

ERIE STREET SOUTH, OAK STREET, SHERK STREET AND SEACLIFF DRIVE, TRAFFIC STUDY



Project No.: 0BM-20-8005

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McINTOSH PERRY

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EXECUTIVE SUMMARY

Study Purpose and Scope

The Municipality of Leamington has engaged McIntosh Perry to undertake a traffic study of the area generally bounded by Oak Street to the north, Seaclyff Drive to the south, Sherk Street to the east, and Erie Street to the west. The purpose of this assignment is to identify transportation-related issues and opportunities throughout the study area and recommend a set of practical solutions that adhere to local and provincial guiding principles. This study will present traffic operations, a safety review, transit and active transportation (AT) networks for existing conditions. A general traffic assessment of the study area will be completed for year 2020, and a 10-year horizon forecast will also be undertaken, as part of the study. Study area concerns will be assessed with recommendations and mitigation measures proposed that address each area concern within the study limits. The study area limits are illustrated in Figure ES1.

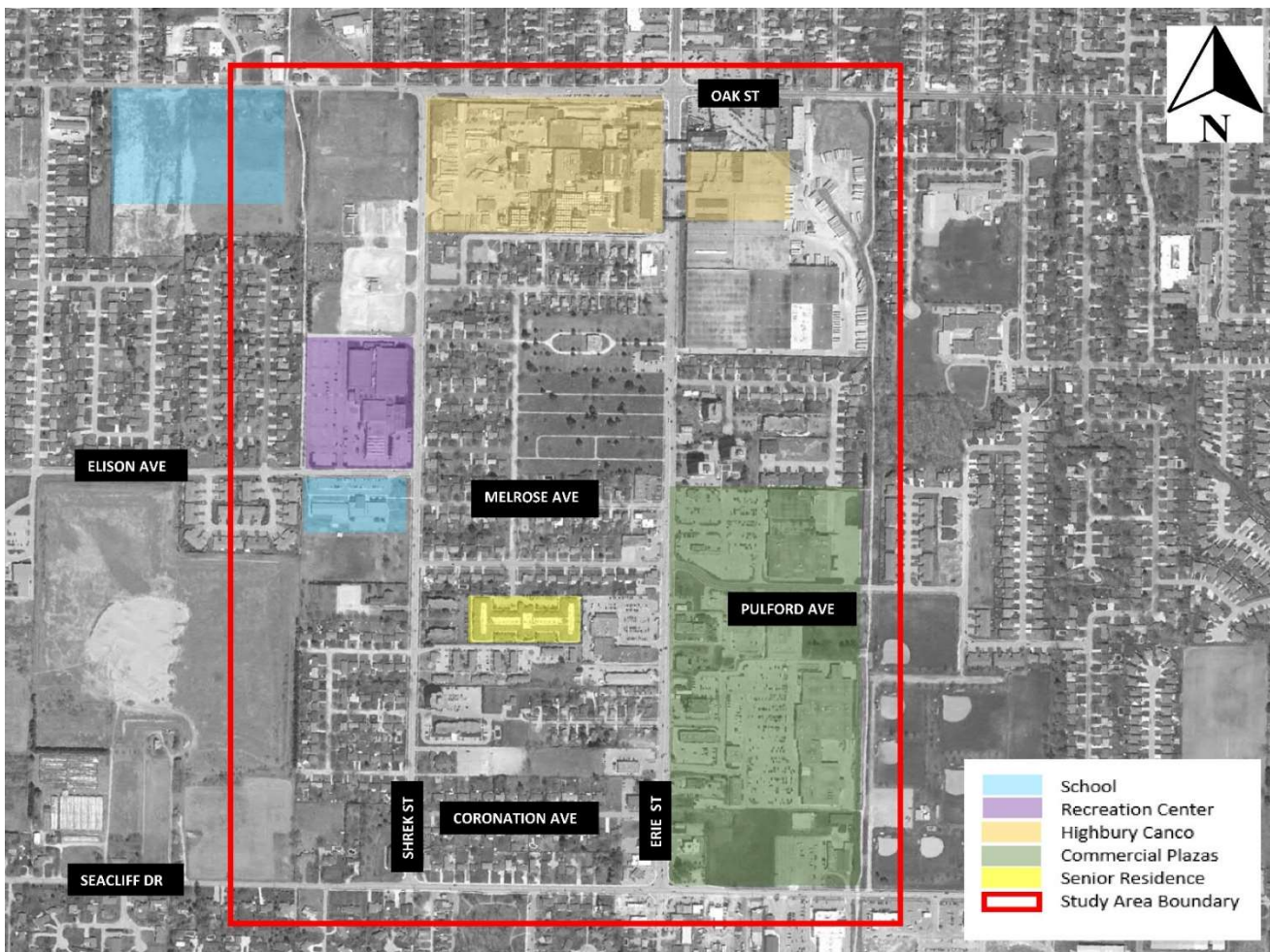


Figure ES1 Study Area

Development Intensification

Growth and development are projected to continue through to 2031 as identified in the Municipality's official plan (2020 Draft). Planning data shared by the Municipality provided information on proposed future developments within the study area that are anticipated to be developed within the study's 10-year horizon. Five area developments have been identified for consideration within the future 2030 study horizon which include:

- Development A – Retail / Commercial (8,830 ft²)
- Development B – Residential Apartments (60 units)
- Development C – Commercial (19,100 ft²)
- Development D – Commercial (133,000 ft²)
- Development E and F – A single development consisting of residential (E) (439 units) and commercial (F) (33,978 ft²) components.

Development intensification will be used to forecast the municipality's growth plan and increased network trips for future condition analysis.

Network Active Transportation Gaps

The study area consists of arterial, collector, and local roads in addition to an active transportation (AT) network that consist of on-road and off-road facilities. The active network consists of shared roads for cyclists and motorists, dedicated bicycle lanes, multi-use trails and sidewalks. Walking and cycling are important highly utilized travel modes in Leamington due to large numbers of International Guest Workers (IGW) on the multiple farms in Leamington, tourists, and for recreational purposes.

Examination of existing connections in the AT network, confirm the presence of existing network gaps that limit east – west connectivity or a safe means of transitioning from one facility to another. Assessment of network improvements will identify methods of enhancing connectivity and eliminating gaps.

Traffic Study Assessment

Traffic assessment was conducted for both existing and future study conditions for the morning (AM) and evening (PM) roadway peak hours of operation. Analysis for the entire study network was completed using Synchro 10 software for 2020 and 2030 study horizon conditions. As Erie Street is significant for the movement of goods, provision of services, and for commuting, the Municipality requested the Erie Street corridor from Oak Street to Seaclyff Drive also be assessed using Vissim micro-simulation software (Vissim 2021) for weekday AM and PM peak periods.

Future conditions analysis reviewed different scenario options to assess network condition operations to guide future requirements and planning for the study area. Future scenario options reviewed included:

- Do Nothing – scenario assessed future network volumes with no changes to the existing transportation network. All lane configurations and intersection signal timings remained consistent with existing (2020) condition analysis.
- Road Diet – application would apply to Erie Street only and would consist of reducing the number of travel lanes from 4 lanes (2 per direction) to three lanes providing 1 northbound lane, 1 southbound lane and a centre two-way left-turn lane; and the addition of curb side bike lane in each direction.
- Ultimate Condition - consisting of providing connection of adjacent development parcels that would allow for vehicular access between properties, acting as a by-pass of Erie Street. Inter-parcel connections were considered on the east side of Erie Street between Pulford Avenue and Seacliff Drive, with a potential future access at Seacliff Drive.

Based on the overall connectivity benefits afforded by the ultimate condition, it has been recommended for future conditions. Interconnection of parcels is recommended to be combined with new pedestrian connections to Seacliff Drive which are considered credible options to relieving traffic on Erie Street.

Implementation of infrastructural changes for the inter-parcel connection and the benefits to be gained are to be weighed by the Municipality against the cost and other factors through further design.

Public Engagement

Notice of Study Commencement was published to the projects page of the Municipality of Leamington's website on June 17, 2020 to generate public awareness of the study. Notices were also provided via digital sources for both of the Virtual Public Engagement Sessions held by the project study team.

Due to the COVID-19 pandemic in person meetings were not possible for this project. Alternatively, presentation material was provided virtually to the public and hosted on the Municipality's website for the two public engagement sessions held. This approach allowed the public to review presentation material at their leisure and provided specified period with which comments were to be made to the project team. Public engagement sessions were advertised via the Municipality's social media accounts (Instagram, Twitter and Facebook) with stakeholder groups notified directly.

The Virtual Public Engagement Session #1 was launched on the Municipality of Leamington website on January 13, 2021 to the public at LeamingtonTrafficStudy.ca. Given pandemic conditions and the inability to host in person meetings presentation boards were available for public viewing and feedback for a two-week period January 13 to January 29.

Engagement session 1 provided an overview of the existing AT, transit and study network. Area specific locations to be reviewed were also introduced to the public. As part of this phase of work assessment of existing operating conditions and collision analysis for the study network based on available collision data for the period 2015 and 2019 (5-years) was presented.

The Virtual Public Engagement Session #2 was launched on the Municipality of Leamington website on August 16, 2021 to the public and made available for public feedback from August 16 to September 3, 2021.

Engagement session 2 served to provide an update on existing issues and study findings related to future area demands and opportunities. It also presents potential solutions and recommendations as a result of the investigation and assessment of study area conditions and allowed the study team to gather input from the public regarding proposed solutions/recommendations.

Area Specific Concerns

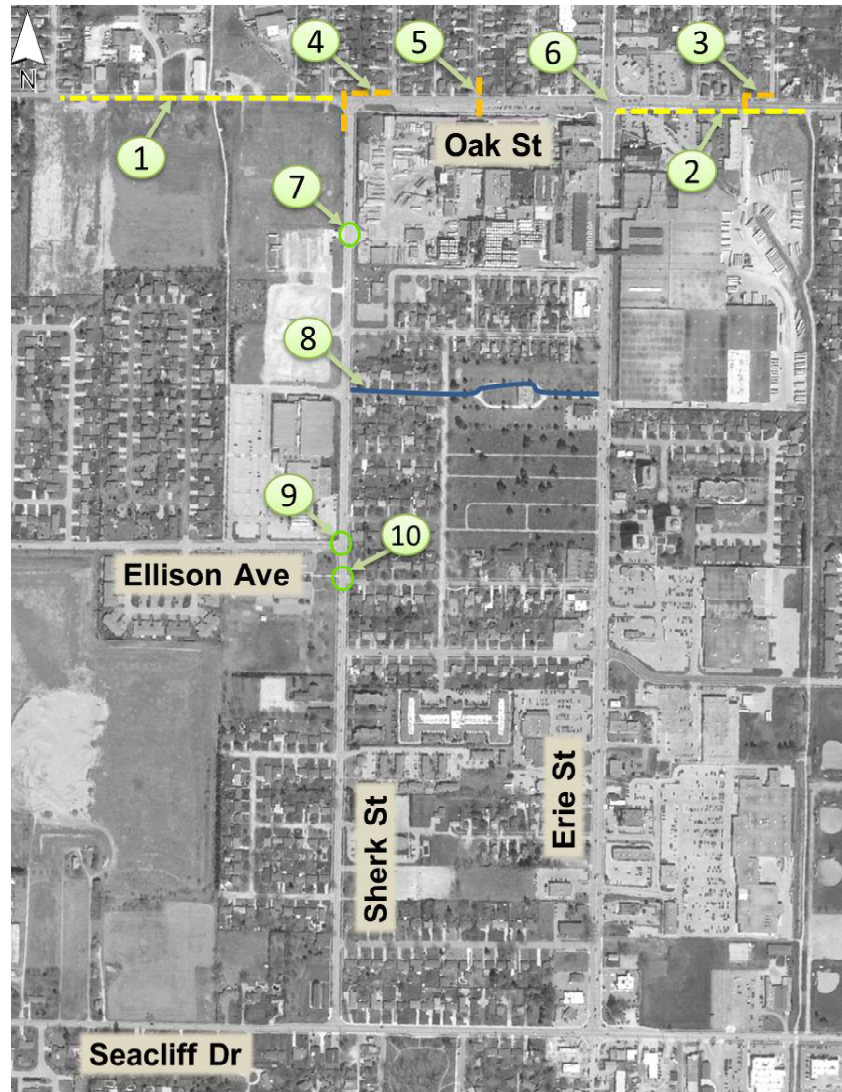
The review of the existing conditions, concerns identified by the community and issues indicated by the municipality for detailed assessment has resulted in identifying several connectivity and operational issues within the study limits.

Area specific concerns highlighted to the study team by the municipality formed the basis for much of the issues addressed. For the study area, a total of 21 area specific concerns have been identified and reviewed with mitigation measures and recommendations provided to address concerns. Area specific concerns have been identified and summarized in *Figure ES2* and *Figure ES3*.

Recommendations

Recommendations have been proposed to address the existing and future road network deficiencies in conjunction with solutions for the listed area specific concerns. A summary of study recommendations is provided in *Table ES1*.

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Locations and conditions to be reviewed include:

- 1 Oak St W:** Multi-use path review
- 2 Oak St E:** Multi-use path review
- 3 Oak St E /Victoria Ave:** AT connection review
- 4 Oak St W/Chestnut Ave – Oak St W/Sherk St:** AT connections and intersection turning movement review
- 5 Oak St W/Fox St:** Bicycle crossing review
- 6 Erie St/Oak St:** AT connections and intersection facilities review
- 7 Sherk St/ Highbury Access:** Pedestrian crossing and intersection control review
- 8 Sherk St/William Ave/NFFRC Access:** Turning movements and bicycle crossing review
- 9 Sherk St/Ellison Ave:** Traffic control and AT connection review
- 10 Sherk St/Melrose Ave:** Review of intersection for potential closure

Figure ES2 Area Specific Concerns (1 – 10)



- 11 Sherk St/Pulford Ave:** Traffic control and AT connection review
- 12 Sherk St/Pulford Ave to Seacliff Dr:** Pedestrian crossing review
- 13 Seacliff Dr/Sherk St:** AT connection review
- 14 Erie St:** Cycling facilities and pedestrian crossing review
- 15 Erie St/Pulford Ave:** Traffic signal timing and AT connection review
- 16 Pulford Ave/Canadian Tire/County Fair Mall Access:** Assess pedestrian crossing requirements at this location
- 17 Pulford Ave:** Cycling facilities review
- 18 Erie St:** Corridor review and road diet assessment
- 19 Erie St/Seacliff Dr:** AT connection review
- 20 16 Seacliff Dr E:** Assess pedestrian crossing requirements at this location
- 21 Ellison Ave:** Cycling facilities review

Figure ES3 Area Specific Concerns (11 – 21)

Table ES1 Recommendations Summary Table

Study Area Location	Proposed Study Area Recommendations
Oak Street	<ul style="list-style-type: none"> - Provide MUP on the north side of Oak Street from the west trail to Westmoreland Avenue and from Poplar Street to Fox Street - Shared northbound bicycle provided from Poplar Street - Provide MUP on the south side of Oak Street from the west trail to the east trail - Provide crossrides: <ul style="list-style-type: none"> - on all approaches of the Sherk Street and Oak Street intersection - across Chestnut Street at Oak Street - at intersection with Erie Street on east, west and, south approaches with connections to MUP or existing bicycle lanes - across Victoria Avenue at Oak Street and at the signalized intersection at the Highbury Canco Access on Oak Street - Provide MUP on the north side of Oak Street from the from traffic signal at Highbury Canco to Victoria Avenue
Sherk Street	<ul style="list-style-type: none"> - Provide a pedestrian crossing between Highbury Canco access gate and parking lot and provide sidewalk in parking lot - Provide MUP on the north side of NFFRC that connections to crossride across Sherk Street and NFFRC access - Signed bike route from Williams Avenue/Henry Street/through cemetery to crossride on Erie Street - Signalization of the Ellison Avenue and Sherk Street intersection (not defined by this study) - Provide crossrides and cycle track at intersection of the Ellison Avenue and Sherk Street for users of all ages and abilities - No closure of Melrose Avenue at Sherk Street - Provide MUP on the west side of Sherk Street from Ellison Avenue to Seacliff Drive when demand and/or traffic volumes trigger the need for separation of cycling facilities. - Potential future crossing/crossrides to be considered at the intersections of Pulford Avenue, Margaret Street or Audrey Street - Provide crossrides and cycle tracks at intersection of Sherk Street and Seacliff Drive for users of all ages and abilities
Ellison Avenue	<ul style="list-style-type: none"> - Remove pedestrian crossing at Ellison Avenue and Queens Hill Crescent / Orchard Heights Avenue and provide crossride at across Ellison Avenue at the west trail - Provide MUP on the south side of Ellison Avenue from west trail to Sherk Street
Erie Street	<ul style="list-style-type: none"> - Provide MUP on the east side of Erie Street from Oak Street to 238 Erie Street and on the west from 238 Erie Street to Seacliff Drive - Provide AT facility across Erie Street between MUP on east and west sides of Erie Street - Provide crossride on west and south legs of Pulford Avenue and Erie Street intersection - Annual signal timing reviews be done to make appropriate adjustments to better accommodate changing traffic volumes

Seacliff Drive	<ul style="list-style-type: none"> - Dedicated westbound right-turn lane to be provided at Sherk Street intersection - MUP to be provided on the north side Seacliff Drive from Erie Street consistent with the Municipalities AT plan - Inter-parcel connection from Walmart plaza to Seacliff Drive recommended, with pedestrian crossing across Seacliff Drive - Barrier free pedestrian connection from Service Ontario plaza to bus stop on south side of Seacliff Drive - Signalization of the Cherry Lane and Seacliff Drive intersection (not defined by this study) - Consolidation of driveway access on the south side of Seacliff Drive where possible in the event of any redevelopment
Pulford Avenue	<ul style="list-style-type: none"> - Provide MUP on the south side of Pulford Avenue from Erie Street to the East Trail and remove existing bicycle lanes - Advanced left-turns to be considered at intersection with Erie Street. Implementation to be based on assessment and traffic demands at intersection. Annual assessment to be considered. - Provide a shared crossing on the east side of the Walmart and Canadian Tire driveway access to accommodate pedestrians and cyclist - Shared lanes to be maintained on Pulford Avenue between Sherk Street and Erie Street, with future consideration for MUP on the south side of Pulford Avenue
Other	<ul style="list-style-type: none"> - Network connections: <ul style="list-style-type: none"> - Connection from commercial plaza at 269-275 Erie Street to Pulford Avenue is not recommended - Connection on north side of Pulford Avenue from east trail to commercial plaza not recommended - Pedestrian connection along north side of driving lane at Canadian Tire access at Erie Street is recommended - Interconnection of Walmart and Canadian Tire plazas for vehicle and pedestrians is recommended - Maintenance repair of existing connection from the commercial plaza to the east trail is recommended - AT facility to be implemented between east and west trails via a combination of new MUP's, signed bicycle routes and crossride facilities - Education and engagement programs can be implemented to provide safer road usage and development of strategies to reduce network trips - Micro-mobility can effectively be introduced to reduce trips and can include e-bikes and e-scooters - Provide signage and wayfinding to encourage use of all accesses at commercial plazas. Unsignalized accesses on Erie Street will incur longer delays for left-turn movements

Note: Signal timing upgrades proposed for network intersections to improve future operation

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1.0 INTRODUCTION

1.1 Purpose and Scope

A municipality within Essex County, Leamington is well known for its vegetable production, concentration of green houses and attractions as a tourism destination. Increases in farming and development of the area has increased traffic operational concerns faced by the community along key arterials corridors.

Due to an increase in traffic concerns the Municipality of Leamington has engaged McIntosh Perry to undertake a traffic study of the area generally bounded by Oak Street to the north, Seacliff Drive to the south, Sherk Street to the east, and Erie Street to the west. The purpose of this assignment is to identify transportation-related issues/opportunities throughout the study area and recommend a set of practical solutions that adhere to local and provincial guiding principles. This study will present traffic operations, a safety review, transit and active transportation (AT) networks for existing conditions. A general traffic assessment of the study area will be completed for year 2020, and a 10-year horizon forecast will also be undertaken, as part of the study. Study area concerns will be assessed with recommendations and mitigation measures proposed address issues within the study limits.

1.2 Study Area

The designated study area includes several major traffic generators including a public school and secondary school, a recreation center, several commercial plazas including a Walmart, and the Highbury Canco industrial facility. The study area for this undertaking is illustrated in [Figure 1-1](#) below.

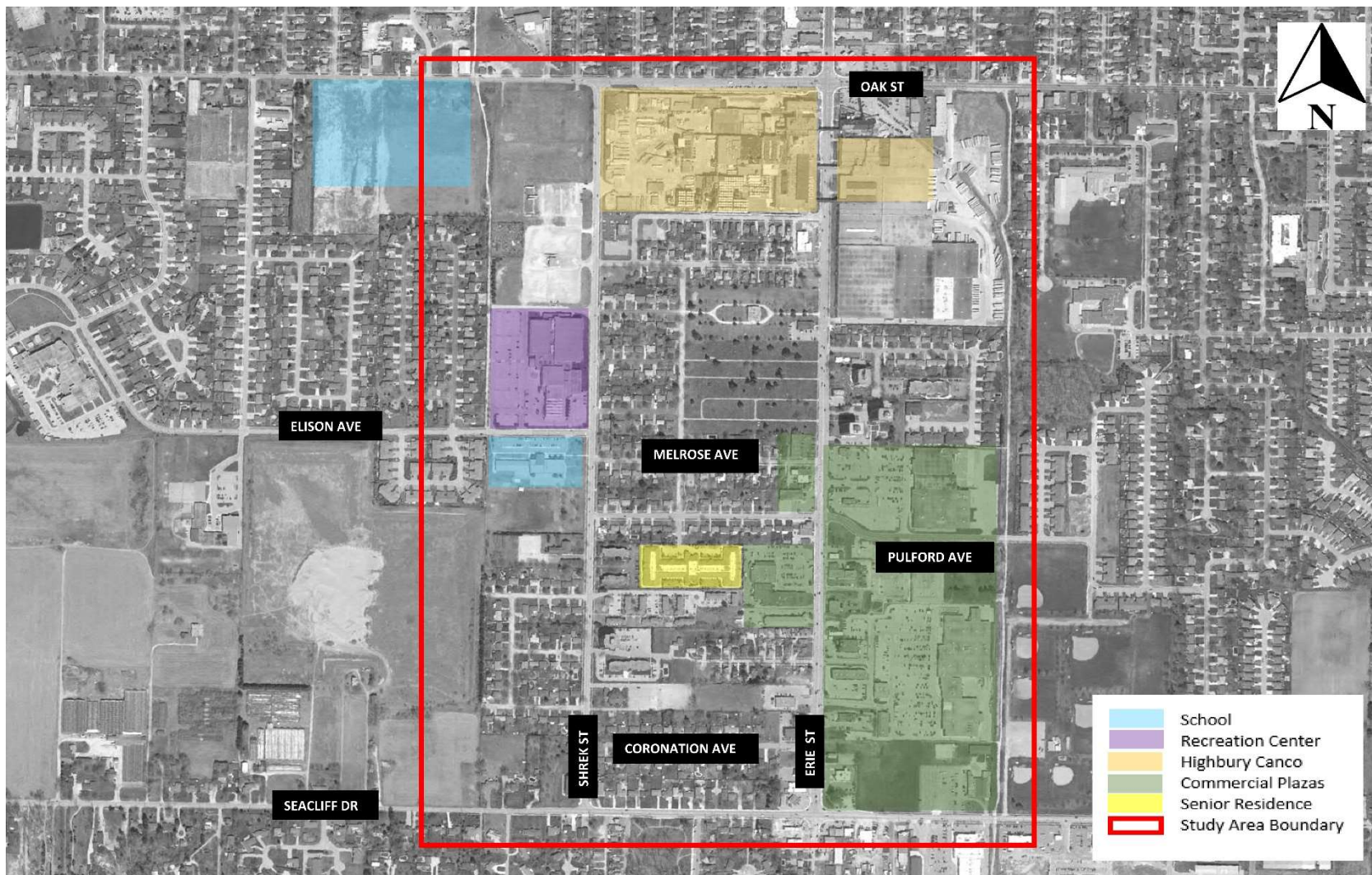


Figure 1-1 Study Area

2.0 PLANNING CONTEXT

2.1 Growth Plan for Municipality of Leamington

The Municipality has a population of 27,595 per 2016 Census Canada data, with the County of Essex 2014 official plan providing a 2031 growth projection to 33,490. The Leamington 2020 official plan (draft) provides an employment forecast of 15,800 jobs for 2031, up from 12,095 per 2016 Census Canada data.

Growth and development in Leamington have increased rapidly in recent years, being largely driven by investment in farming and greenhouses, particularly the cannabis industry. The Municipality's vision to accommodate this forecasted growth is to be achieved through sustainable communities that allows individuals to live, work and play. The long-term vision as described in the Town's Strategic Plan is to provide *"A quality of life experience that will engage our residents, attract new business, and help drive Leamington into the future. Leamington will be a place where people choose to be."*

2.2 Active Transportation Plan

The Leamington Active Transportation Plan (ATP) & Implementation Strategy adopted by City Council serves as a blueprint and implementation road map for short-term and long-term development of both on and off road active transportation (AT) facilities across the municipality. The plans preferred growth options included:

- encourage walking and cycling for short-distance and long-distance touring trips.
- Achieving regional connectivity with surrounding areas.
- Respond to issues and opportunities within urban, semi-urban, and rural communities.



The ATP was developed to identify short-term and long-term infrastructure improvements, policies and processes, programming and outreach initiatives, and tools to facilitate the growth and development of active transportation and recreation municipality-wide. Several corridors identified within the study area are proposed AT routes for the area as shown in [Figure 2-1](#).

The current study will build on concepts and proposals in the 2016 ATP, to improve network connectivity, comfort and safety.

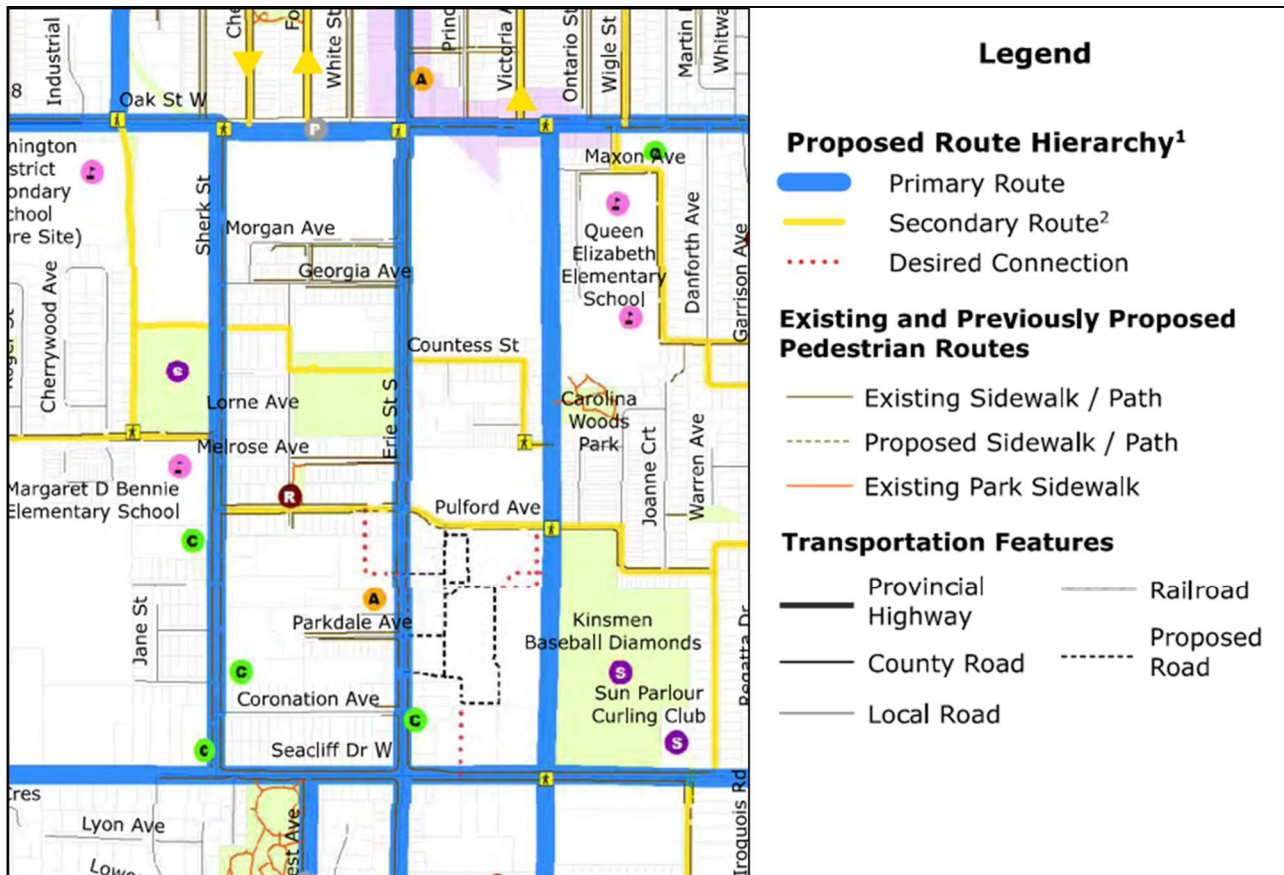


Figure 2-1 Proposed AT Routes

2.3 Development Intensification

Growth and development are projected to continue through to 2031 as identified in the Municipality’s official plan (2020 Draft). The Municipality’s growth management strategy is to direct the majority of future growth and development to primary settlement areas to strengthen the Municipality’s settlement structure, and provide for development patterns that efficiently use land, resources, infrastructure, and public service facilities. Planning data shared by the Municipality provided information on proposed future developments within the study area that are anticipated to be develop within the study’s 10-year horizon.

Five area developments have been identified for consideration within the future 2030 study horizon.

- Development A – Retail / Commercial (8,830 ft²)
- Development B – Residential Apartments (60 units)
- Development C – Commercial (19,100 ft²)
- Development D – Commercial (133,000 ft²)

- Development E and F – A single development consisting of residential (E) (439 units) and commercial (F) (33,978 ft²) components.

Locations of area developments described above are illustrated [Figure 2-2](#).



Figure 2-2 Future Study Area Developments

3.0 EXISTING CONDITIONS

3.1 Road Network

The road network within the study area consists of arterial, collector, and local roadways. The notable roadways in the defined study are described below.

Oak Street is classified as a 4-lane arterial roadway with a posted speed limit of 50 kilometers per hour.

Erie Street South is a 4-lane north south roadway, classified as an arterial roadway with a posted speed limit of 50 kilometers per hour. Within the context of the study area, this roadway provides access to the major department stores and shopping areas in Leamington. This roadway also provides access to the marina located south of Seacliff Drive.

Sherk Street is a 2-lane north-south roadway, classified as an arterial roadway with a posted speed limit of 50 kilometers per hour. Sherk Street is situated in an area where the land use includes residential, industrial, recreational, and schools.

Seacliff Drive is classified as a 4-lane arterial roadway with a posted speed limit of 50 kilometers per hour.

The roadway study area network is illustrated in [Figure 3-1](#).

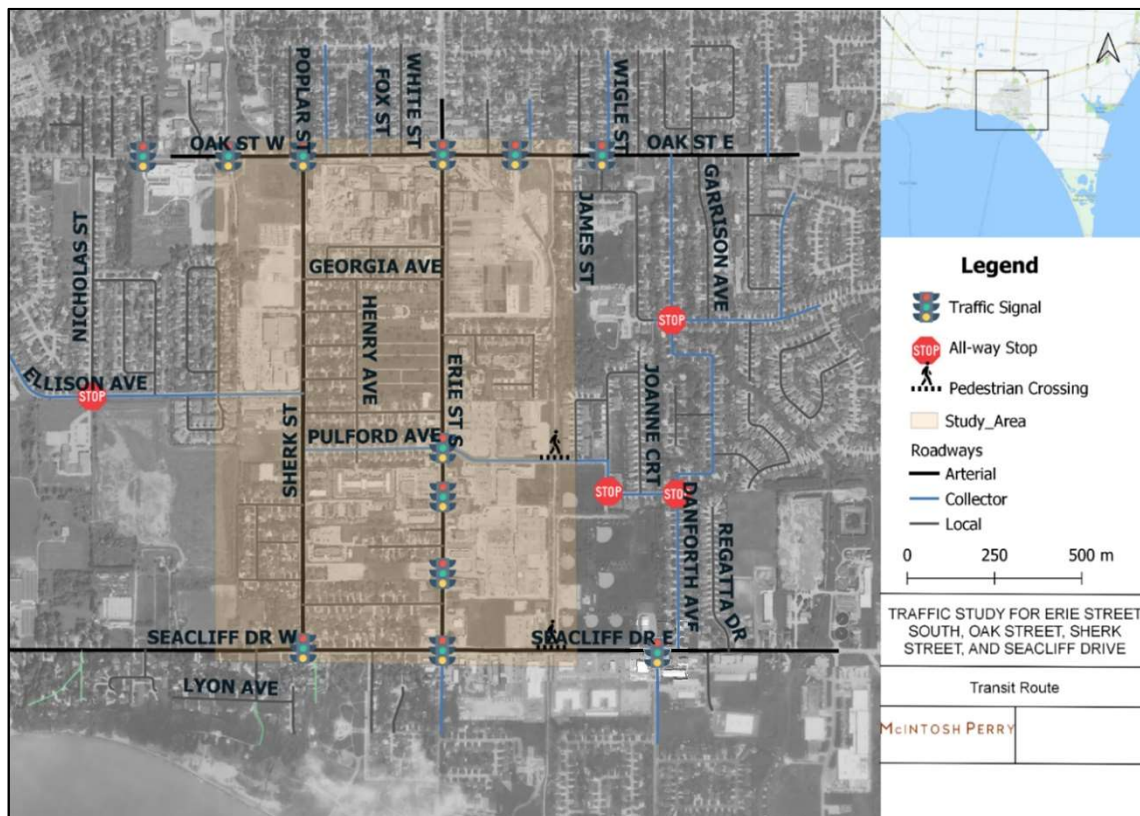


Figure 3-1 Study Area Road Network

3.2 Active Transportation Network

The active transportation (AT) network consists of on-road and off-road facilities that include bike lanes, sidewalks, and multi-use trails.

Bike Lanes

Within the study limits, Sherk Street provides dedicated north-south bike lanes from Oak Street in the north to Seacliff Drive in the south. Bike lanes begin just south of Oak Street and terminate in the vicinity of Coronation Avenue approximately 100m north of Seacliff Drive. Bike lanes are also provided on Pulford Avenue, east of Erie Street. As observed with Sherk Street bike lanes, facilities along Pulford Avenue begin east of Erie Street and not at the intersection, continuing eastward beyond the study boundary toward Carolina Woods Crescent. In the northeast corner of the study area, bicycle lanes are also provided on Oak Street from Victoria Street eastward. Most conflicts between cyclist and motorists tend to occur at intersections. Existing bicycle facility design do not provide protections for cyclists approaching or at major study intersections. Furthermore, these intersections lack facilities for cyclist transition through intersections. It is noted that that bicycle lane facilities are provided at locations beyond the study area network. Existing facilities are illustrated in Figure 3-2.

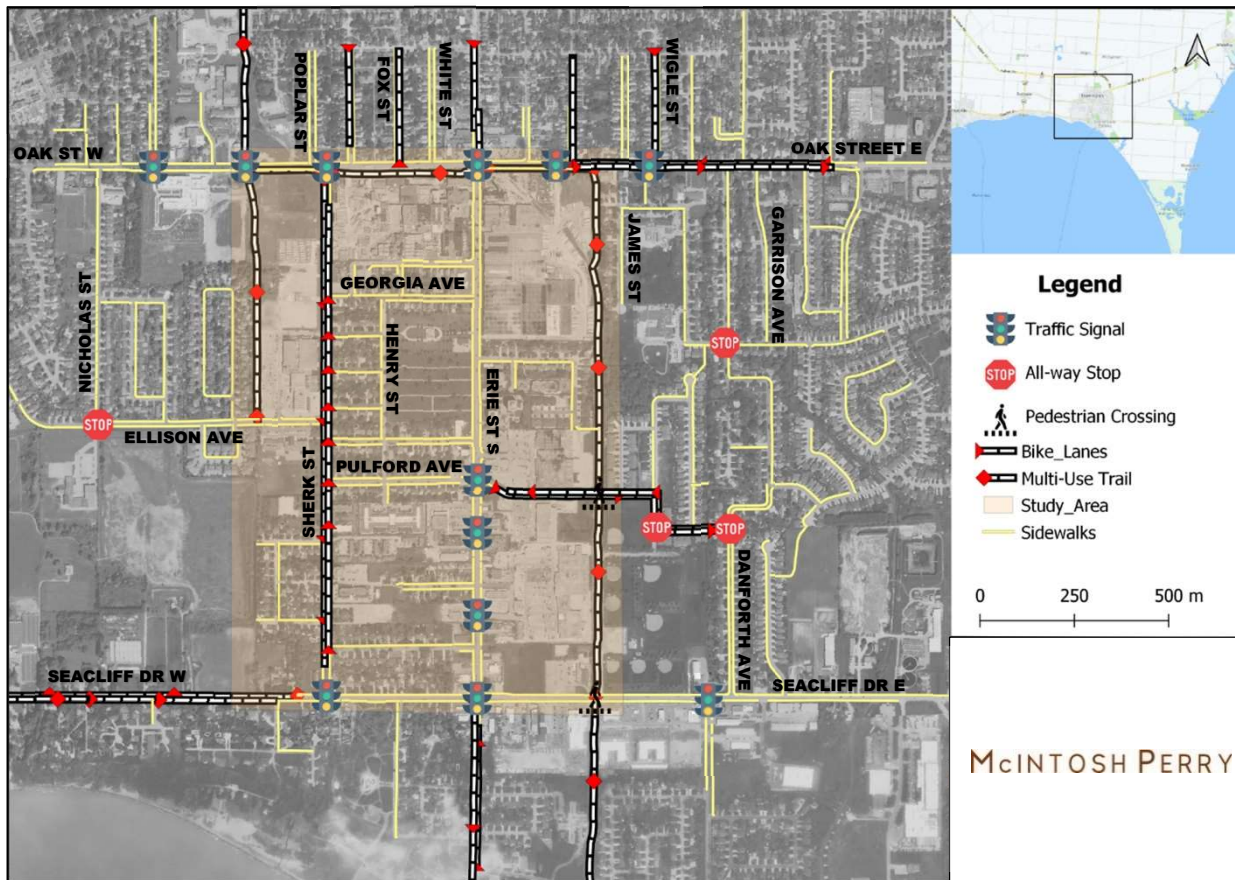


Figure 3-2 Existing Study Area Bicycle Routes

Shared Roads

Within the study boundary two shared roads have been identified. Seacliff Drive west of Sherk Street and Pulford Avenue west of Erie Street.

Share the road signs indicate the likelihood of cyclists on the roadway. This type of signage is used where the road is not wide enough for bicycles and cars to operate safely within one lane. The sign warns motorists that they are to provide safe space on the road for cyclists and other vehicles. Therefore, cars and cyclist must both “share the road” meaning they must operate “one after the other.” A cyclist, or group of cyclists, has the right of “first come, first served” and the full use of the lane. Motorists wishing to pass, must yield and wait until it is safe to do so. Existing signage is shown in [Figure 3-3](#).



Figure 3-3 Signage on Pulford Avenue and Seacliff Drive

Multi-use Trails

The Leamington Trails runs north-south marking the east and west study limit boundaries. The west trail begins at Ellison Avenue in the south extending beyond Oak Street for approximately 1.6 kilometers, terminating at Erie Street north of the study area, approximately 180 meters south of Wilkinson Drive. The east trail runs through the entire study area, from Oak Street in the north to Robson Road in the south beyond the study limits.

Sidewalks

The study area has an extensive sidewalk network, with most streets having sidewalks on at least one side of the roadway. Sidewalks provide connections to residential, commercial, institutional and employment locations within and external to the study area. Sidewalks assist in providing safe connections to pedestrian crossings, trails and link roadways in the area network together.

Network Gaps

Examination of existing connections in the AT network, confirm the presence of existing gaps that limit east – west connectivity or safe means of transitioning from one facility to another. Assessment of network improvements will identify methods of enhancing connectivity and eliminating gaps. Network gaps are illustrated [Figure 3-4](#).

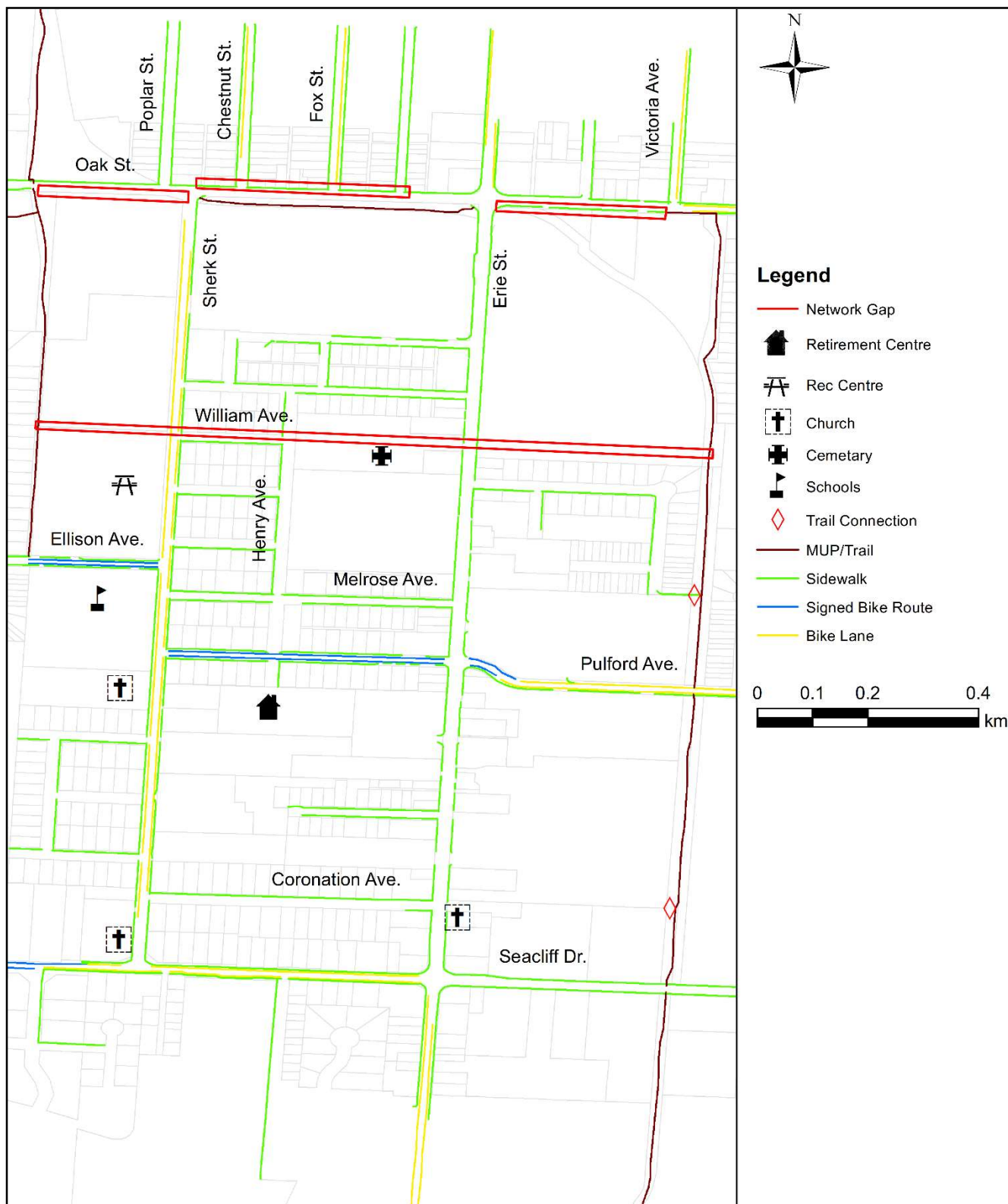


Figure 3-4 Active Transportation Network and Network Gaps

3.3 Transit

As shown in Figure 3-5 Leamington Transit operates two existing transit routes both of which service the study area. There is a regular route that passes through residential, commercial, and industrial areas of the Municipality. The route has been laid out to allow most passengers to only need to ride a portion of the route to get to and from their destinations. The regular route operates Monday to Saturday from 7:00 AM to 7:04 PM, with one-hour headways and no service on holidays. This route services 15 bus stops within the study area.

The Erie Summer route service operates Friday, Saturday and holidays from 7:20 AM to 7:23 PM. This service operates with 30-minute headways commencing on the Friday before Victoria Day and ends on Labour Day. Nine bus stops within the study area facilitate operation of this service.

On days when both the regular route and summer route are operating, transfers are possible from one route to the other route at designated transfer points, which can be seen in Figure 3-5.

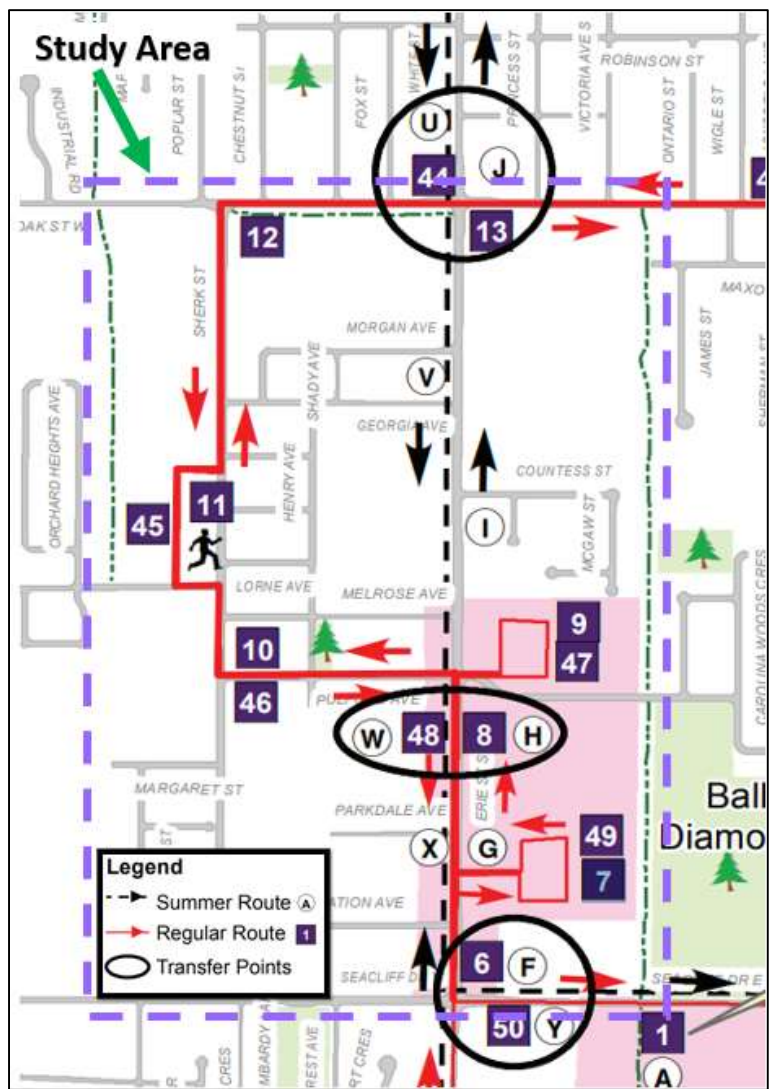


Figure 3-5 Gaps in Active Transportation Network

3.4 Data Collection

Traffic data was collected and assimilated from a number of different sources to develop traffic volumes for existing conditions. Data sources included:

- The Municipality of Leamington through their GridSmart data collection system
- Other count data collected by the Municipality within recent years
- Local traffic studies undertaken within the last 5 years, and
- intersection counts commissioned by MP

At three study locations existing turning movements were estimated based on a first-principles approach by considering available traffic data, study time period, road network and land uses. Estimations were used at these locations as data was either unavailable or could not be counted.

Based on the timing of the study, all traffic volumes collected specifically for the study would not represent typical traffic conditions due to the effects of the COVID-19 pandemic. The pandemic conditions are considered to have impacted vehicle, pedestrian and cyclist volumes for the network. As a result, the study relied on data collected prior to the pandemic where possible, at main intersections to function as study controls. Traffic data collected for the study (original raw data) from the multiple identified sources are provided in **Appendix A**.

To better align traffic volumes for existing conditions with “typical pre-pandemic” conditions, February 2020 GridSmart, traffic counts on Erie Street were used as a baseline for adjustment of available turning movement volumes. Traffic volumes at upstream or downstream intersections from other sources were therefore adjusted (increased) proportionally to establish the existing condition network volumes.

Intersections included as part of the study assessment have been identified in *Table 3-1*. Lane configurations for study intersections under existing conditions have been provided in *Figure 3-6*. *Adjusted* traffic volumes for existing conditions are illustrated in *Figure 3-7*.

Traffic data included as part of this study assessment was also supported by observations by MP staff as part of two site visits conducted at the study area. The first site visit was completed over two days on September 30 and October 1, 2020 followed by a second site visit conducted on June 4, 2021. Site visits occurred during the COVID-19 pandemic where communities across Ontario were experiencing restrictions due to the ongoing pandemic.

Site visits included the review of study intersection operation, pedestrian and cyclist activity, measurement of existing facilities, speed readings of vehicles and taking of pictures and video recordings at locations throughout the study area.

Table 3-1 Study Area Intersections

Location	Control Type	Source Date
Oak Street and Westmoreland Avenue	Unsignalized	April 9, 2019
Oak Street and Industrial Road	Unsignalized	April 10, 2019
Oak Street and Poplar Street	Unsignalized	April 9, 2019
Oak Street and Sherk Street	Signalized	April 11, 2019
Oak Street and Chestnut Street	Unsignalized	March 10, 2021
Oak Street and Fox Street	Unsignalized	March 9, 2021
Oak Street and Erie Street	Signalized	February 28, 2020
Shrek Street and Highbury Canco Access	Unsignalized	October 6, 2020
Sherk Street and William Avenue	Unsignalized	Assumed
Sherk Street and Ellison Avenue	Unsignalized	September 5, 2019
Sherk Street and Melrose Avenue	Unsignalized	March 11, 2021
Sherk Street and Pulford Avenue	Unsignalized	October 6, 2020
Sherk Street and Coronation Avenue	Unsignalized	Assumed
Sherk Street and Seacliff Drive	Signalized	October 6, 2020
Erie Street and Countess Street	Unsignalized	January 18, 2018
Erie Street and Freshco Plaza	Unsignalized	October 6, 2020
Erie Street and Pulford Avenue	Signalized	February 28, 2020
Erie Street and TD Bank Plaza	Signalized	July 3, 2020
Erie Street and Parkdale Avenue	Unsignalized	October 6, 2020
Erie Street and Walmart Plaza	Signalized	October 6, 2020
Erie Street and Coronation Avenue	Unsignalized	Assumed
Erie Street and Seacliff Drive	Signalized	October 6, 2020
Seacliff Drive and Cherry Lane	Signalized	June 4, 2019
Seacliff Drive and Danforth Avenue	Unsignalized	June 13, 2019

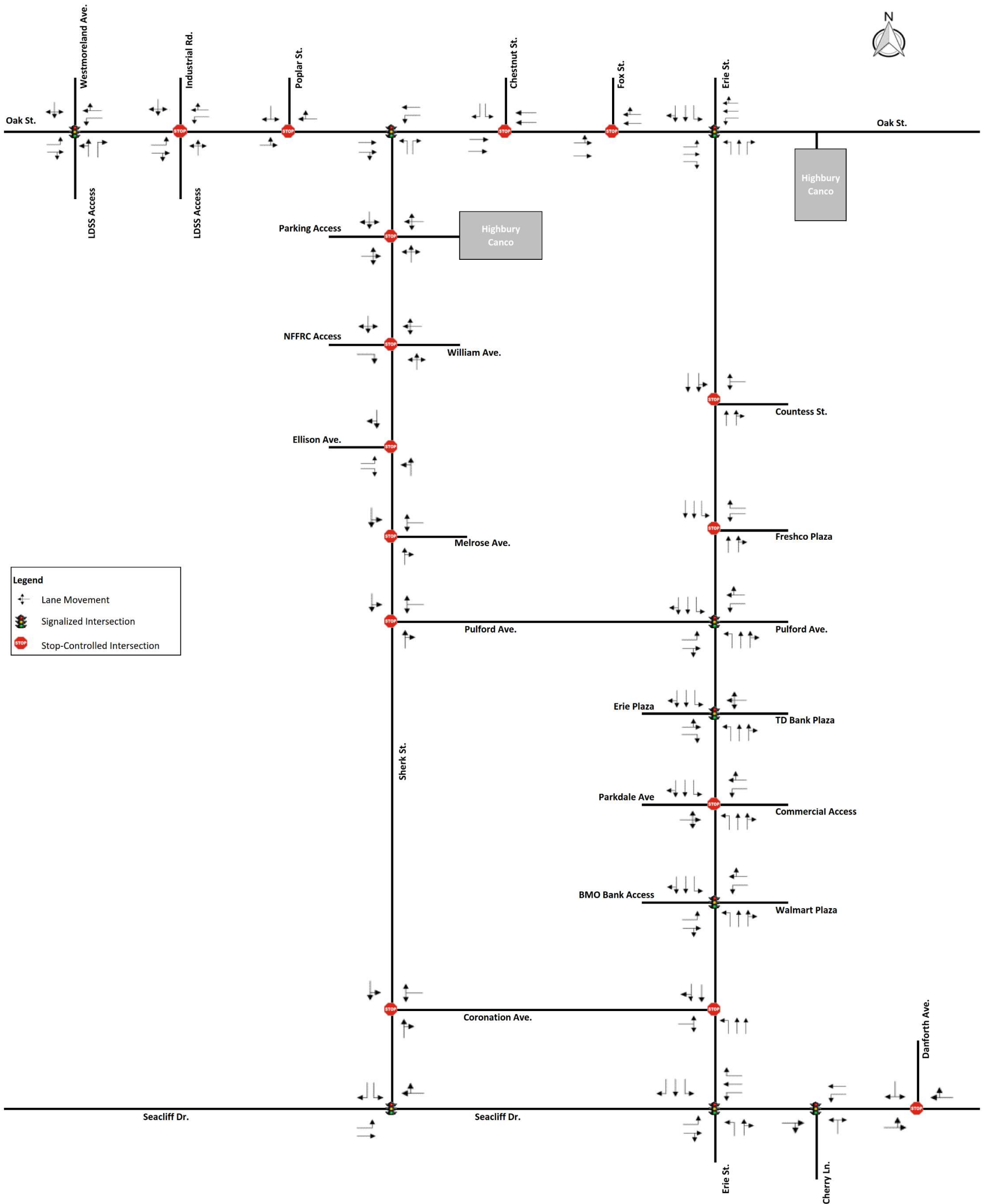


Figure 3-6 Existing Lane Configuration

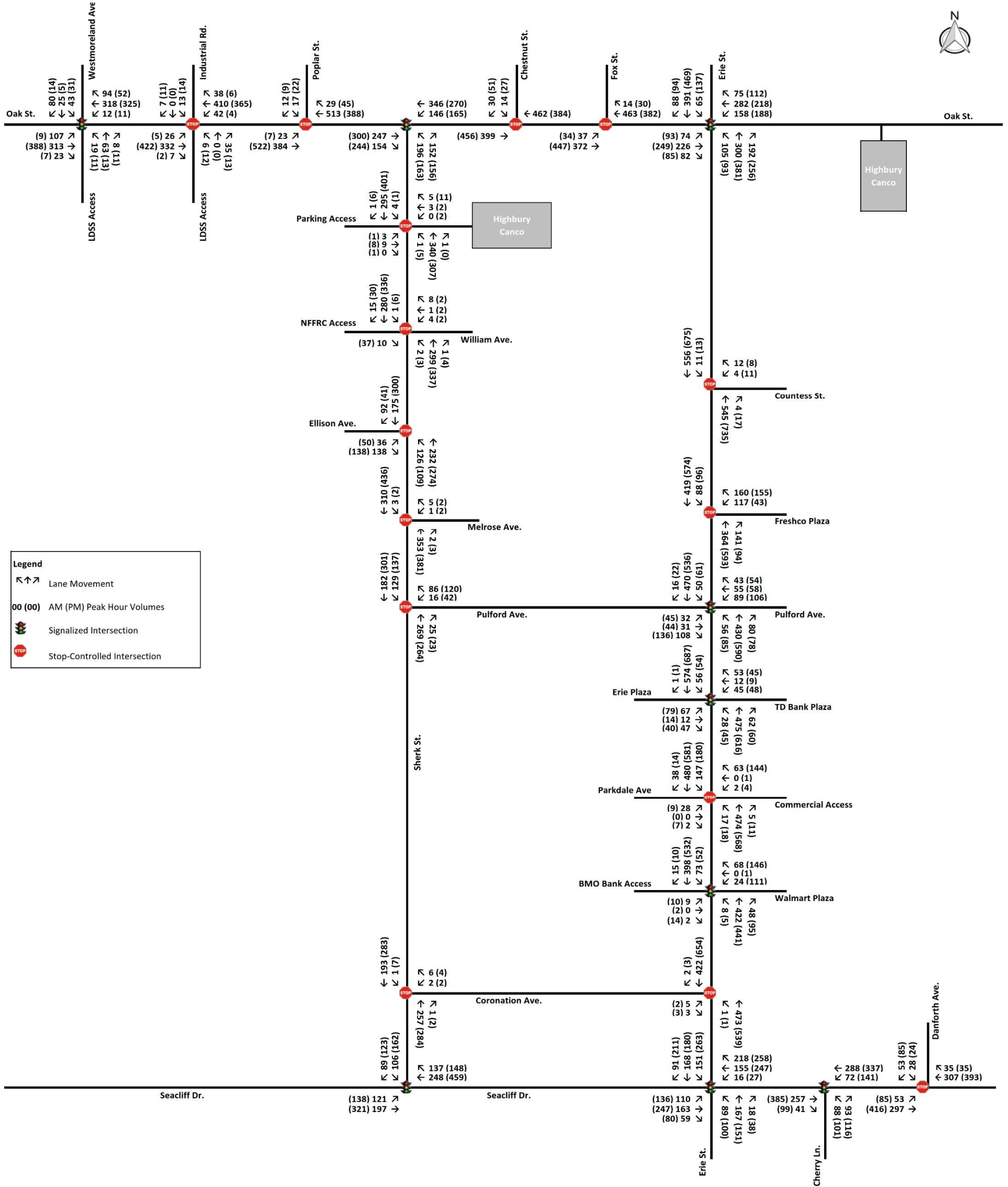


Figure 3-7 Existing 2020 Traffic Volumes

3.5 Farmer Survey

Changes in the farming and the greenhouse industry in Leamington has boosted employment due to the fast-growing cannabis market and increases in agricultural production. The 2020 draft official plan indicates the Municipality has over 1,171.16 ha (2,894 ac) of existing greenhouses and 21,732 hectares of prime agricultural land. It is anticipated that there will be over 1,214 ha (3,000 ac) of greenhouses built, based on current applications. These increases can result in higher vehicle, pedestrian and cyclist volumes on roadways and active transportation networks.

Engagement of farmers within the Municipality, was sought to provide perspective on their growth and site related trips. This information was considered meaningful as part of this study to attain some understanding of farm related site traffic for future expansion of existing farms or development of new farms within Leamington.

A series of telephone surveys with five local greenhouse operators (farms) was undertaken to gain an understanding of each of their operations transportation related impacts. Telephone surveys provided a high-level approximation of daily activities as information provided was not corroborated by actual field survey data. Participating farms and their locations have been summarised below in *Table 3-2*.

Table 3-2 General Farmers Information

Farm	Produce	Address	Farm Size (acres)
AMCO Produce	- Tomatoes - Bell Peppers - Cucumbers	523 Wilkinson Drive	70
Aphria	- Cannabis	265 Talbot Street West	40
DiCiocco Farms	-Tomatoes - Bell Peppers - Cucumbers	308 Talbot Street East	56
Nature Fresh	-Tomatoes - Bell Peppers	525 Essex Road 14, (Farm 1) 645 Highway 77, (Farm 2)	150
Under Sun Acres	- Bell Peppers	620 Mersea Road 10	48

All farms that participated in surveys are located within the vicinity of Talbot Street or further north along Highway 77, north of the Oak Street study boundary. The location of farms that participated in the surveys are illustrated in *Figure 3-8*.

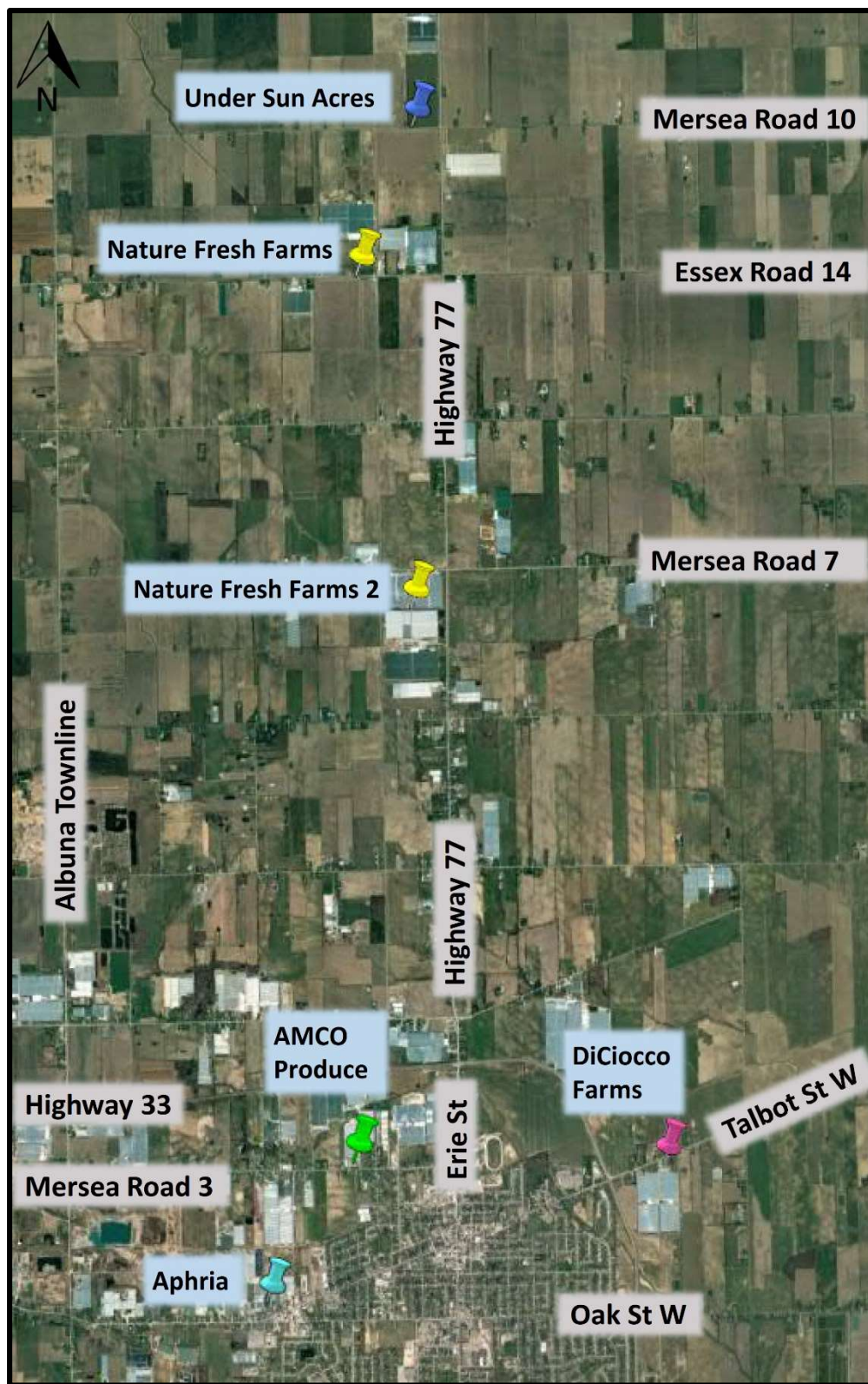


Figure 3-8 Location of Farms

The relationship between farm sizes with respect to employees, trucks, and bikes was undertaken to identify trip rates for farms to provide comparisons of the various facilities. Data used in analysis is based on interviewed farmers, their observations and understanding of their sites and have not been verified with actual survey data. As such, actual rates may vary between farms. Farm employee numbers vary throughout the year based on planting, harvesting and produce type, thus numbers for peak operating conditions (typically harvesting season) of each farm was used for assessment. This period would provide the highest trip generation for each farm correlating with there greatest demand on the associated road network.

A number of the farms operate a shuttle service on Fridays for its foreign workers to get to and from town for the purposes of buying groceries, banking and other individual needs. Since these trips are not a major component of the traffic generated by the farms, it is not included in this trip rate analysis.

All farms that participated in surveys, consisted of both International Guest Workers (IGW) and local workers. Based on conducted surveys, it is estimated that of the workers that cycle to work, the majority are IGW. Similarly, it is estimated that almost all local workers arrive by vehicle by driving, carpooling or are dropped off to farm locations. A summary of farm employees during peak operation is provided in *Table 3-3*. A summary of collected travel data for the sites is provided in *Table 3-4*.

Table 3-3 Employee Summary

Farm	Farm Size (acres)	No. of Employees ¹	Staff /Acre	No. International Workers	
				Peak ²	Low ³
AMCO Produce	70	250	3.6	200	100
Aphria	40	600	15.0	120	120
DiCiocco Farms	56	155	2.8	125	63
Nature Fresh	150	600	4.0	450	300
Under Sun Acres	48	76	1.6	70	50

¹ Total farm employee numbers during peak operation period

² Peak number of International Guest Workers when farms are at peak operation

³ Number of International Guest Workers during slow/reduced operation

Table 3-4 Farm Traffic Volume Summary

Farm	Farm Size (acres)	Truck Trips ¹	Truck Trips Rate (per acre)	Employee Trips ²	Employee Trip Rate (per acre)	Bicycle Parking
AMCO Produce	70	30	0.43	150	2.1	65
Aphria	40	20	0.50	680	17.0	200
DiCiocco Farms	56	14	0.25	60	1.1	70
Nature Fresh	150	80	0.53	210	1.4	450
Under Sun Acres	48	12	0.25	12	0.3	0

¹ Based on number of trucks that drive to site per day, includes inbound and outbound trips (i.e. two-way trips)

² Based on number of employees that drive to site per day, includes inbound and outbound trips made

Collected data shows that a larger farm would require a larger workforce to operate except for Aphria, who’s high employee numbers are due to the farm’s cannabis product. Cannabis requires greater care to grow and operations consists of year round harvesting, hence the higher and more consistent number of employees. Furthermore, farms have a high reliance on IGW, with approximately 75% or more of workforces being made up of IGW except for Aphria with only 20% of the employees being IGW.

Truck and employee trip data were used to develop trip rates for the surveyed farms for typical week-day operation. *Figure 3-9* below summarizes daily truck activity for each of the farms during their busiest periods of operation. Nature Fresh being the largest farmer with 150 acres of farmland, accordingly it has the highest volume of truck traffic of approximately 40 trucks per day (80 two-way trips) followed by AMCO Produce, Aphria, DiCiocco Farms, and Under Sun Acres with 15, 10, 7, and 6 trucks per day respectively. Daily truck traffic trip rate peaks at 0.53 per acre, which occurs at the Nature Fresh farm. Truck trip rates range from 0.25 to 0.53 for the five surveyed farms providing an average rate of 0.39.

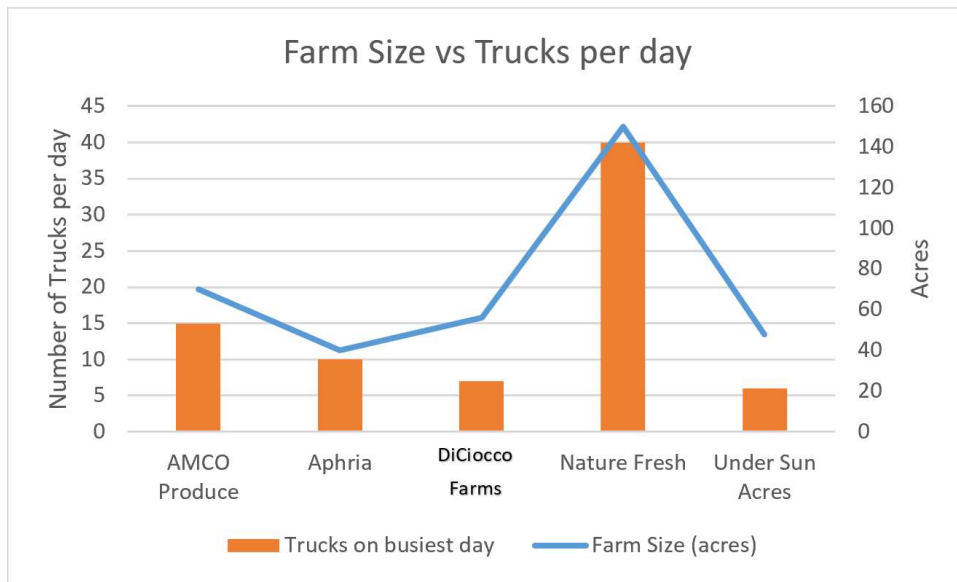


Figure 3-9 Farm Size vs Trucks per day

Employee trips and ultimately trip rate showed a wide variation between the surveyed sites. During peak operation periods, Aphria and Nature Fresh farms have the highest number of employees at 600 each. Per survey data however 75% (450) of Nature Fresh employees are IGW, that live on-site and do not own vehicles. In comparison only 20% of Aphria employees are IGW.

Aphria has the highest number of local employees (480) of the surveyed farms and was estimated to generate 680 daily trips (total of inbound and outbound trips). Based on the farm size, Aphria was forecasted to have an employee trip rate of 17.0 per acre. Under Sun Acres had the lowest trip rate of 0.3, with DiCiocco Farms at 1.1, Nature Fresh at 1.4 and AMCO produce at 2.1.

Surveys identified that bicycle usage is very common amongst IGW. Survey information confirmed that farms provided on-site living accommodations for 100% of its international work force except for AMCO Produce

which provides on-site accommodation to 50% of its IGW. For those IGW that live in on-site accommodations, their main travel modes are primarily by bicycle or walking.

Bicycle parking is provided at four of the five farms surveys, with Under Sun Acres providing no bicycle parking for any of its staff. Nature Fresh farm provides the highest number of bike stalls (see [Table 3-4](#)), provided to accommodate its high number of IGW, of which at least 90% have a bike. Where bicycle parking is provided at the four farms, utilization of these parking spaces is very high as illustrated in [Figure 3-10](#).

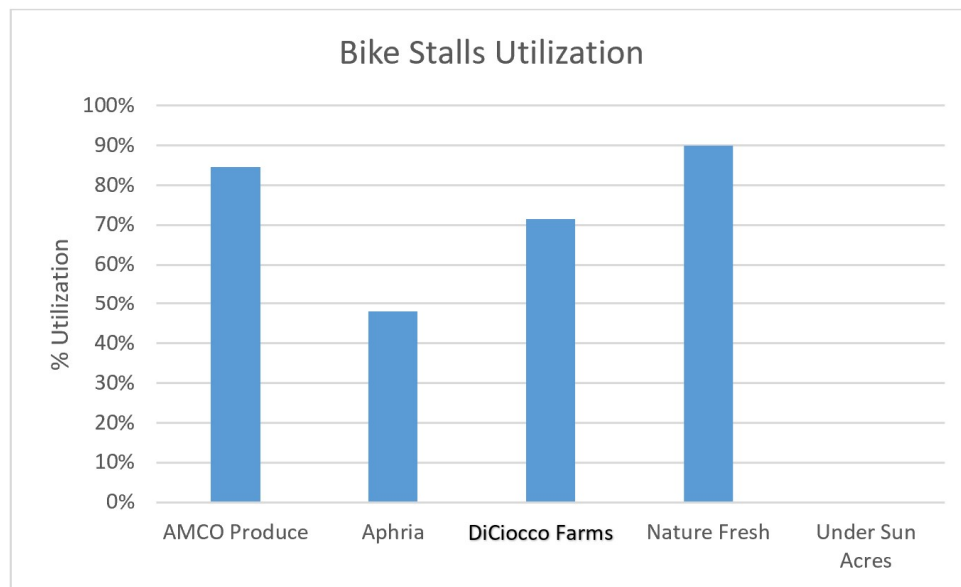


Figure 3-10 Farm Bicycle Parking Utilization

Data compiled from conducted surveys provides some understanding of farm traffic operations that potentially allows for high-level estimates and assumptions for some farm types. A detailed quantitative assessment, inclusive of site traffic surveys is recommended to develop reliable trip rates for farm types. A commissioned study will require a larger sample size of farms to be surveyed and trip data reviewed based on type of produce from surveyed farms. This will provide the Municipality with a reliable means of forecasting trips for future farms.

3.6 Existing Condition Assessment

The traffic analysis was undertaken for existing (2020) conditions for both the AM and PM peak hours using Synchro 10 software which utilizes the Highway Capacity Manual (HCM) methodology for intersection analysis.

Traffic operation performance metrics were reported in terms of level of service (LOS), delays, volume-to-capacity (v/c) ratios and 95th percentile queues. Intersection level of service (LOS) is a recognized method of quantifying the delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing various turning movements. The delay is related to the number of vehicles desiring to make a movement compared to the estimated capacity for that movement. Capacity is based on several criteria related to the opposing traffic flows and intersection geometry. Level of service criteria for signalized and stop controlled intersections is summarized in [Table 3-5](#).

Table 3-5 Intersection Level of Service Criteria

Level of Service	Average Control Delay per Vehicle (sec / veh)	
	Signalized Intersection Delay	Unsignalized Intersection Delay
A	≤ 10	≤ 10
B	>10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

For analysis purposes peak hour factors (PHF) for study intersections were calculated from peak period count data where available and Synchro default values of 0.92 when there was insufficient data. Cycle lengths and signal timings for existing conditions are provided by the Municipality of Leamington which is provided in **Appendix A**.

Analysis tables provide a summary of overall intersection operation including “critical” movements which include, v/c ratios, LOS indicators, delay and 95th percentile queue as defined by:

- LOS of F or worse for the overall intersection, as well as individual or shared movements;
- v/c ratios for overall intersection operations, through movements or shared through/turning movements with 0.90 or above;
- v/c ratios for exclusive movements that will exceed 1.00; and
- 95th percentile queue lengths for individual movements and/or when they exceed available lane storage.

3.6.1 Operational Analysis

A summary of operations of existing conditions at signalized and unsignalized intersections operations for AM and PM peak hours are provided in *Table 3-6* and *Table 3-7*, respectively. Analysis in summary tables have been limited to show critical movements during AM and PM peak hour periods. Detailed synchro analysis reports are provided in **Appendix B**.

Queue analysis was also completed using SimTraffic micro-simulation using 20 minutes seeding time, 60 minute recording, and 5 runs. Queue summaries have been provided for critical turning movements and locations where queuing deficiencies have occurred. Queue requirements at study intersection are anticipated to change under future conditions and as such recommendations of improvements to accommodate queue requirements should be considered under future conditions. Summarized queueing analysis is also provided in *Table 3-6* and *Table 3-7* with detailed queue analysis reports provided in **Appendix C**.

Table 3-6 Existing Signalized Intersection Capacity Analysis Summary

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Oak St W & High School Driveway/Westmoreland Ave	-	B	15	-	-	A	7	-	-
EB Left	100	B	13	0.37	25	A	7	0.01	9
EB Through-Right	65	B	11	0.48	45	A	7	0.31	47
SB Left-Through-Right	>100	C	32	0.73	33	C	24	0.28	18
Oak St W & Shrek St	-	B	14	-	-	B	15	-	-
EB Through	13	C	23	0.49	21	C	33	0.72	20
NB Left	>100	C	24	0.61	44	B	18	0.37	43
NB Right	80	A	5	0.39	28	A	5	0.32	27
Oak St W/Oak St E & Erie St S	-	B	18	-	-	B	19	-	-
EB Through	>100	C	32	0.59	52	C	34	0.65	63
NB Left	40	B	11	0.25	35	B	12	0.25	43
NB Through	>400	C	22	0.48	59	C	28	0.66	86
SB Through-Right	50	B	16	0.37	45	B	18	0.44	58
Erie St S & Pulford Ave	-	A	9	-	-	B	13	-	-
WB Left	25	C	32	0.41	27	D	36	0.53	32
Erie St S & Erie Plaza/TD Bank	-	B	13	-	-	B	18	-	-
NB Through-Right	>100	B	13	0.37	43	B	20	0.43	48
SB Left	40	A	7	0.11	30	A	8	0.11	29
SB Through-Right	>100	B	14	0.36	55	B	18	0.43	75
Erie St S & BMO Bank/Walmart Plaza S	-	B	10	-	-	A	10	-	-
WB Left	70	C	28	0.13	19	D	37	0.52	44
NB Through-Right	66	A	7	0.30	38	B	11	0.31	41
SB Left	30	B	10	0.16	33	A	2	0.10	24
Erie St S & Seacliff Dr W/Seacliff Dr E	-	C	20	-	-	C	23	-	-
EB Through-Right	>300	C	22	0.49	59	C	29	0.65	90
NB Left	20	B	14	0.25	40	B	14	0.23	40
SB Left	50	C	22	0.44	58	C	31	0.62	61
Seacliff Dr W & Sherk St	-	B	14	-	-	C	31	-	-
WB Through-Right	>300	B	17	0.54	73	D	53	0.98	188
SB Left	50	C	31	0.48	45	C	32	0.56	49
Seacliff Dr W & Cherry Ln	-	B	11	-	-	B	14	-	-
EB Through-Right	>500	B	12	0.35	41	B	18	0.62	65
WB Left	14	A	4	0.11	22	A	6	0.27	29
WB Through	48	A	7	0.28	31	A	7	0.32	39
NB Left-Right	>100	B	19	0.50	34	C	22	0.57	43

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

Results show that all signalized study area intersections, operate well under existing conditions with a LOS C or better during both the AM and PM peak hours. All study intersections and turning movements exhibit significant overall reserve capacity during the AM and PM peak hours with the exception of the westbound approach at the Seacliff Drive and Sherk Street intersection which is nearing capacity during the PM peak hour. Here the westbound approach contains a single lane, serving both the through and right movements, for a combined volume of 600 vehicles per hour during the PM peak hour while competing in timing with the southbound and eastbound left-turn phases. Some queue deficiencies occur across the network many of which are minor and can be accommodated in tapers or two-way left-turn lanes (TWLTL).

Table 3-7 Existing Unsignalized Capacity Analysis Summary

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Sherk St & Ellison Ave	-	B	13	-	-	B	13	-	-
EB Left	100	B	10	0.08	15	B	10	0.10	15
NB Left-Through	39	C	16	0.61	34	B	14	0.56	36
Oak St W & Industrial Rd	-	A	2	-	-	A	1	-	-
WB Left	20	A	9	0.06	11	A	8	0.00	3
NB Left-Through-Right	70	C	17	0.15	14	C	15	0.07	13
Oak St W & Poplar St	-	A	1	-	-	A	1	-	-
SB Left-Right	>100	C	24	0.18	15	C	15	0.09	16
Oak St W & Chestnut St	-	A	1	-	-	A	1	-	-
SB Left	>100	C	15	0.04	12	B	15	0.07	14
SB Right	25	B	10	0.04	14	A	10	0.07	14
Erie St S & Countess St	-	A	0	-	-	A	0	-	-
WB Left-Right	>100	B	13	0.04	12	C	22	0.09	13
Erie St S & Freshco Plaza	-	A	7	-	-	A	3	-	-
WB Left	30	E	48	0.62	39	E	47	0.36	19
SB Left	15	A	9	0.11	21	B	10	0.14	24
Erie St S & Parkdale Ave/Walmart Plaza N	-	A	3	-	-	A	3	-	-
EB Left-Through-Right	>100	F	66	0.37	19	E	43	0.15	12
WB Left-Through	60	F	50	0.03	5	F	58	0.07	9
WB Right	60	B	11	0.10	19	B	13	0.24	28
Erie St S & Coronation Ave	-	A	0	-	-	A	0	-	-
EB Left-Right	>100	B	12	0.02	9	B	13	0.01	7
Seacliff Dr E & Danforth Ave	-	A	2	-	-	A	3	-	-
SB Left-Right	>100	B	14	0.19	16	C	17	0.30	23
Sherk St & Coronation Ave	-	A	0	-	-	A	0	-	-
WB Left-Right	>100	B	10	0.01	7	B	11	0.01	8
Sherk St & Pulford Ave	-	A	4	-	-	A	4	-	-
WB Left-Right	>300	B	14	0.23	26	C	17	0.36	33
Sherk St & Melrose Ave	-	A	0	-	-	A	0	-	-
WB Left-Right	>100	B	11	0.01	6	B	14	0.01	6

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Sherk St & William Ave/NFFRC	-	A	0	-	-	A	1	-	-
EB Right	>100	B	10	0.02	0	B	11	0.06	2
WB Left-Through-Right	>100	B	12	0.03	10	B	15	0.02	9
Sherk St & Highbury Canco/Parking Lot	-	A	1	-	-	A	1	-	-
EB Left-Through-Right	30	C	20	0.06	19	C	21	0.05	21

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

Analysis for unsignalized study area intersections, show turning movements will operate with acceptable LOS and delay during the AM and PM peak hour under existing conditions with the exception of the minor approaches at the Erie Street and Parkdale Avenue intersection. At this location, the eastbound and westbound approaches are expected to operate at LOS F due to the higher delay experienced as vehicles wait for an appropriate gap to perform their movement. This higher delay is induced by the requirement to yield to higher order moves at the intersection, which in this scenario are the northbound and southbound movements, including the left turns. The center lane is a continuous two-way left turn lane which can provide refuge for a two-stage left turn maneuver from the minor road/driveway access when there are no vehicles waiting in the northbound and southbound left turn pockets. Furthermore, HCM methodology does not account for the metering effect from upstream signalized intersections. Therefore, the delay at these approaches is expected to be lower than reported as the nearby signal creates additional gaps not accounted for in Synchro. All other intersections were found to operate with a LOS B or better during both the AM and PM peak hours. All study intersections and turning movements exhibit significant overall reserve capacity during the AM and PM peak hours.

Queue analysis shows that most turning movements with dedicated storage can accommodate the expected queueing. Analysis did indicate however a total of 8 turning movements display queues that exceed the available storage length during either the AM or PM peak hour or both. Excess queues at most locations however, can be accommodated within existing tapers.

3.6.2 Link Analysis

A link volume assessment was conducted for the main corridors within the road network based on peak hour volumes derived from the turning movement counts. The highest link volumes in the network were recorded along Erie Street just south of Oak Street. Based on the estimated capacity of Erie Street and other main corridors all roadways during the AM have been forecasted to operate with volume to capacity (v/c) ratios of less than 0.85. Link analysis indicates that there are no capacity constraints present at any point in the AM network as illustrated in *Figure 3-11*.

Link volume assessments were similarly conducted for evening periods using PM peak hour volumes. As observed with the morning analysis, the entire PM peak hour study area road network operates with v/c ratios less than 0.85, as illustrated in *Figure 3-12*.

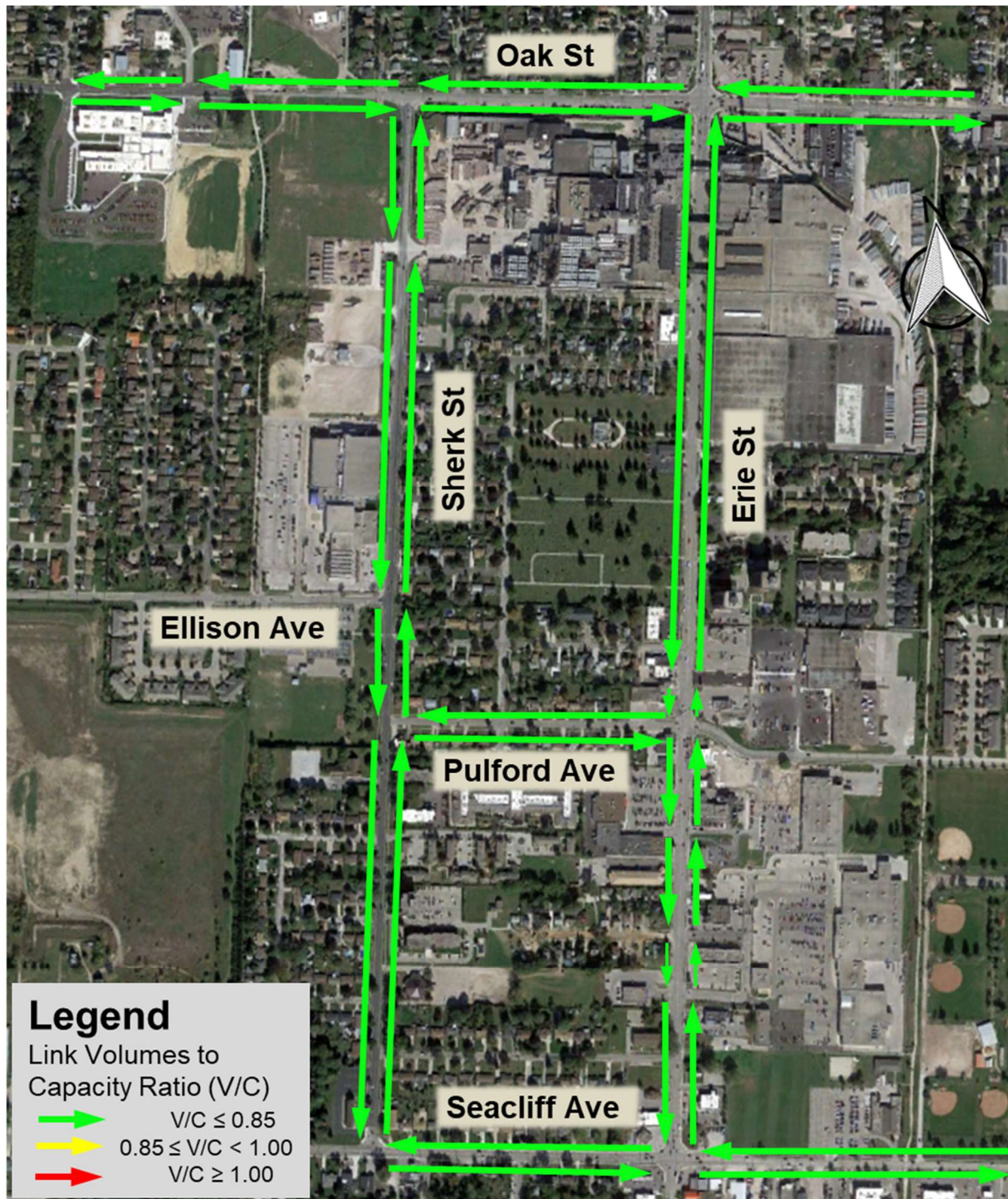


Figure 3-11 Study Network Link Assessment for Existing AM Conditions

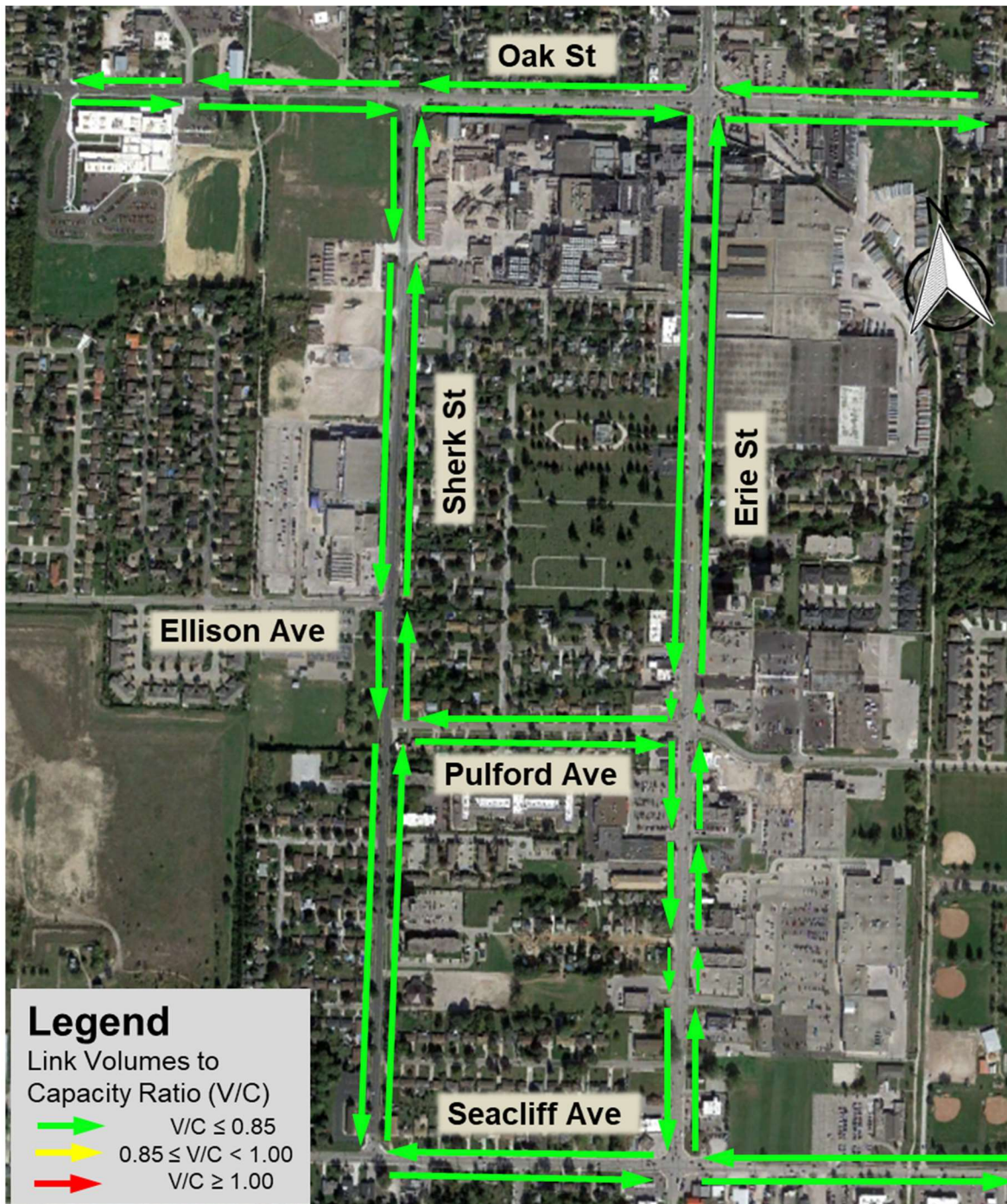


Figure 3-12 Study Network Link Assessment for Existing PM Conditions

3.6.1 Vissim Analysis

As a key corridor within the Leamington community Erie Street is of significant importance for the movement of goods, provision of services and for commute. The spacing between intersection, driveways and multiple existing traffic signals contribute to municipal concerns regarding current and future operation. To provide a more rigorous review of the corridor the Municipality requested the Erie Street corridor from Oak Street to

Seacliff Drive also be assessed using Vissim micro-simulation software (Vissim 2021) to assess weekday AM and PM peak periods. As such Vissim analysis was completed for existing and all future condition scenarios.

The benefit of micro-simulation software such as Vissim is the ability to accurately simulate complex vehicle interactions at a microscopic level. Erie Street has an existing four lane cross section consisting of two north and two southbound lanes and is a potential candidate for a road diet under future conditions. The Vissim model was utilized to provide a detailed analysis for existing conditions (2020). The Erie Street South corridor Vissim model includes the following intersections:

- Erie Street and Oak Street (signalized);
- Erie Street and Seacliff Drive West (signalized);
- Erie Street and Pulford Avenue (signalized);
- Erie Street and Erie Plaza/TD Bank (signalized);
- Erie Street and BMO Bank/Walmart Plaza (signalized);
- Erie Street and Parkdale Avenue (unsignalized);
- Erie Street and Coronation Avenue (unsignalized); and
- Erie Street and Countess Street (unsignalized).

The Vissim model for the Erie Street corridor was developed based on existing road network configurations. The model uses a 15-minute seed time followed by a 1-hour analysis period. Parameters and assumed values related to simulation speed and resolution, as well as vehicle classes and Heavy Goods Vehicle (HGV) proportions, are provided in *Table 3-8*.

Table 3-8: Parameters and Assumed Values

Parameter	Value
Simulation Speed	Maximum
Simulation Resolution	10 time steps per simulation second
Vehicle Types and Classes	VISSIM Defaults
HGV Proportions	Applied according to available vehicle classification data.

The model was coded using static vehicle routes. Separate vehicle routes were coded for cars and heavy vehicles. Static routes typically begin upstream of each intersection and end downstream of that intersection. The static routes vehicles were distributed according to turning movement count (TMC) data. In some cases where the link length between intersections was short and would result in unrealistic weaving patterns, static routes were combined.

Operational analysis for study intersection was completed using signal timing plans provided by the Municipality and network traffic volumes used in existing condition analysis for weekday AM and PM peak hours. Detectors used for signal actuation were placed on the corresponding movement’s lane with an assumed length of 2 m at turning lanes and 0.6 m at through lanes, unless otherwise indicated by the signal timing plan.

Table 3-9 Table 3- provides the default acceleration and deceleration functions, as defined in VISSIM, used in the subject model.

Table 3-9: Default Acceleration and Deceleration Values

Parameter	Automobiles (m/s ²)	Commercial Vehicles (m/s ²)
Maximum acceleration (default)	3.5	2.5
Desired acceleration (default)	3.0	2.5
Maximum deceleration (default)	-7.5	-5.5
Desired deceleration (default)	-2.8	-1.3

Erie Street has a posted speed limit of 50 km/h. As such, the desired speed throughout the network was based on the 50 km/h desired speed distribution. *Reduced speed* areas were coded for right-turn and left-turn movements at intersections as described in *Table 3-10*.

Table 3-10: Assumed Reduced Speeds at Intersections

Movement	Vehicle Class	Reduced Speed (km/h)
Right-Turn	Autos/HGV	15
Left-Turn	Autos/HGV	25

In order to take advantage of the complexity and detailed analysis a Vissim model can produce, it is important that the model be validated to a high degree of accuracy so as to represent a real-world traffic network.

The criteria used for the calibration and validation of the Vissim model are detailed below and are based on the Federal Highway Administration (FHWA) *Guidelines for Applying Traffic Microsimulation Modeling Software*. Both the existing (2020) weekday AM and PM peak hour analysis were developed using traffic volume and travel time comparisons.

In order to achieve calibration, the following parameters were considered for adjustment:

- Wiedemann 74 average standstill distance and the additive and multiplicative part of the safety distance;
- Minimum and Maximum look ahead distance;
- Desired speed distribution, and;
- Connector lane change and emergency stop parameters

Calibration used for conducted Vissim analysis is provided in **Appendix D**.

A summary of the existing operating conditions for the weekday AM and PM peak hours based on the Vissim analysis are summarized in *Table 3-11*. It is noted Vissim analysis does not provide volume to capacity ratios. All Vissim output reports have been provided in **Appendix E**.

As shown, all intersections are expected to operate at a LOS B or better during the AM peak hour with the one exception being the intersection of Erie Street South and Oak Street. During the PM peak hour, all intersections are expected to operate at a LOS C or better. This indicates that the Erie Street South corridor intersections as a whole are operating well and under capacity. All intersection movements are expected to operate at a LOS D or better during both the AM and PM peak hour. Overall, delays and queues were shown to be slightly higher during the PM peak hour.

Table 3-11: Vissim Existing Conditions Summary

Intersection / Movement	Available Storage (m)	AM Peak			PM Peak		
		LOS	Delay (s)	Max Queue (m)	LOS	Delay (s)	Max Queue (m)
Oak St & Erie St S	-	C	20.9	-	C	23.6	-
WB Left	100	D	39.7	61	D	47.9	69
NB Left	40	D	39.7	61	C	33.6	44
SB Through-Right	50	B	10.2	62	B	11.6	87
Seacliff Dr W & Erie St S	-	B	18.8	-	C	20.8	-
WB Through	>400	D	39.5	139	C	30.5	115
WB Right	50	A	6.7	46	A	8.7	51
NB Left	20	B	12.1	26	B	13.9	28
SB Left	50	B	14.0	39	B	19.5	67
Erie St S & Pulford Ave	-	B	11.6	-	B	14.3	-
EB Left	25	C	31.2	26	C	28.4	33
EB Through-Right	>100	D	41.7	26	C	27.0	33
WB Left	25	C	32.2	65	D	37.6	85
SB Left	45	D	38.8	29	D	38.3	27
Erie St S & Erie Plaza/TD Bank	-	B	11.9	-	B	10.6	-
EB Through-Left	50	D	52.6	47	D	45.0	34
WB Left-Through-Right	75	D	53.2	52	D	40.4	34
Erie St S & BMO Bank/Walmart Plaza	-	A	4.7	-	B	11.0	-
EB Left	20	D	39.5	7	B	16.4	7
EB Through-Right	20	A	0.0	7	C	30.9	7
NB Left	20	A	2.6	33	B	11.3	6
NB Through-Right	66	A	3.1	32	B	16.3	75
Erie Street & Parkdale Avenue (TWSC)	-	A	1.3	-	A	1.8	-
WB Right	60	A	7.4	20	A	8.6	31
NB Left	10	A	2.9	12	A	2.2	6
Erie Street & Coronation Ave (TWSC)	-	A	0.4	-	A	0.5	11
EB Left-Through-Right	>100	B	12.0	17	B	14.8	11

Erie Street & Countess St (TWSC)	-	A	0.3	-	A	0.5	-
WB Left-Through-Right	>100	A	7.3	11	B	11.7	16

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

4.0 SAFETY REVIEW

This section documents the transportation safety review undertaken as part of this study. The purpose was to identify collision patterns and trends associated with safety within the study area for all road users.

MP analysed historic traffic data and collision data for the past five (5) years (2015-2019) to gain a refined understanding of the types of exposures and interactions that are most commonly associated with injury and fatal collisions within the study area corridors. Leamington’s economy thrives from their extensive greenhouse industry which also contributes to a majority of the goods movement destined outside of the Municipality. During harvest season, truck volumes increase along certain routes which may produce safety concerns.

A field visit of the study area conducted by MP staff on September 30, 2020 enabled observations of road user behaviours and potential related contributing factors.

4.1 Network Trends

Overall, the number of collisions occurring within the study boundary shows an almost steady increase for the period 2015 to 2018. Collision rates however, fell in 2019 to approximately 2016 levels. Study area data confirms there was a total of 358 collisions recorded between 2015 and 2019 of which 295 (82%) were Property Damage Only (PDO) collisions and 63 (18%) involved injury and 1 fatality in 2017. Network collision trends have been summarised below and summary analysis sheets for recorded study area collisions has been provided in **Appendix F**.

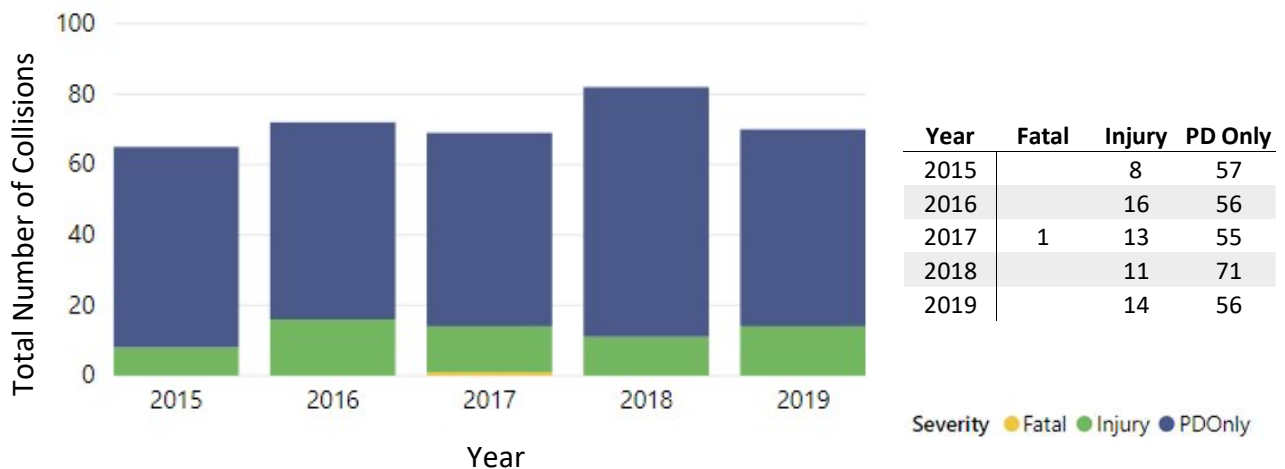


Figure 4-1 Study Area Collision Frequency by Year

The majority of PDO collisions can be attributed to the congestion that occurs due to high commuter volumes during the AM and PM peak periods. Prominent collision impact types such as rear-ends, sideswipes, and

turning collisions often occur when drivers are following too closely, turning, or changing lanes without being aware of their surroundings; this behavior is magnified when there is high traffic demand and little margin for error. Rear-end and sideswipe collisions under congested conditions are often accompanied by low injury rates due to associated low operating speeds.

The overall distribution of collisions can be related to the traffic volume and pedestrian activity within the study area. It can be seen that the frequency of collision is the highest from noon to 4 PM. This corresponds to the midday and PM peak rush hours involving kids getting off school, end of the workday, and more activity in the commercial plazas. The hourly collision profile shown in *Figure 4-2*.

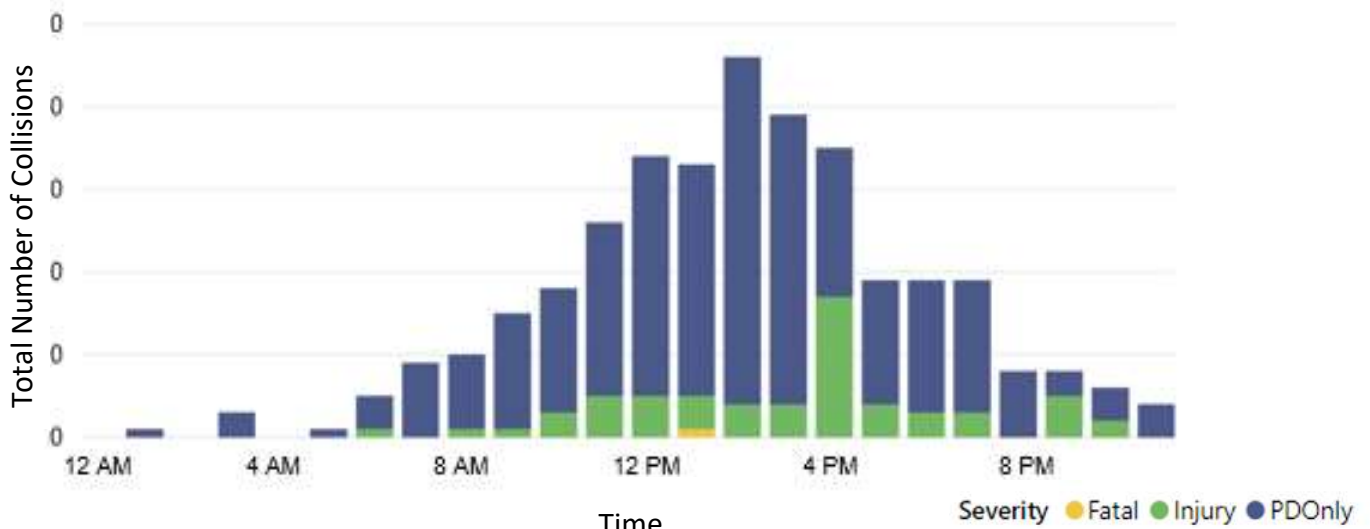


Figure 4-2 Total Study Area Collision Frequency by Hour

4.2 Location-specific Trends

Figure 4-3 below shows a heat map of the study area’s collision history, illustrating the high occurrence of collisions along Oak Street and Erie Street.

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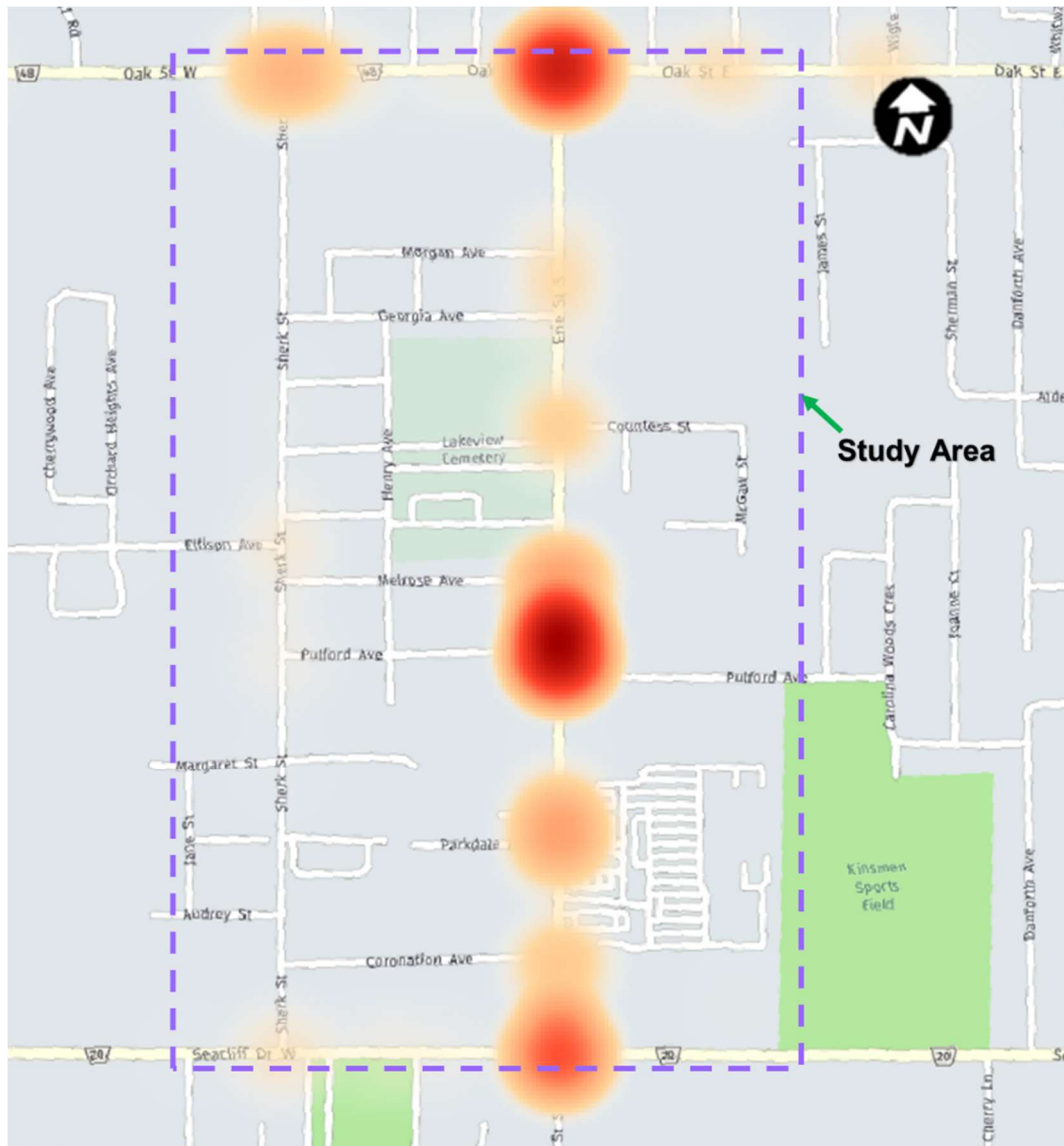


Figure 4-3 Five-year Collision Heat Map (2015-2019)

The heat map indicates the highest concentration of study area collisions occur in the vicinity of:

- Erie Street and Oak Street
- Erie Street and Pulford Avenue
- Erie Street and Seacliff Drive

A summary review of these three high collision locations shows that:

- Approximately 44% of the study area's total collisions occur at these three intersections;
- Approximately 68% of the collisions occur between 11AM and 4PM, and
- Property damage collisions accounts for approximately 84% of all collisions

Erie Street and Oak Street

The intersection was observed to experience high vehicle and pedestrian demand during peak periods on all approaches of the intersection. This is expected since both Oak Street and Erie Street are significant arterial roadways for the municipality. A total of 53 collisions were recorded in the vicinity of the intersection, consisting of six injury collisions and one fatal collision. The fatal collision was located south of the intersection, closer to the previously available pedestrian courtesy crossing.

Of the fifty-three total collisions, twenty-seven (27) or 51% were rear ends, twelve (12) or 23% were side-swipes, eight (8) or 15% were turning, and four (4) or 8% were angle type collisions. Of the eight identified as turning collisions, seven of them occurred at the adjacent private driveways of the 7/11 gas station or the Libro Credit Union. It should be noted that the private driveways are all currently full moves accesses. All four angle collisions were within the signalized intersection.

Rear-end and side-swipe type collisions are common at signalized intersections, lanes with shared configurations such as a shared through-right turn lane, as well as corridors with higher roadside friction due to several driveways and entrances. Both Erie Street and Oak Street currently have elements of all three of these situations. As such, the relatively high number of rear-ends and sideswipes, 39 over 5 years or approximately 8 per year, observed are not out of the ordinary. However, there is evidence that the higher numbers are exacerbated by the adjacent private driveways that allow for full moves access. This is reasonable as the full moves access increases the number of overlapping conflict points and conflict possibilities. To mitigate this, the Municipality may elect to consider restricting movements into the driveways along both arterials by implementing right-in, right-outs accesses, or working with the business owners to redirect site access away from the signalized intersection where possible. Driveway turning restrictions will limit how vehicles can access the site, resulting in potential adverse impacts to business operations.

One fatality occurred on Erie Street, approximately 150 m south of the intersection, within the vicinity of a now removed courtesy crosswalk. The fatal collision involved a pedestrian being struck by vehicle whilst crossing between the east and west Highbury Canco facilities located on Erie Street. **Figure 4-4** below shows the number of collisions throughout the day. It can be seen that high number of collisions occur midday from around 11 AM to 2PM.

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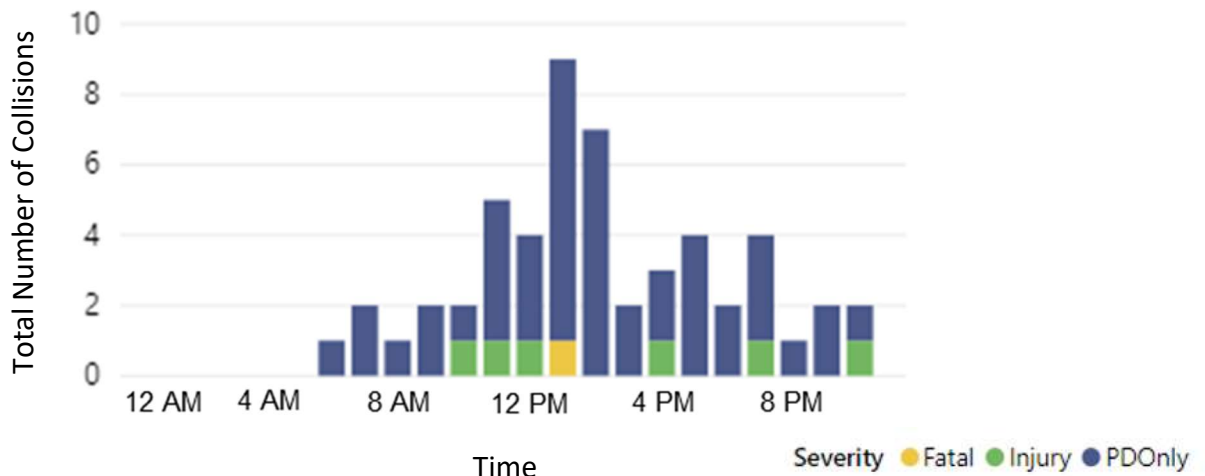


Figure 4-4 Erie Street and Oak Street - Collision Frequency by Time of Day

Erie Street and Pulford Avenue

The Erie Street and Pulford Avenue intersection has the highest number of collisions throughout the study area with a total of 70 collisions, of which 10 resulted in injuries and no fatalities.

Of the total 70 collisions, twenty-nine (29) or 41% were turning type collisions, nineteen (19) or 27% were rear ends, ten (10) or 14% involved parking maneuvers at the adjacent properties, seven (7) or 10% were angle, and four (4) or 6% were sideswipes. Of the twenty-nine identified as turning collisions, twelve of them occurred at adjacent private driveways and entrances. It should be noted that the private driveways are all currently full moves accesses. All seven angle collisions were within the signalized intersection.

As previously discussed rear-end and side-swipe type collisions are common at, signalized intersections, lanes with shared configurations such as a shared through-right turn lane, as well as corridors with higher roadside friction due to several driveways and entrances. Both Erie Street and Pulford Avenue currently have elements of all three of these situations. Of note is the high number of turning collisions, twenty-nine over five years or approximately six per year. Further review indicates that out of the twenty-nine turning collisions, twelve of them occurred at adjacent private driveways and site accesses.

Regardless, at the intersection, the total number of turning (17) and angle type (7) collisions recorded come to twenty-four over five years. Of the twenty-four turning and angle type collisions, twenty-one were recorded to include improper driver action such as failing to yield, improper turns or losing control due to weather conditions. To mitigate the turning and angle collisions, more invasive improvements to the intersection may include providing raised medians, fully protected traffic signal phases and improvements to the intersection sight triangles, particularly in the southwest quadrant. Similarly to the Erie Street and Oak Street intersection, the prevalence of adjacent driveways creates additional safety issues due to the overlapping conflict points from multiple driveways. The Municipality may elect to consider restricting movements into the driveways along both arterials by implementing right-in, right-outs accesses, or working with the business owners to redirect site access away from the signalized intersection where possible.

Figure 4-5 shows the number of collisions that occur at the intersection throughout the day. It can be seen that high number of collisions occur in the afternoon from around 1 PM to 3PM.

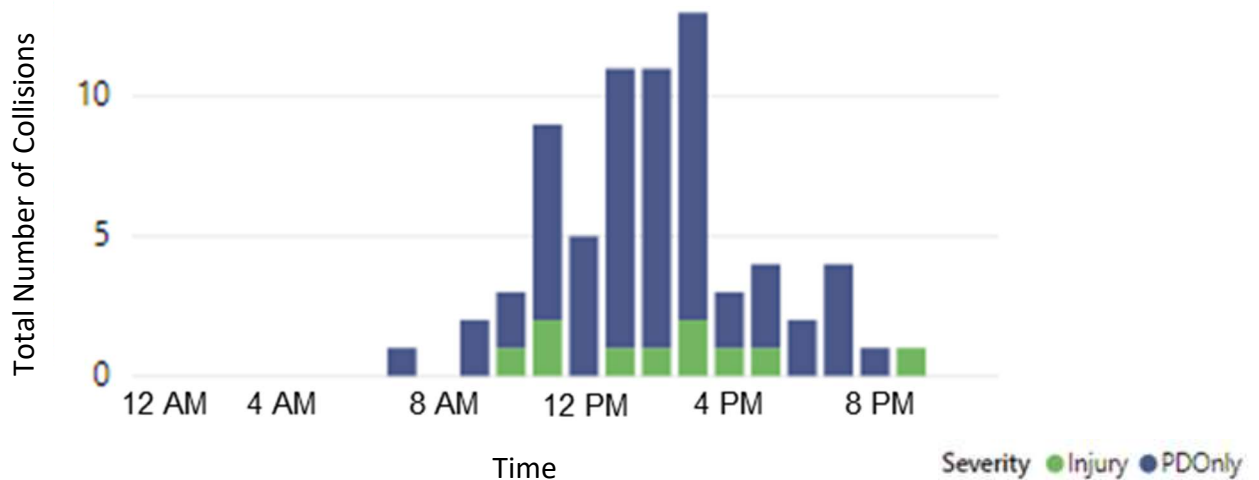


Figure 4-5 Erie Street and Pulford Avenue - Collision Frequency During Time of Day

Erie Street and Seacliff Drive

A total of 27 collisions were recorded at the Erie Street and Seacliff Drive intersection, 8 of which resulted in injuries. No fatalities were recorded. The 9 injury collisions represent 26% of total collisions at the intersection. This injury collision rate has been identified as the highest of all intersections throughout the study area, where collision data has been obtained.

Of the 27 collisions recorded, twelve (12%) or 44% were rear-ends, eleven (11) or 41% were turning, three (3) or 11% were angle, and one was a sideswipe collision. Of the eleven turning collisions, nine of them occurred at adjacent driveways and site accesses. Based on these numbers, there is not a significant safety issue at this intersection. Similarly, to the other intersections along Erie Street, the adjacent driveways and site accesses have a noted impact on the safety within the vicinity of the intersection because of overlapping conflict points. The Municipality may elect to consider restricting movements into the driveways along both arterials by implementing right-in, right-outs accesses, or working with the business owners to redirect site access away from the signalized intersection where possible.

Figure 4-6 shows the intersection collisions summary throughout the day.

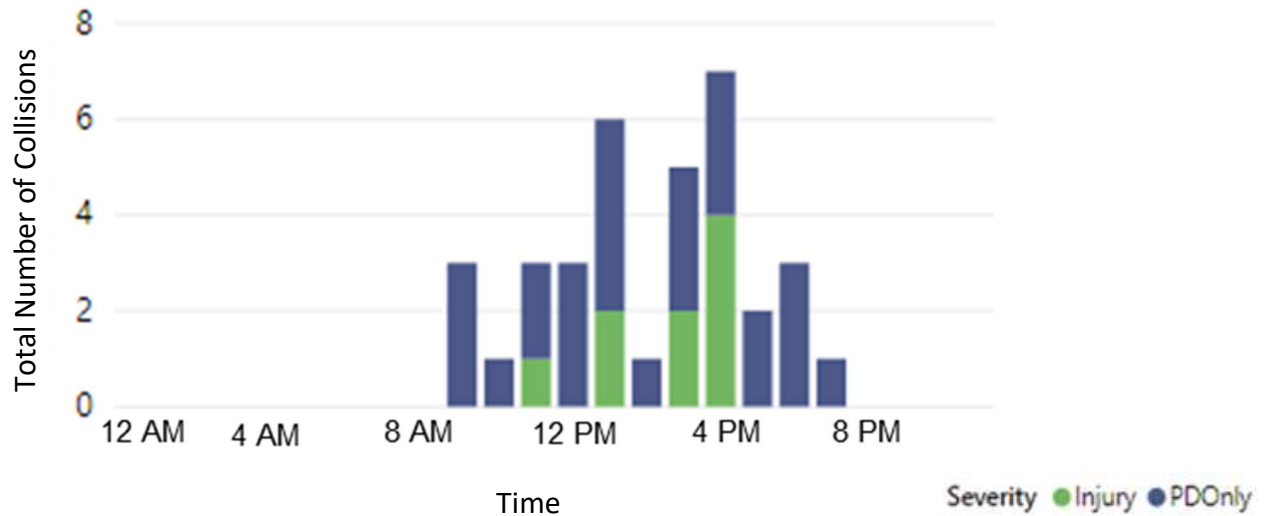



Figure 4-6 Erie Street and Seacliff Drive - Collision Frequency During Time of Day

Pedestrian and Cyclist Collisions

A total of 16 collisions, approximately 5% of all study area collision involved pedestrians or cyclists. A high proportion of these collisions occurred at locations along Erie Street. This may be as a result of high pedestrian volumes along the Erie Street corridor and pedestrians and cyclist crossing to access various facilities along the corridor. *Table 4-1* provides a summary of collision locations.

Table 4-1 Pedestrian and Cyclist Collision Location Summary

Collision Type	Location	Number of Collisions
Cyclist 	Oak Street and Erie Street	1
	Oak Street and Sherk Street	1
	Erie Street and Countess Street	1
	Erie Street and Parkdale Avenue	2
	Erie Street and Pulford Avenue	1
	Erie Street and Coronation Street	1
	Total	7
Pedestrian 	Oak Street and Erie Street (east)	3
	Oak Street and Erie Street (west)	1
	Oak Street and Westmoreland Avenue	1
	Erie Street and Countess Street	1
	Erie Street and Parkdale Avenue	2
	Erie Street and Pulford Avenue	1
	Total	9

5.0 FUTURE HORIZON CONDITIONS

A review and assessment of traffic volumes on the study network for the 10-year study horizon provides the municipality with an understanding of future network constraints based on expected growth. This will enable the municipality to plan future improvements to manage expansions and growth within the community.

5.1 Future Traffic

Traffic volumes within Leamington and specifically the study area will experience growth due to changes in community via development of new homes, places of employment and commercial developments. Development creates new attractions and generates additional vehicle trips, to a destination within the study area or traffic that passes through it, using the road network to get to their ultimate destination.

Network growth, which is traffic that originates outside of the study area and passes through the network was accounted for by applying a 2% annual growth rate to existing volumes at study intersections.

5.1.1 Future Development

Planning information supplied by the Municipality of Leamington identified five (5) developments within study limits to be considered for future traffic volumes. Developments to be considered are summarized in *Table 5-1* with locations illustrated in *Figure 5-1*.

Table 5-1 Study Area Developments

Development	Location	Type / Description	Density
Development A	West of Erie Street and North Seacliff Drive	Commercial – potential single building	8,830 sq.ft
Development B	East of Sherk Street and North Seacliff Drive	Residential - potential mid-rise building containing 60 units	60 Units
Development C	41 Oak Street West	Commercial – development will potentially consist of two buildings	19,100 sq.ft
Development D	South West Corner of Sherk Street and Oak Street	Commercial – potential single building	133,000 sq.ft
Development E &	West of Erie Street and North Seacliff Drive	Residential – forecasted to contained detached singles (199) and two mid-rise buildings containing 140 and 100 units	439 Units
Development F (Mixed-use)	North side of North Seacliff Drive	Commercial – with frontage along Seacliff Drive	34,000 sq.ft



Figure 5-1 Future Area Development Locations

Traffic volumes were generated for development densities shown in *Table 5-1* which were combined with network growth and existing volumes to provide future 2030 total traffic volumes, shown in *Figure 5-2*.

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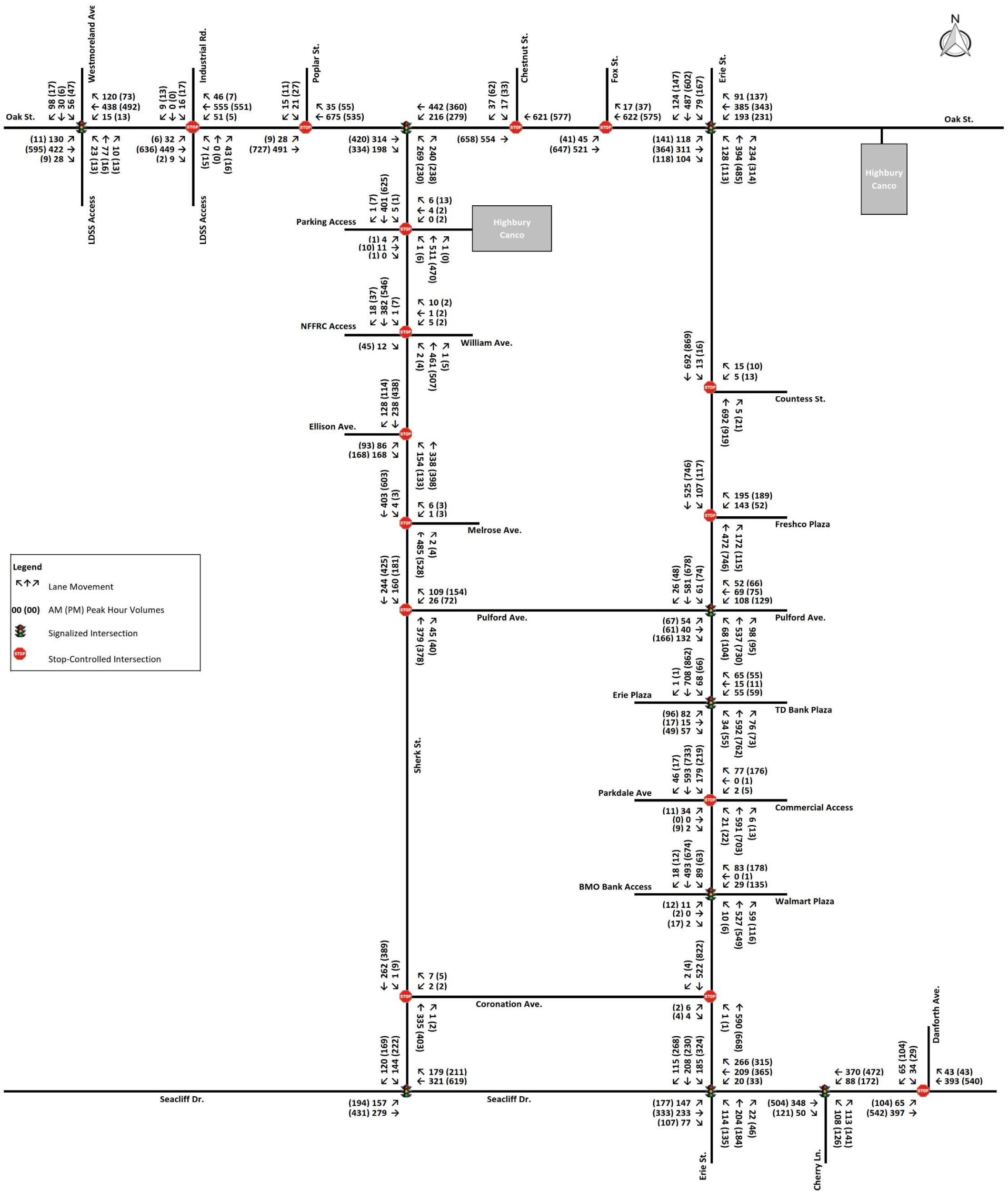


Figure 5-2 Future 2030 Traffic Volumes

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5.2 Future Study Area Scenarios

Future conditions analysis reviewed different scenario options to assess network condition operations to guide future requirements and planning for the study area. Future scenario options reviewed included:

- Do Nothing
- Road Diet
- Ultimate Condition

5.2.1 Do Nothing

The Do Nothing scenario assessed future network volumes with no changes to the existing transportation network. All lane configurations and intersection signal timings remained consistent with existing (2020) condition analysis.

For the Do Nothing scenario, analysis was completed for the entire network in Synchro software with Vissim software also being used to conduct analysis for the Erie Street corridor, which is the focal point for travel. Future 2030 traffic volumes shown in [Figure 5-2](#) were used in analysis. A summary of key movements for both software assessments are provided in [Table 5-2](#), [Table 5-3](#) and [Table 5-4](#).

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Table 5-2 Do Nothing Signalized Synchro Analysis Summary

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Oak St W & High School Driveway/Westmoreland Ave	-	C	27	-	-	A	10	-	-
EB Left	100	D	51	0.83	34	A	7	0.02	24
WB Through-Right	>100	C	23	0.85	63	A	7	0.48	53
Oak St W & Shrek St	-	B	17	-	-	C	23	-	-
EB Through-Right	13	B	19	0.67	22	C	33	0.92	28
NB Left	>100	C	28	0.74	62	C	21	0.52	52
NB Right	80	A	5	0.49	36	A	5	0.44	38
Oak St W/Oak St E & Erie St S	-	C	22	-	-	C	29	-	-
EB Left	40	B	18	0.36	40	B	20	0.45	46
EB Through	>100	D	37	0.72	68	D	38	0.77	73
WB Left	100	C	31	0.69	56	E	61	0.92	117
NB Left	40	B	15	0.38	56	B	18	0.43	75
NB Through	>400	C	27	0.63	99	D	49	0.90	199
SB Left	50	B	11	0.18	43	C	21	0.58	59
SB Through-Right	50	B	20	0.50	65	C	23	0.62	85
Erie St S & Pulford Ave	-	B	10	-	-	B	17	-	-
EB Left	25	C	27	0.26	29	C	27	0.29	31
WB Left	25	D	36	0.53	32	D	46	0.70	42
Erie St S & Erie Plaza/TD Bank	-	B	16	-	-	C	20	-	-
NB Through-Right	>100	B	16	0.50	72	C	24	0.58	75
SB Left	40	A	8	0.16	33	A	8	0.16	52
Erie St S & BMO Bank/Walmart Plaza S	-	B	11	-	-	B	11	-	-
WB Left	70	C	28	0.16	18	D	39	0.60	62
NB Through-Right	66	A	9	0.38	46	B	13	0.41	49
SB Left	30	B	10	0.21	40	A	3	0.14	38
Erie St S & Seacliff Dr W/Seacliff Dr E	-	C	26	-	-	C	33	-	-
EB Through-Right	>300	C	34	0.73	97	E	57	0.94	128
WB Right	50	A	7	0.55	55	A	6	0.52	120
NB Left	20	B	16	0.34	45	B	15	0.34	49
SB Left	50	C	32	0.59	63	D	42	0.81	67
Seacliff Dr W & Sherk St	-	C	23	-	-	F	118	-	-
EB Left	50	A	9	0.42	42	C	27	0.71	59
WB Through-Right	>300	D	36	0.88	113	F	239	1.46	401
SB Left	50	D	35	0.60	54	D	38	0.72	59
Seacliff Dr W & Cherry Ln	-	B	13	-	-	C	21	-	-
EB Through-Right	>500	B	15	0.50	56	C	31	0.85	104
WB Left	14	A	5	0.16	26	A	9	0.47	32
WB Through	48	A	8	0.36	41	A	9	0.45	50

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
NB Left-Right	>100	C	22	0.58	38	C	26	0.68	45

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

Table 5-3 Do Nothing Unsignalized Synchro Analysis Summary

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Sherk St & Ellison Ave	-	D	30	-	-	D	34	-	-
EB Left	100	B	13	0.23	15	B	13	0.22	19
NB Left-Through	39	C	21	0.70	44	E	39	0.90	51
SB Through-Right	>200	E	46	0.94	35	E	38	0.89	112
Oak St W & Industrial Rd	-	A	3	-	-	A	1	-	-
EB Left	100	A	10	0.05	13	A	9	0.01	30
NB Left-Through-Right	70	D	26	0.28	17	D	25	0.16	17
SB Left-Through-Right	71	F	63	0.35	14	D	27	0.16	17
Oak St W & Poplar St	-	A	2	-	-	A	1	-	-
SB Left-Right	>100	E	45	0.37	21	C	21	0.16	73
Oak St W & Chestnut St	-	A	1	-	-	A	1	-	-
SB Left	>100	C	20	0.07	12	C	22	0.14	15
SB Right	25	B	11	0.06	14	B	11	0.10	16
Erie St S & Countess St	-	A	0	-	-	A	1	-	-
WB Left-Right	>100	C	15	0.06	12	D	34	0.17	15
Erie St S & Freshco Plaza	-	C	20	-	-	A	6	-	-
WB Left	30	F	200	1.18	89	F	146	0.78	33
SB Left	15	B	10	0.15	24	B	12	0.20	26
Erie St S & Parkdale Ave/Walmart Plaza N	-	A	7	-	-	A	4	-	-
EB Left-Through-Right	>100	F	220	0.85	24	F	109	0.39	15
WB Left-Through	60	F	91	0.05	5	F	121	0.17	8
NB Left	10	B	10	0.03	13	A	10	0.03	11
SB Left	50	B	11	0.24	28	B	12	0.30	55
Erie St S & Coronation Ave	-	A	0	-	-	A	0	-	-
EB Left-Right	>100	B	13	0.02	9	B	14	0.02	7
NB Left	10	A	9	0.00	0	A	10	0.00	2
Seacliff Dr E & Danforth Ave	-	A	2	-	-	A	4	-	-
SB Left-Right	>100	C	19	0.30	25	D	33	0.55	82
Sherk St & Coronation Ave	-	A	0	-	-	A	0	-	-
WB Left-Right	>100	B	11	0.02	8	B	13	0.02	7
Sherk St & Pulford Ave	-	A	5	-	-	B	14	-	-
WB Left-Right	>300	C	23	0.45	33	F	68	0.88	108
Sherk St & Melrose Ave	-	A	0	-	-	A	0	-	-
WB Left-Right	>100	B	13	0.02	8	C	18	0.02	7

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Sherk St & William Ave/NFFRC	-	A	0	-	-	A	1	-	-
EB Right	>100	B	11	0.02	0	B	13	0.10	3
WB Left-Through-Right	>100	C	15	0.05	11	C	23	0.03	8
Sherk St & Highbury Canco/Parking Lot	-	A	1	-	-	A	1	-	-
EB Left-Through-Right	30	D	33	0.12	19	E	37	0.10	17

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

Table 5-4 Do Nothing Vissim Analysis Summary

Intersection / Movement	Available Storage (m)	AM Peak			PM Peak		
		LOS	Delay (s)	Max Queue (m)	LOS	Delay (s)	Max Queue (m)
Oak St & Erie St S	-	C	20.2	159	C	25.8	224
EB Left	40	C	22.1	46	C	26.8	42
WB Left	100	C	33.8	67	D	40.4	83
NB Left	40	C	22.7	47	D	43.2	84
SB Left	50	B	17.0	28	C	26.8	120
SB Through-Right	50	B	16.7	115	C	23.7	121
Seacliff Dr W & Erie St S	-	B	20.0	219	C	30.3	386
EB Left	90	B	19.4	39	D	43.3	154
WB Right	50	A	8.1	68	B	13.8	66
NB Left	20	C	20.3	80	C	23.4	71
NB Through-Right	>200	C	28.9	120	C	27.7	121
SB Left	50	C	23.4	62	D	44.9	134
Erie St S & Pulford Ave	-	B	12.6	88	B	16.7	139
EB Left	25	C	25.6	39	C	29.6	35
WB Left	25	B	15.2	88	D	35.8	56
SB Left	45	D	37.6	34	C	31.4	27
Erie St S & Erie Plaza/TD Bank	-	B	13.4	82	B	15.0	143
EB Through-Left	50	D	45.2	49	D	50.4	38
NB Through-Right	>100	B	11.6	80	B	13.6	141
Erie St S & BMO Bank/Walmart Plaza	-	A	5.7	63	A	6.9	78
EB Left	20	C	25.7	7	C	29.6	7
WB Left	70	C	28.3	63	C	29.5	77
WB Through-Right	70	B	10.4	63	B	12.2	77
NB Through-Right	66	A	3.9	39	A	5.7	67
Erie Street & Parkdale Avenue (TWSC)	-	A	1.9	40	A	2.7	83

WB Right	60	A	7.8	21	A	9.9	37
NB Left	10	A	2.9	19	A	4.4	6
SB Left	50	A	6.8	40	B	10.7	83
Erie Street & Coronation Ave (TWSC)	-	A	0.5	11	A	2.0	47
EB Left-Through-Right	>100	A	9.5	11	A	3.2	43
Erie Street & Countess St (TWSC)	-	A	0.3	24	A	0.6	19
WB Left-Through-Right	>100	B	12.4	10	B	12.0	16

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

5.2.2 Do nothing Operational Summary

Study intersections will operate with reduced capacity in comparison to existing conditions but will operate with reasonable delay and level of service. Queuing will increase at turning movements throughout the network due to the high traffic volumes for the study horizon. Operations for the westbound right-turn at the Sherk Street and Seacliff Drive intersection will however operate above capacity with significant delay. Analysis indicates that:

- Turning movements at intersections operate with reasonable delay and acceptable levels of service
- Queue deficiencies are common at multiple intersections. Network reviews indicate insufficient opportunities to improve storage lanes. Two-way left-turn lanes (TWLTL) are available however, though-out the Erie Street corridor and can actually be accommodated in these areas. Additionally, deficiencies at some locations are relatively minor, and vehicles can be accommodated in TWLTL. Existing driveways or infrastructural constraints restrict the ability to make substantial changes to better accommodate network queues.
- Some operational improvements can be expected through optimization of traffic signal timings for future travel demands
- The westbound right-turn movement at the Sherk Street and Seacliff Drive intersection operates above capacity and would require a dedicated turning lane to accommodate future operation

The Do Nothing scenario while providing reasonable operation can be improved with adjustments to network signal timing parameters, as such this option was not considered the preferred option for recommendation.

5.2.3 Road Diet

A road diet, is a Transportation Planning measure whereby the number of travel lanes and/or the effective width of the road is reduced to achieve systemic improvements. Implementation is typically used to improve safety or provide space to accommodate other travel modes, such as bicycle lanes.

Erie Street is the main north/south corridor through the study area and has been identified for consideration for the implementation of a road diet. Erie Street runs from the waterfront pier in the south to the Highway 77 / Essex Road 33 / Highway 3 intersection and is the only continuous north/south arterial through core

commercial areas. As such Erie Street is a focal point for commercial traffic and it acts as a thoroughfare for Leamington.

In the case of Erie Street, the implementation of a road diet would result in the following:

- Reduce the number of travel lanes from 4 lanes (2 per direction) to three lanes
- Provide 1 northbound lane, 1 southbound lane and a centre two-way left-turn lane
- Add a curb side bike lane in each direction

Forecasted future 2030 traffic volumes shown in [Figure 5-2](#) were used in the assessment of the Erie Street road diet scenario. The Erie Street corridor was assessed using Vissim software only and consisted of a revised three lane cross-section configuration (1 northbound lane, 1 southbound lane and a centre two-way left-turn lane) for the future study horizon. Traffic signal timing adjustments were applied at signalized corridor intersections to optimize operations. A summary of Erie street corridor intersection operations is summarized in [Table 5-5](#).

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Table 5-5 Road Diet Vissim Analysis Summary

Intersection / Movement	Available Storage (m)	AM Peak			PM Peak		
		LOS	Delay (s)	Max Queue (m)	LOS	Delay (s)	Max Queue (m)
Oak St & Erie St S	-	C	22.6	-	C	27.1	-
EB Left	40	B	19.6	28	C	30.4	42
NB Left	40	E	64.3	132	E	59.2	170
SB Through-Right	50	B	16.5	120	C	33.9	128
Seacliff Dr W & Erie St S	-	C	24.1	-	E	70.3	-
EB Left	90	C	28.5	52	F	222.1	269
WB Through	>400	C	23.3	58	C	34.2	510
WB Right	50	B	12.0	63	F	121.2	510
NB Left	20	C	29.8	60	E	74.4	110
NB Through-Right	>200	D	41.4	143	F	155.2	150
SB Left	50	C	25.8	88	D	52.2	130
Erie St S & Pulford Ave	-	B	18.6	-	C	33.3	-
EB Left	25	D	37.2	46	C	28.5	67
WB Left	25	C	33.5	81	D	49.0	91
NB Left	35	C	24.6	31	C	27.2	41
NB Through-Right	>100	B	14.3	146	B	14.9	147
SB Through-Right	90	B	13.9	161	E	59.0	328
Erie St S & Erie Plaza/TD Bank	-	C	24.0	-	C	29.6	-
EB Through-Left	50	D	42.6	51	D	44.7	41
EB Right	50	A	9.3	53	B	11.0	43
NB Through-Right	>100	C	34.0	139	C	34.4	142
SB Through-Right	>100	B	14.1	145	C	27.5	150
Erie St S & BMO Bank/Walmart Plaza	-	B	14.4	-	C	28.3	-
EB Left	20	D	51.1	14	D	45.2	7
WB Left	70	D	37.3	74	D	49.7	77
WB Through-Right	70	C	27.3	75	E	59.4	77
NB Through-Right	66	C	23.0	97	D	40.5	97
SB Left	30	A	6.4	16	B	12.8	34
SB Through-Right	55	A	1.7	33	A	9.9	79
Erie Street & Parkdale Avenue (TWSC)	-	B	14.3	-	C	21.5	-
EB Left-Through-Right	>100	E	35.4	32	E	45.2	19
WB Left	60	D	25.7	38	F	63.2	65
WB Right	60	A	9.9	38	F	63.2	65
NB Through-Right	55	C	20.3	95	D	27.5	95
SB Left	50	D	26.7	149	D	31.9	138

SB Through-Right	>100	A	1.3	19	A	4.7	149
Erie Street & Coronation Ave (TWSC)	-	B	12.4	-	D	32.4	-
EB Left-Through-Right	>100	C	21.5	14	C	23.2	14
Erie Street & Countess St (TWSC)	-	A	1	-	C	21.8	-
WB Left-Through-Right	>100	C	15.6	11	F	467.7	48
SB Left	>100	A	5.1	113	E	37.4	503

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

5.2.4 Road Diet Operational Summary

Analysis of the Erie Street corridor confirms that implementation of a road diet will result in long term operational constraints and deficiencies within the assessed study area. Analysis indicates that long delays and capacity deficiencies will be common with capacity constraints at study intersections.

- Reduction of travel lanes, from 2 lanes per direction to 1 lane per direction, reduces the available roadway capacity, resulting in unacceptable levels of service and extensive queuing throughout the study corridor.
- Road diet implementation would provide satisfactory operation in the short-term, however, additional capacity would be required to maintain acceptable operation by the 2030 horizon.
- Queueing at signalized intersections will spill back to adjacent intersections impacting operations. Spill backs will ultimately limit the ability of traffic to flow along Erie Street and significantly impact the ability of traffic to access Erie Street from minor roads resulting in queue build up on minor roads
- Future demand or additional growth in the study area beyond the 10-year horizon would result in worsening of operations on Erie Street. As a result, a road diet is not considered to be best suited for the corridor.
- A road diet was initially proposed for Erie Street to allow the introduction of curbside bike lanes. Given that the road diet is not considered a feasible alternative for future network operation, a multi-use path (MUP) along the west side of Erie Street is a feasible alternative to accommodate cyclists.

5.2.5 Inter-parcel Connectivity (Ultimate Condition)

The connection of adjacent development parcels (properties) was reviewed as an ultimate future condition for the Erie Street corridor. These inter-parcel connections would provide vehicular access between properties, acting as a by-pass of Erie Street. The interconnection of commercial properties is viewed as one means of removing traffic from Erie Street, aiding in reducing congestion on Erie Street which is a key concern within the study area. This assessment condition also includes the optimization of traffic signals within the study network to best accommodate future traffic volumes.

Inter-parcel connections were considered on the east side of Erie Street between Pulford Avenue and Seacliff Drive. Canadian Tire at 262 Erie Street and the Walmart Plaza located at 280-304 Erie are two major trip generators within the study area. Previously considered for inter-parcel connection by the municipality, vehicle

trips between the two developments can only be made via Erie Street. Implementing an inter-parcel connection will allow commercial trips to move between the two sites by-passing Erie Street.

Assessment also included a possible connection between the 280-304 Erie Street Walmart Plaza and Seacliff Drive. As a conservative measure the connection at Seacliff Drive was limited to a right-in and right-out only access which has impacts on allowed turning movements and thus the volume of traffic that can utilize the access. The proposed interconnectivity therefore will enable a westbound vehicle on Seacliff Drive to access Canadian Tire located on the south side of Pulford Avenue without having a need to use Erie Street.

Traffic reassignments for the 2030 horizon due to inter-parcel connectivity is illustrated in [Figure 5-3](#). The location of inter-parcel connectivity to the east side of Erie Street between Pulford Avenue and Seacliff Drive, acts as a limiting factor to overall traffic reduction capabilities. Traffic on Erie Street will only use the inter-parcel connections if it is of convenience to the trip being made. As such this would largely be confined to trips accessing the commercial uses, with turning movement restrictions at Seacliff Drive further limiting drivers that may use the connections.

Assessment of the ultimate condition was completed using both Synchro and Vissim analysis software. Synchro was used to assess the entire study network, with Vissim being used to assess the Erie Street corridor. Future condition Synchro assessment for the study network is summarized in [Table 5-6](#) and [Table 5-7](#) for signalized and unsignalized intersections. Erie Street corridor Vissim assessment is summarized in [Table 5-8](#).

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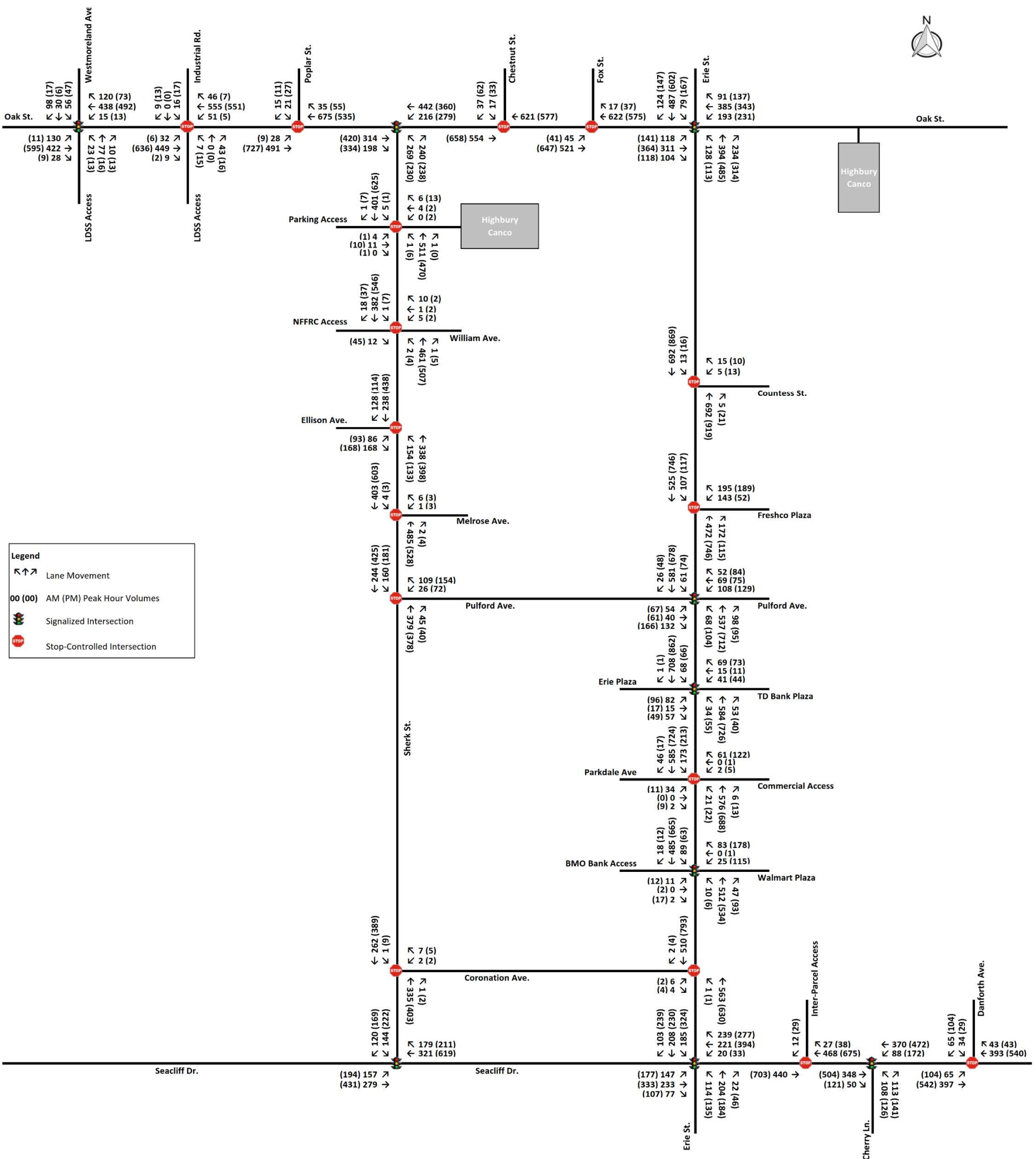


Figure 5-3 Future 2030 Inter-parcel Traffic Volumes

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Table 5-6 Future 2030 Inter-parcel Network Signalized Intersection Capacity Analysis (Synchro)

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Oak St W & High School Driveway/Westmoreland Ave	-	C	27	-		A	10	-	
EB Left	100	D	51	0.83	33	A	7	0.02	7
EB Through-Right	65	C	21	0.71	61	B	10	0.52	62
WB Through-Right	>100	C	23	0.85	58	A	7	0.48	64
Oak St W & Shrek St	-	B	17	-		C	20.6	-	
EB Through-Right	13	B	18	0.66	25	C	24	0.80	25
NB Left	>100	C	28	0.74	61	C	32	0.59	60
NB Right	80	A	5	0.49	35	A	7	0.47	44
Oak St W/Oak St E & Erie St S	-	C	25	-		C	25	-	
WB Left	100	D	51	0.82	75	D	45	0.85	103
NB Left	40	B	13	0.35	54	B	19	0.45	73
NB Through	>400	C	22	0.52	196	D	43	0.87	85
SB Left	50	B	11	0.16	39	C	27	0.64	56
SB Through-Right	50	B	18	0.43	59	C	25	0.64	88
Erie St S & Pulford Ave	-	B	19	-		C	23	-	
EB Left	25	C	32	0.28	28	C	33	0.34	33
WB Left	25	D	46	0.61	34	E	64	0.80	45
Erie St S & Erie Plaza/TD Bank	-	B	16	-		B	16	-	
NB Through-Right	>100	B	16	0.53	59	B	16	0.47	60
SB Left	40	A	7	0.18	25	A	7	0.14	37
SB Through-Right	>100	B	16	0.51	81	B	17	0.52	40
Erie St S & BMO Bank/Walmart Plaza S	-	A	6	-		A	8	-	
WB Left	70	C	34	0.18	17	D	45	0.17	47
SB Left	30	A	2	0.21	30	A	2	0.72	29
SB Through-Right	61	A	2	0.75	62	A	2	0.68	32
Erie St S & Seacliff Dr W/Seacliff Dr E	-	C	21	-		C	29	-	
EB Left	90	B	18	0.41	62	C	23	0.58	92
EB Through-Right	>300	C	31	0.68	157	D	44	0.85	94
WB Right	50	A	7	0.52	78	A	5	0.46	51
NB Left	20	B	19	0.38	45	B	18	0.36	48
SB Left	50	B	18	0.60	58	D	38	0.86	68
Seacliff Dr W & Sherk St	-	B	14	-		C	26	-	
EB Left	50	A	7	0.31	39	B	17	0.64	61
WB Through	>300	B	20	0.55	138	D	45	0.94	71
SB Left	50	D	35	0.60	53	D	48	0.77	62
Seacliff Dr W & Cherry Ln	-	B	13	-		C	22	-	
EB Through-Right	>500	B	16	0.50	51	C	32	0.86	103
WB Left	14	A	5	0.15	24	A	9	0.47	33

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
WB Through	48	A	8	0.36	41	A	9	0.45	50
NB Left-Right	>100	C	22	0.59	42	C	26	0.68	54

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

Table 5-7 Future 2030 Inter-parcel Network Unsignalized Intersection Capacity Analysis (Synchro)

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Sherk St & Ellison Ave	-	D	30	-		D	34	-	
EB Left	100	B	13	0.23	15	B	13	0.22	18
NB Left-Through	39	E	46	0.94	53	E	38	0.89	46
SB Through-Right	>200	C	21	0.70	173	E	39	0.90	40
Oak St W & Industrial Rd	-	A	3	-		A	1	-	
NB Left-Through-Right	70	D	26	0.28	14	D	25	0.16	15
SB Left-Through-Right	71	F	63	0.35	15	D	27	0.16	13
Oak St W & Poplar St	-	A	2	-		A	1	-	
SB Left-Right	>100	E	45	0.37	28	C	21	0.16	17
Oak St W & Chestnut St	-	A	1	-		A	1	-	
SB Left	>100	C	20	0.07	16	C	22	0.14	12
SB Right	25	B	11	0.06	14	B	11	0.10	16
Erie St S & Countess St	-	A	0	-		A	1	-	
WB Left-Right	>100	C	15	0.06	14	D	34	0.17	13
Erie St S & Freshco Plaza	-	C	20	-		A	6	-	
WB Left	30	F	200	1.18	35	F	146	0.78	75
SB Left	15	B	10	0.15	24	B	12	0.20	28
Erie St S & Parkdale Ave/Walmart Plaza N	-	A	7	-		A	4	-	
EB Left-Through-Right	>100	F	220	0.85	14	F	85	0.32	24
WB Left-Through	60	F	92	0.05	7	F	111	0.16	6
NB Left	10	B	10	0.03	14	A	10	0.03	11
SB Left	50	B	11	0.24	31	B	12	0.29	60
Erie St S & Coronation Ave	-	A	0	-		A	0	-	
EB Left-Right	>100	B	13	0.00	8	B	14	0.02	8
NB Left	10	A	9	0.02	2	A	10	0.00	0
Seacliff Dr E & Danforth Ave	-	A	2	-		A	4	-	
SB Left-Right	>100	C	19	0.30	35	D	33	0.55	20
Sherk St & Coronation Ave	-	A	0	-		A	0	-	
WB Left-Right	>100	B	11	0.02	7	B	13	0.02	9
Sherk St & Pulford Ave	-	A	5	-		A	0	-	
WB Left-Right	>300	C	23	0.45	139	F	68	0.88	34
Sherk St & Melrose Ave	-	A	0	-		A	0	-	
WB Left-Right	>100	B	13	0.02	8	C	18	0.02	8

Intersection / Movement	Available Storage (m)	AM Peak				PM Peak			
		LOS	Delay (s)	v/c	Queue (m)	LOS	Delay (s)	v/c	Queue (m)
Sherk St & William Ave/NFFRC	-	A	0	-		A	1	-	
EB Right	>100	B	11	0.02	5	B	13.1	0.10	2
WB Left-Through-Right	>100	C	15	0.05	7	C	22.8	0.03	11
Sherk St & Highbury Canco/Parking Lot	-	A	1	-		A	1	-	
EB Left-Through-Right	30	D	33	0.12	19	E	37	0.10	20

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

Table 5-8 Future 2030 Inter-parcel Erie Street Analysis Summary (Vissim)

Intersection / Movement	Available Storage (m)	AM Peak			PM Peak		
		LOS	Delay (s)	Max Queue (m)	LOS	Delay (s)	Max Queue (m)
Oak St & Erie St S	-	C	25.0	-	C	24.7	-
EB Left	40	C	27.5	26	C	23.7	42
WB Left	100	E	63.4	114	C	33.8	83
NB Left	40	C	28.2	88	D	37.1	76
SB Left	50	B	16.6	21	D	35.2	120
SB Through-Right	50	B	15.8	109	C	20.7	120
Seacliff Dr W & Erie St S	-	B	19.5	-	C	28.4	-
WB Right	50	A	6.2	46	B	12.0	52
NB Left	20	C	20.3	33	C	25.4	143
SB Left	50	B	19.1	73	D	42.9	128
Erie St S & Pulford Ave	-	B	15.9	-	B	15.2	-
EB Left	25	D	37.4	46	C	27.1	44
WB Left	25	D	35.1	81	D	39.9	80
NB Through-Right	>100	B	12.7	147	A	9.8	100
SB Left	45	D	48.2	34	D	36.0	34
Erie St S & Erie Plaza/TD Bank	-	B	10.9	-	B	12.9	-
EB Through-Left	50	D	43.3	49	D	45.2	41
Erie St S & BMO Bank/Walmart Plaza	-	A	4.0	-	A	6.7	-
WB Left	70	D	41.5	66	D	37.2	77
WB Through-Right	70	B	10.4	67	D	45.1	77
Erie Street & Parkdale Avenue (TWSC)	-	A	2.0	-	A	1.8	-
WB Left	60	A	9.1	28	A	8.2	19
NB Left	10	A	1.4	12	A	5.3	12
Erie Street & Coronation Ave (TWSC)	-	A	0.4	-	A	1.6	-

EB Left-Through-Right	>100	A	8.0	11	B	13.2	11
Erie Street & Countess St (TWSC)	-	A	0.4	-	A	0.9	-
WB Left-Through-Right	>100	A	6.7	13	C	19.3	16

Note: Only critical movements for peak hours and movements with storage deficiencies shown.

5.2.6 Operational Summary

Assessment indicates that under future conditions the study network will operate satisfactorily. Similar to the findings of the Do Nothing condition assessment, the intersection of Sherk Street and Seacliff Drive will benefit from a dedicated westbound right-turn lane. Some unsignalized intersection locations along Erie Street indicate some delay is anticipated to vehicles on the minor roads. Operations along Erie Street however, will benefit from traffic choosing to use interconnection routes.

Interconnection of commercial properties, to accommodate vehicular traffic, will provide operational benefits to both the Canadian Tire and Wal-Mart plazas, reducing traffic volumes on Erie Street and, as shown in the analysis, aids in reducing delays along the Erie Street corridor. Construction of a connection between the Canadian Tire plaza and Seacliff Drive will also remove traffic from Erie Street and help to reduce delays through the corridor.

Queuing deficiencies continue to occur throughout the network with limitations on the ability to physically improve storage provisions. It is recommended signal timing reviews be done on an annual basis to make appropriate adjustments to better accommodate changing traffic volumes.

5.3 Scenario Findings

Intersection analyses indicated satisfactory operating conditions for study intersections under both the future Do Nothing and Ultimate Condition with numerous operating deficiencies occurring under the road diet scenario. A further comparative review of travel time delay along the Erie Street corridor from Oak Street to Seacliff Drive for assessed study conditions based on Vissim analysis was conducted. It is recognized however, that the Ultimate Condition does provide the benefit of improved connectivity and allows for greater travel options for road users.

Comparative assessment for the AM and PM peak periods is illustrated in [Figure 5-4](#) and [Figure 5-5](#) respectively.

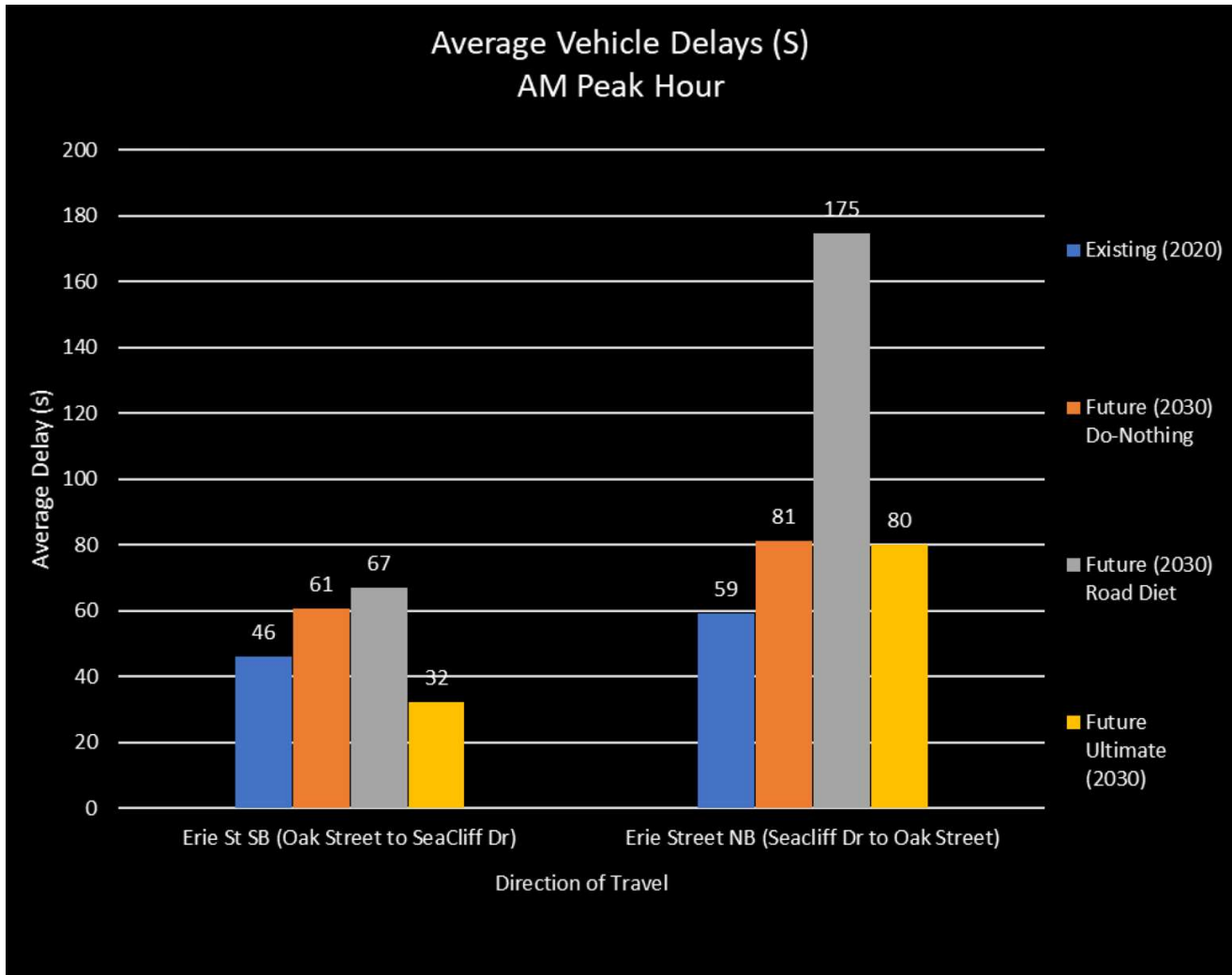


Figure 5-4 AM Peak Hour Comparative Analysis

Southbound and northbound analysis summaries for the AM peak hour illustrated in Figure 5-4 confirm that the road diet option results in significant delay and increased queuing, while the ultimate condition provides better overall operational characteristics than the do nothing and road diet scenarios. The difference in delay between the do nothing and ultimate scenarios is marginal in the northbound direction with the ultimate condition providing better operation southbound.

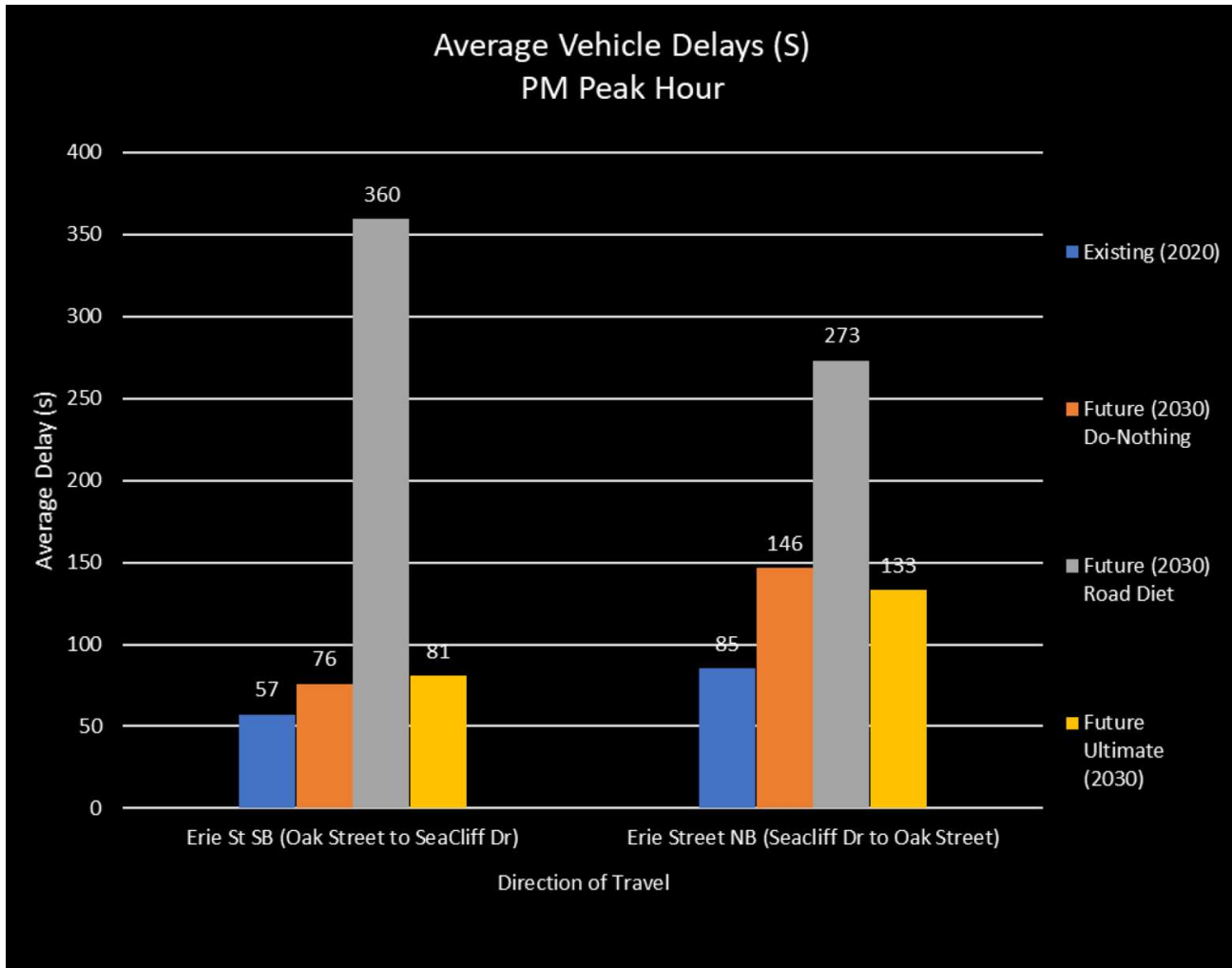


Figure 5-5 PM Peak Hour Comparative Analysis

PM comparative assessment illustrated in Figure 5-5 shows that the road diet operating condition continues to result in significantly longer delays for southbound and northbound travel. For future conditions, the ultimate scenario has the shortest delays northbound and has slightly longer delays than the Do Nothing scenarios southbound.

Although shorter delays will be realized due to the signal timing improvements and inter-parcel connections as part of the ultimate condition, the overall time savings are not anticipated to be significantly overwhelming for all periods. The AM southbound displays the best time savings along the corridor for ultimate condition, with a 29 second advantage over the Do Nothing scenario. The smallest benefit for the ultimate condition is observed for the AM northbound peak period with a second differential from the Do Nothing scenario.

6.0 PROBLEMS AND OPPORTUNITIES

The review of the existing conditions, concerns identified by the community and issues indicated by the municipality for detailed assessment has resulted in identifying several connectivity and operational issues

within the study limits. Area specific concerns highlighted to the study team by the municipality formed the basis for much of the issues needing to be addressed.

6.1 Area Specific Concerns

Growth of the Leamington population has been on an upward trajectory for a number of years and this growth is anticipated to continue with further expansions of the farming sector and new residents to the area. As the population grows, traffic volumes will increase along with operational issues, safety issues, infrastructure issues and development planning issues becoming more prevalent within the community.

For the study area, a total of 21 area specific concerns have been identified and reviewed with mitigation measures and recommendations provided to address concerns. Area specific concerns have been identified and summarized in [Figure 6-1](#) and [Figure 6-2](#).

Area specific locations where capacity constraints and deficiencies were identified via traffic assessment for existing and future network conditions were addressed via the development of mitigation measures to reduce delays and development of turn lanes to provide additional capacity.

Reviews of official plans covering the study area, short-term and long-term planning studies for Leamington, active transportation plans, engineering guidelines and best practices, were all factored in addressing other concerns identified.



Locations and conditions to be reviewed include:

- 1 Oak St W:** Multi-use path review
- 2 Oak St E:** Multi-use path review
- 3 Oak St E /Victoria Ave:** AT connection review
- 4 Oak St W/Chestnut Ave – Oak St W/Sherk St:** AT connections and intersection turning movement review
- 5 Oak St W/Fox St:** Bicycle crossing review
- 6 Erie St/Oak St:** AT connections and intersection facilities review
- 7 Sherk St/ Highbury Access:** Pedestrian crossing and intersection control review
- 8 Sherk St/William Ave/NFFRC Access:** Turning movements and bicycle crossing review
- 9 Sherk St/Ellison Ave:** Traffic control and AT connection review
- 10 Sherk St/Melrose Ave:** Review of intersection for potential closure

Figure 6-1 Area Specific Concerns (1 – 10)



- 11 Sherk St/Pulford Ave:** Traffic control and AT connection review
- 12 Sherk St/Pulford Ave to Seacliff Dr:** Pedestrian crossing review
- 13 Seacliff Dr/Sherk St:** AT connection review
- 14 Erie St:** Cycling facilities and pedestrian crossing review
- 15 Erie St/Pulford Ave:** Traffic signal timing and AT connection review
- 16 Pulford Ave/Canadian Tire/County Fair Mall Access:** Assess pedestrian crossing requirements at this location
- 17 Pulford Ave:** Cycling facilities review
- 18 Erie St:** Corridor review and road diet assessment
- 19 Erie St/Seacliff Dr:** AT connection review
- 20 16 Seacliff Dr E:** Assess pedestrian crossing requirements at this location
- 21 Ellison Ave:** Cycling facilities review

Figure 6-2 Area Specific Concerns (11 – 21)

6.2 Key Mobility Issues

As populations increase the efficiency of mobility within highly travel areas can be significantly impacted leading to congestion in said areas. Methods to reduce congestion then become major focus including providing alternatives to the personal automobile typically the traditional means of completing trips. Identified mobility concerns include:

- Active transportation (AT) connections – AT provides viable alternative travel modes within the Leamington community, with the network comprised of sidewalks, multi-use paths (MUP), bicycle lanes and trails. Gaps present within the existing network and poor connectivity between trails, MUP's and other facilities impact safety and user confidence.
- Pedestrian crossings – pavement markings for pedestrian crossing are absent at some intersections and require improvements of existing facilities at other study locations. Enhanced crossings to better accommodate users of all ages and abilities poses many benefits for the community including improved safety for road users.
- Unsafe crossing practises – Leamington has a healthy pedestrian population comprised of residents, visitors and IGW. Areas without designated pedestrian facilities have become a common feature in the community and created commonly used crossing points. These locations are void of signage, pavement markings and any other features to make motorist aware of crossing pedestrians thus creating collision risks and unsafe crossing locations. Mitigations measures will be examined to improve these conditions.
- Bike lanes on Erie Street – north/south bicycle lanes are provided on Sherk Street, however Erie Street which is the main hub for all commercial activity lacks dedicated infrastructure to accommodate cyclist. Cyclist wishing to use Erie Street must either share the road with traffic or use the existing sidewalk. The current options will deter less experienced cyclist and also creates safety concerns which can be addressed by providing facilities that are suitable for users of all ages and abilities which has been identified to improve traffic safety, reduce congestion, improve air quality and public health.
- Erie Street – the focal point of the study area Erie Street has been described as a congested, consisting of numerous traffic signals and having a limited road allowance. Assessment has further shown that movements at some unsignalized driveways or intersections that experience some delay.

7.0 PUBLIC CONSULTATION

7.1 Notices

The Notice of Study Commencement was published to the projects page of the Municipality of Leamington's website on June 17, 2020 (a copy is enclosed in **Appendix G**). The study notice remained available on the Municipality's website for the duration of the study. Notices were also published via digital sources for both of the Virtual Public Engagement Sessions held by the project study team.

7.2 Consultation Approach

A Consultation and Engagement Plan was developed to take a proactive approach in reaching the various segments of the Leamington community. This approach allowed the team to work with stakeholders and the community to better understand existing issues experienced in they study area and present an assessment of existing conditions as part of the study first Public Engagement Session. Assessment of future study network conditions and proposed area specific concern solutions to address issues found were presented for the second Public Engagement Session.

Due to the COVID-19 pandemic in person meetings were not possible for this project. Alternatively, presentation material was provided virtually to the public and hosted on the Municipalities website for the two public engagement sessions held. This approach allowed the public to review presentation material at their leisure and provided specified period with which comments were to be made to the project team.

Public engagement sessions were advertised via the municipalities social media accounts (Instagram, Twitter and Facebook) with stakeholder groups notified directly. In addition to the public, stakeholders directly notified for this study included:

- Farms that participated in surveys
- Principal of Leamington District School
- Principal of Margaret D. Bennie Public School
- Highbury Canco Corporation
- Local business

7.3 Public Engagement

7.3.1 Virtual Public Engagement Session #1

Notice cards for the Virtual Public Engagement Session #1 was posted to the Municipality's social media accounts on January 8, 2021 prior to the launch of engagement session. Notice cards included an embedded QR code that could be scanned by the public that would take the user to the study page and Public Engagement Session #1. A notice for Engagement Session #1 was also posted in Windsor's online newspaper *windsoriteDOTca* on January 17, 2021. The hyperlink in the notice directed users to the webpage for the traffic study. Study notice materials for engagement session #1 can be found in **Appendix G**.

The Virtual Public Engagement Session #1 was launched on the Municipality of Leamington website on January 13, 2021 to the public at [LeamingtonTrafficStudy.ca](https://www.learmington.ca/LeamingtonTrafficStudy). Given pandemic conditions and the inability to host in person meetings presentation boards were available for public viewing and feedback for a two-week period January 13 to January 29. Visitors to the site had the option of printing or downloading a pdf version of the presentation boards, alternatively a narrated version of the presentation complete with a transcript of the narration was provided.

Presentation material introduced the public to the study context, scope and overall study objectives. Engagement session 1 provided an overview of the existing AT, transit and study network. Area specific locations to be reviewed were also introduced to the public. As part of this phase of work assessment of existing operating conditions and collision analysis for the study network based on available collision data for the period 2015 and 2019 (5-years) was presented.

Operational analysis showed the network overall operated with reasonable levels of service and delay at study intersections. At unsignalized locations long delays were observed for some individual movements. Virtual Public Engagement Session #1 material is provided in **Appendix H**.

7.3.2 Virtual Public Engagement Session #2

Like session 1, Public Engagement Session #2 was held virtually with notices of the session posted to the Municipality's social media accounts on August 11, 2021. This notice was also posted in Windsor's online newspaper on August 17, 2021. The Virtual Public Engagement Session #2 was launched on the Municipality of Leamington website on August 16, 2021 to the public and made available for public feedback from August 16 to September 3, 2021.

Engagement session 2 served to provide an update on existing issues and study findings related to future area demands and opportunities. It also present potential solutions/recommendations as a result of investigation and assessment of study area conditions and allowed the study team to gather input from the public regarding proposed solutions/recommendations. Virtual Public Engagement Session #2 presentation material is provided in **Appendix H**.

7.4 Public Feedback

During the first virtual public engagement session the presentation was viewed 166 times during the period January 13 to January 29, 2021. A total of 17 comments were provided by the community, 15 during the official comment period and two comments thereafter. The following key issues/comments were received through session 1 consultation efforts were:

- Would like to have a connection between Canadian Tire and Wal-Mart for vehicles.
- Insufficient bicycle facilities which include lack of east-west connectivity and facilities along Erie Street.
- Concerns with signal timings and desire for increases in number of advance left turns
- High traffic volumes in the vicinity of Highbury Canco with limited crossing options.
- Safety concerns for pedestrians crossing at the intersection of Sherk Street and Ellison Avenue.
- General unsafe driving habits which include running of stop signs, encroachment of bicycle lanes and pedestrian crossings.
- Improvement of pedestrian crossing facilities, with facilities being suitable for users of all ages and abilities.

The second virtual public engagement session was conducted from August 16 to September 3, 2021. During this period the second presentation was view 129 times. Presentation number two yielded a total of 13 respondents. Comments indicated that residents felt that recommendations proposed took into consideration comments provided from the first engagement session. Comments that were received for the second engagement session however, indicated that some residents continued to have similar concerns to those shared in comments as part of the first engagement session, such as:

- A desire for increases in advance left turns at signalized intersections
- Safety concerns for pedestrians crossing and installation of a traffic signal at the intersection of Sherk Street and Ellison Avenue.
- Speed of vehicles on the road network

8.0 POTENTIAL SOLUTIONS

8.1 Area Specific Assessment

B1 Oak Street West – A review of whether bike lanes are needed between Sherk Street and Westmoreland Avenue was conducted for this segment of Oak Street. The Essex County, County Wide Active Transportation System (CWATS) and the Leamington Active Transportation Plan proposed in boulevard multi-use trail on south side of Oak Street from Sherk Street to the west trail. Additionally, bicycle lanes were proposed in the Leamington Active Transportation Plan and the Leamington District Secondary School Traffic Impact Analysis on the north side of Oak from the west trail to Westmoreland Avenue.

The review process to identify a suitable facility along the Oak Street corridor considered National Association of City Transportation Officials (NACTO), Designing for All Ages and Abilities guideline and Ontario traffic Manual (OTM) Book 18: Cycling Facilities (see **Appendix I**). These guidelines in conjunction with existing facilities and expansion of facilities were pivotal for facility selection.

It is recommended that bike lanes not be implemented and an in-boulevard 3-meter-wide multi-use path (MUP) replace the existing sidewalk on the north side of Oak Street from the west trail to Westmoreland Avenue to accommodate users of all ages and abilities. A MUP is also recommended on the south side of Oak Street from the west trail to Sherk Street as illustrated in **Figure 8-1**.

B2 Oak Street East – The Leamington AT plan recommends the construct of a trail on south side of Oak Street from Erie Street to Victoria. Review the possibility of removing existing south side sidewalk and replacing with 3m wide multiuse path. May require property acquisitions.

A sidewalk currently exists along the south side of Oak Street from Erie Street to Victoria Avenue. This facility was reviewed to determine the possibility of removing existing south side sidewalk and replacing it with an MUP. Based on future connectivity, uniformity of facilities, safety and other benefits of other factors considered, a MUP was recommended to be provided on the south side of Oak Street from Sherk Street to the East trail. This facility will help to address multiple area specific concerns and provides the community with a safe continuous pathway along a main corridor. The MUP will also connect the two main trails, the east and

west trails that run north-south within the study limits, in addition to facilitating access to several bicycle facilities along this segment of roadway.

In addition to replacing sidewalks along the southside of Oak Street, the MUP will replace an existing trail between Sherk Street and Erie Street along the Highbury Canco Oak Street frontage. Implementation of the MUP however, will result in property impacts along the Oak Street frontage with most of these impacts anticipated east of Erie Street. The location of the proposed MUP is illustrated in [Figure 8-1](#).



Figure 8-1 Oak Street Review

B3 Oak Street/ Victoria Avenue – Victoria Avenue is a one-way street that provides northbound only travel and has a curb side bicycle lane. Located approximately 50m west of the east trail, no dedicated facility exists to provide a safe connection between the trail and Victoria Avenue.

To link these two facilities (bicycle lane and trail) the following are recommended:

- A separated crossride is proposed at the signalized Highbury Canco access with a new MUP provided on the northside of Oak Street from the signal to the Victoria Street intersection. Some impacts are anticipated here due to existing grades and may include parking at the adjacent property and existing traffic signal location.
- A mixed crossride is proposed across Victoria Avenue to access the curbside bicycle lane.
- Future monitoring of operations of the Victoria Avenue and Oak Street intersection is recommended to determine effectiveness of signage and pavement markings. Monitoring of the intersection will be used to determine the need for future upgrades of the intersection. Upgrade measures may include restriction of eastbound left-turns during road peak hours (7 AM – 10AM and 3 PM – 7 PM) or other key period to limit queuing and other operation impacts. Future improvement may also include signage (Wa-73 Do Not Block Intersection) and pavement marking is also proposed at Victoria Street.

Cyclists are legally required to dismount when at crosswalks or signalized intersections. A crossride is a facility that provides a designated space where cyclists are permitted to ride across an intersection or crossing.

Denoted by “elephant’s feet” pavement markings, typically 400 x 400 mm in size, crossrides indicate which area people riding their bicycles are expected to travel. Potential recommendations for the intersection will work in conjunction with the southside Oak Street MUP and are illustrated in [Figure 8-2](#).

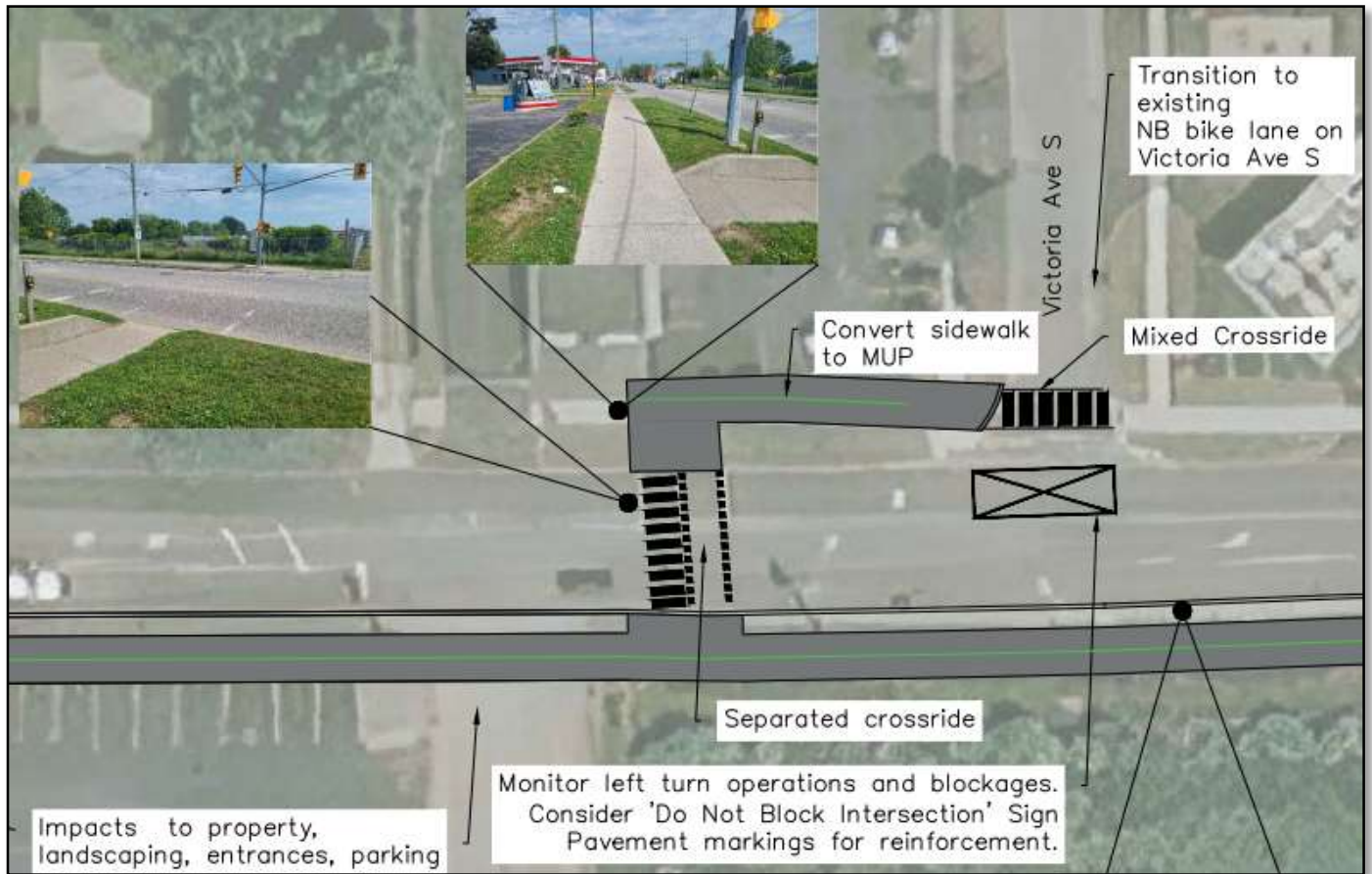


Figure 8-2 Oak Street and Victoria Avenue Crossing

B4 Oak Street / Chestnut Street – Oak Street/Sherk Street – The intersections of Chestnut Street at Oak Street and Sherk Street at Oak Street were reviewed collectively to address multiple concerns at these locations. The intersection of Chestnut Street at Oak Street is located approximately 45m east of Sherk Street and 55m east of Poplar Street. Concerns at the aforementioned intersections include:

- all ages and abilities AT link from the southbound bike lane on Chestnut Street to the southbound bike lane on Sherk Street and the south side of Oak Street
- interconnect of AT facilities through the intersections
- a review of southbound left turns from Chestnut Street on to Oak Street due to westbound queues impacting sight lines

To provide connectivity along the north side of Oak Street, a MUP is proposed from Poplar Street to Chestnut Street with a cycle track providing cyclist connectivity to the southbound bicycle lane. A crossride is to be

provided across Chestnut Street to provide continuity of the AT network. Crossrides are also proposed across all the approaches of the Oak Street and Sherk Street intersection. Crossrides at the Oak Street and Sherk Street intersection will accommodate users of all ages and abilities and connect MUP facilities on both the north and south sides of Oak Street.

Cycle tracks are proposed to connect the existing bicycle lanes to the proposed MUP's on Oak Street. To improve the connectivity of the cycling network a signed bicycle route is proposed northbound on Poplar Street. As such, a cycle track has also been proposed on Poplar Street to transition cyclist from the Oak Street MUP to the shared route on Poplar Street. Cycle tracks are also proposed at Chestnut Street and Sherk Street to transition cyclist to/from bicycle lanes to MUP or crossride facilities.

Analysis completed for the Sherk Street and Oak Street intersection indicated westbound queuing will spill back and block the Chestnut Street intersection during weekday peak periods. This blockage will impact sightlines for left-turn maneuvers and limit the ability of southbound traffic to complete turning movements from Chestnut Street onto Oak Street. As a mitigation measure it is recommended that restriction of southbound left-turns during peak hours (7 AM – 10AM and 3 PM – 7 PM) onto Oak Street be implemented. Proposed facilities to be implemented at the Sherk Street and Oak Street intersection is illustrated in [Figure 8-3](#).

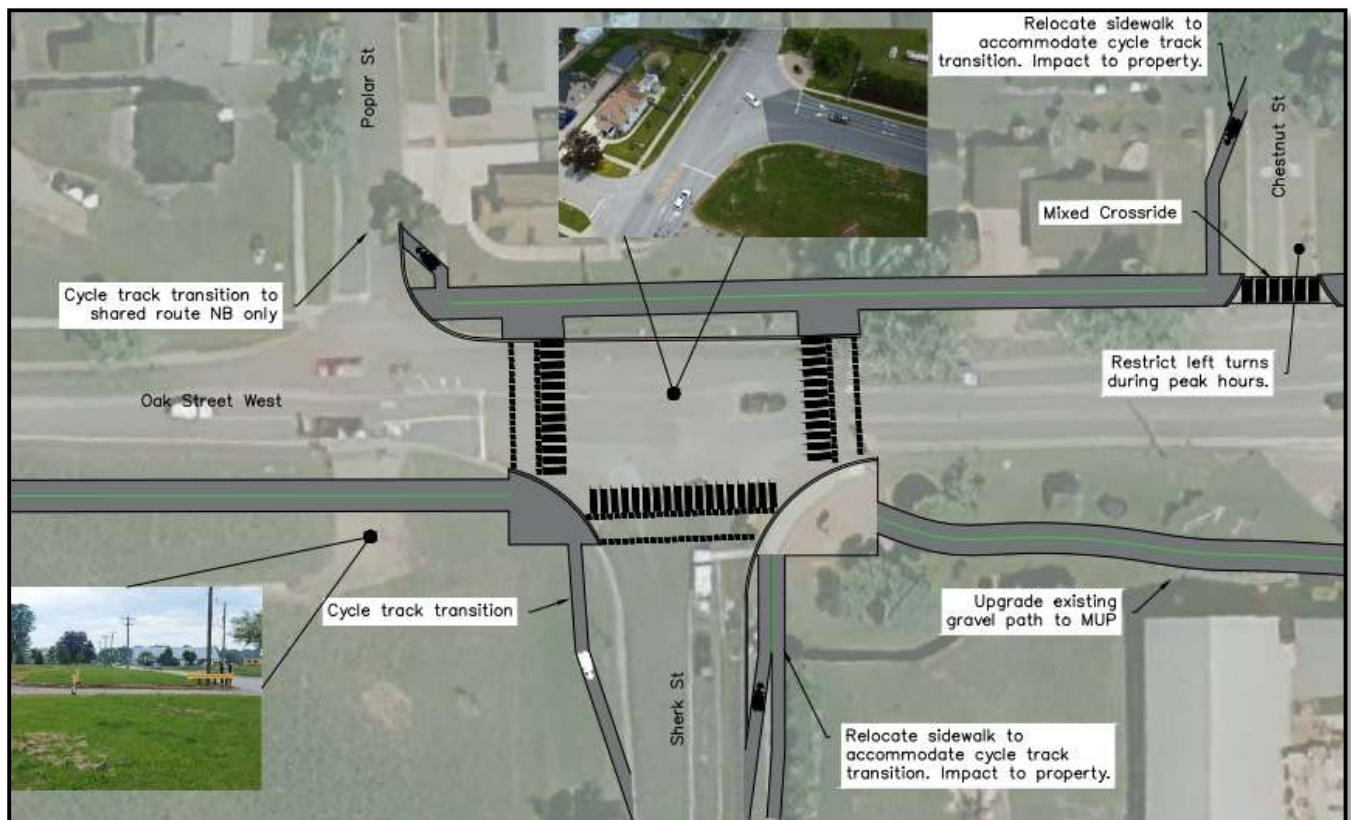


Figure 8-3 Oak Street and Sherk Street AT Facilities

Implementation of the MUP on the north side of Oak Street is anticipated to result in significant infrastructure impacts. There are two very large trees located within the existing boulevard on the northside of Oak Street

that would need to be removed to accommodate an MUP. Utility poles and traffic signals may also require some relocation to accommodate the future facilities recommended.

B5 Oak Street / Fox Street – The intersection of Oak Street and Fox Street is a T-intersection, providing one-way northbound travel and has a northbound bicycle lane along the east curb of Fox Street. The Leamington AT plan identified the need for a crossride at Oak Street and Fox Street to allow cyclists to go from the existing trail on the south side of Oak Street to the northbound Fox Street bike lane.

Oak Street has a four-lane cross-section in the vicinity of Fox Street, a posted speed of 50 kilometers per hour and accommodates high traffic volumes during roadway peak hours. Desire lines may exist for pedestrian and cyclist primarily to and from the Highbury Canco facility via Fox Street, which may be prominent during peak harvest periods. Pedestrian and cyclist volumes from TMC data and on-site observations, however, were consistent with each other at the Fox Street intersection and volumes did not support a need for this connection. No crossing facility currently exists and a new crossing facility at Fox Street would be located approximately mid-block between Sherk Street and Erie Street. Due to northbound only traffic Fox Street currently has no existing intersection control at Oak Street and an uncontrolled crossing at this location was considered undesirable based on traffic volumes on Oak Street and observed speed of some vehicles.

The proposed MUP on the northside of Oak Street will be extended beyond Chestnut Street in combination with a mixed crossride to provide connectivity to Fox Street via the Oak Street and Sherk Street intersection. Given the MUP along the north and south sides of Oak Street, crossride upgrade recommendations at both Sherk Street and Erie Street, the mixed crossride at Fox Street connecting its northbound bicycle lane to the proposed MUP safe connectivity will be provided for northbound cyclists. The proposed AT connections are considered suitable for the location, thus eliminating the need for a mid-block crossride at Fox Street.

Some minor boulevard impacts are anticipated due to the MUP extension over to Fox Street. The proposed northside MUP extension and crossride at Fox Street is illustrated in [Figure 8-4](#).

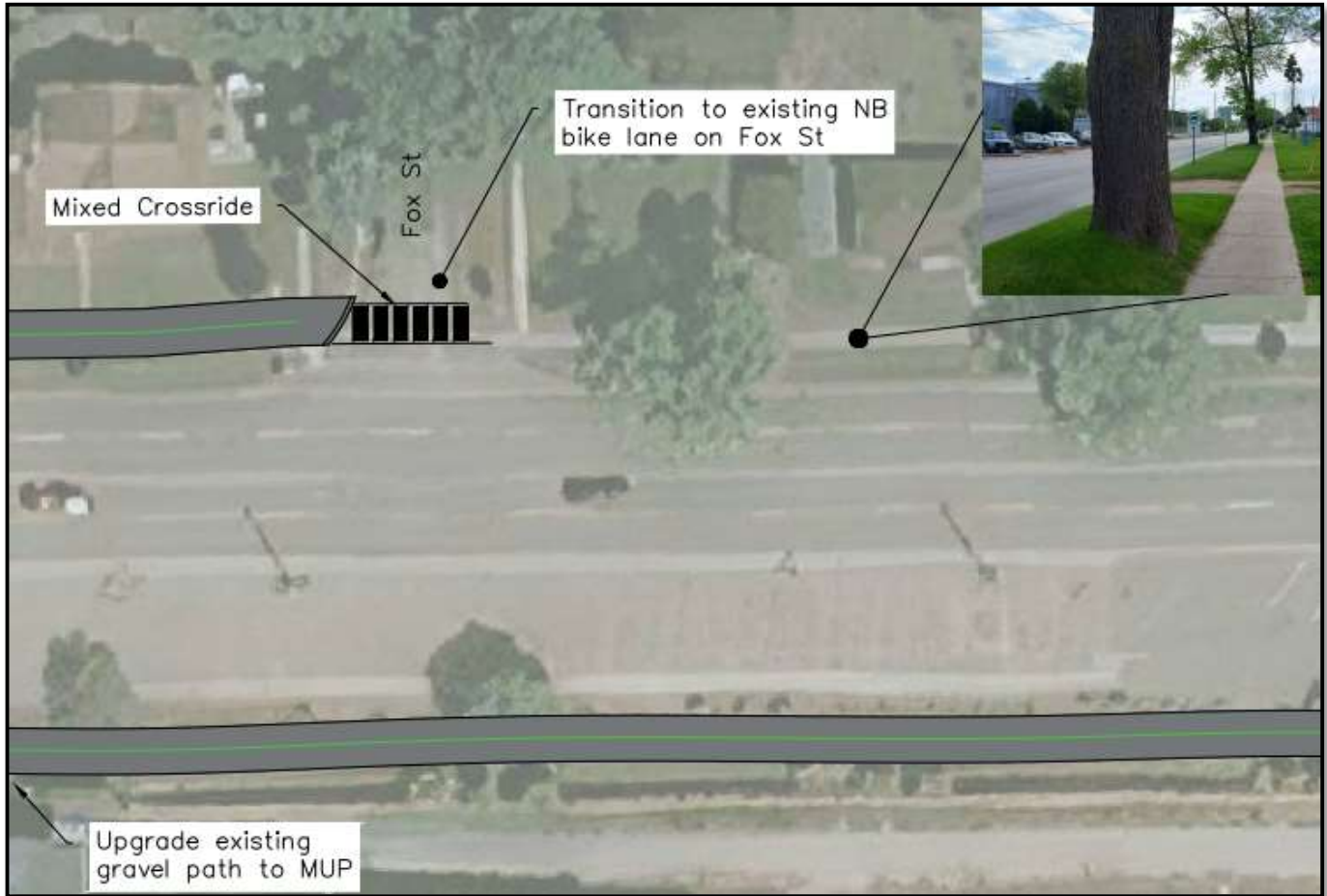


Figure 8-4 Oak Street at Fox Street AT Facilities

B6 Erie Street / Oak Street – The intersection of Erie Street and Oak Street is one of the largest within the study area and accommodates the highest traffic volumes under existing and future conditions. The intersection currently has sidewalks and pedestrian crossing facilities on each approach.

AT facilities for all ages and abilities providing improved interconnection through the intersection were required at this location. Bicycle lanes are present on Erie Street north of Oak Street, however no bicycle facilities are present south of Oak Street. To better accommodate all users through the intersection separated crossrides are proposed for the east, west and south approaches of the intersection as shown in [Figure 8-5](#). Boulevard improvements are proposed on the northeast and west corners of the intersection to provide transitions from the crossrides to the existing on-street bicycle lanes.

As previously discussed, an MUP is to be provided along the south side of Oak Street, that will connect to the proposed crossrides at the intersection. AT connectivity is to be further enhanced by the provision of a 3m wide MUP along the east side of Erie Street to accommodate bicycle and pedestrian traffic. The MUP is recommended as an alternative to on-street bicycle lanes previously considered for Erie Street and will be discussed in further detail in **B14 Erie Street South (Oak to Pulford)**.

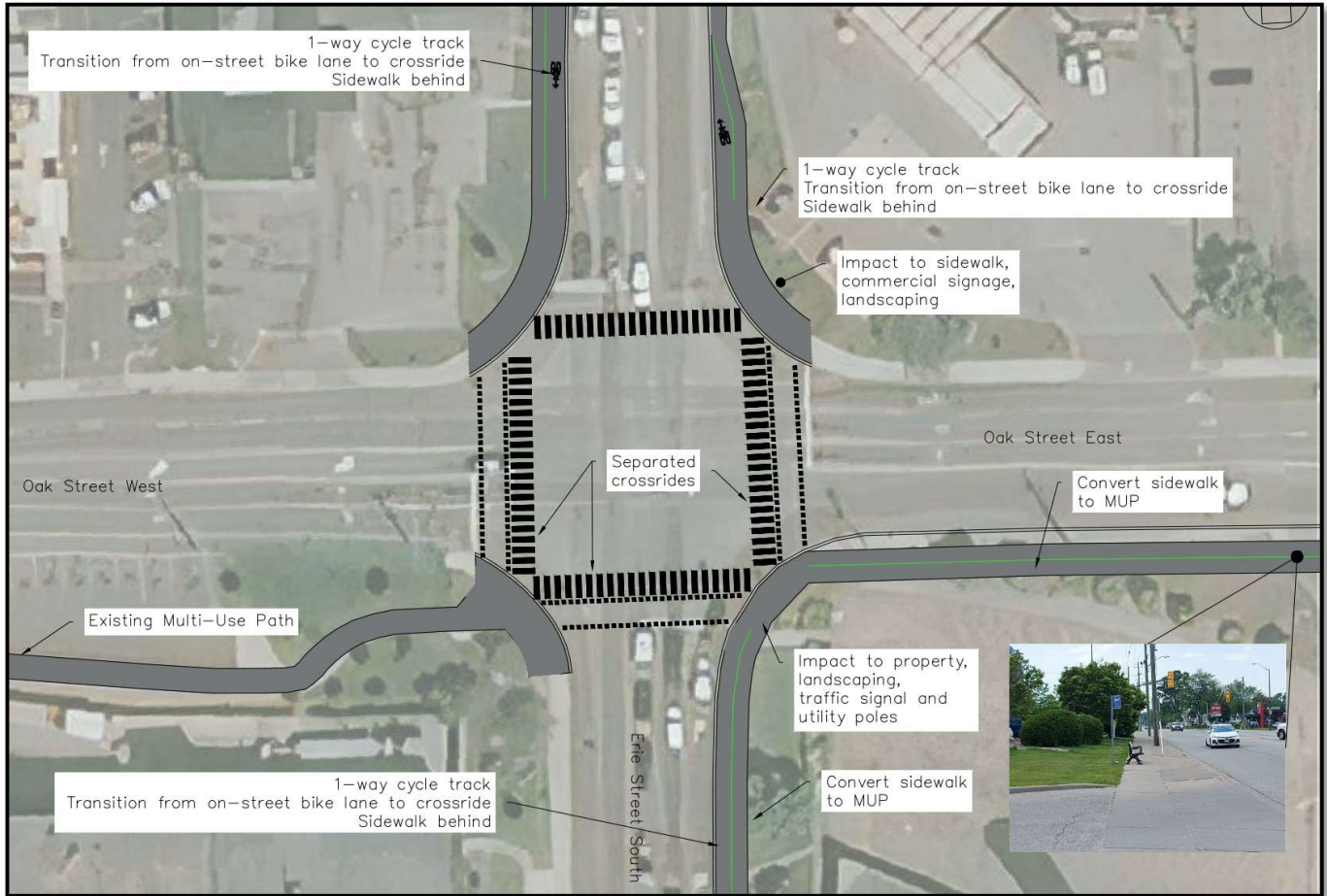


Figure 8-5 Oak Street at Erie Street AT Facilities

Property impacts are anticipated on each corner of the intersection to accommodate MUPs and transitions to bicycle lanes. Impacts may be significant owing to the relocation of utilities, street furniture and landscaping including potential impacts to commercial or private property.

B7 Sherk Street / Highbury Access – Located approximately 200m south of the Oak Street and Sherk Street intersection, the Highbury Canco Access on the east side of Sherk Street allows for the movement of goods and the ingress and egress of employees through an employee pedestrian entrance. An unpaved parking area situated on the west side of Sherk Street, used by Highbury Canco employees, creates a constant crossing need of Sherk Street to access the employee gate.

Traffic volumes collected for the Highbury Canco Access and unpaved parking lot were not very high and no tractor/multi-wagon, semi truck or similar type vehicle was observed entering or exiting the access during the reviewed peak periods. Low volumes may be due to impacts of the pandemic, reduced employee and vehicle traffic.

Low traffic volumes indicated that the access would not be a candidate for signalization at this time. Future reviews of this location can be utilized to confirm if changes in intersection control is warranted. Stop control

signage is present at the parking lot access however no signage is present for outbound Highbury Canco traffic. It is recommended that a stop sign be provided for outbound Highbury Canco traffic. Signage is also proposed on Sherk Street to provide warning to drivers regarding tractor/multi-wagon access exit.

It is proposed a sidewalk be provided on the south side of the parking lot access to improve safety of drivers walking to and from their vehicles. OTM Book 15 which provides a hierarchy for pedestrian crossings (PXO) selection was reviewed to identify a suitable facility for this location. The decision support tool and pedestrian crossover matrix were used in this process. Input in the assessment process include the number of lanes, pedestrian and vehicle volumes which are detailed in **Appendix J**.

Based on evaluation criteria a Type B pedestrian crossing facility (see **Appendix J**) is proposed for the south side of the intersection connecting the Highbury Canco pedestrian access with the new sidewalk connection in the parking area. Proposed recommendations are illustrated in **Figure 8-6**.

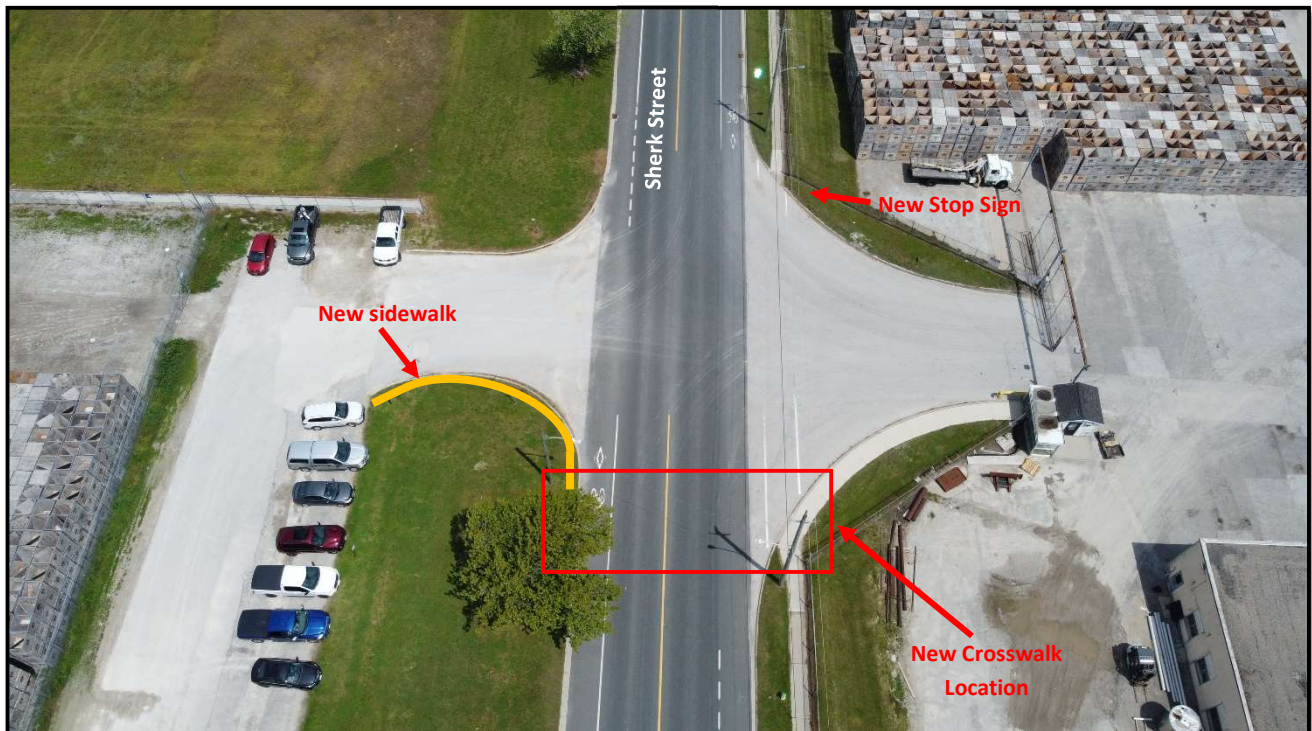


Figure 8-6 Sherk Street Highbury Access

B8 Sherk Street / William Avenue / NFFRC access – The Sherk Street and William Avenue / Nature Fresh Farms Recreational Centre (NFFRC) access is located approximately 220m south of the Highbury Canco access. William Avenue is a local municipal road with residential dwellings on both sides with no sidewalk facilities. It can also be used to access Kingsville Memorial Gardens cemetery. The NFFRC driveway provides inbound and outbound access to the recreational facility, however outbound left-turns have been restricted.

It is noted that typical intersection operation was not possible at this location due to the NFFRC being used as a COVID-19 vaccination centre. As such only outbound traffic was permitted at the site driveway which is illustrated in [Figure 8-7](#).

Turning movements were reviewed at the NFFRC access to determine if eastbound lefts can be permitted for all vehicles. An existing median provides channelization of outbound vehicles to prevent left-turn movements. Speed readings were taken for both northbound and southbound vehicles, and the readings indicated that vehicles were largely compliant with the posted speed of 50 kilometres per hour and did not exceed the speed limit by more than 5 kilometres per hour. As such, it was determined speed was not a considerable factor at this location.

A field review of sight lines demonstrated that existing street furniture obscured sight lines at the NFFRC, however a clear sight line could be achieved if a vehicle rolled forward to the edge of pavement. Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads* (June 2019) was used to determine the required sight distance for a left-turn based on a *design speed* of 60 kilometres per hour. Per TAC guidelines a minimum turning sight distance (TSD), referred to as intersection sight distance (ISD) for a left-turn maneuver is 130m. A vertical curve (crest) along Sherk Street impacts the sight line preventing a clear sight line to be obtained as such no change in allowable turning movement is proposed and stop control operation to be maintained. Observed sight line impacts at the NFFRC access are illustrated in [Figure 8-8](#).

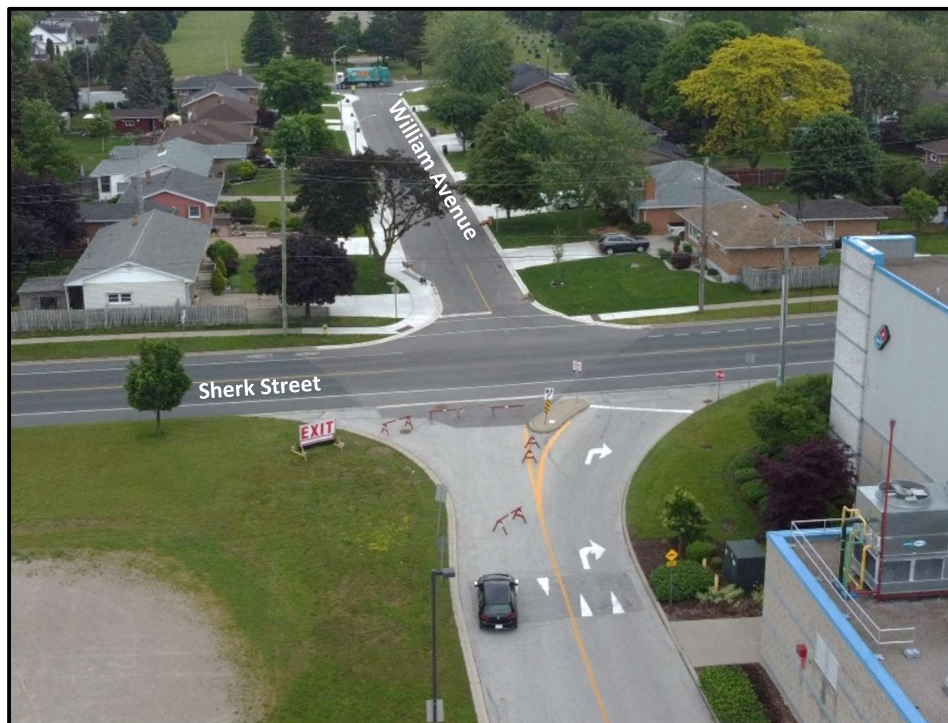


Figure 8-7 Sherk Street at Williams Avenue / NFFRC Access with Restrictions due to Covid-19



Figure 8-8 NFFRC Access Sight Line Impacts

The Leamington AT Plan identified a crossride across Sherk Street to allow completion of an AT facility via the NFFRC parking lot / William Avenue / Cemetery driveway and Countess Street. A review of the study network connectivity confirms that the study area is lacking continuous east – west AT connectivity and implementation of this facility is recommended.

An MUP is proposed across north edge of parking lot from the driveway access will replace designated parallel parking spaces connecting to the west trail. Mixed crossings are proposed across the NFFRC driveway and across Sherk Street on the north side of the intersection to facilitate AT connectivity.

B.9 Sherk Street / Ellison Avenue – Signalization of this intersection has been proposed by the municipality an upgrade that has been one of the more common requests from the community via feedback from the public engagement sessions. Signalization will provide protected pedestrian crossing on all approaches, improving safety at the intersection.

Pedestrian crossings are present on each approach, however upgrade of existing facilities to provide crossrides on the west and south approaches is proposed for the intersection. A cycle track is too be provided in the boulevard on the east side of Sherk Street to connect the crossride to northbound cycle lanes and to provide transitions for southbound cyclist to the crossride across Ellison Avenue and the MUPs. Proposed improvements are illustrated in [Figure 8-9](#).

Crossrides are to be combined with MUPs to be provided along the south side of Ellison Avenue and the west side of Sherk Street, south of Ellison Avenue. The proposed Sherk Street MUP would be a continuous facility from Ellison Avenue to Seacliff Drive. Implantation of the Sherk Street MUP should coincide with future development on the west side of Sherk Street and demand and traffic volumes warrant the need for separation of cycling facilities.

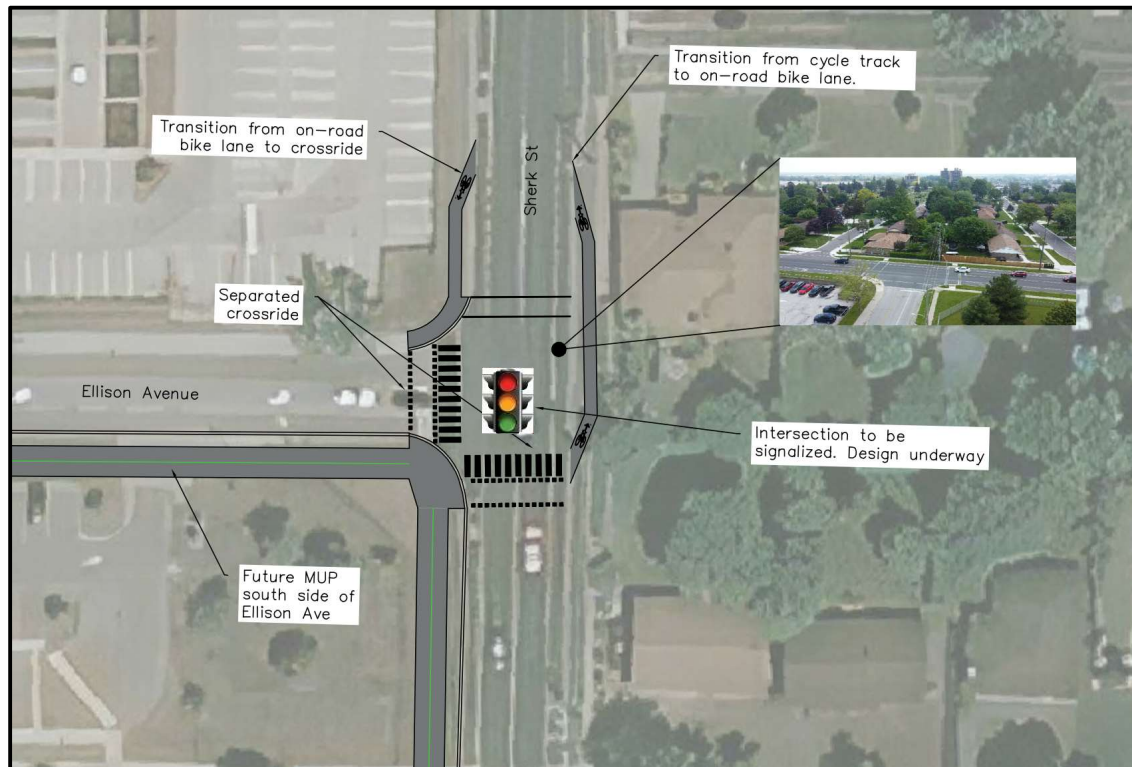


Figure 8-9 Sherk Street and Ellison Avenue Improvements

B10 Sherk Street / Melrose Avenue – The closure of this intersection has been identified for consideration to simplify traffic movements at the Sherk Street and Ellison Avenue. Due to the short offset, southbound lefts historically backed up to the Sherk Street and Ellison Avenue intersection impacting its operation.

Following a network review, closure of Melrose Avenue at Erie Street to vehicular traffic has reduced connectivity and has thus eliminated Melrose Avenue as a throughfare. As such, traffic turning onto Melrose Avenue from Sherk Street has reduced significantly, mitigating operational concerns at the intersection. Drivers that continue to turn onto Melrose Avenue from Sherk are most likely destined to a location within the local neighbourhood. With the closure of Melrose Avenue at Erie Street (see [Figure 8-10](#)), drivers entering Melrose Avenue would be required to access Henry Street then turn on Pulford Avenue to get to Erie Street. This detour is likely to increase delay to drivers and is considered an unlikely travel route. As such, closure of Sherk Street at Melrose Avenue is not being recommended, with future monitoring of the intersection proposed.



Figure 8-10 Closure of Melrose Avenue at Erie Street

B11 Sherk Street / Pulford Avenue – A review of the intersection traffic control at this intersection was required and coordination with the recommendations of other proposed study improvements. Intersection control for this location included assessment under existing stop control, signalization and a roundabout. Analysis showed the intersection would operate satisfactorily under stop-control for both existing and future conditions. Warrant analysis (see **Appendix K**) confirmed traffic signalization requirements will not be met for the location, thus traffic signals have not been recommended. A roundabout design for the location would be constrained by adjacent property impacts and cost of implementation. As such, a roundabout was not considered a feasible option for this location.

Based on assessment and consideration for the discussed intersection control, it is recommended the existing stop control at the intersection be maintained. Additionally, the intersection was reviewed for dedicated turning lane requirements. A review of southbound left-turn operations indicated that a left turn warrant was met for the intersection under both existing and future conditions. Introduction of this dedicated turning lane is recommended as part of network improvements.

Consideration was also given to provision of AT facilities suitable for users of all ages and abilities. Pulford Avenue has a shared lane to accommodate cyclists, however, no upgrade to this facility has been recommended which will be discussed in further detail in **B17 Pulford Avenue**. With a MUP proposed along the west side of Sherk Street, a crossride would be a suitable future improvement to connect Pulford Avenue facilities to the Sherk Street MUP. Implementation of this crossride should be considered to coincide with upgrades to cycling facilities on this section of Pulford Avenue, to be triggered by area development and demand.

B.12 Sherk Street Pulford Avenue to Seacliff Drive – Pulford Avenue is approximately 550m north of Seacliff Drive and no form of pedestrian crossing facilities is present along this segment of the Sherk Street corridor. A review of this section of roadway was required to identify pedestrian crossing opportunities and possible installation of PXO(s) or other types of crossings.

Future development information provided by the Municipality of Leamington indicate substantial development (Development E and F *Figure 5-1*) is anticipated west of Sherk Street between Seacliff Drive and Ellison Avenue. This development will consist of both residential and commercial land uses which create trips that will occur by walking, cycling or some other non-auto mode of transportation. Subject to the new development it is expected new residents will venture over to Erie Street and similar existing residents will journey to the new commercial development. As such pedestrian crossing facilities were considered based on future desire lines. Considering network connectivity options, a potential pedestrian crossing at Margaret Street or Audrey Street at Sherk Street is likely per future development connectivity.

Identified locations are good candidates for future crossing facilities to provide connectivity into the new residential and commercial area. The new develop provides the opportunity for redevelopment of existing local roadways to provide AT facilities and improve connectivity to the recommended Sherk Street MUP and available sidewalks on Pulford Avenue and Seacliff Drive.

B13 Seacliff Drive / Sherk Street – Interconnection of AT facilities through the intersection and the identification of all ages and abilities facilities was required for this intersection.

Crossrides are to be provided across each approach of the intersection with and will connect to the north-south MUP proposed for the west side of Sherk Street. Off-road cycle track transitions are proposed to connect the westbound Seacliff Drive bicycle lanes to crossrides east of the intersection and the north-south Sherk Street MUP to the westbound Seacliff Drive bicycle lanes east of the intersection. A bike bay is proposed to connect eastbound cyclists to the crossride.

A dedicated westbound right-turn lane is proposed to accommodate future traffic demand at the intersection, which will impact the residential driveways on the north side of Seacliff Drive as observed in the future do nothing and ultimate conditions analysis. Subject to impacts of the westbound right turn lane, operational changes are proposed for corner lot residence site driveway. The existing access on Seacliff Drive is to be restricted to right in only. A new driveway access is recommended along Sherk Street that will provide full-moves access. Coordination and consultation with the existing property owner will be required. Proposed AT facilities for the intersection is illustrated in *Figure 8-11*.

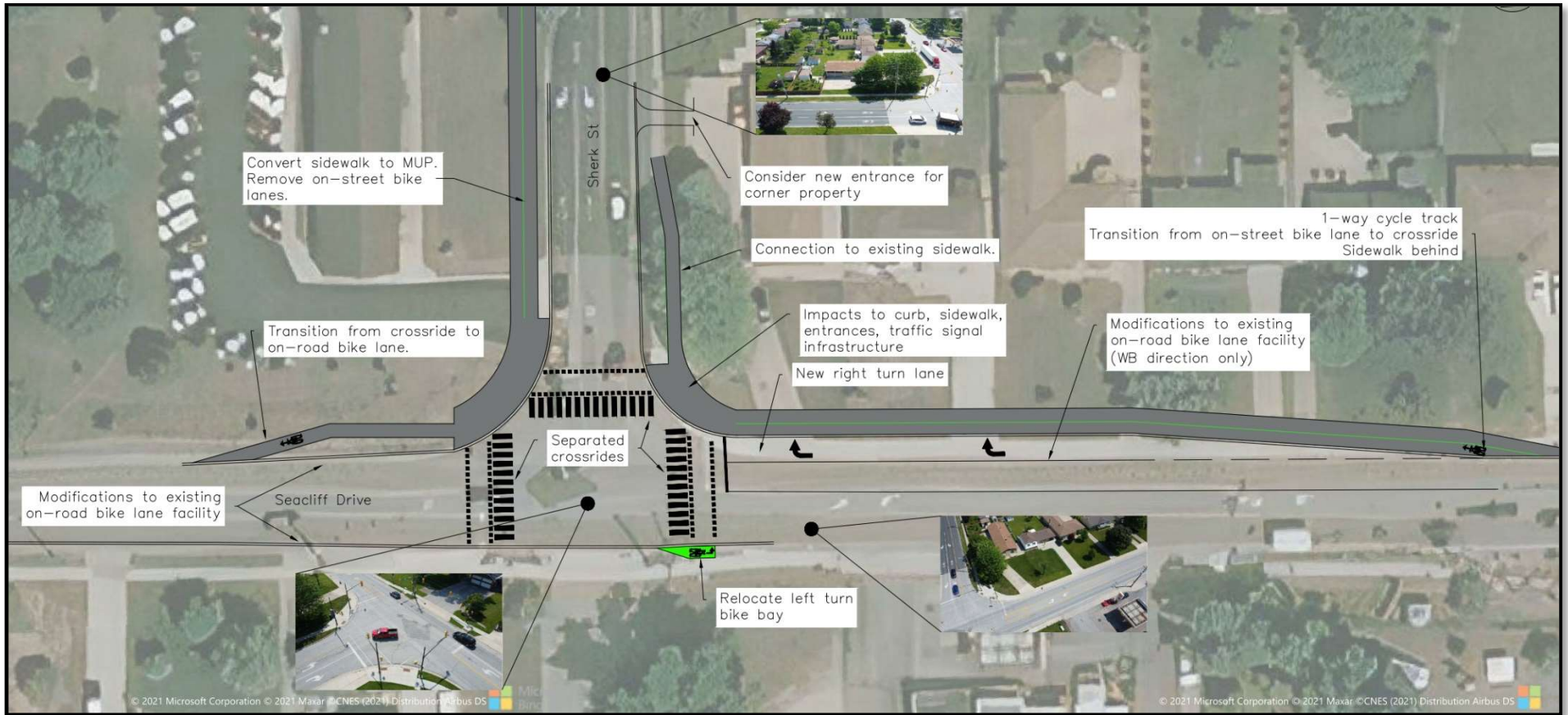


Figure 8-11 Sherk Street at Seacliff Drive AT Facilities

B14 Erie Street South (Oak Street to Pulford Avenue) – Existing east-west pedestrian crossing opportunities were considered insufficient for this section of the corridor and possible installation of PXO(s) or other types of crossings based on actual, desire line and latent crossing demand was to be reviewed and addressed. Assessment of a 3m wide MUP as an alternative to provide cycling facilities in combination with a midblock pedestrian crossing/crossride was also considered.

Corridor assessment for future conditions considered the implementation of a road diet to accommodate bicycle lanes along Erie Street. Road diet assessment confirmed very poor traffic operating conditions resulting in long delays and significant capacity constraints. As an alternative, removal of the existing sidewalks along segments of Erie Street and replacing it with a 3m wide MUP was identified as a feasible alternative to provide cycling facilities and maintain much needed existing roadway capacity. The west side of Erie Street was the preferred location for a continuous MUP, however due to boulevard width limitations in the vicinity of the cemetery the MUP has proposed for segments on both the east and west sides of Erie Street. The MUP facility is to be provided from Oak Street in the north to approximately 70m north of Melrose Avenue along the **east** side of Erie Street and on **west** side of Erie Street from this location to Seacliff Drive in the south with crossride facilities to maintain northside connectivity at roadway intersections.

To provide east-west connectivity between the MUP's on the east and west sides of Erie Street, a signalized mixed crossing for pedestrians and cyclists is proposed in the vicinity of 238 Erie Street based on assessments using OTM Book 15. This connection will provide safe crossing opportunities between the east and west sides of Erie Street, as shown in [Figure 8-12](#). The crossing and MUP in this area will be part of a wider future east-west AT connection. This AT facility would include a signed bike route along Countess Street to McGaw Street and the east trail, a designated AT path through the Kingsville Memorial Gardens cemetery, connecting to Henry Street and the facility described in **B8 Sherk Street / William Avenue / NFFRC access**. This facility will provide a continuous AT facility from west trail to the east trail between Sherk Street and Seacliff Drive.

Implementation of the 3m wide facility is anticipated to result in utility and property impacts along the entire length of Erie Street. The Kingsville Memorial Gardens cemetery plays a significant role in the MUP alignment as it limits the ability to accommodate the MUP along its frontage. Lay-by parking at the front of Highbury Canco on the east side of Erie Street and overhead bridge support for the elevated Highbury Canco crossing also provide constraints to the MUP design, which have been taken into consideration as has been illustrated in [Figure 8-13](#).



Figure 8-12 MUP with AT Facilities Connection to MUP along East and West Side of Erie Street



Figure 8-13 Erie Street MUP Constraints Near Highbury Canco

B15 Erie Street / Pulford Avenue – Identification of all ages and abilities AT facilities through the intersection was required. A review of traffic counts and signal timing plans was also identified to assess if advanced left turn phases need to be added in any of the directions. Should the advance phases be made to the Erie Street and Pulford Avenue intersection, adjustments will also be required at the TD, Walmart and Seacliff Drive intersections as these 4 signals operate in coordination during peak hours.

A mixed cross ride is proposed across the west leg of Pulford Avenue at the intersection to connect the new MUP proposed for Erie Street. A separated crossride is proposed across the south approach of Erie Street at the intersection. Improvement of pedestrian and cycle facilities along Pulford is recommended with a removal of the southside side and replacement with a 3m wide MUP. The MUP is proposed to connect the Erie Street and Pulford Avenue intersection to the east trail. Pedestrian crossings on the other two approaches are to be maintained to continue to provide safe crossing facilities.

Signal timing were reviewed for the intersection to assess the impact of advance left-turn phases at the intersection. The southbound left-turn is the only movement with an advance left-turn phase under existing conditions, which was maintained as part of the completed 2030 future assessments. As part of the area specific assessment, operational impacts were reviewed using the 2030 Ultimate Condition and Synchro/SimTraffic applying a northbound left advance phase in the first instance, followed by advance left-turn phases for all approaches.

Operation of the intersection with north and southbound left-turn advances result in small reductions or increases to intersection capacity and delay during both the AM and PM peak hour periods. The most significant impact is a reduction in the PM westbound through-right turn queues by 36m. Assessment of the intersection with advance left-turns on all approaches produces greater changes in capacity and delay for assessed peak periods. During the AM peak hour the westbound left-turn exhibits the largest decrease in delay 21 seconds for any movement with the highest increase in delay of 8 seconds occurring on the eastbound and northbound through-right. There was a significant reduction in westbound left-turn v/c ratios by 0.21, however queues for most movements increased with the northbound through-right increasing by 24m.

During the PM peak hour capacity improvements occurred on most left turns with the largest improvement occurring on the westbound left-turn, with v/c ratios decreasing by 0.27 and delay decreasing by 28 seconds. Turning movement delay increases, are also anticipated with the largest increase occurring on the eastbound through-right (17 seconds) and v/c ratio increasing by 0.18. Shared through-right movements on all approaches are anticipated to experience queuing increases, the northbound through-right having the largest increase of 41m.

Application of left-turn advances in Vissim software on all approaches for the Ultimate Condition was also reviewed. Vissim analysis indicated increases in delay and queueing were more common for turning movements than show in Synchro/SimTraffic analysis. The biggest queue increase occurs on the eastbound left and through-right movements both having a queue increase of 64m. Vissim analysis indicates however, the southbound left-turn movement would experience the best operational improvement with delays reducing by 35 and 22 seconds respectively for the AM and PM peak periods. Similarly queues for these movements will be

reduce by 17m and 8m for the AM and PM peak periods respectively. A comparative summary of analysis is provided in **Appendix L**.

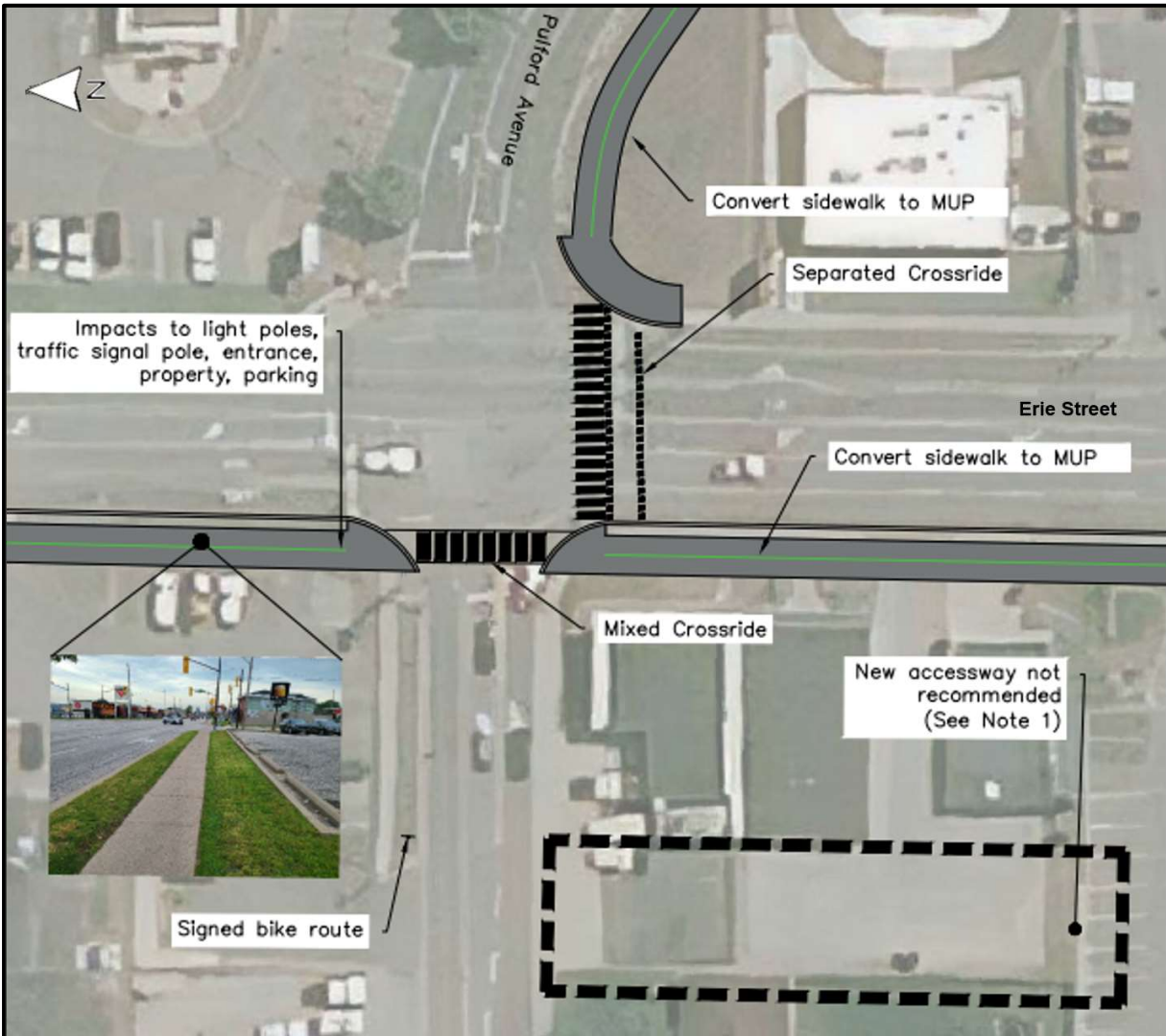
It is noted that the intersection has signal heads for left-turn movement on all approaches, even though phases may not be operational. Analysis confirms that although queuing and delay will increase on some approaches there are some benefits to be obtained from activating advance phasing. Based on intersection operational assessment addition of advanced left turn phases should be considered per traffic demands and annual updates in intersection assessment to meet intersection and network requirements.

The Erie Street plaza adjacent to the intersection located at 275 Erie Street southwest of the intersection experiences operational constraints due to its site traffic volume and the location of its existing driveways. Two accesses are provided to the site via Erie Street, a right in only access and a signalized full moves access. A secondary outbound access was considered by the municipality, that would be located through the rear of the existing commercial area north of the plaza.

A review of this location deemed it unsuitable for a plaza driveway for multiple reasons. The short distance of the Erie Street and Pulford Avenue intersection from this potential access will impact intersection operation and create collision risks. Eastbound queues for the intersection will always spill back beyond the considered access point which would result in blockages creating:

- Increased driver aggression to complete turns or get past the potential access.
- Force turning drivers to accept shorter gaps in traffic.
- Compromised sight lines for drivers.

An access at this location is therefore not recommended. Intersection recommendations are summarized in **Figure 8-14**.



Note 1: Access to plaza would be located within eastbound queuing, thus location not suitable

Figure 8-14 Erie Street at Pulford Avenue AT Facilities

B16 Pulford Avenue / Canadian Tire / County Fair Mall access – This section of Pulford Avenue was to be reviewed to identify suitable pedestrian crossing opportunities and crossing facilities based on actual, desire line and latent crossing demand and applicable pedestrian crossing guidelines.

A pedestrian crossing at this location was to be assessed based on data collected while IGW are in town as they represent the majority of pedestrians crossing in this area. Based on counts at the location, the number of pedestrians crossing was not considered to reflect typical peak crossing demand due to the impacts of the pandemic. A lack of historical data for pedestrian crossings at this location also made it difficult to forecast the true demand.

Improved AT connectivity is required on Pulford Avenue to accommodate cyclists leaving the trail. Grade concerns and potential impact to parking at the County fair Mall (Freshco) plaza resulted in an MUP being

proposed for the south side of Pulford Avenue. Implementation of the MUP will coincide with the removal of existing bicycle lanes. The MUP will run from Erie Street to the east trail. Addition of a MUP on Pulford Avenue provides a good opportunity to further enhanced network connectivity by introducing a crossing facility on Pulford Avenue that connects to the proposed MUP and existing sidewalk on the north side of Pulford Avenue.

Based on known desire lines and latent crossing demand, a shared pedestrian and bicycle crossing facility is proposed on the east side of the aligned accesses of the Canadian Tire and Walmart plazas as illustrated in Figure 8-15.



Figure 8-15 Pulford Avenue AT Facilities

B17 Pulford Ave – Pulford Avenue has existing shared lanes to accommodate cyclists. A review of facility types for cyclists on Pulford Avenue between Erie Street and Sherk Street based on the anticipated traffic volumes for this section of roadway was required.

A two-lane roadway Pulford Avenue is forecasted to accommodate up to 525 PM peak hour trips with the AM period having 30% less traffic between Sherk Street and Erie Street. Following reviews of existing and forecasted cyclist volumes using OTM Book 18, shared lanes on Pulford Avenue west of Erie Street are considered acceptable for future conditions. The addition of sharrows are recommended for enhanced notification. Traffic and cyclist volumes should be monitored in the future for potential need to improve the

existing facility. Should traffic volumes on Pulford Avenue grow significantly, consideration should be given to providing a southside MUP with appropriate connections to the MUPs on Erie Street and Sherk Street. Existing shared lane signage is illustrated in Figure 8-16.



Figure 8-16 Pulford Avenue Shared Lanes

B18 Erie Street – Is described as being a congested roadway segment consisting of numerous traffic signals and a limited road allowance. The Municipality has sought recommendations to improve traffic conditions and provide active transportation while maintaining and encouraging economic growth in the area.

Investigation of property interconnection between the Canadian Tire and the Walmart properties and also a further connection to Seaclyff Drive for the purpose of diverting traffic from the main corridor was to be assessed. In the event the Erie Street road diet was not considered feasible, another option for AT facilities should be considered. Alternatives may include the removal of east or west sidewalks to provide a 3m wide MUP or removal of one northbound lane on Erie Street and installation of 3m wide MUP in its place between 312 Erie Street to Seaclyff Drive.

Erie Street road diet assessment confirmed the corridor is not suitable for a road diet and was reviewed and detailed in Section 5.2.3 of this report. The introduction of a road diet will remove much needed vehicle capacity within the corridor for the future study horizon, thus it is not considered a feasible alternative for the corridor. Alternatively, a 3m wide MUP is proposed on the west side of Erie Street to improve AT connectivity. The MUP facility will not impact the existing Erie Street pavement width and the existing four travel lanes can be maintained along the corridor to provide the much need capacity required for future conditions. Property impacts are anticipated due to the MUP implementation which would be identified through detailed design.

Providing an MUP on the east side of Erie Street or reducing a northbound lane effectively up to Coronation Avenue (312 Erie Street) were not considered viable options for this segment of the corridor. Termination of an east side MUP at Coronation Avenue would result in connectivity issues for cyclist as no on-street bicycle lanes are proposed. An uncontrolled mid-block crossing of this segment of Erie Street would not be suitable

due to the numerous traffic signals. Addition of another crossing would impact traffic flow for an already congestion corridor. For this reason, loss of capacity via lane reduction to a single northbound lane is not recommended as this will also impact westbound right-turning vehicles that can be accommodated with northbound through movements due to the single northbound lane.

Due to the existing road network, vehicles destined to the Canadian Tire and Walmart simultaneously would have to exist the site and enter the second site via Erie Street. Interconnectivity of the Canadian Tire and Wal-Mart properties will make it easier for shoppers to move between the two facilities and remove trips from Erie Street that would access both locations in the same trip (linked trip). The potential connection was identified to be provided adjacent to the TD bank parking lot along the driveway to access the Canadian Tire which has been illustrated in [Figure 8-17](#).



Figure 8-17 Proposed Location for Inter-parcel Connection for Canadian Tire and Walmart Plazas

The connection may have the ripple effect of increasing trips between the commercial properties as linked trips or previous trips to only one location may now become internal site trips due to the fully connected commercial area. Consideration of a connection between the two plazas has previously been reviewed by the municipality and a design for the connection conceived, which is illustrated in [Figure 8-18](#). The connection would require

some redesign of both parking lots, that would include new pedestrian pathways and the impacts to the existing retaining wall.

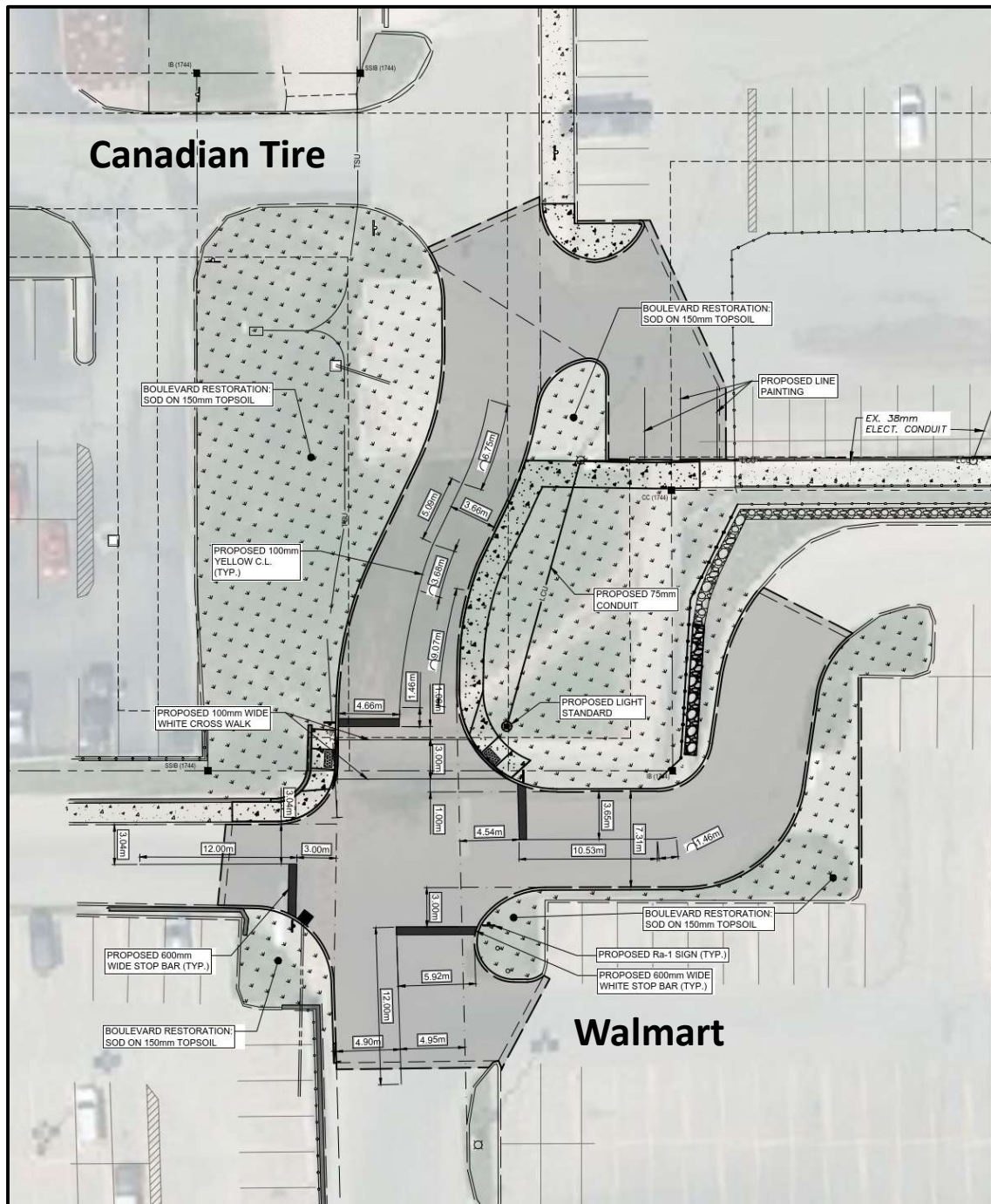


Figure 8-18 Potential Inter-parcel Connection

Providing a connection to Seaciff Drive from the Wal-Mart plaza allows for further diversion of traffic from Erie Street. This connection can allow for vehicle, pedestrian, bicycle or other active travel modes to be accommodated. The location of a possible inter-parcel connection at Seaciff Drive may potentially have

impacts on the Seaclyff Drive and Erie Street intersection and Roma Club property. Three main locations have been considered for connections as shown in Figure 8-19.

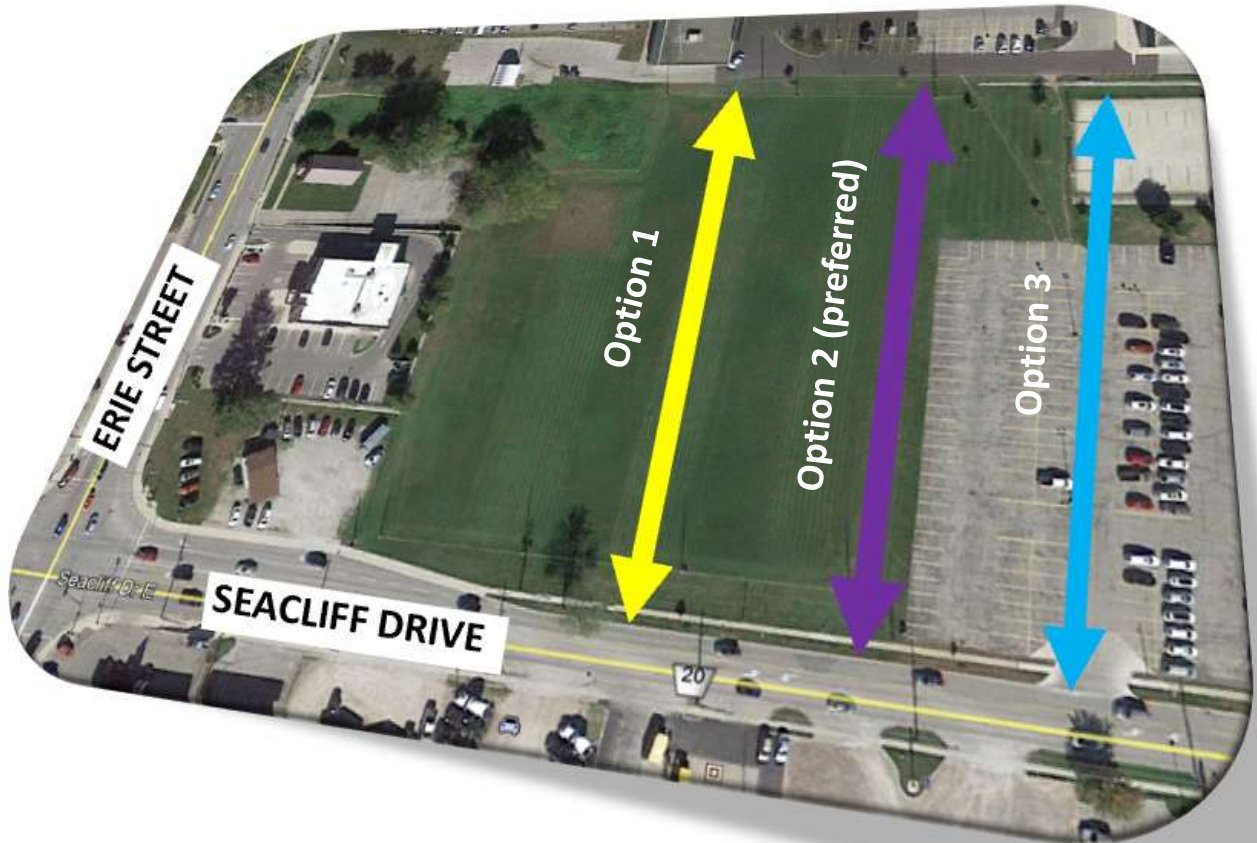


Figure 8-19 Seaclyff Drive Inter-parcel Connection Locations

Option 1 and Option 3 provide connections that align with existing driving aisles at the Walmart plaza and Option 2 is proposed in the middle of the existing parking spaces. Reviews of the proposed options to identify a preferred location considered:

Option 1 may potentially impact westbound queuing at the Erie Street and Seaclyff Drive intersection. This alignment also bisects the undeveloped lands to the west of the Roma Club Site, development consideration for which are unknown.

Option 2 would provide the least impact to the existing parking and access at the Roma Club site and the undeveloped green field area to the west. The location will also allow for greater clearance of the Erie Street and Seaclyff Drive intersection from the access. The location allows for potential alignment with the commercial access on the south side of Seaclyff Drive. Consolidation of accesses along this segment of roadway would be recommended however, to reduce conflict points and collision risks. Consideration would be given to closing

the existing Roma Club accesses and providing access via the new north south connection. Of the three alignments options review this was the prefer option per [Figure 8-19](#).

Option 3 although aligned with a Walmart internal driving aisle has the most significant impact on the Roma Club property and would result in significant impacts to parking and recreational court to the rear of the site. The location of the alignment also passes through the retaining wall between the commercial and club properties and would require consideration of how this would be designed. The connection option however does align with the existing Roma Club driveway access eliminating the need for additional or new access on Seacliff Drive. It provides the greatest clearance from the Erie Street and Seacliff Drive intersection and provides the closest potential crossing location to the observer main pedestrian crossing location.

Reducing congestion on Erie Street is a key concern within the study area and interconnection of commercial properties, introduction of a road diet and new pedestrian connections are concepts considered to achieve this reduction. Interconnection of commercial properties, to accommodate vehicular traffic, will provide operational benefits to both the Canadian Tire and Wal-Mart plazas, reducing traffic volumes on Erie Street. As shown in the analysis, the connection will facilitate reducing delays along the Erie Street corridor. Construction of a connection between the Canadian Tire plaza and Seacliff Drive will also remove traffic from Erie Street and help to reduce delays through the corridor. Although some improvements in delay will be realized due to the connections, the overall travel time savings along the Erie Street corridor are not anticipated to be significant. Pedestrian traffic will also benefit from the connection between the Canadian Tire plaza and Seacliff Drive, as this is a highly traveled route with many pedestrians and the even cyclists observed walking to commercial areas on the south side of Seacliff Drive. Given observed demand for connectivity, the community will benefit significantly from a pedestrian connection in this area.

The road diet is not recommended due to operational constraints and deficiencies outlined in Section 5.2.3. Interconnection of parcels however, is recommended to be combined with new pedestrian connections to Seacliff Drive which are considered credible options to relieving traffic on Erie Street. Intersection operations, traffic flow delays and volumes of diverted traffic due to inter-parcel connections have been assessed and documented in Section 5.2.5. Greater detailed analysis can identify if further improvements and traffic diversion can be attained through full-move operation of the potential new connection at Seacliff Drive compared to the right-in and right-out case assessed in this study. In this scenario, modifications to the multiple driveway accesses on the south side of Seacliff Drive will be required to reduce conflict points and risks.

Implementation of infrastructural changes for the inter-parcel connection and the benefits to be gained are to be weighed by the Municipality against the cost and other factors through further design.

B19 Erie Street / Seacliff Drive – Identification of an all ages and abilities facilities was required at this location to interconnect existing and planned AT facilities through the intersection.

To provide all ages and abilities AT interconnection through the intersection, the existing pedestrian crossings are proposed to be upgraded to separated crossrides across all approaches at the intersection. Existing bicycle lanes are present south of the intersection on Erie Street and west of the intersection on Seacliff Drive. Cycle tracks are proposed at the intersection to provide connectivity from the existing bicycle lanes to the proposed crossrides there by improving the safety of cyclist approach and leaving the intersection.

The Leamington AT plan proposed the upgrade of the sidewalk along the north side of Seacliff Drive to be replaced and upgraded by a MUP facility. This proposed facility has been included as part of the AT network upgrades and crossrides at the Erie Street at Seacliff Drive will provide cyclists with connectivity to facilities beyond the intersection. The MUP proposed on the west side of Erie Street will be a continuous feature from Oak Street at the north boundary of the study limits and will connect to crossride facilities at the Seacliff Drive and Erie Street intersection. Proposed facilities at the intersection are illustrated in Figure 8-20.

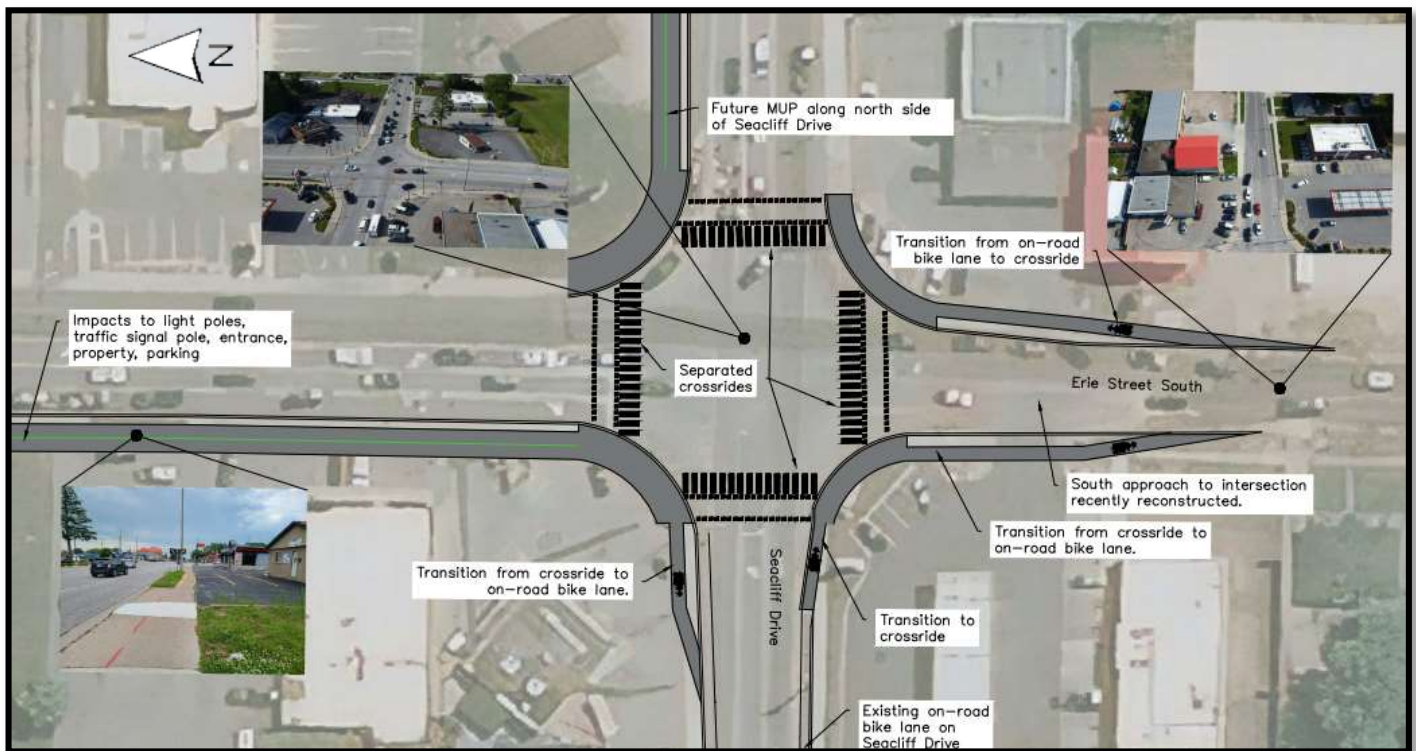


Figure 8-20 Erie Street at Seacliff Drive AT Facilities

B20 Seacliff Drive East at 16 Seacliff Drive East – Based on actual, desire line and latent crossing demand a review of this section of Seacliff Drive was required to identify if a potential location for a pedestrian crossing. Connectivity to Seacliff Drive was to be reviewed in conjunction with other recommendations with this study.

Desire lines south of the Walmart plaza have been created by consistent pedestrian and cyclist traffic destined to and from commercial areas on the south side of Seacliff Drive. Existing desire lines have been influenced by a physical barrier, a retaining wall separating the Walmart commercial plaza and Leamington Roma Club at their property boundary.

The desire line begins at the end of the retaining wall, cuts through the Roma Club property with pedestrians proceeding through the property's parking lot toward Seacliff Drive. The physical barrier between adjacent properties and existing desire line which is about to be accessed by a cyclist and is shown in Figure 8-21.

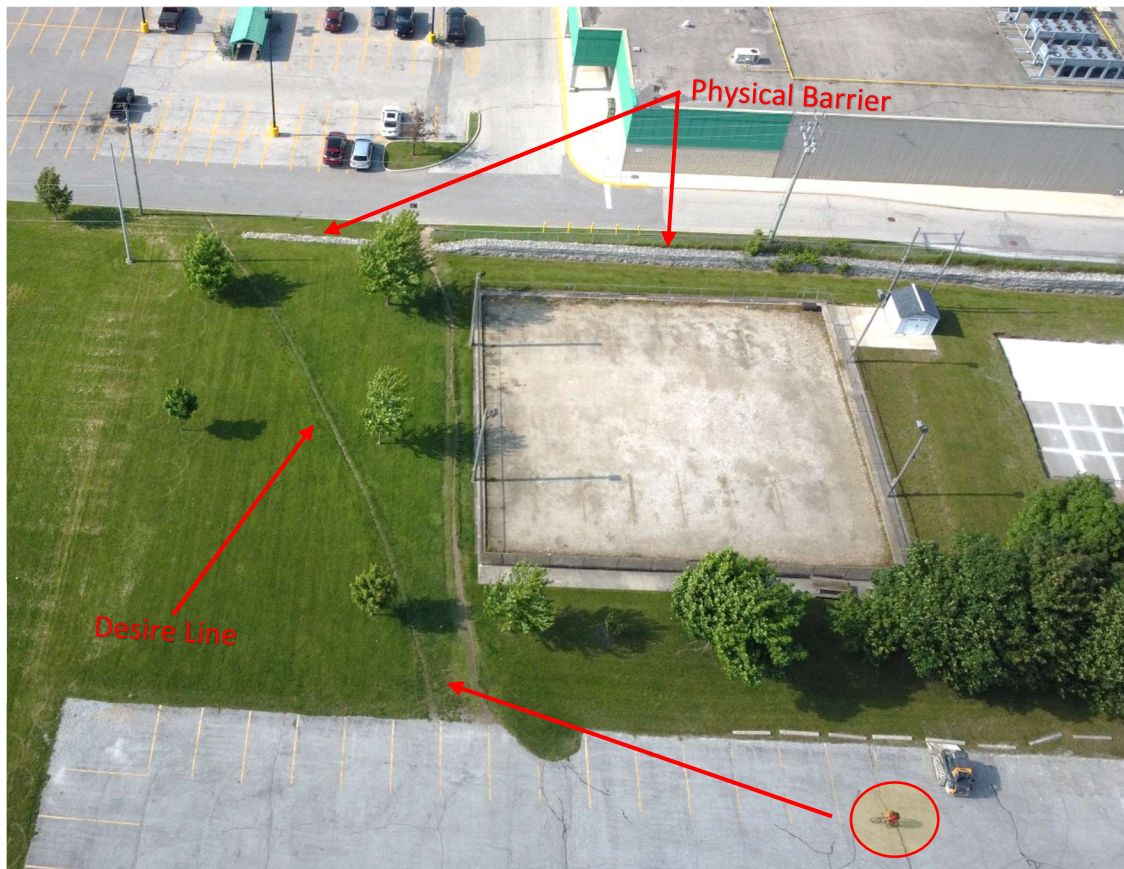


Figure 8-21 Erie Street at Seacliff Drive AT Facilities

An existing Type B pedestrian crossing facility is provided at the east trail to accommodate safe crossing of Seacliff Drive. This designated crossing facility is located approximately 80m east of observed occurrences of pedestrians crossing Seacliff Drive having used the identified desire lines. Figure 8-22 illustrates observed crossing activity of pedestrians.

Pedestrian activity is unlikely to be ceased at this location without restrictive measures taken regarding the identified desire line. Extension of the existing fence on the retaining wall can serve as a physical barrier to channel pedestrians to the trail and existing pedestrian crossing facilities. This may potentially have a reverse effect and create a new desire line and crossing location. Additionally the inter-parcel connection location may potentially have impacts on Seacliff Drive and Erie Street intersection operations and Roma Club property and access.



Figure 8-22 Pedestrians Crossing at Seaclyff Drive

Connection to Seaclyff Drive from the Wal-Mart plaza is recommended with accommodation of a pedestrian crossing facility along the existing pedestrian desire line to be provided. Should the inter-parcel connection to Seaclyff Drive be provided as discussed in **B18 Erie Street** the crossing facility should be provided based on the intersection type and location on Seaclyff Drive. The type of facility to be considered for this location would be determined by the Municipality of Leamington, based on a detailed assessment of intersection configuration, control and operational characteristics.

B.21 Ellison Avenue – A review of cyclists on Ellison Avenue between Sherk Street and the west trail based on anticipated future traffic volumes for this section of roadway was required.

Cyclists are accommodated on Ellison Avenue via shared lanes between the west trail and Sherk Street. For future conditions, cycling facilities for Ellison Avenue, the existing west trail, and future traffic volume forecasts for Ellison Avenue and Sherk Street were assessed based on OTM Book 18.

To provide continuity between facilities it is proposed that:

- The sidewalk on the south side of Ellison Avenue be replaced with an MUP from Sherk Street to Queens Hill Crescent and remove shared lane signage.
- The existing pedestrian crossing on Ellison Avenue at Orchard Heights / Queens Hill Crescent is to be removed and replaced by a combined / mixed crossside with Type B pedestrian crossing signage and

beacons at the trail and will provide connectivity for pedestrians and cyclist between the trail / sidewalk to the south side MUP and school.

Proposed facilities for Ellison Avenue is shown below in [Figure 8-23](#).



Figure 8-23 Ellison Avenue AT Facilities

8.2 Future Network Connections

Connectivity deficiencies has limited safe movement and willingness of community members to fully utilize active modes when desired. This has also led to the occurrence of desire lines and unsafe pedestrian crossing habits within the network. A select number of connections, considered beneficial to community movement was identified for review and has been illustrated in [Figure 8-24](#).

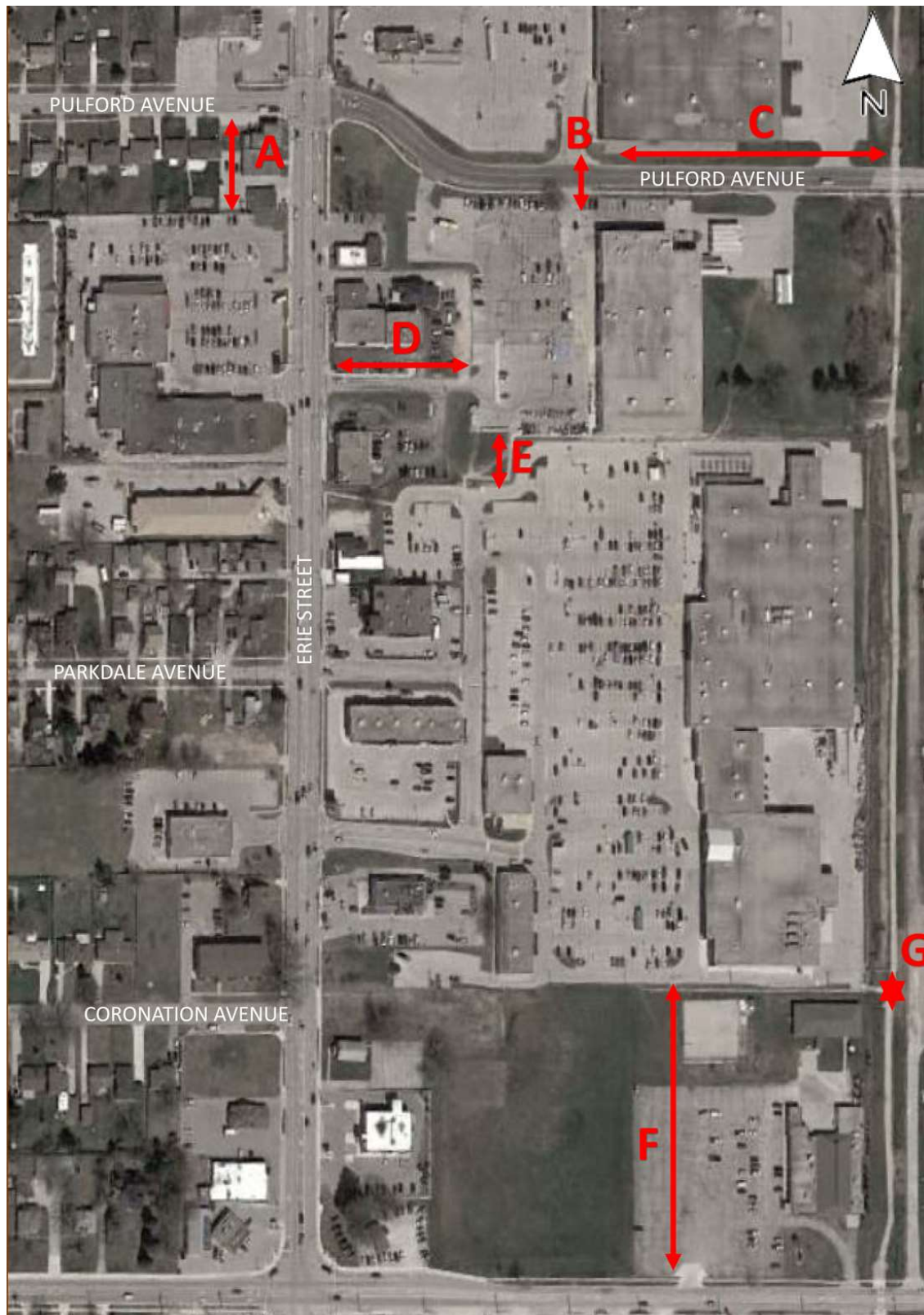


Figure 8-24 Study Area Network Connections Reviewed

A summary review of identified area connections is provided below:

- **A** – A potential connection from Pulford Avenue west of Erie Street to the commercial plaza at 269-275 Erie Street. The proximity to this location to the Erie Street and Pulford Avenue intersection access will impact intersection operation as discussed in **B15**. It has been indicated that left-turning volumes don't fully clear at the signalized intersection and an access that can provide an alternate to eastbound left-turns be considered.

An access onto Pulford Avenue closer to the rear of plaza parking lot (vicinity of 10 Pulford Avenue) would be a safer alternative to accommodate turning movements. This would be a costly alternative as property acquisition would be required. A connection at location A as shown is **not recommended**.

- **B** – A pedestrian connection at this location was reviewed based on desire lines and existing pedestrian crossing habits as part of **B16**. A crossing at this location will connect to a proposed MUP along Pulford Avenue and the existing sidewalk at the plaza driveway significantly improving safety for users and as such is **recommended**
- **C** – Site visit observations noted the presence of a pedestrian desire line from the east trail to the plaza parking lot. A connection was considered for this area however, an existing grade change at the plaza entrance and preference of a proposed MUP on southside of Pulford Avenue resulted in further connectivity at this location being **not recommended**
- **D** – Desire line at this location per the worn path due to pedestrians activity provides support to this connection being formalized to provide improved safe internal connection, as such this is **recommended**
- **E** – Examined as part of the inter-parcel connectivity discussed in **B18** this connection will accommodate both vehicle and pedestrian traffic. Implementation will reduce turning movements at commercial accesses on Erie Street, allowing trips to be made internally between parcels. Due to the convenience afforded to shoppers by this connection reduction in traffic volumes on Erie Street this connection has been **recommended**
- **F** – Another inter-parcel connection reviewed in **B18**, this connection will provide direct connectivity to Seacliff Drive and remove some volume from Erie Street. Impacts to existing parking lots and connection location are to be considered. This connection however has been **recommended**
- **G** – An existing connection from the commercial plaza to the east trail (see [Figure 8-25](#)), some maintenance is required for the existing connection (see [Figure 8-26](#)). Damage to the steps up to the plaza need to be repaired, clearing of vegetation is needed and regular repairs and upkeep of the handrail and fencing are **recommended**



Figure 8-25 Existing Trail Connection

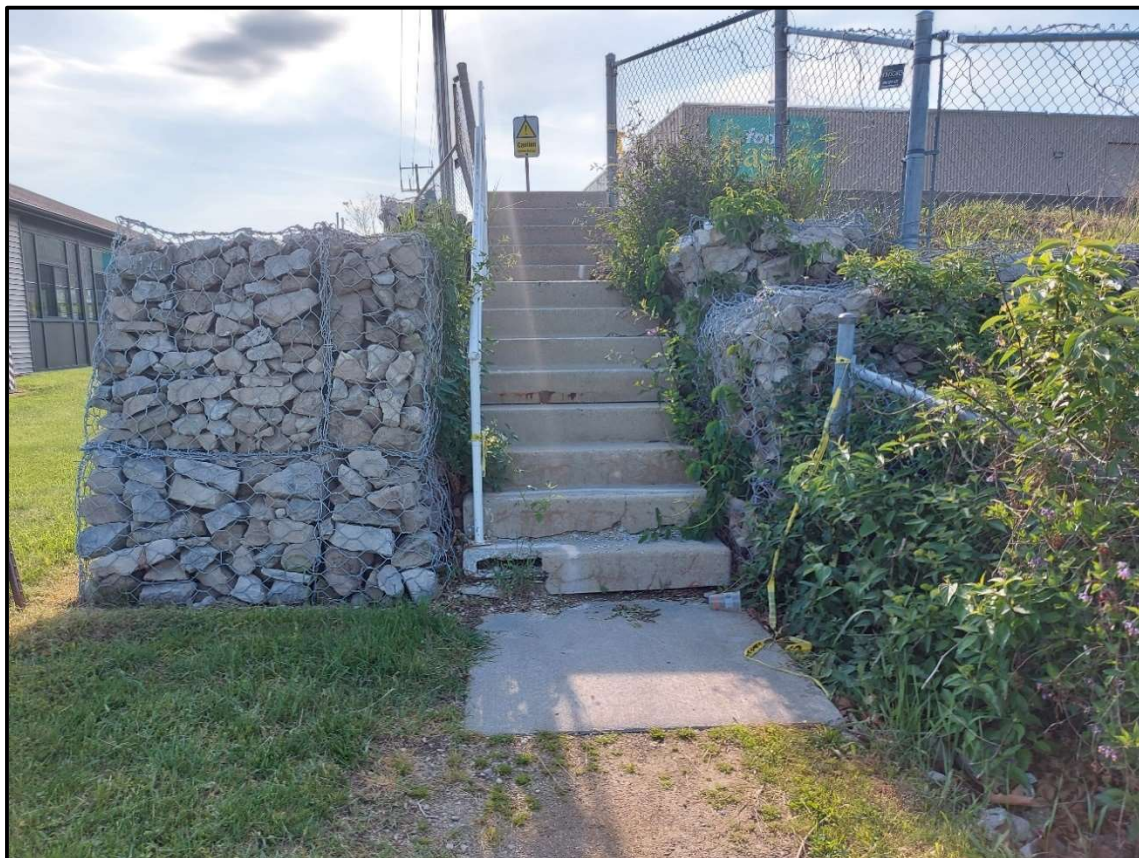


Figure 8-26 Damage to Step Connection from Commercial Plaza to East Trail

An active transportation network for the study area incorporating recommendations for potential solutions reviewed in Section 8 has been summarised in Figure 8-27.

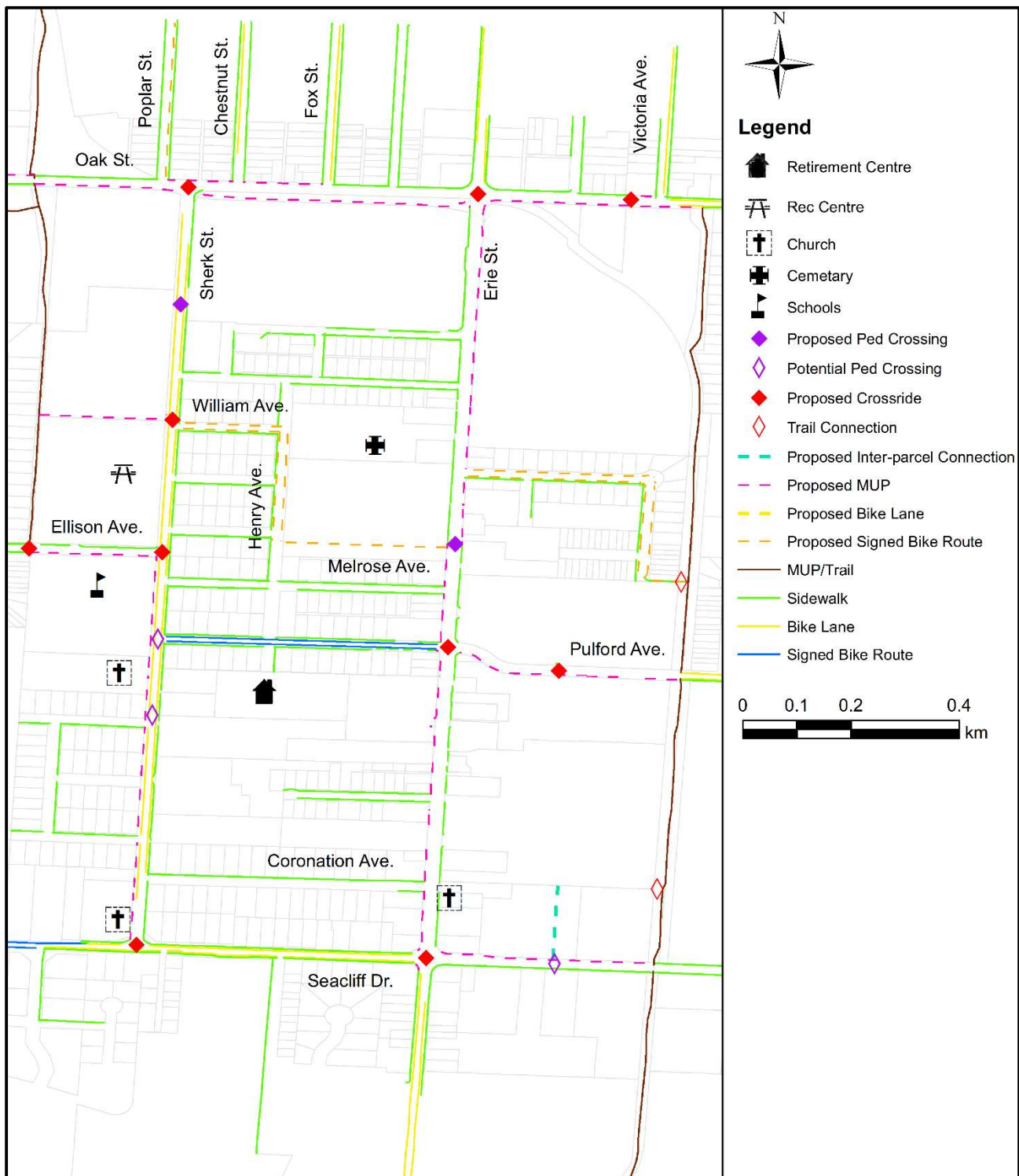


Figure 8-27 Future Study Area Active Transportation Network

8.3 Other Area Network Solutions

8.3.1 Seacliff Drive and Cherry Lane

Although outside of the study area boundary the intersections of Cherry Lane and Danforth Avenue were included for study intersection assessment under existing and future conditions. Under future conditions the intersection of Seacliff Drive and Cherry Lane operates with turning movements having long delays and operating over capacity. A traffic study for the Municipality of Leamington dated August 2019 identified improvements to the intersection and adjacent road network. Key recommendations for the Cherry Lane intersection included:

- Relocation of the Curling Club driveway opposite Cherry Lane
- Signalization of the Seacliff Drive and Cherry Lane intersection
- Signalized crossrides at the west and south legs of the proposed signalized intersection
- Separate turning Lanes for Cherry Street on to Seacliff Drive
- Multi-use path be provided on the northside of Seacliff Drive between the east trail and Cherry Lane

Analysis for the intersection with recommendations indicate shows the signalized location will operate with acceptable level of service, reduced delay and all movements will have significant reserve capacity. The report for the intersection including findings and recommendations provided in **Appendix M**. Based on a review of the report, recommendations proposed are supported by this study for implementation.

8.3.2 Seacliff Drive Accesses and Connections

A number of commercial driveways are present along the south side of Seacliff Drive. Should redevelopment of any properties in this area occur it is recommended that consolidation of driveways be undertaken where possible to reduce the number of access points. Should the new north-south connection to Seacliff Drive be implemented alignment and consolidation of accesses to the property on the south side along with relocation of the Roma Club access(es) to an internal connection.

The lack of a direct pedestrian connection from the Service Ontario located in the commercial plaza at 24 Seacliff Drive and the bus stop in front of the plaza on Seacliff Drive has been identified as a concern for residents. It is recommended that a barrier free connection that is suitable for users of all ages and abilities be provided from the plaza to the bus stop. The required connection location is shown in **Figure 8-28**.



Figure 8-28 Seacliff Drive Plaza Barrier Free Connection

8.3.3 Engagement and Education

Engagement and educational campaigns that focus on the availability and safe use of existing and future active transportation facilities and programmes that increases safe non-auto movement of individuals through out the study area.

During the study process it was identified the study area did not have a Business Improvement Area (BIA) group or commercial working group. Development of a BIA working group can be beneficial for core areas to collectively develop strategies, such as providing delivery/pick up services, coordination of incentives and promotions to lure customers out of peak period trips, that can assist in reducing traffic volumes on main corridors during peak times.

A common travel method or means of obtaining services in today's world is through the use of app-based services such as ridesharing, public transit, micro-mobility and ordering services and more. Working with a BIA or individual business in key corridor areas can potentially offer services that members of the community can utilize to eliminate trips they may otherwise have taken.

Teleworking is an ever-expanding way of doing business which has increased exponentially with the pandemic. Individuals working remotely has grown at a rate that means fewer people require a car for a 9 to 5 commute. The Municipality can seek to partner with suitable business to offer incentives to employees to work remotely where possible to reduce auto trips on the road network.

Programs and information packages in different languages to reach “*all members of the community*” is recommended to help improve how individuals use the road and educate them on AT options and networks. Program should promote safety at crossing locations for drivers, cyclists and pedestrians. The Municipality can work with farms and other major stakeholder groups within the area (schools, library’s, commercial stores driving schools) to distribute information and host workshops to reach as many road users as possible to improve knowledge about safe road usage.

8.3.4 Signage and Wayfinding

The layout of the study area means there are limited access routes to commercial areas, thus during peak periods locations that are unsignalized may experience long delays. An example of this is the unsignalized Freshco access at Erie Street. Signage to encourage drivers to use other accesses where they are available can be implemented to reduce queuing at highly utilized locations

8.3.5 Micro-mobility

Micro-mobility generally refers to short commutes of less than 5-10km and use of vehicles that don’t exceed 24 km/hr. Micro-mobility aims to solve the transportation problems of cities and urban spaces and is a growing trend due to the level of convenience, affordability and environmental friendliness. It is considered an effective solution for last mile transportation. E-scooters and e-bikes fall into this category, using clean energy like rechargeable batteries to fight climate change and provide a sustainable means of transportation. Regular bike share can also be included as part of the mobility program.

Micro-mobility can be easily integrated with other strategies and provide a steppingstone for initiatives targeting increased transit use, curbside management of car and ride-share programs. These solutions can share MUP infrastructure proposed for Erie Street, Oak Street, Sherk Street, and Seacliff Drive. Micro-mobility stations can be installed at key locations such as farms, commercial shopping areas, hotels and the pier. Location of stations within a defined micro-mobility area will provide transport to visitors entering or exiting the area.

9.0 SUMMARY OF RECOMMENDATIONS

A number of recommendations have been proposed following a review of the study area network for existing and future conditions. Recommendations have been proposed to address many of the operational concerns and network deficiencies identified. A summary of study recommendations is provided in *Table 9-1*.

Table 9-1 Recommendations Summary Table

Study Area Location	Proposed Study Area Recommendations
Oak Street	<ul style="list-style-type: none"> - Provide MUP on the north side of Oak Street from the west trail to Westmoreland Avenue and from Poplar Street to Fox Street - Shared northbound bicycle provided from Poplar Street - Provide MUP on the south side of Oak Street from the west trail to the east trail - Provide crossrides: <ul style="list-style-type: none"> - on all approaches of the Sherk Street and Oak Street intersection - across Chestnut Street at Oak Street - at intersection with Erie Street on east, west and, south approaches with connections to MUP or existing bicycle lanes - across Victoria Avenue at Oak Street and at the signalized intersection at the Highbury Canco Access on Oak Street - Provide MUP on the north side of Oak Street from the from traffic signal at Highbury Canco to Victoria Avenue
Sherk Street	<ul style="list-style-type: none"> - Provide a pedestrian crossing between Highbury Canco access gate and parking lot and provide sidewalk in parking lot - Provide MUP on the north side of NFFRC that connections to crossride across Sherk Street and NFFRC access - Signed bike route from Williams Avenue/Henry Street/through cemetery to crossride on Erie Street - Signalization of the Ellison Avenue and Sherk Street intersection (not defined by this study) - Provide crossrides and cycle track at intersection of the Ellison Avenue and Sherk Street for users of all ages and abilities - No closure of Melrose Avenue at Sherk Street - Provide MUP on the west side of Sherk Street from Ellison Avenue to Seacliff Drive when demand and/or traffic volumes trigger the need for separation of cycling facilities - Potential future crossing/crossrides to be considered at the intersections of Pulford Avenue, Margaret Street or Audrey Street - Provide crossrides and cycle tracks at intersection of Sherk Street and Seacliff Drive for users of all ages and abilities
Ellison Avenue	<ul style="list-style-type: none"> - Remove pedestrian crossing at Ellison Avenue and Queens Hill Crescent / Orchard Heights Avenue and provide crossride at across Ellison Avenue at the west trail - Provide MUP on the south side of Ellison Avenue from west trail to Sherk Street
Erie Street	<ul style="list-style-type: none"> - Provide MUP on the east side of Erie Street from Oak Street to 238 Erie Street and on the west from 238 Erie Street to Seacliff Drive - Provide AT facility across Erie Street between MUP on east and west sides of Erie Street - Provide crossride on west and south legs of Pulford Avenue and Erie Street intersection - Annual signal timing reviews be done to make appropriate adjustments to better accommodate changing traffic volumes

Seacliff Drive	<ul style="list-style-type: none"> - Dedicated westbound right-turn lane to be provided at Sherk Street intersection - MUP to be provided on the north side Seacliff Drive from Erie Street consistent with the Municipalities AT plan - Inter-parcel connection from Walmart plaza to Seacliff Drive recommended, with pedestrian crossing across Seacliff Drive - Barrier free pedestrian connection from Service Ontario plaza to bus stop on south side of Seacliff Drive - Signalization of the Cherry Lane and Seacliff Drive intersection (not defined by this study) - Consolidation of driveway access on the south side of Seacliff Drive where possible in the event of any redevelopment
Pulford Avenue	<ul style="list-style-type: none"> - Provide MUP on the south side of Pulford Avenue from Erie Street to the East Trail and remove existing bicycle lanes - Advanced left-turns to be considered at intersection with Erie Street. Implementation to be based on assessment and traffic demands at intersection. Annual assessment to be considered. - Provide a shared crossing on the east side of the Walmart and Canadian Tire driveway access to accommodate pedestrians and cyclist - Shared lanes to be maintained on Pulford Avenue between Sherk Street and Erie Street, with future consideration for MUP on the south side of Pulford Avenue
Other	<ul style="list-style-type: none"> - Network connections: <ul style="list-style-type: none"> - Connection from commercial plaza at 269-275 Erie Street to Pulford Avenue is not recommended - Connection on north side of Pulford Avenue from east trail to commercial plaza not recommended - Pedestrian connection along north side of driving lane at Canadian Tire access at Erie Street is recommended - Interconnection of Walmart and Canadian Tire plazas for vehicle and pedestrians is recommended - Maintenance repair of existing connection from the commercial plaza to the east trail is recommended - AT facility to be implemented between east and west trails via a combination of new MUP's, signed bicycle routes and crossride facilities - Education and engagement programs can be implemented to provide safer road usage and development of strategies to reduce network trips - Micro-mobility can effectively be introduced to reduce trips and can include e-bikes and e-scooters - Provide signage and wayfinding to encourage use of all accesses at commercial plazas. Unsignalized accesses on Erie Street will incur longer delays for left-turn movements

Note: Signal timing upgrades proposed for network intersections to improve future operation