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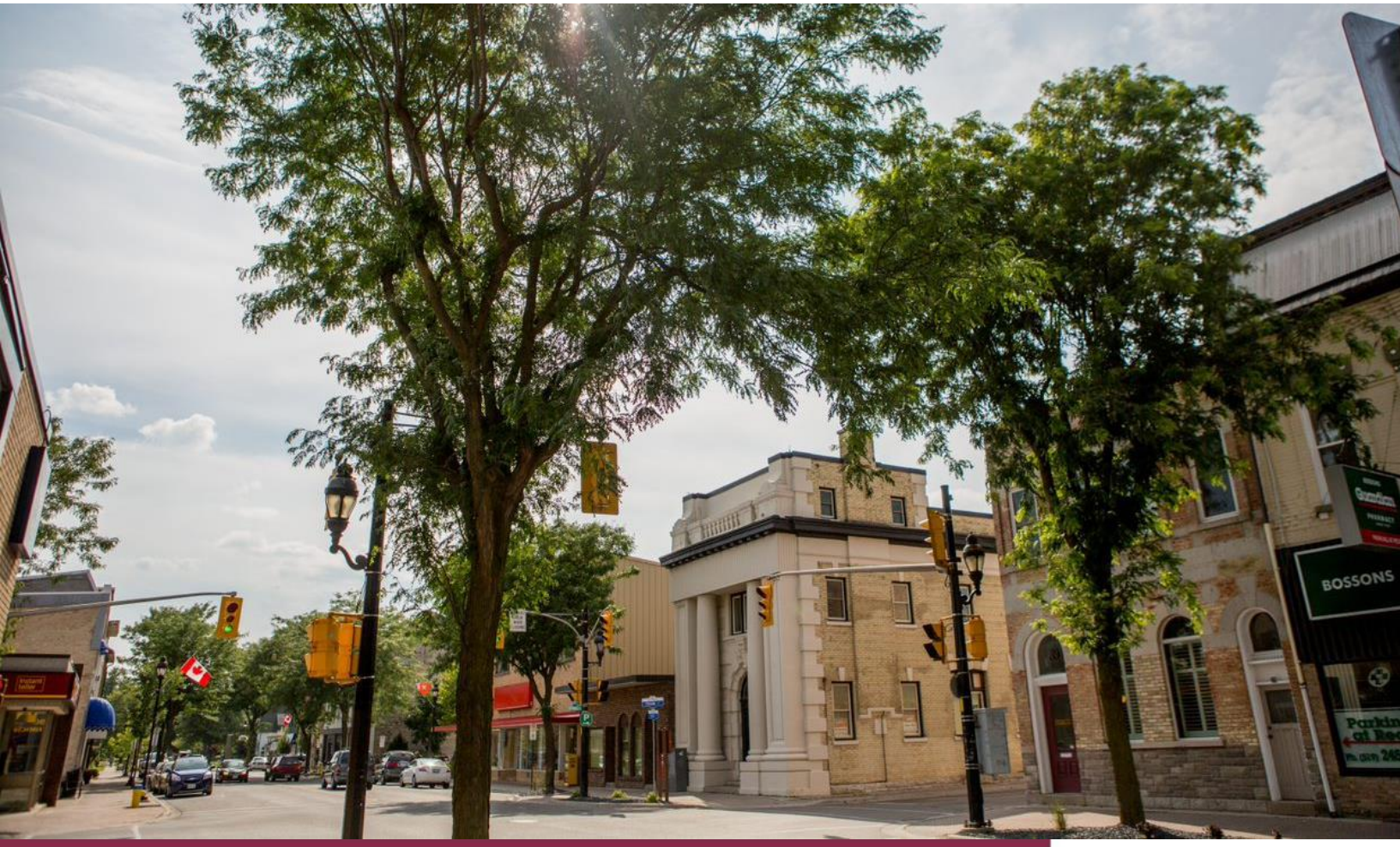


Strathroy-Caradoc

TRANSPORTATION MASTER PLAN

GROWING TOGETHER
STRATHROY-CARADOC
URBAN OPPORTUNITY - RURAL HOSPITALITY
Comprehensive Planning for Tomorrow

Table of Contents

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Introduction

The purpose of the Transportation Master Plan (TMP) is to prepare the Municipality for the future forecasted growth in population and employment and plan for changing travel behaviours. By incorporating emerging technology and mobility trends affecting travel behaviour, the TMP offers proactive strategy to adapt to them. Developing a TMP enhances the Municipality's existing transportation facilities in the short-term and sets a course towards a more sustainable, integrated, and multimodal transportation system for the future.

The TMP has been prepared under the Municipal Class Environmental Assessment (MCEA) process for master plans. The TMP addresses MCEA Phase 1 (opportunity statement) and Phase 2 (alternatives assessment) and has included public consultation in order to fulfill this process.

Existing Transportation Network

To begin the process of planning an efficient and effective transportation network, an inventory of all existing transportation facilities and amenities was undertaken. Understanding where and what types of facilities have already been constructed across Strathroy-Caradoc helps to maintain the value of past investments and identify current travel patterns. Although a largely auto-centric community, Strathroy-Caradoc maintains a wide assortment of transportation facilities supporting several different travel modes. This includes trails, sidewalks and on-road cycling routes that support active transportation, transit services, and an extensive road network that supports the movement of automobiles and heavy trucks. Equally important to review and document are amenities that regulate and control the movement of modes, both in their own designated operating spaces and at points where these different spaces intersect. This includes traffic controls and at grade and grade separated mode crossings (bridges, underpasses).

Existing Policy Review

The Transportation Master Plan (TMP) will be updated to ensure it conforms with applicable County and Provincial plans and policies, that concern accessibility, traffic operations and other key considerations. Additionally, the TMP was developed to be consistent with the current Provincial Policy Statement (2020). The Plan was also coordinated and aligned with relevant municipal plans and strategies to the greatest extent possible. Key examples include the County of Middlesex Official Plan, Middlesex County Strategic Plan (2021-2024), Middlesex County Cycling Strategy, Middlesex County Economic Development Strategy Update, Strathroy-Caradoc Strategic Plan 2020-2029, Downtown Strathroy Master Plan and North Meadows Secondary Plan. Further, our commitment to collaboration places an emphasis on governance and coordination, including the need for community stakeholder engagement and communications throughout the plan's development and implementation process.

Transportation Principles

Understanding existing conditions helped inform the development of the TMP's vision statement (MCEA process Phase 1 opportunity statement), which reads:

> The Strathroy-Caradoc transportation network is **accessible to all**, and prioritizes the **connectivity**, **comfort**, and **safety of vulnerable road users**. The transportation network aligns with broader **growth plans** for the municipality, including the growth of more **sustainable modes of travel**, and provides **options** for people to travel by whatever **mode** they choose.

Essential to the development of Strathroy-Caradoc's TMP was a public engagement program held over the course of the project. The program was designed to offer a wide range of means to offer feedback, which would ensure all key stakeholders could sufficiently share their concerns, aspirations, and priorities for the plan. Due to the ongoing COVID-19 pandemic, all activities were facilitated using several interactive online programmes. This innovative approach allowed for greater flexibility and convenience in how participants could engage with the project. Public engagement for Strathroy-Caradoc's TMP was broadly organized within two rounds of consultation. Complimentary of these activities, members of the municipality's project team were also routinely consulted for their input and direction across key milestones in the project process.

Future Condition Assessment

While the TMP offers guidance related to the selection, design and implementation of active transportation, additional specification will be deferred to other relevant policies. Greater detail on the identification, design and delivery of off-road trail routes is provided within the Recreational Trails Master Plan – which was developed concurrently with the TMP. Additionally, many of the on-road cycling network recommendations will be taken from the Middlesex Cycling Strategy, which holds jurisdiction within Strathroy-Caradoc. Rather than involve the development of a complete active transportation facility network, active transportation work completed as part of the TMP primarily served to address outstanding gaps from previously proposed networks and that proposed as part of the Recreational Trails Master Plan (RTMP).

There was considerable dialogue regarding transit throughout the course of the study. Reviewing examples of other municipalities that are similar to Strathroy-Caradoc provided two options for transit service, including fixed-route service and on-demand service. On-demand transit service appears to be a logical starting point for the introduction of municipal transit. The inter-community transit service pilot has shown that there is a demand for travel to and from towns in Strathroy-Caradoc. Ridesharing services, such as local taxi services, Uber or Lyft could also be considered as viable options. It is recommended that the Municipality partner with neighbouring municipalities, public providers, existing private taxi operators, and ride-hail apps potentially available to community residents in the future to provide a form of on-demand transit service to and from key community locations in Strathroy, as well as other parts of the Municipality, like Mt. Brydges, industrial areas, and major farming operations.

Given the existing conditions and initial feedback from stakeholders, the TMP then sought to address Phase 2 of the MCEA process: the assessment of alternative future scenarios. The forecast population and employment were added to the existing road network in a transportation travel demand model to determine if existing road infrastructure would be sufficient to meet future demands. The first scenario was modelled to have no transportation infrastructure improvements. The modelling results showed that Caradoc Street between Metcalfe and Carroll Streets would be expected to be approaching over capacity in the long-term. The focus of the TMP is on new roads to provide access to future developments and improving intersections (through signalization or roundabouts) to accommodate forecast growth. The second and third alternatives identified additional road links to be considered that improved connectivity of the network. The fourth alternative, which is the preferred option, seeks to utilize McEvoy Road as an alternative access to Strathroy and provide a "road diet" to Caradoc Street to reclaim this road for people. Numerous new roads are proposed in Strathroy and Mt. Brydges to accommodate future development. In the long-term, extensions of Jenna Drive and Pannell Lane can be considered in coordination with the Township of Adelaide Metcalfe to facilitate further development on the northwest portion of Strathroy-Caradoc. This preferred alternative also includes the identification of a number of intersections that may need to be improved with signalization or roundabouts in the future to accommodate growth.

Supportive Transportation Policy

Transportation policies that support and help implement the TMP also were reviewed as part of the TMP. A Complete Streets policy was developed and Traffic Calming methodology was prepared. Other policy items addressed include road design, community speed limits, transportation elements of new developments, railway crossings, electric mobility, and goods movement. All of the policy work is recommended to be incorporated under the umbrella of a Complete Streets policy and incorporated into the Official Plan, as appropriate. The policy states the transportation network should be designed, constructed, operated, and maintained for all modes of transportation and all transportation users.

Implementation Strategy

With the preferred transportation alternative identified, the recommended road improvements were incorporated into an implementation plan that groups the projects into short (generally in the next five years), medium (generally in the next six to 15 years) and long term (generally in the next 16 to 25 years) timeframes. The recommended improvements of the preferred alternative and their proposed timing is presented in the report.

High-level costs for these improvements were calculated and available funding sources were identified. A performance monitoring plan was also developed to help gauge how the investments in transportation infrastructure are influencing the way people travel.

Summary of Recommendations

The recommendations for seven key areas of study have been summarized to provide all the strategic actions which represent the next steps to implement the TMP.

Active Transportation

Network Recommendations

- Combine recommendations of the existing Middlesex County Cycling Strategy and Recreational Trails Master Plan conceptual trails network with newly identified linkages to create a complete network which integrates the on-road and off-road systems.
- Consider and review warrants for potential pedestrian crossings.
- Consider rail crossing surface improvements and other potential rail safety improvements at key routes along the active transportation network.

Programming Recommendations

- Expand the Ontario Active School Travel Program within a greater number of local schools.
- Align existing facility maintenance standards with the guidelines of the Minimum Maintenance Standards for Municipal Highway (O. Reg 239/02), as amended.

Transit

- Consider on-demand transit service as an introduction of municipal transit.
- Consider a range of management and contracting options, including partnering with neighbouring municipalities, public, and private service providers.

Road Network

- Select Alternative four as the preferred alternative for the Municipality’s future road network, which includes new roads and improvements to existing intersections to accommodate future residential, industrial growth, and re-imagines Caradoc Street for people.
- Roads will be upgraded in accordance with the Municipality's Servicing standards and no new roads are recommended purely for capacity concerns.

Complete Streets Policy

- Adopt the Complete Street Policy in order for the municipality’s street network to be designed, constructed, operated, and maintained for all users and all modes of travel.

1

Introduction

STRATHROY-CARADOC
TRANSPORTATION
MASTER PLAN

1 Introduction

1.1 What is a Transportation Master Plan?

A Transportation Master Plan (TMP) is a flexible living document that establishes the vision for moving people and goods across the Municipality by assessing the existing transportation network and performance as well as, determining future demand based on population and employment forecasts. From there, the TMP then develops actions and policies to address the Municipality's needs with respect to active transportation, transit and road infrastructure and services.

The TMP recommendations seek to achieve the community's expressed vision of a well-connected, inclusive, and accessible transportation system that caters to the needs of all users and all modes of travel. A TMP can serve many functions, including:

- A community vision: meeting the mobility needs of existing and future generations;
- A communication tool: to discuss mobility challenges and opportunities to address these; and
- An implementation guide: setting a framework for what is going to be done when.

The Municipality's Recreation and Trails Master Plan (RTMP), which was developed alongside the TMP, focused on walking and cycling infrastructure network. Recommendations from the Recreation and Trails Master Plan have been directly inputted into the TMP.

A Transportation Master Plan is typically updated every five to ten years to proactively adapt to changes in legislated policy as well as socio-economic, technological and mobility trends, and addresses these changes in a community-specific manner.

1.2 Municipal Context

The Transportation Master Plan (TMP) for Strathroy-Caradoc has a dual purpose of providing high-level, municipal-wide recommendations for walking, cycling, transit and roads, while at the same time addressing pressing localized issues regarding travel in the municipality. The Municipality wishes to prepare an implementation plan of multi-modal improvements and support this with numerous transportation-related policies that can be incorporated into the Official Plan.

The Municipality is planning for forecast growth that will see the population increase from 21,590 in 2016 to 35,360 by the year 2046. This growth of 13,770 people represents 64% growth in population over this 30-year time period.

1.3 Purpose and Project Approach

The purpose of the TMP is to ready the Municipality for the future forecasted growth and to plan for changing travel behaviours. By incorporating emerging technology and mobility trends affecting travel behaviour, the TMP is able to strategize ways for proactively adapting to them. This report is intended to reflect these trends and strategize how to proactively adapt to them. Developing a TMP enhances the Municipality's existing transportation routes in the short-term and sets a course towards a more sustainable, integrated, and multimodal transportation system for the future.

The following TMP sets the stage for the approach that is being taken to address growth, travel behaviour, and changing trends in Strathroy-Caradoc. The document serves as a long-range planning tool for the Municipality, defining and prioritizing transportation infrastructure till the year 2046. Underpinning the approach taken to develop the municipality's TMP are three key principles:

1. Improve management of its transportation related resources in a collaborative and financially responsible manner;
2. Support infrastructure recommendations that allow users from across the municipality to travel by their mode of choice; and
3. Proactively address transportation issues through the creation of a visionary sustainable, multi-modal network and provide strategic guidance on maintenance.

1.4 MCEA Process

The TMP was developed in accordance with the Municipal Class Environmental Assessment Process for master plans, which requires the following key steps and stages:

- Phase 1: Development of an opportunity statement, objectives and an overall TMP vision;
- Phase 2: Development and evaluation of alternative scenarios and a preferred alternative; and
- Consultation: Engagement of public representatives and stakeholders at least twice over the course of the study.

2

Existing Transportation Network

STRATHROY-CARADOC
TRANSPORTATION MASTER PLAN

2 Existing Transportation Network

To begin the process of planning an efficient and effective transportation network, an inventory of all existing transportation routes and amenities should be undertaken. Understanding where and what types of routes have already been constructed across Strathroy-Caradoc helps to maintain the value of past investments and identify current travel patterns. Although a largely auto centric community, Strathroy-Caradoc maintains a wide assortment of transportation routes supporting several different travel modes. This includes trails, sidewalks and on-road cycling routes that support active transportation, transit services, and an extensive road network that supports the movement of automobiles and heavy trucks. Equally important to review and document are amenities that regulate and control the movement of modes, both in their own designated operating spaces and at points where these different spaces intersect. This includes traffic controls, signalized and unsignalized, and at grade and grade separated mode crossings (bridges, underpasses).

2.1 Active Transportation Network

As a municipality characterized by its scenic landscapes, active transportation in Strathroy-Caradoc has long been celebrated as a source of recreation and way to reconnect with nature. This importance is demonstrated through the extent of Strathroy-Caradoc's existing active transportation (AT) and off-road trails network, found in both its urban areas and conservation sites, and relevant aspirations stated in its Official Plan and recent Strategic Plan. These routes remain vital sources of recreation and mobility for the municipality's residents and its visitors.

Owing to the distribution of the municipality's population, the majority of Strathroy-Caradoc's existing active transportation routes remained concentrated within the settlement areas of Strathroy and Mt. Brydges. This includes sidewalks along main roadway arteries and primary residential areas, as well as localized trail connectors through parkland and nearby natural areas. Separate from which these areas, there are also walking and hiking trails found within the municipality's conservation areas, including: Mill Stream Conservation Area, Clark Wright Conservation Area, Longwoods Road Conservation Area, and Strathroy Conservation Area.

While offering a valuable foundation, many of these routes remain either isolated or fragmented, rather than integrated as part of one continuous, broad network. This includes the absence of a dedicated active transportation corridor between the communities of Strathroy and Mt. Brydges, as a well as continuous localized networks within them. This results in active transportation being largely used as a source of passive recreation, rather than a means to travel between different communities and travel destinations across the municipality.

2.1.1 Sidewalks

All of the municipality's existing sidewalk facilities are found within the urban areas of Strathroy, Mt. Brydges, and Melbourne **(Figure 1).** This includes along main streets as well as the local streets of their respective central residential areas, such as Centre St W. Within Strathroy, sidewalks along key popular commercial streets remain enlarged, either to accommodate seating, greenery, decorative lighting, or other features which enhance the streetscape. Key examples include sections of Front St E and Frank St. Although already featuring sidewalks, plans have also been adopted through the Municipality's Downtown Strathroy Master Plan, to incorporate similar sidewalk enhancements along Head St, James St, and Centre St.

Figure 1: Section of Frank St within Downtown Strathroy, which Features Wide Sidewalks with Additional Space for Amenities

(Source: Strathroy Downtown Master Plan)

Complimentary to these sidewalk facilities, the central Strathroy area also features a trail system along the northern banks of the Sydenham River. Stretching over 3-kilometers long, the facility provides connections to both the town's commercial core as well as the nearby natural areas of Alexandra Park and the Strathroy Conservation Area. As an additional recommendation of the Municipality's Downtown Master Plan, several improvements have been proposed for the facility. This includes re-landscaping the approach to the existing Frank St pedestrian bridge, adding along Sydenham River's south bank and constructing a new foot bridge across the river at the site of the old dam at Pincombe Pond located in Strathroy Conservation Area.

2.1.2 Cycling Routes

Strathroy-Caradoc maintains a limited network of both on-road and off-road routes. Currently, County Roads within the municipality feature either a gravel shoulder or partially paved / partially gravel shoulders. Specific roadways include: County Rd 9, County Rd 81, County Rd 14, County Rd 11, County Rd 2, and County Rd 39. Along County Rd 81 through the settlement area of Mt. Brydges and a section of Calvert Dr, fully paved shoulders are provided (**Figure 2**). Complimentary of these on-road routes, the municipality also features off-road paths suitable for cycling within local conservation areas.

Figure 2: Paved Shoulders Along Adelaide St, within Central Mt Brydges

(Source: Google Maps, 2021)

2.1.3 Trail Routes

Strathroy-Caradoc features many conservation areas, comprised of trails and pathways that accommodate hikers, cyclists, and other forms of active transportation. Key areas include: Mill Stream Conservation Area, Clark Wright Conservation Area, Longwoods Road Conservation Area, and Strathroy Conservation Area **(Figure 3).** The Strathroy Conservation area is located directly within the urban centre and offers a 3-kilometre trail that provides connections to several parks and other nearby natural areas, all of which fall under the jurisdiction of either the St Clair Region Conservation Authority or Lower Thames Valley Conservation Authority.

Figure 3: A Pedestrian Bridge Located within the Strathroy Conservation Area

(Source: St Clair Region Conservation Authority)

2.1.4 Middlesex County Cycling Network

In 2018, Middlesex County (Strathroy- Caradoc's parent municipality) adopted a county-wide cycling strategy. The document lists a series of recommended programs and infrastructure to improve cycling safety, comfort, and access across all parts of the County. Among these items included a series of newly proposed cycling routes within Strathroy-Caradoc, located along County Roads. These projects were specifically chosen, in offering a considerable benefit to network connectivity, their support for existing cycling or a considerable safety benefit to existing conditions.

The Middlesex County cycling routes are shown in **Figure 50**, **Figure 51**, and **Figure 52** with the future cycling network.

2.1.5 Provincial Cycling Network

Complimentary of the Middlesex County Cycling Strategy's proposed cycling network, Strathroy Caradoc also includes segments of the province-wide cycling network. Detailed within the #CycleON Action Plans 1.0 and 2.0, the network features a grid of key cycling routes along provincially owned highways, that connect all regions of Ontario. This includes a section which generally follows the alignment of Highway 81 (Adelaide Rd) within Strathroy Caradoc. As a key travel route within the municipality which connects its two largest population centers (Strathroy and Mt. Brydges), the route remains a key informant of all future network planning.

2.2 Transit Services

Current transit provision within Strathroy-Caradoc consists of a select number of services. This includes a few daily train trips, serviced by VIA Rail from the rail station in downtown Strathroy **(Figure 4)** and a recently launched inter-community transit pilot travelling between nearby urban centres. These services only facilitate connections to and from different regions, with no municipal transit service within Strathroy-Caradoc.

Figure 4: VIA Rail Passenger Rail Network, Across Southern Ontario and Quebec

(Source: VIA Rail)

2.2.1 VIA Rail

Located within the heart of Strathroy's downtown area off Metcalfe St W, lies the municipality's passenger rail station shown in **Figure 5**.The station serves as a flag stop station for Canada's national train service, VIA Rail. The station is serviced by two daily trips, one eastbound towards Toronto and one westbound towards Sarnia. These trips provide connections to the communities of Wyoming, London, Ingersoll, Woodstock, Brantford, Aldershot, and Oakville – in addition to the line terminals of Sarnia and Toronto.

Figure 5: The Strathroy Rail Station's Current Ticket Office

(Source: VIA Rail)

Per the Ministry of Transportation's (MTO) recently released draft Transportation Plan for Southwestern Ontario, opportunities are currently being explored to enhance the frequency and reliability of passenger service along this corridor. This includes investments to the existing rail infrastructure as well as consideration for a possible intercommunity transit service through improved connections between the VIA Rail and GO Transit passenger rail services.

2.2.2 Inter-Community Transit (Pilot project funded by MTO)

To enhance transit mobility across Southwestern Ontario, the Province of Ontario launched a community bus pilot, operating between Sarnia and London and some urban centres in-between, including Strathroy-Caradoc. Formally launched on August 4, 2020, the service operates three round trips on weekdays and two on weekends, with a bus that can carry between 10 and 12 passengers and is fully accessible. This includes stops within the Strathroy-Caradoc communities of Strathroy and Mt. Brydges, with stops at Front St E (by The Shops on Sydenham) and the intersection of Adelaide Rd and Glendon Dr, respectively. The service is provided through a private contractor, Voyago, and launched as part of Ontario Community Transportation Grant Program and was the result of investments paid into Canada Infrastructure Program. Fares for the service operate under a "by distance" structure, with the minimum fee being $5 and maximum being $20. This excludes children under the age of 5 who ride for free. A map of key stops and the route's alignment **(Figure 6),** as well as a breakdown of its respective fare structure **(Figure 7)** is provided within the figures below.

Figure 6: Routing of the Inter-Community Transit Pilot

(Source: Municipality of Strathroy-Caradoc)

Stop #		1	2	3	4	5	6	7	F-1
		London Airport	Downtown London	Komoka	Mount Brydges	Strathroy	Lambton Mall	Bayside Terminal	Flex Stop - VIA Sarnia
1	London Airport		$5	$10	$10	$10	$20	$20	$20
2	Downtown London	$5		$10	$10	$10	$20	$20	$20
3	Komoka	$10	$10		$5	$5	$15	$15	$15
4	Mount Brydges	$10	$10	$5		$5	$10	$10	$10
5	Strathroy	$10	$10	$10	$5		$10	$10	$10
6	Lambton Mall	$20	$20	$15	$10	$10		$5	$5
7	Bayside Terminal	$20	$20	$15	$10	$10	$5		$5
F-1	Flex Stop - VIA Sarnia	$20	$20	$15	$10	$10	$5	$5	

Figure 7: Inter-Community Transit Pilot "Pay-by-Distance" Fare Structure

(Source: Municipality of Strathroy-Caradoc)

Ridership data from November 2020 through January 2022 was provided. This shows that:

- Monthly ridership originating in Strathroy and Mt. Brydges was in the range of 25 to 70 riders or approximately 1 to 3 riders per day;
- A greater number of riders board the intercommunity shuttle from Strathroy as compared to Mt. Brydges, by ratios ranging from 2:1 to 10:1, depending on the month;
- Typically, London was a more popular destination; and

- Prior to the Provincial lockdown in November of 2020, ridership was consistently higher than in the following months. It is difficult to discern a trend, given this disruption in activity patterns.

While the passenger volumes are still low, the transit service is likely performing a valuable function for residents who cannot drive, who choose not to or, who cannot afford a car. The transit service connects them to an array of services, to social connections, and to the broader network of provincial transit services. In this way, transit service allows residents to stay in the Strathroy-Caradoc communities, maintaining economic, social life and stability.

Currently, VIA Rail and MTO's inter-community transit service are providing connections to the surrounding cities and municipalities including Sarnia and London. Daily VIA Rail services provide trips to Toronto. The inter-community transit service was implemented in August 2020 and the ridership information was reviewed from August 2020 to April 2021. Based on the pilot project, it is found that:

- 20-30% of the total ridership was from Strathroy and Mt. Brydges; and
- The most used route was 'Run 2 – to London' starting at 8:20 am.

2.3 Goods Movement Corridors

Owing to its proximity to major markets and the province's extensive 400 series highway network, the municipality of Strathroy-Caradoc is a key gateway for freight movement and industrial activity. There is a high concentration of freight-based routes and uses located throughout the municipality, including those within its two industrial parks. While the municipality benefits from its proximity to the 401-series highway, most valuable is the 402-series highway which features multiple exits and interchanges to the local road network. In addition to the nearby highways, considerable amounts of freight are also moved along the local segments of the provincial rail network. This includes the CN owned Strathroy rail subdivision as well as the CP owned Windsor and Chatham rail subdivisions.

2.3.1 Highway 402

As one of the original segments of the province's 400-series highway, Highway 402 represents a key transportation corridor between Southern Ontario and the US Midwest. In its current alignment, the highway extends between the Blue Water Bridge International Crossing into the United States (near Sarnia) and an interchange with Highway-401, just outside of London. Today, the highway services high volumes of traffic related to both trade as well as general travel. Segments located within Strathroy-Caradoc feature four traffic lanes, with two in each direction. In total, the highway features three interchanges with local roadways within the municipality, all designed under a "partial clover level (A4)" configuration. The intersecting roadway and exit number of these interchanges are as follows:

- County Rd 39 (Hickory Drive), Exit #69
- County Rd 14 (Glendon Drive), Exit #82
- County Rd 2 (Longwoods Rd), Exit #86

The Ministry of Transportation has recently signalled its intention of improving Highway-402's efficiency and reliability. This includes a commitment to expand truck parking along the highway through the repurposing of a former truck inspection centre.

2.3.2 County Roads (with interchanges to Highway 402)

Within the Strathroy-Caradoc area, there are several County roads that service a large portion of the municipality's vehicular traffic. Like most parts of Southwestern Ontario, many of these roads follow a grid-like pattern across the municipality. This includes County Roads 14, 2, 9 and 39, which mostly intersect the municipality at direct angles. The most notable exception is County Rd 81 (Adelaide), which winds its way through the municipality, connecting its two most prominent urban centres: Strathroy and Mt. Brydges. Another exception is County Rd 11 (Muncey Road), which connects the community of Muncey to County Rd 2 (Longwoods Road).

2.3.3 Rail Corridors

The municipality of Strathroy-Caradoc features considerable rail infrastructure, servicing both freight and passenger traffic. This includes segments of the CN Strathroy Subdivision, CN Chatham Subdivision and CP Windsor Subdivision, key trunk lines crossing large areas of Southern Ontario shown in **Figure 8**.

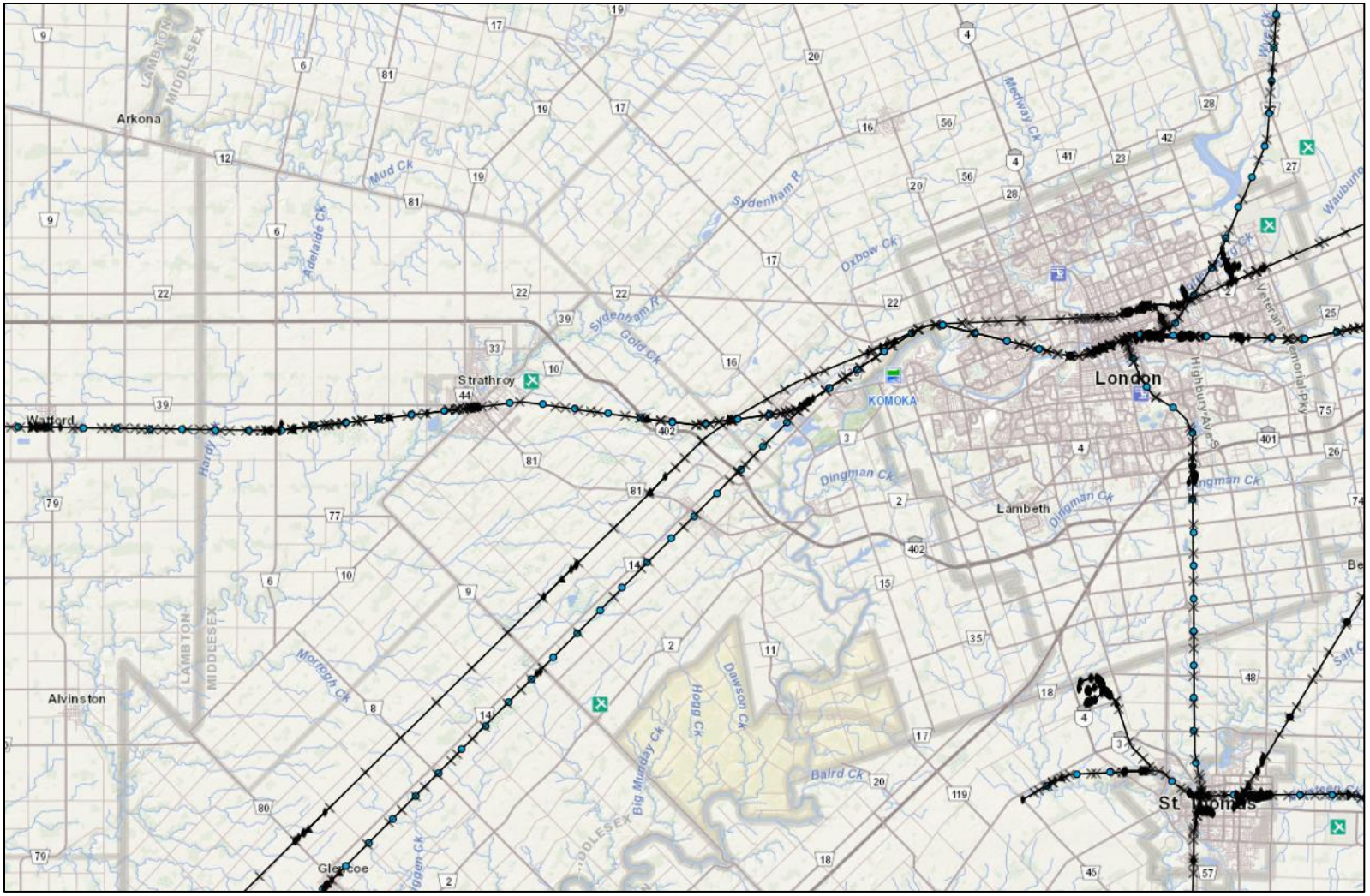


Figure 8: Alignment of Rail Corridors within Strathroy-Caradoc and Surrounding Areas

(Source: Ontario GeoHub)

Additional properties pertaining to each line is provided within **Table 1**.

Table 1: Summary of Key Properties of the Three Rail Lines that Intersect Strathroy-Caradoc

CN Strathroy Subdivision	CN Chatham Subdvision	CP Windsor Subdivision
Traffic along line is fully signalized (CTC Territory)	Traffic along line is fully signalized (CTC Territory)	Traffic along line is fully signalized (CTC Territory)
Local train station (CN Strathroy): located near the intersection with Metcalfe Street, at Mile 20.0	Crosses Adelaide St (Mt. Brydges) at mile 12.0	Corridor services a mix of passenger and freight traffic
Corridor used to be entirely double tracked but now features sidings	Corridor services freight traffic only	Corridor is exclusively single track
Corridor services a mix of passenger and freight traffic	Corridor is exclusively single track	

2.4 Street Network

The Strathroy-Caradoc road network is comprised of various components with different functions and applicable growth and planning policies. The framework is distinctive between the municipality's urban and rural areas, given the nature of travel and types of jurisdiction found within each. Within urban areas, road segments are categorized among one of three types: arterial roads, collector roads and local roads.

2.4.1 Jurisdiction (MTO, Middlesex County, SC)

As a lower-tier municipality, many segments of Strathroy-Caradoc's road network fall under the direct jurisdiction of, or shared ownership with Middlesex County (**Figure 9**). Referred to as "County Roads", these roadways generally function as either collectors or arterials. While distinguished by different functions, both arterial and collector road classes are designed to facilitate the efficient movement of traffic between provincial freeways, highways, and local roads (roads under the jurisdiction of local municipalities, including Strathroy-Caradoc). County owned arterial roads located within Strathroy-Caradoc include: County Rd 81, County Rd 14, County Rd 9, County Rd 10, County Rd 33, County Rd 37, County Rd 39, County Rd 44, and County Rd 2 ,while County Rd 11 remains the only County owned collector road. Provisional right-of-way widths for these road types are 36 m in rural sections reduced to 30 m in urban sections, or 30 m in rural sections reduced to 26 m in urban sections. One of the reasons for a wider right-of way for rural sections is to accommodate roadside ditches that are used for drainage.

Complimentary to County Roads, the Municipality of Strathroy-Caradoc also features a large segment of the provincially owned 402 Highway. Like other 400 series highways, the roadway features fully controlled-access and therefore fully grade separated from all intersecting roads and railways. Access to Highway 402 within Strathroy-Caradoc is provided at four different interchanges, each with County Roads (County Roads 2, 14, 39 and 81). Both the current operations and planned expansions to the roadway are under the jurisdiction of Ontario's Ministry of Transportation.

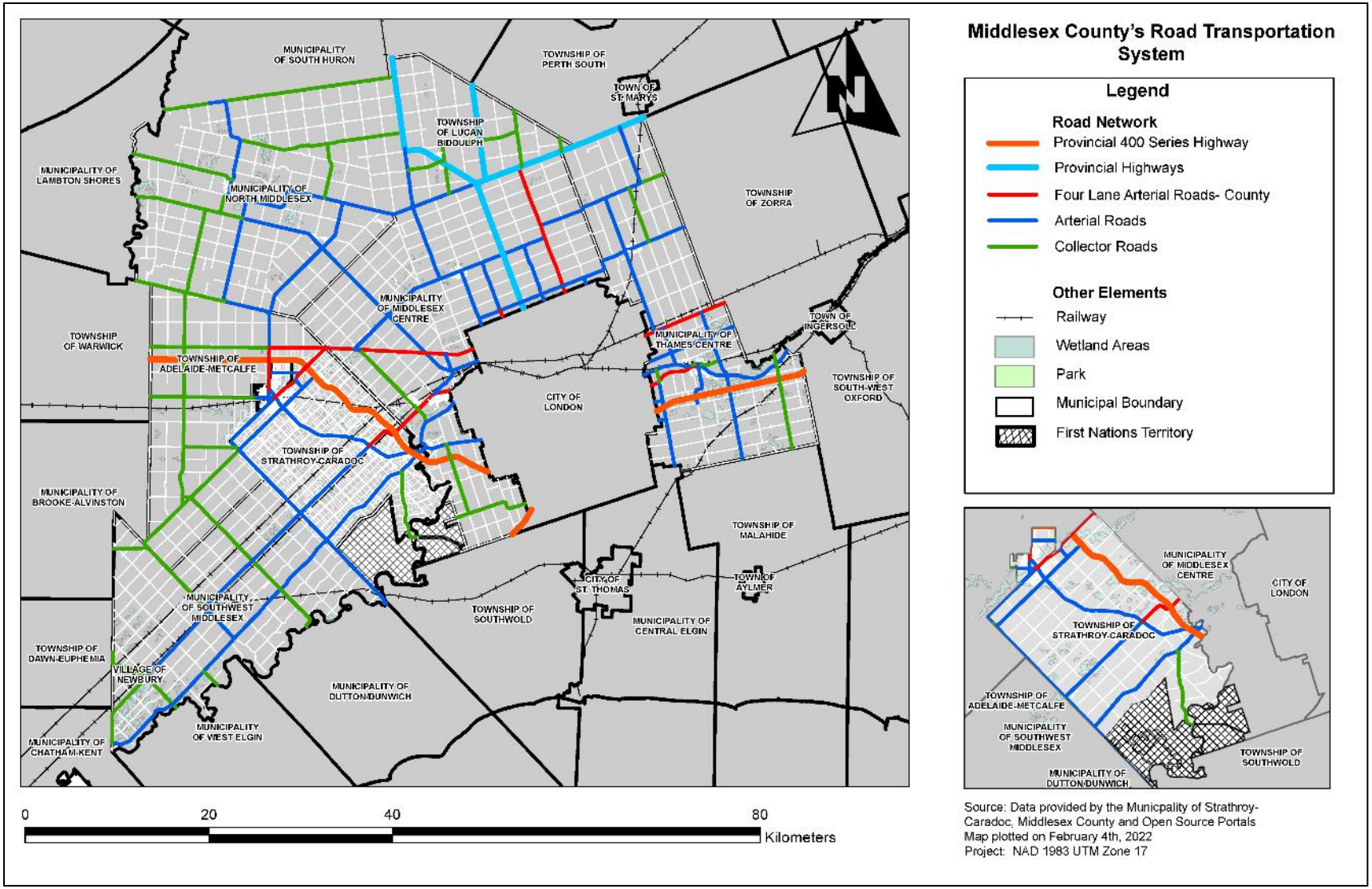


Figure 9: Map of Middlesex County's Road Transportation System, with an Inset Map of the Strathroy-Caradoc Area

2.4.2 Potential Upload of Roads

The municipal road network was reviewed to determine if any existing municipal road is functioning as a regional road for through traffic in the County and would be a candidate for upload to the County. Parkhouse Drive was identified as having the potential for uploading since it connects with Glendon Dr (County Rd 14) which interchanges with Highway 402. Vehicle traffic volumes on Parkhouse Drive are expected to increase with the forecast growth in Mt. Brydges. Parkhouse Drive also extends beyond Strathroy-Caradoc into the Municipality of Southwest Middlesex. Due to its nearby connection to Highway 402, rising traffic volumes on account of growth, and its extent across multiple municipalities, Parkhouse Drive is seen as a road that should be considered for upload to the County.

2.4.3 Annual Average Daily Travel (AADTs)

Average annual daily vehicle traffic volumes (AADTs) were reviewed for County roads within the Municipality to assess system preformance and the need for additional road widening. As shown within **Figure 10**, traffic volumes on all County roads appears low, with no segment exceeding an AADT value of the highest range of 11,301 – 13,754 average annual daily trips. Of the County roads examined, segments which form County Road 81 (Caradoc St S, Adelaide Rd and Centre Rd) feature the highest traffic, while Melbourne Rd, Glendon Dr and Calvert Dr feature lower traffic volumes. While some County roads have lower volumes than others, it is recognized that they are not “low” volume roads. For example, Glendon Dr has high volumes, especially the section east of Mt. Brydges, but is considered low compared to Caradoc St S, Adelaide Rd and Centre Rd that feature the highest traffic volumes.

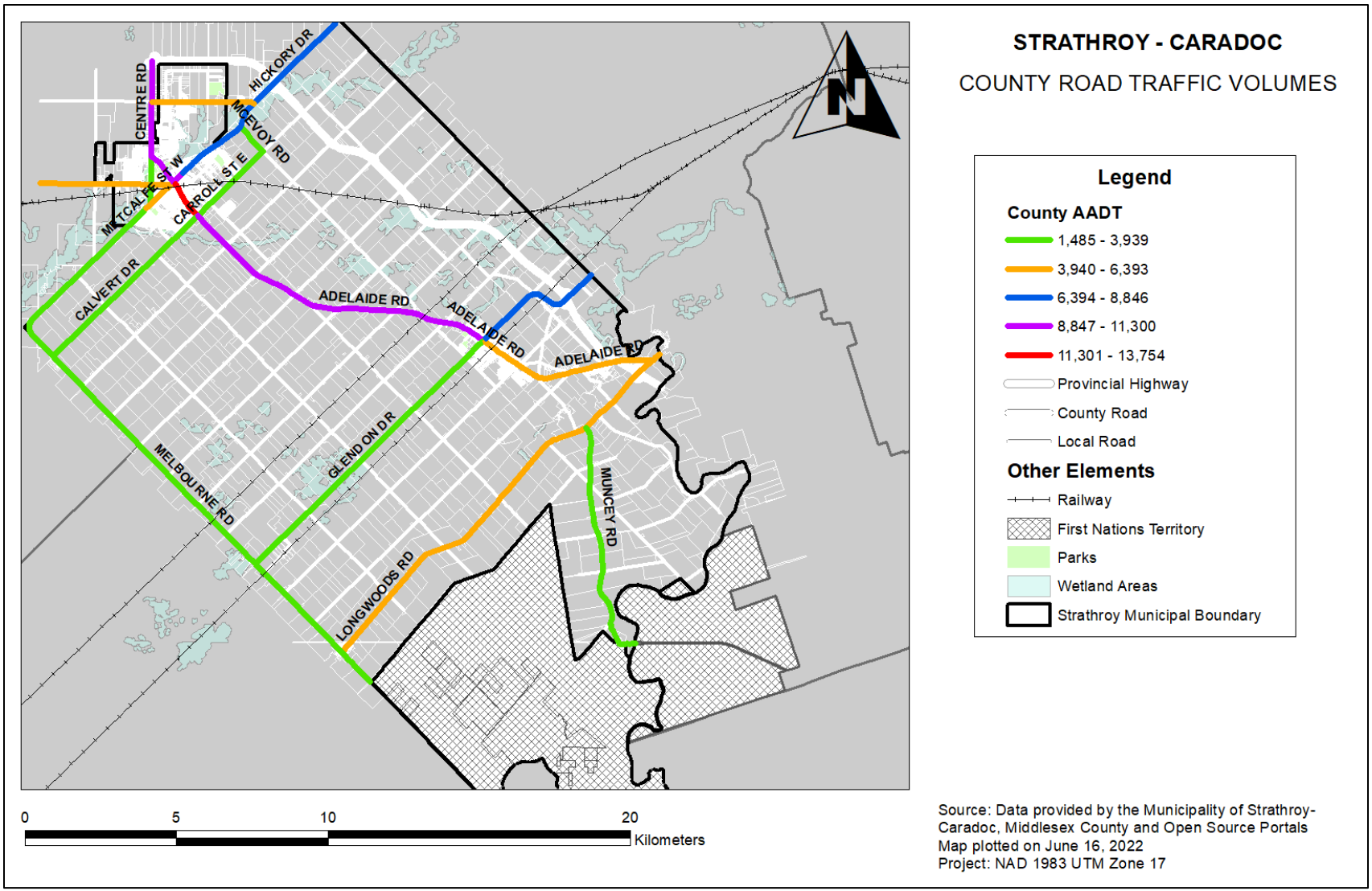


Figure 10: Existing Average Annual Daily Traffic Volumes on County Roads

The existing AADT volumes were also analyzed to determine if there is enough vehicle capacity to accommodate these volumes and to see if any road links may be approaching capacity (**Figure 11)**. This volume-to-capacity analysis is important to determine where solutions are needed today and potentially in the future, which may include new infrastructure improvements. Planning best practice stipulates that a road link with a volume-to-capacity ratio of 0.85 or higher should be considered for improvements, either through measures to reduce vehicle demand or increase the supply of capacity.

The resulting volume-to-capacity ratios were reported, and colour coded in the following categories:

- Green: volume-to-capacity ratio of 0.00 up to 0.69: low congestion, free flow traffic, no capacity constraints;
- Yellow: volume-to-capacity ratio of greater than 0.69 up to 0.85: moderate congestion, capacity available with no action needed, but to be monitored for future capacity constraints;
- Red: volume-to-capacity ratio of greater than 0.85: heavy congestion, solutions should be identified to reduce vehicle demand or increase capacity.

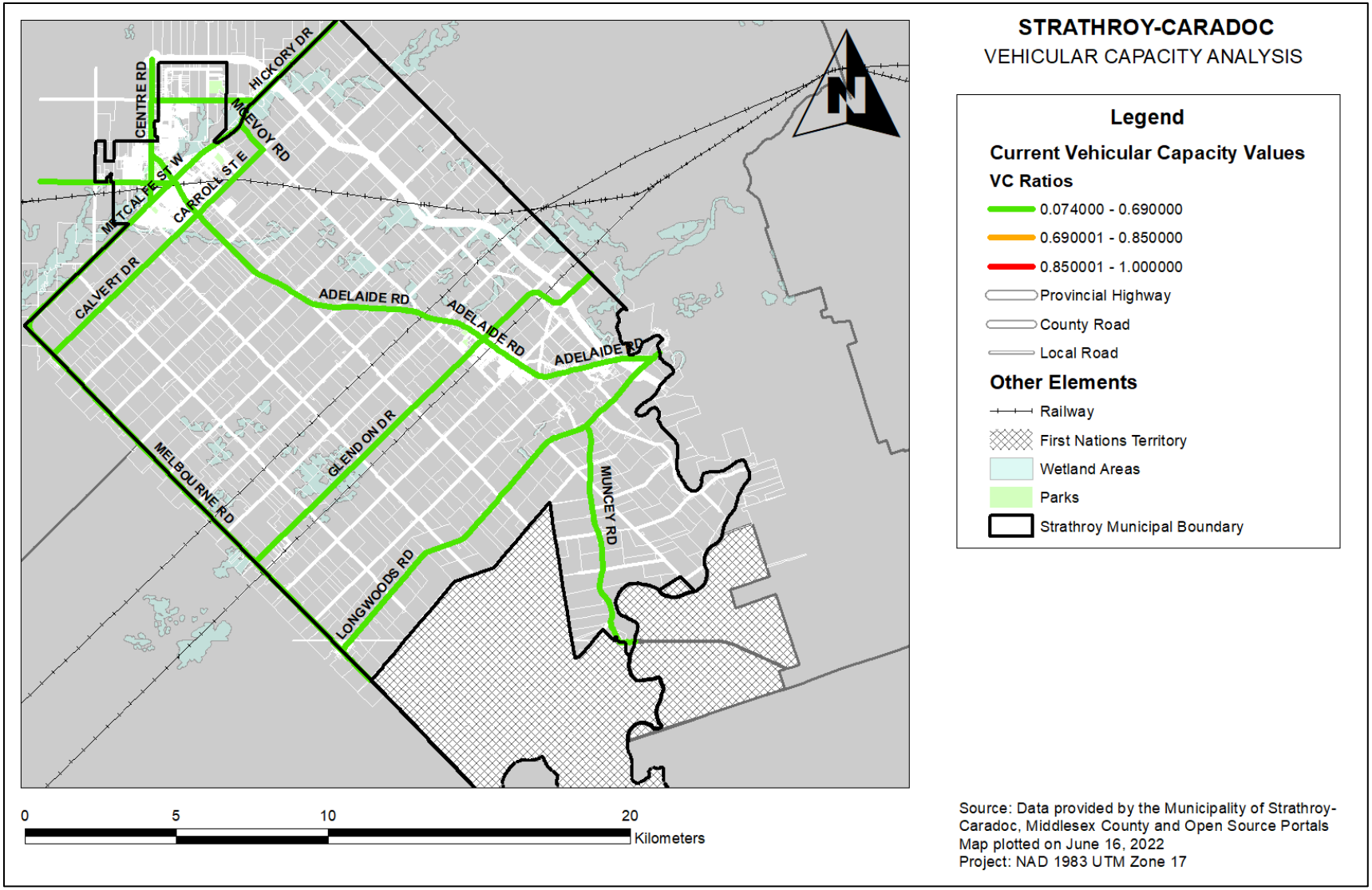


Figure 11: Existing Vehicle Traffic Conditions Volume-to-Capacity Ratio Analysis

This analysis shows that the road links where data are available all are within capacity today, with no links requiring additional capacity or other measures to address vehicle traffic volumes. The roads not included in this analysis are considered to have lower vehicle traffic volumes and also would not require intervention to reduce demand or provide additional capacity. Based on the 2016 Census data, approximately 50% travel within the Municipality for commuting. 33% of those living in Strathroy-Caradoc travel to London for work. Results of this analysis are fully summarized in **Table 2** and **Figure 12.**

Table 2: Trip Activity Originating or Destined for Strathroy-Caradoc from Surrounding Municipalities

Those travelling from Strathroy-Caradoc (S-C as HOME)				**Those travelling to Strathroy-Caradoc (S-C as WORK)**		
Strathroy-Caradoc	3860	46.8%		Strathroy-Caradoc	3860	53.5%
London	2735	33.1%		London	1170	16.2%
Middlesex Centre	365	4.4%		Adelaide-Metcalfe	470	6.5%
Adelaide-Metcalfe	365	4.4%		Southwest Middlesex	295	4.1%
Sarnia	140	1.7%		Middlesex Centre	295	4.1%
North Middlesex	130	1.6%		Warwick	210	2.9%
St. Thomas	95	1.2%		North Middlesex	210	2.9%
Warwick	80	1.0%		Lambton Shores	155	2.1%
Southwest Middlesex	70	0.8%		Brooke-Alvinston	95	1.3%
Thames Centre	60	0.7%		Sarnia	95	1.3%
Woodstock	55	0.7%		St. Thomas	70	1.0%
Ingersoll	45	0.5%		Plympton-Wyoming	70	1.0%
Toronto	40	0.5%		Lucan Biddulph	45	0.6%
Plympton-Wyoming	35	0.4%		Central Elgin	40	0.6%
Chatham-Kent	30	0.4%		Dawn-Euphemia	35	0.5%
St. Clair	30	0.4%		Chatham-Kent	30	0.4%
Lambton Shores	30	0.4%		Dutton/Dunwich	25	0.3%
Stratford	25	0.3%		Enniskillen	25	0.3%
Bluewater	25	0.3%		Thames Centre	20	0.3%
Cambridge	20	0.2%				
Petrolia	20	0.2%				

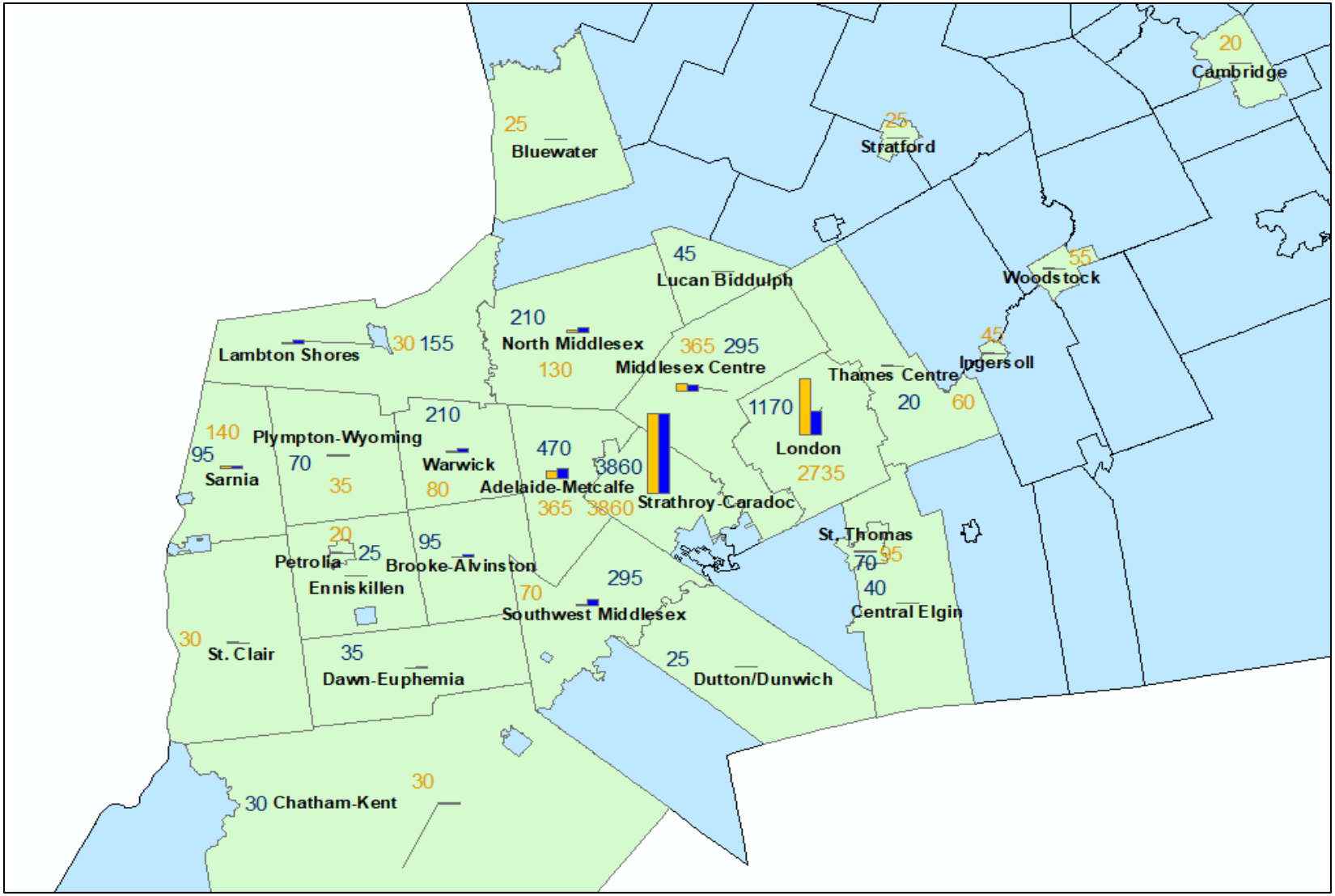


Figure 12: Distribution of Travel Originating and Destined for Strathroy-Caradoc, From the Surrounding Municipalities

2.4.4 Railway Crossings

With three different provincial rail lines passing through the Strathroy-Caradoc, there are several railway crossings found throughout the municipality. These facilities are all designed as at-grade crossings, where roadway users are required to stop and wait for passing trains, whenever the signalized control measures are activated. This excludes points of crossing around Highway 402, which remain completely grade separated through underpasses.

The complete list of signalized and at-grade crossings found within the Municipality are listed within **Table 3**.

Table 3: List of Signalized and At-Grade Rail Crossings Found within Strathroy-Caradoc

CN Strathroy	CN Chatham	CP Windsor
Strathroy - Metcalfe St W (County Rd 19) - Richmond St - Oxford St - Victoria St - Caradoc St S - Queen St - Carroll St E	Mt. Brydges - Adelaide Rd - Rougham Rd	
Rural Areas - Walkers Dr - McEvoy Rd - Scotchmere Dr - Inadale Dr - Highway 402 (separated) - Aberdeen Rd - Olde Dr - Thorn Dr - Amiens Rd	Rural Areas - Amiens Rd - Highway 402 (separated) - Glendon Dr - Christina Rd - Sutherland Rd - Glen Oak Rd - Melbourne Rd	Rural Areas - Amiens Rd - Highway 402, (separated) - Springwell Rd - Adelaide Rd - Christina Rd - Sutherland Rd - Glen Oak Rd - Melbourne Rd

2.4.5 On-Street Parking

On-street parking within Strathroy-Caradoc remains limited to the major streets of the municipality's urban areas of Strathroy and Mt. Brydges. Within Mt. Brydges, this includes sections of Adelaide Rd (both-sides) and Glendon Dr (one-side), as well along all neighborhood local roads. Within Strathroy, this includes sections of Front St E, Frank St, Centre St W, as well as neighborhood local roads. In addition, the Municipality does not have on-street parking readily available on any County roads. The central Strathroy area also features several private lots either fronting or backing onto local strip malls, including The Shops on Sydenham off Front-St E. Regulations governing the operations of on-street parking are specified within By-Law No. 20-07. This includes an annual prohibition against

on-street parking overnight along local Strathroy streets during the wintertime, to assist with road snow clearance.

3

Existing Policy Review

STRATHROY-CARADOC
TRANSPORTATION MASTER PLAN

3 Existing Policy Review

The proposed Transportation Master Plan does not exist in isolation but must compliment the municipality's current policy context. Reviewing existing policies enacted at the Provincial, County and Municipal levels, is a vital exercise to better understand local priorities. This includes items specific to transportation as well as those with overlapping jurisdiction, such as land use planning, economic development, and recreational programming. An examination of the existing policy context also identifies potential gaps and omissions, that could be resolved through the adoption of a TMP.

3.1 Provincial Policies

Provincial policies provide high-level, strategic direction on growth and development across Ontario. The overarching provincial policy is the **Provincial Policy Statement, 2020 (PPS)**, which promotes land use patterns that support strong communities, healthy environments, and enhanced quality of life. Through the land use planning system, the PPS promotes the need for diverse transportation choices, emphasizing active transportation and transit before other modes. Other notable policy directives include the **Accessibility for Ontarians with Disabilities Act, 2005**. While not directly affecting the TMP, the built environment standards can be applied to the planning, design, and construction of transportation-related facilities. AODA provides standards for the appropriate design and location of transportation facilities to ensure that the network is accessible and useable by users of all abilities. Although the TMP is a strategic document and does not address detailed design, AODA requirements will be incorporated through the concept of Complete Streets. With an underlying objective of establishing a sustainable and multi-modal transportation system, both recently updated **Ontario Traffic Manual Book 18: Cycling Facilities (2021)**, **#CycleON Action Plan 2.0 (2018)** and **Ontario Trails Strategy (2010)** were reviewed for technical guidance and prioritize connectivity with planned regional active transportation facilities.

3.2 County Policies

The Municipality of Strathroy-Caradoc exists within Middlesex County. The County of Middlesex has supporting policy documents that outline the goals and objectives for future planning, growth, and development within the county. The TMP will reflect the vision of these other initiatives to provide context specific-specific recommendations. Existing plans and policies at this level include:

- County of Middlesex Official Plan (Consolidated version, 2006)
- Middlesex County Strategic Plan (2021-2024)
- Middlesex County Homeless Prevention and Housing Plan (2019-2024)
- Middlesex County Cycling Strategy (2018)
- Middlesex County Economic Development Strategy Update (2021-2025)

3.3 Municipal Policies

Similar to provincial policies and county policies, municipal policies provide a framework for municipalities for decision making. Municipal policies ensure that there is consistency throughout the municipality. These policies often exist to create communities within municipalities that are safe, healthy, and livable for all members of the community. Existing municipal level plans and policies that exist for Strathroy-Caradoc include:

- Municipality of Strathroy-Caradoc Official Plan (2013-2034)
- Strathroy-Caradoc Strategic Plan 2020-2029
- Downtown Strathroy Master Plan (2020)
- North Meadows Secondary Plan (2021)

The TMP is being undertaken concurrent with a Municipal Comprehensive Review, which includes multiple subject-specific studies. Related studies, such as the Recreational Trails Master Plan and the Fire Station Location Study, are being coordinated to incorporate appropriate items, such as new off-road trails, and consider factors that influence transportation decisions, such as the location of a new fire station.

4

Transportation Principles

STRATHROY-CARADOC
TRANSPORTATION MASTER PLAN

4 Transportation Principles

Based on the technical review of existing conditions, understanding of the existing policy framework, and feedback from the first round of consultation, the TMP vision statement and guiding principles were confirmed. The analysis of future conditions and the multi-modal transportation recommendations were prepared with the vision and principles in mind.

4.1 TMP Vision Statement

The vision statement meets the requirements of Phase 1 of the EA process to stipulate a problem / opportunity statement. The vision statement is:

The Strathroy-Caradoc transportation network is accessible to all, and prioritizes the connectivity, comfort, and safety of vulnerable road users. The transportation network aligns with broader growth plans for the municipality, including the growth of more sustainable modes of travel, and provides options for people to travel by whatever mode they choose.

4.2 Guiding Principles

Four guiding principles have been developed to help support the vision statement and bring the vision to reality. These principles include:

1. **Prioritize Active Transportation**: Walking, cycling, and travel using a mobility device will be prioritized to increase the practicality and attractiveness for local trips.
2. **Develop a Street Network for the Future**: The bonds between land use, anticipated growth, and transportation will be strengthened.
3. **Design for Complete Streets**: The transportation network will be designed to accommodate all transportation users regardless of age, ability, and mode of travel.
4. **Identify an Action Plan**: Strategic transportation improvements will be identified and phased to meet the current and future mobility needs of the community.

4.3 Public Input

Essential to the development of Strathroy-Caradoc's TMP was an extensive public engagement program held over the course of the project (**Table 4**). The program was designed to offer a wide range of means to offer feedback, which would ensure all key stakeholders could sufficiently share their concerns, aspirations, and priorities for the plan. Due to the ongoing COVID-19 pandemic, all activities were facilitated using several interactive online programs. This innovative approach allowed for greater flexibility and convenience in how participants could engagement. Public engagement for Strathroy-Caradoc's TMP was broadly organized within two rounds of consultation. The first round of consultation occurred from January 2021 to May 2021 and included a virtual public session on March 10, 2021. The second round of consultation occurred from June to August 2021

and included a virtual public session on July 15, 2021. Complimentary of these activities, members of the municipality's project team were also routinely consulted for their input and direction across key milestones in the project process:

Table 4: List of Engagement Activities Held During the Development of the Transportation Master Plan

Round 1	Round 2
Objectives	Objectives
Activities – Kick-off Meeting – SAC Meeting – TAC Meeting – Visioning Workshop (Public Engagement Workshop #1) – Online Interactive Survey	Activities – SAC Meeting – TAC Meeting – (Public Engagement Workshop #2) – Public Open House #1
Entire Project	
Activities – Social Media Promotion – Ongoing Client Discussions	

4.3.1 Consulted Audiences

To gather a broad range of local input and feedback to inform meaningful recommendations within the TMP, a wide assortment of local stakeholders were consulted throughout the plan's development. Recognizing that each stakeholder holds different concerns, preferences, and interests in the project, chosen communication methods were uniquely tailored to each audience. This approach informed a comprehensive and enriching engagement program that yielded key insights and considerations defining of the Strathroy-Caradoc context. Provided within **Table 5** is a complete list of the different stakeholders consulted, the rationale behind why they were included, and the events and communication methods employed to gather their input.

Table 5: List of Audiences Consulted During the TMP's Development, and the Associated Events and Communication Methods Used

Consulted Audience	**Description and Justification for Inclusion**	**Events & Communication Methods**
Members of Strathroy-Caradoc Council	Provide the plan's final approval and enrich its contents with detailed understanding of the municipality's finances, overlapping priorities and community priorities.	Virtual/ Presentations (workshops and Council sittings).
Transportation Master Plan Project Team	Decision maker and senior leadership sounding board / approval body and liaison between the consultant team and Council. Reports to project's overarching municipal steering committee.	Bi-weekly virtual meetings, attendance at all major consultation events.
Technical Advisory Committee (TAC)	Group of representatives from with authority or expertise over key Project outcomes or aspects. Notable parties include members of the local school boards, applicable conservation authorities (St Clair Region, Thames Centre, and Lower Thames Valley) and local Utilities provided.	Workshops and meetings held across major stages of project work.
Stakeholder Advisory Committee (SAC)	12-15 representatives who will enrich understandings of the local context and provide an additional opinion on key project outcomes and processes. Those featured on the committee included: residents, youth members, landowners, businesses owners and other interested stakeholders.	Workshops and meetings held across major stages of project work.
Members of the Public	All those who either live, work or play within the municipality of Strathroy-Caradoc.	Virtual Public Information Centers, Online Surveys and Commenting Boards.
Other	While lacking their own formal engagement activity, members of nearby indigenous communities, landowners and developers and Middlesex County staff were also consulted during the study.	

4.3.2 Engagement Round 1

The first round of the project's engagement occurred roughly between January 2021 and May 2021, and sought to engage the public to inform understandings of the local context and underlying TMP principles and objectives. Provided within the sections below, are a list of all held activities in events.

Interactive Website

To provide additional engagement opportunities an interactive website was also released to share project details and gather feedback. Hosted off the Municipality's website, between February 1, 2021, and March 7, 2021, the site generated over 300 interactions. Developed using the virtual "Bang the Table" application, the site hosted many multimedia features (**Figure 13**). This included relevant project materials that site visitors could download, a bulletin of project updates, as well as a forum to submit comments and map locations of interest within the municipality. From the two interactive tools that offered a medium to submit feedback, numerous different pieces of feedback were provided. These insights helped to inform both the scope and location of different recommendations, proposed as part of the TMP.

Some data from the Interactive Mapping Tool

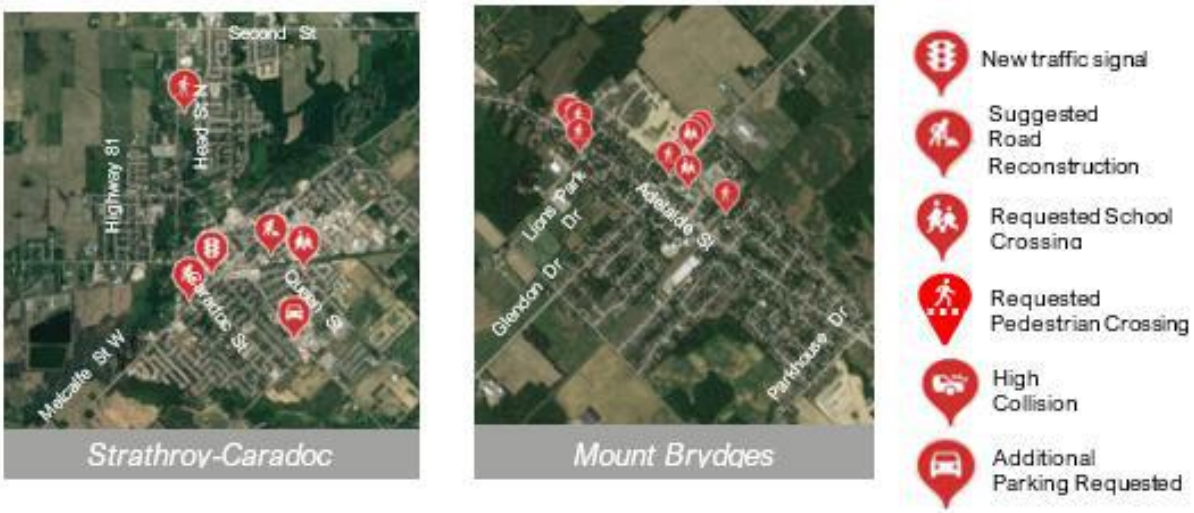


Figure 13: Example of Results From the Interactive Mapping Tool Featured within the TMP's Online Public Survey

Comment Form Results

- Implement bike lanes along Adelaide Rd between Strathroy and Mt. Brydges;
- Implement turning lanes along major roads within Mt. Brydges;
- Ensure safe crosswalks to access all schools and major park areas in Strathroy-Caradoc;
- Adopt 'Vision Zero' as a guiding principle;
- Prioritize accessible design which accommodate those with limited mobility due to aging, disability, or health conditions;
- Increase the throughput of other roads in anticipation of greater traffic demand along Highway 81.

Visioning Workshop (Public Engagement Workshop #1)

Held on March 10, 2021, the Visioning Workshop was a well attended event that intended to formalize an underlying vision to guide the overall master plan study process. Hosted close to the beginning of the project process, the event established the tone and expectations for future engagement activities. Specific key objectives included:

1. To provide an overview of the project process;
2. To develop a shared vision and guiding principles for the Strathroy-Caradoc; and
3. To inform the community about next steps on how to stay involved

Workshop participants were asked a series of questions related to their understanding of the municipality's current transportation system and their priorities for its future. The questions and associated gathering of feedback were all facilitated using Miro – a visually interactive polling toll. Based off the answers provided to these questions and other discussion held during the workshop, the following insights were gathered:

Q: When thinking about Strathroy-Caradoc in 2046, what are the first 3 words that come to mind when describing your ideal community?

- Welcoming, engaging, inclusive;
- Friendly, active, accessible;
- Progressive, community, livable;
- Connected, affordable, serviced;
- Progressive, equality, rural-character.

Q: What are some challenges to achieving your vision for Strathroy-Caradoc?

- Limited tax base;
- Lack of transportation options;
- Proximity to London;
- Urban vs Rural conflict;
- Aging population;
- Growing while maintaining character.

Q: Opportunities that can help achieve your vision for Strathroy-Caradoc?

- Sense of welcoming community; Emphasis on environment and connections to river;
- Strong foundation to attract more businesses and services;
- Strong community engagement within planning process.

Q: What three words reflect your vision for the future of transportation in Strathroy-Caradoc?

- Affordable, easy-access, reliable;
- Multi-modal, connectivity, green;
- Urban, pedestrian friendly and efficient.

Q: Best thing about transportation in Strathroy-Caradoc right now?

- Proximity to 402;
- Roads remain well maintained;
- Easily accessible, lack of congestion;
- Lots of parking in Strathroy.

Q: Worst thing about transportation in Strathroy-Caradoc right now?

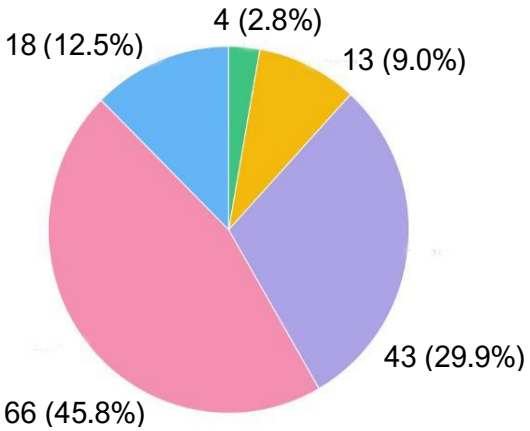
- Auto centric;
- Barrier of railways and rail crossings;
- Lack of grid-iron road network due to natural constraints;
- No bike lanes on Adelaide Rd between Strathroy and Mt. Brydges.

Other Items:

- Need for additional north-south corridor (bypass Caradoc St)
- Constraint of costly land acquisitions
- Plan for future transit service;
- Improve drainage of sidewalks below grade

Visioning Survey

Following the release of a draft TMP vision statement and accompanying list of objectives, an online survey was released to the public to acquire their confirmation and any suggestions for feedback. Hosted off the project's website between April 1, 2021, and May 7, 2021, the survey featured five questions specific to the TMP, which generated responses from 147 participants. Responses to these questions among other raised feedback items, are summarized in **Figure 14**.



Support for proposed TMP Vision Statement

18 (12.5%) Very Supportive

66 (45.8%) Supportive

43 (29.9%) Neutral

13 (9.0%) Opposed

4 (2.8%) Very Opposed

Figure 14: Results from the public survey on the TMP's proposed Vision Statement

Weighted Ranks (1 being the most important and 4 the least important)

TMP guiding principles

1. Prioritize Active Transportation: Walking, cycling, and rolling will be prioritized to increase the practicality and attractiveness for local trips [**Average Rank: 2.07**].
2. Design for Complete Streets: The transportation network will be designed to accommodate all transportation users regardless of age, ability, and mode of travel [**Average Rank: 2.49**]
3. Action-Oriented: Strategic transportation improvements will be identified and phased to meet the current and future mobility needs of the community [**Average Rank: 2.63**]
4. Develop a Street Network for the Future: The bonds between land use, anticipated growth, and transportation will be strengthened [**Average Rank: 2.76**]

- Suggested Changes to guiding principles
- More streets with multi-modal infrastructure and improved drainage;
- Provide an underpass underneath the rail corridor for emergency vehicles;
- More routes for cyclists, pedestrians and other vulnerable road users, particularly along major roadways;
- Improve transit service to/from Sarnia and London;
- Ensure future decisions remain made with sufficient community input;
- Improve Queen St rail crossing;
- Provide a more specific definition of what “sustainability” refers to.

Opportunities to achieve TMP vision

1. Supporting Active Transportation (walking, rolling, or cycling)
- **[Average Rank: 1.89]**
2. Growing Community
- **[Average Rank: 2.29]**
3. Promoting Mixed-use Development
- **[Average Rank: 2.72]**
4. Compact Geography
- **[Average Rank: 3.06]**

Challenges to achieve TMP vision

1. Lack of Sidewalks
- **[Average Rank: 2.12]**
2. Funding
- **[Average Rank: 2.56]**
3. Rail Corridor Crossings
- **[Average Rank: 2.56]**
4. Auto-Centric Development
- **[Average Rank: 3.06]**

TAC Meeting #1

- The first Technical Advisory Committee (TAC) meeting was held remotely on May 4, 2021. Key goals of the meeting included confirming understandings of the existing context as well as identify key issues and goals that the proposed TMP ought to address. Along with an overview of the project progress made to date, participants representing the project's various technical stakeholders were invited to share their key concerns considerations for the project:
- Imperative that the construction of new transportation facilities be coordinated with local utility providers to streamline construction;
- Align planned transportation investment with forecasted employment and population growth projects and directives of applicable provincial policies.

SAC Meeting #1

The first Stakeholder Advisory Committee (SAC) meeting was held remotely on May 11, 2021. The goal of this meeting was both to share updates made in developing the TMP and solicit the group's feedback on the plan's underlying vision, principles, and objectives. In addition to a summary presentation, the event also featured a roundtable discussion that invited participants to list topics they wanted the TMP to address as well as any other ideas or goals that should be considered by the project team (**Figure 15**).

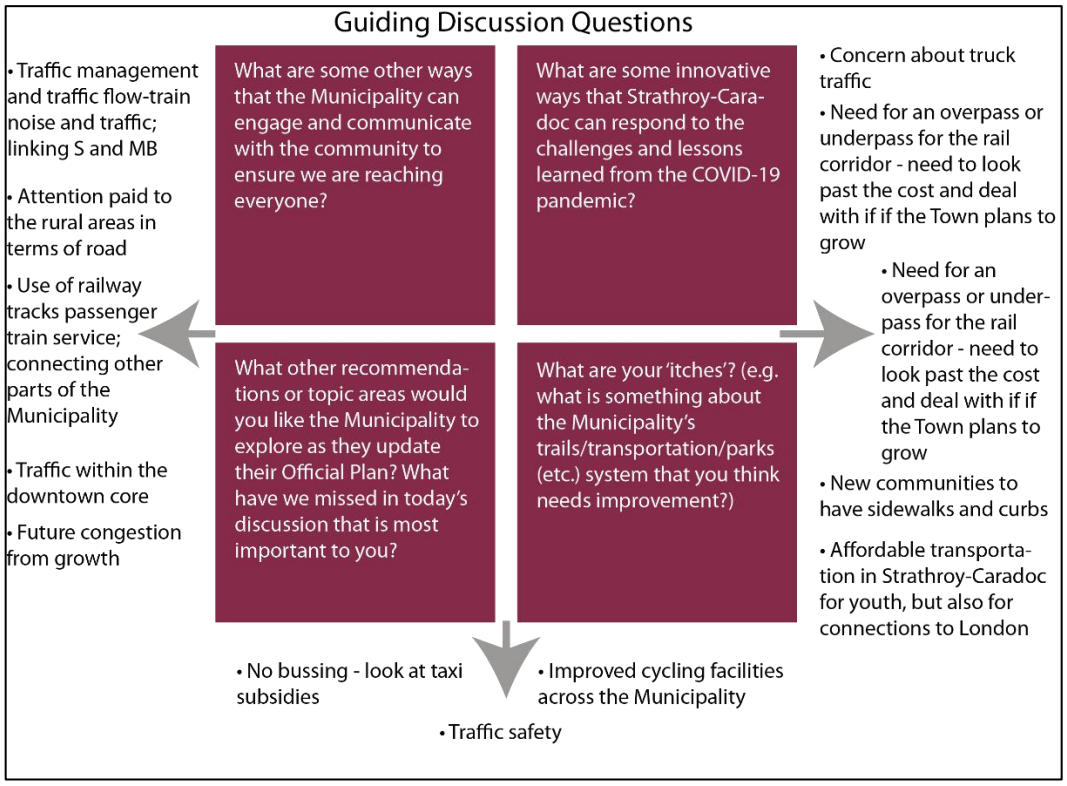


Figure 15: Summary of Key Themes and Discussion Items Raised During the TMP's First Stakeholder Advisory Committee Meeting

4.3.3 Engagement Round 2

The second round of public engagement held for the TMP sought to confirm preliminary recommendations with municipal staff, members of the public and key stakeholders. Relying on vision statement and principles confirmed during the first round of engagement, combined with a thorough understanding of applicable best practices and technical guidance, several intermediate project deliverables were shared. Notable shared included the draft proposed future facilities network, modelling forecasts and draft policy and program recommendations. Comparative to the first round of engagement, the following events were intended to inform and finalize recommendations and contents of the TMP. In addition to informal meetings and discussion with municipal staff, the second round of engagement also featured the project's first virtual public open house and an additional meeting with the TAC and SAC working groups.

SAC & TAC Meeting #2

Held on Tuesday, July 13, 2021, the second Technical Advisory Committee (TAC) and Stakeholder Advisory Committee (SAC) sought to gain each group's feedback on the draft ultimate transportation network and draft list of policy recommendations. Facilitated with the interactive mapping tool, Mural, participants were invited to confirm preliminary planning work and identify and gaps and deficiencies which remained unaddressed. Following the meeting, the presented Mural "board" was kept online for an additional week, to offer attendees (and those unable to attend the meeting) additional time to provide the feedback. A summary of key items raised during the meeting, categorized by each transportation mode, is provided within the graphics listed below in **Figure 16** through **Figure 18**.

Road Network Improvements

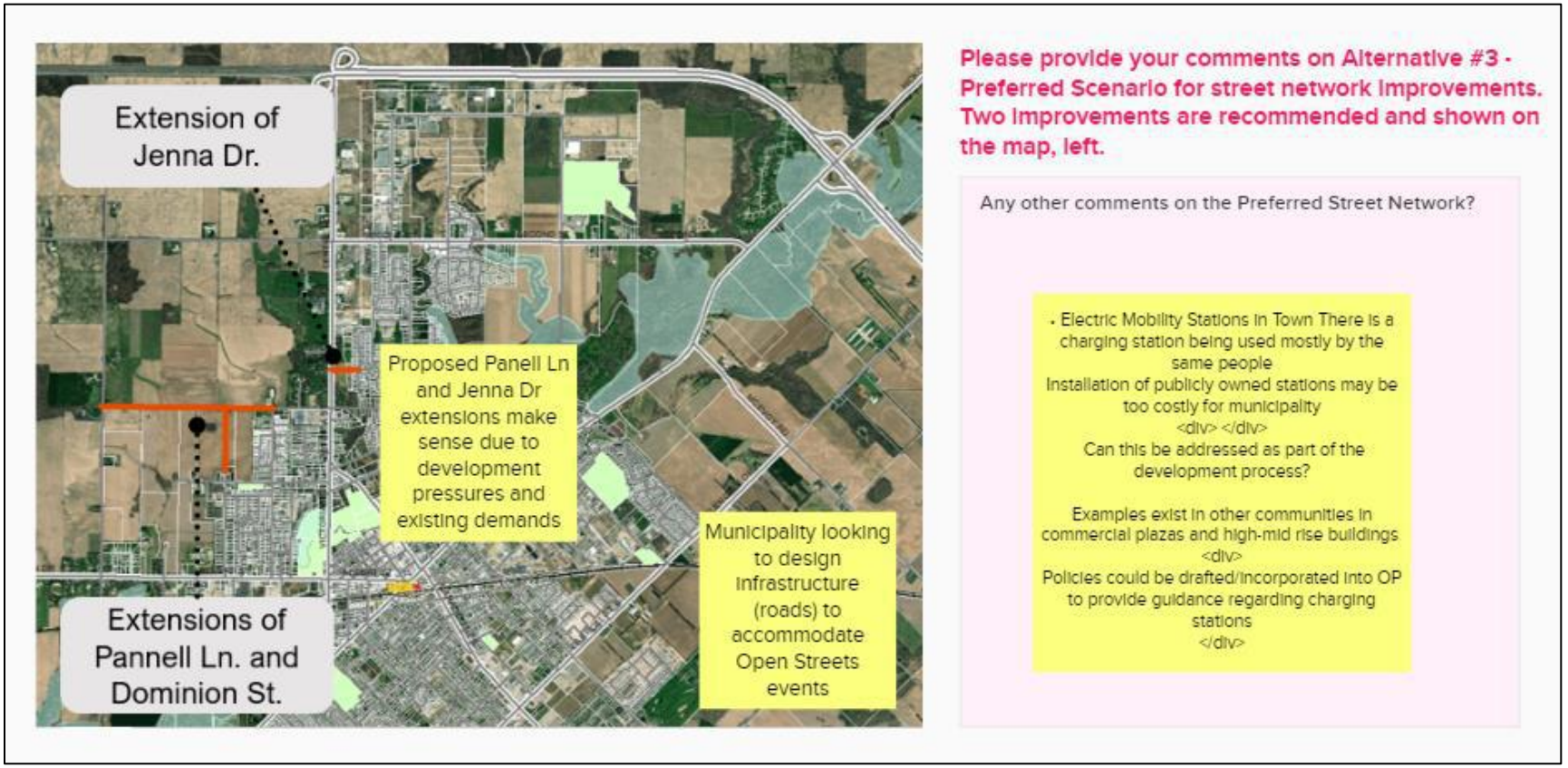


Figure 16: Proposed Road Network, Mural Boards Created for the Second SAC and TAC Workshop Meetings

Active Transportation Recommendations

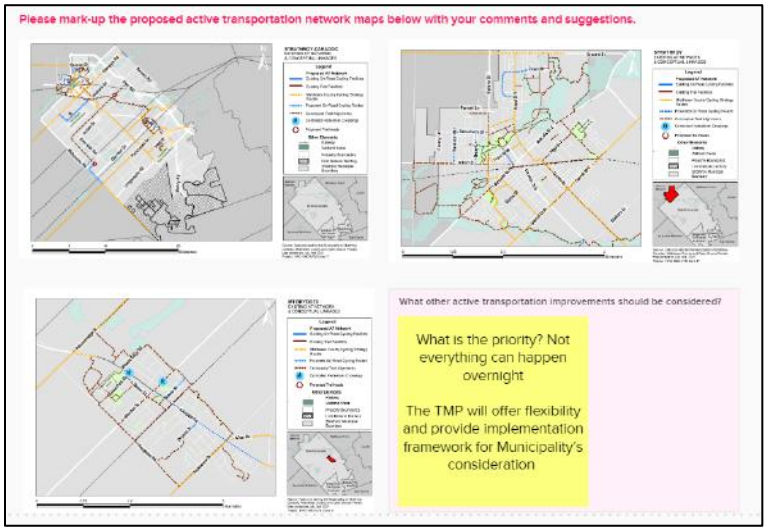


Figure 17: Proposed Active Transportation Network, the Mural Boards Created for the Second SAC and TAC Workshop Meetings

Transit Network Improvements

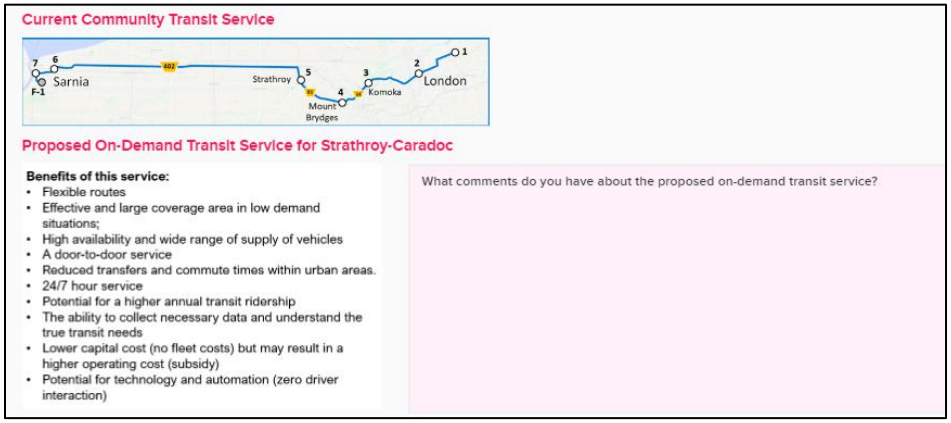


Figure 18: Proposed Transit Service Strategy, Mural Boards Created for the Second SAC and TAC Workshop Meetings

TMP Virtual Public Open House

To allow members of the public to also share their feedback on the TMP's preliminary recommendations, a virtual public open house was held on the evening of Thursday, July 15, 2021. Similar to the previous internal meetings, the following event featured a live presentation as well as online comment boards, using the Mural program. Hosted for a week after the live presentation, the following key comments were generated:

- Support for increased active transportation routes to minimize traffic as municipality grows and improve quality of life;
- Suggestion that cycling routes be prioritized along key travel corridors (i.e., McKeller St, Queen St and Victoria St);
- Preference for separated cycling routes (i.e., separated bike lanes and multi-use pathways) along high traffic roads like Caradoc St and Head St;
- Support idea of building a "spine" trail system using the memorial trail facility, recommend that route be extended south to improve community access;
- Provide active transportation connections to regional destinations, including Clark Wright Conservation area, trout haven and fair grounds;
- Implement bridges, boardwalks, and other facilities along trail routes to address concerns involving washouts;
- Encourage more development in the form of mixed use to reduce car dependency and support intermodal travel (i.e., within Downtown Strathroy); and
- Provide an active transportation connection between Strathroy and Mt. Brydges.

5

Future Condition Assessment

STRATHROY-CARADOC
TRANSPORTATION MASTER PLAN

5 Future Condition Assessment

The future condition assessment provides analysis and recommendations for all modes of transportation in the Municipality, to accommodate forecast population and employment growth to the year 2046 and beyond. Understanding key trends in how people, goods and services are moving in, out and around Strathroy-Caradoc is necessary to informing better planning decisions and recommendations. Among the key trends identified is a growing preference and adoption of multi-modal transportation. Although largely an auto centric community, there has been growing demand for alterative more suitable forms of transportation, including transit and active transportation.

Currently, VIA Rail Canada maintains two daily eastbound and westbound passenger train trips out of the local Strathroy VIA rail station. A new fully accessible inter-community transit service connecting the City of Sarnia, City of London, and Municipality of Strathroy-Caradoc launched in the Summer of 2020. In 2018, the Middlesex County Cycling Strategy was adopted with new routes recommended within Strathroy-Caradoc and, the municipality continues to expand its local trail network to accommodate ongoing residential growth. Despite these investments, there remains a need to continue this momentum by identifying key decisions vital to supporting the community into the future.

5.1 Active Transportation

Broadly defined as any form of human-powered transportation, such as walking or cycling, active transportation offers a wide range of benefits to both residents and visitors to Strathroy-Caradoc. Like all other transport modes, active transportation must be planned to reflect current travel needs and considerations and those forecasted into the future. Increased active transportation use can considerably improve local air quality and reduce carbon emissions that contribute to climate change. With a high growth rate forecasted for the municipality's transportation, proper active transportation planning remains an important strategy to accommodate this growth more sustainability. While a form of mobility, active transportation provides a range of benefits that enhances the sustainability, health, and economic aspects of the local area. This includes lower emissions due to car travel, new opportunities for increased physical and recreational activity that yield improved health outcomes and new tourism-based businesses that create jobs. These reasons justify listing greater consideration of active transportation and complete streets design, as underlying objectives of the following TMP update.

5.1.1 Active Transportation Network

The key to encouraging greater active transportation use is an extensive active transportation network with accompanying supportive amenities that make it both a safe and convenient way to travel. This includes an interconnected system of road-way based routes, including bike lanes, paved shoulders, and sidewalks as well as off-road trails and pathways.

While the TMP offers guidance related to the selection, design and implementation of these items, additional specification will be deferred to other relevant policies. Greater detail on the identification, design and delivery of off-road trail routes is provided within the Recreational Trails Master Plan – which was developed concurrently with the following TMP update. Additionally, many of the on-road cycling network recommendations will be taken from the Middlesex Cycling Strategy, which holds jurisdiction within Strathroy-Caradoc. Having only been adopted as recently as 2018, the plan maintains a highly relevant degree of localized knowledge and applicable best practices, making its recommendations worthy of preservation. Also included within the proposed network were recommendations listed within #CycleON Action Plan 2.0 (2018). Most notably is a proposed on-road cycling connection between Strathroy and Mt. Brydges and other segments of provincial highway found within the municipality. Along segments of the Middlesex County Cycling Strategy proposed network that are overlapped by routes listed in either the RTMP or TMP, the recommendation of the more recent plan should apply.

All documents served as a useful foundation to ensure consistency with other policies and preserve the value of past planning work. As the RTMP network features a broader range of facility types than most trails network, including multi-use pathways (classified as “Type 1 Trails: Urban Trails”) and most signed routes (classified as “Type 5: Neighbourhood Greenways”), the plan remained the primary driver of the municipality’s active transportation network. Rather than involve the development of a complete active transportation route network, active transportation work completed as part of the TMP primarily served to address outstanding gaps within the RTMP network and previously proposed cycling networks. With extensive sidewalk coverage already, these recommendations also accounted for all improvements towards pedestrian mobility. Gaps in the current sidewalk network were identified and addressed to create a continuous and connected network that serves key destinations. Improvements to the municipality’s sidewalk network are also detailed within the policy guidance related to Complete Streets and New Road Classifications, provided within Chapter 6 of the following TMP.

Network Development Approach

The provision of a safe, well connected route network remains a key determinant of one’s willingness to travel across Strathroy-Caradoc by active transportation. The recommendations presented in this document are guided by a 5-step process, illustrated below. This process was adapted from OTM’s Book 18 5-Step network development model and other applicable best practices, with adjustments made to reflect the unique phases of work undertaken as part of the TMP update. To avoid redundancy, this excluded all neighbourhood greenways and off-road routes which were instead, identified as part of the municipality’s own Recreational Trails Master Plan. Given the importance in combining both on-road and off-road systems as one integrated active transportation network, however, the recommendations were developed in tandem.

Step 1: Identify Existing Conditions

- Map out location of currently proposed active transportation routes, including those listed under: the Middlesex County Cycling Strategy (2018), #CycleON Action Plan 2.0 (2018) and relevant local secondary plans
- Complete a series of field visits to assess the state of current AT routes and relevant conditions

Step 2: Develop Selection Criteria

- Meet with members of the technical and stakeholder advisory committees to identify goals for the active transportation network;
- Consult members of the public and relevant stakeholders to identify priorities active transportation investment
- Coordinate with RTMP project team to maintain an integrated network

Step 3: Identify Candidate Routes and Targeted Locations

- Meet with members of the technical and stakeholder advisory committees to identify goals for the active transportation network;
- Consult members of the public and relevant stakeholders to identify priorities in active transportation investment
- Coordinate with RTMP project team to maintain objective of designing an integrated active transportation network

Step 4: Assign Appropriate Facilities and Treatments

- Meet with members of the technical and stakeholder advisory committees to identify goals for the active transportation network;
- Consult members of the public and relevant stakeholders to identify priorities active transportation investment
- Coordinate with RTMP project team to maintain objective of designing an integrated active transportation network

Step 5: Refine Network based off Costing Details

- Consult members of the public and relevant stakeholders to identify priorities active transportation investment
- Coordinate with RTMP project team to maintain objective of designing an integrated active transportation network

Existing Conditions

To leverage the value of past planning work and ensure broader active transportation connectivity, the proposed active transportation network was built upon the alignment of existing on-road and off-road routes. This includes existing paved shoulders and recreational trails, previously described within Chapter 2 of the TMP. The location and alignment of these routes, across the entire Municipality and within the urban areas of Mt. Brydges and Strathroy, are depicted within the network maps shown in **Figure 19, Figure 20,** and **Figure 21.**

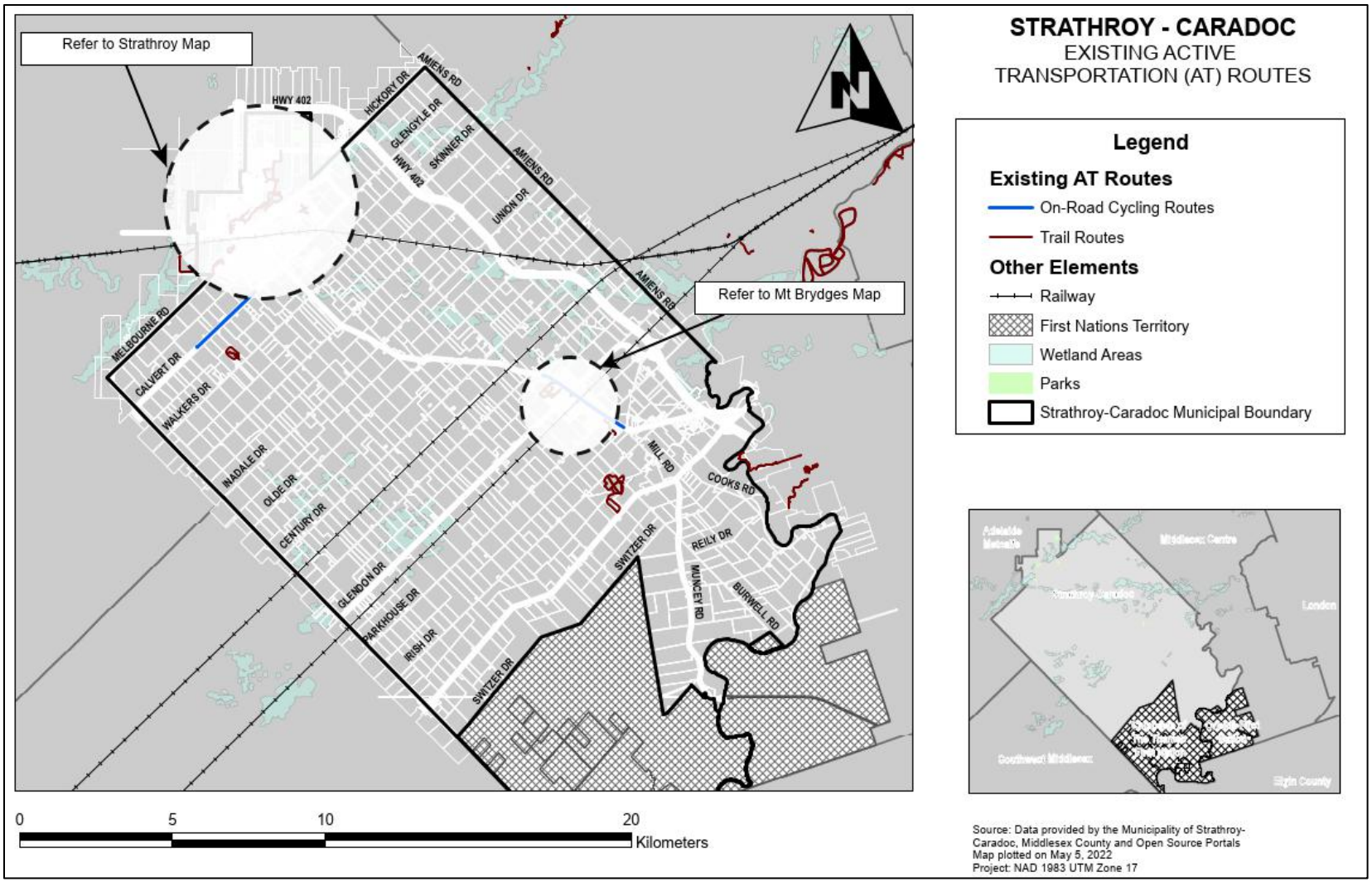


Figure 19: Existing On-Road Cycling Routes and Off-Road Trails within Strathroy-Caradoc

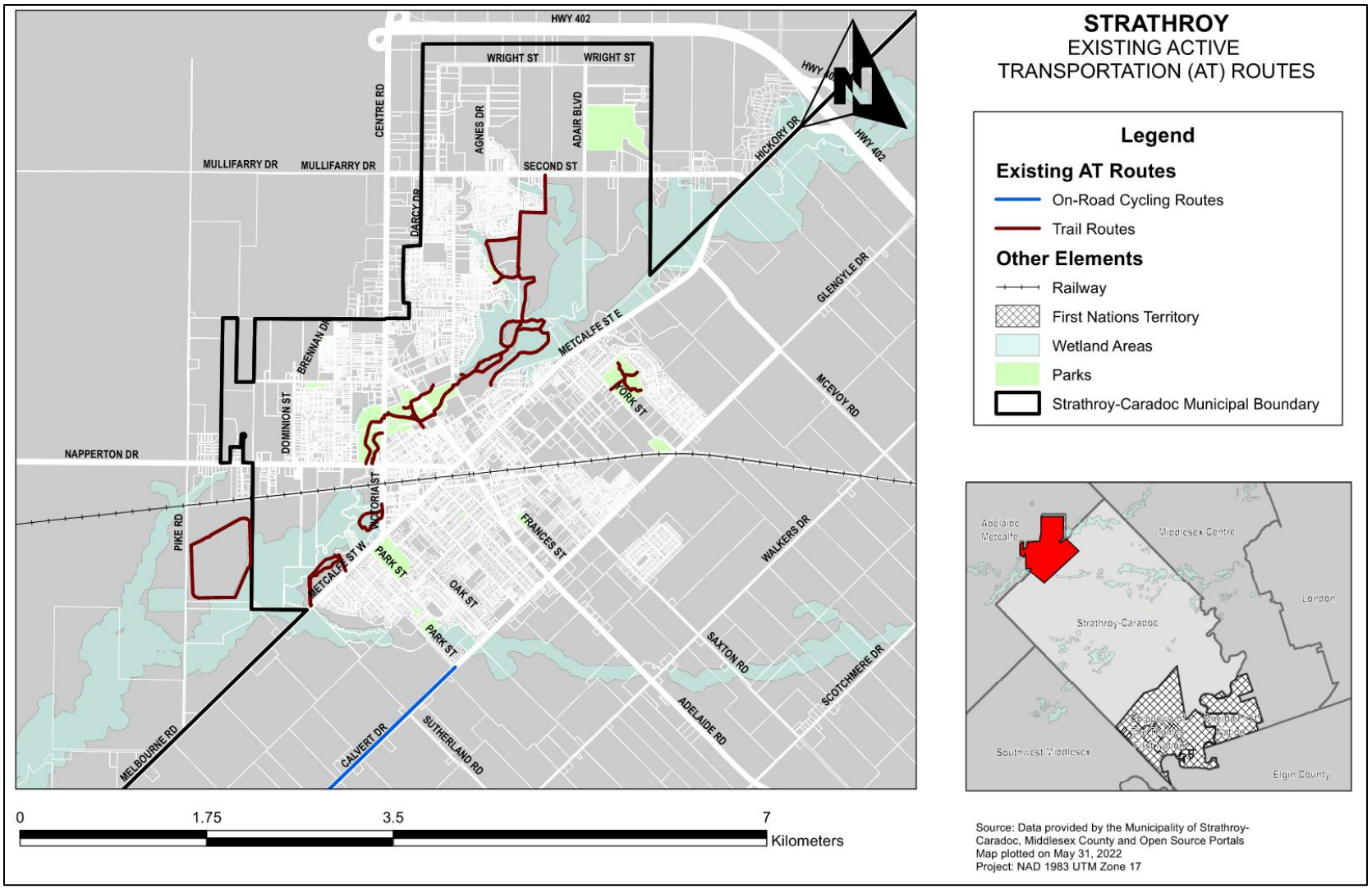


Figure 20: Existing On-Road Cycling Routes and Off-Road Trails within Strathroy

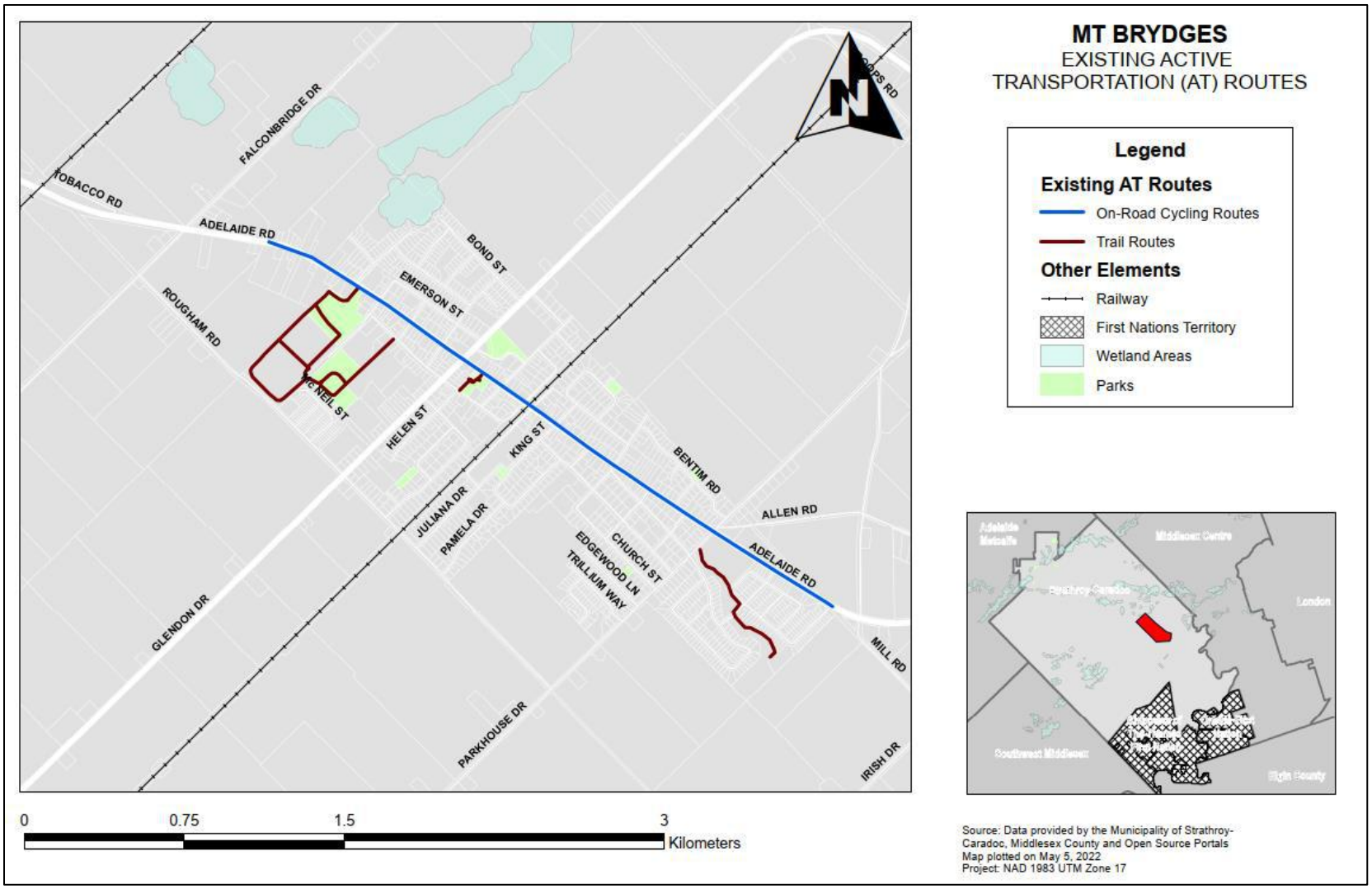


Figure 21: Existing On-Road Cycling Routes and Off-Road Trails within Mt. Brydges

Route Selection Criteria

Both the existing recommendations laid out within the Middlesex County Cycling Strategy and those proposed within the Recreational Trails Master Plan, served as the foundation upon which new route recommendations were made. Key priorities in identifying these new routes included: addressing connectivity gaps, ensuring integration between on-road and off-road systems and addressing concerns raised during recent consultation events. Other defining selection criteria includes the following:

- Connectivity & Directness: Offer the most direct path of travel, enhancing cycling's competitiveness and aligning it better with typical travel behavior.
- Access & Potential Use: Located along corridors and provide access to sites with higher trip activity, as assumed by their concentration of residential, commercial, and institutional uses.
- User Safety & Comfort: Offer cyclists a safe and comfortable travel experience by being located along roadways with lower traffic volumes and speeds and improved roadway conditions.
- Cost & Feasibility: Selected based on affordability and overall feasibility, preferencing 'table road-dieting or the bundling of related capital projects.
- Tourism: Provide access to key natural and built destinations, such as local conservation areas, museums, commercial main strips, and other sites known to attract visitors.
- On-road and Off-road Integration: Improve connectivity between proposed and existing on-road and off-road trail routes.
- Local Demand: Align with expressed local demand, as identified either by the client or from project engagement events.

Candidate Routes

To leverage the value of past planning work and ensure broader active transportation connectivity, the proposed active transportation network maintained the recommendations of the Middlesex Cycling Strategy (2018) and Provincial On-Road Cycling Network. This included the following planned routes:

Provincial On-Road Cycling Network

- 19.9 km of on-road route (route type not specified)

Middlesex Cycling Strategy

- 91.4 km of signed route
- 13.2 km of paved shoulder
- 5.4 km of buffered paved shoulder
- 0.6 km of multi-use trail

With the TMP being developed in tandem with the municipality's Recreational Trails Master Plan (RTMP), route recommendations from each plan were designed as one integrated network. Given the RTMP's broader range of route types, its proposed recommendations represented a far greater extent of the proposed complete network.

Network Development Outcomes

With the complete list of candidate active transportation routes confirmed, segments recommended from the TMP (excluding routes listed under the RTMP, Provincial Cycling Network and Middlesex County Cycling Strategy) were then assigned an appropriate route type. These assignments were based off a combination of considerations including, continuity with existing facilities and facility recommendations, client concerns and public feedback. All recommended facilities also relied on an application of technical guidance listed within leading technical references. Listed within **Table 6** below are some key guidelines that inform both the selection and design of different active transportation facilities. The table also identifies applicable passages, where additional guidance can be provided.

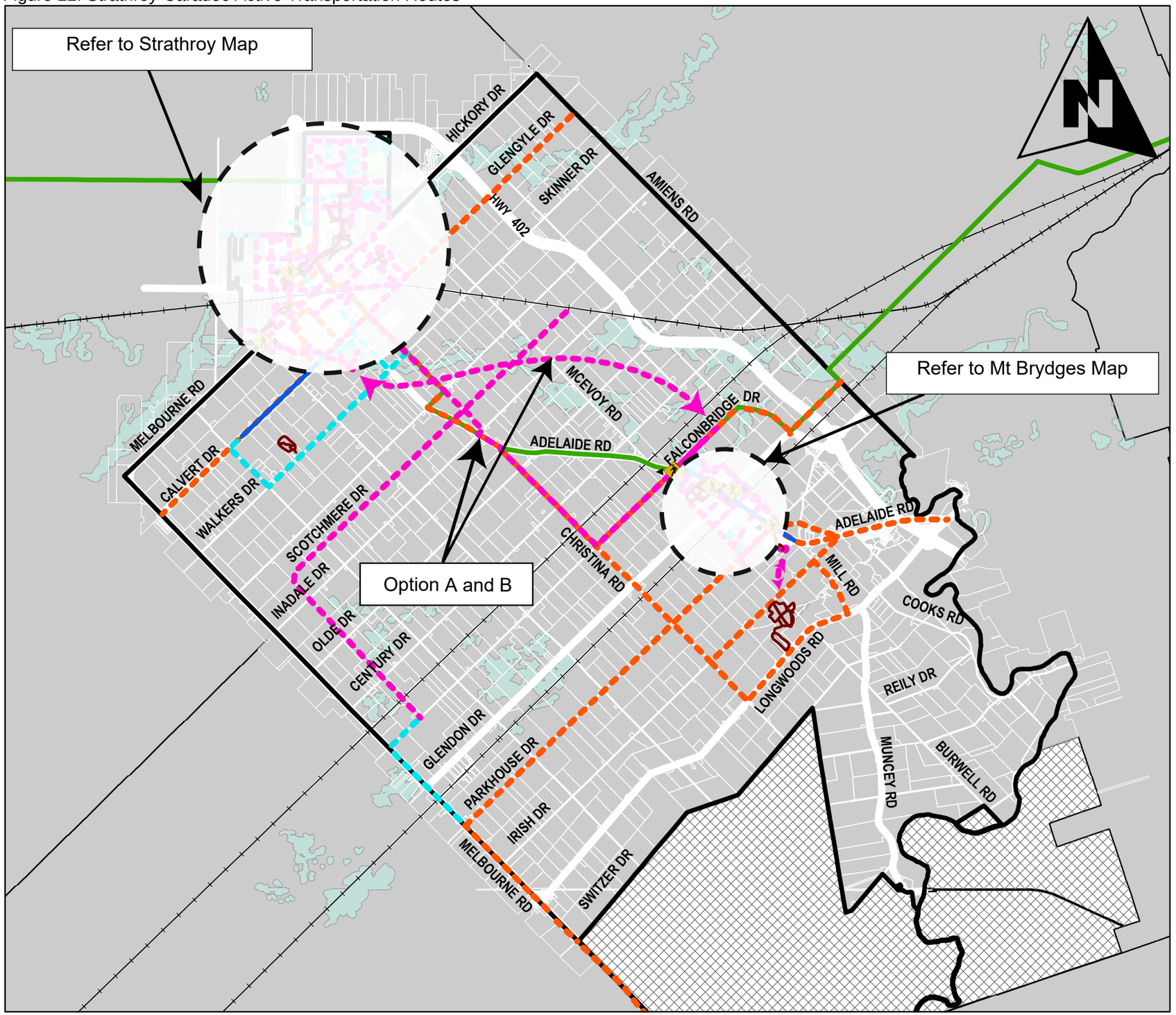
Table 6: High-Level Design Guidance for Facilities Listed within the Proposed Active Transportation Network

Route	Two-way Traffic Volumes (ADT)	Operating Speed	Facility Width	Applicable References
Bike Lane	≥2,500	≥40 km/h	1.5 – 1.8 metres	OTM Book 18, section 4.4
	Maximum one motor vehicle lane per direction, otherwise consider a buffered bike lane at a minimum			
Buffered Paved Shoulder			1.5 – 2.0 metres + 0.5 – 1.0 m buffer	OTM Book 18, section 4.5.4
Paved Shoulder	≥1,000	≥40 km/h	1.5 metres – 2.0m	OTM Book 18, section 4.5.4
	At higher volumes and speeds, consider a buffered paved shoulder			
Signed route	≤2,500	≥40 km/h[1]	3.0 – 4.5 metre travel lane	OTM Book 18, section 4.5.2, 4.5.3

Note:
In locations where traffic volumes are very low (e.g., less than 1,000 cars per day), the threshold for speed could be higher. Practitioners are encouraged to reference the OTM Book 18 facility selection process to help identify the desirable level of separation for a facility based on traffic volumes and posted speed. The facility selection process includes three steps. It is important that practitioners complete each step to identify the best possible facility type based off the specific context and roadway characteristics.

Combining the results of these route selections with those recommended through the RTMP, Provincial Cycling Network and Middlesex County Cycling Strategy, a complete active transportation network was developed. Maps showing the complete active transportation network, across the municipality and within Strathroy and Mt. Brydges are shown in **Figure 22** through **Figure 28**. Details on the different trail classifications can be found within the RTMP.

Figure 22: Strathroy-Caradoc Active Transportation Routes



STRATHROY-CARADOC

PROPOSED ACTIVE TRANSPORTATION (AT) ROUTES

Legend

Existing AT Routes

- On-Road Cycling Routes
- Trail Routes

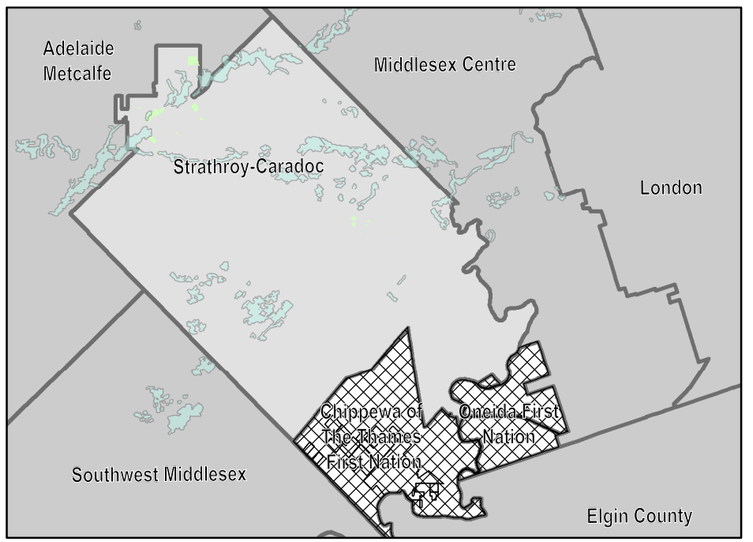
Proposed AT Routes

- On-Road Cycling Routes
- Routes from Recreational Trails Master Plan
- Middlesex County Cycling Strategy Routes

Other Elements

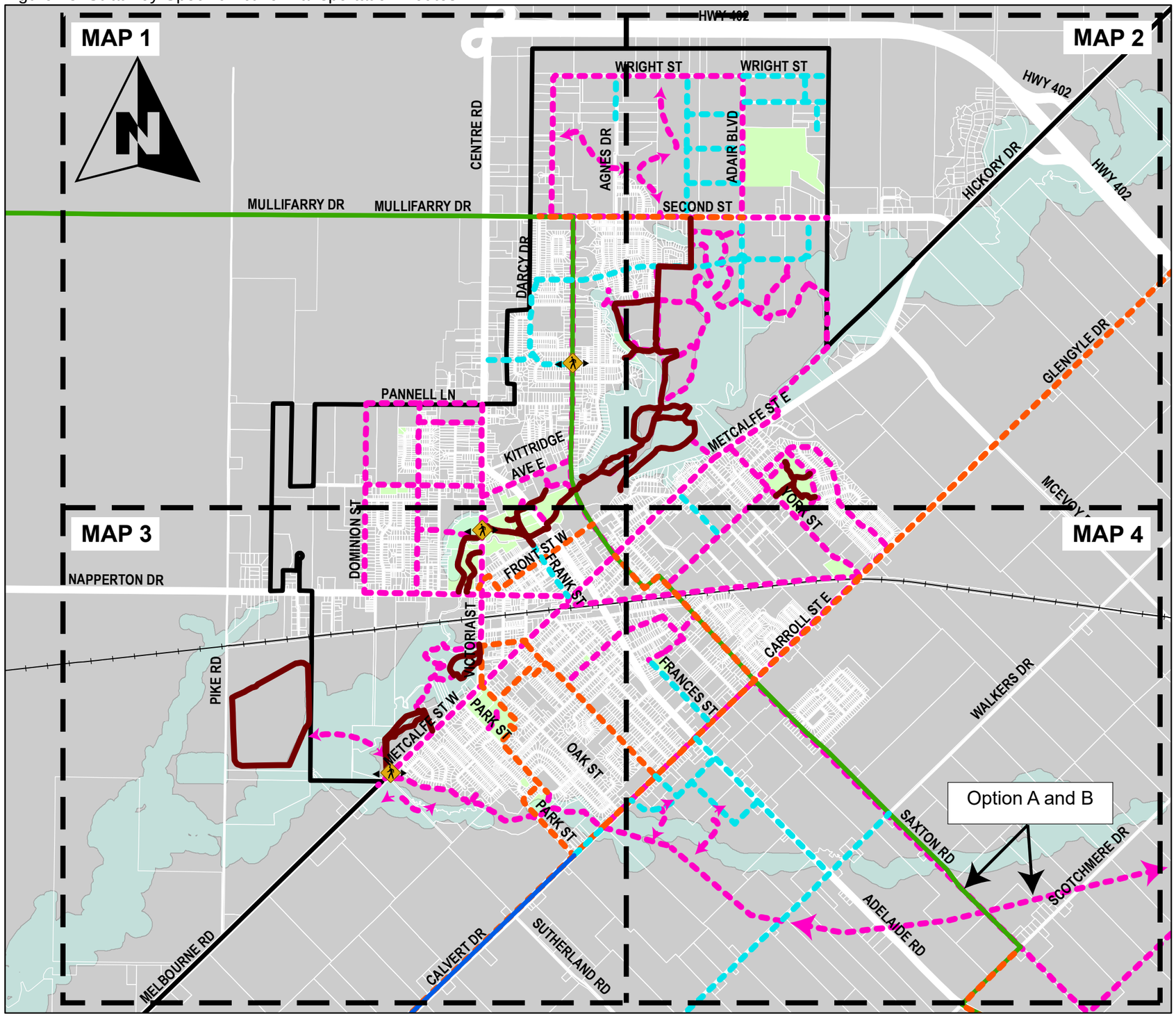
- Province Wide Cycling Network
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Recommended Enhanced Pedestrian Crossing (Location and Type to be Determined)
- Strathroy-Caradoc Municipal Boundary

Note: Refer to the Middlesex County Cycling Strategy Report (2018) and the Province Wide Cycling Network in the #CycleON Action Plans 1.0 and 2.0 for detailed information regarding existing and proposed facilities.



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 23: Strathroy-Specific Active Transportation Routes



STRATHROY
PROPOSED ACTIVE TRANSPORTATION (AT) ROUTES

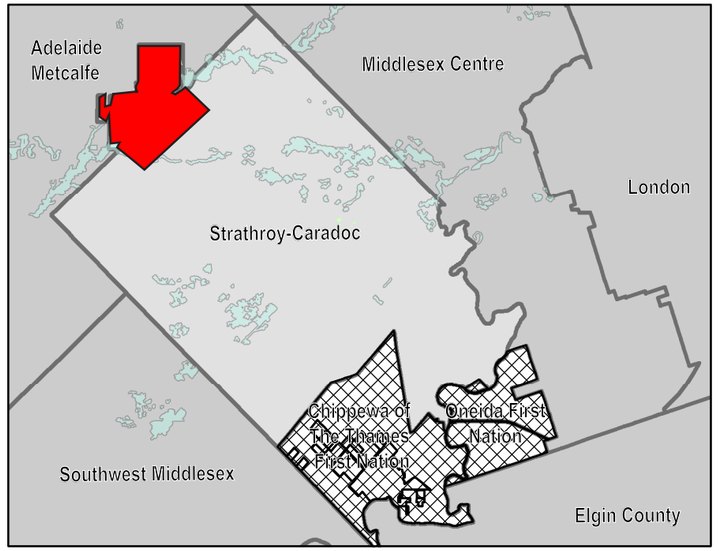
Legend

Existing AT Routes
- On-Road Cycling Routes
- Trail Routes

Proposed AT Routes
- On-Road Cycling Routes
- Routes from Recreational Trails Master Plan
- Middlesex County Cycling Strategy Routes

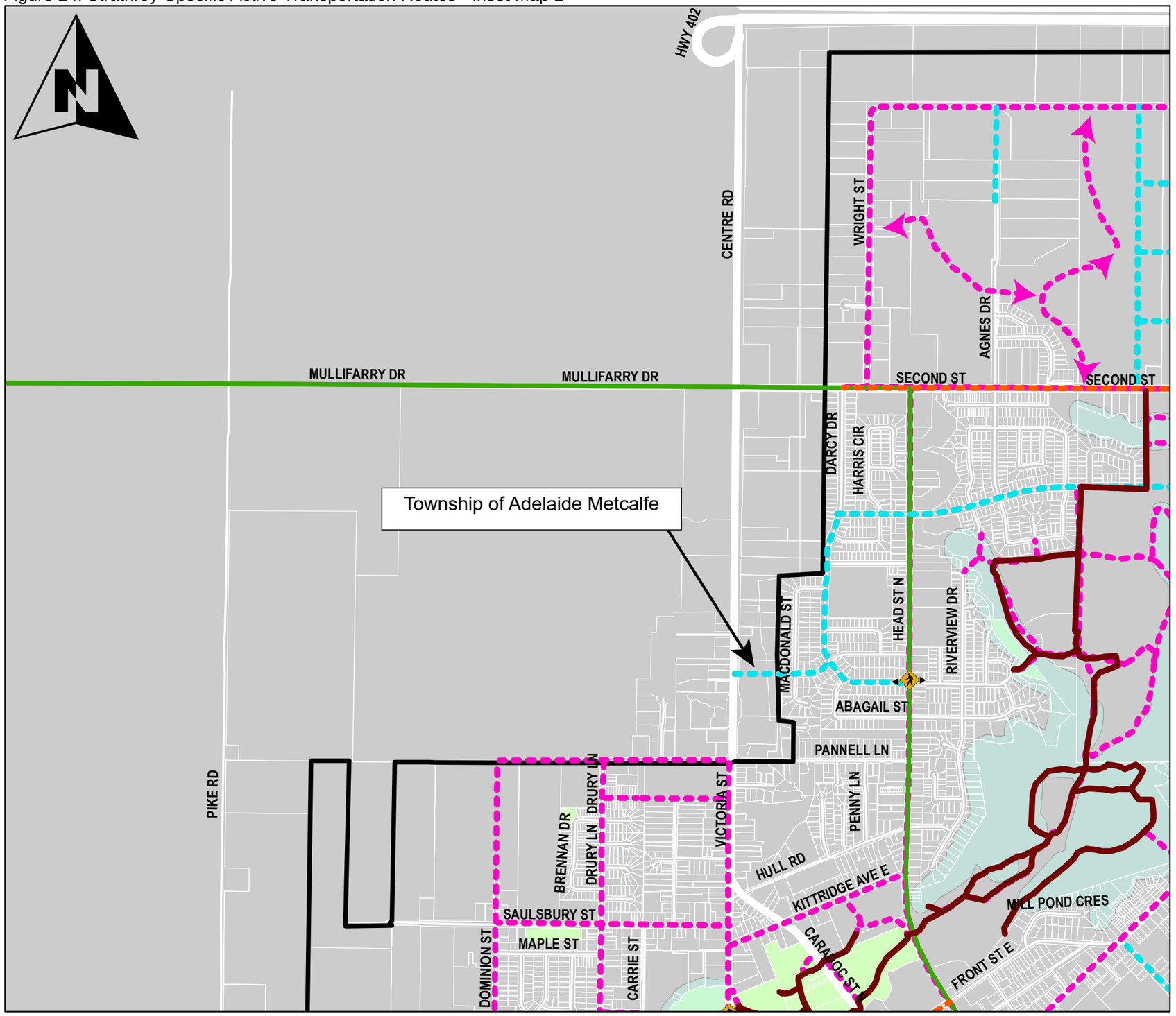
Other Elements
- Provincial On-Road Cycling Network
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Recommended Enhanced Pedestrian Crossing (Location and Type to be Determined)
- Strathroy-Caradoc Municipal Boundary

Note: Refer to the Middlesex County Cycling Strategy Report (2018) and the Province Wide Cycling Network in the #CycleON Action Plans 1.0 and 2.0 for detailed information regarding existing and proposed facilities.



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 24: Strathroy-Specific Active Transportation Routes - Inset Map 1



STRATHROY (MAP 1)
PROPOSED ACTIVE TRANSPORTATION (AT) ROUTES

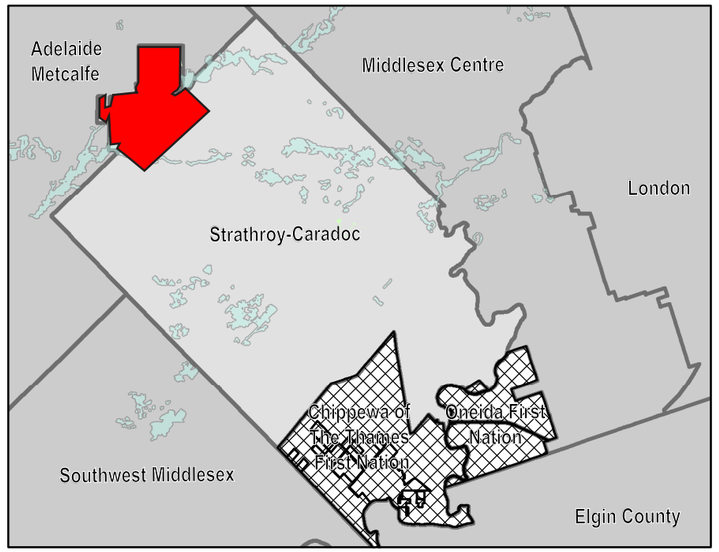
Legend

Existing AT Routes
- On-Road Cycling Routes
- Trail Routes

Proposed AT Routes
- On-Road Cycling Routes
- Routes from Recreational Trails Master Plan
- Middlesex County Cycling Strategy Routes

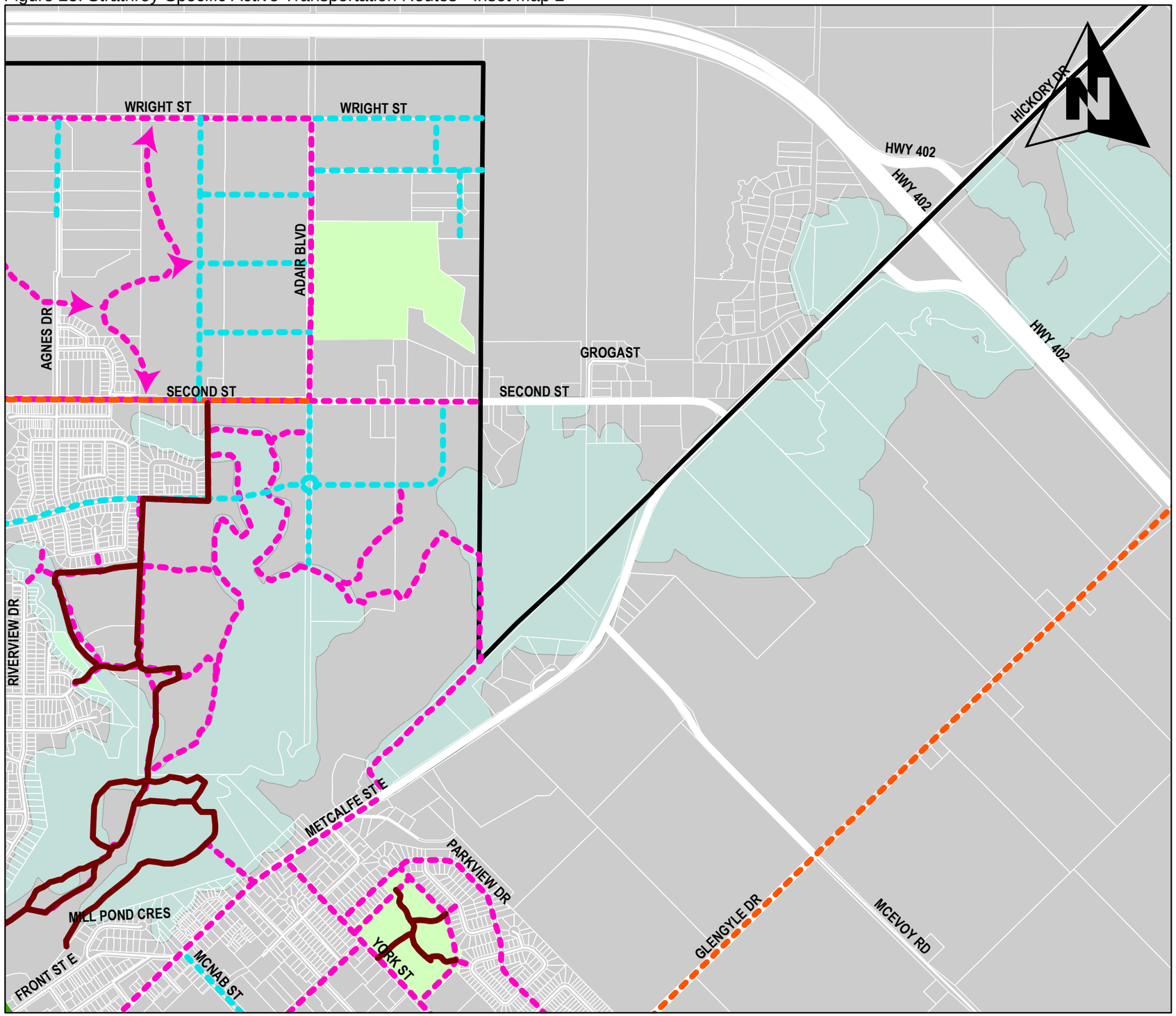
Other Elements
- Provincial On-Road Cycling Network
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Recommended Enhanced Pedestrian Crossing (Location and Type to be Determined)
- Strathroy-Caradoc Municipal Boundary

Note: Refer to the Middlesex County Cycling Strategy Report (2018) and the Province Wide Cycling Network in the #CycleON Action Plans 1.0 and 2.0 for detailed information regarding existing and proposed facilities.



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 25: Strathroy-Specific Active Transportation Routes - Inset Map 2



0 0.75 1.5 3 Kilometers

STRATHROY (MAP 2)
PROPOSED ACTIVE TRANSPORTATION (AT) ROUTES

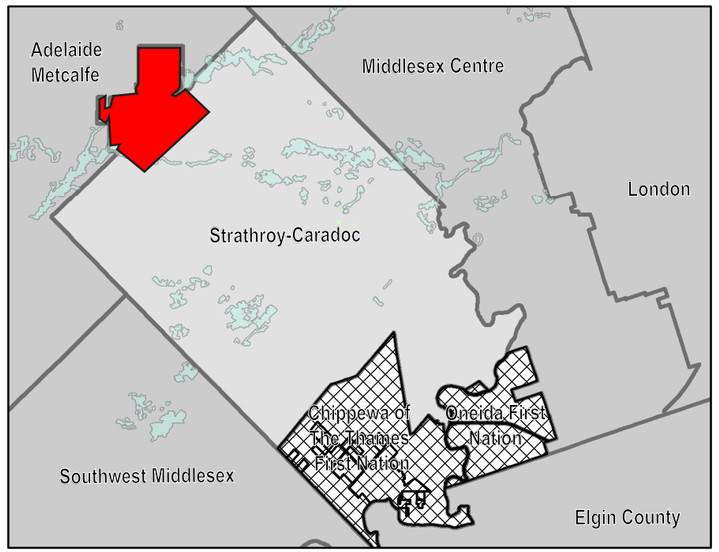
Legend

Existing AT Routes
- On-Road Cycling Routes
- Trail Routes

Proposed AT Routes
- On-Road Cycling Routes
- Routes from Recreational Trails Master Plan
- Middlesex County Cycling Strategy Routes

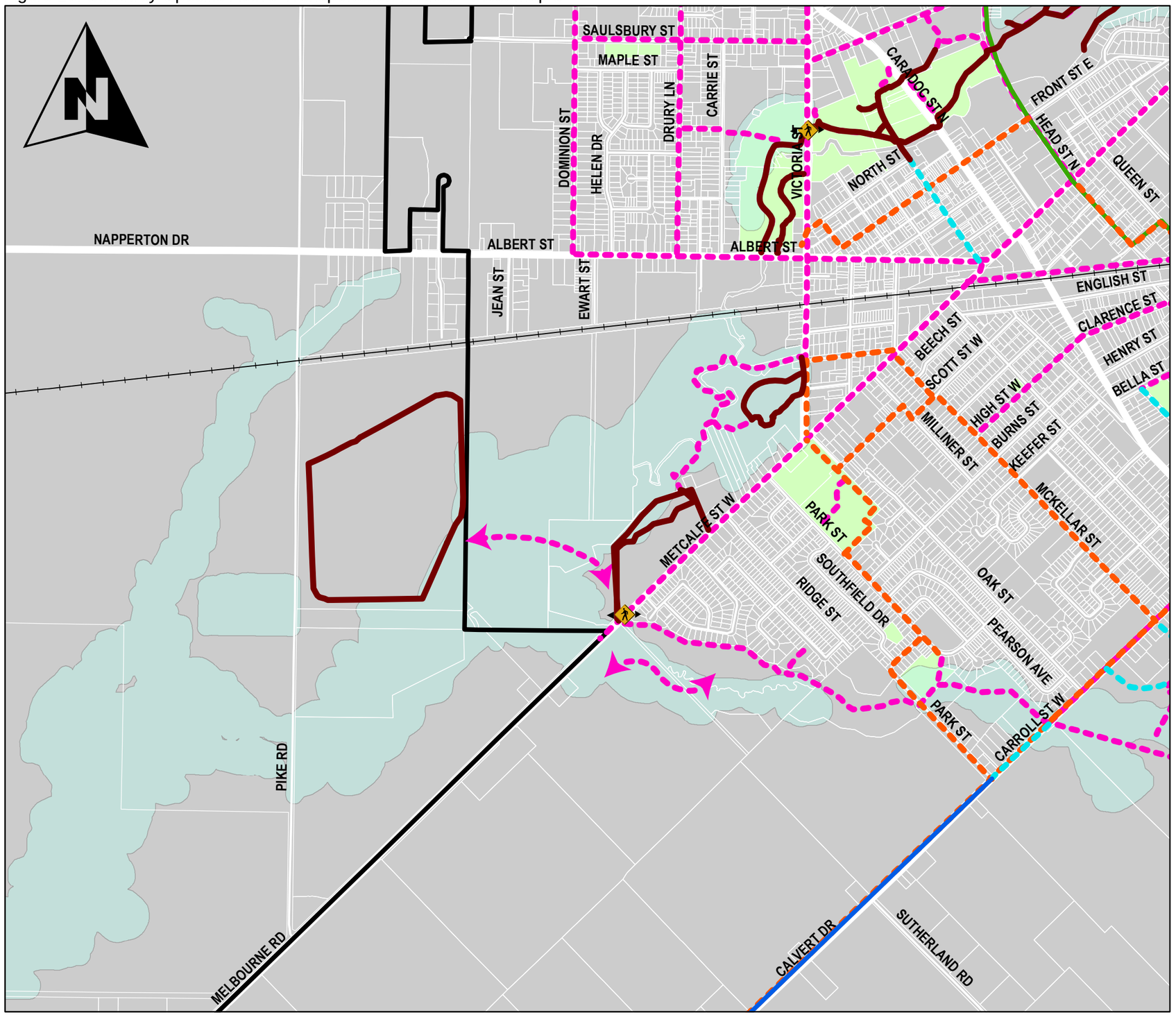
Other Elements
- Provincial On-Road Cycling Network
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Recommended Enhanced Pedestrian Crossing (Location and Type to be Determined)
- Strathroy-Caradoc Municipal Boundary

Note: Refer to the Middlesex County Cycling Strategy Report (2018) and the Province Wide Cycling Network in the #CycleON Action Plans 1.0 and 2.0 for detailed information regarding existing and proposed facilities.



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 26: Strathroy-Specific Active Transportation Routes - Inset Map 3



0 0.75 1.5 3 Kilometers

STRATHROY (MAP 3)
PROPOSED ACTIVE TRANSPORTATION (AT) ROUTES

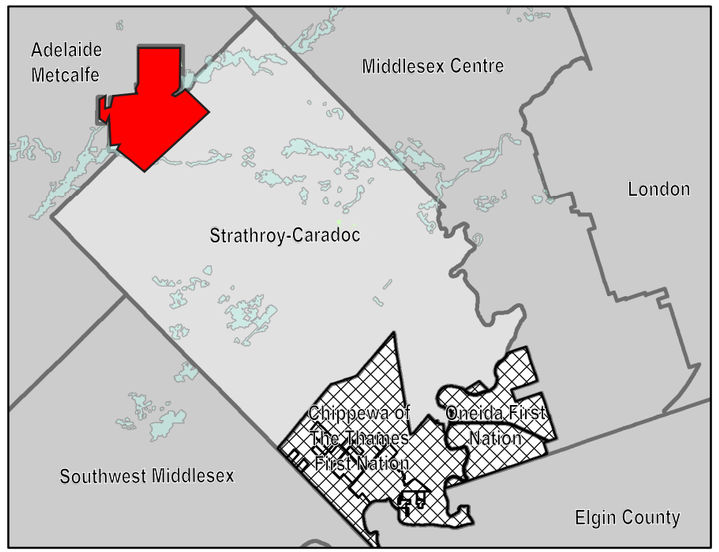
Legend

Existing AT Routes
- On-Road Cycling Routes
- Trail Routes

Proposed AT Routes
- On-Road Cycling Routes
- Routes from Recreational Trails Master Plan
- Middlesex County Cycling Strategy Routes

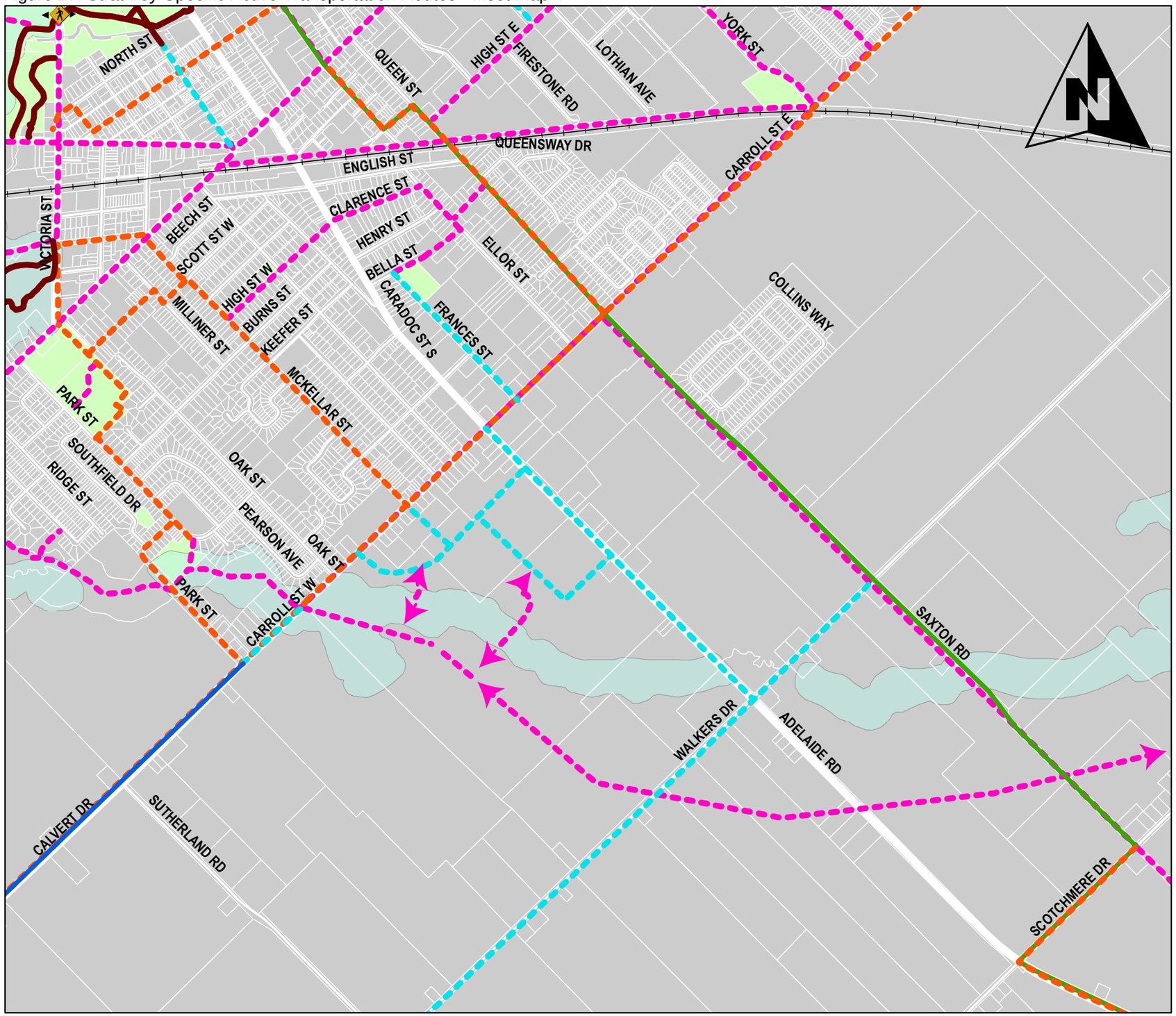
Other Elements
- Provincial On-Road Cycling Network
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Recommended Enhanced Pedestrian Crossing (Location and Type to be Determined)
- Strathroy-Caradoc Municipal Boundary

Note: Refer to the Middlesex County Cycling Strategy Report (2018) and the Province Wide Cycling Network in the #CycleON Action Plans 1.0 and 2.0 for detailed information regarding existing and proposed facilities.



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20,2022
Project: NAD 1983 UTM Zone 17

Figure 27: Strathroy-Specific Active Transportation Routes - Inset Map 4



STRATHROY (MAP 4)
PROPOSED ACTIVE TRANSPORTATION (AT) ROUTES

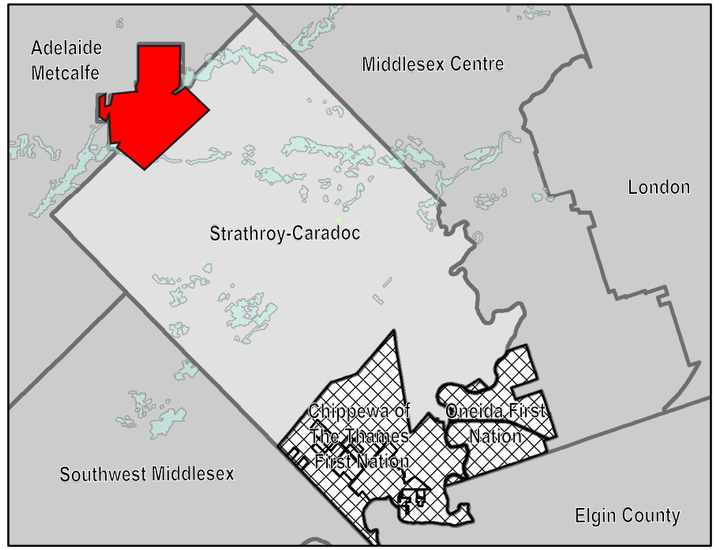
Legend

Existing AT Routes
- On-Road Cycling Routes
- Trail Routes

Proposed AT Routes
- On-Road Cycling Routes
- Routes from Recreational Trails Master Plan
- Middlesex County Cycling Strategy Routes

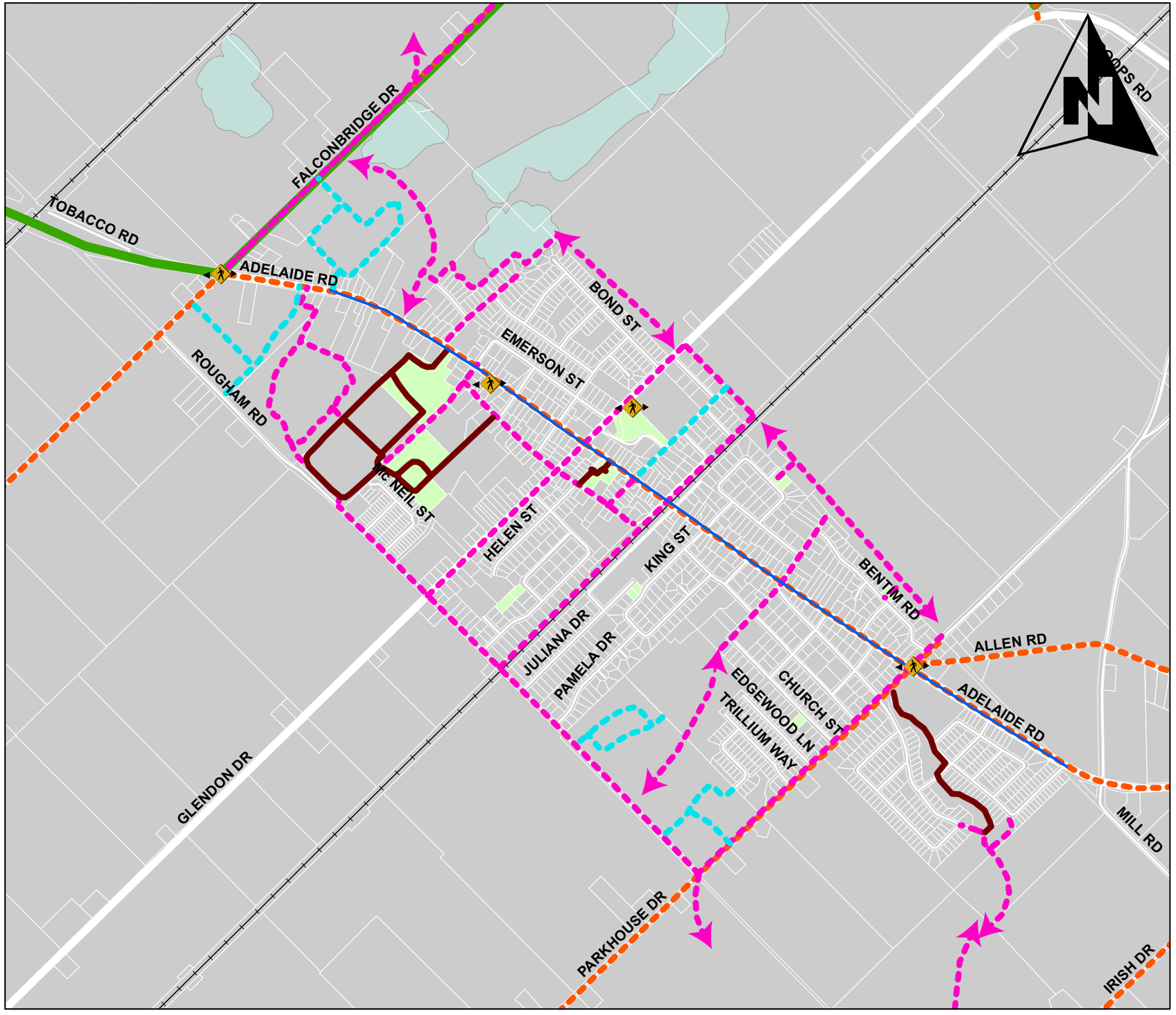
Other Elements
- Provincial On-Road Cycling Network
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Recommended Enhanced Pedestrian Crossing (Location and Type to be Determined)
- Strathroy-Caradoc Municipal Boundary

Note: Refer to the Middlesex County Cycling Strategy Report (2018) and the Province Wide Cycling Network in the #CycleON Action Plans 1.0 and 2.0 for detailed information regarding existing and proposed facilities.



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 28: Mt. Brydges Active Transportation Routes



MT BRYDGES
PROPOSED ACTIVE TRANSPORTATION (AT) ROUTES

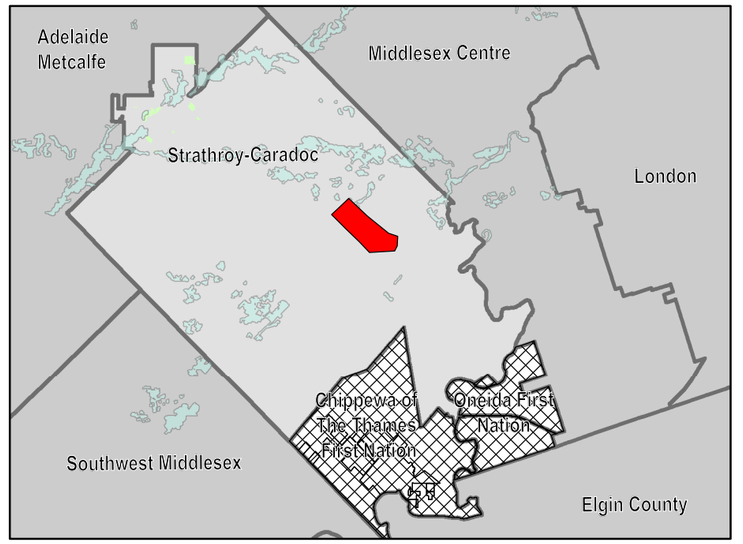
Legend

Existing AT Routes
- On-Road Cycling Routes
- Trail Routes

Proposed AT Routes
- On-Road Cycling Routes
- Routes from Recreational Trails Master Plan
- Middlesex County Cycling Strategy Routes

Other Elements
- Province Wide Cycling Network
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Recommended Enhanced Pedestrian Crossing (Location and Type to be Determined)

Note: Refer to the Middlesex County Cycling Strategy Report (2018) and the Province Wide Cycling Network in the #CycleON Action Plans 1.0 and 2.0 for detailed information regarding existing and proposed facilities.



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on May 31, 2022
Project: NAD 1983 UTM Zone 17

Improved Crossings

Owing to Strathroy-Caradoc's vast and varied geography, both the proposed trail and on-road networks intersect a variety of constraining natural and built features. The design of routes may also be challenging at some crossings and intersections due to the right-of-way width, traffic volume, vehicle operating speeds, roadway function, culverts and grade / elevation change, environmental features, etc. This reality underscores the importance in not only designing high quality facilities but also, applying appropriate treatments at these more conflict-prone intersections and crossings. These provisions ensure the proper integration of all network components and support a more seamless travel experience from origin to destination.

Included among these proposed treatments are enhanced pedestrian crossings. These facilities are vital in improving the integration of active transportation network and facilitating the safe movement of more vulnerable traffic users such as children and elderly folk. Guidance related to the design of pedestrian crossings is provided within Ontario Traffic Manual (OTM) Book 15 – Pedestrian Crossing Facilities. Pedestrian crossings can be identified as either **controlled** or **uncontrolled**, depending on whether they feature some form of formal traffic control or require users to yield to oncoming traffic, respectively. According to the Middlesex County Crosswalk Guidelines, there are three types of pedestrian crosswalks that are utilized in the County of Middlesex, including traffic signals, pedestrian crossover, and supervised school crossings.

As part of the TMP's first round of engagement, an interactive mapping tool was setup, inviting members of the public to identify areas of concern within the municipality's existing transportation system. Among the items raised were suggested locations for improved pedestrian crossings, including school crossings. These locations are listed in **Figure 29** through **Figure 32** and can be considered. They will also be identified for further study as well as review including pedestrian counts and analysis based on warrants incorporated in OTM Book 15 and the Middlesex County Crosswalk Policy. There are multiple ways to accommodate a pedestrian crossing and additional data needs to be collected to determine the most appropriate location and types of crossing suitable for the area. As all locations will support the safe crossing of youth and other vulnerable road users over an arterial roadway (50km), they are recommended to feature some form of control.

Glendon Dr & Bond St:

School crossing to provide a safer access point to Caradoc Public School

Figure 29: Glendon Dr and Bond St Intersection

(Source Google Maps)

Adelaide Rd & Lions Park Dr:

Pedestrian crossing to provide a safer access point to the Tri-Township Arena and Lions Park Mt. Brydges

Figure 30: Adelaide Rd and Lions Park Dr Intersection

(Source: Google Maps)

Victoria St & Rotary Trail Crossing:

Improve continuity along the Rotary Trail System and facilitate safer crossings along the roadway.

Figure 31: Victoria St and Rotary Trail Crossing

(Source: Google Maps)

Head St N & Deruiter Dr:

Pedestrian crossing to address popular desire line, especially for students.

Figure 32: Head St N & Deruiter Dr Crossing

(Source: Google Maps)

Rail Crossings

With three major rail lines crossing the municipality, the proposed active transportation network will also feature intersections with the rail network. Most of these junctures operate as at grade crossings which create uneven surfaces that can be more hazardous or uncomfortable for AT users to cross. While ideal to fully separate these travel modes through new structures (i.e. overpasses, underpasses, bridges), the quantity and scale of each intervention makes such an approach financially unfeasible. As a more feasible alternative, the Municipality should consider applying common design features, including those listed below:

- Crossing Surface: The crossing surface must be of a width that is equal to the width of the travelled way and shoulders of the road, plus 0.5 m on each side and must be smooth and continuous.
- Enhanced Signage: "Look both ways for trains" sign should be placed on the approach.
- Pavement Markings: A dashed line may be provided for at least 15 metres in advance of crossing a bicycle lane crosses a skewed railroad crossing.
- Warning Detection System: In circumstances where the centreline alignment of the bicycle or shared facility is greater than 3.6 metres from the primary warning system for the at-grade road crossing, a separate warning system or device is recommended. Rubber Track Guards: Consist of a rubber surface placed between exposed rail tracks, along an at-grade crossing. They improve the friction between tires and exposed rail along at-grade railway crossings, making it more comfortable and safer for cyclists to cross.

As identified within the report's existing conditions analyses, there are currently 30 at grade signalized rail crossings found throughout the municipality of Strathroy-Caradoc. While ideal to apply the forementioned treatments at all of these locations, investments should be prioritized at locations with greater anticipated travel demand. This includes those located within the urban areas of Strathroy and Mt. Brydges as well as those located along roadways identified within the proposed active transportation network.

5.1.2 Active Transportation Programs

Equally vital to supporting active transportation are range of supportive programs that build awareness and focus on the safety of interested and existing users. Listed below are two key examples, identified based off a review of best practices deemed applicable to the Strathroy-Caradoc context.

School-based Active Transportation Strategy

To encourage more local residents to consider active transportation, programs must be tailored to different key audiences. This includes the local student population, who remain more dependent on active transportation for their mobility. Encouraging students to travel by active transportation promotes a healthier and more active lifestyle and, can build cultural support for active transportation more broadly. As children often require their parent's permission to use active transportation on their own, any effective program must also be targeted at parents as well as students.

One approach is to implement the Ontario Active School Travel Program within a larger number of local schools. Run by Green Communities Canada, the initiative offers local schools access to range of educational resources, online or in-person workshops as well as program toolkits, that they can be used to encourage their students to commute using active modes. Within Strathroy-Caradoc, the initiative has since been implemented in three local schools, as part of the St Thomas Elgin London Middlesex Oxford Active & Safe Routes to School (ARTS) initiative. While a positive start, investments should be made to expand the initiative to more schools, including the two only local high schools: Strathroy District Collegiate Institute and Holy Cross Catholic Secondary School. To oversee this expansion

and improved existing arrangements, recommended that a School Travel Planning Facilitator role should be established. Given the municipality's limited financial and staffing resources, partnerships should be explored with either Middlesex County or the Middlesex-London Health Unit for support in expanding the program. Other suggestions for encouraging more active school travel in Strathroy-Caradoc include:

- Hosting events taking students on mountain bike trips, such as the non-profit organization Trip for Kids.
- Providing support for after-school bike clubs.
- Supporting and leading biking and walking school buses, an organized system of walking or biking a group of children from home to school under the supervision of one or more adult volunteers.
- Creating an advisory committee to monitor and help coordinate school based active transportation initiatives, which features representatives from the local school boards and their student body.

Route Maintenance Program

In addition to designing a complete cycling network, appropriate protocols and practices must be in place to ensure its routine maintenance and state of well-repair. Absence of a comprehensive and effective maintenance not only undermines the safety and comfort of cycling routes but, their longevity as useful infrastructure. Like all other aspects of the cycling network, recommended maintenance activities should be tailored to the municipality's available resources and current asset management practices and applicable best practices. This includes those of comparable municipalities as well as leading technical references, such as OTM Book 18 and Provincial Minimum Maintenance Standards (MMS).

Given Strathroy-Caradoc's seasonal climate, maintenance activities must also address winter-specific concerns such as snow clearance and de-icing. With cycling activity usually lower in the winter season, maintenance activities should be prioritized along key cycling routes, to justify the high expense. While not a requirement, the Minimum Maintenance Standards for Municipal Highways (O. Reg 239/02) remains a trusted precedent among municipalities across Ontario. As of 2018, the guidelines were updated to include specific standards on snow clearance, ice prevention and ice treatment on both on-road and off-road routes.

5.1.3 Active Transportation Recommendations

Network Recommendations

- Combine recommendations of the existing Middlesex County Cycling Strategy and Recreational Trails Master Plan conceptual trails network with newly identified linkages to create a complete network which integrates the on-road and off-road systems.
- Consider and review warrants for potential pedestrian crossings at or in proximity to Glendon Dr & Bond St, Victoria St & Rotary Trail, Head St N & Deruiter Dr, and Adelaide Rd & Lions Park Dr.
- Consider guide rails in accordance with the Ontario Traffic Manual

– Consider rail guards and other potential rail safety improvements at key routes along the active transportation network.

Programming Recommendations

– Expand the Ontario Active School Travel Program within a greater number of local schools.
– Align existing route maintenance standards with the guidelines of the Minimum Maintenance Standards for Municipal Highway (O. Reg 239/02), as amended.

5.2 Transit

5.2.1 Potential Transit Demand Patterns

In defining a future transit strategy, it is difficult to relate the current demand data to what may occur in future, without a local transit service in place. Thus in defining the strategy, one must rely on a review of development patterns, examples from other similar municipalities, and provincial policy direction. The two options for transit service are a fixed-route service (as seen in larger municipalities, such as London) and an on-demand service (i.e., a service which would respond to specific calls for service, and not operating on a fixed-route or timetable).

Provincial policy direction indicates that on-demand services should be considered, in addition to fixed route services. Given the lack of transit history in Strathroy-Caradoc, it is logical to consider on-demand service as a potential starting point.

Key destinations and planned development areas were reviewed to understand where people would be travelling within Strathroy and Mt. Brydges, should municipal transit service be introduced. As the two largest towns in the municipality, Strathroy with a population of 14,400 and Mt. Brydges with a population of 1,800, make-up 70% and 9% of Strathroy-Caradoc's population, respectively. Key destinations are Strathroy Downtown, the Strathroy Middlesex General Hospital, commercial locations along Caradoc St N, Strathroy VIA Rail Station, and Service Ontario.

Development in Strathroy and Mt. Brydges is typically low-density, with residential uses spreading out in a number of directions from the historic commercial centres. Demand in Mt. Brydges would be most likely to be destined to either Strathroy or London, for work, school or retail or social/medical services. While Strathroy is the larger community, the development density and pattern do not create a strong basis for fixed-route service. This suggests that on-demand transit services would be a more logical choice; it would be difficult to define a small number of attractive fixed routes in either Strathroy or Mt. Brydges. Demand is likely to be dispersed for the foreseeable future.

Given this expected future baseline, on-demand service in other Ontario municipalities has been reviewed to provide context for Strathroy-Caradoc. This review is provided in the following section.

5.2.2 On-Demand Transit Service Implementation in Other Municipalities

On-demand transit service has been implemented in a number of municipalities in Ontario. On-demand transit is a needs-based transit service in which riders can specify pick-up and drop-off locations at the time of their desired travel. Typically, the service request is conducted on a mobile application and can also be requested through a website or a phone call. Municipalities have adopted this where a traditional fixed route system may not be deemed effective. Two examples are reviewed below. The Town of Innisfil implemented its on-demand transit service as their sole source of public transportation in 2017. The City of Bellville utilized on-demand transit for its night services where dispatchers are not available.

5.2.2.1 Town of Innisfil

The Town of Innisfil was the first Canadian municipality to partner with Uber to provide transit service. The Town of Innisfil has over 36,000 people with an area of over 262km^2. The Town implemented a program to subsidize a portion of the Uber fare as their transit service. The Town of Innisfil recognized the following benefits of the on-demand transit services compared to the traditional public transit services based on their three years of implementation:

1. A door-to-door service as the proposed fixed routes would not have been within walking distance for many of the residents;
2. The ability to collect necessary data through the Uber service and understand the community's true transit needs;
3. The ability to provide a 24 hour/7 day a week service; collected data shows that 33% of the trips taken were outside of the proposed fixed-route transit operation hours;
4. Lower capital cost (no fleet costs) but may result in a higher operating cost (subsidy);
5. Overall lower transit fares for residents; and
6. Higher annual transit ridership; a conventional transit scenario in Innisfil was expected to provide 22,000 riders with one bus and 37,000 riders with two buses but about 80,000 riders were served with the Town's subsidized Uber scheme in 2020.

Since the Town of Innisfil was the first municipality to use Uber as its sole transit service, there were some obstacles, mainly related to accessibility. Uber is an app-based platform where all operations are completed on a smartphone which limits those without a smartphone. To resolve this issue, the Town partnered with GoGoGrandparent where people can call to request transit service. Vehicles through Uber are not wheelchair accessible. For wheelchair-accessible vehicles, Innisfil partnered with Barrie-Innisfil Taxi where those using the taxi service can still benefit from the subsidized program.

During their pilot project period (from May 15 to July 15, 2017), early results showed that the Town spent $26,462 in comparison to the $270,000 for year one start-up costs required for the conventional transit scenario. During the first two months, 4,868 trips were taken by 1,500 people. The Town allocated $100,000 for Stage 1 of the program which ended at the end of 2017.

The fare system for Innisfil's transit service has an incremental system for key destinations as shown in **Table 7**. For any other locations within the Innisfil boundary, $4 is subsidized from the final cost.

Table 7: Fare System for Innisfil's Transit Service

Key Destinations		
$4	$5	$6
– Innisfil Recreational Complex/Town Hall – Innisfil ideaLAB, Library – Community Centre – Community Church, Foodbank	– GO Station along Yonge St	– Barrie South GO Train Station – Innisfil Heights Employment Area – Highway 400 Carpool lot

Innisfil also implemented the Essential Trip Assistance Program in March 2020 to assist and support residents during the COVID-19 pandemic. This program provided monthly vouchers and additional return vouchers for essential trips to/from grocery stores, clinics, and pharmacies. A total of 7,325 trips have been taken through the Essential Trip Assistance Program from March 2020 to March 2021.

Innisfil's experience with Uber has been a qualified success. Many people now have access to transit, but the popularity of the system has resulted in unexpected costs to the Municipality.

5.2.2.2 City of Bellville

The City of Belleville has an existing fixed-route transit system, and recently also implemented an on-demand transit service, partnered with Pantonium. The City of Belleville has a population of over 50,000 people and an annual transit ridership of over 1.1 million annual passengers. Belleville Transit operates with a combination of regular fixed routes and on-demand services during the evening, as well as services for special events, trolley routes, and specialized accessible mobility transit.

Belleville had a unique problem - the dispatchers were not available during the evening bus service hours. This limited any flexibility of the routes during night operations. Belleville Transit leveraged their existing transit fleet and partnered with Pantonium as a method to connect riders and drivers through the online transit platform.

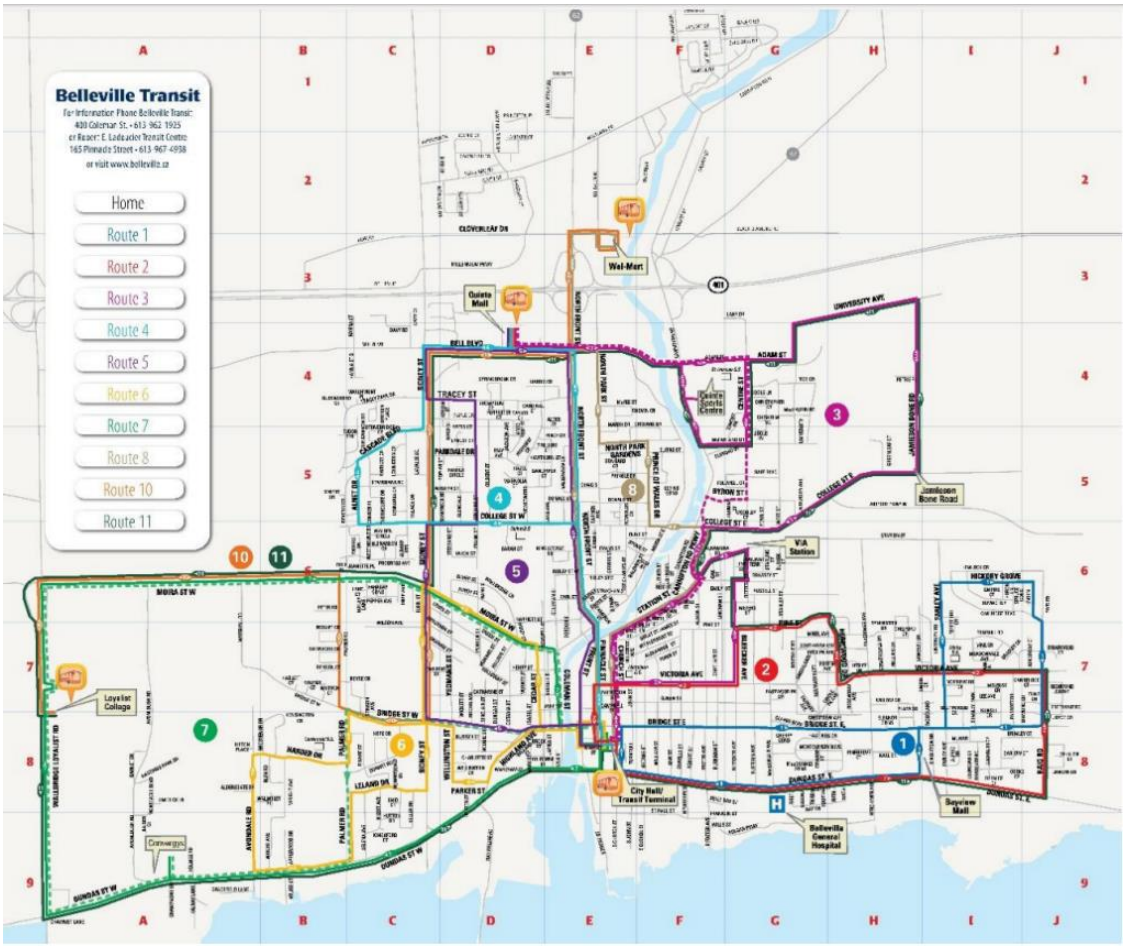
The benefits that Belleville Transit envisioned by using on-demand transit were to provide:

1. Flexible routes;
2. Effective and large coverage area in low demand situations;
3. High availability and wide range of supply of vehicles on a day to day basis;
4. Potential for technology and automation (zero driver interaction); and
5. Reduced transfers and commute times within urban areas.

Based on the first month of the nighttime service pilot period in 2018, the following results were found:

1. Increased ridership by 300%;
2. Decreased per vehicle mileage by 30%;
3. Increased number of bus stops covered by 70% with the same number of vehicles and service hours;
4. Collected data providing information on widely travelled locations as shown in **Figure 33.**

Similar to many other cities and municipalities, there was a significant decrease in transit ridership (close to 80%) due to COVID-19 impacts. Starting on March 27, 2020, the City of Belleville implemented on-demand service only, partnered with Pantonium. With the on-demand service, the fleet size was reduced from 19 buses (16 fleets and 3 specialized buses) to 5-6 vehicles.



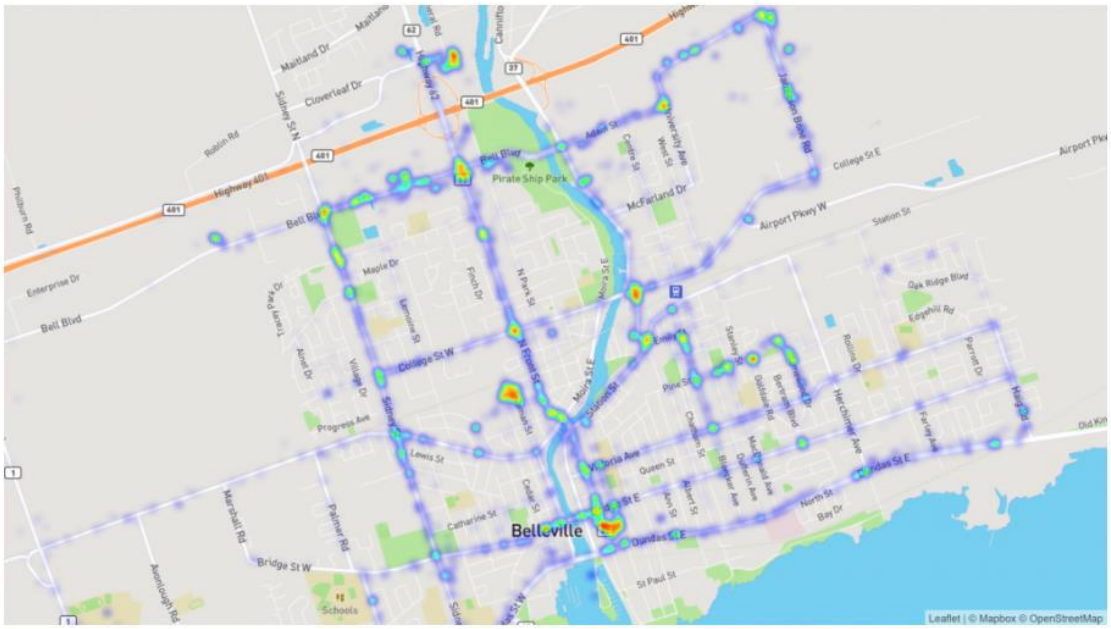


Figure 33: Belleville Late Night Transit Network Pilot Map & Travel Activity Heat Map Used to Inform Network Coordination

(Source: Pantonium)

5.2.3 Transit Feasibility Assessment

Three potential servicing scenarios were developed to assess transit feasibility in Strathroy-Caradoc at a high level.

Scenario 1: Conventional Fixed-Route Transit

Scenario 1 would involve implementing a conventional fixed-route system within Strathroy based on two potential one-way circulator routes as displayed in **Figure 34.** Under this scenario, services would operate at hourly frequencies, 7 days a week, between 7:00 AM and 7:00 PM. Scheduling would be developed to facilitate timed transfers at a central location within Downtown Strathroy. Conventional bus routes would serve all key destinations in Strathroy and be within a five minute (400m) walking distance of most of the rest of the community, with the notable exception of the Molnar Industrial Park. Services would be provided to bus stops on a predictable and reliable basis with a predetermined schedule.

Figure 34: Potential Fixed-Route Service Network

Scenario 2: On-Demand Flex-Route Transit

Scenario 2 would require the same vehicles and service hour requirements as scenario 1 but would introduce flex routing and on-demand services to customers, allowing vehicles

to travel off-route to serve additional locations (such as Molnar Industrial Park) based on real-time demand, while maintaining a reliable schedule. Like scenario 1, bus service would be available at hourly frequencies, 7 days a week, between 7:00AM and 7:00PM.

Scenario 3: On-Demand Taxi and/or Ride Hail App Based Transit

Scenario 3 enables private operators such as existing taxi providers and potential ride-hail app service operators (i.e., Uber, Lyft, etc.) to provide transit service. Private operators are subsidized by the Municipality to provide on-demand trips to and from select locations within the municipality, with users paying a similar rate to what they would pay if they were boarding a local bus. Based on the model developed and operated in Innisfil over the past 5 years, on-demand trips could be booked using smartphone apps or by calling a taxi dispatcher with carpooling encouraged whenever possible to reduce operating costs. The parameters of the transit subsidy would be determined by the City and could flex relatively easily depending on priorities and trial-and-error. While Scenario 3 provides the potential for direct door-to-door trips, service would be less predictable than a scheduled conventional bus. For instance, unlike conventional bus service, customers would not know exactly when they would be picked up, how long their trip might take, and what route they may take to arrive at their destination.

5.2.3.1 OPTION EVALUATION

A comparative assessment of the three high-level transit implementation scenarios is provided in **Table 8**.

Transit service assumptions have been developed in accordance with Canadian averages for systems servicing populations < 50,000, as sourced from the Canadian Urban Transit Agency's 2019 (pre-COVID 19) statistics.

- Bus routes are assumed to function at average speeds of 15 km/h, inclusive of stops and terminal time;
- 30 passenger 30-foot buses are assumed at a cost of $300,000 per vehicle; a vehicle spare rate of 25% is assumed;
- An operating cost of $105 per service hour is assumed. This cost is inclusive of vehicle operations, maintenance, and labour;
- In the absence of an existing transit system, ridership is estimated based on a standard 10 rides per service hour estimate, which reflects a Canadian average for systems with low service area populations. Ridership estimates are conducted for high-level feasibility purposes only and should not be taken as a studied projection of potential ridership within Strathroy. Ridership is assumed as constant across all scenarios;
- For calculation purposes, a standardized $3 per trip fare is assumed for all rider types, across all three scenarios.
- 3 km average on-demand taxi or ride-hail app trip lengths are assumed at a flat fee of $3.50 + $1.75/km = $8.75.

Table 8: Option Evaluation

	Scenario 1: Conventional Fixed-Route Transit	Scenario 2: On-Demand Flex-Route Transit	Scenario 3: On-Demand Taxi or Ride-Hail App Based Transit
Service Structure	2 Fixed Bus Routes	2 Flex Bus Routes	Zone Based
Area Coverage	◑	◕	●
Reliability	●	◕	◔
Route Directness	◔	◑	◕
Frequency	Hourly	Hourly	On-Demand
Hours of Operation	7:00AM - 7:00PM	7:00AM - 7:00PM	Potentially All-Day
Vehicle Requirements	2 + 1 Spare	2 + 1 Spare	N/A
	●	High	
	○	Low	

Scenario 3 – on-demand taxi or ride-hail app-based transit allows the Municipality to provide transit service to Strathroy with no fleet-related capital costs and likely markedly lower annual operating costs as compared to bus-based transit scenarios 1 and 2. By partnering with taxi services and/or ride-hail apps, the Municipality would have the option to provide discounted mobility options to residents while serving the entirety of Strathroy. While on-demand services are naturally not as predictable as scheduled bus service, they provide far greater flexibility in terms of destinations served and hours of operation.

5.2.4 Transit Recommendations

A transit system within Strathroy-Caradoc would be advantageous for residents who do not own a car or cannot drive. A transit system can enable independence and support the viability of the community by allowing aging residents the ability to remain in place longer and providing independent travel options for youth and others without driver's licenses.

Currently, inter-community public transit services are provided but there is no internal transit service within any of the communities of Strathroy-Caradoc. Inter-Community Bus connects London to Sarnia through Mt. Brydges and Strathroy with three trips per direction per day. With boardings in Mt. Brydges and Strathroy amounting to 1 to 3 passengers per day (between 30 and 70 passenger boardings per month), there does not appear to be a need for an expansion of inter-community transit service at this time.

Within Strathroy itself, a case could be made for the need for some form of intracommunity transit service, though in the absence of ridership data it is difficult to determine the degree of need. In 2016, the community of Strathroy had a population of 14,400, comprising 70% of the total population of Strathroy-Caradoc. Communities of comparable size to Strathroy, including Cranbrook, BC (population 18,800) and Miramichi, NB (population 17,500) support basic transit systems with 4 to 5 vehicles and 8,000 to 12,000 annual revenue hours.

Investing in a conventional transit system would require a significant financial commitment on the part of the Municipality to purchase the required fleet and operate the service on an on-going basis.

Instead, it is recommended that if the Municipality wishes to proceed with some form of transit, that the Municipality partner with neighbouring municipalities, public, and private entities to provide transit service. The Municipality could approach existing private taxi operators and ride-hail apps potentially available to community residents in the future to provide a form of on-demand transit service to and from key community locations in Strathroy, as well as other parts of the Municipality, like Mt. Brydges, and major farming operations.

This approach to transit provision can be tailored to best suit the needs of the community, and align with available resources. The approach avoids the significant capital outlay that would be required to purchase vehicles, significantly reducing risk to the municipality.

It is recommended that the Municipality consider subsidizing taxi or ride-hail app trips to and from the following key destinations:

- Downtown Strathroy
- Downtown Mt. Brydges
- Strathroy Middlesex General Hospital
- Gemini Sportsplex / Strathroy Collegiate Institute, and Holy Cross Catholic Secondary School
- Strathroy VIA Rail Station
- Service Ontario
- Walmart
- Canadian Tire
- Real Canadian Superstore
- Business park employment areas
- Commercial services along Caradoc Street N, Adelaide Road, and Centre Street

It is recommended that the Municipality obtain basic trip data from operators as a condition of partnership. Data should include: number of trips per day, trip length, trip departure time, passenger trip origin (pick-up), passenger trip destination (drop-off), whether carpooling occurred, and fare (if reduced fare products are offered). The data can then be used on an on-going basis to refine the on-demand system and determine community readiness for conventional transit.

5.3 Goods Movement

Highway 402 and the County road network are designated for goods movement in Strathroy-Caradoc. These roads will continue to serve goods movement in the years to come. Any potential grade separation between rail and road should consider the benefit to goods movement as one of the performance criteria in the assessment of the location of the grade separation.

5.3.1 Goods Movement Recommendations

The Municipality should plan convenient access for trucks to employment lands from Municipal roads to the County road network to help facilitate goods movement.

5.4 Street Network

To fulfill Phase 2 of the EA process for master plans, alternative road network scenarios were analyzed to consider what improvements would be needed to accommodate the forecast population and employment.

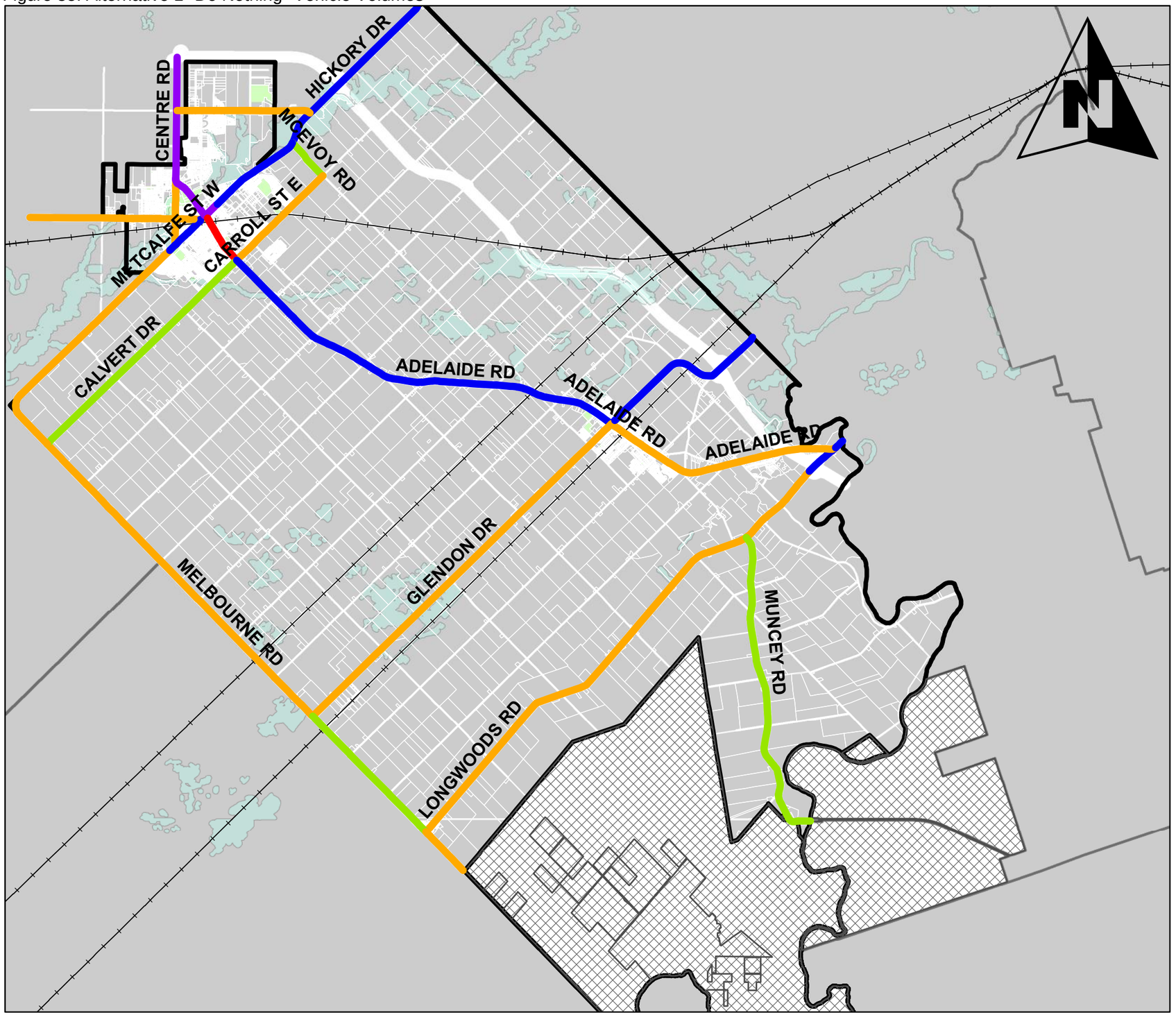
5.4.1 Alternative Future Street Networks

The first step was to consider future vehicle traffic volumes in light of forecast population growth. The population is expected to grow by 64% over the 30-year planning time period. The analysis of existing conditions showed spare capacity in the road network, with the highest volume to capacity ratio measured of about 0.65. The existing traffic volume data were then grown by 64% to determine if any road segments might be approaching or theoretically over capacity.

The first scenario analyzed was the “no transportation infrastructure improvements”, “Do Nothing”, scenario where the future vehicle volumes were applied to the existing road network with no additional road links or additional capacity through road widenings added. The vehicle volumes for this scenario are shown on **Figure 35**. The capacity of the road was compared to the vehicle volumes to compute the volume-to-capacity ratios. This analysis is shown in

Figure 36. The analysis shows that Caradoc Street between Metcalfe Street and Carroll Street would be theoretically over capacity if traffic volumes grew by 64%. None of the road links studied are expected to be approaching capacity in the horizon year. This is a valuable finding, because, with the exception of the noted stretch of Caradoc Street, it allows the conversation on the street network to shift from capacity to one of connectivity and adding streets to facilitate new population and employment growth.

Figure 35: Alternative 1 "Do Nothing" Vehicle Volumes



0 5 10 20
Kilometers

STRATHROY - CARADOC
30 YEAR COUNTY ROAD TRAFFIC VOLUMES

Legend

AADT Ranges

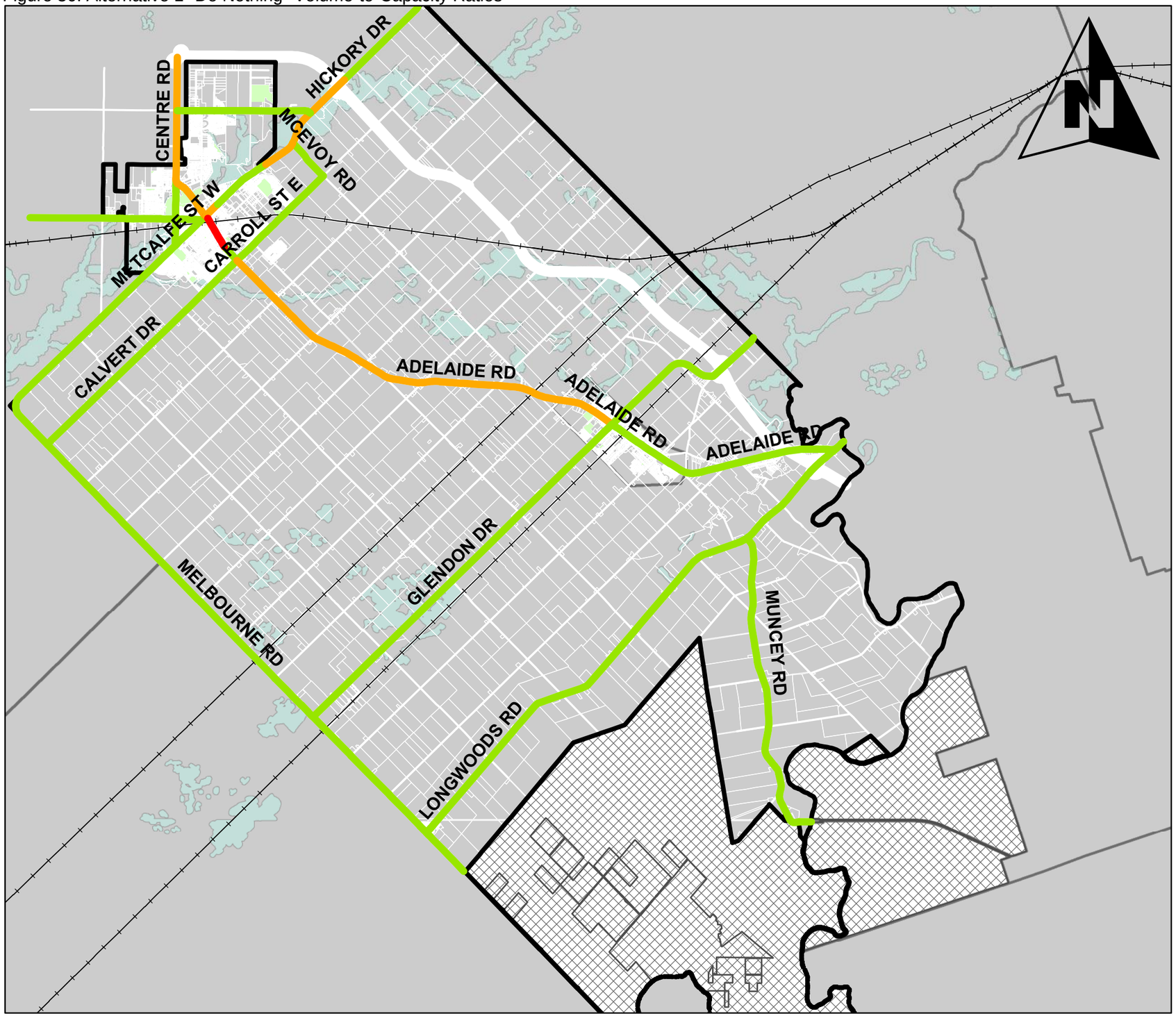
- 0 - 5000
- 5001 - 10000
- 10001 - 15000
- 15001 - 20000
- 20001 - 25000
- Provincial Highway
- County Road
- Local Road

Other Elements

- Railway
- First Nations Territory
- Parks
- Wetland Areas
- Strathroy-Caradoc Municipal Boundary

Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 36: Alternative 1 "Do Nothing" Volume-to-Capacity Ratios



STRATHROY - CARADOC
COUNTY ROAD
VEHICULAR CAPACITY ANALYSIS

Legend

30 Year Horizon- Vehicle Capacity Values

- < 0.69
- 0.69 - 0.84
- 0.85 - 1.00
- > 1.00
- Provincial Highway
- County Road
- Local Road

Other Elements

- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Strathroy-Caradoc Municipal Boundary

Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

For Alternative 2, additional road links were considered to improve the connectivity of the road network. These links were identified by Municipal staff in previous planning exercises and were examined in the context of the TMP. Alternative 2 showing the additional links is provided in **Figure 37**.

This road network was analyzed for connectivity and considering other factors such as environmental constraints, usefulness of the corridor given future development, and financial costs. The individual road links were analyzed and some were removed for the following reasons:

- Connection of Head and Queen Streets: Constructing an east-west missing link parallel to the rail corridor between Head and Queen Streets could improve connectivity between these two streets and assist in north-south travel through Strathroy. This link is not recommended for the following reasons:
    - It would require the removal of a stand of mature trees along the rail corridor – environmental concern;
    - Head and Queen Street already are connected via Metcalfe and Tanton Streets – alternate connectivity does exist
    - This link was not seen as providing enough benefit to justify the financial cost and environmental loss of trees, given that other suitable routes already exist.
- New corridor between Hickory Drive and Walkers Drive: This new north-south corridor could improve connectivity on the eastern edge of Strathroy. This link is not recommended for the following reasons:
    - The corridor is outside of the urban boundary and no new development would be expected on the east side of the link;
    - The existing residential subdivisions along the west side of the proposed link are built in such a way to preclude a public street connection to the new corridor.
    - As this would only be a single loaded road, and the connections to the existing development are not readily available, this project was dropped as it would not provide enough benefit for existing or future population to warrant the financial expenditure to construct the road.
- New corridor between Second Street and Hickory Drive: This road corridor would provide an additional link to the high schools, sports complex, and other land uses on Second Street. This link is not recommended for the following reasons:
    - The corridor would traverse a portion of the Strathroy Conservation Area and would raise significant environmental concerns
    - The corridor would not connect to another road to the south, as the proposed corridor between Hickory Drive and Walkers Drive is not recommended.
    - A corridor that traverses the Strathroy Conservation Area is not recommended as the benefits of the road link do not outweigh the costs of A limited portion of the corridor north of the Conservation Area could be maintained to facilitate future development along the south side of Second Avenue.

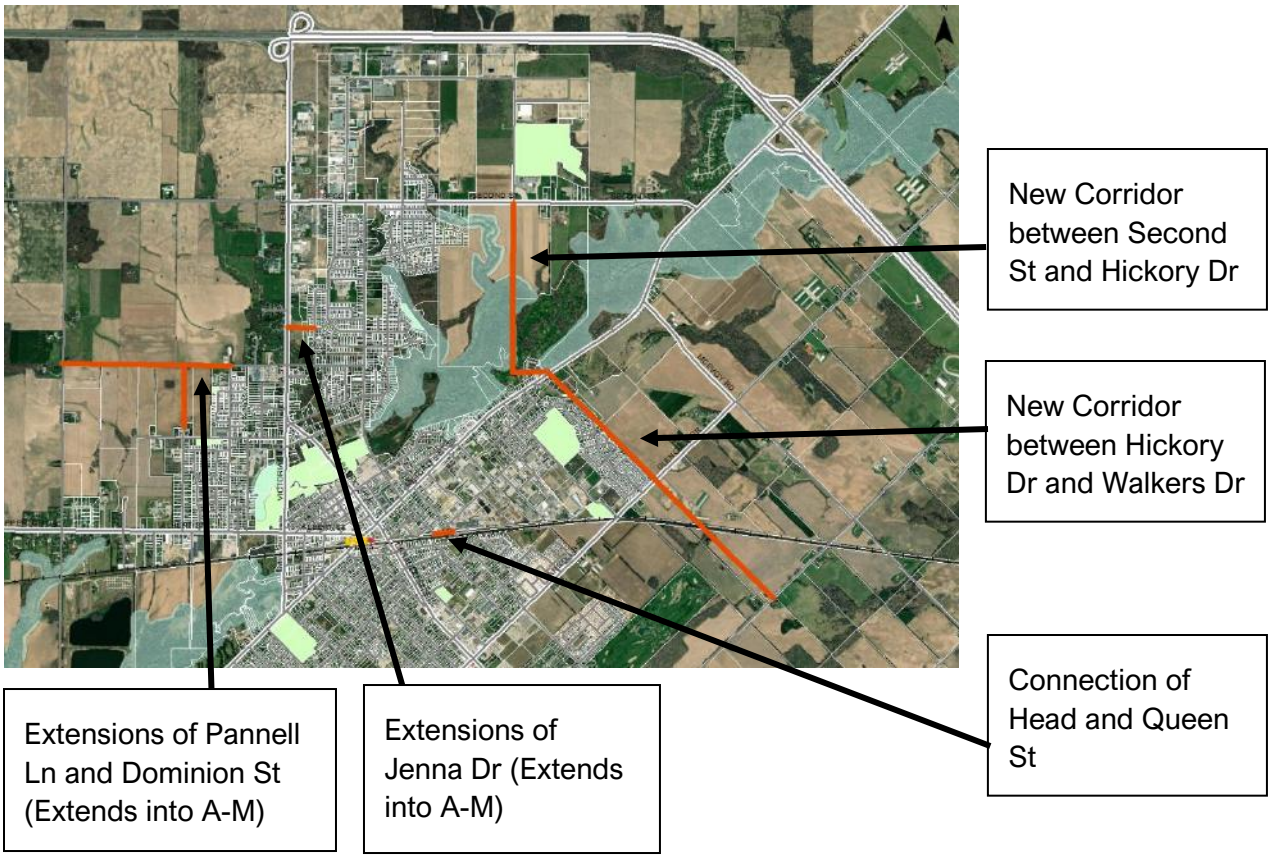


Figure 37: Alternative 2 Road Network

A third alternative was developed that removed the roads screened out from Alternative 2 – Network Expansion to form Alternative 3. The road network for Alternative 3 is shown in **Figure 38**. Several roads were maintained in this alternative, including:

- Extension of Jenna Drive: This connection would improve connectivity of a northern residential neighbourhood in Strathroy, providing access to Centre Road as an alternative to Head Street for north-south travel. While a field would have to be traversed, no buildings would need to be removed (the connection to Jenna at MacDonald has already been protected) and no environmental features would need to be crossed. This connection would require coordination with the Township of Adelaide Metcalfe as the connection would cross the Strathroy-Caradoc municipal boundary.
- Extensions of Pannell Lane and Dominion Street: Pannell Lane could be extended west to cross the Strathroy-Caradoc municipal boundary, and Dominion Street extended north to facilitate further development of the northwest portion of Strathroy-Caradoc. These extensions are not required for existing traffic volumes and would only be constructed in conjunction with development. Unlike the Dominion Street extension, the

Pannell Lane extension would require coordination with the Township of Adelaide Metcalfe.

One new road improvement was considered to address capacity constraints noted in the future Do Nothing scenario analysis:

- Capacity improvements on Caradoc Street: Caradoc Street between Metcalfe and Carroll Streets has been identified as over capacity in the ultimate horizon year. This segment of the street currently varies between a three- and four-lane cross section. The three-lane section may benefit from widening to four lanes, and the four-lane section could benefit from a centre turning lane or dedicated turning lanes at intersections. There is limited right-of-way width to accommodate road widening and traffic volumes will need to be monitored in the coming years to determine if additional capacity through additional lanes or turning lanes is required.
- Additionally, numerous new roads could be constructed as part of new residential or industrial subdivisions.

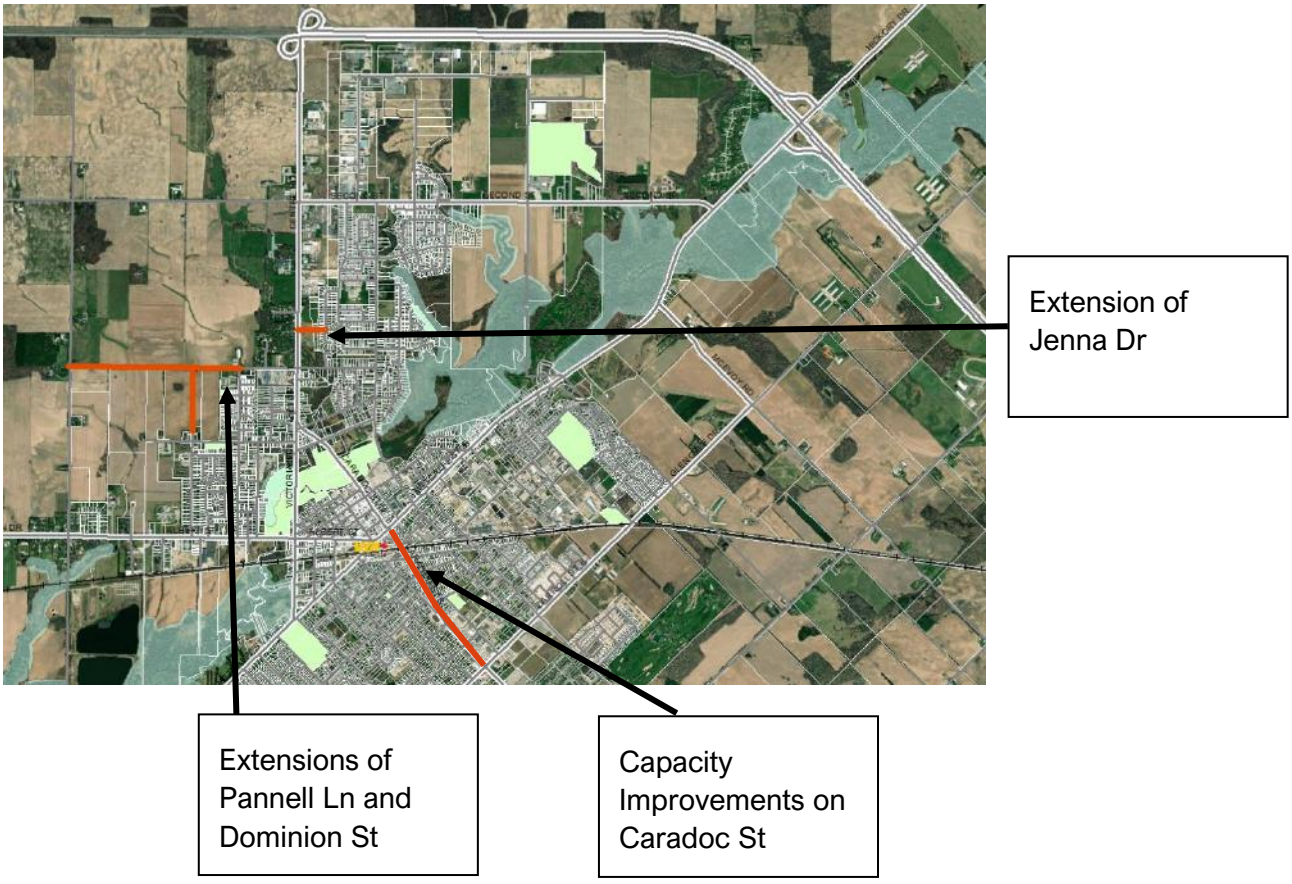


Figure 38: Alternative 3 Road Network

5.4.2 Preferred Future Road Network

With continued consultation, it was determined that widening Caradoc Street to four lanes (over even five with turning lanes) did not embody the vision that the community has for Strathroy. Such an action would induce more vehicle traffic through this main gateway to the community, detract from the opportunities and comfort of active transportation, and complicate safety for all street users. An alternative to widening is actually reducing, to maintain at three lanes and consider reducing to three lanes the sections that are four lanes. The road diet would provide the opportunity to add active transportation routes, landscaping, and create a sense of place as multi-modal traffic enters Strathroy from the south.

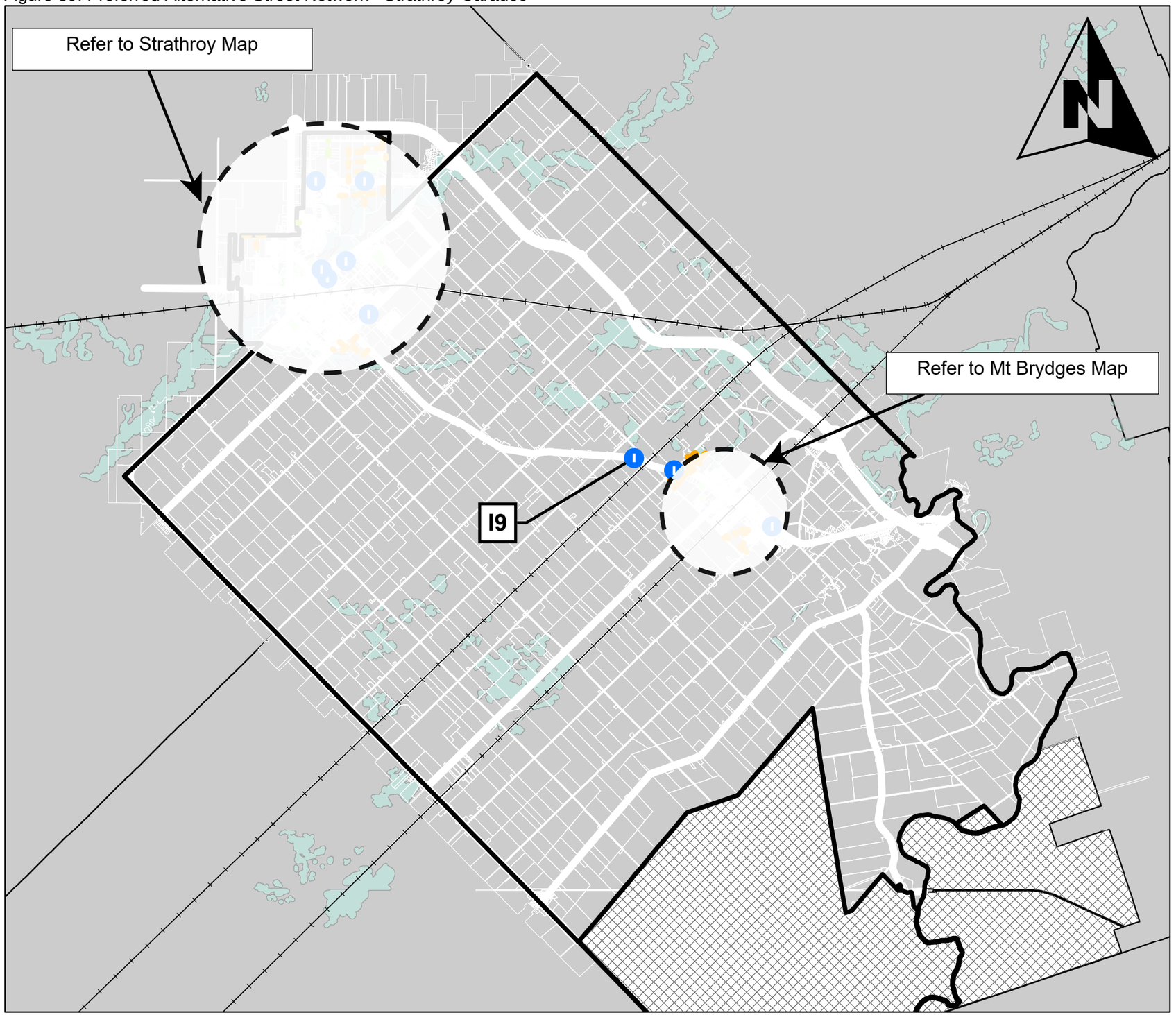
An alternative to Adelaide Road / Caradoc Street to access Strathroy is McEvoy Road. Improvements to the intersection of Adelaide Road and McEvoy Road are recommended in **Section 5.4.3** to help facilitate McEvoy Road as an alternative with capacity to handle vehicles traveling to and from Strathroy. Utilizing the capacity of McEvoy Road provides the opportunity to re-imagine Adelaide Road / Caradoc Street as a more people-friendly street.

Numerous residential and industrial subdivisions with new road networks are planned to accommodate the growth in population and employment. The road network from these new developments has been coded into the preferred alternative to exhibit how the road network may evolve and to link the roads with active transportation facilities as well.

The final preferred street network is shown in **Figure 39** through **Figure 41**.

Figure 39: Preferred Alternative Street Network - Strathroy-Caradoc

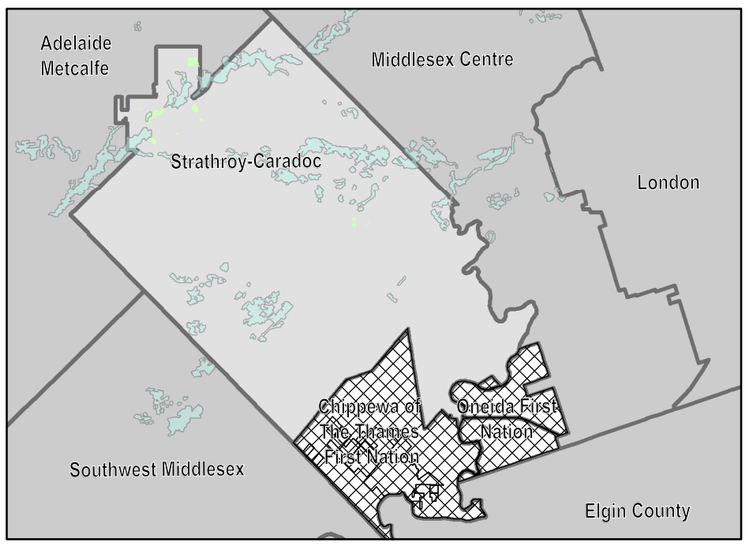
STRATHROY-CARADOC
PROPOSED ROAD IMPROVEMENTS



Legend

Road Improvements
- New Development Roads
- Road Extension
- Intersection Improvements

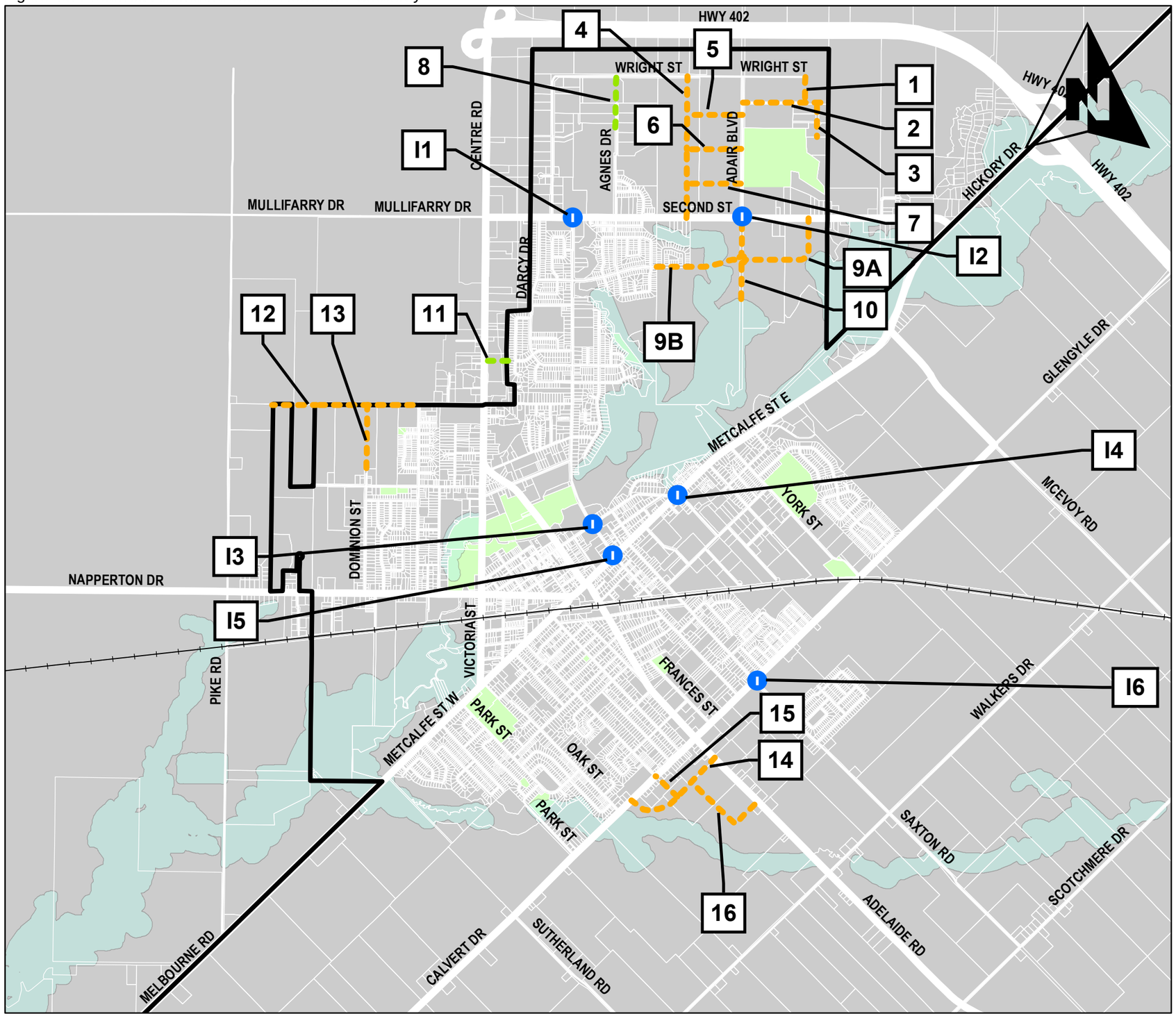
Other Elements
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Strathroy-Caradoc Municipal Boundary

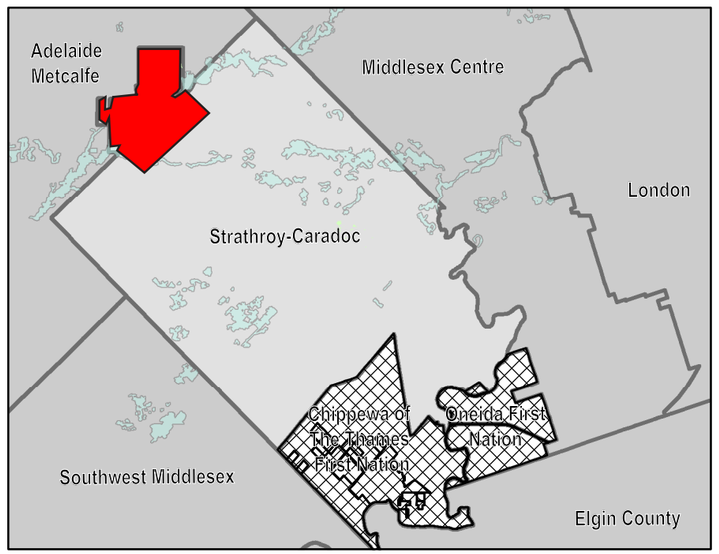


Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 40: Preferred Alternative Street Network – Strathroy

STRATHROY
PROPOSED ROAD IMPROVEMENTS





Legend

Road Improvements
- New Development Roads
- Road Extension
- Intersection Improvements

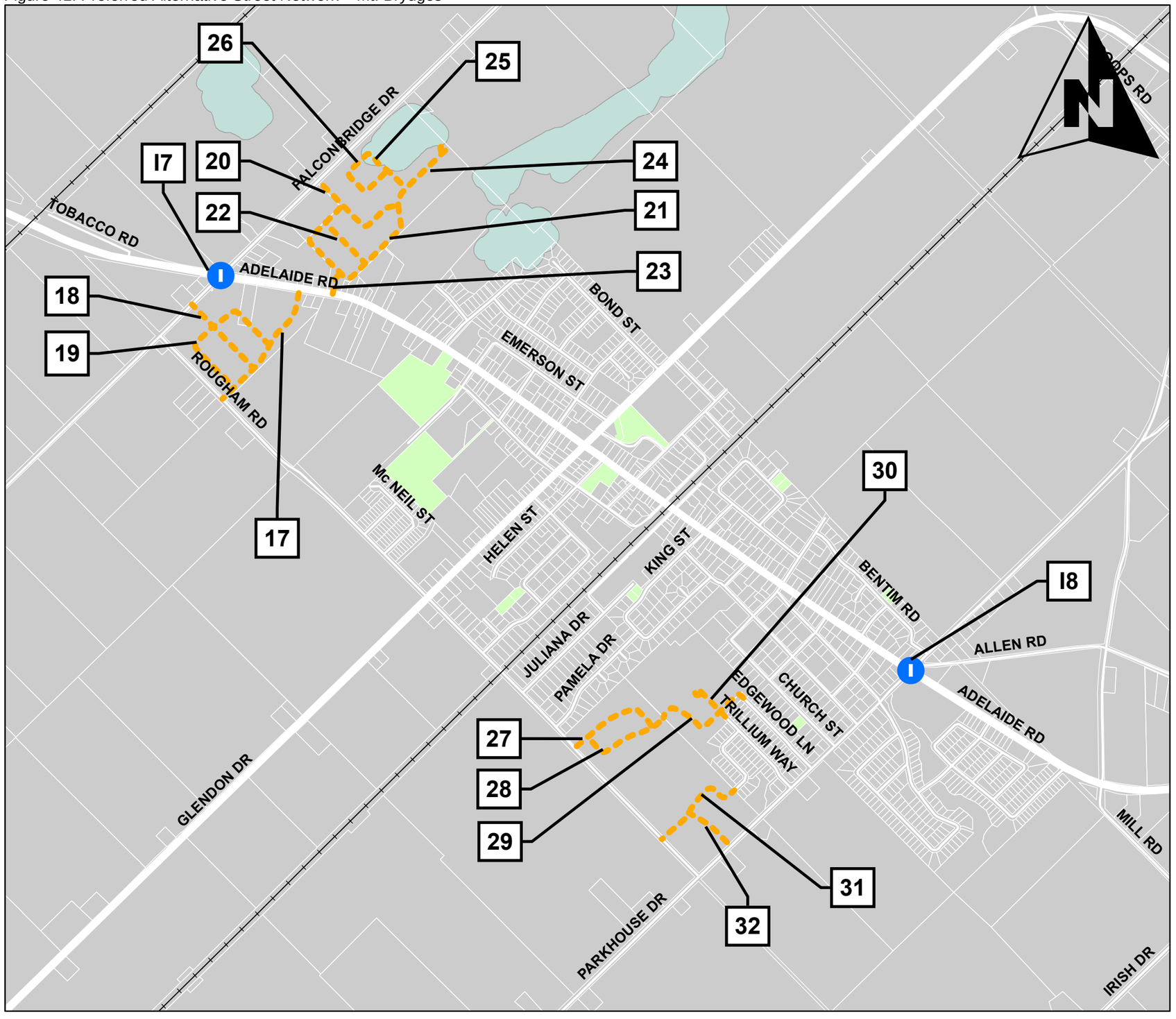
Other Elements
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Strathroy-Caradoc Municipal Boundary

0 1.75 3.5 7 Kilometers

Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 41: Preferred Alternative Street Network – Mt. Brydges

MT BRYDGES
PROPOSED ROAD IMPROVEMENTS



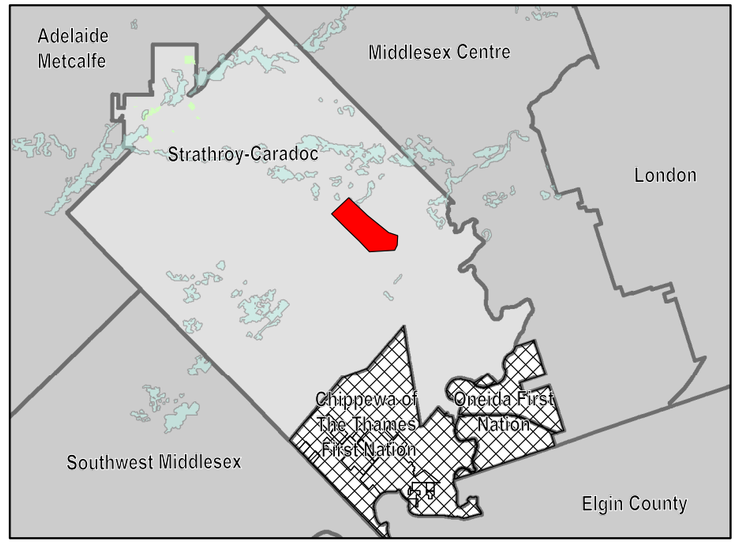
Legend

Road Improvements

- New Development Roads
- Intersection Improvements

Other Elements

- Railway
- First Nations Territory
- Wetland Areas
- Parks



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

5.4.3 Intersections for Improvements

Intersections along major corridors were also reviewed from a strategic land use and growth perspective to identify locations where signalization / intersection improvements (such as a roundabout) may be needed in the future.

Through this analysis, a number of intersections were identified for possible future strategic improvement. To pursue signalization or a roundabout, new traffic data should be collected to conduct a traffic signal warrant. If signals are not warranted, engineering judgement should be considered to see if there are safety concerns or other elements of the physical design of the intersection that would lead to the recommendation of improvements such as a roundabout or signalization. The intersections identified in this TMP include:

1. **Second St and Head St N:** This is an important east-west arterial road that has lands designated for development on either side of it. Head Street is an important north-south corridor. As the lands around this intersection develop, this intersection would likely need to be signalized.
2. **Second St and Adair Blvd:** This intersection provides access to Holy Cross Catholic Secondary School, Strathroy Collegiate Institute, and the Gemini Sportsplex. A signal would provide a controlled crossing for pedestrians and cyclists and could encourage active modes of travel to these destinations.
3. **Front St and Head St:** This all-way stop controlled intersection could be considered for signalization, recognizing volumes generated by the shopping centres on the northwest and southwest corners of the intersection. A signalized intersection would provide a signalized pedestrian crossing for those accessing the Catholic elementary school on the southeast corner of the intersection.
4. **Front St E and McNab Ave on Metcalfe St E:** This is an off-set intersection and may require some realignment. The Front St E portion may be signalized as a T-intersection with the McNab portion remaining a T-intersection with McNab Ave stop-controlled. This intersection was previously identified in the Official Plan for improvement.
5. **Head St N and Metcalfe St E:** Head St is an important north-south corridor and alternative to Centre / Caradoc St. Signalization could help transition into the downtown and would provide a controlled crossing for pedestrians and cyclists.
6. **Saxton Rd and Carroll St E:** This intersection provides access to a commercial area. Signalization would provide an indication to westbound travellers that they are entering the urban area and provides a controlled crossing for pedestrians and cyclists. Signalization would be needed for consideration if the lands on the southeast corner of this intersection were to redevelop into an urban land use.
7. **Adelaide Rd and Falconbridge Dr:** Serving as the entry intersection for southbound traffic approaching the Mt. Brydges community, this intersection presently has Adelaide Road traffic as a free-flow movement and Falconbridge Drive traffic as stop-controlled. With further development of Mt. Brydges, this intersection could be signalized or converted to a roundabout to address additional traffic volumes. It also could be considered for improvements to address safety concerns related to the skew. Signalization or a roundabout would indicate to the driver a transition from a less

populated area into a new community and would allow for a transition to a lower speed for southbound traffic.

8. **Adelaide Rd and Parkhouse Dr**: This intersection is the entrance to the Mt. Brydges community for northbound traffic. With further development of Mt. Brydges and recognizing that Parkhouse Drive provides access to Highway 402, this intersection could be considered for improvements such as a roundabout or signalization. Similar to the Adelaide Rd and Falconbridge Dr intersection, a roundabout or signalization would indicate to the driver a transition from a less populated area into a new community and would allow for a transition to a lower speed for northbound traffic.
9. **Adelaide Rd and McEvoy Rd:** As a T-intersection, this intersection may not meet traffic signal warrants for vehicle volumes, but a higher percentage of trucks may be using McEvoy Rd due to the agricultural operations near this intersection and signalization or a roundabout may help facilitate truck movements for trucks accessing Adelaide Rd from McEvoy Rd. Importantly, McEvoy Rd is an alternative access to and from Strathroy, designed to relieve vehicle pressure on Adelaide Rd. Improving this intersection will make McEvoy Rd more attractive for users and will help facilitate re-imagining Adelaide Road / Caradoc Street for people and reduced vehicle volumes.

The Municipality may identify the need for future intersection improvements that are not shown in this TMP as part of development application review and/or the detailed design of roads to further support the implementation of this Plan.

5.4.4 Roundabout Considerations

Roundabouts are an intersection control device that can be considered for newly constructed intersections or when existing intersections are being studied to consider changes to their traffic control measures, such as the intersections highlighted in **Section 5.4.3**.

The advantages and disadvantages of roundabouts compared to the traffic signal and stop controlled intersections include:

Advantages:

1. Safety for the users through reduced crash frequencies and intensities
2. Reduced delays to the vehicles
3. Lower operational and maintenance costs
4. Traffic calming by slowing traffic through intersections
5. Environmental benefits from lower fuel emissions from reduced acceleration and deceleration and idling time

Disadvantages:

1. Not dynamic to the changes in demand and may result in traffic from one approach dominating other approaches
2. Need for more space to accommodate and may result in property impacts
3. Safety issue includes difficulty in crossing for children, seniors, and visually impaired
4. Higher construction costs

5. Difficulty in accommodating multi axle or large vehicles

Several common elements need to be considered when determining the suitability of a roundabout for intersection control. These include:

Spatial Requirements

The roundabout needs to be evaluated for the availability of sufficient municipal property to construct a roundabout before other forms of intersection control are considered.

Spacing from Other Intersections and Rail Tracks

The roundabout needs to be evaluated for spacing from other control type intersections, how it impacts other intersections from an operational perspective, and its possible impacts on signal progression where traffic signals also exist in a corridor. Spacing relative to rail tracks should also be considered, where applicable.

Vehicles Operation

The operations conditions of the planned roundabout need to be evaluated against the operation conditions of alternative control types using vehicle delay and queue lengths during the a.m. and p.m. peak hours. The evaluation needs to include the forecasted operational conditions after 10 years from the project opening year to compare the benefits from a roundabout and alternative stop or signal control type.

Multimodal Operations and Safety Considerations

Pedestrian safety at the planned roundabout needs to be evaluated based on the expected pedestrian user types like children, seniors, and visually impaired and compared against the pedestrian safety provided by alternative stop controlled or signal control intersection.

Cyclists' safety at the planned roundabout need to be evaluated based on the type of roundabout considered and its location with respect to urban setting or along active transportation routes and compared against the safety provided by alternative stop controlled or signal controlled intersection.

The planned roundabout needs to be evaluated for the operational safety of other road users from expected large vehicles (transit, emergency vehicles, oversized trucks, and agriculture machinery vehicles) that need to be accommodated dictated by the functional classification of intersecting roadway type and the compared against the operational safety provided by alternative stop controlled or signal controlled intersection.

Roundabout Policy

As a policy, the Municipality will:

Consider roundabouts first when constructing new intersections or when considering changing the type of intersection control at an existing intersection, recognizing the different elements that need to be satisfied for a roundabout to be an appropriate traffic control measure.

Roundabouts likely would only be possible in new development areas, on the edge of existing development, or in rural areas due to physical space constraints. In existing urban areas, private property and building location may prohibit construction of a roundabout.

Of the intersections recommended for possible signalization noted in **Section 5.4.3**, the following may be appropriate for a roundabout:

- **Adelaide Rd at Falconbridge Dr:** Existing buildings only impact one corner of the intersection and modest realignment of the roads may not require building demolition.
- **Adelaide Rd at Parkhouse Dr**: Existing buildings impact one corner of the intersection and realignment of the roads may not require building demolition. The intersection of Allen Rd with Parkhouse Dr would have to be considered in the roundabout design.
- **Adelaide Rd & McEvoy Rd:** This intersection provides an alternative to Adelaide Road to access Strathroy on McEvoy Rd and should be controlled beyond the use of a minor street stop sign to encourage use of McEvoy Rd. Impacts to the surrounding agricultural operations and lands would need to be considered, but this rural location could provide the opportunity to construct a roundabout.

5.4.5 Railway Crossings

CN and CP rail lines travel through the communities of Strathroy and Mt. Brydges, with the CN Rail line bisecting the existing urban area of Strathroy. There are many constraints to moving the rail lines, making moving the tracks to another location infeasible. The desire for a grade separated crossing was voiced by the public during consultation and has been a topic of discussion for some time. The discussion during the development of the TMP regarding rail has centred on considering a potential locations for a rail / road grade separation and the timing of when a separation possibly might occur. Transport Canada has specific guidelines outlining the threshold of vehicles and trains per day to consider grade separation. No existing at-grade crossing in Strathroy-Caradoc is near this threshold at this time – all are well below the threshold. With this in mind, no grade separation is expected in the foreseeable future. The Municipality will want to revisit grade separation in coming years, for possible action in the 25 to 40 year timeframe, depending on a number of factors, such as the growth in the Municipality and the growth of freight traffic. The Municipality will work closely with the rail authority for the planning and implementation of any possible grade separation.

This TMP profiles five locations in Strathroy. Additional locations could be considered in the Municipality, including in Mt. Brydges, such as on Adelaide Road between Railroad Street and Longfield Street. **Figure 42** illustrates five railway crossings that could be considered for grade separation in Strathroy at an appropriate time in the long-term future:

1. CN Strathroy Subdivision / Carroll Street East
2. CN Strathroy Subdivision / Queen Street
3. CN Strathroy Subdivision / Caradoc Street North
4. CN Strathroy Subdivision / Metcalfe Street West
5. CN Strathroy Subdivision / Victoria Street

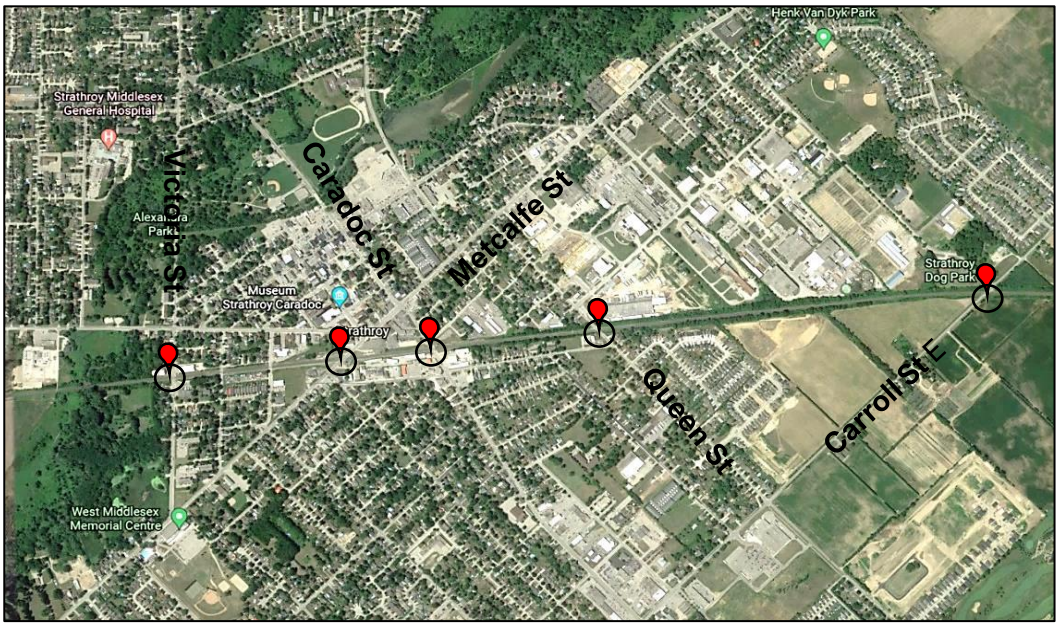


Figure 42: Five Railway Crossings that have been Considered for Grade Separation in Strathroy-Caradoc

The **Carroll Street East** crossing in the southeast portion of the community (**Figure 43**) would have the least impact to surrounding land uses and would not require the demolition of buildings (**Figure 44)**. It would require the closure of York Street and Carroll / Glengyle intersection. While entailing the smallest impact to existing land uses, it also would have the least impact to people and goods movement. This route is not a main travel route and a grade separation at this location would be of limited value.

Figure 43: Carroll St East Rail Crossing Location

Railway grade separation at **Queen Street** would provide a grade separated crossing that could be used by emergency vehicles from Strathroy Fire Department to respond to emergencies south of the rail tracks shown in **Figure 44**. Queen Street is primarily a residential corridor but does provide some north-south connectivity, with its northern terminus at Metcalfe Street. Some industrial buildings and one residential dwelling may need to be demolished and the access to one home on the north side of the tracks may need to be reconfigured. The intersection of English Street at Queen Street may need to be closed.

Figure 44: Queen St Rail Crossing Location

A grade separated crossing at **Caradoc Street North** would provide a crossing along the busiest street in Strathroy shown in **Figure 45**. The Caradoc intersection with Canaan Street would have to be closed and some industrials buildings may need to be demolished. Access to commercial developments would need to be reconfigured and some may no longer have access from Caradoc Street.

Figure 45: Caradoc Street Rail Crossing Location

Metcalfe Street is a major route through Strathroy-Caradoc and provides full access to Highway 402 and would be beneficial to goods movement as well as municipal traffic. Grade separation of **Metcalfe Street West** in the downtown would provide an alternative to Caradoc Street shown in **Figure 46**. Some industrial properties would be affected with reconfigured access and the Adelaide Street intersection may need to be closed.

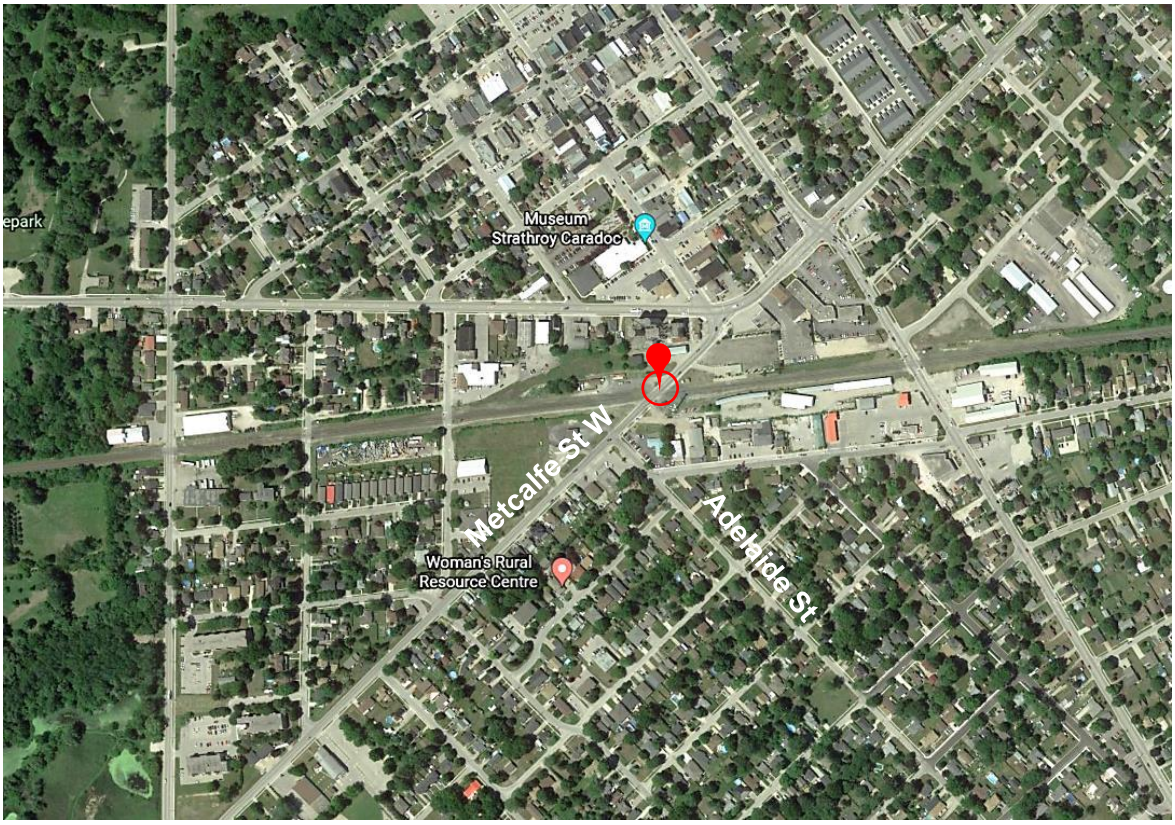


Figure 46: Metcalfe Street Rail Crossing

Grade separation on **Victoria Street** on the west edge of downtown Strathroy would impact several residential homes and commercial businesses, possibly requiring these to be demolished shown in **Figure 47**. Victoria Street connects Caradoc Street and Metcalfe Street, but is further removed from other options and it contains a number of residential dwellings along its corridor.

Figure 47: Victoria Street Rail Crossing

Railway grade separations at Metcalfe Street West and Queen Street would both provide emergency services will direct access across the CN Strathroy Subdivision at crossing locations that are located near the Strathroy Fire Department and Middlesex London Paramedic Services facilities.

The analysis of the five locations being considered is summarized in **Table 9**.

Table 9: Planning-Level Analysis of Possible Grade Separation Locations in Strathroy-Caradoc

Alternative	**Analysis Criteria**				
	Compatible Land Use	**Convenient Location**	**Disruption to Existing Access**	**Demolition of Properties**	**Financial Costs**
Carroll Street East	High	Low	Medium	Low	Low
Queen Street	Low	Medium	High	High	Medium
Caradoc Street North	High	High	High	Medium	High
Metcalfe Street West	High	High	Medium	Medium	Medium
Victoria Street	Low	Medium	High	High	High

There are advantages and disadvantages for all five locations. Where some locations may provide the benefit of uninterrupted flow of traffic, they also require costly property demolitions and land use changes. For future decisions, it is important to understand the local context prior to implementation and weigh the cost and benefit.

Carroll Street East would have the lowest financial costs and the least amount of disturbance to existing land uses, but it is situated in the least convenient location and may not benefit enough people to justify the financial costs.

Victoria Street and Queen Street have merit, but these corridors have more residential land uses and grade separation would result in the demolition of residential units and some businesses.

A crossing on Caradoc Street would serve the most people but may require reconsideration of the recent infrastructure investments made along this corridor and would disturb access to numerous businesses. The financial costs of this option would be among the highest of the options considered.

Metcalfe Street is centrally located and is a main thoroughfare that provides access to Highway 402 and, would serve both cars and trucks well from a local and regional connectivity perspective. A limited number of industrial land uses would be impacted, and a limited number of buildings would have to be demolished.

If the Municipality wishes to pursue a grade separated crossing in Strathroy-Caradoc, it is recommended that there be a detailed feasibility study for any locations considered, be it

the ones profiled in this TMP or other locations, to further assess the impact to the community. It is recommended to not pursue grade separation further at this time due to limited justification in terms of vehicles and trains per day per the Transport Canada guidelines for grade separation, the disruption in the community fabric, and the financial costs associated with grade separation.

5.5 Downtown Core Parking

New developments are expected to be constructed on existing surface parking lots in the downtown, reducing the number of parking spaces and adding demand for parking through the new developments. The Municipality wants to find the right balance of parking spaces without oversupplying and using valuable land for parking. The Municipality should conduct a parking utilization study of the downtown core to determine how many public parking spaces typically are occupied during a weekday and during a weekend, and determine if there are an adequate number of spaces available to accommodate the loss of public parking and the potential new demand of the new developments. If the data analysis suggests that there will not be enough public parking spaces to meet demand, the Municipality should consider ways to add new public parking spaces elsewhere and encourage other modes of travel by expanding available bike parking and pedestrian amenities, such as benches. Possibilities for additional public parking could include underutilized lots such as 40 Metcalfe St W. The Municipality should further consider developing a cash-in-lieu parking policy to help facilitate downtown development.

6

Supportive Transportation Policy

STRATHROY-CARADOC
TRANSPORTATION MASTER PLAN

6 Supportive Transportation Policy

Accompanying policy guidance has been developed to help meet the vision of the TMP and support the TMP implementation. Where appropriate, these policies will be incorporated directly into the Official Plan to help set the direction for mobility within the Municipality. Policies have been prepared for the following categories:

1. Complete Streets;
2. Road design standards;
3. Community speed limits;
4. New developments, as they relate to transportation infrastructure;
5. Traffic calming;
6. Railway crossings;
7. Electric mobility; and
8. Goods movement.

6.1 Complete Streets

A Complete Streets policy allows streets to be planned, designed, constructed, operated, and maintained for all modes of transportation and all street users. Designing with Complete Streets in mind, people can travel by any mode seamlessly to destinations. Through this Policy, the purpose is to shift the focus of the use of streets to provide an equal platform for all road users.

The Complete Streets Policy will follow Strathroy-Caradoc's street classification enhancing road function, providing connectivity, and a sense of safety through design and implementation. The Policy will be a guideline for internal staff, engineers and planners, and developers to approach transportation design with a uniform perspective of addressing all modes of travel. The policy promotes equal consideration to multiple transportation mode users in order to provide a balanced and inclusive transportation network.

6.1.1 Purpose & Objectives

The Complete Streets Policy objectives include:

- Providing a safe and comfortable street environment for all ages and abilities, including pedestrians, cyclists, transit riders, mobility device users and drivers;
- Promoting sustainable travel and improve public health; and
- Reviewing and encourage more comprehensive capital program planning.

6.1.2 The 10 Complete Streets Guiding Principles

The National Complete Streets Coalition is the leading association that developed 10 elements of Complete Streets. These 10 elements have been adapted by **Complete Streets for Canada** to use as guidelines to develop policies. The 10 guiding principles are shown in **Table 10**.

Table 10: Guiding Principles Adapted by Complete Streets Canada

Guiding Element		Description
Vision		
1.	Embodies a Community Vision	Establishes a motivating community vision, objectives, and purpose for implementing Complete Streets elements.
Core Commitments		
2.	Defines All Users and Modes	Specifies and provides equal consideration to people of all ages and abilities, as well as all modes of travel, especially walking, cycling, riding transit, on wheelchairs or scooters, driving trucks, buses, and automobiles.
3.	Applies to All Projects and Phases	Recognizes opportunities of application to new and retrofit transportation projects are subject to the policy, including design, planning, construction, maintenance, and operations.
4.	Identifies Clear, Accountable Exceptions	Accounts for any appropriate exemptions due to legislative, topographical, technical, cost-benefit limitations or other exemptions that are specified and approved by a high-level official.
5.	Encourages Network Connectivity and Integration	Promotes continuous integration of different modes in a comprehensive and connected street network.
Best Practices		
6.	Adoptable by All Agencies and Jurisdictions	Establishes an approach that can be adopted and understood by all departments and other agencies that may be involved in the process.
7.	Utilizes Latest Design Guidelines	Draws from the use of the latest and best design criteria and guidelines while recognizing the need for flexibility to balance user needs.

Guiding Element		Description
8.	Acknowledges Context Sensitive Solutions	Considers the current and planned context, buildings, land use and transportation needs to recommend planning and design solutions to be adapted.
9.	Defines Performance Standards with Measurable Outcomes	Establishes qualitative or quantitative performance indicators to evaluate and monitor policy impacts over time.
Implementation		
10.	Proposes Specific Implementation Steps	Lists specific steps and identifies a timeline for implementing Complete Streets.

6.1.3 Strathroy-Caradoc's Application of the 10 Guiding Principles

Strathroy-Caradoc's Complete Streets Policy is an adaptation of these 10 guiding principles.

6.1.3.1 Vision

The Transportation Master Plan developed an overall transportation vision that aligns with the Complete Streets approach:

The Strathroy-Caradoc transportation network is accessible to all, and prioritizes the connectivity, comfort, and safety of vulnerable road users. The transportation network aligns with broader growth plans for the municipality, including the growth of more sustainable modes of travel, and provides options for people to travel by whatever mode they choose.

6.1.3.2 Core Commitment

Defines All Users and Modes: When planning and designing new and upgrading existing roadways, considerations of pedestrians, cyclists, transit riders and drivers should be included. Routes should be free of barriers for vulnerable users such as children, seniors, and those with disabilities to ensure safety, reliability, and convenience. Prior to implementation, those that may be affected should be consulted.

Applies to All Projects and Phases: For all new projects operated and funded by Strathroy-Caradoc, the Complete Streets approach should be considered at all stages of the project, especially during the initial stages. For upgrade projects and maintenance related projects, connectivity of routes and completeness of roadway usages should be considered. Privately funded projects within the municipality should adhere to this policy and be constructed with special attention to vulnerable road users.

Identifies Clear, Accountable Exceptions: There may be exceptions in following the Complete Streets Policy with approval from the Municipality's management team. Notable examples include:

- Where there may be negative impacts to the natural environment;
- When the overall cost of Complete Streets elements outweighs the original intent of the project even with consideration of alternative funding; or
- Where there are no future development plans or needs based on long-range plans and demand analysis.

Encourages Network Connectivity and Integration: Any roadway and route connections should be reviewed to provide seamless transitions and convenient route planning. The review and planning should be completed at a macro level for the network connectivity and at a micro level for route connectivity. Integration between various modes of transportation should be considered such as transit to walking in order to increase first-and last-mile travel and for safe and efficient trips.

6.1.3.3 Best Practices

Adoptable by All Agencies and Jurisdictions: Collaborate and sharing knowledge with Middlesex County and neighbouring communities regarding the Complete Streets approach is beneficial for continuity of practices. For a consistent approach, Ontario's Growth Plan supports Complete Streets and has set a clear vision. A neighbouring municipality such as the City of London has a Complete Streets Policy and Design Manual that can be referenced for detailed designs. Agencies such as conservation authorities, emergency services, rail companies and private developers should be informed of the Complete Streets Policy and consulted for any impacts to their services.

Utilizes Latest Design Guidelines: The Municipalities' policies, bylaws, standards, and guidelines will be used with industry best practices when designing the Municipality's streets. This could include opportunities for green infrastructure in the design of the street network.

Acknowledges Context Sensitive Solutions: Strathroy-Caradoc includes two urban areas and rural areas where the environment, built form and travel behaviours may vary. While the vision and the approach are the same, the complete streets solutions may reflect neighbourhood-level issues.

Defines Performance Standards with Measurable Outcomes: A set of evaluation criteria are required to monitor and understand future needs and performance of complete streets elements. It is also important to develop a set of goals or thresholds for the Municipality to work towards in order to determine success in Strathroy-Caradoc context. An audit of the existing infrastructures and policies would provide an appropriate starting point. Suitable evaluation criteria for Strathroy-Caradoc are:

- Number of new projects with Complete Streets principles incorporated
- Number of AODA accommodations built
- Number of streetscaping elements such as trees planted, and streetlights installed

- Number of safety improvements projects
- Total km of cycling routes in its categories
- Total km of pedestrian facilities and trails
- Number of transit accessibility accommodations built
- Maintenance records

6.1.3.4 Implementation

Proposes Specific Implementation Steps: The next steps for Complete Streets Policy for Strathroy-Caradoc are to:

1. Confirm and incorporate the Complete Streets Policy as part of the Municipality's best practices;
2. Review existing policies that can incorporate Complete Streets principles;
3. Review ongoing projects and new projects to implement Complete Streets elements;
4. Consider existing design standards in light of complete streets and determine if changes to these standards would help incorporate complete streets. Additionally, consider developing design guidelines, or revising existing design guidelines, based on a Complete Streets approach to incorporate as part of the Municipality's roadway design guidelines;
5. Consult with the municipal staff to confirm any changes to design standards and any proposed Complete Streets Design Guidelines; and
6. Develop a list of goals to obtain and timelines to reach by and monitor Complete Streets elements using evaluation criteria.

Streets Considered for Complete Streets

Streets that are identified for cycling improvements in this TMP would be good candidates for complete streets implementation, as they often have facilities for vehicles and pedestrians, but lack routes for cyclists. Possible candidates for complete streets consideration have been included in **Table 11.**

Table 11. Possible Considerations for Complete Streets

Strathroy	Mt. Brydges	Melbourne
Front St Frank St Head St Centre St James St Colborne St	Bowan St	Brook St

These streets are recommended for cycling improvements and experience pedestrian activity. Some are adjacent to commercial retail and restaurants that fosters pedestrian friendly activity and walkability.

Pedestrian Scale Lighting

These streets offer pedestrian-scale lighting, which provides safer environments in terms of both traffic safety and crime. The Municipality can find alternative power sources such as solar panel technology or motion sensors to minimize energy costs and to promote sustainability in the street design.

Green Infrastructure

Currently Front St and Frank St have some green infrastructure in place which captures stormwater runoff and provides relief to the "heat island" effect as well as filtering polluted air. Green infrastructure also provides visual, character and health restoring properties to the street, and could be appropriate in other locations across the municipality.

Street Furniture

Street furniture has the potential to improve the experience of a public space and allows it to be more active. The Municipality currently has benches and trash bins located on Frank St and Front St. Presently, planters have been installed along Caradoc St and Head St. The Municipality could further consider building tree beds and art installations in downtown locations of Strathroy, Mt. Brydges, and Melbourne.

Bicycle Facilities

The Municipality has made an effort to accommodate cyclists by installing bicycle racks along Frank St and Front St. The Municipality could consider following the Bicycle Parking Guidelines as best practice, since the current design of the bike racks has specific limitations. For example, the current bike racks resemble coat hanger style of bike rack which has a top bar that limits the types of bikes it can accommodate shown in **Figure 48**. The Municipality should look to expand the availability of bike parking at Municipal-owned buildings and should incorporate bike parking standards into the site plan application process and parking by-laws.

RACKS TO AVOID

Because of performance concerns, APBP recommends selecting other racks instead of these.

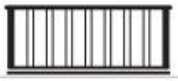
WAVE also called undulating or serpentine		Not intuitive or user-friendly; real-world use of this style often falls short of expectations; supports bike frame at only one location when used as intended.
SCHOOLYARD also called comb, grid		Does not allow locking of frame and can lead to wheel damage. Inappropriate for most public uses, but useful for temporary attended bike storage at events and in locations with no theft concerns. Sometimes preferred by recreational riders, who may travel without locks and tend to monitor their bikes while parked.
COATHANGER		This style has a top bar that limits the types of bikes it can accommodate.
WHEELWELL		Racks that cradle bicycles with only a wheelwell do not provide suitable security, pose a tripping hazard, and can lead to wheel damage.
BOLLARD		This style typically does not appropriately support a bike's frame at two separate locations.
SPIRAL		Despite possible aesthetic appeal, spiral racks have functional downsides related to access, real-world use, and the need to lift a wheel to park.
SWING ARM SECURED		These racks are intended to capture a bike's frame and both wheels with a pivoting arm. In practice, they accommodate only limited bike types and have moving parts that create unneeded complications.

Figure 48: Existing Bicycle Parking on Front St and Bicycle Parking Guidelines Outlining Racks to Avoid

Accessibility for All

Roads should be designed to accommodate all people regardless of their age or ability, without the needs for special assistance. The Municipality has put effort by painting guard strips for the visually impaired as well as marked parking bays. Aside from accessible sidewalks and crossings, design details such as braille signage, surface types could also be considered to improve sustainability and the safety of the users. For example, permeable paving materials such as porous asphalt, permeable concrete and soft paving are more desirable than non-permeable materials. Permeable materials help reduce stormwater run-off, is less costly to maintain, improves water quality, and provides grip for pedestrians during difficult weather conditions.

Overall, these streets cater to the integration of different modes of travel such as providing sidewalks, benches, and vehicular parking, which makes these streets suitable for complete streets consideration. They are identified for cycling improvements which could include cycling routes as well as cycling amenities like bike parking. Opportunities to build-upon and expand this character to other areas of the downtown should be considered.

6.2 Road Design Standards

The Municipality of Strathroy-Caradoc's road classification is outlined in the Official Plan. The description of each road classification is distinctive within the communities of Strathroy, Mt. Brydges, and the remaining rural communities. Strathroy-Caradoc has four road classifications: arterial, primary and secondary collector, and local roads. Historically, the criteria have been based around roadway functions, traffic flow, property access, and roadway capacity.

With a renewed transportation vision for Strathroy-Caradoc that prioritizes a multi-modal network and Complete Streets approach, factors, and elements to classifying roadways have been updated to include walking, cycling and transit as part of the design and planning process.

6.2.1 Strathroy Context

Strathroy is the largest community in Strathroy-Caradoc. The road network consists of arterial, collector and local roads. It also has prominent downtown and key commercial corridors. Strathroy's road network includes access to the Provincial Highway 402, a key connection to southwestern Ontario and the border of the United States. Strathroy connects many of the rural communities and has diverse needs and functions for its road network.

6.2.2 Mt. Brydges Context

Mt. Brydges is the second largest community in Strathroy-Caradoc. The community has one main corridor, Adelaide Road, where it connects to Highway 402. The road network

consists of arterial roads and local streets. The arterial roads are under the jurisdiction of the County of Middlesex.

6.2.3 Rural Roadways

The smaller rural communities within Strathroy-Caradoc are connected by rural roads. The characteristics of arterial, collector, and local roads are shown in **Table 12**.

6.2.4 Complete Streets Considerations

The existing road classification has been reviewed and updated to align with the Municipality's Transportation Master Plan's vision. Consideration for walking, cycling and transit have been included with the lens of Complete Streets.

Inclusion of facilities to accommodate additional modes of transportation are dependent on available road width, traffic volume, and design speed of the road. The decision criteria include network connectivity however safety is the highest priority.

6.2.5 Sidewalks

Sidewalks are important infrastructure in community building and promoting active travel for all ages and abilities. As part of the complete streets approach, sidewalks will be required on both sides of new arterial and collector roads and on at least one side of new local roads. If the Municipality approves new condominium roads, sidewalks will be required on at least one side of the road.

When existing roads are scheduled for full reconstruction or major rehabilitation, the status of the sidewalks will be reviewed and, if appropriate due to the classification and context, sidewalks may be added if missing.

6.2.6 Trees within the Right-of-Way

To maintain and enhance the quality of life in the municipality, the urban tree canopy that exists within the Municipal right-of-way needs to be maintained. Only urbanized road sections would be considered for trees within the right-of-way. The Municipality already has a Tree Bylaw and a Tree Planting Policy that need to continue to be applied. New developments need to accommodate tree planting, where removal of any existing trees should be avoided as much as possible with compensation of tree plantings commensurate with the number of trees removed. New residential development should typically include one tree per property in the public right-of-way.

Sometimes a tree may need to be removed as part of road works to improve the safety of a road link or intersection. Removal of any existing trees for safety or other road works should be compensated with tree plantings commensurate with the number of trees being removed at a minimum and exceeded where possible.

6.2.7 Low Impact Development Measures

Low impact development measures (LIDs) are cost-effective and environmentally sustainable measures to accommodate water runoff from the road surfaces. These measures can be incorporated into the boulevards within the right-of-way in the appropriate context. The TMP supports LID measures in principle, recognizing that they need to be applied on a case-by-case basis in a context-sensitive way and that the road network will still need to be accommodated with a storm system for any new developments as a secured outlet of stormwater.

6.2.8 Road Classification

The hierarchical system of the arterial, collector and local roads states that the arterial roads provide for a high volume of vehicle traffic at a moderate speed for inter-urban trips, and collector roads provide a connection between local and arterial roads at low to moderate speeds. All roads that are not classified as arterial or collector are expected to function as local roads, which accommodate lower volumes of traffic. A higher order of road class type is given priority for any repairs to maintain the traffic flow. Private streets shall only be considered in developments registered under the *Condominium Act* or as otherwise may be permitted by the Municipality.

6.3 Community Speed Limits

There are a wide range of speed limits in place across the Municipality, with the Ontario standard guidance of 50km/h in communities and 80km/h in rural areas often in place, but also with other speed limits used given the land uses along the road segment. The TMP provides the opportunity to revisit speed limits to consider current best practice as to where they may be reduced due to the local context. In general,

- Local roads in community settings should be posted not higher than 50 km/h;
- Community safety zones may be established near schools, parks, community centres, playing fields, and other sensitive land uses, to reduce speeds to a maximum of 40 km/h, with 30 km/h considered around land uses in residential neighbourhoods. Community safety zones should be designated in coordination with the Strathroy Caradoc Police Service, as these zone require police enforcement of speed limits to be effective;
- Within the downtown of Strathroy on urban local streets, speed limits should be at most 40 km/h, with 30 km/h considered in parts of the downtown with the highest pedestrian traffic, such as Front and Frank Streets. Similar to community safety zones, reducing speed limits on downtown streets requires coordination with the Police Service to provide enforcement;
- Collector roads through community residential areas should not be posted higher than 60km/h;
- Collector roads through mixed-use or commercial areas should not be posted higher than 60km/h;

- Arterial roads should not be posted higher than 90km/h, with lower speed limits (as low as 60km/h) considered when development along arterial roads is generating multi-modal traffic; and
- Rural roads should not be posted higher than 90km/h, with lower speed limits considered when development along rural roads is generating multi-modal traffic.

6.4 Transportation Policies for New Developments

Embedded within Strathroy-Caradoc's Official Plan are detailed criteria for new developments, including requirements for pedestrian facilities on new streets. Where possible, the Municipality is encouraged to introduce standards and policies requiring new developments to provide sidewalks on both side of the street in urban conditions and cycling routes along collectors and arterial roads, to the satisfaction of the Municipality. The combination of the Complete Streets Principles and Road Design Standards, detailed in Sections 6.1 and 6.2, should set the minimum standards for both pedestrian facilities and cycling routes. Where further possible, the Municipality is encouraged to develop accessibility standards to ensure road improvements and new implementation of facilities are designed to meet accessibility requirements.

6.4.1 Development Area Entrance Planning in Urban (Community) Areas

New developments in Strathroy or Mt. Brydges need to abide by the Municipality's cross sections for new roads and need to provide the appropriate walking facilities and cycling routes. Additionally, much as the new development roads need to connect to existing roads, new development walking facilities and cycling routes need to connect to the existing active transportation network. Sidewalks in new development will connect to the nearest existing sidewalk to prevent gaps in the sidewalk network as reasonable given the context. Cycling routes in new developments will connected through at least a shared facility to another part of the on-road cycling routes or off-road trails.

6.4.2 Paved Shoulder Policy in Rural Areas

Rather than construct active transportation routes as standalone projects, this work should be considered when the roads are next scheduled in the Municipality's Capital Budget for reconstruction / rehabilitation, to conserve costs. Although most rural segments of the cycling network can operate as signed routes (based off the guidance of OTM Book 18's Facility Selection Tool), upgrades to a paved shoulder should be implemented whenever possible, to achieve greater comfort and convenience. This can involve mandating wider roadway platform standards that can accommodate paved shoulders (with a desired width of 1.5 metres) as a requirement for all new or reconstructed roadways.

An example of this approach is found on Glengyle Drive, which includes provisions to add new paved shoulders. Although led by Middlesex County, the project nonetheless demonstrates the opportunity in leveraging road capital programs to deliver new cycling infrastructure. From a municipal risk management perspective, implementing the green

Bicycle Route Marker sign (on roads considered appropriate for such application) or the yellow Share the Road warning sign can also demonstrate the Municipality's awareness that people are already biking on the road. When rural roads on the proposed cycling network are scheduled for life cycle improvements, staff should consider the feasibility of widening the roadway platform to implement paved shoulders to improve conditions for cycling. Paved shoulders can also benefit pedestrians in rural areas – as per the Highway Traffic Act, people are permitted to walk in a roadway shoulder facing the direction of oncoming traffic. Furthermore, Paved Shoulders can provide space for slow moving agricultural equipment, such as combines and tractors – making it easier for motor traffic to bypass and avoid being impeding.

6.4.3 Wayfinding and Signage (including 911 Signage)

New developments need to follow wayfinding and signage policies already established by the Municipality and County for safety, continuity, and ease of travel. For safety, new developments need to properly display their E911 address to help ensure that emergency response vehicles can find the correct location in as quick a manner as possible. New developments, be it a single dwelling unit, subdivision of multiple houses, industrial development, or any other new land use, need to comply with Middlesex County's E911 Address Display Specifications.

The Municipality of Strathroy-Caradoc adopted a Wayfinding Strategy in 2021 to reinforce the sense of place, identity, and interconnections of the Municipality and improve wayfinding. This strategy governs the design of signs used in the Municipality for wayfinding. For continuity and ease of travel within the Municipality, any street signs or other directional or wayfinding signs erected for public wayfinding as part of new developments should follow the Wayfinding Strategy.

6.5 Traffic Calming

Traffic calming is a range of programs and measures to improve road conditions for the non-motorized and motorized road users that may be caused by traffic speeding and volume. The objective is to alter driver behaviour to reduce speed to the intended limit for the context of a road's intended use. The traffic calming policy is intended to achieve the following through implementation of traffic calming measures:

- Increase awareness and education regarding roadway usage and driver behaviour;
- Restore and maintain the designed purpose, speed, and function of the roadway;
- Provide high quality of life to residents through reduced conflicts; and
- Determine appropriate measures for its intended improvements within a reasonable cost.

The latest national guideline regarding traffic calming practice is the *Canadian Guide to Traffic Calming*. It was published on 2018 through the partnership of Transportation Association of Canada (TAC) and Canadian Institute of Transportation Engineers (CITE).

A set of road characteristics are outlined through a two-step warrant process to determine whether the road segment/corridor is eligible for traffic calming. The first

step informs the suitability of traffic calming implementation, and the second step provides detail on which traffic calming device is the most suitable based on the data provided.

6.5.1 Warrant Step 1 - Suitability Check for Traffic Calming

The first step screening is a desktop review based on the information available in-house. When a traffic calming request is received, the screening criteria are used to determine if further action is warranted. **Table 12** shows the various criteria used to screen check traffic calming.

Table 12: Screening Check for Traffic Calming

Category	Description
Roadway Classification	The location must be identified as • Collector • Local
Posted Speed	The location must have a posted speed of 50km/h or lower
Roadway Segment Length	The road segment where the concern is located must be at least 300 metres between two intersections The roadway segment should be linear and does not include a curve sharper than 30 degrees
Roadway Surface	The roadway must be paved
Roadway Grade	The vertical grade of the roadway must be less than 8%
Location Area	The location must be within a residential neighbourhood
Previously Evaluated	The location must not have been evaluated for traffic calming in the last three years

At this point, the requestor will be notified of the traffic calming eligibility, the appropriate reasons, and the next steps. It should be noted that the locations that do not meet the preliminary criteria but have a significant local concern regarding speeding and high volume, alternative traffic calming programs such as educational campaign can be implemented.

If the street in question is eligible for traffic calming, the requestor will be required to obtain signatures on a petition asking for traffic calming from 51% of the residents on the street in question. Once the Municipality receives the petition, the Warrant Step 2 can be followed.

6.5.2 Warrant Step 2 - Traffic Calming Measure Eligibility

The second warrant criteria are used to determine the appropriate type of traffic calming measure depending on the concerns identified through the process. The scoring system can inform the severity and priority of the location for future planning. Locations should reach 60% of the available points in order to qualify for traffic calming. Traffic calming measure eligibility is shown in **Table 13**.

Table 13: Traffic Calming Measure Eligibility

Warrant Criteria	**Warrant Description**	**Scoring System**
Operating Speed	The 85th percentile measured speed of vehicles using the street is 10 km/h greater than the posted speed limit	2 points (urban) 1 point (rural) for each km/h above the 85th percentile speed Max Available Points: 25
Traffic Volume	Threshold: Collector Roads: 1,000 veh/day Local Roads: 500 veh/day	2 points for each 100 vehicles above collector road threshold 2 points for each 100 vehicles above local road threshold Max Available Points: 25
Collision History	Collisions with vulnerable road users such as pedestrians, cyclists and collisions involving high speeds	5 points for every collision meeting the collision description in the past 3 years Max Available Points: 15
Active Transportation Generator	Active Transportation generators are places that attract people to access by walking and cycling such as a school, daycare, playground, community centre, library, and retail centre.	5 points for every active transportation generator within 200m of the study area Max Available Points: 10
Pedestrian Facilities	Available sidewalk along the roadway	10 points for no sidewalks 5 points for sidewalks on only one side Max Available Points: 10
Cycling Routes	Designated routes for cyclists provide space for them and heightened safety such as bike lanes, multi-use pathways and trails	10 points for no cycling routes 5 points for shared and dedicated routes such as sharrows, paved shoulders, and bike lanes 0 points for separated routes such as multi-use trails Max Available Points: 10

6.5.3 Types of Traffic Calming Measures

There are different categories of traffic calming measures included in this policy that are suitable for geometrics and practices within Strathroy-Caradoc. The education and signage measures are considered passive and are recommended for locations that may not be eligible for physical infrastructure changes. These passive measures can be achieved in a shorter time period with community support. Pavement marking and some road narrowing measures can be implemented for a lower cost and as the first approach measures. The vertical deflections and some horizontal deflections require physical geometric construction, therefore may need additional design study once eligible. Some of the types of traffic calming measures are shown in **Table 14.** Additional types of traffic calming measures are provided in the *Canadian Guide to Traffic Calming.*

Table 14: Types of Traffic Calming Measures

Traffic Calming Measure	Description & Considerations
Education & Signage	
Education Campaign	Education programs and campaigns for all road users to raise awareness of road safety can include information on traffic calming devices, proper roadway usage, and preventative safety measures. Audience-specific programs such as Active and Safe Routes to School Program can provide additional information for students and parents. Suitable for all locations and places, especially in neighbourhoods with schools for safety improvements.
Speed Display Devices	Interactive sign that displays vehicle speeds as oncoming motorists' approach. Suitable for all locations for speed reduction.
Vehicle Activated Signs (VAS)	Roadside signs that are equipped with radar speed detectors and alerts drivers when activated by speeds surpassing a threshold or when a hazard is ahead. Suitable for all locations including urban and rural roads for speed and conflict reduction.
Gateway	A combination of traffic calming devices, welcome signs or changes in the landscape that provide a message to help identify transitional zones between rural areas and urban/rural residential zones, villages, or hamlets. Suitable for entrances to communities for speed management.

Traffic Calming Measure	Description & Considerations
Speed Watch Program	Volunteers and residents are involved to help monitor traffic and record license plates of vehicles travelling at excessive speeds. Letters may be sent to registered owners of these vehicles by the authorities alerting them of their excessive speeding. Suitable for locations that may not be eligible for physical infrastructure changes but would like speed reduction and education programs
Traffic Calmed Neighbourhood	Informal signs to caution motorists of the traffic calming measures and potentially pedestrian generated facilities nearby. Can be used as a gateway feature for a certain area/corridor. Suitable for urban areas with schools and vulnerable residents for speed and traffic volume reduction
Pavement Markings	
On-Road 'Sign' Pavement Markings	Pavement markings providing information that would typically be shown to drivers through signage painted on the roadway to provide a larger and different visual perspective. Suitable for local and collector neighbourhoods for speed reduction.
Converging Chevrons / Transverse Bars	Pavement markings painted in the shape of a "V" pointing in the roadway travel direction to create the illusion that a vehicle's speed is increasing. Suitable for local and collector neighbourhoods for speed reduction.
Vertical Deflection	
Speed Cushion	Vertically raised by asphalt, plastic, or rubber to reduce speed. Designed for larger vehicles such as emergency and transit vehicles to pass over it without slowing down. Suitable for local and collector neighbourhoods for speed reduction.

Traffic Calming Measure	Description & Considerations
Raised Intersection/ Raised Crosswalk	An elevated crosswalk or a full intersection. Can also be used as a gateway feature for a corridor. Suitable for local and collector neighbourhoods for speed reduction.
Speed Hump / Speed Table	A raised area of a roadway that deflects both the wheels and body of a vehicle. A speed table is a wider speed hump with a flat-topped section. Suitable for local and collector neighbourhoods for speed reduction.
Road Narrowing	
Road Diet	Repurposing the right-of-way widths. Suitable for local and collector neighbourhoods for speed and conflict reduction.
Curb Extension	Reducing the curb radius at intersection corners for a narrower roadway width and shortened crosswalk. This can help motorists to slow down when making a right turn. Not suitable for streets with cycling routes. Suitable for local and collector neighbourhoods for speed, volume, and conflict reduction.
Vertical Centreline Treatment	Using raised centre medians such as flexible post delineators or raised pavement markings to define the roadway width and sense of constriction to slow down the traffic. Suitable for local and collector neighbourhoods for speed reduction.
On-Street Parking	Allowing on one or two sides of the roadway with parallel parking to reduce the roadway width. Suitable for local and collector neighbourhoods for speed reduction, if the pavement width is already wide enough to accommodate on-street parking.

6.6 Railway Crossings

Railways have played a vital role in the history of the Municipality of Strathroy-Caradoc. To continue serving the municipality via rail services and protecting the safety of the public, railway crossings need to consider standards and measures that minimize road-rail conflict wherever possible. In Section 5 of this TMP, five railway crossings have been considered for future study if grade separation were to be contemplated.

6.6.1 Protecting for Future Grade Separations

Grade separations can be an overpass or tunnel that allow vehicles to pass over or under a rail line. The Municipality should refer to Transport Canada's Grade Separation Assessment Guideline and the Crossing Exposure Index (CEI) to appropriately quantify the need for grade separations at existing railway crossings.

6.7 Electric Mobility

Electric mobility is a form of travel using any vehicle that is not reliant on gasoline as their primary fuel source, and instead is powered by electricity. With growing populations and expanding travel demands, electric mobility options can provide several benefits for municipalities like Strathroy-Caradoc. At the present time, transportation accounts for 20% of the Ontario's greenhouse gas (GHG) emissions. Electric mobility as a new mechanism for travel is a value-added approach with added benefits such as reduced GHG emissions, reduced transportation-related noise pollution, and improved public health.

Electric mobility can be implemented in different forms throughout Strathroy-Caradoc, such as:

- Micro-mobility to support intra-city commuting and first and last mile connections using electric bike sharing or e-scooters;
- Electrification in the form of electric vehicles with investment in charging infrastructure; and
- Commercial electrification in the form of e-commerce.

To support this expansion of electric mobility across Strathroy-Caradoc's transportation network, the Municipality can invest in electric vehicle charging facilities on municipal property and purchasing electric vehicles for the municipal fleet. In addition, the Municipality can require electric vehicle charging stations at future private developments by updating zoning by-laws and the site plan application process.

6.7.1 Micro-mobility Charging

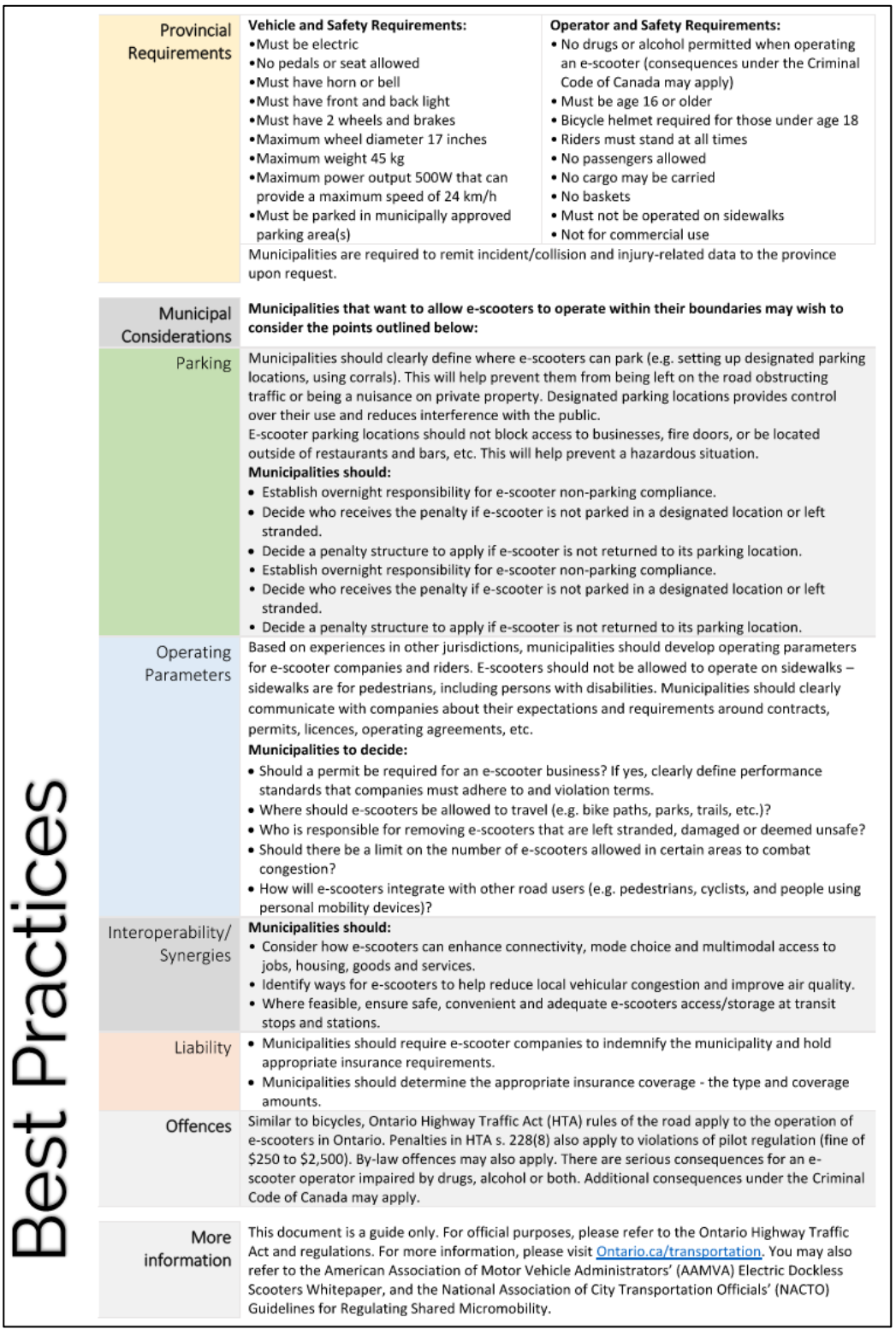
Micro-mobility is a small, lightweight vehicle such as shared bicycles, e-scooters, or e-bikes that are primarily used for short-term use, including first and last mile connections. Prior to introducing micro-mobility, consideration should be given to the ownership and operation of service, including vehicle and charging stations. Several options include municipal-owned and operated, third-party providers operate within the jurisdiction, or

public-private partnerships. Further consideration should be given to prioritizing micro-mobility infrastructure, inclusive of designed lanes on roadways as well as docking and charging stations, in the application of complete streets as well as road design standards noted in Section 6.2.

Complimentary of the more conventional active transportation modes, guidance should also be provided on relevant emerging trends and technology, including e-scooters. Generally, micro-mobility refers to the various emerging mobility options that rely on a combination of human and electrically powered propulsion.

As of January 2020, the provincial government has initiated a five-year pilot program that allows municipalities to regulate the operations of e-scooters within their own jurisdiction through associated bylaws. While municipalities can regulate where e-scooters may operate locally, all pilots are subject to a list of requirements and guidelines set out by the Ministry of Transportation (**Figure 49**). These items were developed through a best practices review conducted among jurisdictions where already permitted under law. While the pilot should be adopted based on public demand, e-scooters offer considerable benefits to the local community. The assistance provided by e-scooters can minimize barriers involving physically exercising, making active transportation accessible to a wider range of users. This is not only beneficial to residents but visitors to the municipality, creating new possible opportunities for tourism.

A suggested first step for the municipality is to engage members of the public to determine whether an e-scooter pilot is desired, either through a survey or consultation event(s). If public support is identified, the municipality should then coordinate with members of its traffic and parks and recreation departments to confirm the extent of local facilities, where appropriate, to permit operation. Funding should then also be allocated towards the installation of public charging infrastructure; most likely within Strathroy where travel activity is greatest.



Best Practices

Provincial Requirements	**Vehicle and Safety Requirements:** •Must be electric •No pedals or seat allowed •Must have horn or bell •Must have front and back light •Must have 2 wheels and brakes •Maximum wheel diameter 17 inches •Maximum weight 45 kg •Maximum power output 500W that can provide a maximum speed of 24 km/h •Must be parked in municipally approved parking area(s)	**Operator and Safety Requirements:** • No drugs or alcohol permitted when operating an e-scooter (consequences under the Criminal Code of Canada may apply) • Must be age 16 or older • Bicycle helmet required for those under age 18 • Riders must stand at all times • No passengers allowed • No cargo may be carried • No baskets • Must not be operated on sidewalks • Not for commercial use
	Municipalities are required to remit incident/collision and injury-related data to the province upon request.	
Municipal Considerations	**Municipalities that want to allow e-scooters to operate within their boundaries may wish to consider the points outlined below:**	
Parking	Municipalities should clearly define where e-scooters can park (e.g. setting up designated parking locations, using corrals). This will help prevent them from being left on the road obstructing traffic or being a nuisance on private property. Designated parking locations provides control over their use and reduces interference with the public. E-scooter parking locations should not block access to businesses, fire doors, or be located outside of restaurants and bars, etc. This will help prevent a hazardous situation. **Municipalities should:** • Establish overnight responsibility for e-scooter non-parking compliance. • Decide who receives the penalty if e-scooter is not parked in a designated location or left stranded. • Decide a penalty structure to apply if e-scooter is not returned to its parking location. • Establish overnight responsibility for e-scooter non-parking compliance. • Decide who receives the penalty if e-scooter is not parked in a designated location or left stranded. • Decide a penalty structure to apply if e-scooter is not returned to its parking location.	
Operating Parameters	Based on experiences in other jurisdictions, municipalities should develop operating parameters for e-scooter companies and riders. E-scooters should not be allowed to operate on sidewalks – sidewalks are for pedestrians, including persons with disabilities. Municipalities should clearly communicate with companies about their expectations and requirements around contracts, permits, licences, operating agreements, etc. **Municipalities to decide:** • Should a permit be required for an e-scooter business? If yes, clearly define performance standards that companies must adhere to and violation terms. • Where should e-scooters be allowed to travel (e.g. bike paths, parks, trails, etc.)? • Who is responsible for removing e-scooters that are left stranded, damaged or deemed unsafe? • Should there be a limit on the number of e-scooters allowed in certain areas to combat congestion? • How will e-scooters integrate with other road users (e.g. pedestrians, cyclists, and people using personal mobility devices)?	
Interoperability/ Synergies	**Municipalities should:** • Consider how e-scooters can enhance connectivity, mode choice and multimodal access to jobs, housing, goods and services. • Identify ways for e-scooters to help reduce local vehicular congestion and improve air quality. • Where feasible, ensure safe, convenient and adequate e-scooters access/storage at transit stops and stations.	
Liability	• Municipalities should require e-scooter companies to indemnify the municipality and hold appropriate insurance requirements. • Municipalities should determine the appropriate insurance coverage - the type and coverage amounts.	
Offences	Similar to bicycles, Ontario Highway Traffic Act (HTA) rules of the road apply to the operation of e-scooters in Ontario. Penalties in HTA s. 228(8) also apply to violations of pilot regulation (fine of $250 to $2,500). By-law offences may also apply. There are serious consequences for an e-scooter operator impaired by drugs, alcohol or both. Additional consequences under the Criminal Code of Canada may apply.	
More information	This document is a guide only. For official purposes, please refer to the Ontario Highway Traffic Act and regulations. For more information, please visit Ontario.ca/transportation. You may also refer to the American Association of Motor Vehicle Administrators' (AAMVA) Electric Dockless Scooters Whitepaper, and the National Association of City Transportation Officials' (NACTO) Guidelines for Regulating Shared Micromobility.	

Figure 49: Summary of the Ontario Requirements and Guidelines Pertaining to the Adoption of a Municipal E-Scooter Bylaw Pilot

(Source: MTO)

6.7.2 Electric Vehicle Charging

The Municipality should consider developing standards requiring, where possible, new developments to be future ready by accommodating electric vehicle and applicable charging stations. Steps towards supporting the electrification of vehicles and their increased usage can include implementing charging stations at municipally owned facilities such as the Strathroy-Caradoc Recreation Centre, Middlesex County Library, and the Municipality of Strathroy-Caradoc. Examples of electric vehicle charging stations such as Thomas Street should be expanded along Frank Street and Front Street given their proximity to the Downtown. To incentivize the use of these alternative energy vehicles, the Municipality can consider installing Level 2 and/or Level 3 Charging infrastructure to ensure compatibility as well as higher voltage charging.

6.7.3 Commercial Fleet Electrification

With Strathroy-Caradoc's concentration of freight-based activity combined with the rapid transition to e-commerce, expansion towards commercial electrification can support local economic growth. Standards and policies for commercial electrification can focus on specific areas such curbside management for electric commercial vehicles, dedicated loading areas for e-delivery services such as bikes and e-scooters, and proper allocation of parking to prioritize alternative energy delivery vehicles. The Municipality should first consider this approach at gateway locations noted in the Strathroy Downtown Master Plan, specifically along Front Street, Frank Street, and Metcalfe Street.

6.8 Goods Movement Spring By-law

Every year in the spring thaw, some Municipal roads in rural areas potentially could be damaged with rutting by vehicles and trucks with an axle transmitting weight to the road in excess of 5,000 kilograms. The Municipality will identify the Municipal roads that could be damaged and develop a by-law and post these roads as restricted to this weight for the period of March 1st – through April 30th each year, with the dates potentially adjusted by the Municipality based on weather conditions. The by-law will be coordinated with the County's approach to spring load restrictions and will include all roads classified as local roads.

7

Implementation

STRATHROY-CARADOC
TRANSPORTATION
MASTER PLAN

7 Implementation

This chapter provides an implementation strategy for the recommended transportation network improvements, dividing them into three timeframes – short-term, medium-term, and long-term. The implementation plan recognizes that no project will be constructed without funding and/or approval from Council. The plan is dynamic and acknowledges that priorities can change.

Moreover, the implementation plan is supported by a high-level costing plan to provide an indication of estimated funds needed to construct the different projects. In order to gauge progress toward creating a more complete multi-modal transportation network, a monitoring plan is included at the end of the chapter.

The recommended transportation network includes both projects that will be led by the Municipality/County, as well as those conceptual roads that will be secured and funded by applicants through future developments to demonstrate overall network connectivity.

7.1 Phasing of Recommendations

Efficient prioritization and allocation of financial resources are required to implement the recommendations of this TMP successfully. The phasing plan includes high level cost estimates for the active transportation and road capital projects. As a living document, these costs will need to be reviewed and updated as the projects continue to detailed design and implementation. As the timeline progresses, additional studies, detailed designs and technical assessments are required to identify the unique requirements of each project.

All transportation recommendations are phased within one of three implementation horizons:

- **Short-Term:** Generally implemented within 0 – 5 years from the TMP's adoption
- **Medium-Term:** Generally implemented within 6 – 15 years from the TMP's adoption
- **Long-Term:** Generally implemented within 16 – 25 years from the TMP's adoption

This phasing scheme was applied to all recommendations, including routes recommended as part of the proposed road and active transportation recommendations. Assignments within these horizons were based upon the Strathroy-Caradoc Residential Land Needs Assessment (August 2020) for transportation infrastructure to support residential development, an understanding of the timing of industrial growth, and the analysis of future traffic volumes on County roads through the Municipality.

7.1.1 Active Transportation Network Phasing

Like all other identified recommendations, those pertaining to active transportation network were assigned among the three implementation horizons of: short-term, medium-term, and long-term. This phasing process relied on the same considerations and principles which informed how the active transportation network was developed, including close

coordination with the RTMP. Provided below is a summary of the criteria generally used to inform how different segments of the active transportation network were phased:

Short-Term Horizon (0-5 Years)

- Facilities that represent "quick-wins" given their low cost and high feasibility relative to their benefit to overall network connectivity and user comfort (i.e., Neighbourhood Greenways, Signed Routes);
- Facilities likely to service a high degree of demand, based on their proximity to key travel destinations and travel corridors (i.e., Second St Urban Trail); and
- Facilities flagged by municipal staff or members of the public as key priorities (i.e., upgrades to Rotary Trail System, enhanced pedestrian crossings).

Medium-Term Horizon (6-15 Years)

- Facilities that provide a substantive network improvement yet are forestalled due to cost and constructability challenges (i.e., Metcalfe St Urban Trail); and
- Facilities whose cost and usage are contingent on the completion of newly planned subdivisions.

Long-Term Horizon (16-25 Years)

- Facilities with substantive cost and constructability challenges (i.e., trail link between Strathroy and Mt. Brydges);
- Facilities that serve as a secondary route within the overall network; and
- Facilities which require the buy-in and coordination of additional stakeholders (i.e., primary trails along rail corridors).

Supplementary to the following criteria, projects that directly connect to each other were often phased together to encourage construction streamlining and to avoid creating network dead heads. Furthermore, projects previously proposed through the Middlesex County Cycling Strategy were assigned within an implementation horizon which aligns with their original phasing. A complete summary of the active transportation network phasing is provided within **Table 15** and illustrated in **Figure 50**, **Figure 51**, and **Figure 52**.

Table 15: High-Level Overview of the Proposed Active Transportation Network's Phasing

Source Plan	Facility Type	Existing Length (km)	Proposed Length (km)			Total Length (km)
			Short-Term (0-5 Years)	Medium-Term (6-15 Years)	Long-Term (16-25 Years)	
Middlesex County Cycling Strategy & TMP Recommendations	Proposed Signed Route	0	36.15	6.23	28.35	**70.73**
	Multi-Use Trail	0	0	2.93	0.58	**3.51**
	Proposed Bike Lane	0	4.28	0	5.11	**9.39**
	Proposed Paved Shoulder	5.78	0.72	0	13.23	**19.73**
	Proposed Buffered Paved Shoulder	0	2.58	0	2.87	**5.45**
	Proposed Enhanced Pedestrian Crossings	0	3 (units)	0	0	**3 (units)**
TMP	SC	5.78	2.82	6.22	58.92	**67.96**
	Strathroy	2.63	4.36	1.82	4.37	**10.55**
	Mt. Brydges	3.15	0.47	-	-	**0.47**
RTMP Recommendations	Unclassified Trails	9.13	0	0	0	**9.13**
	Urban Trail (Type 1)	0	0.72	10.58	8.23	**19.54**
	Primary Trail (Type 2)	0.79	3.20	0.36	5.25	**9.61**
	Secondary Trail (Type 3)	9.48	1.98	12.12	26.70	**50.29**
	Woodland Trail (Type 4)	1.94	2.81	0.74	0.00	**5.49**
	Neighbourhood Greenway (Type 5)	0	11.12	0	0	**11.12**
	Totals	**38.69**	**71.21**	**41.00**	**153.61**	**292.97**

Figure 50: Strathroy-Caradoc Phasing for Proposed Active Transportation Routes

STRATHROY-CARADOC
PROPOSED TRAIL ROUTES PHASING

Legend

Existing AT Routes

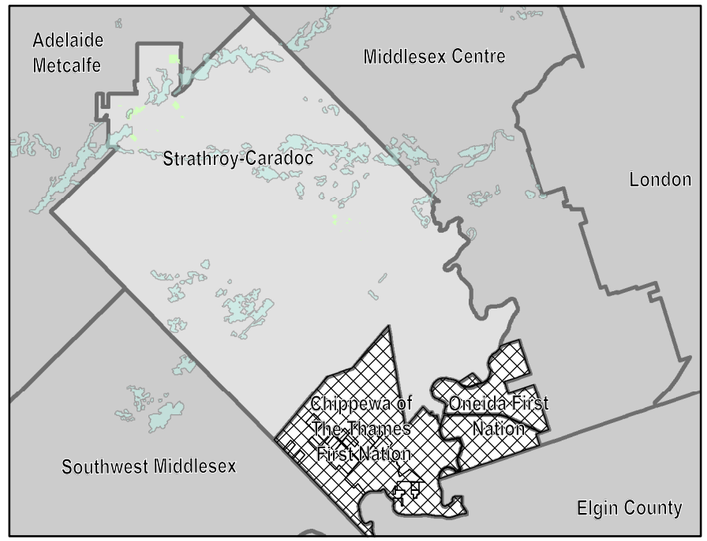
- Existing Cycling Facilities
- Existing Trail

Proposed AT Routes Phasing

- Long-Term
- Medium Term; Medium-Term
- Short-Term

Other Elements

- Enhanced Crossings
- Railway
- First Nations Territory
- Strathroy-Caradoc Municipal Boundary
- Wetland Areas
- Parks



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 51: Strathroy Phasing for Proposed Active Transportation Routes

STRATHROY
PROPOSED TRAIL ROUTES PHASING

Legend

Existing AT Routes

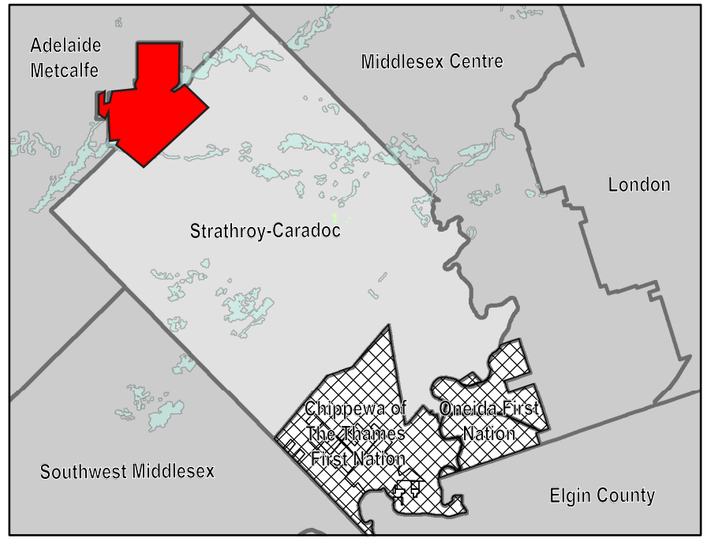
- Existing Cycling Facilities
- Existing Trail

Proposed AT Routes Phasing

- Long-Term
- Medium-Term
- Short-Term

Other Elements

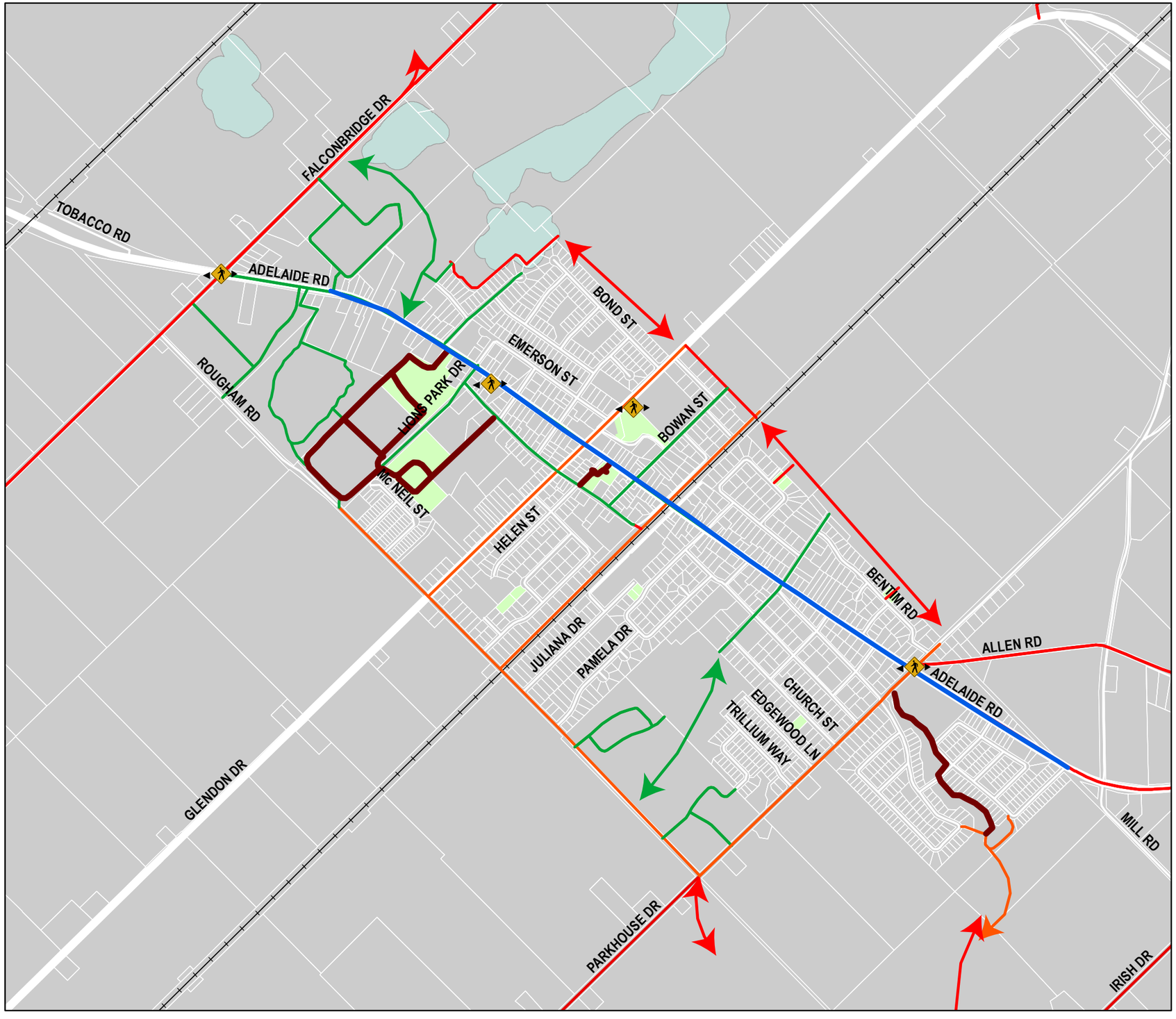
- Enhanced Crossings
- Railway
- Strathroy-Caradoc Municipal Boundary
- First Nations Territory
- Wetland Areas
- Parks



0 1.75 3.5 7 Kilometers

Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 52: Mt.Brydges Phasing for Proposed Active Transportation Routes



MT BRYDGES
PROPOSED TRAIL ROUTES PHASING

Legend

Existing AT Routes

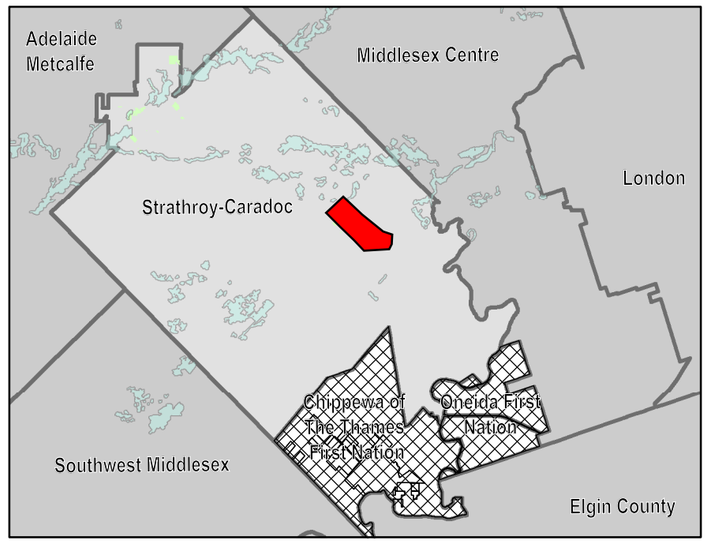
- Existing Cycling Facilities
- Existing Trail

Proposed AT Routes Phasing

- Long-Term
- Medium-Term
- Short-Term

Other Elements

- Enhanced Crossings
- Railway
- Strathroy-Caradoc Municipal Boundary
- First Nations Territory
- Wetland Areas
- Parks



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

7.1.2 Road Phasing

The estimated phasing for proposed roads being considered is summarized in **Table 16**. The location ID numbers are shown on the maps in **Figure 53** through **Figure 55**. Roads in new developments would be expected to be constructed solely by the developer, and the exact timing of construction will be development-driven. For the purposes of the TMP, new development roads in industrial areas are assumed to be constructed in the short term, with new development roads in residential areas expected to be constructed in the medium term.

Table 16: Estimated Phasing for Proposed Roads of Preferred Alternative

ID	Description	Road	Segment	Improvement Type	Phasing Period
Strathroy Road Projects					
1	New Road	Street A	Wright St to Street B	New 2-lane construction	Medium-term
2	New Road	Street B	Adair Blvd to Municipal Boundary	New 2-lane construction	Medium-term
3	New Road	Street C	Street B to Terminus	New 2-lane construction	Medium-term
4	New Road	Street D	Wright St to Second St	New 2-lane construction	Short-term
5	New Road	Street E	New road parallel to Adair Blvd to Adair Blvd	New 2-lane construction	Long-term
6	New Road	Street F	New road parallel to Adair Blvd to Adair Blvd	New 2-lane construction	Long-term
7	New Road	Street G	New road parallel to Adair Blvd to Adair Blvd	New 2-lane construction	Long-term
8	Extension of Agnes Drive	Agnes Dr	Wright St to 0.372 km south of Wright St	New 2-lane construction	Short-term
9	Extension of Thorn Dr (North Meadows Secondary Plan), East of Adair Blvd	Thorn Dr	Adair Blvd to Second St	New 2-lane construction	Medium-term
	Extension of Thorn Dr (North Meadows Secondary Plan), West of Adair Blvd	Thorn Dr	Head St N to Adair Blvd	New 2-lane construction	Short-term
10	Extension of Adair Blvd (North Meadows Secondary Plan)	Adair Blvd	Adair Blvd to Terminus	New 2-lane construction	Short-term
11	Extension of Jenna Drive	Jenna Drive	Jenna Drive to Centre Road	New 2-lane construction	Long-term

ID	Description	Road	Segment	Improvement Type	Phasing Period
12	Extension of Pannell Lane	Pannell Lane	Panell Lane to current terminus	New 2-lane construction	Long-term
13	Extension of Dominion Street	Dominion St	Dominion St to Pannell Lane	New 2-lane construction	Short-term
14	New Development Road	Street H	Carroll St W to Adelaide Rd	New 2-lane construction	Medium-term
15	New Development Road	Street I	Carroll St W to Street H	New 2-lane construction	Short-term
16	New Development Road	Street J	Adelaide Rd to Street H	New 2-lane construction	Medium-term
Mt. Brydges Road Projects					
17	New Development Road	Street K	Adelaide Rd to Rougham Rd	New 2-lane construction	Short-term
18	New Development Road	Street L	Falconbridge Dr to Street K	New 2-lane construction	Short-term
19	New Development Road	Street M	Street K to Street K	New 2-lane construction	Short-term
20	New Development Road	Street N	Falconbridge Dr to Street O	New 2-lane construction	Short-term
21	New Development Road	Street O	Street N to Street N	New 2-lane construction	Short-term
22	New Development Road	Street P	Street O to Street O	New 2-lane construction	Short-term
23	New Development Road	Street Q	Adelaide Rd to Street O	New 2-lane construction	Short-term
24	New Development Road	Street R	Street O to property line	New 2-lane construction	Short-term
25	New Development Road	Street S	Street R to Street T	New 2-lane construction	Short-term
26	New Development Road	Street T	Street S to Street S	New 2-lane construction	Short-term
27	New Development Road	Street U	Rougham Rd to Street V	New 2-lane construction	Short-term
28	New Development Road	Street V	Street U to end of property line	New 2-lane construction	Short-term
29	New Development Road	Edgewood Lane	Property line to Edgewoood Lane	New 2-lane construction	Short-term
30	New Development Road	Trillium Place	Trillium Way to Terminus	New 2-lane construction	Short-term
31	New Development Road	Street W	Property Line to Rougham Rd	New 2-lane construction	Short-term
32	New Development Road	Street X	Street W to Parkhouse Dr	New 2-lane construction	Short-term

Figure 53: Strathroy-Caradoc Phasing for Proposed Roads

STRATHROY-CARADOC

PROPOSED ROAD IMPROVEMENTS PHASING

Refer to Strathroy Map

Refer to Mt Brydges Map

AMIENS RD
HICKORY DR
GLENGYLE DR
SKINNER DR
UNION DR
MCEVOY RD
ADELAIDE RD
FALCONBRIDGE DR
I9
CHRISTINA RD
MILL RD
COOKS RD
REILY DR
MUNCEY RD
BURWELL RD
LONGWOODS RD
SWITZER DR
MELBOURNE RD
CALVERT DR
WALKERS DR
INADALE DR
OLDE DR
CENTURY DR
GLENDON DR
PARKHOUSE DR
IRISH DR

0 5 10 20 Kilometers

Legend

Road Improvements Phasing

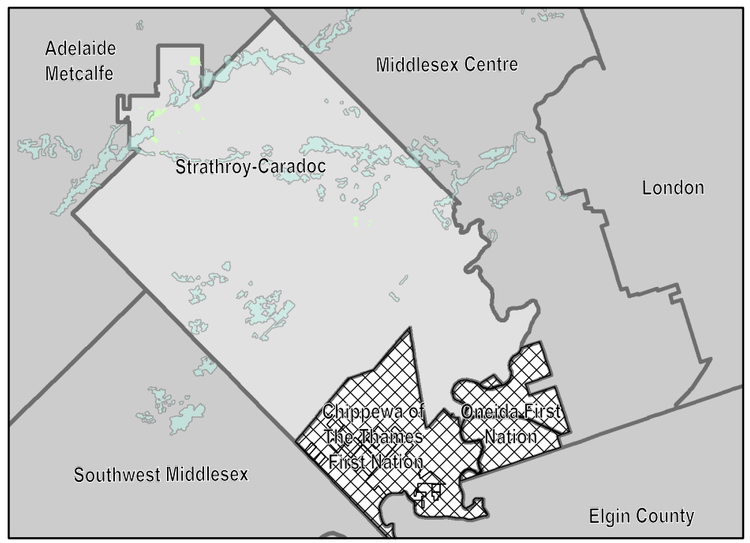
- Long-Term
- Medium-Term
- Short-Term

Intersection Improvements Phasing

- Long-Term
- Medium-Term
- Short-Term

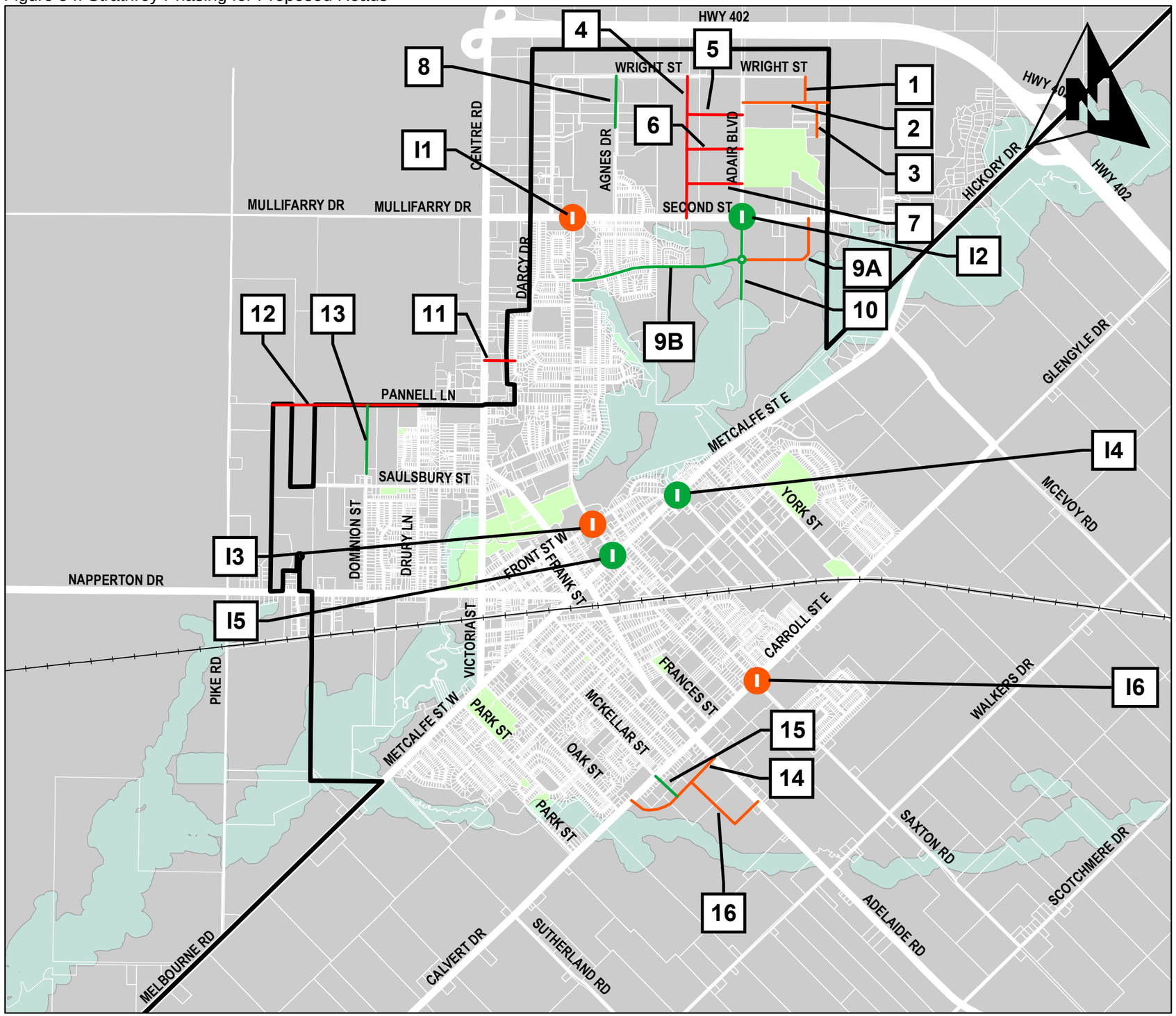
Other Elements

- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Strathroy-Caradoc Municipal Boundary



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 54: Strathroy Phasing for Proposed Roads



0 1.75 3.5 7 Kilometers

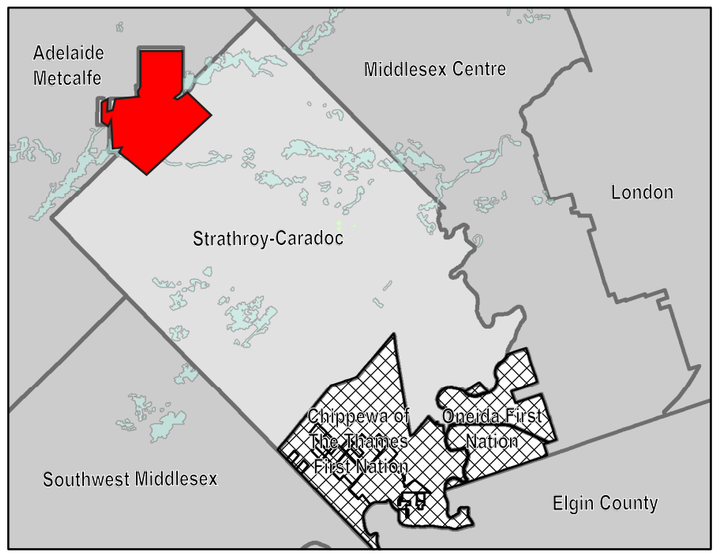
STRATHROY
PROPOSED ROAD IMPROVEMENTS PHASING

Legend

Road Improvements Phasing
- Long-Term
- Medium-Term
- Short-Term

Intersection Improvements Phasing
- Long-Term
- Medium-Term
- Short-Term

Other Elements
- Railway
- First Nations Territory
- Wetland Areas
- Parks
- Strathroy-Caradoc Municipal Boundary



Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

Figure 55: Mt.Brydges Phasing for Proposed Roads

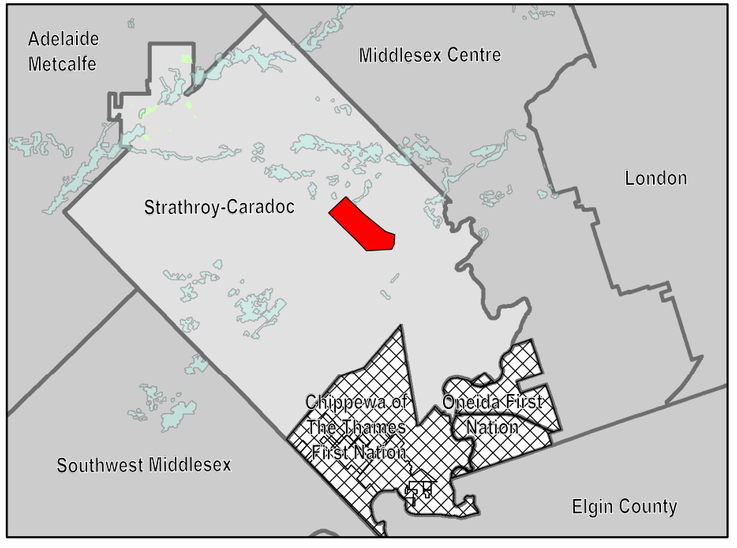
MT BRYDGES
PROPOSED ROAD IMPROVEMENTS PHASING

Legend

Road Improvements Phasing
- Long-Term
- Medium-Term
- Short-Term

Intersection Improvements Phasing
- I Long-Term
- I Medium-Term
- I Short-Term

Other Elements
- Railway
- First Nations Territory
- Wetland
- Parks



0 0.75 1.5 3 Kilometers

Source: Data provided by the Municipality of Strathroy-Caradoc, Middlesex County and Open Source Portals
Map plotted on June 20, 2022
Project: NAD 1983 UTM Zone 17

7.2 Costing

The multi-modal transportation recommendations in the TMP are made specifically to address growth in population and employment and the required facilities to accommodate this growth. The projects that are costed as part of this TMP include both the construction of new Municipal roads and conceptual roads that will be secured as part of future development applications and paid for at the expense of the applicant. Costing provided for conceptual roads as part of future developments are provided for information/reference purposes only. The below summarizes the two types of road recommendations:

Road Type		Funding Mechanism(s)
New Roads Constructed as part of a Draft Plan of Subdivision process	→	Sole cost of the development proponent
Road upgrades	→	– Cost sharing between development proponents and the Municipality – Municipality / County Capital Projects

The costing for Municipally-funded roads provided in this section is intended to inform subsequent updates to the Municipality's Development Charges Background Study and included, as appropriate, in the development charges for growth.

The costing of the infrastructure improvements has been divided between the active transportation network and the road network.

Further, there are additional Municipal roads that have been identified or may be identified in the future for future roadway improvements, including but not limited to road right-of-way and/or pavement width, active transportation routes, infrastructure needs, or streetscaping. It must be noted these additional projects would be funded either partially or fully through Development Charges, and so the timing of construction will be largely driven by the pace of development.

7.2.1 Active Transportation Network

Based on facility assignments and proposed phasing, a total cost estimate to implement the network was determined. In addition to using industry leading facility unit costs based on the precedence of comparable projects, cost estimates relied on a series of assumptions:

- Unit prices gathered from recent tenders and projects of similar scope in Ontario;
- Costs are not intended for functional design purposes as they only include the costs of installation of facilities;
- Costs are not meant to be prescriptive but provide a preliminary estimate of the potential implementation costs;
- Assumption that facilities are implemented across typical environmental conditions and topography, and;
- Best practices from past initiatives completed by comparable municipalities and may vary depending on capacity and availability of funds.

A complete breakdown of how this costing was completed, including applied per linear kilometer unit costs, is summarized below within **Table 17**. As denoted within the table, this network includes recommendations from the RTMP, existing Middlesex County Cycling Strategy, and those recommended directly from the TMP. To provide a more accurate total costs, routes recommended as part of the adopted Middlesex County Cycling Strategy were re-cost using current cost estimates. Costs are broken down by owner, as assumed by the jurisdiction of the roadway or area where the on-road and off-road facility is proposed, respectively. This excludes costs assigned to MTO, which are specifically routes listed on the Province's On-Road Cycling network that are found on Provincially-owned highways.

Table 17: High-Level Cost Estimate of the Active Transportation Network: Short-Term (0-5 Years), Medium-Term (6-15 Years) and Long-Term (16-25 Years)

Source Plan	Facility Type	Proposed Cost (CAD$)									Total Proposed Cost (CAD$)			
		Short-Term (0-5 Years)			Medium-Term (6-15 Years)			Long-Term (16-25 Years)						
		Local	County	MTO		County	MTO	Local	County	MTO	Local	County	MTO	Total
Middlesex County Cycling Strategy	Proposed Signed Route	$23,000	$18,000	$2,000	$7,000	$ -	$ -	$30,000	$4,000	$ -	$60,000	$22,000	$2,000	$84,000
	Multi-use Trail	$ -	$ -	$ -	$ -	$ -	$ -	$117,000	$ -	$ -	$117,000	$ -	$ -	$117,000
	Proposed Bike Lane	$71,000	$53,000	$ -	$ -	$ -	$ -	$104,000	$45,000	$ -	$175,000	$97,000	$ -	$272,000
	Proposed Paved Shoulder	$59,000	$84,000	$ -	$ -	$ -	$ -	$ -	$2,646,000	$ -	$59,000	$2,730,000	$ -	$2,789,000
TMP	On-Road Routes	$1,520,000	$880,000	$ -	$570,000	$1,950,000	$ -	$1,370,000	$18,440,000	$ -	$3,460,000	$21,270,000	$0	$24,730,000
RTMP Recommendations	Urban Trail (Type 1)	$216,000	$ -	$ -	$3,175,000	$ -	$ -	$2,470,000	$ -	$ -	$5,861,000	$ -	$ -	$5,861,000
	Primary Trail (Type 2)	$641,000	$ -	$ -	$72,000	$ -	$ -	$1,051,000	$ -	$ -	$1,764,000	$ -	$ -	$1,764,000
	Secondary Trail (Type 3)	$198,000	$ -	$ -	$1,212,000	$ -	$ -	$2,670,000	$ -	$ -	$4,081,000	$ -	$ -	$4,081,000
	Woodland Trail (Type 4)	$70,000	$ -	$ -	$18,000	$ -	$ -	$ -	$ -	$ -	$89,000	$ -	$ -	$89,000
	Neighbourhood Greenway (Type 5)	$129,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$129,000	$ -	$ -	$129,000
Totals		**$2,927,000**	**$1,035,000**	**$2,000**	**$5,054,000**	**$1,950,000**	**$ -**	**$7,812,000**	**$21,135,000**	$ -	**$15,795,000**	**$24,119,000**	**$2,000**	**$39,916,000**

7.2.2 Road Network

This section of the TMP provides high-level costs estimate for the roads identified in the preferred alternative, in addition to roads which will be secured through new developments at the cost of development proponents. The costs will require confirmation as the project approach implementation through assessment and detailed design of the facilities. The road cost estimates typically assume $2.6 million per kilometre for road works within the right-of-way, including excavation and preparation, construction, construction management, and active transportation facilities. Excluded from this $2.6 million are utilities, underground work, electrification, and any land acquisition costs. The estimated costing for proposed roads road segments using the preferred alternative is provided in **Table 18**.

The costing for the proposed intersection improvements are provided in **Table 19.** Several intersection improvements are noted as a traffic signal or a roundabout. The cost estimates are based on a traffic signal. A roundabout would be expected to cost more to construct, on an order of magnitude as 10 times the cost of a signalized intersection. This higher cost can be mitigated over time, as a roundabout typically costs less to operate and maintain than traffic signals.

The location ID numbers are shown on the maps in **Figure 39** through **Figure 41**. The costs to construct roads in new developments would be expected to be paid solely by the developer. The exact cost of construction of all roads will be determined in detailed design.

Table 18: Estimated Costing for Proposed Road Improvements of Preferred Alternative

ID	Description	Road	Segment	Segment Length (km)	Costing ($)
Strathroy Road Projects					
1	New Road	Street A	Wright St to Street B	0.2	$465,000
2	New Road	Street B	Adair Blvd to Municipal Boundary	0.6	$1,595,000
3	New Road	Street C	Street B to Terminus	0.3	$645,000
4	New Road	Street D	Wright St to Second St	1.0	$2,643,000
5	New Road	Street E	New road parallel to Adair Blvd to Adair Blvd	0.4	$1,032,000
6	New Road	Street F	New road parallel to Adair Blvd to Adair Blvd	0.4	$1,032,000
7	New Road	Street G	New road parallel to	0.4	$1,032,000

ID	Description	Road	Segment	Segment Length (km)	Costing ($)
			Adair Blvd to Adair Blvd		
8	Extension of Agnes Drive	Agnes Dr	Wright St to 0.372 km south of Wright St	0.4	$960,000
9A	Extension of Thorn Dr (North Meadows Secondary Plan), East of Adair Blvd	Thorn Dr	Adair Blvd to Second St	0.7	$1,874,000
9B	Extension of Thorn Dr (North Meadows Secondary Plan), West of Adair Blvd	Thorn Dr	Head St N to Adair Blvd	1.3	$3,324,000
10	Extension of Adair Blvd (North Meadows Secondary Plan)	Adair Blvd	Adair Blvd to Terminus	0.7	$1,683,000
11	Extension of Jenna Drive	Jenna Drive	Jenna Drive to Centre Road	0.2	$576,000
12	Extension of Pannell Lane	Pannell Lane	Pannell Lane to current terminus	1.0	$2,705,000
13	Extension of Dominion Street	Dominion St	Dominion St to Pannell Lane	0.5	$1,288,000
14	New Development Road	Street H	Carroll St W to Adelaide Rd	0.8	$2,013,000
15	New Development Road	Street I	Carroll St W to Street H	0.2	$568,000
16	New Development Road	Street J	Adelaide Rd to Street H	0.7	$1,729,000
TOTAL		10		$25,160,000	

Mt. Brydges Road Projects

17	New Development Road	Street K	Adelaide Rd to Rougham Rd	0.5	$1,280,000
18	New Development Road	Street L	Falconbridge Dr to Street K	0.3	$821,000
19	New Development Road	Street M	Street K to Street K	0.2	$529,000
20	New Development Road	Street N	Falconbridge Dr to Street O	0.4	$981,000

ID	Description	Road	Segment	Segment Length (km)	Costing ($)
21	New Development Road	Street O	Street N to Street N	0.7	$1,840,000
22	New Development Road	Street P	Street O to Street O	0.2	$529,000
23	New Development Road	Street Q	Adelaide Rd to Street O	0.1	$203,000
24	New Development Road	Street R	Street O to property line	0.3	$839,000
25	New Development Road	Street S	Street R to Street T	0.2	$488,000
26	New Development Road	Street T	Street S to Street S	0.3	$748,000
27	New Development Road	Street U	Rougham Rd to Street V	0.4	$911,000
28	New Development Road	Street V	Street U to end of property line	0.3	$852,000
29	New Development Road	Edgewood Lane	Property line to Edgewoood Lane	0.4	$978,000
30	New Development Road	Trillium Place	Trillium Way to Terminus	0.2	$488,000
31	New Development Road	Street W	Property Line to Rougham Rd	0.4	$939,000
32	New Development Road	Street X	Street W to Parkhouse Dr	0.2	$501,000
TOTAL			5	$12,930,000	
GRAND TOTAL (Strathroy & Mount Brydges)			15	$38,090,000	

Table 19: Intersection Costing

Intersection	Name	Improvement Type	ID	Phasing	Cost Rounded ($)	Total
Strathroy	Head St N & Second St	Signal	I1	Medium-term	$287,500	$1,725,000
	Adair Blvd & Second St	Signal	I2	Short-term	$287,500	
	Front St & Head St	Signal	I3	Medium-term	$287,500	
	Front St E and McNab Ave on Metcalfe St E	Signal	I4	Short-term	$287,500	

Intersection	Name	Improvement Type	ID	Phasing	Cost Rounded ($)	Total
	Head St N & Metcalfe St E	Signal	I5	Short-term	$287,500	
	Saxton Road and Carroll St E	Signal	I6	Medium-term	$287,500	
Mt Brydges	Adelaide Rd & Falconbridge Dr	Signal/ Roundabout	I7	Short-term	$287,500	$575,000
	Adelaide Rd & Parkhouse Dr	Signal/ Roundabout	I8	Short-term	$287,500	
SC Roads	Adelaide Rd & McEvoy Rd	Signal/ Roundabout	I9	Short-term	$287,500	$287,500
TOTAL					$2,590,000	

7.3 Funding

It is acknowledged that the recommended capital projects in the TMP will require significant ongoing investment. At the Federal, Provincial, County and Municipal level there are additional funding opportunities beyond the annual capital budget process to support future projects.

The following sections outline the proposed funding options which are available for the various modes. The Municipality should continue to monitor and explore funding programs made available by all levels of government on a regular basis.

7.3.1 Roads Funding

7.3.1.1 Federal Funding Strategies

As part of the overall $53-billion 2014 New Building Canada Plan (NBCP), the New Building Canada Fund (NBCF) was established in 2014 to fund projects from 2014 to 2024. NBCF is a $14-billion Fund to support and encourage infrastructure projects of national, regional, and local significance that promote economic growth, job creation and productivity.

Another funding opportunity would be the Canada Community-Building Fund (CCBF). As of June 29, 2021, the Gas Tax Fund was renamed the Canada Community-Building Fund. It was announced on July 29, 2021, that Ontario has received over $850 million through NBCF for the 2021-22 fiscal year, along with a top-up of more than $816 million. This top-up more than doubles the amount of money that Ontario communities received through the program in 2020-21 enabling them to carry out infrastructure projects that support the well-being of their residents.

7.3.1.2 Provincial Funding Strategies

Infrastructure Ontario's Loan Program provides long-term financing to eligible public-sector clients to help renew infrastructure and deliver value to customers and residents. Infrastructure Ontario (IO) advertises the loan program as benefiting from:

- Affordable rates;
- Access to capital market financing without any fees or commissions;
- Longer loan terms designed to match the life of the asset;
- No need to refinance over the life of the loan; and
- Online application with access to dedicated and experienced staff.

IO loans can be used for any capital investment including roads, bridges and other projects that enhance mobility for all transportation users.

7.3.1.3 Development Charges

Another source of funding is the development charge imposed on new developments to cover the cost of the proposed local infrastructure. Current development charges were established based off the outcomes of the Municipality of Strathroy-Caradoc 2019 Development Charges Background Study. Part of the cost required for roads, except those new roads constructed as part of the Draft Plan of Subdivision process, can be funded via development charge mechanism.

7.3.2 Transit Funding

7.3.2.1 Federal, Provincial and Regional Governments Funding

The Federal government has a program called Rural Transit Solutions Fund which seeks to help Canadians living in rural and remote areas get around their communities more easily and connect with nearby communities. The Rural Transit Solutions Fund is the first federal fund to target the development of transit solutions in rural communities. It is making $250 million in federal funding available over 5 years, beginning in 2021, to support the development of locally driven and transit solutions that will help people in rural communities to get to work, school, appointments, and visit loved ones. Eligible applicants can seek grants of up to $50,000 in support of project planning, up to $3 million to help cover capital costs (e.g., purchase of a vehicle or digital platforms), and up to $5 million to support zero-emission transit solutions.

As mentioned previously in this report, the Ontario government is also investing $2.8 million in local transit for Strathroy-Caradoc, Middlesex County and Lambton Shores through the Community Transportation Grant Program.

7.3.3 Active Transportation Funding

7.3.3.1 Federal, Provincial and Regional Governments Funding

Across all levels of government, there are a variety of funding sources and opportunities available to finance the implementation of new active transportation facilities and initiatives. Paramount among these opportunities is the Federal Government's Active Transportation Fund, which commits up to $400 million over the next five years to fund active transportation

initiatives. This includes new and expanded networks of pathways, bike lanes, trails, and pedestrian bridges, as well as support active transportation planning and stakeholder engagement activities. Another substantial funding opportunity comes from the Ontario Trillium Fund (OTF). Administered by the Ontario Trillium Foundation, a Government of Ontario agency, the fund sponsors projects across the province which contribute to the enhanced well-being of Ontarians. Over the past six years alone, OTF has invested over $613 million into local initiatives, including active transportation projects. Other notable funding opportunities made available at the provincial and federal levels include:

- Ontario Municipal Commuter Cycling Fund;
- Federal Active Transportation Fund;
- Canada Community-Building Fund (CCBF) previously known as Federal Gas Tax Fund; and
- New Building Canada Fund – Provincial-Territorial Infrastructure Component.

7.3.3.2 Development Charges and Construction

One common approach in Ontario to raise funds for active transportation construction involves leveraging support for active transportation infrastructure or programs from new developments. This can be achieved by modifying the Municipality's existing development charges (DC) scheme to include active transportation as a specific line item, as has been done in many other municipalities.

Additionally, the Municipality can also mandate the provision of on-road active transportation facilities as part of the development construction process, by setting which as a condition of draft plan of subdivision or site plan approval. Given the number of new subdivisions being built across Strathroy-Caradoc; particularly within the urban centres of Strathroy and Mt. Brydges, there is an opportunity to offset costs associated with much of the proposed active transportation network through the construction of developer-led and funded road works.

7.4 Monitoring the Integrated Multi-Modal Network

7.4.1 Monitoring Progress

The Municipality will want to track progress on implementing transportation studies, initiatives and physical projects and their impact on creating a more balanced transportation modal split during peak hours. Monitoring the performance of the TMP will help confirm the transportation projects included in the TMP and will also help identify where modifications or updates to the TMP are needed. A monitoring plan is needed to measure different aspects of multi-modal facilities, services, and their respective performance shown in

Table 20.

Table 20: Multi-Modal Data Collection Framework with Key Indicators

Indicator	Measure	Data Source	Frequency
	Total kilometres of on/off road cycling routes (such as bike lanes, cycle tracks, off-road trails, and paved shoulders)	County and Municipality	At least every three years
	Total kilometres of new sidewalks	County and Municipality	At least every three years
	Number of crosswalks or intersection improvements	County and Municipality	At least every three years
Inter-Community Transit	Number of kilometres of existing and new transit routes (Transit coverage)	County	At least every two years
	Ridership	County	Yearly
Road Network	Volume to capacity ratios on north-south and east-west screen lines during the p.m. peak period	County and Municipality automated traffic counts are collected bi-annually	At least every three years
	Total lane kilometres of new roads	County and Municipality	At least every three years
	Total lane kilometres of repaved or newly-treated roads	County and Municipality	At least every three years
Safety	Number of collisions (motorists)	Police collision reports	Yearly
Vehicle Registration	Number of registered vehicles per 1,000 inhabitants	Number Plate registration	Yearly

Automated traffic counts should be collected on bi-annually intervals. To obtain more data for walking or cycling, the Municipality would have to initiate its own counting program using Municipal resources or enlist the support of active transportation advocacy groups, other stakeholders, or the general public.

7.5 Summary of Recommendations

The TMP contains important recommendations throughout several chapters of the document that should be implemented in a priority manner as outlined in the phasing plans. The recommendations include physical infrastructure projects, policies, and additional studies to help strengthen the Municipality's multi-modal transportation network and to help make the municipality "future ready".

The recommendations for seven key areas of study have been summarized to provide all the strategic actions which represent the next steps to implement the TMP.

7.5.1 Active Transportation

Network Recommendations

- Combine recommendations of the existing Middlesex County Cycling Strategy and Recreational Trails Master Plan conceptual trails network with newly identified linkages to create a complete network which integrates the on-road and off-road systems.
- Consider and review warrants for potential pedestrian crossings.
- Consider rail crossing surface improvements and other potential rail safety improvements at key routes along the active transportation network.

Programming Recommendations

- Expand the Ontario Active School Travel Program within a greater number of local schools.
- Align existing facility maintenance standards with the guidelines of the Minimum Maintenance Standards for Municipal Highway (O. Reg 239/02), as amended.

7.5.2 Transit

- Consider on-demand transit service as an introduction of municipal transit.
- Consider a range of management and contracting options, including partnering with neighbouring municipalities, public, and private service providers.

7.5.3 Road Network

- Select Alternative four as the preferred alternative for the Municipality's future road network, which includes new roads and improvements to existing intersections to accommodate future residential and industrial growth, re-imagines Caradoc Street for people.
- Roads will be upgraded in accordance with the Municipality's Servicing standards and no new roads are recommended purely for capacity concerns.

7.5.4 Complete Streets Policy

- Adopt the Complete Street Policy in order for the municipality's street network to be designed, constructed, operated, and maintained for all users and all modes of travel.