movement, while the remainder involved through traffic.

4.7 Neighbourhood Traffic Management

Not Applicable: The Neighbourhood Traffic Management module is exempt from this TIA, as defined in the study scope. This module is not required for development applications that do not rely on local or collector streets for access.

4.8 Transit

4.8.1 Route Capacity

Not Applicable: The Transit Route Capacity module is exempt from this TIA, as defined in the study scope. This module is not required for development applications that generate fewer than 75 transit trips.

4.8.2 Transit Priority Measures

The addition of site-generated traffic to the existing study area intersections is anticipated to increase average intersection delays by up to 3s. As such, no transit priority measures are deemed necessary as a consequence of this development.

4.9 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 development applications that generate less than 200 person-trips.

4.10 Future Multi-Modal Level of Service

Segment- and intersection-based MMLOS analysis has been completed to assess future conditions. The existing conditions analysis is summarized in Section 3.8. Future conditions have only been evaluated for roadway segments and intersections that are expected to be modified in the future, or for new roadway segments and intersections.

4.10.1 Segment-Based MMLOS

It is not anticipated that Limebank Road will be reconstructed within the timeframe of this study. As such, the future MMLOS results will be the same as the existing MMLOS results.

Segment-based MMLOS results for the portion of realigned Leitrim Road adjacent to the proposed development is provided in **Table 4-1**.

Table 4-1 Future Segment-based MMLOS Results

Segment	Travel Mode	Side	Overall LOS	Critical LOS	Target	Deviation
Realigned Leitrim Road	Pedestrian	West	D	D	D	0
		East	D	D		0
	Bicycle	West	D	D	D	0
		East	D	D		0
	Transit	West	C	-	E	+2
		East	C			+2

The interim two-lane urban road configuration for realigned Leitrim Road is expected to meet all of its MMLOS targets.

4.10.2 Intersection-Based MMLOS

It is not expected that any of the existing signalized intersections will be reconstructed within the timeframe of this study. Refer to Section 3.8.2 for the MMLOS analysis results of the existing intersections.

The timing for the signalization of the Limebank & Realigned Leitrim intersection is unknown and therefore supplemental analysis has been completed to assess a scenario in which this intersection is signalized at the horizon year of this study. MMLOS analysis has been completed for this scenario and the results are provided in Section 4.12.3.

4.11 Intersection Operational Review

4.11.1 Intersection Control

The following section evaluates the need to conduct traffic signal warrant analyses and roundabout analyses at any applicable study area intersections. The results of the intersection control warrants discussed below are provided in **Appendix I**.

4.11.1.1 Traffic Signal Warrants

Traffic signal warrant analysis was completed for the Limebank & Realigned Leitrim intersection under Future (2030) Background Traffic conditions. The turning movement volumes presented in Section 4.2.2 were adjusted to account for the left-turn volumes that would utilize the intersection if full-movements were possible rather than being restricted to right-in/right-out. Assuming the Riverside South Business Park is approximately 85% built-out by 2030, the results of the traffic signal warrant analysis indicate that traffic signals will be warranted at this intersection. Should the build-out of the Business Park be slower than anticipated, it is probable that traffic signals will not be warranted by 2030.

4.11.1.2 Roundabout Analysis

The City's Roundabout Implementation Policy indicates that intersections that satisfy any of the following criteria should be screened utilizing the Roundabout Initial Feasibility Screening Tool:

- At any new City intersection;
- Where traffic signals are warranted; and
- At intersections where capacity or safety problems are being experienced.

The results of the Roundabout Initial Feasibility Screening Tool indicate that a roundabout is technically feasible, however, as the Leitrim Road Realignment EA recommends traffic signals at this location a roundabout will not be considered.

4.11.2 Intersection Capacity Analysis Criteria

In qualitative terms, Level of Service (LOS) describes a user's perception of the operational conditions of a transportation facility. For vehicular LOS, these conditions are generally defined in terms of delay, speed and travel time, freedom to maneuver, traffic interruptions, safety, comfort and convenience. The two key metrics used to evaluate vehicular LOS are as follows:

- **Volume to Capacity (v/c) Ratio:** The ratio of traffic volume (either measured or forecast) to the capacity of the intersection or roadway.
- **Average Delay:** The average elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line, including the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position.

LOS is given a letter designation 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 facility is operating beyond its theoretical capacity.

For signalized intersections, the City of Ottawa has developed criteria for signalized intersections as part of the TIA Guidelines which directly relate the v/c ratio to a LOS designation. In contrast, the LOS for unsignalized intersections is based on average delay using the criteria outlined in the Highway Capacity Manual (HCM) 2010. These criteria are presented in **Table 4-3** below.

Table 4-2 Level of Service Thresholds

Level Of Service	Signalized	Unsignalized
	v/c Ratio	Delay (Seconds per Vehicle)
A	0 to 0.60	<10
B	0.61 to 0.70	>10 and <15
C	0.71 to 0.80	>15 and <25
D	0.81 to 0.90	>25 and <35
E	0.91 to 1.00	>35 and <50
F	> 1.00	>50

The LOS target throughout the study area is LOS 'E' or better.

4.11.3 Intersection Capacity Analysis Results

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 of existing conditions utilized a Peak Hour Factor (PHF) of 0.90, while analysis of future conditions considers optimized signal timing plans and the use of a Peak Hour Factor (PHF) of 1.0 to recognize peak spreading beyond a 15-minute period in congested conditions.

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

The subsequent sections present the results of the intersection capacity analysis. All tables summarize study area intersection LOS results during the weekday morning and weekday afternoon peak hour periods.

The intersection capacity analysis reports have been provided in **Appendix F**.

4.11.3.1 Future (2025) Background Traffic

Intersection capacity analysis has been undertaken using the Future (2025) Background Traffic volumes presented previously in **Exhibit 4-1**. The results of the intersection capacity analysis are summarized below.

Table 4-3 Intersection Capacity Analysis Results: Future (2025) Background Traffic

Intersection	Traffic Control	Peak Hour	Overall LOS (v/c or Delay)	Critical Movements (v/c or Delay)
Limebank & Leitrim	Signalized	AM	C (0.74)	NBT (0.80)
		PM	B (0.66)	WBL (0.72)
Limebank & Realigned Leitrim	Unsignalized[1]	AM	A (10.0s)	EBR (10.0s)
		PM	C (17.3s)	EBR (17.3s)
Limebank & Spratt	Signalized	AM	C (0.73)	EBL (0.80)
		PM	B (0.61)	SBT (0.70)

[1] *It is assumed that this site access will be configured as a right-in/right-out access throughout the timeframe of this study.*

Based on the above results, both existing signalized intersections will function at an acceptable Level of Service (i.e., LOS 'E' or better) under Future (2025) Background Traffic conditions. The right-in/right-out access to the Riverside South Business Park (i.e., future Limebank & Realigned Leitrim) will also operate at an acceptable Level of Service.

4.11.3.2 Future (2030) Background Traffic

Intersection capacity analysis has been undertaken using the Future (2030) Background Traffic volumes presented previously in **Exhibit 4-2**. The results of the intersection capacity analysis are summarized below.

Table 4-4 Intersection Capacity Analysis Results: Future (2030) Background Traffic

Intersection	Traffic Control	Peak Hour	Overall LOS (v/c or Delay)	Critical Movements (v/c or Delay)
Limebank & Leitrim	Signalized	AM	B (0.64)	**NBL (1.19)**
		PM	C (0.79)	WBL (0.80)
Limebank & Realigned Leitrim	Unsignalized[1]	AM	B (10.9s)	EBR (10.9s)
		PM	**F (243.7s)**	**EBR (243.7s)**
Limebank & Spratt	Signalized	AM	D (0.81)	NBT (0.88)
		PM	D (0.89)	SBL (0.89)

[1] *It is assumed that this site access will be configured as a right-in/right-out access throughout the timeframe of this study.*

For the purposes of this study, it is assumed that approximately 85% of the Riverside South Business Park will be built-out by 2030, although in reality the buildout rate of this development will be dependent on market conditions and it may not reach this level of buildout by 2030. At this level of buildout, heavy traffic demand exiting the Riverside South Business Park will result in significant delays at the right-in/right-out access during the weekday afternoon peak hour. Additionally, the right-in/right-out restrictions are anticipated to result in a high volume of motorists completing U-turn movements at the intersection of Limebank & Leitrim resulting in capacity issues at this intersection as well.

As discussed in Section 4.11.1, it is anticipated that once the Riverside South Business Park is approximately 85% built-out it will generate sufficient traffic to warrant the signalization of this intersection. Supplemental analysis has been completed to assess traffic operations at the study area intersections assuming this intersection were signalized prior to 2030 and the results are discussed in Section 4.12.

4.11.3.3 Future (2025) Total Traffic

Intersection capacity analysis has been undertaken using the Future (2025) Total Traffic volumes presented previously in **Exhibit 4-3**. The results of the intersection capacity analysis are summarized below.

Table 4-5 Intersection Capacity Analysis Results: Future (2025) Total Traffic

Intersection	Traffic Control	Peak Hour	Overall LOS (v/c or Delay)	Critical Movements (v/c or Delay)
Limebank & Leitrim	Signalized	AM	C (0.76)	NBT (0.81)
		PM	C (0.72)	WBL (0.75)
Limebank & Site Access	Unsignalized[1]	AM	C (17.0s)	WBR (17.0s)
		PM	B (11.0s)	WBR (11.0s)
Limebank & Realigned Leitrim	Unsignalized[2]	AM	C (17.3s)	WBR (17.3s)
		PM	C (17.8s)	EBR (17.8s)
Limebank & Spratt	Signalized	AM	C (0.76)	EBL (0.81)
		PM	B (0.62)	SBT (0.71)

[1] *Right-in/right-out access.*

[2] *It is assumed that this site access will be configured as a right-in/right-out access throughout the timeframe of this study.*

The results of the intersection capacity analysis suggest that the addition of site-generated traffic to the study area intersection will only have a minor impact on traffic operations.

4.11.3.4 Future (2030) Total Traffic

Intersection capacity analysis has been undertaken using the Future (2030) Total Traffic volumes presented previously in **Exhibit 4-4**. The results of the intersection capacity analysis are summarized below.

Table 4-6 Intersection Capacity Analysis Results: Future (2030) Total Traffic

Intersection	Traffic Control	Peak Hour	Overall LOS (v/c or Delay)	Critical Movements (v/c or Delay)
Limebank & Leitrim	Signalized	AM	B (0.65)	**NBL (1.21)**
		PM	D (0.83)	NBL (0.87)
Limebank & Site Access	Unsignalized[1]	AM	C (21.6s)	WBR (21.6s)
		PM	B (12.9s)	WBR (12.9s)
Limebank & Realigned Leitrim	Unsignalized[2]	AM	C (22.1s)	WBR (22.1s)
		PM	**F (265.4s)**	**EBR (265.4s)**
Limebank & Spratt	Signalized	AM	D (0.84)	NBT (0.90)
		PM	**E (0.91)**	**SBL (0.91)**

[1] *Right-in/right-out access.*

[2] *It is assumed that this site access will be configured as a right-in/right-out access throughout the timeframe of this study.*

As observed under Future (2030) Background Traffic, significant delays are projected on the eastbound approach of the future Limebank & Realigned Leitrim intersection. These delays are due to the traffic generation by the adjacent Riverside South Business Park.

The northbound left-turn movement at the Limebank & Leitrim intersection is expected to experience capacity issues under Future (2030) Total Traffic conditions, and the southbound left-turn movement at the Limebank & Spratt intersection will begin to approach its theoretical capacity. These capacity issues are due to the heavy volume of U-turn traffic demand that will be generated by the adjacent Riverside South Business Park. Once the Limebank & Realigned Leitrim intersection is reconstructed as a signalized intersection, it is expected that these capacity issues will be resolved.

None of the intersection capacity issues noted above are a result of site-generated traffic. These capacity issues are due to background traffic demand.

As discussed previously, supplemental analysis has been completed to assess the impact signalizing the Limebank & Realigned Leitrim intersection would have on traffic operations at the study area intersections.

4.12 Supplemental Analysis

Due to the uncertainly regarding the pace of development for the Riverside South Business Park, it is unknown when the Limebank & Realigned Leitrim intersection will warrant signalization. The intersection capacity analysis summarized in Section 4.11, therefore, has assumed that this intersection would remain as a right-in/right-out intersection throughout the timeframe of this study. This section summarizes the supplemental analysis which has been completed to determine the impact of signalizing the Limebank & Realigned Leitrim intersection on the study area intersections.

Alternative Future (2030) Background & Total Traffic volume projections have been prepared for the study area intersections for the supplemental analysis. With the Limebank & Realigned Leitrim intersection configured as a right-in/right-out intersection, a large volume of traffic from both the proposed development as well as the adjacent Riverside South Business Park would be required to make U-turn movements at the two existing signalized intersections. With the signalization of the Limebank & Realigned Leitrim intersection, it would be possible for this traffic to turn left directly onto Limebank Road from their respective site accesses instead.

Additionally, it is expected that bus stops will be provided adjacent to the site when the Limebank & Realigned Leitrim intersection signalized. This is expected to increase the attractiveness of transit as a travel mode for employees. Considering the similarity between the characteristics and context of this site and the proposed Riverside South Business Park development on the west side of Limebank Road, the mode share targets adopted for the Riverside South Business Park development have been similarly adopted for the proposed development as well for the purposes of this supplemental analysis.

Intersection capacity analysis has been completed using these alternative traffic volume projections in accordance with the methodology and criteria outlined in Section 4.11. The subsequent sections present the results of the intersection capacity analysis.

MMLOS analysis has also been completed for this new signalized intersection and the results are presented below.

The intersection capacity analysis reports and MMLOS analysis results have been provided in **Appendix F** and **Appendix E**, respectively.

4.12.1 Future (2030) Background Traffic

Intersection capacity analysis has been undertaken using the alternative Future (2030) Background Traffic volume which accounts for the impact signalizing the Limebank & Realigned Leitrim intersection would have on traffic patterns within the study area. The results of the intersection capacity analysis are summarized below.

Table 4-7 Intersection Capacity Analysis Results: Future (2030) Background Traffic, Supplemental Analysis

Intersection	Traffic Control	Peak Hour	Overall LOS (v/c or Delay)	Critical Movements (v/c or Delay)
Limebank & Leitrim	Signalized	AM	D (0.86)	NBT (0.88)
		PM	C (0.73)	WBL (0.79)
Limebank & Realigned Leitrim	Signalized[1]	AM	B (0.68)	NBT (0.68)
		PM	D (0.88)	EBL (0.88)
Limebank & Spratt	Signalized	AM	D (0.83)	NBT (0.86)
		PM	B (0.69)	SBT (0.78)

[1] *It is assumed that the intersection would be configured with left-turn lanes on all approaches, two through lanes and right-turn lanes on the northbound and southbound approaches, and a shared through-right lane on the eastbound and westbound approaches.*

As illustrated above, the signalization of the Limebank & Realigned Leitrim is expected to significantly improve traffic operations at the intersection, while also reducing traffic demand at the two existing intersections.

4.12.2 Future (2030) Total Traffic

Intersection capacity analysis has been undertaken using the alternative Future (2030) Total Traffic volumes which account for the impact signalizing the Limebank & Realigned Leitrim intersection would have on traffic patterns within the study area. The results of the intersection capacity analysis are summarized below.

Table 4-8 Intersection Capacity Analysis Results: Future (2030) Total Traffic, Supplemental Analysis

Intersection	Traffic Control	Peak Hour	Overall LOS (v/c or Delay)	Critical Movements (v/c or Delay)
Limebank & Leitrim	Signalized	AM	D (0.87)	WBL (0.89)
		PM	C (0.73)	WBL (0.80)
Limebank & Site Access	Unsignalized[1]	AM	C (18.4s)	WBR (18.4s)
		PM	B (12.2s)	WBR (12.2s)
Limebank & Realigned Leitrim	Unsignalized[2]	AM	B (0.66)	NBT (0.66)
		PM	D (0.89)	EBL (0.89)
Limebank & Spratt	Signalized	AM	D (0.83)	NBT (0.87)
		PM	B (0.70)	SBT (0.78)

[1] *Right-in/right-out access.*

[2] *It is assumed that the intersection would be configured with left-turn lanes on all approaches, two through lanes and right-turn lanes on the northbound and southbound approaches, and a shared through-right lane on the eastbound and westbound approaches.*

As observed under background traffic conditions, the signalization of the Limebank & Realigned Leitrim is expected to improve traffic operations under total traffic conditions as well. All study area intersections are expected to operate at an acceptable Level of Service (i.e., LOS 'E' or better) following the signalization of this intersection.

4.12.3 MMLOS Analysis

Intersection-based MMLOS analysis results for the signalized intersection of Limebank & Realigned Leitrim Road are summarized in **Table 4-10**. The analysis assumes that the intersection is constructed to protected intersection standards.

Table 4-9 Future Intersection-based MMLOS Results, Supplemental Analysis

Intersection	Travel Mode	Overall LOS	Critical LOS	Target	Deviation
Limebank & Realigned Leitrim	Pedestrian	C	D	D	+1
	Bicycle	B	D	D	+2
	Transit	B	C	E	+3
	Auto	C	-	E	+2

As a signalized intersection, the future Limebank & Realigned Leitrim intersection is expected to meet all its MMLOS targets.

4.13 Geometric Review

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

4.13.1 Sight Distance and Corner Clearance

The proposed site accesses are located along straight segments of Limebank Road and the future realigned Leitrim Road with clear sightlines in both directions.

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads indicates that a minimum corner clearance of 70m should be provided between a signalized intersection and a downstream private approach. The right-in/right-out access on Limebank Road will have a corner clearance of approximately 200m from the future signalized intersection of Limebank & Realigned Leitrim, thereby exceeding the minimum requirements.

The guidelines further recommend that private approaches upstream of a signalized intersection should be positioned in advance of the left-turn lane taper if possible. Under future interim conditions (i.e., temporary two-lane road), the westbound left-turn lane of the future signalized intersection of Limebank & Realigned Leitrim is anticipated to extend up to 115m in length (including the taper) while under ultimate conditions (i.e., four-lane realigned Leitrim Road) the dual westbound left-turn lanes will extend up to 180m in length (including the taper). The westernmost access on realigned Leitrim Road will be located approximately 230m upstream of the intersection and therefore meets the corner clearance requirements.

4.13.2 Clear Throat Length

The TAC Geometric Design Guide for Canadian Roads indicates that a minimum clear throat length of 60m is required for driveways on arterial roads for a development of this size. The clear throat length is measured from edge of the roadway to the point of first conflict on site. The clear throat length available at each of the site accesses is as follows:

- Access #1 (right-in/right-out driveway on Limebank Road): **45m**
- Access #2 (westernmost driveway on Realigned Leitrim Road): 80m
- Access #3 (easternmost driveway on Realigned Leitrim Road): **53m**

As illustrated above, the minimum clear throat length requirement is met for Access #2, but Access #1 and #3 are short of the minimum requirement by 7-15m.

The critical time period for Access #1 is the weekday morning peak hour when approximately 41 passenger vehicles and four trucks are expected to turn right into the site. Access #3 is expected to accommodate approximately half as much traffic as Access #1. If a temporary on-site blockage were to occur due to parking maneuver and cause queueing at either access, it would take approximately 5 minutes for the queue in Access #1 to spillback onto Limebank Road and more than 10 minutes for the queue in Access #3 to spillback onto Realigned Leitrim Road. As it is unlikely that on-site blockage would be present for this amount of time, it is expected that the substandard clear throat lengths will be sufficient to accommodate the expected traffic demands of this specific site.

Once the Limebank & Realigned Leitrim intersection is signalized, it is expected that traffic entering via Access #1 will decrease and traffic entering Access #3 will increase. Under this scenario, it would take approximately 14 minutes and 8 minutes for queues at Access #1 and #3, respectively, to spillback to the public roadway. Again, as it is unlikely that on-site blockages would be present for this amount of time, it can be concluded that sufficient clear throat length has been provided.

4.13.3 Auxiliary Lane Analysis

Auxiliary turning lane requirements for all intersections within the study area are described below. All results are based on Future (2031) Total Traffic conditions.

4.13.3.1 Signalized Auxiliary Left-Turn Requirements

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

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

Where:
N = number of vehicles per hour
L = Length occupied by a vehicle in the queue = 7 m
C = number of traffic signal cycles per hour

The results of the auxiliary left-turn lane analysis are summarized below in **Table 4-11**.

Table 4-10 Auxiliary Left-Turn Storage Analysis at Signalized Intersections: Future (2030) Total Traffic

Intersection	Approach	95th Percentile Queue Length (m)	Maximum Calculated Queue (m)	Existing/Future Parallel Lane Length (m)	Storage Deficiency (m)
Limebank & Leitrim	NB	45	55	195	-
	SB	55	60	210	-
	EB	5	5	130	-
	WB	95	125	120	5
Limebank & Realigned Leitrim (Interim Configuration)	NB	30	85	105[1]	-
	SB	20	20	-[2]	20
	EB	120	100	125[1]	-
	WB	20	15	-[2]	20
Limebank & Spratt	NB	20	20	205	-
	SB	65	90	255	-
	EB	135	185	100	85
	WB	35	40	95	-

[1] *Future parallel lane lengths are based on the recommended auxiliary lane lengths from the Riverside South Employment Lands and Blocks 13, 14, Transporation Impact Assessment, Addendum #1 (Arcadis IBI Group, March 2023).*

[2] *Future parallel lane lengths have not been established for these movements yet.*

The results indicate that the westbound left-turn queues at the Limebank & Leitrim intersection may exceed the available storage by only 5m. Given the small magnitude of this queue spillback, no mitigation measures are recommended.

The eastbound left-turn queues at the Limebank & Spratt intersection are also expected to exceed the available storage capacity during the weekday peak hours. It is not possible to extend the dual left-turn lanes at this location due to the signalized entrance to Urbandale Plaza to the west. As such, no mitigation measures are recommended.

Under Future (2030) Total Traffic conditions, there is the potential that the future Limebank & Realigned Leitrim intersection will be reconstructed to an interim signalized intersection configuration. The Riverside South Employment Lands and Blocks 13, 14, Transportation Impact Assessment, Addendum #1 (Arcadis IBI Group, March 2023) has previously identified left-turn storage requirements for the northbound and eastbound left-turn lanes but has not identified the storage requirements for the southbound and westbound left-turn lanes. Based on the results of the analysis, it is recommended that a minimum of 20m of storage be provided for the southbound and westbound left-turn lanes when this interim signalized intersection is constructed. Note that these minimum storage requirements do not take into consideration the future extension of realigned Leitrim Road beyond the eastern limits of the site or any other future development that may use this road.

Note: The above storage lengths shall be considered at the design stage for these intersections. The values presented do not give consideration to deceleration or taper requirements.

4.13.3.2 Right-Turn Lane Requirements (Unsignalized Intersections)

Section 9.14 of TAC also provides guidance on the use of auxiliary right-turn lanes at unsignalized intersections and suggests that auxiliary right-turn lanes should be considered “when the volume of decelerating or

accelerating vehicles compared with the through traffic volume causes undue hazard". As large tractor-trailers will be frequently entering the site via the right-in/right-out access on Limebank Road, it is recommended that an auxiliary right-turn lane be provided at this access to allow these large vehicles to decelerate without impact through traffic on Limebank Road. A functional design has been prepared for this right-turn lane in support of a future Roadway Modification Application (RMA) and is provided in **Appendix J**.

4.13.3.3 Auxiliary Right-Turn Lane Requirements (Signalized Intersections)

For signalized intersections, Section 9.14 of 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, and may not be applicable in all circumstances. The highest of the weekday morning and afternoon peak hour volumes under Future (2030) Total Traffic conditions were considered in this evaluation. Auxiliary right-turn lane warrants were not evaluated for movements with existing right-turn lanes.

The results of the auxiliary right-turn lane analysis are summarized below in **Table 4-12** below.

Table 4-11 Auxiliary Right-Turn Lane Storage Analysis at Signalized Intersections: Future (2030) Total Traffic

Intersection	Approach	Maximum Right Turn Volume	Maximum Percentage of Vehicles Turning Right (%)	Right-Turn Lane Recommended?
Limebank & Realigned Leitrim (interim configuration)	NB	18	1%	No
	SB	320	33%	Yes
	EB	205	43%	No[1]
	WB	12	24%	No
Limebank & Spratt	EB	43	14%	No

[2] *As it is anticipated that there will be a negligible volume of eastbound through traffic at this intersection, therefore, the through lane will operate as a de facto right-turn lane.*

The results of the auxiliary right-turn lane analysis indicate that a southbound right-turn lane is warranted at the Limebank & Realigned Leitrim intersection. As indicated in the Riverside South Employment Lands and Blocks 13, 14, Transportation Impact Assessment, Addendum #1 (Arcadis IBI Group, March 2023), a minimum of 15m of storage is recommended for this right-turn lane.

4.14 Summary of Recommended Modifications

Based on the results of the intersection capacity analysis, auxiliary lane analysis and MMLOS analysis, the following modifications are recommended:

- **Limebank Road & Access #1:**
  - Provide an auxiliary right-turn lane at the site access as illustrated in **Appendix J**.
    Note: This is directly triggered by the proposed development.
- **Limebank Road & Realigned Leitrim Road:**
  - Signalize the intersection when warranted. When signalizing the intersection, construct the intersection to protected intersection standards, provide southbound and westbound left-turn lanes with a minimum of 20m of storage and provide transit stops near the intersection. Ensure that large trucks can complete right-turn maneuvers at the intersection in accordance with industry best practices. ***Note: This is triggered by background development demands and not by the proposed development.***

Additionally, it is recommended that the City consider reconstructing the existing intersections in accordance with protected intersection standards when reconstructing Limebank Road in the future.

5 Conclusion

The proposed development is expected to generate up to 103 two-way auto trips and 19 two-way truck trips during the weekday morning and afternoon peak hours. These auto and truck trips were assigned to/from the north, south, east and west based on the commuter travel patterns as well as the distribution of truck origins/destinations.

As the timing for the signalization of the Limebank & Realigned Leitrim intersection is uncertain, it was assumed that the intersection would be restricted to right-in/right-out throughout the timeframe of this study. The results of the traffic signal warrant analysis suggest that traffic signals will be warranted once the adjacent Riverside South Business Park is 85% built-out.

As indicated by the analysis conducted for this study, it is not anticipated that site-generated traffic will trigger any intersection capacity issues within the study area. However, the adjacent Riverside South Business Park is anticipated to generate some capacity issues once it is 85% built-out, unless the Limebank & Realigned Leitrim intersection is signalized. With the signalization of this intersection, all study area intersections are anticipated to operate at an acceptable Level of Service.

The review of auxiliary lane requirements at the study area intersections indicates that the future interim signalized configuration of the Limebank & Realigned Leitrim intersection will require auxiliary left-turn lanes with a minimum of 20m of storage in the southbound and westbound directions. A northbound right-turn lane is also recommended at the right-in/right-out access on Limebank Road (Access #1). A draft functional design has been prepared for this right-turn lane in support of an RMA and is provided in **Appendix J**.

Multi-Modal Level of Service analysis was conducted for the roadway segments and signalized intersections within the study area. Based on the results of the analysis, it is recommended that when the City is next reconstructing the study area intersections, that they ensure that the intersection designs adhere to protected intersection standards.

It should be noted that the above recommendations would improve mobility and comfort for all travel modes but are not required to accommodate the proposed development. Level of Service for cyclists and pedestrians is largely dictated by the size of an intersection and therefore mitigation measures are often limited in these circumstances. The proposed measures are recommended in order to address existing deficiencies and not as a direct consequence of the proposed development.

It is also recommended that new transit stops be provided at the intersection of Limebank & Realigned Leitrim to ensure adequate transit coverage for the site. However, in the absence of safe pedestrian crossings, these transit stops should only be implemented once the intersection is signalized.

All intersections were shown to operate well under their theoretical capacities within the timeframe of this study with the recommended mitigation measures. A post-development monitoring plan is therefore not a requirement of this study.

Based on the findings of this study, it is the overall opinion of Arcadis that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network with consideration of the recommendations outlined above.

Appendix A

Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

*Revised per City of Ottawa update to the TIA Guidelines, effective June 14, 2023.

1. Description of Proposed Development

Municipal Address	4101 Limebank Road
Description of Location	Northeast of Riverside South - The subject property is generally bound by Limebank Road to the west and undeveloped lands to the north, south, and east between Leitrim Road and Spratt Road.
Land Use Classification	DR – Development Reserve Zone.
Development Size (units)	N/A
Development Size (m^2)	51,796m^2 warehouse.
Number of Accesses and Locations	Two (2) right-in/right-out driveways on Limebank Road and two (2) driveways on the future realigned Leitrim Road.
Phase of Development	Single Phase
Buildout Year	2025

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


D1
5,391m²
D2
5,395m²
D3
5,584m²
C1
5,395m²
C2
5,395m²
C3
6,474m²
B1
5,395m²
B2
5,395m²
B3
6,474m²
INTERIOR SIDE YARD SETBACK
REAR YARD SETBACK
BUILDING ENTRANCE
19 LOADING DOCKS
16 LOADING DOCKS
LOADING DOCKS
INDUSTRIAL CONDOS
20-UNITS (298m2 each)
INDUSTRIAL CONDOS
13-UNITS (298m2 each)
PARKING
FRONT YARD SETBACK
MIN. 30M BUILDING SETBACK
MIN. 10M SETBACK TO PAVING
PIPELINE EASEMENT
FUTURE STREET PROPERTY LINE
FUTURE ROAD REALIGNMENT
STORM WATER MANAGEMENT DESIGNATION AS PER CDP
VEHICULAR ACCESS
VEHICULAR ACCESS
POTENTIAL FUTURE ACCESS
POTENTIAL FUTURE ACCESS
LIMEBANK RD

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 (60 person trips)	
Single-Detatched[1]	60 units	
Multi-Use Family (Low Rise)[1]	90 units	
Multi-Use Family (High-Rise)[1]	150 units	
Office[2]	1,400 m^2	
Industrial[2]	7,000 m^2	✓
Fast-food restaurant or coffee shop[2]	110 m^2	
Destination retail[2]	1,800 m^2	
Gas station or convenience market[2]	90 m^2	

** If the 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.*

[1] Table 2 Table 3 & Table 4 TRANS Trip Generation Summary Report

[2] ITE Trip Generation manual 11.1 Ed.

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 Cross-Town Bikeways?		✓
Is the development in a Design Priority Area (DPA), Transit-oriented Development (TOD) zone or Hub?*		✓

**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). Hubs are identified as Protected Major Transit Station Areas (PTMSAs) and identified in Schedule C1-Protected Major Transit Station Areas (PMTSAs).*

Based on the results above, the Location Trigger is <u>NOT</u> satisfied.

4. Safety Triggers

	Yes	No
Are the posted speed limits on a boundary street 80 km/hr or greater?	✓	
Are there any horizontal/vertical curvatures on a boundary street which limits sightlines 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 the 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?	✓	

As indicated above, the Trip Generation and Safety the triggers were satisfied. As such, a TIA Study is required for the proposed development.

Appendix B

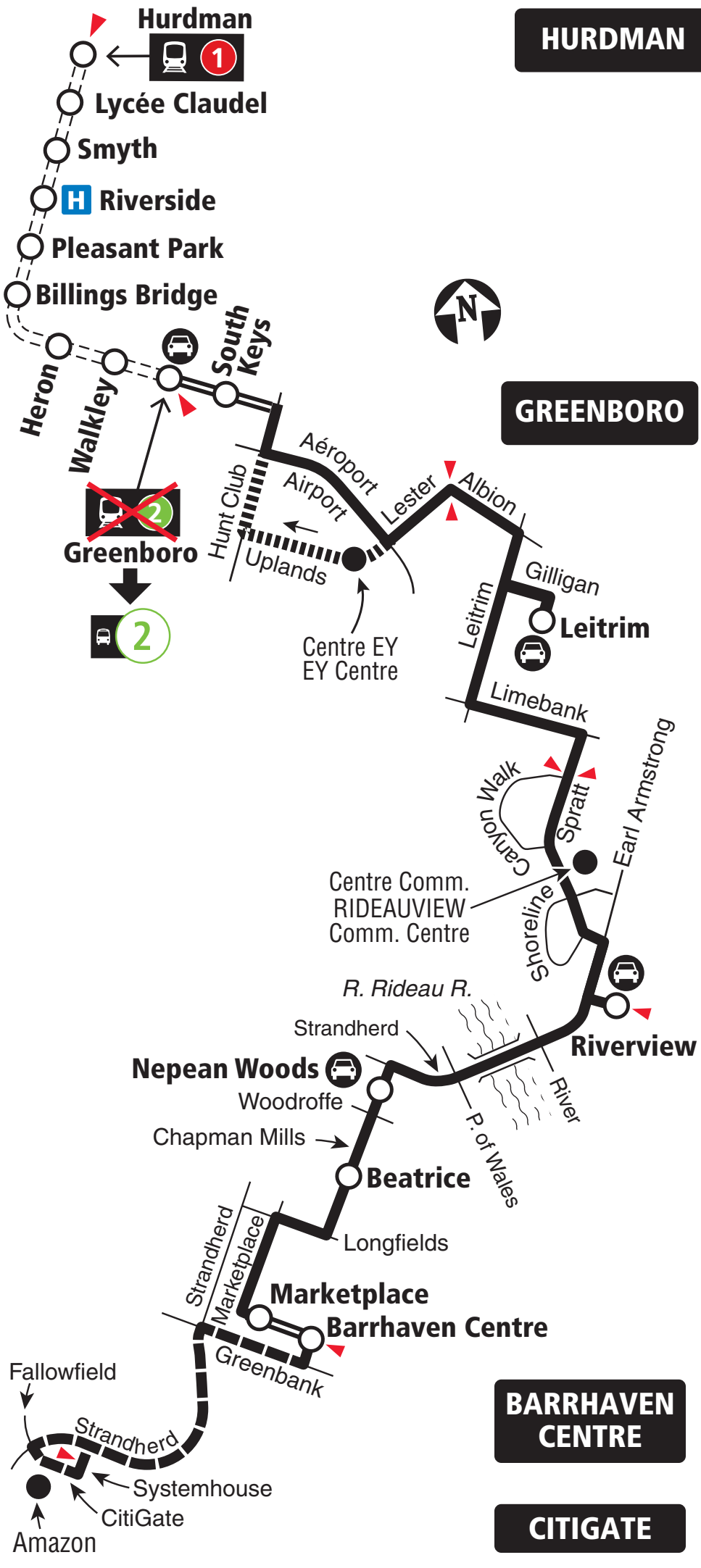
OC Transpo Routes

99 Rapide

CITIGATE
BARRHAVEN CENTRE

HURDMAN
GREENBORO

7 days a week / 7 jours par semaine



Transitway & Station

Transitway & Station
Peak period / Période de pointe

Saturday & Sunday only / Sam. et dim. seulement

Limited service / Service limité

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

2021.09

Schedule / Horaire 613-560-1000

Text / Texto* 560560

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

*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service
Service à la clientèle **613-560-5000**

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

Security / Sécurité **613-741-2478**

Effective September 5, 2021
En vigueur 5 septembre 2021

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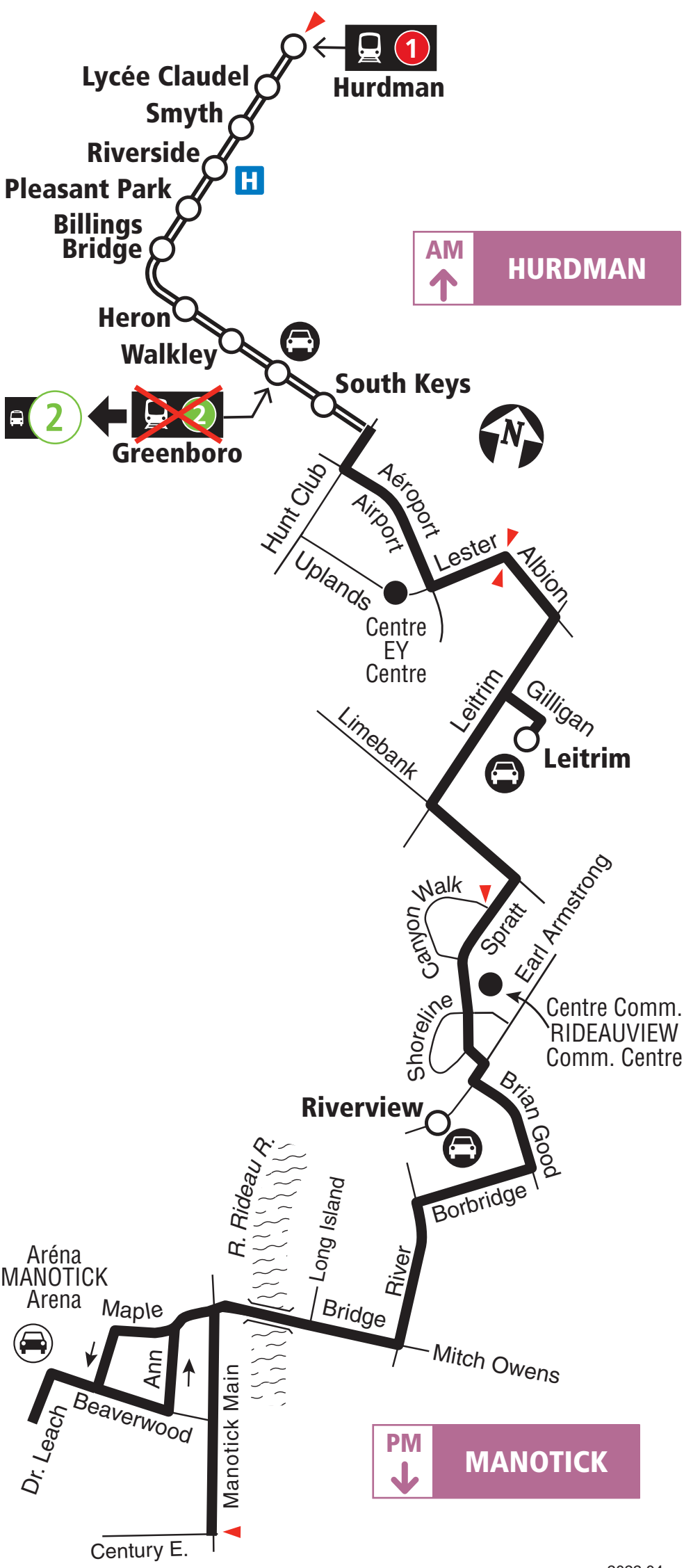
299 MANOTICK / HURDMAN

Connexion

Monday to Friday / Lundi au vendredi

Peak periods only

Périodes de pointe seulement



2022.04

Transitway & Station

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

2022.04

Schedule / Horaire 613-560-1000

Text / Texto* 560560

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

*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service
Service à la clientèle **613-560-5000**

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

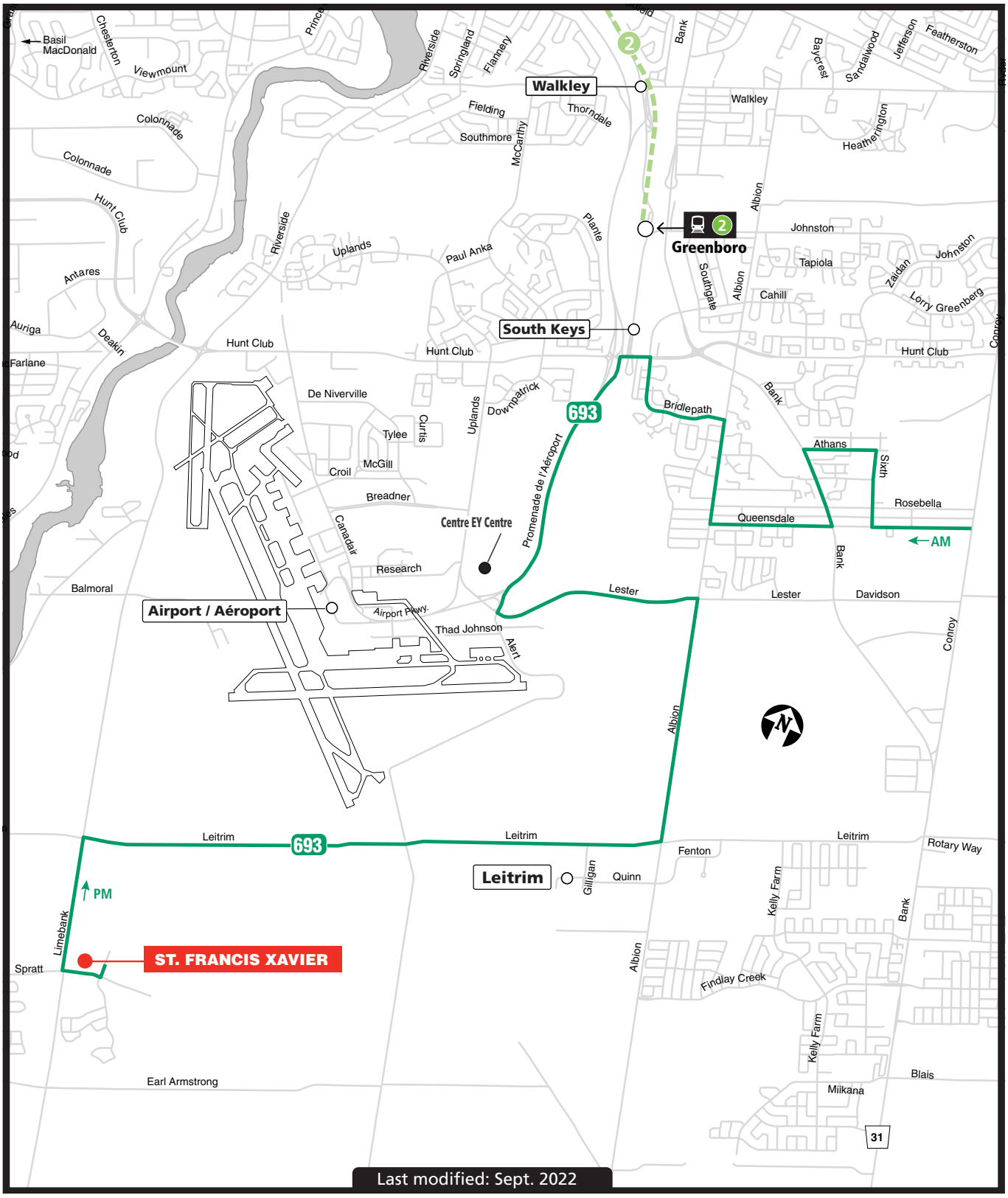
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Effective April 24, 2022

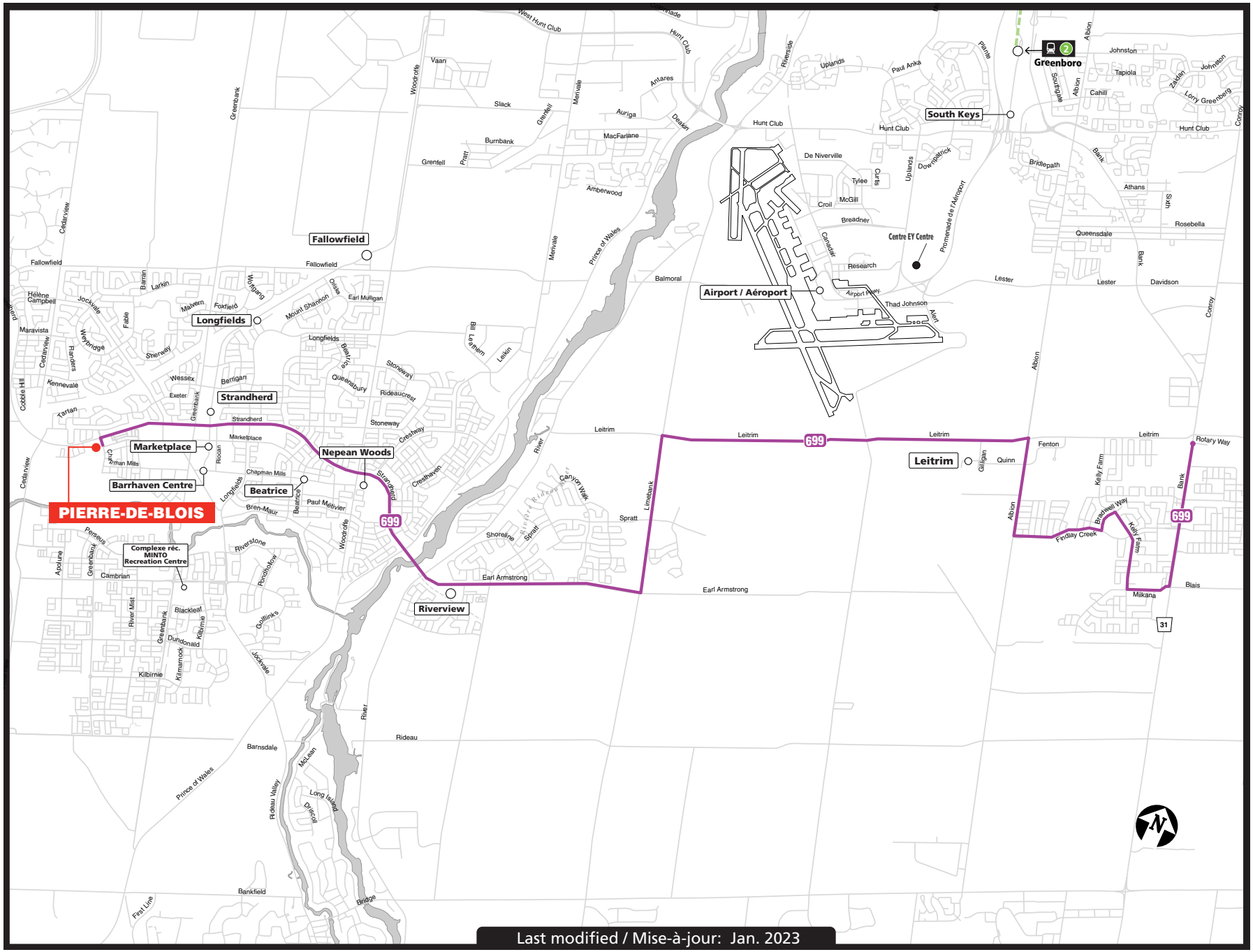
En vigueur 24 avril 2022

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Last modified: Sept. 2022


PIERRE-DE-BLOIS
Marketplace
Barrhaven Centre
Beatrice
Nepean Woods
Strandherd
Longfields
Fallowfield
Airport / Aéroport
Centre EY Centre
South Keys
Greenboro
Leitrim
Riverview
699
31
Complexe réc. MINTO Recreation Centre
Last modified / Mise-à-jour: Jan. 2023

Appendix C

Turning Movement Counts

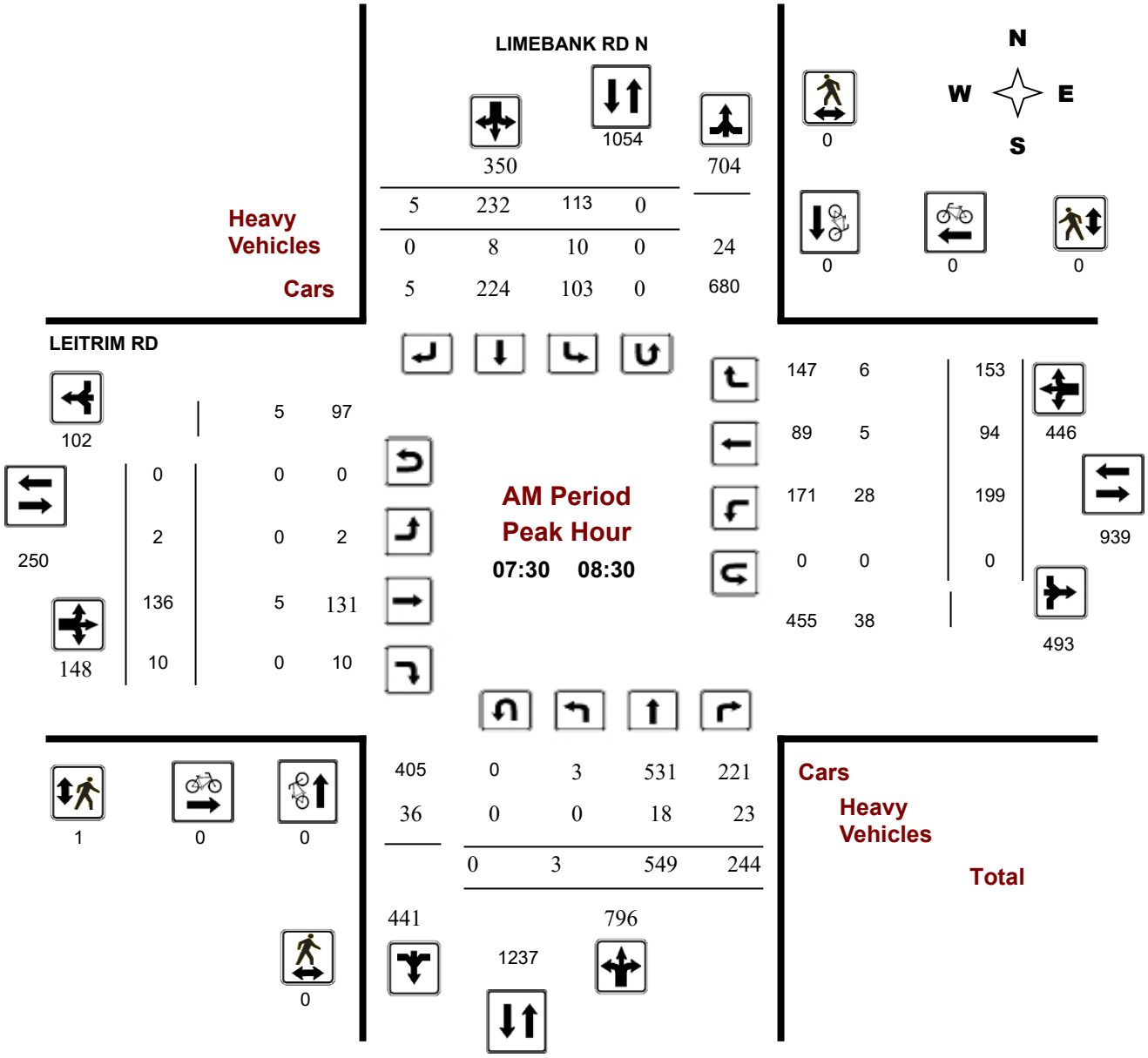
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LEITRIM RD @ LIMEBANK RD N

Survey Date: Wednesday, February 02, 2022 **WO No:** 40094

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



Comments

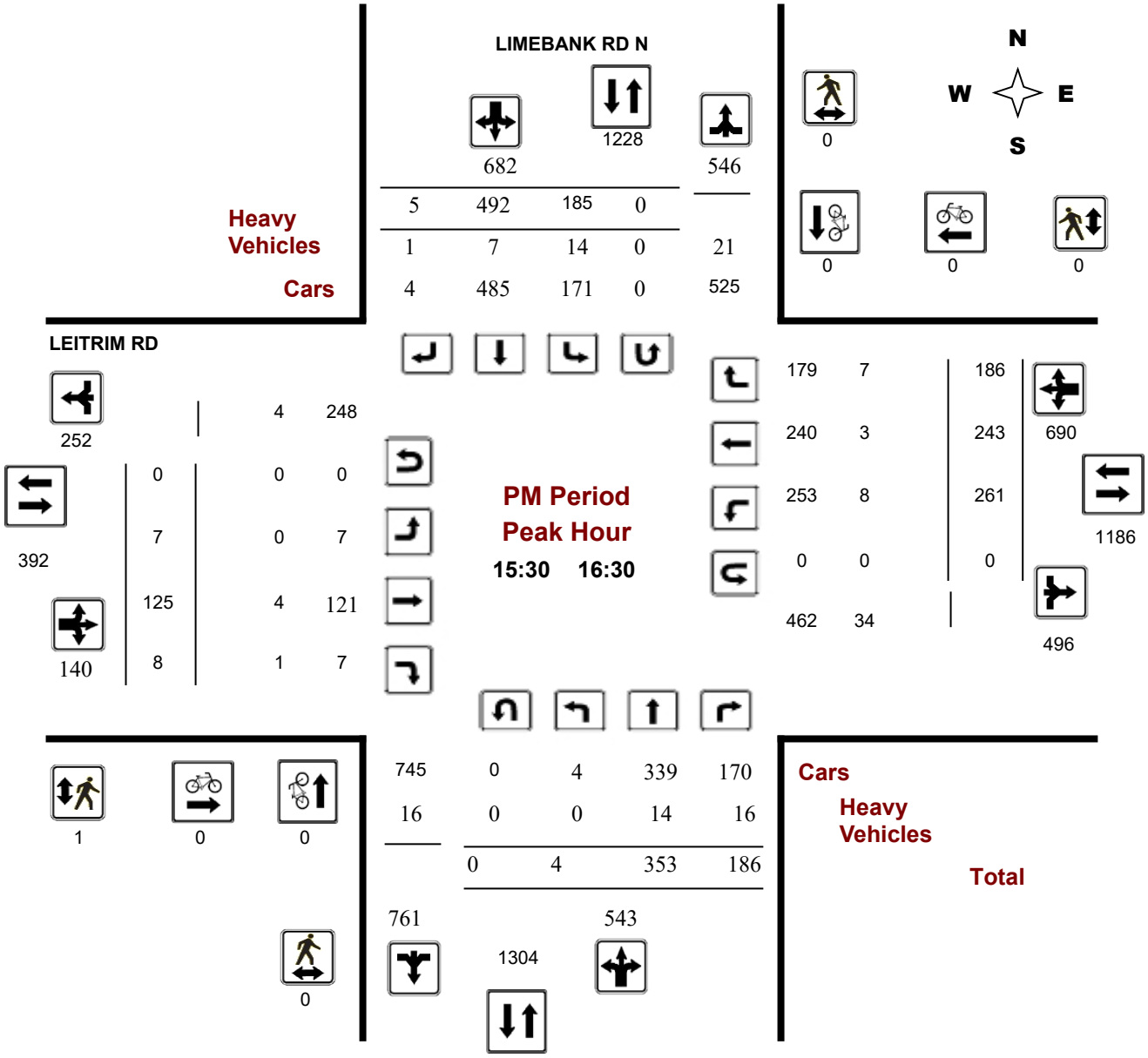
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LEITRIM RD @ LIMEBANK RD N

Survey Date: Wednesday, February 02, 2022 **WO No:** 40094

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



Comments

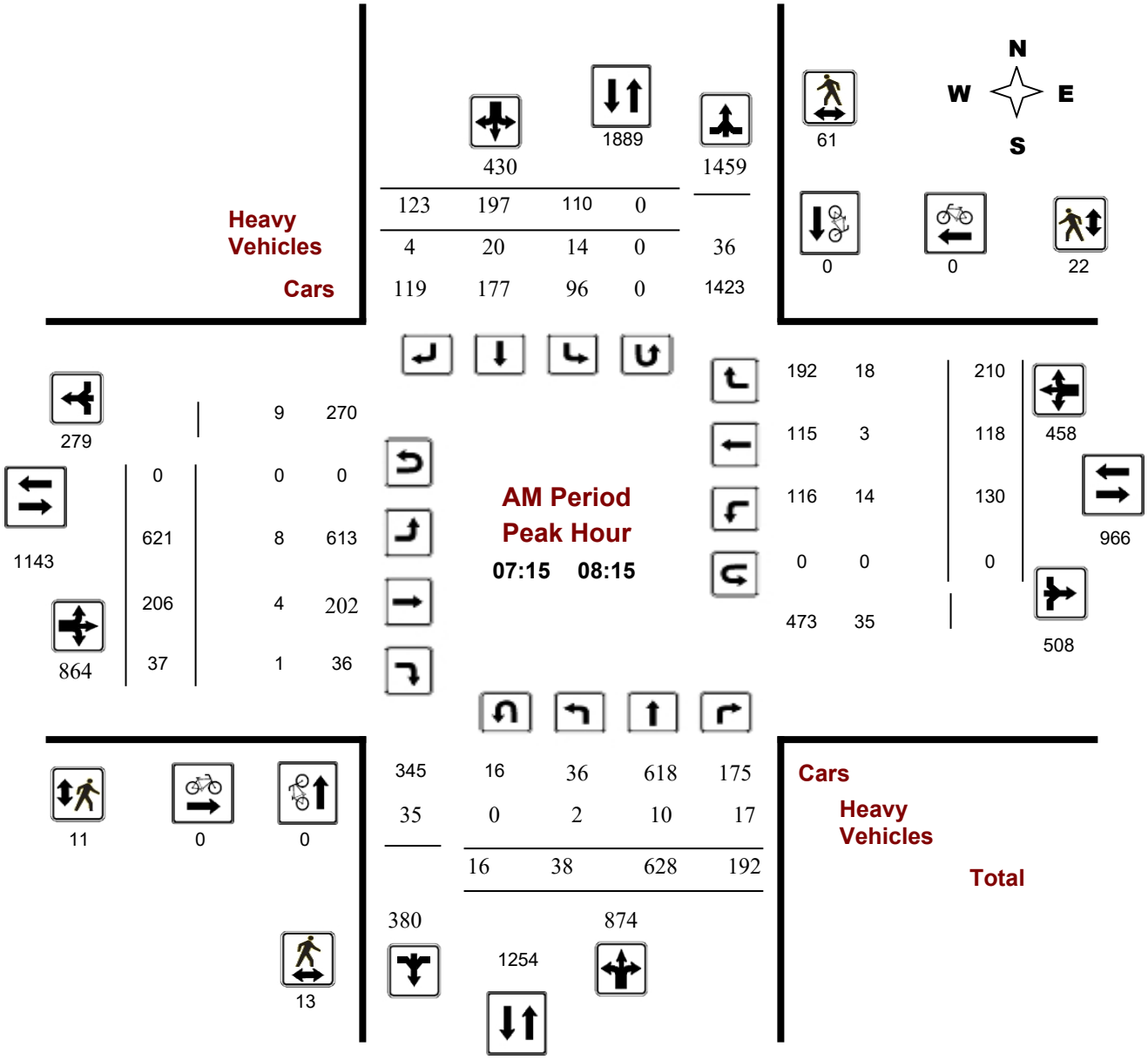
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LIMEBANK RD @ SPRATT RD

Survey Date: Wednesday, December 18, 2019 **WO No:** 39637

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



Comments 5467460 - LIMEBANK RD & SPRATT RD - WED DEC 18TH - 8 HRS - LORETTA

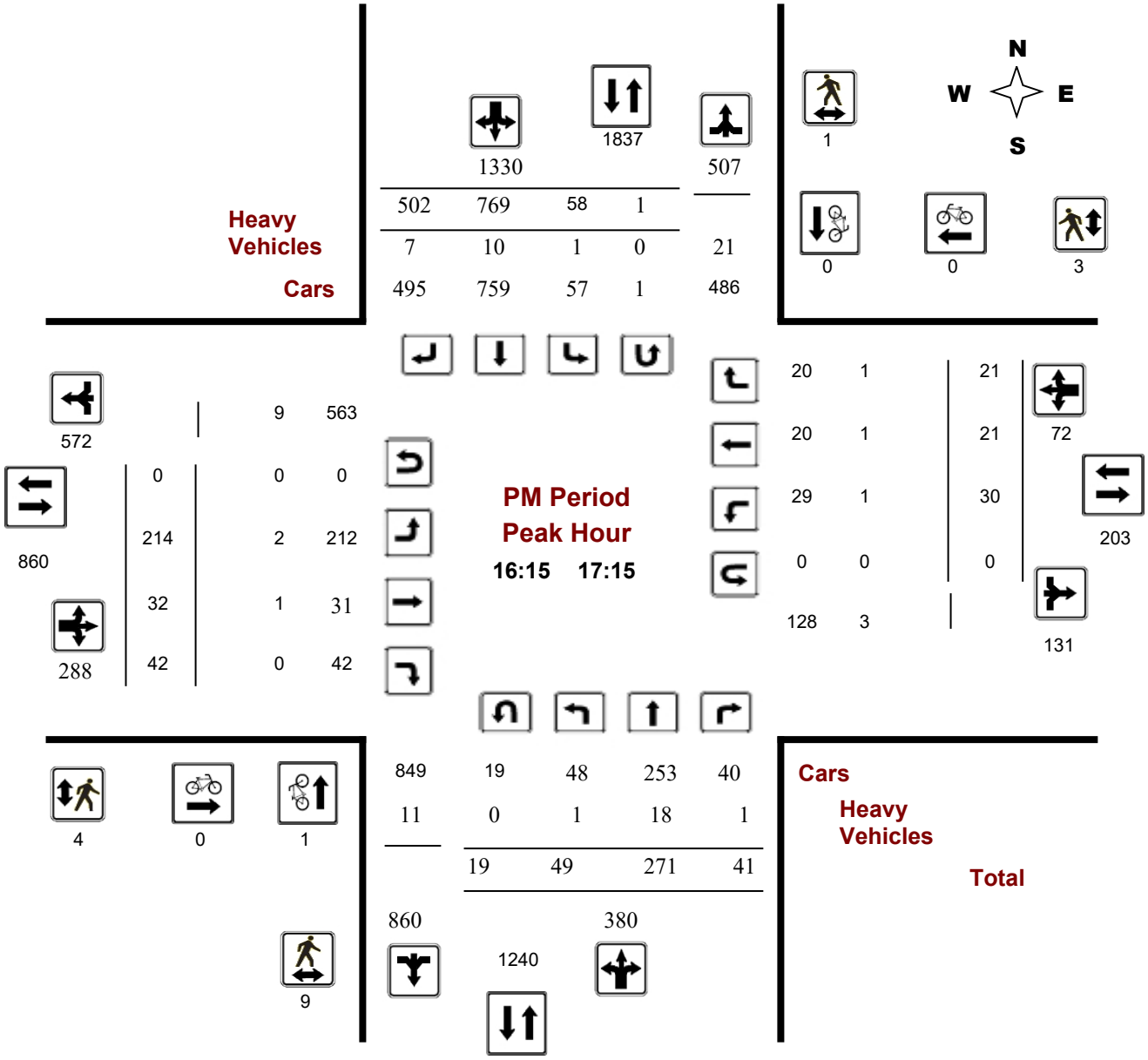
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LIMEBANK RD @ SPRATT RD

Survey Date: Wednesday, December 18, 2019 **WO No:** 39637

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



Comments 5467460 - LIMEBANK RD & SPRATT RD - WED DEC 18TH - 8 HRS - LORETTA

Appendix D

Collision Data

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: LIMEBANK RD @ SPRATT RD

Traffic Control: Traffic signal **Total Collisions:** 12

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Feb-13, Sat,19:20	Clear	Angle	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2016-Feb-25, Thu,23:23	Drifting Snow	Rear end	P.D. only	Ice	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2016-Oct-21, Fri,16:20	Clear	Rear end	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Passenger van	Other motor vehicle	
2017-Jun-21, Wed,15:45	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-18, Thu,17:36	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Feb-07, Thu,01:35	Clear	SMV other	P.D. only	Slush	South	Going ahead	Automobile, station wagon	Curb	0
2019-Oct-16, Wed,07:40	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	School bus	Other motor vehicle	0
					North	Turning right	School bus	Other motor vehicle	
2020-Jan-16, Thu,13:15	Clear	Angle	Non-fatal injury	Wet	South	Going ahead	Truck - open	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Sep-26, Sat,01:11	Clear	SMV other	P.D. only	Dry	South	Turning right	Automobile, station wagon	Curb	0
2020-Oct-02, Fri,22:10	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2020-Dec-09, Wed,08:30	Snow	SMV other	P.D. only	Loose snow	South	Turning left	Automobile, station wagon	Curb	0
2020-Dec-11, Fri,23:04	Clear	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: LIMEBANK RD btwn LEITRIM RD & SPRATT RD

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
2018-Jan-07, Sun,12:09	Clear	SMV other	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Pole (utility, power)	0
2018-Feb-04, Sun,03:37	Snow	SMV other	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Skidding/sliding	0
2018-Dec-16, Sun,02:30	Clear	Rear end	P.D. only	Dry	North	Going ahead	Unknown	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Feb-08, Fri,08:59	Clear	Other	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Debris falling off vehicle	0
					South	Going ahead	Unknown	Other	
2019-Nov-22, Fri,18:36	Clear	SMV other	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Animal - wild	0
2020-Feb-06, Thu,23:08	Snow	SMV other	Non-fatal injury	Loose snow	South	Going ahead	Pick-up truck	Curb	0
2020-Feb-12, Wed,07:40	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

Appendix E

MMLOS Analysis Results

Multi-Modal Level of Service - Segments Form

Project: 4101 Limebank Road
Consultant: Arcadis
Date: Nov 22, 2024
Scenario: Existing and Future

	Segment Name	Limebank (Adjacent to Site)				Realigned Leitrim (Temporary Two-Lane Configuration)			
	OP Transect / Policy Area	Industrial and Logistics or Mixed Industrial				Industrial and Logistics or Mixed Industrial			
	Segment Component	Majority (>50%)		Critical		Majority (>50%)		Critical	
	Side of Street	W or N	E or S	W or N	E or S	W or N	E or S	W or N	E or S
Pedestrian	PLOS Inputs								
	Posted Speed (km/h)	80 km/h		80 km/h		50 km/h		50 km/h	
	Two-Way ADT	14,890		14,890		548		548	
	Pedestrian Facility	Sidewalk	Sidewalk	Sidewalk	Sidewalk	Sidewalk	Sidewalk	Sidewalk	Sidewalk
	Does the facility meet the TMP Sidewalk or MUP Policy? If not, for MUPs, does the location have a low volume of peak daily users AND are pedestrian volumes likely less than 20% of total users?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Facility Width (m)	2.00m	2.00m	2.00m	2.00m	1.50m	1.50m	1.50m	1.50m
	Offset from Motor Vehicle Travel Lanes (m)	≥ 3.0m	≥ 3.0m	≥ 3.0m	≥ 3.0m	-	-	-	-
	Presence of Adjacent Parking?	No	No	No	No	-	-	-	-
	General Purpose Curb Lane ADT	-	-	-	-	-	-	-	-
	Max. Distance between Controlled Crossings (m)	> 400m	> 400m	> 400m	> 400m	-	-	-	-
	Score	3.00	3.00	3.00	3.00	2.00	2.00	2.00	2.00
	PLOS	C	C	C	C	D	D	D	D
	Target PLOS	D				D			
Bicycle	BLOS Inputs								
	Cycling Route Classification	Elsewhere				Elsewhere			
	Cycling Facility	Painted or Physically Separated Bike Lanes	Painted or Physically Separated Bike Lanes	Painted or Physically Separated Bike Lanes	Painted or Physically Separated Bike Lanes	Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space
	Is the minimum level of separation provided according to OTM Book 18 Pre-Selection Nomograph - Rural Context (Figure 5.6)? (for paved shoulders)	-	-	-	-	-	-	-	-
	Facility Operation	Unidirectional	Unidirectional	Unidirectional	Unidirectional	-	-	-	-
	Pedestrian/Cyclist Volume	-	-	-	-	-	-	-	-
	Facility Width	2.0-2.5m	2.0-2.5m	2.0-2.5m	2.0-2.5m	-	-	-	-
	Boulevard/Buffer Width (excluding curb)	-	-	-	-	-	-	-	-
	Unsignalized Roadway Crossing Type (where cyclists are required to yield)	None	None	None	None	None	None	None	None
	Number of Travel Lanes at Crossing	-	-	-	-	-	-	-	-
	Crossing includes Median Refuge (≥ 2.7m)	-	-	-	-	-	-	-	-
	Cross-street Posted Speed (km/h)	-	-	-	-	-	-	-	-
	Cycling Path Blockages (e.g. bus stops and/or loading zones)	Rare	Rare	Rare	Rare	Rare	Rare	Rare	Rare
	Score	2.88	2.88	2.88	2.88	1.60	1.60	1.60	1.60
	BLOS	C	C	C	C	D	D	D	D
	Target BLOS	D				D			
Transit	TLOS Inputs								
	Transit Facility	Mixed Traffic				Mixed Traffic			
	Facility Type	Mixed Traffic	Mixed Traffic			Mixed Traffic	Mixed Traffic		
	Expected Transit Running Time (Qualitative)	Slightly Impeded or Unimpeded	Slightly Impeded or Unimpeded			Slightly Impeded or Unimpeded	Slightly Impeded or Unimpeded		
	Transit Travel Speed (Mixed Traffic Only)	Enter Speed (if available)	Enter Speed (if available)			Enter Speed (if available)	Enter Speed (if available)		
	TLOS	C	C			C	C		
	Target TLOS	E (D if road connects to transit station)				E (D if road connects to transit station)			
Public Realm	PRLOS Inputs								
	Context	Other Streets	Other Streets			Other Streets	Other Streets		
	Inner Boulevard Width	≤ 0.6m	≤ 0.6m			≤ 0.6m	≤ 0.6m		
	Middle Boulevard Width	2.0-2.99m	2.0-2.99m			≤ 0.5m	≤ 0.5m		
	Outer Boulevard (Frontage) Width	≥ 3.0m	≥ 3.0m			≥ 3.0m	≥ 3.0m		
	Transit Route on Segment?	Yes	Yes			No	No		
	Bus Stop Elements	No platform or shelter	No platform or shelter			-	-		
	Number of Midblock Traffic Lanes (both travel directions)	4				≤ 2			
	Score	51.00	51.00			72.00	72.00		
	PRLOS	C	C			B	B		
		C				B			

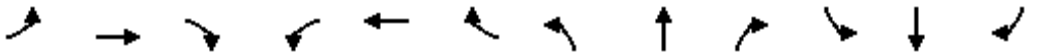
Multi-Modal Level of Service - Intersections Form

Project: 4101 Limebank Road
Consultant: Arcadis
Date: Nov 22, 2024
Scenario: Existing and Future

	Intersection Name	Limebank & Leitrim				Limebank & Spratt				Limebank & Realigned Leitrim			
	OP Transect / Policy Area	Industrial and Logistics or Mixed Industrial				Outer Urban or Suburban				Industrial and Logistics or Mixed Industrial			
Pedestrian	PLOS Inputs												
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	8	8	7	7	8	8	8	8	6	6	1-3	1-3
	Median Refuge (≥2.7m)	No	No	No	No	No	No	No	No	No	No	No	No
	Crosswalk Treatment	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings
	Signal Cycle Length (sec)	> 120				> 120				106-120			
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel
	Right-Turn Signal Phasing	-	-	-	-	-	-	-	-	Permissive	Permissive	Permissive	Permissive
	Right-Turn Volume	> 150 to 300 veh/h	≤ 150 veh/h	> 300 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	> 300 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	≤ 150 veh/h	> 300 veh/h
	Right-Turn Effective Corner Radius	-	-	-	-	-	-	-	-	≤ 8m	≤ 8m	≤ 8m	≤ 8m
	Cross-street Posted Speed (km/h)	80 km/h		80 km/h		60 km/h		80 km/h		50 km/h		80 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL
	Left-Turn Signal Phasing	Fully Protected	Fully Protected	Fully Protected	Fully Protected	Fully Protected	Fully Protected	Fully Protected	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm
	Left-Turn Volume	-	-	-	-	-	-	-	-	> 100 veh/h	≤ 50 veh/h	≤ 50 veh/h	> 100 veh/h
	Left-Turn Opposing Lanes	-	-	-	-	-	-	-	-	-	-	-	-
	Score	0.55	0.55	1.00	1.15	0.55	0.55	0.55	0.40	2.15	2.20	4.15	3.35
	PLOS	E	E	E	E	E	E	E	F	D	D	B	C
		E				E				C			
	Target PLOS	D				C				D			
Bicycle	BLOS Inputs												
	Cycling Route Classification	Elsewhere				Elsewhere				Elsewhere			
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Crossride	Crossride	Crossride	Crossride
	Two-Way ADT (in Cyclist Travel Direction)	7,930		14,153		7,366		14,890		2,682		14,890	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
	Crossride Operation	-	-	-	-	-	-	-	-	Unidirectional	Unidirectional	Unidirectional	Unidirectional
	Target Crossride Setback Met?	-	-	-	-	-	-	-	-	Yes	Yes	Yes	Yes
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL
	Cyclist Left-Turn Treatment Type	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes	Protected Corner	Protected Corner	Protected Corner	Protected Corner
	Vehicle Lanes Crossed by Cyclists	-	-	-	-	-	-	-	-	-	-	-	-
	Score	25	25	25	25	25	25	25	25	100	130	140	60
	BLOS	E	E	E	E	E	E	E	E	B	A	A	D
		E				E				B			
	Target BLOS	D				C				D			
Transit	TLOS Inputs												
	Transit Facility	Mixed Traffic				Mixed Traffic				Mixed Traffic			
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay	21-35 sec	36-55 sec			21-35 sec	36-55 sec		36-55 sec	21-35 sec	11-20 sec		
	Example Transit Priority Treatment	-	-			-	-		-	-	-		
	TLOS	C	D	-	-	C	D	-	D	C	B	-	-
		C				D				B			
	Target TLOS	E (D if road connects to transit station)				E (D if road connects to transit station)				E (D if road connects to transit station)			
Auto	AutoLOS Inputs												
	Overall Intersection Volume to Capacity Ratio	0.61 to 0.70				0.61 to 0.70				0.71 to 0.80			
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table				See Separate Traffic Operations Table				See Separate Traffic Operations Table			
	AutoLOS	B				B				C			
	Target AutoLOS	E				E				E			

Appendix F

Intersection Capacity Analysis Results

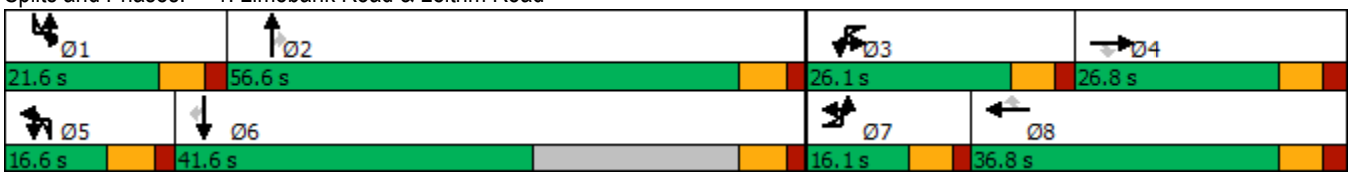


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	167	12	235	111	181	6	1029	474	139	275	6
Future Volume (vph)	2	167	12	235	111	181	6	1029	474	139	275	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	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)	3354	1750	1547	2942	1733	1488	3354	3357	1419	3077	3357	1547
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3354	1750	1547	2942	1733	1488	3347	3357	1419	3077	3357	1526
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			201			488			188
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		395.5			472.5			509.3			517.2	
Travel Time (s)		17.8			21.3			22.9			23.3	
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 (%)	0%	4%	0%	14%	5%	4%	0%	3%	9%	9%	3%	0%
Adj. Flow (vph)	2	186	13	261	123	201	7	1143	527	154	306	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	186	13	261	123	201	7	1143	527	154	306	7
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	21.0	21.0	5.0	21.0	21.0
Minimum Split (s)	11.1	30.8	30.8	11.1	30.8	30.8	11.6	27.6	27.6	11.6	27.6	27.6
Total Split (s)	16.1	26.8	26.8	26.1	36.8	36.8	16.6	56.6	56.6	21.6	41.6	41.6
Total Split (%)	12.3%	20.4%	20.4%	19.9%	28.1%	28.1%	12.7%	43.2%	43.2%	16.5%	31.7%	31.7%
Maximum Green (s)	10.0	20.0	20.0	20.0	30.0	30.0	10.0	50.0	50.0	15.0	35.0	35.0
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
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	None	None	None	None	None	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)		17.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	5.7	16.7	16.7	15.6	36.4	36.4	5.9	46.0	46.0	11.3	61.7	61.7
Actuated g/C Ratio	0.05	0.14	0.14	0.13	0.31	0.31	0.05	0.40	0.40	0.10	0.53	0.53
v/c Ratio	0.01	0.74	0.03	0.66	0.23	0.33	0.04	0.86	0.62	0.52	0.17	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	59.0	67.9	0.2	58.1	33.3	6.4	59.2	40.9	7.0	58.5	15.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	67.9	0.2	58.1	33.3	6.4	59.2	40.9	7.0	58.5	15.8	0.0
LOS	E	E	A	E	C	A	E	D	A	E	B	A
Approach Delay		63.4			35.1			30.4			29.7	
Approach LOS		E			D			C			C	
Queue Length 50th (m)	0.2	43.0	0.0	31.1	21.1	0.0	0.8	127.3	5.6	18.4	17.9	0.0
Queue Length 95th (m)	1.7	#75.4	0.0	46.9	42.7	18.4	3.5	#177.5	37.0	30.4	34.6	0.0
Internal Link Dist (m)		371.5			448.5			485.3			493.2	
Turn Bay Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Base Capacity (vph)	294	307	424	516	552	611	294	1472	896	405	1829	917
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	0.01	0.61	0.03	0.51	0.22	0.33	0.02	0.78	0.59	0.38	0.17	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 131.1			
Actuated Cycle Length: 116.2			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 33.5		Intersection LOS: C	
Intersection Capacity Utilization 73.3%		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.			

Splits and Phases: 1: Limebank Road & Leitrim Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	621	206	37	130	118	210	17	38	678	192	110	289
Future Volume (vph)	621	206	37	130	118	210	17	38	678	192	110	289
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0	255.0	
Storage Lanes	2		0	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor	0.88	1.00		0.98		0.90		0.98		0.96	0.98	
Frt		0.977				0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3321	3292	0	3022	3357	1419	0	3243	3390	1419	2968	3144
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	2908	3292	0	2956	3357	1278	0	3187	3390	1357	2912	3144
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		12				190				213		
Link Speed (k/h)		60			60				80			80
Link Distance (m)		209.4			525.1				473.0			635.3
Travel Time (s)		12.6			31.5				21.3			28.6
Confl. Peds. (#/hr)	61		13	13		61		11		22	22	
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%	3%	11%	3%	9%	0%	5%	2%	9%	13%	10%
Adj. Flow (vph)	690	229	41	144	131	233	19	42	753	213	122	321
Shared Lane Traffic (%)												
Lane Group Flow (vph)	690	270	0	144	131	233	0	61	753	213	122	321
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	11.5	41.5		11.5	41.5	41.5	11.6	11.6	41.7	41.7	11.6	41.7
Total Split (s)	56.5	26.5		31.5	26.5	26.5	16.6	16.6	61.7	61.7	26.6	31.7
Total Split (%)	33.0%	15.5%		18.4%	15.5%	15.5%	9.7%	9.7%	36.0%	36.0%	15.5%	18.5%
Maximum Green (s)	50.0	20.0		25.0	20.0	20.0	10.0	10.0	55.0	55.0	20.0	25.0
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	2.0	2.1
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)	6.5	6.5		6.5	6.5	6.5		6.6	6.7	6.7	6.6	6.7
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	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
Recall Mode	Min	None		None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		10.0			10.0	10.0			10.0	10.0		10.0
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		25.0
Pedestrian Calls (#/hr)		0			0	0			0	0		0
Act Effct Green (s)	31.2	32.6		11.8	13.1	13.1		7.9	34.0	34.0	10.9	40.3
Actuated g/C Ratio	0.27	0.28		0.10	0.11	0.11		0.07	0.29	0.29	0.09	0.35
v/c Ratio	0.78	0.29		0.47	0.35	0.75		0.28	0.76	0.39	0.44	0.30

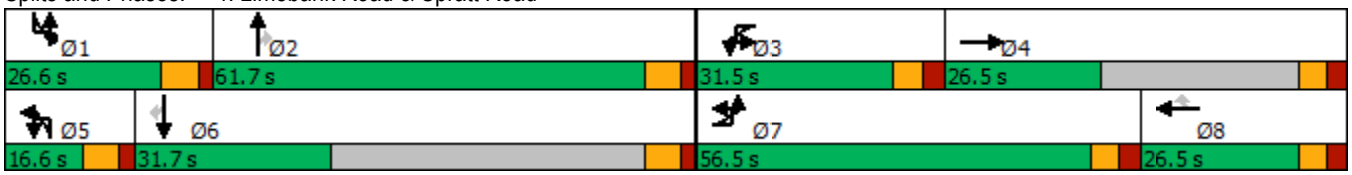


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	123
Future Volume (vph)	123
Ideal Flow (vphpl)	1800
Storage Length (m)	230.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.97
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1502
Flt Permitted	
Satd. Flow (perm)	1460
Right Turn on Red	Yes
Satd. Flow (RTOR)	147
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	11
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Adj. Flow (vph)	137
Shared Lane Traffic (%)	
Lane Group Flow (vph)	137
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	41.7
Total Split (s)	31.7
Total Split (%)	18.5%
Maximum Green (s)	25.0
Yellow Time (s)	4.6
All-Red Time (s)	2.1
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.7
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	10.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	40.3
Actuated g/C Ratio	0.35
v/c Ratio	0.23

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	47.4	33.6		59.3	54.6	29.2		62.3	44.5	6.9	60.0	31.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	33.6		59.3	54.6	29.2		62.3	44.5	6.9	60.0	31.2
LOS	D	C		E	D	C		E	D	A	E	C
Approach Delay		43.6			44.3				37.8			31.1
Approach LOS		D			D				D			C
Queue Length 50th (m)	69.9	23.2		15.2	14.1	8.7		6.4	76.8	0.0	12.8	27.2
Queue Length 95th (m)	121.7	44.0		33.7	30.7	43.9		17.6	132.5	19.0	29.5	51.2
Internal Link Dist (m)		185.4			501.1				449.0			611.3
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0	255.0	
Base Capacity (vph)	1485	1350		675	600	384		290	1668	776	531	1828
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	0.46	0.20		0.21	0.22	0.61		0.21	0.45	0.27	0.23	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 171.3			
Actuated Cycle Length: 116.7			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 39.4		Intersection LOS: D	
Intersection Capacity Utilization 97.2%		ICU Level of Service F	
Analysis Period (min) 15			

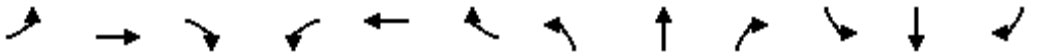
Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBR
Control Delay	5.2
Queue Delay	0.0
Total Delay	5.2
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	12.5
Internal Link Dist (m)	
Turn Bay Length (m)	230.0
Base Capacity (vph)	910
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.15

Intersection Summary

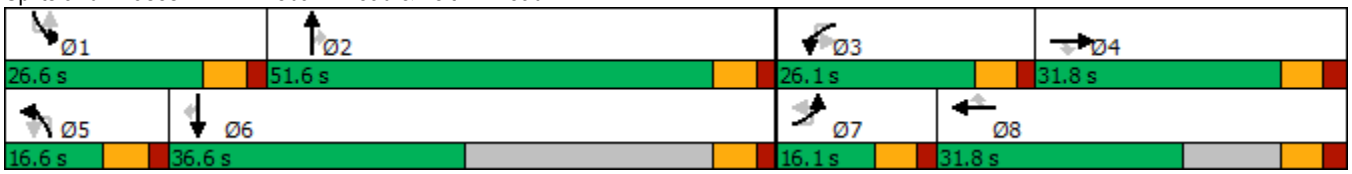


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	132	15	476	247	189	4	360	197	196	901	5
Future Volume (vph)	7	132	15	476	247	189	4	360	197	196	901	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	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)	3354	1767	1381	3257	1802	1488	3354	3325	1419	3106	3424	1289
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3354	1767	1381	3257	1802	1488	3352	3325	1419	3106	3424	1271
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			210			234			181
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		395.5			472.5			509.3			517.2	
Travel Time (s)		17.8			21.3			22.9			23.3	
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 (%)	0%	3%	12%	3%	1%	4%	0%	4%	9%	8%	1%	20%
Adj. Flow (vph)	8	147	17	529	274	210	4	400	219	218	1001	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	147	17	529	274	210	4	400	219	218	1001	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	21.0	21.0	5.0	21.0	21.0
Minimum Split (s)	11.1	30.8	30.8	11.1	30.8	30.8	11.6	27.6	27.6	11.6	27.6	27.6
Total Split (s)	16.1	31.8	31.8	26.1	31.8	31.8	16.6	51.6	51.6	26.6	36.6	36.6
Total Split (%)	11.8%	23.4%	23.4%	19.2%	23.4%	23.4%	12.2%	37.9%	37.9%	19.5%	26.9%	26.9%
Maximum Green (s)	10.0	25.0	25.0	20.0	25.0	25.0	10.0	45.0	45.0	20.0	30.0	30.0
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
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	None	None	None	None	None	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)		17.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	5.8	13.5	13.5	20.1	37.6	37.6	5.7	21.7	21.7	12.0	38.2	38.2
Actuated g/C Ratio	0.06	0.14	0.14	0.21	0.40	0.40	0.06	0.23	0.23	0.13	0.41	0.41
v/c Ratio	0.04	0.58	0.04	0.76	0.38	0.29	0.02	0.52	0.43	0.55	0.72	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	45.1	47.4	0.2	43.7	23.5	4.6	45.2	35.1	6.6	44.3	28.2	0.0
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	45.1	47.4	0.2	43.7	23.5	4.6	45.2	35.1	6.6	44.3	28.2	0.0
LOS	D	D	A	D	C	A	D	D	A	D	C	A
Approach Delay		42.7			30.2			25.1			30.9	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	0.7	24.7	0.0	45.4	32.0	0.0	0.3	32.8	0.0	18.9	73.2	0.0
Queue Length 95th (m)	3.2	46.8	0.0	#81.4	70.7	15.9	2.1	53.2	15.5	32.9	#138.7	0.0
Internal Link Dist (m)		371.5			448.5			485.3			493.2	
Turn Bay Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Base Capacity (vph)	360	474	540	699	730	727	360	1605	806	667	2021	824
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	0.02	0.31	0.03	0.76	0.38	0.29	0.01	0.25	0.27	0.33	0.50	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 136.1			
Actuated Cycle Length: 93.7			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 30.1		Intersection LOS: C	
Intersection Capacity Utilization 74.9%		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.			

Splits and Phases: 1: Limebank Road & Leitrim Road





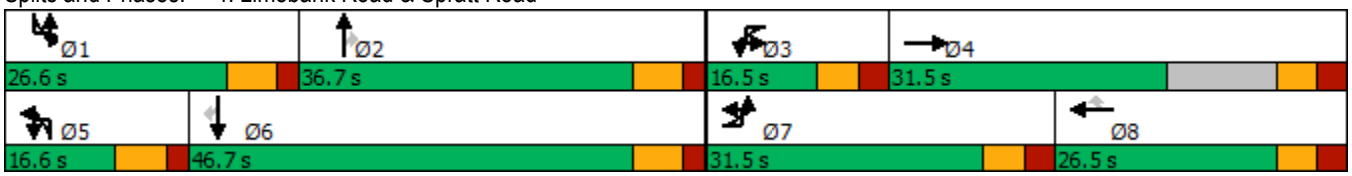
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	214	32	42	30	21	21	21	49	325	41	1	58
Future Volume (vph)	214	32	42	30	21	21	21	49	325	41	1	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	1.00	0.99		0.99		0.99		1.00		0.98		1.00
Frt		0.915				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3086	0	3257	3293	1473	0	3308	3232	1517	0	3289
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	3315	3086	0	3211	3293	1454	0	3302	3232	1492	0	3279
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		47				269				267		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	1		9	9		1		4		3		3
Confl. Bikes (#/hr)										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 (%)	1%	3%	0%	3%	5%	5%	0%	2%	7%	2%	0%	2%
Adj. Flow (vph)	238	36	47	33	23	23	23	54	361	46	1	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	83	0	33	23	23	0	77	361	46	0	65
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	41.5		11.5	41.5	41.5	11.6	11.6	41.7	41.7	11.6	11.6
Total Split (s)	31.5	31.5		16.5	26.5	26.5	16.6	16.6	36.7	36.7	26.6	26.6
Total Split (%)	26.0%	26.0%		13.6%	21.8%	21.8%	13.7%	13.7%	30.3%	30.3%	21.9%	21.9%
Maximum Green (s)	25.0	25.0		10.0	20.0	20.0	10.0	10.0	30.0	30.0	20.0	20.0
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	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
Recall Mode	None	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		10.0			10.0	10.0			10.0	10.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		0			0	0			0	0		
Act Effct Green (s)	13.3	14.7		7.1	11.4	11.4		8.1	29.3	29.3		7.8
Actuated g/C Ratio	0.17	0.19		0.09	0.15	0.15		0.11	0.38	0.38		0.10

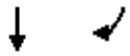
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	831	502
Future Volume (vph)	831	502
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.98
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3424	1532
Flt Permitted		
Satd. Flow (perm)	3424	1507
Right Turn on Red		Yes
Satd. Flow (RTOR)		558
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		4
Confl. Bikes (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	1%	1%
Adj. Flow (vph)	923	558
Shared Lane Traffic (%)		
Lane Group Flow (vph)	923	558
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	41.7	41.7
Total Split (s)	46.7	46.7
Total Split (%)	38.5%	38.5%
Maximum Green (s)	40.0	40.0
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	10.0	10.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)	29.1	29.1
Actuated g/C Ratio	0.38	0.38

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.41	0.13		0.11	0.05	0.05		0.22	0.29	0.06		0.19
Control Delay	36.5	18.2		42.0	39.2	0.2		40.6	18.9	0.2		40.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	36.5	18.2		42.0	39.2	0.2		40.6	18.9	0.2		40.9
LOS	D	B		D	D	A		D	B	A		D
Approach Delay		31.8			29.0				20.6			
Approach LOS		C			C				C			
Queue Length 50th (m)	19.4	2.6		2.7	1.8	0.0		6.3	22.5	0.0		5.3
Queue Length 95th (m)	34.0	9.6		7.8	6.1	0.0		14.4	35.5	0.0		12.7
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	1247	1644		489	989	625		496	1586	868		988
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	0.19	0.05		0.07	0.02	0.04		0.16	0.23	0.05		0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 121.3			
Actuated Cycle Length: 76.2			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 21.1		Intersection LOS: C	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
v/c Ratio	0.71	0.61
Control Delay	25.2	5.1
Queue Delay	0.0	0.0
Total Delay	25.2	5.1
LOS	C	A
Approach Delay	18.6	
Approach LOS	B	
Queue Length 50th (m)	70.4	0.0
Queue Length 95th (m)	100.1	20.5
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	2025	1119
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.46	0.50

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	186	14	257	114	186	40	6	1077	531	155	324
Future Volume (vph)	3	186	14	257	114	186	40	6	1077	531	155	324
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1750	1547	2942	1733	1488	0	3354	3357	1419	3077	3357
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1750	1547	2942	1733	1488	0	3345	3357	1419	3077	3357
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			186			186				474		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	4%	0%	14%	5%	4%	0%	0%	3%	9%	9%	3%
Adj. Flow (vph)	3	186	14	257	114	186	40	6	1077	531	155	324
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	186	14	257	114	186	0	46	1077	531	155	324
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	29.0	29.0	23.0	40.9	40.9	11.8	11.8	61.1	61.1	18.0	67.3
Total Split (%)	8.5%	22.1%	22.1%	17.5%	31.2%	31.2%	9.0%	9.0%	46.6%	46.6%	13.7%	51.3%
Maximum Green (s)	5.0	22.2	22.2	16.9	34.1	34.1	5.2	5.2	54.5	54.5	11.4	60.7
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.1	17.1	17.1	14.6	36.0	36.0		5.3	46.0	46.0	10.3	54.1
Actuated g/C Ratio	0.04	0.15	0.15	0.13	0.31	0.31		0.05	0.40	0.40	0.09	0.47
v/c Ratio	0.02	0.71	0.04	0.69	0.21	0.31		0.29	0.80	0.62	0.56	0.20



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1547
Flt Permitted	
Satd. Flow (perm)	1525
Right Turn on Red	Yes
Satd. Flow (RTOR)	188
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Adj. Flow (vph)	6
Shared Lane Traffic (%)	
Lane Group Flow (vph)	6
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	67.3
Total Split (%)	51.3%
Maximum Green (s)	60.7
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	54.1
Actuated g/C Ratio	0.47
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	60.3	64.4	0.1	60.6	33.2	6.5		64.0	36.2	7.4	61.8	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	64.4	0.1	60.6	33.2	6.5		64.0	36.2	7.4	61.8	19.5
LOS	E	E	A	E	C	A		E	D	A	E	B
Approach Delay		59.9			36.9				27.7			32.8
Approach LOS		E			D				C			C
Queue Length 50th (m)	0.3	42.9	0.0	30.5	19.4	0.0		5.6	116.0	8.3	18.5	23.7
Queue Length 95th (m)	2.1	70.6	0.0	47.7	39.8	18.0		12.6	151.1	39.7	31.6	35.3
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	149	347	456	444	574	617		156	1636	934	313	1822
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.54	0.03	0.58	0.20	0.30		0.29	0.66	0.57	0.50	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 131.1			
Actuated Cycle Length: 114.8			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 32.6		Intersection LOS: C	
Intersection Capacity Utilization 79.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	914
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1618	0	0	636
Future Vol, veh/h	0	0	1618	0	0	636
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	9
Mvmt Flow	0	0	1618	0	0	636

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	809	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	328	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	328	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱			↱		↑↑	↱		↑↑	↱
Traffic Vol, veh/h	0	0	15	0	0	0	0	1618	0	0	543	93
Future Vol, veh/h	0	0	15	0	0	0	0	1618	0	0	543	93
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	5	0	0	9	0
Mvmt Flow	0	0	15	0	0	0	0	1618	0	0	543	93

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	272	-	-	809	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	732	0	0	328	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	732	-	-	328	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	0	0	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	732	-	-	-
HCM Lane V/C Ratio	-	-	0.02	-	-	-
HCM Control Delay (s)	-	-	10	0	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	625	206	37	130	118	213	18	38	739	192	9	110
Future Volume (vph)	625	206	37	130	118	213	18	38	739	192	9	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	0.85	0.99		0.97		0.89		0.98		0.95		0.98
Frt		0.977				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3290	0	3022	3357	1419	0	3244	3390	1419	0	2994
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	2830	3290	0	2942	3357	1257	0	3178	3390	1350	0	2927
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		14				148				192		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	61		13	13		61		11		22		22
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%	3%	11%	3%	9%	0%	5%	2%	9%	0%	13%
Adj. Flow (vph)	625	206	37	130	118	213	18	38	739	192	9	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	625	243	0	130	118	213	0	56	739	192	0	119
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	52.0	71.0		20.0	39.0	39.0	14.0	14.0	60.3	60.3	20.0	20.0
Total Split (%)	30.4%	41.4%		11.7%	22.8%	22.8%	8.2%	8.2%	35.2%	35.2%	11.7%	11.7%
Maximum Green (s)	45.5	64.5		13.5	32.5	32.5	7.4	7.4	53.6	53.6	13.4	13.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		13			61	61			22	22		
Act Effct Green (s)	30.7	44.9		11.1	25.4	25.4		7.2	35.5	35.5		10.8
Actuated g/C Ratio	0.24	0.35		0.09	0.20	0.20		0.06	0.27	0.27		0.08
v/c Ratio	0.80	0.21		0.50	0.18	0.59		0.31	0.80	0.38		0.48

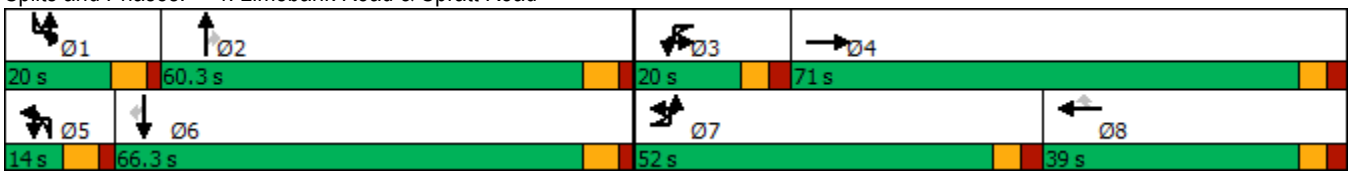


Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	306	124
Future Volume (vph)	306	124
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.97
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3144	1502
Flt Permitted		
Satd. Flow (perm)	3144	1456
Right Turn on Red		Yes
Satd. Flow (RTOR)		147
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		11
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	10%	3%
Adj. Flow (vph)	306	124
Shared Lane Traffic (%)		
Lane Group Flow (vph)	306	124
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	66.3	66.3
Total Split (%)	38.7%	38.7%
Maximum Green (s)	59.6	59.6
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	11	11
Act Effct Green (s)	43.0	43.0
Actuated g/C Ratio	0.33	0.33
v/c Ratio	0.29	0.21

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Control Delay	56.9	29.5		69.5	47.9	24.8		72.4	52.5	7.5		69.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	56.9	29.5		69.5	47.9	24.8		72.4	52.5	7.5		69.6
LOS	E	C		E	D	C		E	D	A		E
Approach Delay		49.2			43.3				44.9			
Approach LOS		D			D				D			
Queue Length 50th (m)	81.4	21.5		17.3	13.4	14.3		7.5	97.2	0.0		15.8
Queue Length 95th (m)	116.6	37.3		32.4	26.9	47.8		17.2	135.2	18.6		30.4
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	1224	1726		330	884	440		194	1472	695		325
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	0.51	0.14		0.39	0.13	0.48		0.29	0.50	0.28		0.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 171.3			
Actuated Cycle Length: 130.1			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 44.3		Intersection LOS: D	
Intersection Capacity Utilization 92.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Limebank Road & Spratt Road



Lane Group	SBT	SBR
Control Delay	36.3	3.9
Queue Delay	0.0	0.0
Total Delay	36.3	3.9
LOS	D	A
Approach Delay	36.2	
Approach LOS	D	
Queue Length 50th (m)	33.5	0.0
Queue Length 95th (m)	50.8	9.2
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	1519	779
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.20	0.16

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	8	147	17	493	254	194	8	4	408	232	218	945
Future Volume (vph)	8	147	17	493	254	194	8	4	408	232	218	945
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1767	1381	3257	1802	1488	0	3354	3325	1419	3106	3424
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1767	1381	3257	1802	1488	0	3350	3325	1419	3106	3424
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			232			194				234		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	3%	12%	3%	1%	4%	0%	0%	4%	9%	8%	1%
Adj. Flow (vph)	8	147	17	493	254	194	8	4	408	232	218	945
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	147	17	493	254	194	0	12	408	232	218	945
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	28.0	28.0	37.0	53.9	53.9	12.0	12.0	48.1	48.1	23.0	59.1
Total Split (%)	8.2%	20.6%	20.6%	27.2%	39.6%	39.6%	8.8%	8.8%	35.3%	35.3%	16.9%	43.4%
Maximum Green (s)	5.0	21.2	21.2	30.9	47.1	47.1	5.4	5.4	41.5	41.5	16.4	52.5
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.2	14.5	14.5	21.1	40.3	40.3		5.6	24.8	24.8	12.6	42.5
Actuated g/C Ratio	0.05	0.14	0.14	0.21	0.40	0.40		0.06	0.25	0.25	0.13	0.42
v/c Ratio	0.05	0.57	0.04	0.72	0.35	0.27		0.06	0.50	0.44	0.56	0.65

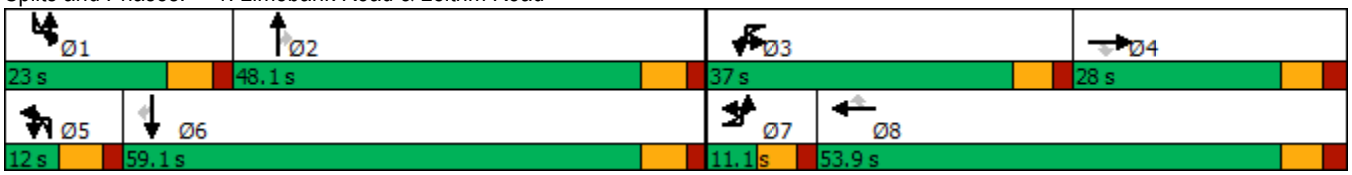


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1289
Flt Permitted	
Satd. Flow (perm)	1270
Right Turn on Red	Yes
Satd. Flow (RTOR)	181
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	20%
Adj. Flow (vph)	5
Shared Lane Traffic (%)	
Lane Group Flow (vph)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	59.1
Total Split (%)	43.4%
Maximum Green (s)	52.5
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	42.5
Actuated g/C Ratio	0.42
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	55.8	52.4	0.2	44.5	24.4	4.7		55.2	35.9	7.2	49.8	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	55.8	52.4	0.2	44.5	24.4	4.7		55.2	35.9	7.2	49.8	27.3
LOS	E	D	A	D	C	A		E	D	A	D	C
Approach Delay		47.4			30.9				26.0			31.4
Approach LOS		D			C				C			C
Queue Length 50th (m)	0.7	24.8	0.0	42.3	29.5	0.0		1.0	34.0	0.0	18.9	67.8
Queue Length 95th (m)	3.9	59.3	0.0	81.4	76.1	16.2		5.1	60.7	18.3	42.4	137.0
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	173	388	484	1042	885	830		187	1428	743	527	1861
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.05	0.38	0.04	0.47	0.29	0.23		0.06	0.29	0.31	0.41	0.51

Intersection Summary			
Area Type:	Other		
Cycle Length: 136.1			
Actuated Cycle Length: 100			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 31.0		Intersection LOS: C	
Intersection Capacity Utilization 76.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	773
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	638	0	0	1467
Future Vol, veh/h	0	0	638	0	0	1467
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	0	638	0	0	1467

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	319	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	683	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	683	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱			↱		↑↑	↱		↑↑	↱
Traffic Vol, veh/h	0	0	80	0	0	0	0	638	0	0	1447	20
Future Vol, veh/h	0	0	80	0	0	0	0	638	0	0	1447	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	0	0	80	0	0	0	0	638	0	0	1447	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	724	-	-	319	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	373	0	0	683	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	373	-	-	683	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.3	0	0	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	373	-	-	-
HCM Lane V/C Ratio	-	-	0.214	-	-	-
HCM Control Delay (s)	-	-	17.3	0	-	-
HCM Lane LOS	-	-	C	A	-	-
HCM 95th %tile Q(veh)	-	-	0.8	-	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	215	32	42	30	21	22	21	49	346	41	47	60
Future Volume (vph)	215	32	42	30	21	22	21	49	346	41	47	60
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	1.00	0.99		0.98		0.99		1.00		0.98		1.00
Frt		0.915				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3083	0	3257	3293	1473	0	3308	3232	1517	0	3317
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	3315	3083	0	3203	3293	1454	0	3300	3232	1492	0	3305
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		42				210				208		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	1		9	9		1		4		3		3
Confl. Bikes (#/hr)										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 (%)	1%	3%	0%	3%	5%	5%	0%	2%	7%	2%	0%	2%
Adj. Flow (vph)	215	32	42	30	21	22	21	49	346	41	47	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	215	74	0	30	21	22	0	70	346	41	0	107
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	20.0	45.0		11.5	36.5	36.5	13.0	13.0	49.8	49.8	15.0	15.0
Total Split (%)	16.5%	37.1%		9.5%	30.1%	30.1%	10.7%	10.7%	41.1%	41.1%	12.4%	12.4%
Maximum Green (s)	13.5	38.5		5.0	30.0	30.0	6.4	6.4	43.1	43.1	8.4	8.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		9			1	1			3	3		
Act Effct Green (s)	12.8	17.8		5.8	14.2	14.2		7.1	27.6	27.6		8.4
Actuated g/C Ratio	0.17	0.23		0.07	0.18	0.18		0.09	0.36	0.36		0.11

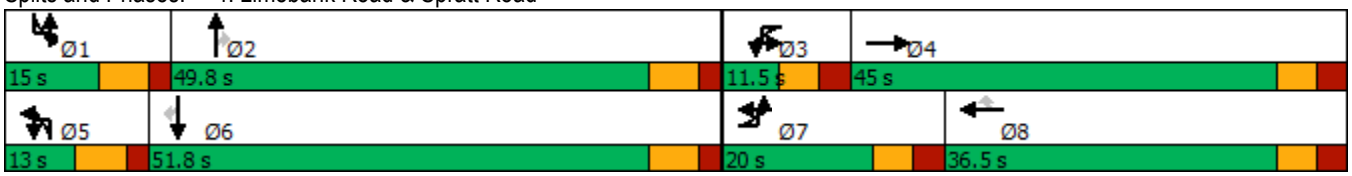


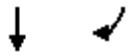
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	893	505
Future Volume (vph)	893	505
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.98
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3424	1532
Flt Permitted		
Satd. Flow (perm)	3424	1506
Right Turn on Red		Yes
Satd. Flow (RTOR)		505
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		4
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	1%	1%
Adj. Flow (vph)	893	505
Shared Lane Traffic (%)		
Lane Group Flow (vph)	893	505
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	51.8	51.8
Total Split (%)	42.7%	42.7%
Maximum Green (s)	45.1	45.1
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	4	4
Act Effct Green (s)	28.7	28.7
Actuated g/C Ratio	0.37	0.37

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.39	0.10		0.12	0.03	0.05		0.23	0.30	0.06		0.30
Control Delay	39.3	15.5		47.1	34.3	0.2		45.2	21.9	0.2		43.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	39.3	15.5		47.1	34.3	0.2		45.2	21.9	0.2		43.6
LOS	D	B		D	C	A		D	C	A		D
Approach Delay		33.2			29.3				23.5			
Approach LOS		C			C				C			
Queue Length 50th (m)	16.4	2.1		2.3	1.5	0.0		5.4	21.3	0.0		8.2
Queue Length 95th (m)	38.0	8.2		8.7	5.4	0.0		16.1	43.2	0.0		22.1
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	675	1801		245	1488	772		318	2016	1009		419
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	0.32	0.04		0.12	0.01	0.03		0.22	0.17	0.04		0.26

Intersection Summary			
Area Type:	Other		
Cycle Length: 121.3			
Actuated Cycle Length: 77.5			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 23.0		Intersection LOS: C	
Intersection Capacity Utilization 70.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
v/c Ratio	0.70	0.58
Control Delay	26.6	5.2
Queue Delay	0.0	0.0
Total Delay	26.6	5.2
LOS	C	A
Approach Delay	20.6	
Approach LOS	C	
Queue Length 50th (m)	64.1	0.0
Queue Length 95th (m)	117.3	22.3
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	2203	1149
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.41	0.44

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	234	17	351	123	200	237	6	1213	679	194	543
Future Volume (vph)	3	234	17	351	123	200	237	6	1213	679	194	543
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1750	1547	2942	1733	1488	0	3354	3357	1419	3077	3357
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1750	1547	2942	1733	1488	0	3348	3357	1419	3077	3357
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			241			200				401		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	4%	0%	14%	5%	4%	0%	0%	3%	9%	9%	3%
Adj. Flow (vph)	3	234	17	351	123	200	237	6	1213	679	194	543
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	234	17	351	123	200	0	243	1213	679	194	543
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	28.0	28.0	25.0	41.9	41.9	31.0	31.0	61.1	61.1	17.0	47.1
Total Split (%)	8.5%	21.4%	21.4%	19.1%	32.0%	32.0%	23.6%	23.6%	46.6%	46.6%	13.0%	35.9%
Maximum Green (s)	5.0	21.2	21.2	18.9	35.1	35.1	24.4	24.4	54.5	54.5	10.4	40.5
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.0	19.8	19.8	18.0	41.7	41.7		14.5	51.9	51.9	10.3	47.7
Actuated g/C Ratio	0.04	0.16	0.16	0.14	0.33	0.33		0.11	0.41	0.41	0.08	0.38
v/c Ratio	0.02	0.86	0.04	0.84	0.22	0.32		1.19dl	0.88	0.83	0.78	0.43



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	7
Future Volume (vph)	7
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1547
Flt Permitted	
Satd. Flow (perm)	1525
Right Turn on Red	Yes
Satd. Flow (RTOR)	243
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Adj. Flow (vph)	7
Shared Lane Traffic (%)	
Lane Group Flow (vph)	7
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	47.1
Total Split (%)	35.9%
Maximum Green (s)	40.5
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	47.7
Actuated g/C Ratio	0.38
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	61.0	80.5	0.2	71.6	33.4	6.1		61.5	43.0	23.1	79.0	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	61.0	80.5	0.2	71.6	33.4	6.1		61.5	43.0	23.1	79.0	31.2
LOS	E	F	A	E	C	A		E	D	C	E	C
Approach Delay		74.9			45.2				38.8			43.4
Approach LOS		E			D				D			D
Queue Length 50th (m)	0.4	59.3	0.0	46.0	22.0	0.0		31.4	149.1	69.7	25.8	54.0
Queue Length 95th (m)	2.1	#100.7	0.0	#68.9	42.3	18.2		43.6	179.8	132.5	#44.5	73.4
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	133	295	462	443	572	625		652	1459	843	255	1267
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.79	0.04	0.79	0.22	0.32		0.37	0.83	0.81	0.76	0.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 131.1			
Actuated Cycle Length: 126.2			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 43.2		Intersection LOS: D	
Intersection Capacity Utilization 95.5%		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.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	727
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	2013	0	0	1154
Future Vol, veh/h	0	0	2013	0	0	1154
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	9
Mvmt Flow	0	0	2013	0	0	1154

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1007	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	242	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	242	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	91	0	0	0	0	2013	0	0	597	557
Future Vol, veh/h	0	0	91	0	0	0	0	2013	0	0	597	557
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	5	0	0	9	0
Mvmt Flow	0	0	91	0	0	0	0	2013	0	0	597	557

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	299	-	-	1007	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	703	0	0	242	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	703	-	-	242	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	703	-	-	-
HCM Lane V/C Ratio	-	-	0.129	-	-	-
HCM Control Delay (s)	-	-	10.9	0	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.4	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	644	206	39	130	118	225	20	39	975	192	52	112
Future Volume (vph)	644	206	39	130	118	225	20	39	975	192	52	112
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	0.85	0.99		0.97		0.89		0.98		0.95		0.98
Frt		0.976				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3286	0	3022	3357	1419	0	3247	3390	1419	0	3081
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	2830	3286	0	2942	3357	1257	0	3185	3390	1350	0	3031
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		15				148				192		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	61		13	13		61		11		22		22
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%	3%	11%	3%	9%	0%	5%	2%	9%	0%	13%
Adj. Flow (vph)	644	206	39	130	118	225	20	39	975	192	52	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	644	245	0	130	118	225	0	59	975	192	0	164
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	52.0	71.0		20.0	39.0	39.0	14.0	14.0	60.3	60.3	20.0	20.0
Total Split (%)	30.4%	41.4%		11.7%	22.8%	22.8%	8.2%	8.2%	35.2%	35.2%	11.7%	11.7%
Maximum Green (s)	45.5	64.5		13.5	32.5	32.5	7.4	7.4	53.6	53.6	13.4	13.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		13			61	61			22	22		
Act Effct Green (s)	34.5	48.2		11.5	25.2	25.2		7.3	47.9	47.9		12.3
Actuated g/C Ratio	0.23	0.33		0.08	0.17	0.17		0.05	0.33	0.33		0.08
v/c Ratio	0.83	0.23		0.55	0.21	0.67		0.37	0.88	0.34		0.64

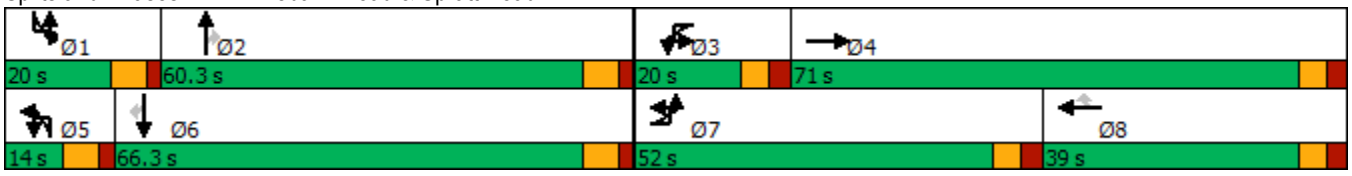


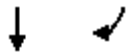
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	363	127
Future Volume (vph)	363	127
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.97
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3144	1502
Flt Permitted		
Satd. Flow (perm)	3144	1456
Right Turn on Red		Yes
Satd. Flow (RTOR)		147
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		11
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	10%	3%
Adj. Flow (vph)	363	127
Shared Lane Traffic (%)		
Lane Group Flow (vph)	363	127
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	66.3	66.3
Total Split (%)	38.7%	38.7%
Maximum Green (s)	59.6	59.6
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	11	11
Act Effct Green (s)	56.6	56.6
Actuated g/C Ratio	0.38	0.38
v/c Ratio	0.30	0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Control Delay	64.9	34.4		79.0	55.6	32.0		82.0	58.8	6.7		81.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	64.9	34.4		79.0	55.6	32.0		82.0	58.8	6.7		81.5
LOS	E	C		E	E	C		F	E	A		F
Approach Delay		56.5			50.8				51.8			
Approach LOS		E			D				D			
Queue Length 50th (m)	101.8	27.3		20.7	16.6	22.1		9.5	151.1	0.0		26.2
Queue Length 95th (m)	124.4	38.8		33.7	28.1	55.4		18.2	#198.0	18.4		41.2
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	1066	1504		287	770	402		169	1282	630		291
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	0.60	0.16		0.45	0.15	0.56		0.35	0.76	0.30		0.56

Intersection Summary			
Area Type:	Other		
Cycle Length: 171.3			
Actuated Cycle Length: 147.2			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 50.7		Intersection LOS: D	
Intersection Capacity Utilization 98.9%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
Control Delay	35.4	3.9
Queue Delay	0.0	0.0
Total Delay	35.4	3.9
LOS	D	A
Approach Delay	40.8	
Approach LOS	D	
Queue Length 50th (m)	42.5	0.0
Queue Length 95th (m)	61.0	10.1
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	1322	697
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.27	0.18

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	185	21	546	273	209	51	4	609	355	274	1077
Future Volume (vph)	10	185	21	546	273	209	51	4	609	355	274	1077
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1767	1381	3257	1802	1488	0	3354	3325	1419	3106	3424
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1767	1381	3257	1802	1488	0	3351	3325	1419	3106	3424
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			232			209				355		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	3%	12%	3%	1%	4%	0%	0%	4%	9%	8%	1%
Adj. Flow (vph)	10	185	21	546	273	209	51	4	609	355	274	1077
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	185	21	546	273	209	0	55	609	355	274	1077
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	28.0	28.0	36.0	52.9	52.9	13.0	13.0	46.6	46.6	25.5	59.1
Total Split (%)	8.2%	20.6%	20.6%	26.5%	38.9%	38.9%	9.6%	9.6%	34.2%	34.2%	18.7%	43.4%
Maximum Green (s)	5.0	21.2	21.2	29.9	46.1	46.1	6.4	6.4	40.0	40.0	18.9	52.5
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.2	16.9	16.9	24.4	43.8	43.8		6.4	33.4	33.4	15.4	45.9
Actuated g/C Ratio	0.04	0.14	0.14	0.21	0.37	0.37		0.05	0.28	0.28	0.13	0.39
v/c Ratio	0.07	0.73	0.05	0.80	0.41	0.30		0.30	0.64	0.54	0.67	0.80

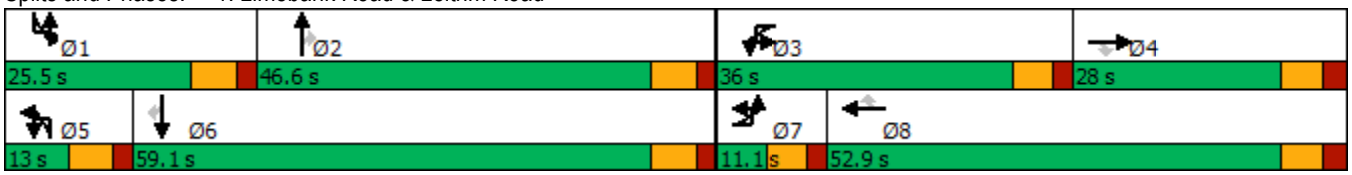


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1289
Flt Permitted	
Satd. Flow (perm)	1270
Right Turn on Red	Yes
Satd. Flow (RTOR)	181
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	20%
Adj. Flow (vph)	6
Shared Lane Traffic (%)	
Lane Group Flow (vph)	6
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	59.1
Total Split (%)	43.4%
Maximum Green (s)	52.5
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	45.9
Actuated g/C Ratio	0.39
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	63.3	68.0	0.2	55.6	31.9	5.3		64.3	41.3	6.9	59.7	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	68.0	0.2	55.6	31.9	5.3		64.3	41.3	6.9	59.7	39.0
LOS	E	E	A	E	C	A		E	D	A	E	D
Approach Delay		61.2			39.1				30.6			43.0
Approach LOS		E			D				C			D
Queue Length 50th (m)	1.2	42.9	0.0	64.6	45.0	0.0		6.7	66.8	0.0	32.7	123.6
Queue Length 95th (m)	4.5	73.3	0.0	92.0	83.1	16.8		14.7	94.6	23.8	51.2	163.4
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	147	330	446	859	745	738		189	1173	730	518	1586
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.07	0.56	0.05	0.64	0.37	0.28		0.29	0.52	0.49	0.53	0.68

Intersection Summary			
Area Type:	Other		
Cycle Length: 136.1			
Actuated Cycle Length: 117.2			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 39.5		Intersection LOS: D	
Intersection Capacity Utilization 84.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	685
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	969	0	0	1708
Future Vol, veh/h	0	0	969	0	0	1708
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	0	969	0	0	1708

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	485	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	533	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	533	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	37.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱			↱		↑↑	↱		↑↑	↱
Traffic Vol, veh/h	0	0	482	0	0	0	0	969	0	0	1588	120
Future Vol, veh/h	0	0	482	0	0	0	0	969	0	0	1588	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	0	0	482	0	0	0	0	969	0	0	1588	120

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	794	-	-	485	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	~ 335	0	0	533	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	~ 335	-	-	533	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	243.7	0	0	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	335	-	-	-
HCM Lane V/C Ratio	-	-	1.439	-	-	-
HCM Control Delay (s)	-	-	243.7	0	-	-
HCM Lane LOS	-	-	F	A	-	-
HCM 95th %tile Q(veh)	-	-	25.5	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	220	32	43	30	21	24	23	51	415	41	278	71
Future Volume (vph)	220	32	43	30	21	24	23	51	415	41	278	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	1.00	0.99		0.98		0.99		1.00		0.98		1.00
Frt		0.914				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3080	0	3257	3293	1473	0	3309	3232	1517	0	3341
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	3315	3080	0	3203	3293	1454	0	3303	3232	1492	0	3329
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		43				210				209		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	1		9	9		1		4		3		3
Confl. Bikes (#/hr)										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 (%)	1%	3%	0%	3%	5%	5%	0%	2%	7%	2%	0%	2%
Adj. Flow (vph)	220	32	43	30	21	24	23	51	415	41	278	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	75	0	30	21	24	0	74	415	41	0	349
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	12.0	37.3		12.0	37.3	37.3	12.0	12.0	37.0	37.0	35.0	35.0
Total Split (%)	9.9%	30.8%		9.9%	30.8%	30.8%	9.9%	9.9%	30.5%	30.5%	28.9%	28.9%
Maximum Green (s)	5.5	30.8		5.5	30.8	30.8	5.4	5.4	30.3	30.3	28.4	28.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		9			1	1			3	3		
Act Effct Green (s)	8.5	13.5		6.0	13.5	13.5		5.9	24.7	24.7		14.7
Actuated g/C Ratio	0.11	0.17		0.07	0.17	0.17		0.07	0.31	0.31		0.18

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1122	522
Future Volume (vph)	1122	522
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.98
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3424	1532
Flt Permitted		
Satd. Flow (perm)	3424	1506
Right Turn on Red		Yes
Satd. Flow (RTOR)		522
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		4
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	1%	1%
Adj. Flow (vph)	1122	522
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1122	522
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	60.0	60.0
Total Split (%)	49.5%	49.5%
Maximum Green (s)	53.3	53.3
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	4	4
Act Effct Green (s)	37.2	37.2
Actuated g/C Ratio	0.46	0.46

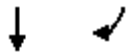
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.63	0.14		0.12	0.04	0.06		0.31	0.42	0.07		0.89dl
Control Delay	50.8	18.5		46.0	33.7	0.2		47.3	25.7	0.2		37.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	50.8	18.5		46.0	33.7	0.2		47.3	25.7	0.2		37.1
LOS	D	B		D	C	A		D	C	A		D
Approach Delay		42.6			27.9				26.7			
Approach LOS		D			C				C			
Queue Length 50th (m)	18.0	2.3		2.3	1.5	0.0		5.8	26.5	0.0		26.0
Queue Length 95th (m)	#61.4	9.2		8.6	5.3	0.0		16.8	56.1	0.0		54.0
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	350	1300		240	1363	725		240	1348	744		1275
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	0.63	0.06		0.13	0.02	0.03		0.31	0.31	0.06		0.27

Intersection Summary

Area Type: Other
Cycle Length: 121.3
Actuated Cycle Length: 80.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 23.9 Intersection LOS: C
Intersection Capacity Utilization 71.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
v/c Ratio	0.71	0.54
Control Delay	22.6	4.0
Queue Delay	0.0	0.0
Total Delay	22.6	4.0
LOS	C	A
Approach Delay	20.3	
Approach LOS	C	
Queue Length 50th (m)	76.4	0.0
Queue Length 95th (m)	139.1	18.7
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	2453	1227
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.46	0.43

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	186	18	286	114	186	48	7	1098	544	155	341
Future Volume (vph)	3	186	18	286	114	186	48	7	1098	544	155	341
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1750	1547	2942	1733	1488	0	3354	3357	1419	3077	3357
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1750	1547	2942	1733	1488	0	3346	3357	1419	3077	3357
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			186			186				474		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	4%	0%	14%	5%	4%	0%	0%	3%	9%	9%	3%
Adj. Flow (vph)	3	186	18	286	114	186	48	7	1098	544	155	341
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	186	18	286	114	186	0	55	1098	544	155	341
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	29.0	29.0	23.0	40.9	40.9	11.8	11.8	61.1	61.1	18.0	67.3
Total Split (%)	8.5%	22.1%	22.1%	17.5%	31.2%	31.2%	9.0%	9.0%	46.6%	46.6%	13.7%	51.3%
Maximum Green (s)	5.0	22.2	22.2	16.9	34.1	34.1	5.2	5.2	54.5	54.5	11.4	60.7
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.1	17.3	17.3	15.3	36.8	36.8		5.3	46.7	46.7	10.3	54.9
Actuated g/C Ratio	0.04	0.15	0.15	0.13	0.32	0.32		0.05	0.40	0.40	0.09	0.47
v/c Ratio	0.02	0.72	0.05	0.74	0.21	0.31		0.36	0.81	0.64	0.57	0.22

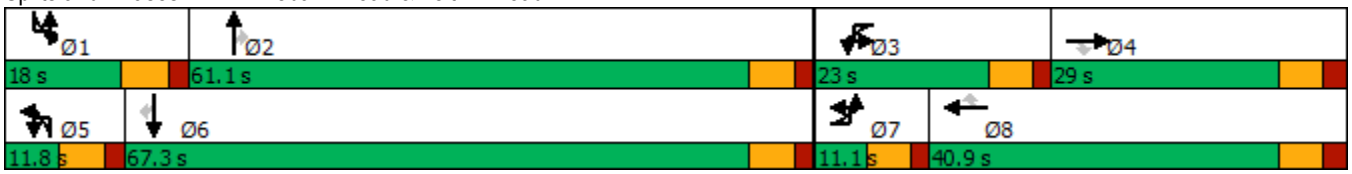


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1547
Flt Permitted	
Satd. Flow (perm)	1525
Right Turn on Red	Yes
Satd. Flow (RTOR)	188
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Adj. Flow (vph)	6
Shared Lane Traffic (%)	
Lane Group Flow (vph)	6
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	67.3
Total Split (%)	51.3%
Maximum Green (s)	60.7
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	54.9
Actuated g/C Ratio	0.47
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	60.7	65.2	0.2	63.2	33.3	6.5		66.1	37.1	8.0	62.6	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	65.2	0.2	63.2	33.3	6.5		66.1	37.1	8.0	62.6	19.8
LOS	E	E	A	E	C	A		E	D	A	E	B
Approach Delay		59.5			39.4				28.7			32.8
Approach LOS		E			D				C			C
Queue Length 50th (m)	0.3	43.8	0.0	34.8	19.8	0.0		6.8	121.3	10.4	18.9	25.5
Queue Length 95th (m)	2.1	70.6	0.0	#55.1	39.8	18.0		14.4	155.5	44.4	31.6	37.1
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	147	342	452	437	573	617		153	1610	927	308	1793
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.54	0.04	0.65	0.20	0.30		0.36	0.68	0.59	0.50	0.19

Intersection Summary			
Area Type:	Other		
Cycle Length: 131.1			
Actuated Cycle Length: 116.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 33.6		Intersection LOS: C	
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.			

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	902
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	21	1640	55	0	694
Future Vol, veh/h	0	21	1640	55	0	694
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	9
Mvmt Flow	0	21	1640	55	0	694

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	820	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	322	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	322	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	322	-
HCM Lane V/C Ratio	-	-	0.065	-
HCM Control Delay (s)	-	-	17	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	15	0	0	21	0	1674	55	0	601	93
Future Vol, veh/h	0	0	15	0	0	21	0	1674	55	0	601	93
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	5	0	0	9	0
Mvmt Flow	0	0	15	0	0	21	0	1674	55	0	601	93

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	301	-	-	837	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	701	0	0	314	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	701	-	-	314	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	17.3	0	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	701	314	-	-
HCM Lane V/C Ratio	-	-	0.021	0.067	-	-
HCM Control Delay (s)	-	-	10.2	17.3	-	-
HCM Lane LOS	-	-	B	C	-	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	641	206	37	130	118	213	18	38	784	192	58	110
Future Volume (vph)	641	206	37	130	118	213	18	38	784	192	58	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	0.85	0.99		0.97		0.89		0.98		0.95		0.98
Frt		0.977				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3290	0	3022	3357	1419	0	3244	3390	1419	0	3091
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	2830	3290	0	2942	3357	1257	0	3178	3390	1350	0	3026
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		14				148				192		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	61		13	13		61		11		22		22
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%	3%	11%	3%	9%	0%	5%	2%	9%	0%	13%
Adj. Flow (vph)	641	206	37	130	118	213	18	38	784	192	58	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	641	243	0	130	118	213	0	56	784	192	0	168
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	52.0	71.0		20.0	39.0	39.0	14.0	14.0	60.3	60.3	20.0	20.0
Total Split (%)	30.4%	41.4%		11.7%	22.8%	22.8%	8.2%	8.2%	35.2%	35.2%	11.7%	11.7%
Maximum Green (s)	45.5	64.5		13.5	32.5	32.5	7.4	7.4	53.6	53.6	13.4	13.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		13			61	61			22	22		
Act Effct Green (s)	32.4	46.5		11.3	25.3	25.3		7.2	38.7	38.7		12.2
Actuated g/C Ratio	0.24	0.34		0.08	0.19	0.19		0.05	0.28	0.28		0.09
v/c Ratio	0.81	0.22		0.52	0.19	0.60		0.33	0.81	0.37		0.61

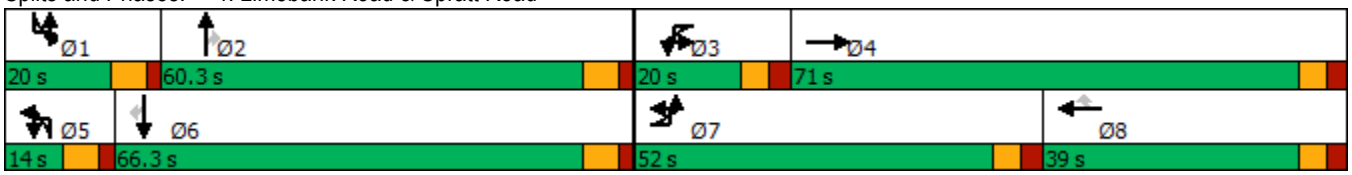


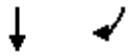
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	310	128
Future Volume (vph)	310	128
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.97
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3144	1502
Flt Permitted		
Satd. Flow (perm)	3144	1456
Right Turn on Red		Yes
Satd. Flow (RTOR)		147
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		11
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	10%	3%
Adj. Flow (vph)	310	128
Shared Lane Traffic (%)		
Lane Group Flow (vph)	310	128
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	66.3	66.3
Total Split (%)	38.7%	38.7%
Maximum Green (s)	59.6	59.6
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	11	11
Act Effct Green (s)	47.5	47.5
Actuated g/C Ratio	0.35	0.35
v/c Ratio	0.28	0.21

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Control Delay	59.7	31.2		73.1	50.9	26.4		76.1	54.3	7.2		74.8
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	59.7	31.2		73.1	50.9	26.4		76.1	54.3	7.2		74.8
LOS	E	C		E	D	C		E	D	A		E
Approach Delay		51.8			45.8				46.7			
Approach LOS		D			D				D			
Queue Length 50th (m)	88.7	23.0		18.2	14.3	15.3		7.9	109.4	0.0		23.6
Queue Length 95th (m)	123.9	38.6		33.7	28.0	49.8		17.7	146.9	18.7		42.1
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	1164	1642		314	840	425		184	1400	670		319
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	0.55	0.15		0.41	0.14	0.50		0.30	0.56	0.29		0.53

Intersection Summary			
Area Type:	Other		
Cycle Length: 171.3			
Actuated Cycle Length: 136.3			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 46.7		Intersection LOS: D	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
Control Delay	35.9	4.2
Queue Delay	0.0	0.0
Total Delay	35.9	4.2
LOS	D	A
Approach Delay	40.0	
Approach LOS	D	
Queue Length 50th (m)	34.6	0.0
Queue Length 95th (m)	52.1	10.3
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	1443	748
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.21	0.17

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	8	147	18	501	254	194	39	8	450	268	218	949
Future Volume (vph)	8	147	18	501	254	194	39	8	450	268	218	949
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1767	1381	3257	1802	1488	0	3354	3325	1419	3106	3424
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1767	1381	3257	1802	1488	0	3350	3325	1419	3106	3424
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			232			194				268		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	3%	12%	3%	1%	4%	0%	0%	4%	9%	8%	1%
Adj. Flow (vph)	8	147	18	501	254	194	39	8	450	268	218	949
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	147	18	501	254	194	0	47	450	268	218	949
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	28.0	28.0	37.0	53.9	53.9	12.0	12.0	48.1	48.1	23.0	59.1
Total Split (%)	8.2%	20.6%	20.6%	27.2%	39.6%	39.6%	8.8%	8.8%	35.3%	35.3%	16.9%	43.4%
Maximum Green (s)	5.0	21.2	21.2	30.9	47.1	47.1	5.4	5.4	41.5	41.5	16.4	52.5
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.2	14.8	14.8	22.0	41.4	41.4		5.6	29.9	29.9	12.8	40.3
Actuated g/C Ratio	0.05	0.14	0.14	0.21	0.39	0.39		0.05	0.28	0.28	0.12	0.38
v/c Ratio	0.05	0.60	0.05	0.75	0.36	0.28		0.27	0.48	0.45	0.58	0.73

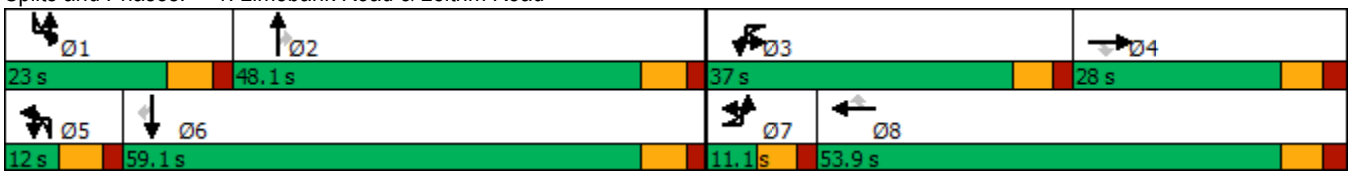


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1289
Flt Permitted	
Satd. Flow (perm)	1270
Right Turn on Red	Yes
Satd. Flow (RTOR)	181
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	20%
Adj. Flow (vph)	5
Shared Lane Traffic (%)	
Lane Group Flow (vph)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	59.1
Total Split (%)	43.4%
Maximum Green (s)	52.5
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	40.3
Actuated g/C Ratio	0.38
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	58.9	57.1	0.2	48.6	27.1	4.9		59.6	35.0	6.7	54.0	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	57.1	0.2	48.6	27.1	4.9		59.6	35.0	6.7	54.0	34.2
LOS	E	E	A	D	C	A		E	D	A	D	C
Approach Delay		51.2			33.9				26.6			37.7
Approach LOS		D			C				C			D
Queue Length 50th (m)	0.8	28.7	0.0	49.7	35.3	0.0		4.8	40.4	0.0	22.0	90.7
Queue Length 95th (m)	3.9	59.3	0.0	82.8	76.1	16.2		13.2	67.2	20.2	42.4	137.6
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	163	364	468	977	832	791		176	1340	732	495	1746
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.05	0.40	0.04	0.51	0.31	0.25		0.27	0.34	0.37	0.44	0.54

Intersection Summary			
Area Type:	Other		
Cycle Length: 136.1			
Actuated Cycle Length: 106.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 34.5		Intersection LOS: C	
Intersection Capacity Utilization 77.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	736
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	56	694	31	0	1510
Future Vol, veh/h	0	56	694	31	0	1510
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	56	694	31	0	1510

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	347	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	655	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	655	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	655	-
HCM Lane V/C Ratio	-	-	0.085	-
HCM Control Delay (s)	-	-	11	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.3	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	80	0	0	56	0	669	31	0	1490	20
Future Vol, veh/h	0	0	80	0	0	56	0	669	31	0	1490	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	0	0	80	0	0	56	0	669	31	0	1490	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	745	-	-	335	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	361	0	0	667	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	361	-	-	667	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.8	10.9	0	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	361	667	-	-
HCM Lane V/C Ratio	-	-	0.222	0.084	-	-
HCM Control Delay (s)	-	-	17.8	10.9	-	-
HCM Lane LOS	-	-	C	B	-	-
HCM 95th %tile Q(veh)	-	-	0.8	0.3	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	219	32	42	30	21	22	21	49	390	41	60	60
Future Volume (vph)	219	32	42	30	21	22	21	49	390	41	60	60
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	1.00	0.99		0.98		0.99		1.00		0.98		1.00
Frt		0.915				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3083	0	3257	3293	1473	0	3308	3232	1517	0	3321
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	3315	3083	0	3203	3293	1454	0	3300	3232	1492	0	3309
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		42				210				208		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	1		9	9		1		4		3		3
Confl. Bikes (#/hr)										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 (%)	1%	3%	0%	3%	5%	5%	0%	2%	7%	2%	0%	2%
Adj. Flow (vph)	219	32	42	30	21	22	21	49	390	41	60	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	219	74	0	30	21	22	0	70	390	41	0	120
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	20.0	45.0		11.5	36.5	36.5	13.0	13.0	49.8	49.8	15.0	15.0
Total Split (%)	16.5%	37.1%		9.5%	30.1%	30.1%	10.7%	10.7%	41.1%	41.1%	12.4%	12.4%
Maximum Green (s)	13.5	38.5		5.0	30.0	30.0	6.4	6.4	43.1	43.1	8.4	8.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		9			1	1			3	3		
Act Effct Green (s)	12.9	17.9		5.9	14.3	14.3		7.2	28.2	28.2		8.6
Actuated g/C Ratio	0.16	0.23		0.08	0.18	0.18		0.09	0.36	0.36		0.11

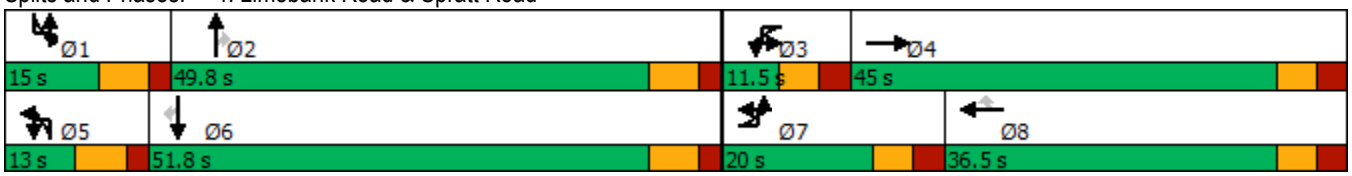


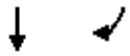
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	908	521
Future Volume (vph)	908	521
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.98
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3424	1532
Flt Permitted		
Satd. Flow (perm)	3424	1506
Right Turn on Red		Yes
Satd. Flow (RTOR)		521
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		4
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	1%	1%
Adj. Flow (vph)	908	521
Shared Lane Traffic (%)		
Lane Group Flow (vph)	908	521
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	51.8	51.8
Total Split (%)	42.7%	42.7%
Maximum Green (s)	45.1	45.1
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	4	4
Act Effct Green (s)	29.4	29.4
Actuated g/C Ratio	0.38	0.38

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.40	0.10		0.12	0.03	0.05		0.23	0.34	0.06		0.33
Control Delay	39.8	15.6		47.6	34.7	0.2		45.7	22.1	0.2		44.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	39.8	15.6		47.6	34.7	0.2		45.7	22.1	0.2		44.5
LOS	D	B		D	C	A		D	C	A		D
Approach Delay		33.7			29.6				23.6			
Approach LOS		C			C				C			
Queue Length 50th (m)	17.1	2.2		2.4	1.6	0.0		5.6	24.6	0.0		9.4
Queue Length 95th (m)	38.8	8.2		8.7	5.4	0.0		16.1	48.5	0.0		24.2
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	670	1788		243	1477	768		316	2000	1002		417
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	0.33	0.04		0.12	0.01	0.03		0.22	0.20	0.04		0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 121.3			
Actuated Cycle Length: 78.3			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
v/c Ratio	0.71	0.59
Control Delay	26.6	5.2
Queue Delay	0.0	0.0
Total Delay	26.6	5.2
LOS	C	A
Approach Delay	20.8	
Approach LOS	C	
Queue Length 50th (m)	65.8	0.0
Queue Length 95th (m)	119.7	23.0
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	2185	1149
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.42	0.45

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	234	21	380	123	200	245	7	1234	692	194	559
Future Volume (vph)	3	234	21	380	123	200	245	7	1234	692	194	559
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1750	1547	2942	1733	1488	0	3354	3357	1419	3077	3357
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1750	1547	2942	1733	1488	0	3348	3357	1419	3077	3357
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			241			200				401		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	4%	0%	14%	5%	4%	0%	0%	3%	9%	9%	3%
Adj. Flow (vph)	3	234	21	380	123	200	245	7	1234	692	194	559
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	234	21	380	123	200	0	252	1234	692	194	559
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	28.0	28.0	25.0	41.9	41.9	31.0	31.0	61.1	61.1	17.0	47.1
Total Split (%)	8.5%	21.4%	21.4%	19.1%	32.0%	32.0%	23.6%	23.6%	46.6%	46.6%	13.0%	35.9%
Maximum Green (s)	5.0	21.2	21.2	18.9	35.1	35.1	24.4	24.4	54.5	54.5	10.4	40.5
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.0	19.8	19.8	18.4	42.2	42.2		14.9	52.3	52.3	10.3	47.7
Actuated g/C Ratio	0.04	0.16	0.16	0.14	0.33	0.33		0.12	0.41	0.41	0.08	0.38
v/c Ratio	0.02	0.86	0.05	0.89	0.21	0.32		1.21dl	0.89	0.84	0.78	0.44



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	7
Future Volume (vph)	7
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1547
Flt Permitted	
Satd. Flow (perm)	1525
Right Turn on Red	Yes
Satd. Flow (RTOR)	243
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Adj. Flow (vph)	7
Shared Lane Traffic (%)	
Lane Group Flow (vph)	7
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	47.1
Total Split (%)	35.9%
Maximum Green (s)	40.5
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	47.7
Actuated g/C Ratio	0.38
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	61.0	81.3	0.2	77.7	33.5	6.1		61.8	44.4	24.6	79.8	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	61.0	81.3	0.2	77.7	33.5	6.1		61.8	44.4	24.6	79.8	31.8
LOS	E	F	A	E	C	A		E	D	C	E	C
Approach Delay		74.5			49.6				40.1			43.8
Approach LOS		E			D				D			D
Queue Length 50th (m)	0.4	59.3	0.0	50.4	22.0	0.0		32.6	153.1	74.9	25.8	56.1
Queue Length 95th (m)	2.1	#100.7	0.0	#77.7	42.3	18.2		45.0	184.4	#142.0	#44.5	76.2
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	132	293	460	439	575	627		647	1446	839	253	1261
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.80	0.05	0.87	0.21	0.32		0.39	0.85	0.82	0.77	0.44

Intersection Summary			
Area Type:	Other		
Cycle Length: 131.1			
Actuated Cycle Length: 127			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 44.8		Intersection LOS: D	
Intersection Capacity Utilization 97.3%		ICU Level of Service F	
Analysis Period (min) 15			

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

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	724
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	21	2035	55	0	1212
Future Vol, veh/h	0	21	2035	55	0	1212
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	9
Mvmt Flow	0	21	2035	55	0	1212

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1018	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	238	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	238	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	238	-
HCM Lane V/C Ratio	-	-	0.088	-
HCM Control Delay (s)	-	-	21.6	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.3	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	91	0	0	21	0	2069	55	0	654	557
Future Vol, veh/h	0	0	91	0	0	21	0	2069	55	0	654	557
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	5	0	0	9	0
Mvmt Flow	0	0	91	0	0	21	0	2069	55	0	654	557

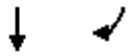
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	327	-	-	1035	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	675	0	0	232	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	675	-	-	232	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	22.1	0	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	675	232	-	-
HCM Lane V/C Ratio	-	-	0.135	0.091	-	-
HCM Control Delay (s)	-	-	11.2	22.1	-	-
HCM Lane LOS	-	-	B	C	-	-
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	661	206	39	130	118	225	20	39	1020	192	102	112
Future Volume (vph)	661	206	39	130	118	225	20	39	1020	192	102	112
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	0.85	0.99		0.97		0.89		0.98		0.95		0.98
Frt		0.976				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3286	0	3022	3357	1419	0	3247	3390	1419	0	3141
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	2830	3286	0	2942	3357	1257	0	3186	3390	1350	0	3093
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		15				148				192		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	61		13	13		61		11		22		22
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%	3%	11%	3%	9%	0%	5%	2%	9%	0%	13%
Adj. Flow (vph)	661	206	39	130	118	225	20	39	1020	192	102	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	661	245	0	130	118	225	0	59	1020	192	0	214
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	52.0	71.0		20.0	39.0	39.0	14.0	14.0	60.3	60.3	20.0	20.0
Total Split (%)	30.4%	41.4%		11.7%	22.8%	22.8%	8.2%	8.2%	35.2%	35.2%	11.7%	11.7%
Maximum Green (s)	45.5	64.5		13.5	32.5	32.5	7.4	7.4	53.6	53.6	13.4	13.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		13			61	61			22	22		
Act Effct Green (s)	35.7	49.4		11.6	25.3	25.3		7.2	50.5	50.5		13.2
Actuated g/C Ratio	0.24	0.33		0.08	0.17	0.17		0.05	0.33	0.33		0.09
v/c Ratio	0.85	0.23		0.57	0.21	0.68		0.38	0.90	0.33		0.78

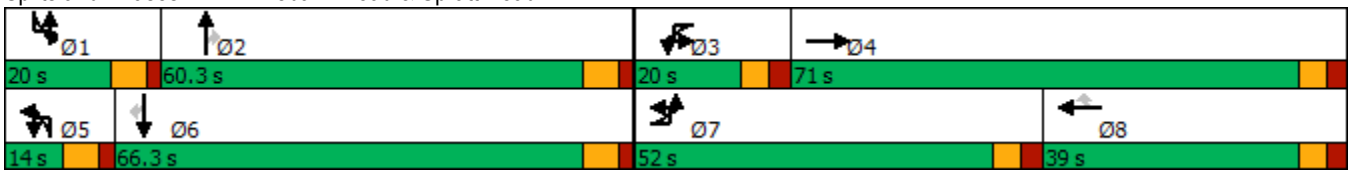


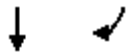
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	367	131
Future Volume (vph)	367	131
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.97
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3144	1502
Flt Permitted		
Satd. Flow (perm)	3144	1456
Right Turn on Red		Yes
Satd. Flow (RTOR)		147
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		11
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	10%	3%
Adj. Flow (vph)	367	131
Shared Lane Traffic (%)		
Lane Group Flow (vph)	367	131
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	66.3	66.3
Total Split (%)	38.7%	38.7%
Maximum Green (s)	59.6	59.6
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	11	11
Act Effct Green (s)	60.0	60.0
Actuated g/C Ratio	0.40	0.40
v/c Ratio	0.30	0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Control Delay	67.3	35.1		81.0	57.0	32.8		83.3	61.3	6.6		89.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	67.3	35.1		81.0	57.0	32.8		83.3	61.3	6.6		89.9
LOS	E	D		F	E	C		F	E	A		F
Approach Delay		58.6			52.1				54.1			
Approach LOS		E			D				D			
Queue Length 50th (m)	105.3	27.3		20.9	16.8	22.3		9.5	162.7	0.0		35.1
Queue Length 95th (m)	128.0	38.8		33.9	28.0	55.6		18.3	#219.5	18.6		#60.4
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	1021	1441		275	737	391		162	1228	611		284
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	0.65	0.17		0.47	0.16	0.58		0.36	0.83	0.31		0.75

Intersection Summary			
Area Type:	Other		
Cycle Length: 171.3			
Actuated Cycle Length: 151.7			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 53.3		Intersection LOS: D	
Intersection Capacity Utilization 102.3%		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: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
Control Delay	35.4	4.3
Queue Delay	0.0	0.0
Total Delay	35.4	4.3
LOS	D	A
Approach Delay	46.0	
Approach LOS	D	
Queue Length 50th (m)	43.5	0.0
Queue Length 95th (m)	62.0	11.1
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	1266	674
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.29	0.19

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	185	22	553	273	209	82	8	652	390	274	1082
Future Volume (vph)	10	185	22	553	273	209	82	8	652	390	274	1082
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Storage Lanes	2		1	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor								1.00				
Frt			0.850			0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3354	1767	1381	3257	1802	1488	0	3354	3325	1419	3106	3424
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	3354	1767	1381	3257	1802	1488	0	3351	3325	1419	3106	3424
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)			232			209				390		
Link Speed (k/h)		80			80				80			80
Link Distance (m)		395.5			472.5				303.9			517.2
Travel Time (s)		17.8			21.3				13.7			23.3
Confl. Peds. (#/hr)								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 (%)	0%	3%	12%	3%	1%	4%	0%	0%	4%	9%	8%	1%
Adj. Flow (vph)	10	185	22	553	273	209	82	8	652	390	274	1082
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	185	22	553	273	209	0	90	652	390	274	1082
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Detector Phase	7	4	4	3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	11.6	27.6	27.6	11.6	27.6
Total Split (s)	11.1	28.0	28.0	36.0	52.9	52.9	13.0	13.0	46.6	46.6	25.5	59.1
Total Split (%)	8.2%	20.6%	20.6%	26.5%	38.9%	38.9%	9.6%	9.6%	34.2%	34.2%	18.7%	43.4%
Maximum Green (s)	5.0	21.2	21.2	29.9	46.1	46.1	6.4	6.4	40.0	40.0	18.9	52.5
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8		6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		2.0	2.0		2.0	2.0			2.0	2.0		2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0			14.0	14.0		14.0
Pedestrian Calls (#/hr)		0	0		0	0			0	0		1
Act Effct Green (s)	5.1	17.0	17.0	24.9	44.3	44.3		6.5	34.8	34.8	15.6	43.9
Actuated g/C Ratio	0.04	0.14	0.14	0.21	0.37	0.37		0.05	0.29	0.29	0.13	0.37
v/c Ratio	0.07	0.73	0.06	0.81	0.41	0.31		0.87dl	0.67	0.57	0.67	0.86



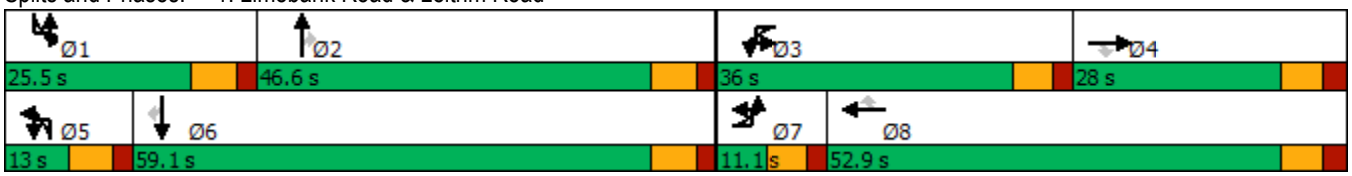
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1800
Storage Length (m)	185.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.99
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1289
Flt Permitted	
Satd. Flow (perm)	1270
Right Turn on Red	Yes
Satd. Flow (RTOR)	181
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	1.00
Heavy Vehicles (%)	20%
Adj. Flow (vph)	6
Shared Lane Traffic (%)	
Lane Group Flow (vph)	6
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	21.0
Minimum Split (s)	27.6
Total Split (s)	59.1
Total Split (%)	43.4%
Maximum Green (s)	52.5
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.6
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	2.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	43.9
Actuated g/C Ratio	0.37
v/c Ratio	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	63.5	68.7	0.3	56.5	32.2	5.3		69.2	42.2	7.0	60.3	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	68.7	0.3	56.5	32.2	5.3		69.2	42.2	7.0	60.3	43.1
LOS	E	E	A	E	C	A		E	D	A	E	D
Approach Delay		61.5			39.8				32.2			46.4
Approach LOS		E			D				C			D
Queue Length 50th (m)	1.2	43.3	0.0	66.0	45.3	0.0		11.1	73.2	0.0	33.0	125.4
Queue Length 95th (m)	4.5	73.3	0.0	93.2	83.1	16.8		21.5	102.2	25.1	51.2	164.3
Internal Link Dist (m)		371.5			448.5				279.9			493.2
Turn Bay Length (m)	130.0		130.0	120.0		150.0		195.0		180.0	210.0	
Base Capacity (vph)	144	322	441	837	728	726		184	1144	744	505	1546
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.07	0.57	0.05	0.66	0.38	0.29		0.49	0.57	0.52	0.54	0.70

Intersection Summary			
Area Type:	Other		
Cycle Length: 136.1			
Actuated Cycle Length: 119.1			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 41.1		Intersection LOS: D	
Intersection Capacity Utilization 84.4%		ICU Level of Service E	
Analysis Period (min) 15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 1: Limebank Road & Leitrim Road





Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	0.0
Internal Link Dist (m)	
Turn Bay Length (m)	185.0
Base Capacity (vph)	673
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	56	1025	31	0	1752
Future Vol, veh/h	0	56	1025	31	0	1752
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	56	1025	31	0	1752

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	513	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	512	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	512	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	512	-
HCM Lane V/C Ratio	-	-	0.109	-
HCM Control Delay (s)	-	-	12.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.4	-

Intersection	
Int Delay, s/veh	38.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱			↱		↑↑	↱		↑↑	↱
Traffic Vol, veh/h	0	0	482	0	0	56	0	1000	31	0	1632	120
Future Vol, veh/h	0	0	482	0	0	56	0	1000	31	0	1632	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	15	-	-	15
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	0	0	482	0	0	56	0	1000	31	0	1632	120

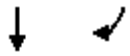
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	816	-	-	500	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	~ 324	0	0	522	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	~ 324	-	-	522	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	265.4	12.7	0	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	-	-	324	522	-	-
HCM Lane V/C Ratio	-	-	1.488	0.107	-	-
HCM Control Delay (s)	-	-	265.4	12.7	-	-
HCM Lane LOS	-	-	F	B	-	-
HCM 95th %tile Q(veh)	-	-	26.6	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	225	32	43	30	21	24	23	51	459	41	291	71
Future Volume (vph)	225	32	43	30	21	24	23	51	459	41	291	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	1.00	0.99		0.98		0.99		1.00		0.98		1.00
Frt		0.914				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3080	0	3257	3293	1473	0	3309	3232	1517	0	3341
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	3315	3080	0	3203	3293	1454	0	3303	3232	1492	0	3330
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		43				210				209		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	1		9	9		1		4		3		3
Confl. Bikes (#/hr)										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 (%)	1%	3%	0%	3%	5%	5%	0%	2%	7%	2%	0%	2%
Adj. Flow (vph)	225	32	43	30	21	24	23	51	459	41	291	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	75	0	30	21	24	0	74	459	41	0	362
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	12.0	37.3		12.0	37.3	37.3	12.0	12.0	37.0	37.0	35.0	35.0
Total Split (%)	9.9%	30.8%		9.9%	30.8%	30.8%	9.9%	9.9%	30.5%	30.5%	28.9%	28.9%
Maximum Green (s)	5.5	30.8		5.5	30.8	30.8	5.4	5.4	30.3	30.3	28.4	28.4
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		9			1	1			3	3		
Act Effct Green (s)	8.5	13.5		6.0	13.5	13.5		5.8	24.7	24.7		15.1
Actuated g/C Ratio	0.11	0.17		0.07	0.17	0.17		0.07	0.31	0.31		0.19



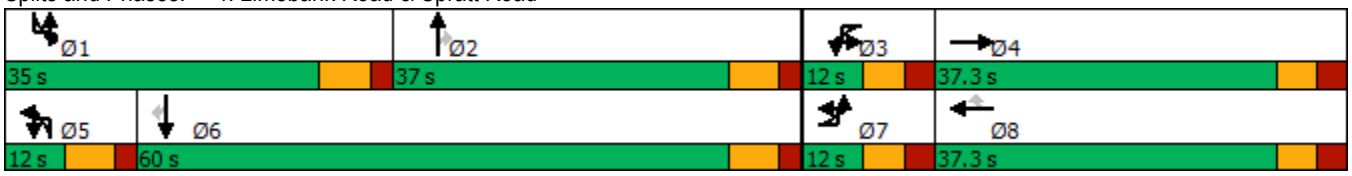
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1137	537
Future Volume (vph)	1137	537
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.98
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3424	1532
Flt Permitted		
Satd. Flow (perm)	3424	1506
Right Turn on Red		Yes
Satd. Flow (RTOR)		537
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		4
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	1%	1%
Adj. Flow (vph)	1137	537
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1137	537
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	60.0	60.0
Total Split (%)	49.5%	49.5%
Maximum Green (s)	53.3	53.3
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	4	4
Act Effct Green (s)	37.5	37.5
Actuated g/C Ratio	0.46	0.46

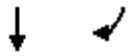
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.65	0.14		0.13	0.04	0.06		0.31	0.47	0.07		0.91dl
Control Delay	51.7	18.5		46.1	33.8	0.2		47.5	26.5	0.2		36.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	51.7	18.5		46.1	33.8	0.2		47.5	26.5	0.2		36.9
LOS	D	B		D	C	A		D	C	A		D
Approach Delay		43.4			28.0				27.4			
Approach LOS		D			C				C			
Queue Length 50th (m)	~18.9	2.3		2.3	1.5	0.0		5.8	30.2	0.0		27.1
Queue Length 95th (m)	#62.9	9.2		8.6	5.3	0.0		16.8	62.8	0.0		55.8
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	348	1295		239	1357	722		239	1339	740		1270
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	0.65	0.06		0.13	0.02	0.03		0.31	0.34	0.06		0.29

Intersection Summary

Area Type: Other
Cycle Length: 121.3
Actuated Cycle Length: 80.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 24.2 Intersection LOS: C
Intersection Capacity Utilization 72.6% ICU Level of Service C
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.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
v/c Ratio	0.72	0.55
Control Delay	22.8	4.0
Queue Delay	0.0	0.0
Total Delay	22.8	4.0
LOS	C	A
Approach Delay	20.3	
Approach LOS	C	
Queue Length 50th (m)	78.0	0.0
Queue Length 95th (m)	141.8	19.1
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	2443	1228
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.44

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	234	17	351	123	200	6	1213	679	194	543	7
Future Volume (vph)	3	234	17	351	123	200	6	1213	679	194	543	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	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)	3354	1750	1547	2942	1733	1488	3354	3357	1419	3077	3357	1547
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3354	1750	1547	2942	1733	1488	3348	3357	1419	3077	3357	1525
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			178			451			188
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		395.5			472.5			303.9			517.2	
Travel Time (s)		17.8			21.3			13.7			23.3	
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 (%)	0%	4%	0%	14%	5%	4%	0%	3%	9%	9%	3%	0%
Adj. Flow (vph)	3	234	17	351	123	200	6	1213	679	194	543	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	234	17	351	123	200	6	1213	679	194	543	7
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	21.0	21.0	5.0	21.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	27.6	27.6	11.6	27.6	27.6
Total Split (s)	11.1	28.0	28.0	25.0	41.9	41.9	11.6	61.1	61.1	17.0	66.5	66.5
Total Split (%)	8.5%	21.4%	21.4%	19.1%	32.0%	32.0%	8.8%	46.6%	46.6%	13.0%	50.7%	50.7%
Maximum Green (s)	5.0	21.2	21.2	18.9	35.1	35.1	5.0	54.5	54.5	10.4	59.9	59.9
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		1	1
Act Effct Green (s)	5.0	19.8	19.8	18.0	41.7	41.7	5.0	51.9	51.9	10.3	66.6	66.6
Actuated g/C Ratio	0.04	0.16	0.16	0.14	0.33	0.33	0.04	0.41	0.41	0.08	0.53	0.53
v/c Ratio	0.02	0.86	0.04	0.84	0.22	0.33	0.05	0.88	0.80	0.78	0.31	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	61.0	80.5	0.2	71.6	33.4	8.4	61.5	43.0	18.7	79.0	18.2	0.0
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	61.0	80.5	0.2	71.6	33.4	8.4	61.5	43.0	18.7	79.0	18.2	0.0
LOS	E	F	A	E	C	A	E	D	B	E	B	A
Approach Delay		74.9			45.9			34.4			33.9	
Approach LOS		E			D			C			C	
Queue Length 50th (m)	0.4	59.3	0.0	46.0	22.0	3.7	0.7	149.1	54.3	25.8	38.6	0.0
Queue Length 95th (m)	2.1	#100.7	0.0	#68.9	42.3	23.7	3.1	179.8	113.6	#44.5	60.6	0.0
Internal Link Dist (m)		371.5			448.5			279.9			493.2	
Turn Bay Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Base Capacity (vph)	133	295	416	443	572	611	133	1459	871	255	1782	897
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	0.02	0.79	0.04	0.79	0.22	0.33	0.05	0.83	0.78	0.76	0.30	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 131.1			
Actuated Cycle Length: 126.2			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 39.3		Intersection LOS: D	
Intersection Capacity Utilization 95.5%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Limebank Road & Leitrim Road



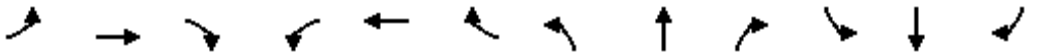
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1776	0	0	916
Future Vol, veh/h	0	0	1776	0	0	916
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	9
Mvmt Flow	0	0	1776	0	0	916

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	888	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	291	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	291	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

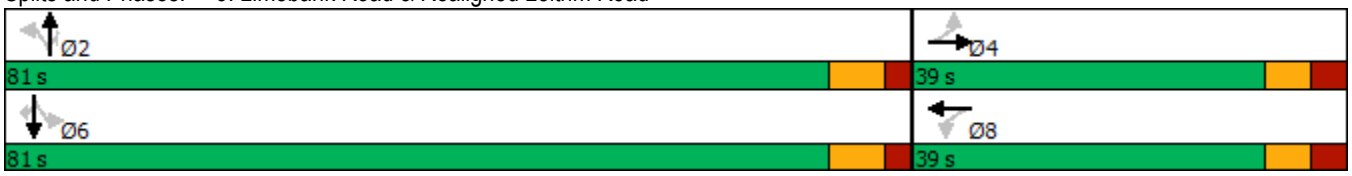


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	0	39	0	0	0	237	1724	0	0	597	320
Future Volume (vph)	52	0	39	0	0	0	237	1724	0	0	597	320
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	125.0		0.0	15.0		0.0	105.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			2.5			7.6			7.6		
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
Frt		0.850										0.850
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1729	1547	0	1820	1820	0	1729	3293	1820	1820	3172	1547
Flt Permitted	0.757						0.426					
Satd. Flow (perm)	1378	1547	0	1820	1820	0	775	3293	1820	1820	3172	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		308										235
Link Speed (k/h)		60			60			80			80	
Link Distance (m)		472.7			426.7			635.3			205.5	
Travel Time (s)		28.4			25.6			28.6			9.2	
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 (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	9%	0%
Adj. Flow (vph)	52	0	39	0	0	0	237	1724	0	0	597	320
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	39	0	0	0	0	237	1724	0	0	597	320
Turn Type	Perm	NA		Perm			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)	38.6	38.6		38.6	38.6		34.3	34.3	34.3	34.3	34.3	34.3
Total Split (s)	39.0	39.0		39.0	39.0		81.0	81.0	81.0	81.0	81.0	81.0
Total Split (%)	32.5%	32.5%		32.5%	32.5%		67.5%	67.5%	67.5%	67.5%	67.5%	67.5%
Maximum Green (s)	31.5	31.5		31.5	31.5		73.6	73.6	73.6	73.6	73.6	73.6
Yellow Time (s)	4.1	4.1		4.1	4.1		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	3.4	3.4		3.4	3.4		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)	7.5	7.5		7.5	7.5		7.4	7.4	7.4	7.4	7.4	7.4
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		Min	Min	Min	Min	Min	Min
Walk Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Flash Dont Walk (s)	29.1	29.1		29.1	29.1		24.9	24.9	24.9	24.9	24.9	24.9
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	11.4	11.4					60.8	60.8			60.8	60.8
Actuated g/C Ratio	0.14	0.14					0.77	0.77			0.77	0.77
v/c Ratio	0.26	0.08					0.40	0.68			0.25	0.26
Control Delay	40.4	0.3					7.7	8.8			4.5	1.9
Queue Delay	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	40.4	0.3					7.7	8.8			4.5	1.9
LOS	D	A					A	A			A	A
Approach Delay		23.3						8.7			3.6	
Approach LOS		C						A			A	
Queue Length 50th (m)	7.8	0.0					13.6	75.9			15.4	3.6
Queue Length 95th (m)	21.0	0.0					29.1	110.9			23.8	11.2
Internal Link Dist (m)		448.7			402.7			611.3			181.5	
Turn Bay Length (m)	125.0						105.0					15.0
Base Capacity (vph)	592	840					675	2870			2765	1378
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	0.09	0.05					0.35	0.60			0.22	0.23

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 79.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 7.5		Intersection LOS: A	
Intersection Capacity Utilization 85.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Limebank Road & Realigned Leitrim Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	644	206	39	130	118	225	20	39	975	192	112	363
Future Volume (vph)	644	206	39	130	118	225	20	39	975	192	112	363
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0	255.0	
Storage Lanes	2		0	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor	0.85	0.99		0.97		0.89		0.98		0.95	0.98	
Frt		0.976				0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3321	3286	0	3022	3357	1419	0	3247	3390	1419	2968	3144
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	2830	3286	0	2942	3357	1257	0	3185	3390	1350	2920	3144
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		14				148				192		
Link Speed (k/h)		60			60				80			80
Link Distance (m)		209.4			525.1				473.0			635.3
Travel Time (s)		12.6			31.5				21.3			28.6
Confl. Peds. (#/hr)	61		13	13		61		11		22	22	
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%	3%	11%	3%	9%	0%	5%	2%	9%	13%	10%
Adj. Flow (vph)	644	206	39	130	118	225	20	39	975	192	112	363
Shared Lane Traffic (%)												
Lane Group Flow (vph)	644	245	0	130	118	225	0	59	975	192	112	363
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	36.7
Total Split (s)	48.0	65.5		19.5	37.0	37.0	13.7	13.7	69.3	69.3	17.0	72.6
Total Split (%)	28.0%	38.2%		11.4%	21.6%	21.6%	8.0%	8.0%	40.5%	40.5%	9.9%	42.4%
Maximum Green (s)	41.5	59.0		13.0	30.5	30.5	7.1	7.1	62.6	62.6	10.4	65.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	2.0	2.1
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)	6.5	6.5		6.5	6.5	6.5		6.6	6.7	6.7	6.6	6.7
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	3.0
Recall Mode	Min	None		None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		5.0
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		25.0
Pedestrian Calls (#/hr)		13			61	61			22	22		11
Act Effct Green (s)	33.2	47.3		11.3	25.3	25.3		7.1	48.5	48.5	9.8	55.1
Actuated g/C Ratio	0.23	0.33		0.08	0.18	0.18		0.05	0.34	0.34	0.07	0.38
v/c Ratio	0.85	0.23		0.55	0.20	0.66		0.37	0.86	0.33	0.56	0.30

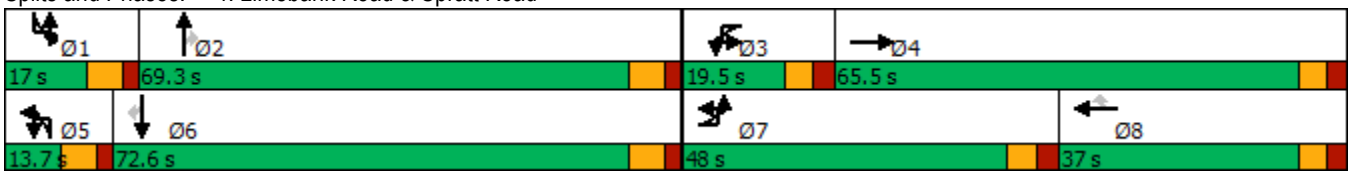


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	127
Future Volume (vph)	127
Ideal Flow (vphpl)	1800
Storage Length (m)	230.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.97
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1502
Flt Permitted	
Satd. Flow (perm)	1456
Right Turn on Red	Yes
Satd. Flow (RTOR)	147
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	11
Peak Hour Factor	1.00
Heavy Vehicles (%)	3%
Adj. Flow (vph)	127
Shared Lane Traffic (%)	
Lane Group Flow (vph)	127
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	36.7
Total Split (s)	72.6
Total Split (%)	42.4%
Maximum Green (s)	65.9
Yellow Time (s)	4.6
All-Red Time (s)	2.1
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.7
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	5.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	11
Act Effct Green (s)	55.1
Actuated g/C Ratio	0.38
v/c Ratio	0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	66.2	34.5		78.9	54.9	31.4		82.0	54.1	6.1	82.5	34.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	34.5		78.9	54.9	31.4		82.0	54.1	6.1	82.5	34.7
LOS	E	C		E	D	C		F	D	A	F	C
Approach Delay		57.5			50.3				47.9			37.0
Approach LOS		E			D				D			D
Queue Length 50th (m)	96.5	25.7		19.7	15.7	20.6		9.0	145.1	0.0	17.1	42.0
Queue Length 95th (m)	130.9	40.9		34.3	28.4	56.1		18.6	183.1	17.0	30.9	58.8
Internal Link Dist (m)		185.4			501.1				449.0			611.3
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0	255.0	
Base Capacity (vph)	999	1414		284	742	393		167	1539	717	224	1502
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	0.64	0.17		0.46	0.16	0.57		0.35	0.63	0.27	0.50	0.24

Intersection Summary			
Area Type:	Other		
Cycle Length: 171.3			
Actuated Cycle Length: 144.4			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 48.9		Intersection LOS: D	
Intersection Capacity Utilization 98.2%		ICU Level of Service F	
Analysis Period (min) 15			

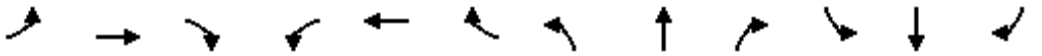
Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBR
Control Delay	3.6
Queue Delay	0.0
Total Delay	3.6
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	9.5
Internal Link Dist (m)	
Turn Bay Length (m)	230.0
Base Capacity (vph)	772
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.16

Intersection Summary

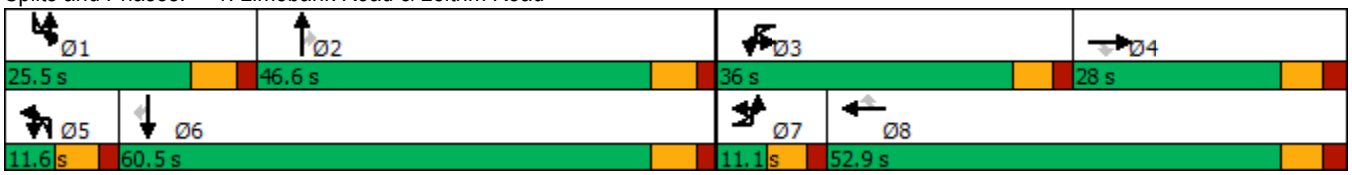


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	185	21	546	273	209	4	609	355	274	1077	6
Future Volume (vph)	10	185	21	546	273	209	4	609	355	274	1077	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	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)	3354	1767	1381	3257	1802	1488	3354	3325	1419	3106	3424	1289
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3354	1767	1381	3257	1802	1488	3351	3325	1419	3106	3424	1270
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			209			355			181
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		395.5			472.5			303.9			517.2	
Travel Time (s)		17.8			21.3			13.7			23.3	
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 (%)	0%	3%	12%	3%	1%	4%	0%	4%	9%	8%	1%	20%
Adj. Flow (vph)	10	185	21	546	273	209	4	609	355	274	1077	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	185	21	546	273	209	4	609	355	274	1077	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	21.0	21.0	5.0	21.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	27.6	27.6	11.6	27.6	27.6
Total Split (s)	11.1	28.0	28.0	36.0	52.9	52.9	11.6	46.6	46.6	25.5	60.5	60.5
Total Split (%)	8.2%	20.6%	20.6%	26.5%	38.9%	38.9%	8.5%	34.2%	34.2%	18.7%	44.5%	44.5%
Maximum Green (s)	5.0	21.2	21.2	29.9	46.1	46.1	5.0	40.0	40.0	18.9	53.9	53.9
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		1	1
Act Effct Green (s)	5.2	16.6	16.6	23.7	44.8	44.8	5.2	29.3	29.3	15.1	49.3	49.3
Actuated g/C Ratio	0.05	0.15	0.15	0.21	0.40	0.40	0.05	0.26	0.26	0.14	0.44	0.44
v/c Ratio	0.06	0.71	0.05	0.79	0.38	0.29	0.03	0.70	0.56	0.65	0.71	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	61.2	63.2	0.2	52.2	27.6	4.9	61.0	43.2	7.4	56.2	30.2	0.0
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	61.2	63.2	0.2	52.2	27.6	4.9	61.0	43.2	7.4	56.2	30.2	0.0
LOS	E	E	A	D	C	A	E	D	A	E	C	A
Approach Delay		57.0			36.0			30.2			35.3	
Approach LOS		E			D			C			D	
Queue Length 50th (m)	1.1	39.1	0.0	58.9	40.0	0.0	0.4	64.7	0.0	29.9	97.4	0.0
Queue Length 95th (m)	4.5	73.3	0.0	92.0	83.1	16.8	2.6	94.6	23.8	51.2	160.5	0.0
Internal Link Dist (m)		371.5			448.5			279.9			493.2	
Turn Bay Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Base Capacity (vph)	155	346	457	900	804	780	155	1230	748	543	1732	732
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	0.06	0.53	0.05	0.61	0.34	0.27	0.03	0.50	0.47	0.50	0.62	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 136.1			
Actuated Cycle Length: 111.7			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 35.4		Intersection LOS: D	
Intersection Capacity Utilization 84.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Limebank Road & Leitrim Road



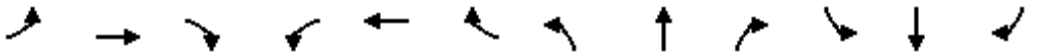
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	918	0	0	1657
Future Vol, veh/h	0	0	918	0	0	1657
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	0	918	0	0	1657

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	459	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	554	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	554	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

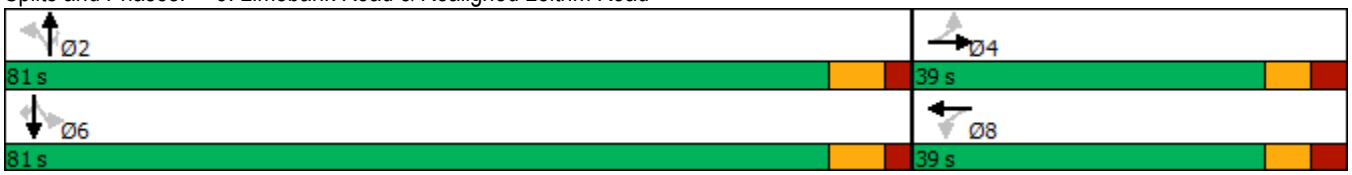


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	0	205	0	0	0	51	641	0	0	1588	69
Future Volume (vph)	277	0	205	0	0	0	51	641	0	0	1588	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	125.0		0.0	15.0		0.0	105.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			2.5			7.6			7.6		
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
Frt		0.850										0.850
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1729	1547	0	1820	1820	0	1729	3262	1820	1820	3390	1547
Flt Permitted	0.757						0.060					
Satd. Flow (perm)	1378	1547	0	1820	1820	0	109	3262	1820	1820	3390	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40										41
Link Speed (k/h)		60			60			80			80	
Link Distance (m)		472.7			426.7			635.3			205.5	
Travel Time (s)		28.4			25.6			28.6			9.2	
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 (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	308	0	228	0	0	0	57	712	0	0	1764	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	308	228	0	0	0	0	57	712	0	0	1764	77
Turn Type	Perm	NA		Perm			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)	38.6	38.6		38.6	38.6		34.3	34.3	34.3	34.3	34.3	34.3
Total Split (s)	39.0	39.0		39.0	39.0		81.0	81.0	81.0	81.0	81.0	81.0
Total Split (%)	32.5%	32.5%		32.5%	32.5%		67.5%	67.5%	67.5%	67.5%	67.5%	67.5%
Maximum Green (s)	31.5	31.5		31.5	31.5		73.6	73.6	73.6	73.6	73.6	73.6
Yellow Time (s)	4.1	4.1		4.1	4.1		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	3.4	3.4		3.4	3.4		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)	7.5	7.5		7.5	7.5		7.4	7.4	7.4	7.4	7.4	7.4
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		Min	Min	Min	Min	Min	Min
Walk Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Flash Dont Walk (s)	29.1	29.1		29.1	29.1		24.9	24.9	24.9	24.9	24.9	24.9
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	28.1	28.1					67.0	67.0			67.0	67.0
Actuated g/C Ratio	0.25	0.25					0.61	0.61			0.61	0.61
v/c Ratio	0.88	0.54					0.88	0.36			0.86	0.08
Control Delay	67.4	35.8					107.1	11.6			23.4	5.4
Queue Delay	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	67.4	35.8					107.1	11.6			23.4	5.4
LOS	E	D					F	B			C	A
Approach Delay		54.0						18.7			22.6	
Approach LOS		D						B			C	
Queue Length 50th (m)	69.1	37.9					10.2	40.9			165.3	3.2
Queue Length 95th (m)	#116.7	63.1					#23.4	52.2			200.8	9.0
Internal Link Dist (m)		448.7			402.7			611.3			181.5	
Turn Bay Length (m)	125.0						105.0					15.0
Base Capacity (vph)	406	484					74	2246			2335	1078
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	0.76	0.47					0.77	0.32			0.76	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 110.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 27.0		Intersection LOS: C	
Intersection Capacity Utilization 75.0%		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.			

Splits and Phases: 3: Limebank Road & Realigned Leitrim Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	220	32	43	30	21	24	23	51	415	41	1	71
Future Volume (vph)	220	32	43	30	21	24	23	51	415	41	1	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	1.00	0.99		0.98		0.99		1.00		0.98		1.00
Frt		0.914				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3080	0	3257	3293	1473	0	3309	3232	1517	0	3289
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	3315	3080	0	3203	3293	1454	0	3303	3232	1492	0	3278
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		43				151				149		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	1		9	9		1		4		3		3
Confl. Bikes (#/hr)										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 (%)	1%	3%	0%	3%	5%	5%	0%	2%	7%	2%	0%	2%
Adj. Flow (vph)	220	32	43	30	21	24	23	51	415	41	1	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	75	0	30	21	24	0	74	415	41	0	72
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	18.0	43.0		11.5	36.5	36.5	12.0	12.0	54.1	54.1	12.7	12.7
Total Split (%)	14.8%	35.4%		9.5%	30.1%	30.1%	9.9%	9.9%	44.6%	44.6%	10.5%	10.5%
Maximum Green (s)	11.5	36.5		5.0	30.0	30.0	5.4	5.4	47.4	47.4	6.1	6.1
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		9			1	1			3	3		
Act Effct Green (s)	12.3	17.4		5.8	14.3	14.3		6.2	34.0	34.0		6.9
Actuated g/C Ratio	0.15	0.21		0.07	0.17	0.17		0.08	0.42	0.42		0.08

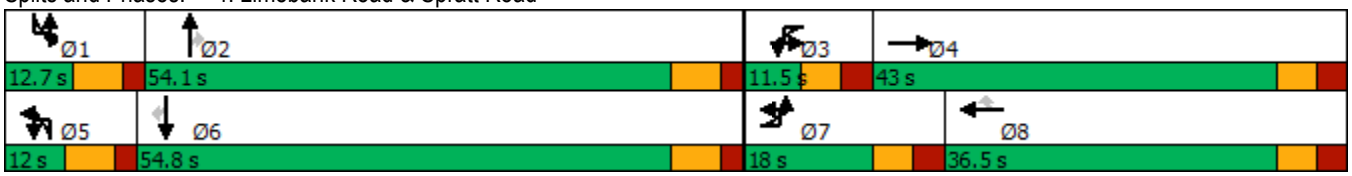
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1122	522
Future Volume (vph)	1122	522
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.98
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3424	1532
Flt Permitted		
Satd. Flow (perm)	3424	1506
Right Turn on Red		Yes
Satd. Flow (RTOR)		522
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		4
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	1%	1%
Adj. Flow (vph)	1122	522
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1122	522
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	54.8	54.8
Total Split (%)	45.2%	45.2%
Maximum Green (s)	48.1	48.1
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	4	4
Act Effct Green (s)	34.5	34.5
Actuated g/C Ratio	0.42	0.42

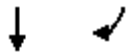
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.44	0.11		0.13	0.04	0.06		0.29	0.31	0.06		0.26
Control Delay	43.1	16.7		49.1	36.1	0.3		49.5	19.2	0.1		48.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	43.1	16.7		49.1	36.1	0.3		49.5	19.2	0.1		48.1
LOS	D	B		D	D	A		D	B	A		D
Approach Delay		36.4			29.9				22.0			
Approach LOS		D			C				C			
Queue Length 50th (m)	18.8	2.4		2.6	1.7	0.0		6.5	25.3	0.0		6.2
Queue Length 95th (m)	#40.2	8.5		8.7	5.4	0.0		16.9	48.6	0.0		16.4
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	539	1609		230	1395	703		252	2056	1003		283
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	0.41	0.05		0.13	0.02	0.03		0.29	0.20	0.04		0.25

Intersection Summary

Area Type: Other
Cycle Length: 121.3
Actuated Cycle Length: 81.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 23.3 Intersection LOS: C
Intersection Capacity Utilization 71.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

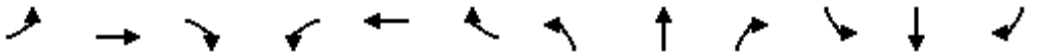
Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
v/c Ratio	0.78	0.56
Control Delay	27.1	4.6
Queue Delay	0.0	0.0
Total Delay	27.1	4.6
LOS	C	A
Approach Delay	21.1	
Approach LOS	C	
Queue Length 50th (m)	87.5	0.0
Queue Length 95th (m)	152.6	21.6
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	2200	1154
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.51	0.45

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	234	21	381	123	200	7	1226	690	194	569	7
Future Volume (vph)	3	234	21	381	123	200	7	1226	690	194	569	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	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)	3354	1750	1547	2942	1733	1488	3354	3357	1419	3077	3357	1547
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3354	1750	1547	2942	1733	1488	3348	3357	1419	3077	3357	1525
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			178			451			188
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		395.5			472.5			303.9			517.2	
Travel Time (s)		17.8			21.3			13.7			23.3	
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 (%)	0%	4%	0%	14%	5%	4%	0%	3%	9%	9%	3%	0%
Adj. Flow (vph)	3	234	21	381	123	200	7	1226	690	194	569	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	234	21	381	123	200	7	1226	690	194	569	7
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	21.0	21.0	5.0	21.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	27.6	27.6	11.6	27.6	27.6
Total Split (s)	11.1	28.0	28.0	25.0	41.9	41.9	11.6	61.1	61.1	17.0	66.5	66.5
Total Split (%)	8.5%	21.4%	21.4%	19.1%	32.0%	32.0%	8.8%	46.6%	46.6%	13.0%	50.7%	50.7%
Maximum Green (s)	5.0	21.2	21.2	18.9	35.1	35.1	5.0	54.5	54.5	10.4	59.9	59.9
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		1	1
Act Effct Green (s)	5.0	19.8	19.8	18.4	42.2	42.2	5.0	52.2	52.2	10.3	66.9	66.9
Actuated g/C Ratio	0.04	0.16	0.16	0.14	0.33	0.33	0.04	0.41	0.41	0.08	0.53	0.53
v/c Ratio	0.02	0.86	0.05	0.89	0.21	0.33	0.05	0.89	0.81	0.78	0.32	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	61.0	81.2	0.2	77.8	33.4	8.4	61.7	44.0	19.7	79.7	18.5	0.0
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	61.0	81.2	0.2	77.8	33.4	8.4	61.7	44.0	19.7	79.7	18.5	0.0
LOS	E	F	A	E	C	A	E	D	B	E	B	A
Approach Delay		74.4			50.3			35.3			33.8	
Approach LOS		E			D			D			C	
Queue Length 50th (m)	0.4	59.3	0.0	50.5	22.0	3.7	0.9	151.5	58.4	25.8	40.8	0.0
Queue Length 95th (m)	2.1	#100.7	0.0	#78.0	42.3	23.7	3.5	182.7	119.2	#44.5	63.8	0.0
Internal Link Dist (m)		371.5			448.5			279.9			493.2	
Turn Bay Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Base Capacity (vph)	132	293	414	440	575	613	132	1447	868	253	1769	892
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	0.02	0.80	0.05	0.87	0.21	0.33	0.05	0.85	0.79	0.77	0.32	0.01

Intersection Summary

Area Type: Other
Cycle Length: 131.1
Actuated Cycle Length: 126.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 40.6 Intersection LOS: D
Intersection Capacity Utilization 97.2% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Limebank Road & Leitrim Road



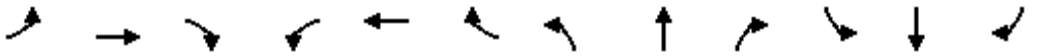
Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	20	1781	19	0	975
Future Vol, veh/h	0	20	1781	19	0	975
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	5	0	0	9
Mvmt Flow	0	20	1781	19	0	975

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	891	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	289	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	289	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	289	-
HCM Lane V/C Ratio	-	-	0.069	-
HCM Control Delay (s)	-	-	18.4	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.2	-

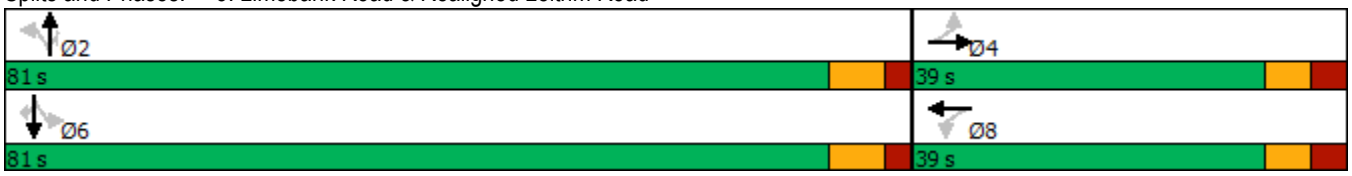


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	0	39	15	0	5	237	1743	18	59	597	320
Future Volume (vph)	52	0	39	15	0	5	237	1743	18	59	597	320
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	125.0		0.0	15.0		0.0	105.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			2.5			7.6			7.6		
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
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1547	0	1729	1547	0	1729	3293	1547	1729	3172	1547
Flt Permitted	0.754			0.732			0.426			0.105		
Satd. Flow (perm)	1372	1547	0	1332	1547	0	775	3293	1547	191	3172	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		308			40				41			235
Link Speed (k/h)		60			60			80			80	
Link Distance (m)		472.7			426.7			635.3			205.5	
Travel Time (s)		28.4			25.6			28.6			9.2	
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 (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	9%	0%
Adj. Flow (vph)	52	0	39	15	0	5	237	1743	18	59	597	320
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	39	0	15	5	0	237	1743	18	59	597	320
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)	38.6	38.6		38.6	38.6		34.3	34.3	34.3	34.3	34.3	34.3
Total Split (s)	39.0	39.0		39.0	39.0		81.0	81.0	81.0	81.0	81.0	81.0
Total Split (%)	32.5%	32.5%		32.5%	32.5%		67.5%	67.5%	67.5%	67.5%	67.5%	67.5%
Maximum Green (s)	31.5	31.5		31.5	31.5		73.6	73.6	73.6	73.6	73.6	73.6
Yellow Time (s)	4.1	4.1		4.1	4.1		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	3.4	3.4		3.4	3.4		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)	7.5	7.5		7.5	7.5		7.4	7.4	7.4	7.4	7.4	7.4
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		Min	Min	Min	Min	Min	Min
Walk Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Flash Dont Walk (s)	29.1	29.1		29.1	29.1		24.9	24.9	24.9	24.9	24.9	24.9
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	11.1	11.1		11.1	11.1		75.3	75.3	75.3	75.3	75.3	75.3
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.80	0.80	0.80	0.80	0.80	0.80
v/c Ratio	0.32	0.09		0.10	0.02		0.38	0.66	0.01	0.39	0.24	0.25
Control Delay	47.8	0.4		41.9	0.2		6.7	7.8	0.3	14.2	3.9	1.7
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	47.8	0.4		41.9	0.2		6.7	7.8	0.3	14.2	3.9	1.7
LOS	D	A		D	A		A	A	A	B	A	A
Approach Delay		27.5			31.4			7.6			3.8	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	9.9	0.0		2.8	0.0		13.6	77.9	0.0	3.4	15.4	3.6
Queue Length 95th (m)	21.0	0.0		8.7	0.0		29.1	113.7	0.6	15.1	23.8	11.2
Internal Link Dist (m)		448.7			402.7			611.3			181.5	
Turn Bay Length (m)	125.0			15.0			105.0		15.0	15.0		15.0
Base Capacity (vph)	478	740		464	565		619	2631	1244	152	2534	1283
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	0.05		0.03	0.01		0.38	0.66	0.01	0.39	0.24	0.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 94.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 87.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Limebank Road & Realigned Leitrim Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	658	206	39	130	118	225	20	39	999	192	112	374
Future Volume (vph)	658	206	39	130	118	225	20	39	999	192	112	374
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0	255.0	
Storage Lanes	2		0	2		1		2		1	2	
Taper Length (m)	7.6			7.6				7.6			7.6	
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.97	0.95
Ped Bike Factor	0.85	0.99		0.97		0.89		0.98		0.95	0.98	
Frt		0.976				0.850				0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	3321	3286	0	3022	3357	1419	0	3247	3390	1419	2968	3144
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	2830	3286	0	2942	3357	1257	0	3186	3390	1350	2922	3144
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		14				148				192		
Link Speed (k/h)		60			60				80			80
Link Distance (m)		209.4			525.1				473.0			635.3
Travel Time (s)		12.6			31.5				21.3			28.6
Confl. Peds. (#/hr)	61		13	13		61		11		22	22	
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%	3%	11%	3%	9%	0%	5%	2%	9%	13%	10%
Adj. Flow (vph)	658	206	39	130	118	225	20	39	999	192	112	374
Shared Lane Traffic (%)												
Lane Group Flow (vph)	658	245	0	130	118	225	0	59	999	192	112	374
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	36.7
Total Split (s)	48.0	65.5		19.5	37.0	37.0	13.7	13.7	69.3	69.3	17.0	72.6
Total Split (%)	28.0%	38.2%		11.4%	21.6%	21.6%	8.0%	8.0%	40.5%	40.5%	9.9%	42.4%
Maximum Green (s)	41.5	59.0		13.0	30.5	30.5	7.1	7.1	62.6	62.6	10.4	65.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	2.0	2.1
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)	6.5	6.5		6.5	6.5	6.5		6.6	6.7	6.7	6.6	6.7
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	3.0
Recall Mode	Min	None		None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		5.0
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		25.0
Pedestrian Calls (#/hr)		13			61	61			22	22		11
Act Effct Green (s)	34.1	48.1		11.3	25.3	25.3		7.1	49.9	49.9	9.8	56.5
Actuated g/C Ratio	0.23	0.33		0.08	0.17	0.17		0.05	0.34	0.34	0.07	0.39
v/c Ratio	0.85	0.23		0.56	0.20	0.66		0.38	0.87	0.33	0.57	0.31

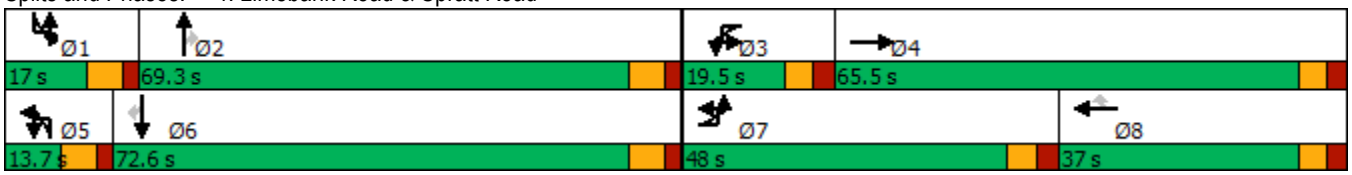


Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	131
Future Volume (vph)	131
Ideal Flow (vphpl)	1800
Storage Length (m)	230.0
Storage Lanes	1
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	0.97
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1502
Flt Permitted	
Satd. Flow (perm)	1456
Right Turn on Red	Yes
Satd. Flow (RTOR)	147
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	11
Peak Hour Factor	1.00
Heavy Vehicles (%)	3%
Adj. Flow (vph)	131
Shared Lane Traffic (%)	
Lane Group Flow (vph)	131
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	36.7
Total Split (s)	72.6
Total Split (%)	42.4%
Maximum Green (s)	65.9
Yellow Time (s)	4.6
All-Red Time (s)	2.1
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.7
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	5.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	11
Act Effct Green (s)	56.5
Actuated g/C Ratio	0.39
v/c Ratio	0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	67.3	34.9		80.2	55.9	32.1		83.3	55.2	6.0	84.0	34.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	34.9		80.2	55.9	32.1		83.3	55.2	6.0	84.0	34.9
LOS	E	C		F	E	C		F	E	A	F	C
Approach Delay		58.5			51.2				49.0			37.3
Approach LOS		E			D				D			D
Queue Length 50th (m)	100.9	26.2		20.2	16.1	21.3		9.2	152.0	0.0	17.5	44.0
Queue Length 95th (m)	134.1	40.9		34.3	28.4	56.1		18.6	189.1	17.0	30.9	60.7
Internal Link Dist (m)		185.4			501.1				449.0			611.3
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0	255.0	
Base Capacity (vph)	982	1390		280	729	389		164	1513	708	220	1477
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	0.67	0.18		0.46	0.16	0.58		0.36	0.66	0.27	0.51	0.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 171.3			
Actuated Cycle Length: 146.7			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 49.7		Intersection LOS: D	
Intersection Capacity Utilization 99.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBR
Control Delay	4.1
Queue Delay	0.0
Total Delay	4.1
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	10.4
Internal Link Dist (m)	
Turn Bay Length (m)	230.0
Base Capacity (vph)	762
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.17

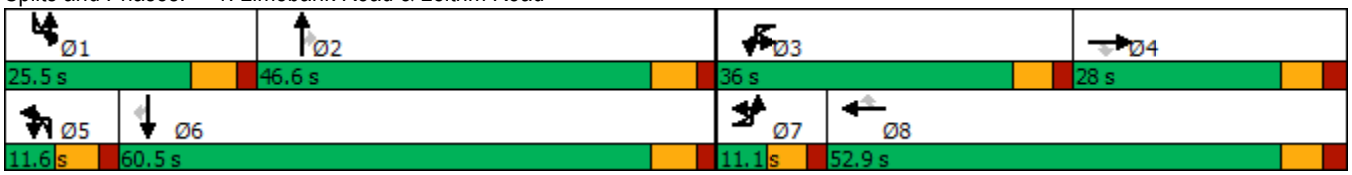
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	185	22	560	273	209	8	638	384	274	1099	6
Future Volume (vph)	10	185	22	560	273	209	8	638	384	274	1099	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	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)	3354	1767	1381	3257	1802	1488	3354	3325	1419	3106	3424	1289
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3354	1767	1381	3257	1802	1488	3351	3325	1419	3106	3424	1270
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			209			384			181
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		395.5			472.5			303.9			517.2	
Travel Time (s)		17.8			21.3			13.7			23.3	
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 (%)	0%	3%	12%	3%	1%	4%	0%	4%	9%	8%	1%	20%
Adj. Flow (vph)	10	185	22	560	273	209	8	638	384	274	1099	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	185	22	560	273	209	8	638	384	274	1099	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	21.0	21.0	5.0	21.0	21.0
Minimum Split (s)	11.1	25.8	25.8	11.1	25.8	25.8	11.6	27.6	27.6	11.6	27.6	27.6
Total Split (s)	11.1	28.0	28.0	36.0	52.9	52.9	11.6	46.6	46.6	25.5	60.5	60.5
Total Split (%)	8.2%	20.6%	20.6%	26.5%	38.9%	38.9%	8.5%	34.2%	34.2%	18.7%	44.5%	44.5%
Maximum Green (s)	5.0	21.2	21.2	29.9	46.1	46.1	5.0	40.0	40.0	18.9	53.9	53.9
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	1.9	2.6	2.6	1.9	2.6	2.6	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.8	6.8	6.1	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Walk Time (s)		2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		1	1
Act Effct Green (s)	5.2	16.7	16.7	24.3	45.5	45.5	5.2	30.2	30.2	15.3	50.4	50.4
Actuated g/C Ratio	0.05	0.15	0.15	0.21	0.40	0.40	0.05	0.27	0.27	0.13	0.44	0.44
v/c Ratio	0.07	0.71	0.06	0.80	0.38	0.29	0.05	0.72	0.58	0.66	0.72	0.01

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	62.0	64.7	0.3	53.5	28.1	4.9	61.9	44.1	7.5	57.2	30.7	0.0
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	62.0	64.7	0.3	53.5	28.1	4.9	61.9	44.1	7.5	57.2	30.7	0.0
LOS	E	E	A	D	C	A	E	D	A	E	C	A
Approach Delay		58.1			37.1			30.6			35.8	
Approach LOS		E			D			C			D	
Queue Length 50th (m)	1.1	40.1	0.0	62.0	41.0	0.0	0.9	69.5	0.0	30.7	102.1	0.0
Queue Length 95th (m)	4.5	73.3	0.0	94.4	83.1	16.8	3.9	99.8	25.0	51.2	164.8	0.0
Internal Link Dist (m)		371.5			448.5			279.9			493.2	
Turn Bay Length (m)	130.0		130.0	120.0		150.0	195.0		180.0	210.0		185.0
Base Capacity (vph)	152	341	453	886	797	774	152	1211	760	534	1719	727
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	0.07	0.54	0.05	0.63	0.34	0.27	0.05	0.53	0.51	0.51	0.64	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 136.1			
Actuated Cycle Length: 113.5			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 36.0		Intersection LOS: D	
Intersection Capacity Utilization 85.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Limebank Road & Leitrim Road



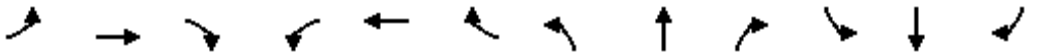
Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	49	929	12	0	1694
Future Vol, veh/h	0	49	929	12	0	1694
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	49	929	12	0	1694

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	465	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	550	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	550	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	550	-
HCM Lane V/C Ratio	-	-	0.089	-
HCM Control Delay (s)	-	-	12.2	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.3	-

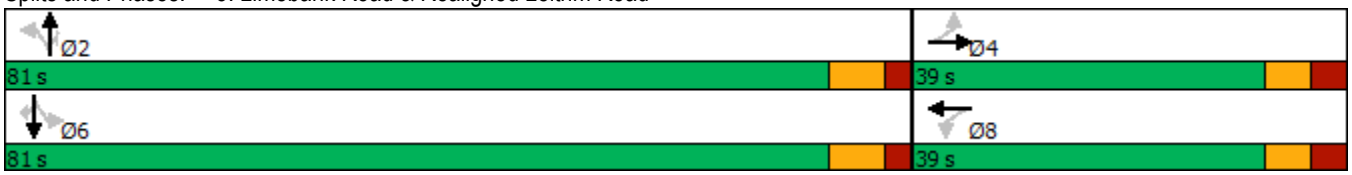


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	0	205	38	0	12	51	653	10	37	1588	69
Future Volume (vph)	277	0	205	38	0	12	51	653	10	37	1588	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	125.0		0.0	15.0		0.0	105.0		15.0	15.0		15.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			2.5			7.6			7.6		
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
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1547	0	1729	1547	0	1729	3262	1547	1729	3390	1547
Flt Permitted	0.749			0.521			0.060			0.352		
Satd. Flow (perm)	1363	1547	0	948	1547	0	109	3262	1547	641	3390	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			233				41			41
Link Speed (k/h)		60			60			80			80	
Link Distance (m)		472.7			426.7			635.3			205.5	
Travel Time (s)		28.4			25.6			28.6			9.2	
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 (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	308	0	228	42	0	13	57	726	11	41	1764	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	308	228	0	42	13	0	57	726	11	41	1764	77
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)	38.6	38.6		38.6	38.6		34.3	34.3	34.3	34.3	34.3	34.3
Total Split (s)	39.0	39.0		39.0	39.0		81.0	81.0	81.0	81.0	81.0	81.0
Total Split (%)	32.5%	32.5%		32.5%	32.5%		67.5%	67.5%	67.5%	67.5%	67.5%	67.5%
Maximum Green (s)	31.5	31.5		31.5	31.5		73.6	73.6	73.6	73.6	73.6	73.6
Yellow Time (s)	4.1	4.1		4.1	4.1		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	3.4	3.4		3.4	3.4		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)	7.5	7.5		7.5	7.5		7.4	7.4	7.4	7.4	7.4	7.4
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		Min	Min	Min	Min	Min	Min
Walk Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Flash Dont Walk (s)	29.1	29.1		29.1	29.1		24.9	24.9	24.9	24.9	24.9	24.9
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	28.4	28.4		28.4	28.4		67.0	67.0	67.0	67.0	67.0	67.0
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.60	0.60	0.60	0.60	0.60	0.60
v/c Ratio	0.89	0.54		0.17	0.02		0.88	0.37	0.01	0.11	0.86	0.08
Control Delay	68.2	35.7		36.6	0.1		107.1	11.8	0.0	10.4	23.5	5.4
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	68.2	35.7		36.6	0.1		107.1	11.8	0.0	10.4	23.5	5.4
LOS	E	D		D	A		F	B	A	B	C	A
Approach Delay		54.4			28.0			18.5			22.5	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	69.4	37.9		7.7	0.0		10.2	41.8	0.0	3.7	165.3	3.2
Queue Length 95th (m)	#117.7	63.1		17.3	0.0		#23.4	53.4	0.0	8.8	200.8	9.0
Internal Link Dist (m)		448.7			402.7			611.3			181.5	
Turn Bay Length (m)	125.0			15.0			105.0		15.0	15.0		15.0
Base Capacity (vph)	399	482		278	618		74	2236	1073	439	2325	1073
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	0.77	0.47		0.15	0.02		0.77	0.32	0.01	0.09	0.76	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 110.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 89.5%		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: 3: Limebank Road & Realigned Leitrim Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	224	32	43	30	21	24	23	51	432	41	1	71
Future Volume (vph)	224	32	43	30	21	24	23	51	432	41	1	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0		0.0	95.0		60.0		205.0		180.0		255.0
Storage Lanes	2		0	2		1		2		1		2
Taper Length (m)	7.6			7.6				7.6				7.6
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	0.95	0.97	0.95	1.00	0.95	0.97
Ped Bike Factor	1.00	0.99		0.98		0.99		1.00		0.98		1.00
Frt		0.914				0.850				0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3321	3080	0	3257	3293	1473	0	3309	3232	1517	0	3289
Flt Permitted	0.950			0.950				0.950				0.950
Satd. Flow (perm)	3315	3080	0	3203	3293	1454	0	3303	3232	1492	0	3278
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		43				151				149		
Link Speed (k/h)		60			60				80			
Link Distance (m)		209.4			525.1				473.0			
Travel Time (s)		12.6			31.5				21.3			
Confl. Peds. (#/hr)	1		9	9		1		4		3		3
Confl. Bikes (#/hr)										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 (%)	1%	3%	0%	3%	5%	5%	0%	2%	7%	2%	0%	2%
Adj. Flow (vph)	224	32	43	30	21	24	23	51	432	41	1	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	75	0	30	21	24	0	74	432	41	0	72
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases						8				2		
Detector Phase	7	4		3	8	8	5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	36.5		11.5	36.5	36.5	11.6	11.6	36.7	36.7	11.6	11.6
Total Split (s)	18.0	43.0		11.5	36.5	36.5	12.0	12.0	54.1	54.1	12.7	12.7
Total Split (%)	14.8%	35.4%		9.5%	30.1%	30.1%	9.9%	9.9%	44.6%	44.6%	10.5%	10.5%
Maximum Green (s)	11.5	36.5		5.0	30.0	30.0	5.4	5.4	47.4	47.4	6.1	6.1
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.0	2.0	2.1	2.1	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	6.5		6.6	6.7	6.7		6.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	Min	Min	None	None
Walk Time (s)		5.0			5.0	5.0			5.0	5.0		
Flash Dont Walk (s)		25.0			25.0	25.0			25.0	25.0		
Pedestrian Calls (#/hr)		9			1	1			3	3		
Act Effct Green (s)	12.3	17.5		5.8	14.3	14.3		6.2	35.1	35.1		6.9
Actuated g/C Ratio	0.15	0.21		0.07	0.17	0.17		0.07	0.42	0.42		0.08



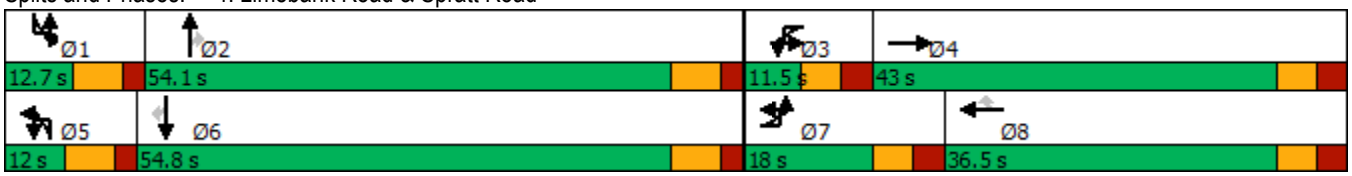
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1147	534
Future Volume (vph)	1147	534
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		230.0
Storage Lanes		1
Taper Length (m)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		0.98
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3424	1532
Flt Permitted		
Satd. Flow (perm)	3424	1506
Right Turn on Red		Yes
Satd. Flow (RTOR)		534
Link Speed (k/h)	80	
Link Distance (m)	635.3	
Travel Time (s)	28.6	
Confl. Peds. (#/hr)		4
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	1%	1%
Adj. Flow (vph)	1147	534
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1147	534
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	36.7	36.7
Total Split (s)	54.8	54.8
Total Split (%)	45.2%	45.2%
Maximum Green (s)	48.1	48.1
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.1	2.1
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.7	6.7
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Recall Mode	Min	Min
Walk Time (s)	5.0	5.0
Flash Dont Walk (s)	25.0	25.0
Pedestrian Calls (#/hr)	4	4
Act Effct Green (s)	35.7	35.7
Actuated g/C Ratio	0.43	0.43

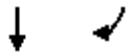
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.46	0.11		0.13	0.04	0.06		0.30	0.32	0.06		0.26
Control Delay	43.8	17.0		49.7	36.6	0.3		50.1	19.1	0.1		48.8
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	43.8	17.0		49.7	36.6	0.3		50.1	19.1	0.1		48.8
LOS	D	B		D	D	A		D	B	A		D
Approach Delay		37.1			30.2				21.9			
Approach LOS		D			C				C			
Queue Length 50th (m)	19.5	2.5		2.6	1.7	0.0		6.6	26.5	0.0		6.4
Queue Length 95th (m)	#42.0	8.5		8.7	5.4	0.0		16.9	50.6	0.0		16.4
Internal Link Dist (m)		185.4			501.1				449.0			
Turn Bay Length (m)	100.0			95.0		60.0		205.0		180.0		255.0
Base Capacity (vph)	531	1585		226	1375	695		248	2036	995		279
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	0.42	0.05		0.13	0.02	0.03		0.30	0.21	0.04		0.26

Intersection Summary

Area Type: Other
Cycle Length: 121.3
Actuated Cycle Length: 83
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 23.3 Intersection LOS: C
Intersection Capacity Utilization 72.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Limebank Road & Spratt Road





Lane Group	SBT	SBR
v/c Ratio	0.78	0.56
Control Delay	27.0	4.5
Queue Delay	0.0	0.0
Total Delay	27.0	4.5
LOS	C	A
Approach Delay	21.1	
Approach LOS	C	
Queue Length 50th (m)	90.4	0.0
Queue Length 95th (m)	157.6	21.9
Internal Link Dist (m)	611.3	
Turn Bay Length (m)		230.0
Base Capacity (vph)	2179	1152
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.53	0.46

Intersection Summary

Appendix G

TDM Checklists

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

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

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

TDM-supportive design & infrastructure measures: *Non-residential developments*			Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑ See site plan
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)*	☑ See site plan
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)*	☑ A sidewalk connection will be provided to the existing sidewalk on Limebank
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑ A sidewalk connection will be provided to the existing sidewalk on Limebank
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	☑ Landscaping will be provided along walking routes
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐ N/A
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

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

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

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

Legend

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

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

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

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

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

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☐
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7. TDM MARKETING & COMMUNICATIONS	
		7.1 Multimodal travel information	
		Commuter travel	
BASIC	★	7.1.1 Provide a multimodal travel option information package to new/relocating employees and students	☑
		Visitor travel	
BETTER	★	7.1.2 Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2 Personalized trip planning	
		Commuter travel	
BETTER	★	7.2.1 Offer personalized trip planning to new/relocating employees	☐
		7.3 Promotions	
		Commuter travel	
BETTER		7.3.1 Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8. OTHER INCENTIVES & AMENITIES	
		8.1 Emergency ride home	
		Commuter travel	
BETTER	★	8.1.1 Provide emergency ride home service to non-driving commuters	☐
		8.2 Alternative work arrangements	
		Commuter travel	
BASIC	★	8.2.1 Encourage flexible work hours	☐
BETTER		8.2.2 Encourage compressed workweeks	☐
BETTER	★	8.2.3 Encourage telework	☐
		8.3 Local business travel options	
		Commuter travel	
BASIC	★	8.3.1 Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4 Commuter incentives	
		Commuter travel	
BETTER		8.4.1 Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5 On-site amenities	
		Commuter travel	
BETTER		8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

Appendix H

Swept Path Analysis Results

1 A202 **BUILDING TYPE "A"**

BUILDINGS [A1-33]
- 1-STOREY INDUSTRIAL CONDOMINIUM
- 3.2.2.79, GROUP F, DIVISION 3, UP TO 2-STOREY
- GFA = 292 M² (PER CONDO)

VEHICULAR ACCESS

ACCESS REQUIREMENTS TO BE DESIGNED PER TIA RECOMMENDATIONS.

LIMEBANK RD.

SETBACK - FRONT YARD

SETBACK - INTERIOR SIDE YARD

SETBACK - REAR YARD

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10

A11 A12 A13 A14 A15 A16 A17 A18 A19 A20

A21 A22 A23 A24 A25 A26 A27

A28 A29 A30 A31 A32 A33

B1 GFA = 5,350 M²

B2 GFA = 5,350 M²

C1 GFA = 5,350 M²

C2 GFA = 5,350 M²

C3 GFA = 6,400 M²

OFFICE LOCATION
TOTAL GFA = 600 M²

D1 GFA = 5,350 M²

D2 GFA = 5,350 M²

D3 GFA = 5,436 M²

SWM POND
6,000 M³

FUTURE ROAD REALIGNMENT

SETBACK - FUTURE

PROPERTY - FUTURE

PROPERTY - EXISTING

SETBACK - BUILDING

SETBACK - PAVING

C/L PIPELINE EASEMENT

1 A201 **BUILDING TYPE "B"**

BUILDINGS [B1-3], [C1-3] & [D1-3]
- 1-STOREY WAREHOUSE
- 2-STOREY OFFICE
- 3.2.2.69.B, GROUP F, DIVISION 2, UP TO 4-STOREYS

LIETRIM RD.

Appendix I

Intersection Control Warrants

IBI

OTM BOOK 12* - TRAFFIC SIGNAL WARRANT

Project: 4101 Limebank Road **Date:** July 31, 2024

Project #: 144893

Location: Limebank Road (Major Roadway) at Realigned Leitrim Road (Minor Roadway)

Orientation: North/South East/West

Municipality: Ottawa **Scenario:** Future (2030) Background Traffic

Justification 1 - Minimum Vehicle Volume

WARRANT	MINIMUM REQUIREMENT				COMPLIANCE								SECTIONAL PERCENT
	FREE FLOW	RESTR. FLOW	ADJUST. FREE FLOW	ADJUST. RESTR. FLOW	7:00 AM	8:00 AM	9:00 AM	10:00 AM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	
A. Vehicle volumes, all approaches	480	720	**720**	1080	2968 100%	1484 100%	1484 100%	1484 100%	2831 100%	1415 100%	1415 100%	1415 100%	100%
B. Vehicle volume along minor roads	120	170	**216**	306	91 42%	45 21%	45 21%	45 21%	482 100%	241 100%	241 100%	241 100%	63%

Justification 2 - Delay to Cross Traffic

WARRANT	MINIMUM REQUIREMENT				COMPLIANCE								SECTIONAL PERCENT
	FREE FLOW	RESTR. FLOW	ADJUST. FREE FLOW	ADJUST. RESTR. FLOW	7:00 AM	8:00 AM	9:00 AM	10:00 AM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	
A. Vehicle volumes, along artery	480	720	**720**	1080	2877 100%	1439 100%	1439 100%	1439 100%	2349 100%	1175 100%	1175 100%	1175 100%	100%
B. Combined vehicle and pedestrian volume crossing artery from minor roads	50	70	**60**	84	171 100%	26 44%	26 44%	26 44%	277 100%	138 100%	138 100%	138 100%	79%

Justification 3 - Volume/Delay Combination

JUSTIFICATION	SATISFIED TO 80% OR MORE?	BOTH SATISFIED TO 80% OR MORE?
Justification 1 - Minimum Vehicular Volume	N/A	N/A
Justification 2 - Delay to Cross Traffic	N/A	

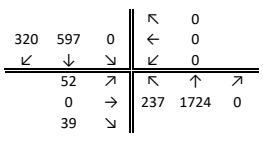
Justification 7 - Projected Volumes

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT				COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	ADJUSTED FREE FLOW	ADJUSTED RESTRICTED FLOW	SECTIONAL AHV	SECTIONAL %	ENTIRE %
1. MINIMUM VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720	**900**	1350	1449	100%	53%
	B. Vehicle volume along minor roads (Average Hour)	120	170	**270**	383	143	53%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720	**900**	1350	1306	100%	100%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (Average Hour)	50	75	**75**	113	82	100%	

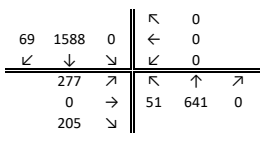
Projected Traffic Volumes:

Average Hourly Volume (AHV) Equation: AHV = (amPHV + pmPHV)/4

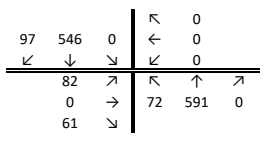
AM Peak Hour Volumes



PM Peak Hour Volumes



Average Hourly Volumes (AHV)



Eight Hour Traffic Volumes:**

Hour	Major Road						Minor Road						Ped*
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
7:00 AM	237	1724	0	0	597	320	52	0	39	0	0	0	0
8:00 AM	119	862	0	0	298	160	26	0	19	0	0	0	0
9:00 AM	119	862	0	0	298	160	26	0	19	0	0	0	0
10:00 AM	119	862	0	0	298	160	26	0	19	0	0	0	0
3:00 PM	51	641	0	0	1588	69	277	0	205	0	0	0	0
4:00 PM	26	321	0	0	794	35	138	0	103	0	0	0	0
5:00 PM	26	321	0	0	794	35	138	0	103	0	0	0	0
6:00 PM	26	321	0	0	794	35	138	0	103	0	0	0	0

** Number of pedestrians crossing the major road*
*** These are projected 8-hour traffic volumes.*

Notes:

1. Vehicle volume warrant (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above.

2+ Lanes per Direction

2. Warrant values for free flow apply when the 85th percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000. Warrant values for restricted flow apply to large urban communities when the 85th percentile speed of artery traffic does not exceed 70 km/h.

Free Flow

3. The lowest sectional percentage governs the entire warrant.

4. For "T" intersections the warrant values for the minor road should be increased by 50% (Warrant 1B only).

3-legged Intersection

5. All flow values for Justification 1 and 2 are to be increased by 20% in the case of new intersections, Justification 3 is to only be used for existing intersections and all flow values for Warrant 1 and Warrant 2 of Justification 7 are to be increased by 20% for existing intersections and by 50% in the case of new intersections.

New Intersection

6. The crossing volumes are defined as the sum of:
   (a) Left-turns from both minor road approaches.
   (b) The heaviest through volume from the minor road.
   (c) 50% of the heavier left turn movement from major road when both of the following are met:
      (i) the left-turn volume >120 vph
      (ii) the left-turn volume plus the opposing volume >720 vph
   (d) Pedestrians crossing the main road.

CONCLUSION: **Based on Justification 7, the intersection meets the minimum warrants for traffic control signals.**

* "Ontario Traffic Manual, Book 12 (March 2012)", Ontario Ministry of Transportation.

City of Ottawa
Roundabout Initial Feasability Screening Tool

The intent of this screening tool is to provide a relatively quick assessment of the feasibility of a roundabout at a particular intersection in comparison to other appropriate forms of traffic control or road modifications including all-way stop control, traffic signals, auxiliary lanes, etc. The intended outcome of this tool is to provide enough information to assist staff in deciding whether or not to proceed with an Intersection Control Study to investigate the feasibility of a roundabout in more detail.

1	Project Name:	4101 Limebank Road
2	Intersection:	Limebank & Realigned Leitrim
3	Location and Description of Intersection: Lane Configuration, total or approach AADT, distance to nearby intersection(s), etc. Attach or sketch a diagram and include existing and/or horizon-year turning movements. If an existing intersection then indicate type of control	Future intersection located approximately midway on Limebank Road between Spratt Road and existing Leitrim Road.
4	What traditional modifications are proposed? All-way stop control, traffic signals, auxiliary lanes, etc. Attach or sketch a diagram if necessary.	Traffic signals
5	What size of roundabout is being considered? Describe, and attach a Roundabout Traffic Flow Worksheet	Two-lane roundabout
6	Why is a roundabout being considered?	As an alternative to traffic signals

DRAFT

7 Are there contra-indications for

If "Yes" is indicated for one or more of the contra-indications then a roundabout may be problematic at the subject intersection. That is not to say that a roundabout is not possible, just that there may be difficulties or high

No.	Contra-Indication	Outcome
1	Is there insufficient property at the intersection (i.e. less than 44 metres diameter if considering a single-lane roundabout, and less than 60 metres if considering a two-lane roundabout) or property constraints that would require demolition of adjacent structures?	Yes [ ] No [X]
2	Are there any instances where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?	Yes [ ] No [X]
3	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	Yes [ ] No [X]
4	Is the intersection located within a coordinated signal system?	Yes [ ] No [X]
5	Is there a closely-spaced traffic signal or railway crossing that could not be controlled with a nearby roundabout?	Yes [ ] No [X]
6	Are significant differences in directional flows or any situations of sudden high demand expected?	Yes [X] No [ ]
7	Are there known visually-impaired pedestrians that cross this intersection?	Yes [ ] No [X]

8 Are there suitability factors for a roundabout?

If "Yes" is indicated for two or more of the suitability factors then a roundabout should be technically feasible at the subject intersection..

No.	Suitability Factor	Outcome
1	Does the intersection currently experience an average collision frequency of more than 1.5 injury crashes per year, or a collision rate in excess of 1 injury crash per 1 million vehicles entering (MVE)?	Yes [ ] No [X]
2	Has there been a fatal crash at the intersection in the last 10 years?	Yes [ ] No [X]
3	Are capacity problems currently being experienced, or expected in the future?	Yes [X] No [ ]
4	Are traffic signals warranted, or expected to be warranted in the future?	Yes [X] No [ ]
5	Does the intersection have more than 4 legs, or unusual geometry?	Yes [ ] No [X]
6	Will Planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left-turn lanes)?	Yes [ ] No [X]
7	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Yes [ ] No [X]

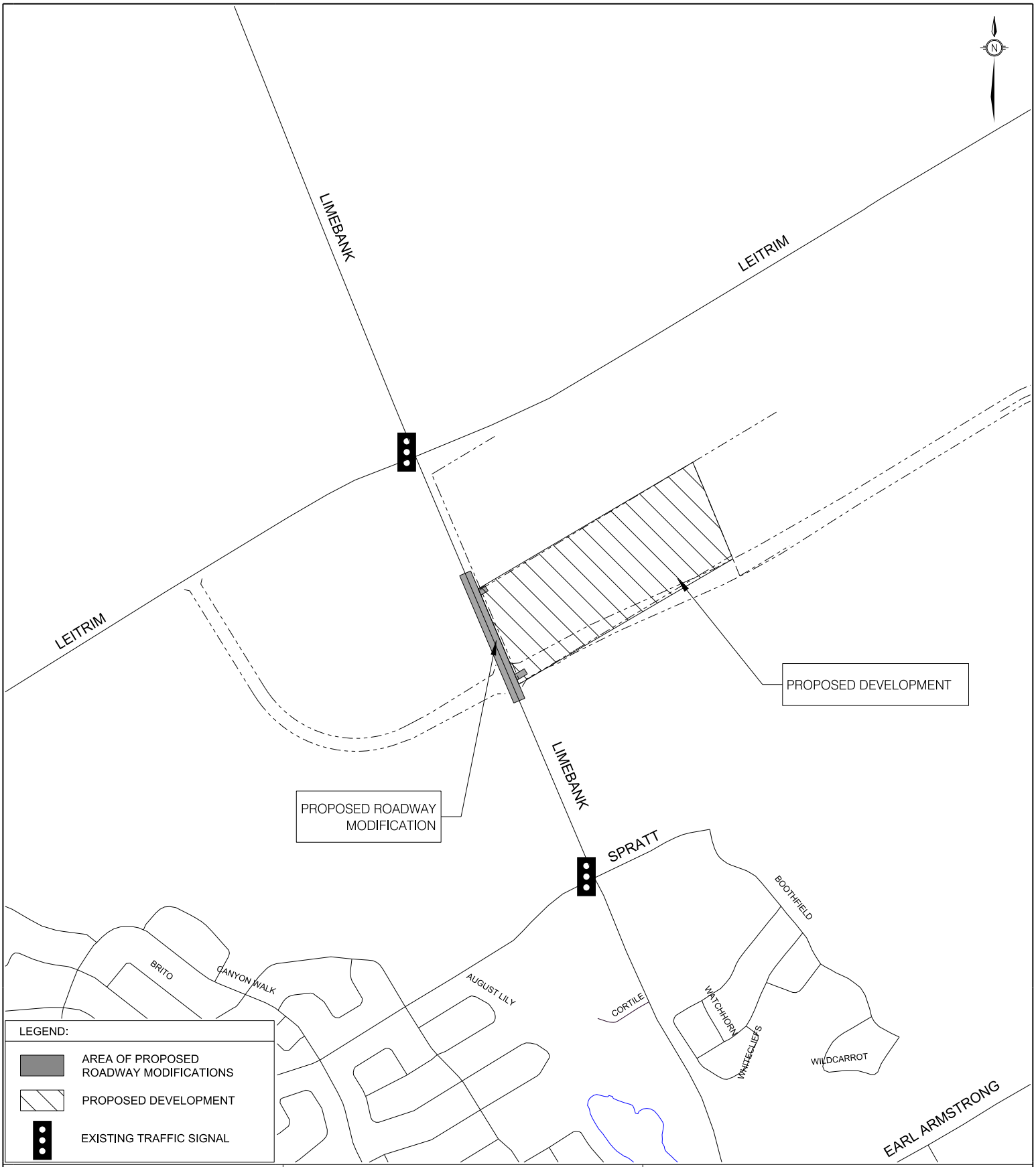
DRAFT

9	Conclusions/recommendation whether to proceed with an Intersection Control Study:	Although a roundabout is technically viable for this location, providing a roundabout at this location would be inconsistent with the recommendations of the Leitrim Road Realignment EA. As such, a roundabout is not recommended at this location.

DRAFT

Appendix J

Functional Design



Ottawa

PLANNING AND GROWTH MANAGEMENT

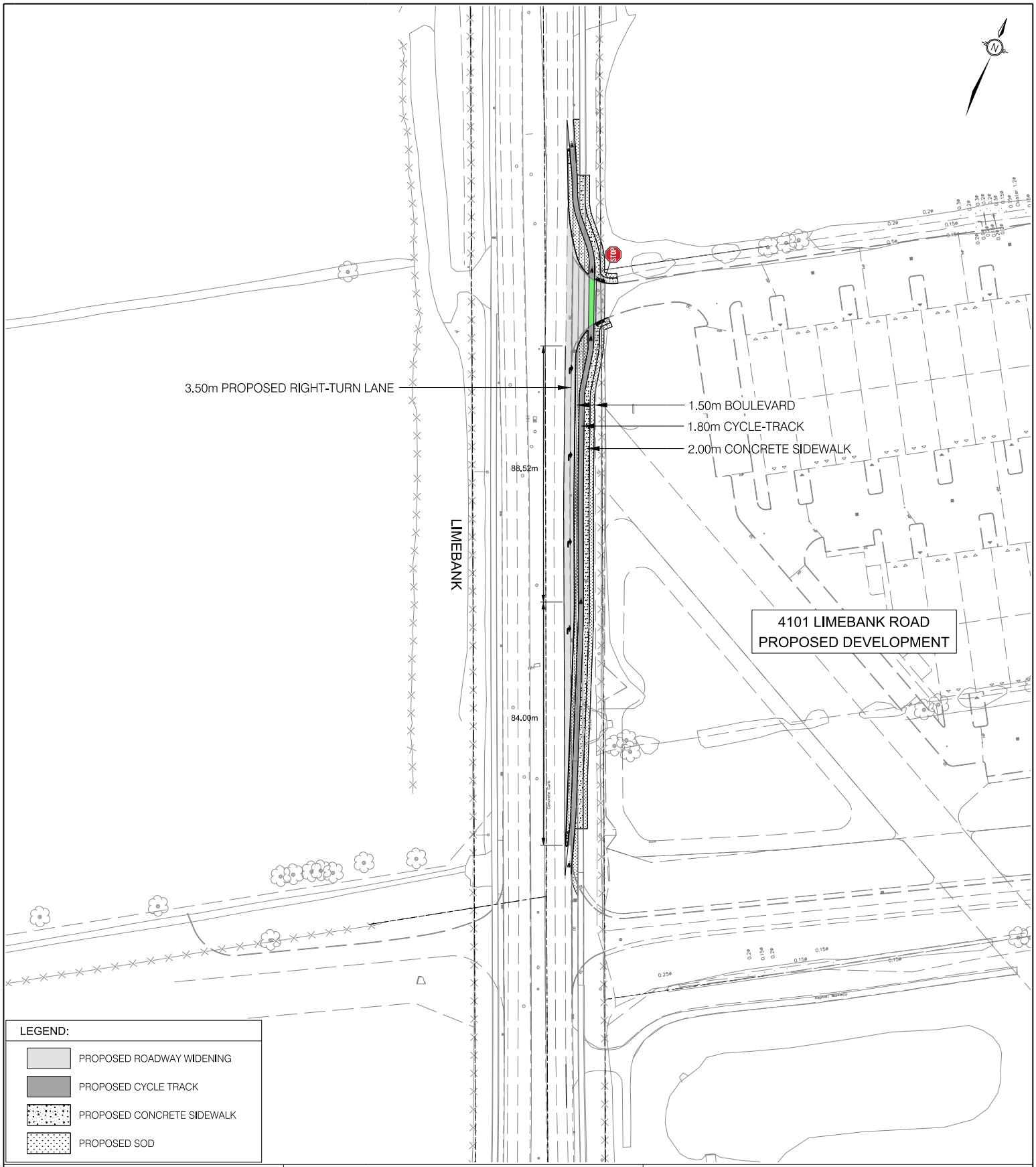
KEY PLAN

4101 LIMEBANK ROAD

NORTHBOUND RIGHT-TURN LANE AT ACCESS TO 4101 LIMEBANK ROAD

Design Review and Implementation

Approved By: M. Giampa	Drawing No.: RMA-2024-TPD-XXXA
Completed By: ARCADIS	
Scale: N.T.S.	Date: NOV. 2024



PLANNING AND GROWTH MANAGEMENT

PROPOSED MODIFICATION

4101 LIMEBANK ROAD

NORTHBOUND RIGHT-TURN LANE AT ACCESS TO 4101 LIMEBANK ROAD

Design Review and Implementation

Approved By: M. Giampa	Drawing No.: RMA-2024-TPD-XXXB
Completed By: ARCADIS	
Scale: N.T.S.	Date: NOV. 2024

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