MIDDLESEX COUNTY | CYCLING STRATEGY

JUNE 2018

middlesex county | wsp

North Middlesex SWM SOUTHWEST MIDDLESEX STRATHROY-CARADOC MUNICIPALITY OF Thames Centre

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Chapter 1.0 Introduction

Middlesex County is located within southwestern Ontario in close proximity to a number of different tourism destinations making it not only an area where people travel through but also a potential destination for active trips. Growing and enhancing active transportation – with a focus on cycling – is an opportunity for Middlesex County, the Local Municipalities and other partners. Developing a long-term County-wide Cycling Strategy which can be used to guide planning, design, implementation and operation of cycling infrastructure and programming is the County's first step in shifting to a cycling friendly destination.

Contents of chapter 1.0 include...

Purpose of chapter 1.0...

Chapter 1.0 is intended to be used as a means of:

COMMUNICATING	To decision makers and stakeholders about the values and benefits of investing cycling
EDUCATING	Readers on the various types of cyclists that are being accommodated through the development and implementation of the Strategy
DOCUMENTING	The process which was used to develop the Cycling Strategy for Middlesex County.

1.1 Purpose of the Cycling Strategy

There are a number of reasons why Middlesex County has developed a cycling specific strategy. The following sections provide a more detailed explanation of those reasons and how they shaped the content of the Strategy. In early 2017, WSP Canada Group Limited (WSP) was retained by Middlesex County to work with the County, local municipalities, stakeholders and interested citizens to develop a Cycling Strategy to address long-term planning, design and implementation of cycling infrastructure, programs, policies and initiatives.

The Strategy is not intended to be prescriptive; a tool only for County staff; or a replacement for other existing planning policy at the County and / or local municipal level. The strategy has been developed as a flexible and adaptable tool which will help to guide and support future decision making, communication, outreach and coordination by staff, stakeholder, residents and decision makers.

The Strategy has been developed based on best practices, previous work completed by the County Local Municipalities, conservation authorities and other partners, and input from the public and key stakeholders. The Strategy has been developed to promote safe, accessible, comfortable, connected and continuous cycling and active transportation facilities (both on and off-road) throughout Middlesex County and to surrounding municipalities. **Figure 1** illustrates the project objectives which were identified for the Cycling Strategy.

PROJECT OBJECTIVES

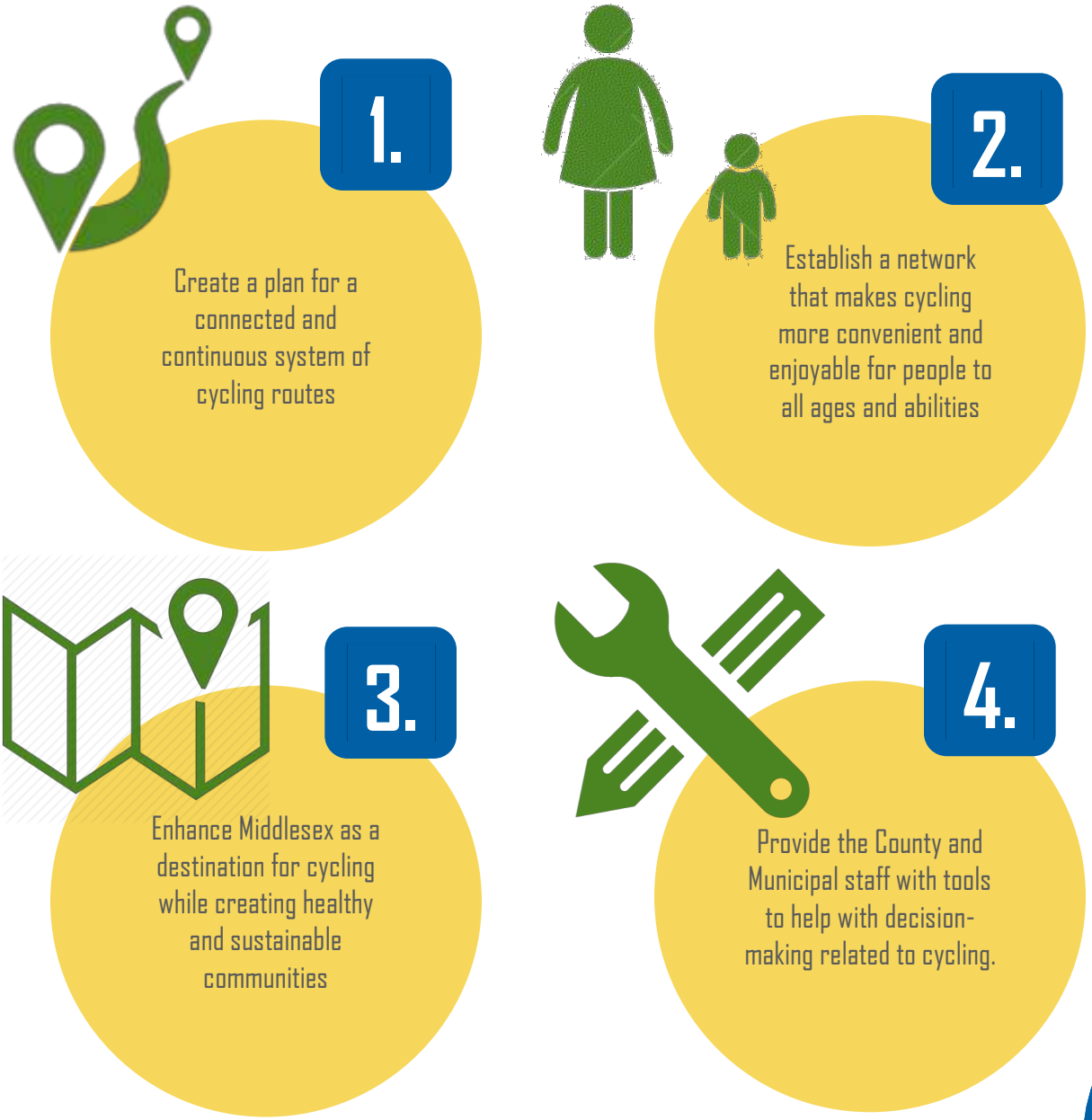


Figure 1 – Middlesex Cycling Strategy Objectives

1.2 About Cyclists

Cycling facilities, programs and policies are not a one-size-fits-all approach. Understanding different types of cyclists, the types of trips they make, their interests and concerns helped to shape the findings and recommendations of the Cycling Strategy.

Cyclists can generally be categorized into four groups based on their level of experience, confidence and cycling skills. **Figure 2** illustrates these four groups and their representation among the total population.

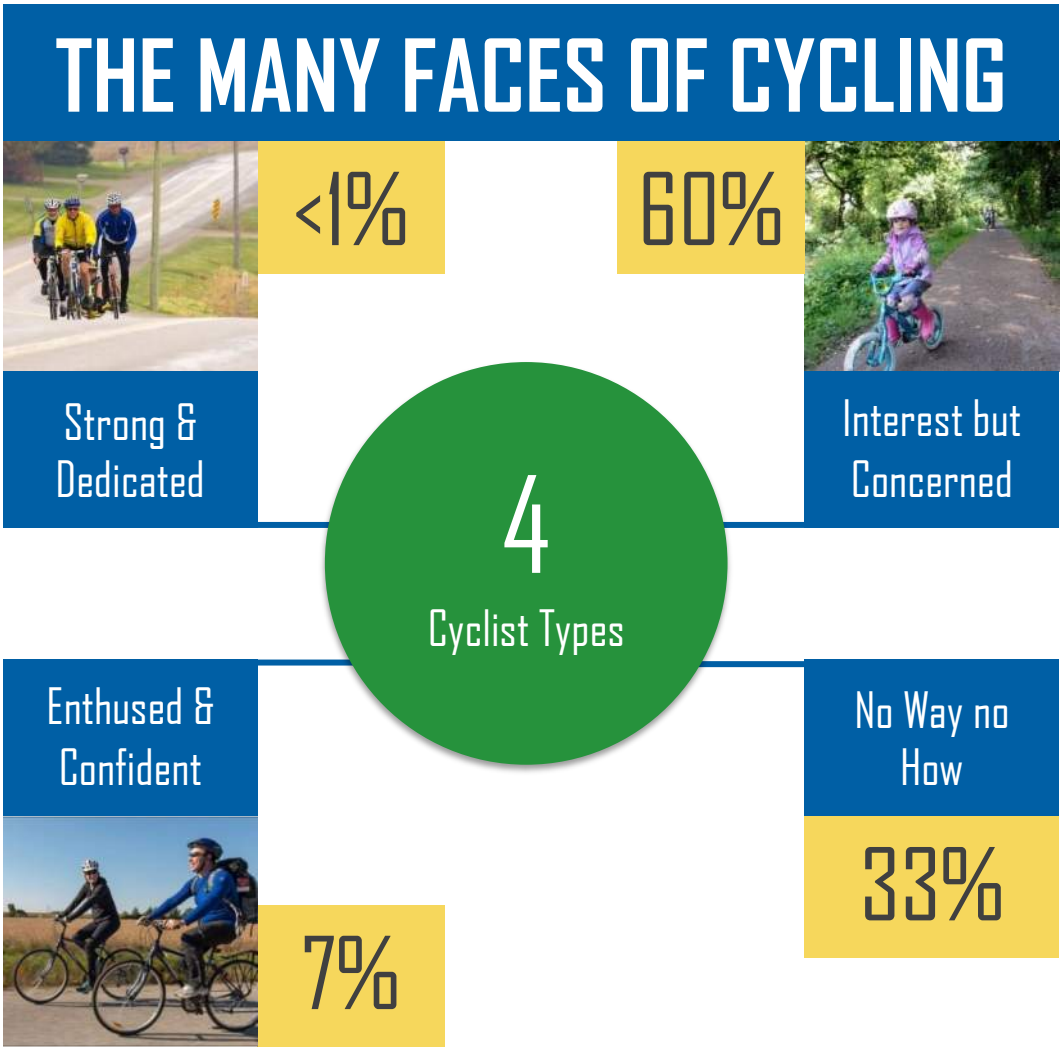


Figure 2 – Overview of Cyclist Types

	Description	Location
1. Strong & Dedicated	» Smallest but most visible group » Advanced cycling skills **Preferred Facilities:** » No facilities typically necessary but high use of paved shoulders	» Comfortable riding along motorized traffic » Often cycle in any weather or roadway condition
2. Enthused & Confident	» Comfortable sharing the roadway with other vehicles **Preferred Facilities:** » Cycle tracks, bike lanes and paved shoulders » Off-road pathways in boulevards or through parks	» Prefer to use route with dedicated space for cyclist » Route and facilities should be convenient for their destination
3. Interested but Concerned	» They are not comfortable on most roadways but are curious about cycling in other locations where they can find routes with a high level of comfort. **Preferred Facilities:** » Multi-use pathways in boulevards or through parks and natural areas	» Tend to avoid routes with high and moderate volumes of vehicle traffic » Easily discouraged with high-speed traffic or extreme topography
4. No way no How	They may never have cycled before and / or are simply not interested in cycling as form of recreation or transportation.	N/A

Table 1 – Cyclist Type Descriptions

The Middlesex Cycling Strategy caters to groups 1 to 3, with a focus on the "Interested but Concerned" group, because it represents the largest sector of the population.

There is significant potential to engage this group in cycling as a means of recreation and potentially transportation if their concerns regarding personal safety, comfort and cycling confidence are addressed with appropriate cycling infrastructure, facility maintenance, cyclist and driver education.

A cyclist's behaviours / preferences can be influenced by a number of different factors. The factors can vary significantly and can also be influenced and adapted through the implementation of a cycling network and the use of outreach and communication tools and tactics. There are a total of six (6) factors which were identified and considered when developing the Middlesex Cycling Strategy. They are illustrated in **Figure 2**.

Figure 3 – Summary of Cyclist Type Influences

Defining and understanding these factors is important when not only planning routes and designing a network but also when establishing an implementation plan and recommending priorities and policies.

Of the six (6) cycling influences noted above; the category "trip purpose" can be the most specifically defined. When considering trip purpose there are three types which can generally be defined by distance, duration, purpose / intent. A more detailed description of these "trip purposes" is provided in **Table 2**.

Trip Type	Description	Cyclist Group
Utilitarian	Purposeful trips for day-to-day activities such as getting to and from work, school, errands, and general transportation. Utilitarian trips are often made using the street network and direct routes.	Mostly made by Group 1 cyclists, and sometimes Group 2
Touring	Longer trips where cycling is the main mode of transportation for vacations and exploring new areas of the community. Trips vary from full day excursions to multi-day trips. Cyclists plan their trips in advance and are willing to spend money for accommodation and food at their destination point.	Most often made by Groups 1 and 2 cyclists, sometimes Group 3
Recreational	Trips generally for leisure purposes. Trips often be made on weekends as opposed to weekdays, and may be related to destinations of cultural or natural significance. Routes are often less direct than those for utilitarian or touring purposes, and often involve the use of secondary / local neighbourhood roads and off-road trails as part of their preferred network of routes.	Most often made by Groups 2 and 3, sometimes Group 1

Table 2 – Overview of Cyclist Trip Types

1.3 Why Invest in Cycling?

Research indicates that implementation and promotion of cycling can benefit both the individual and the community. Establishing the business case for investing in cycling supports the commitment to improve existing infrastructure and add to it, as well as support programs to promote cycling. **Figure 4** illustrates some of the key documented benefits which can be realized from investing in cycling infrastructure and programs to promote and encourage cycling.

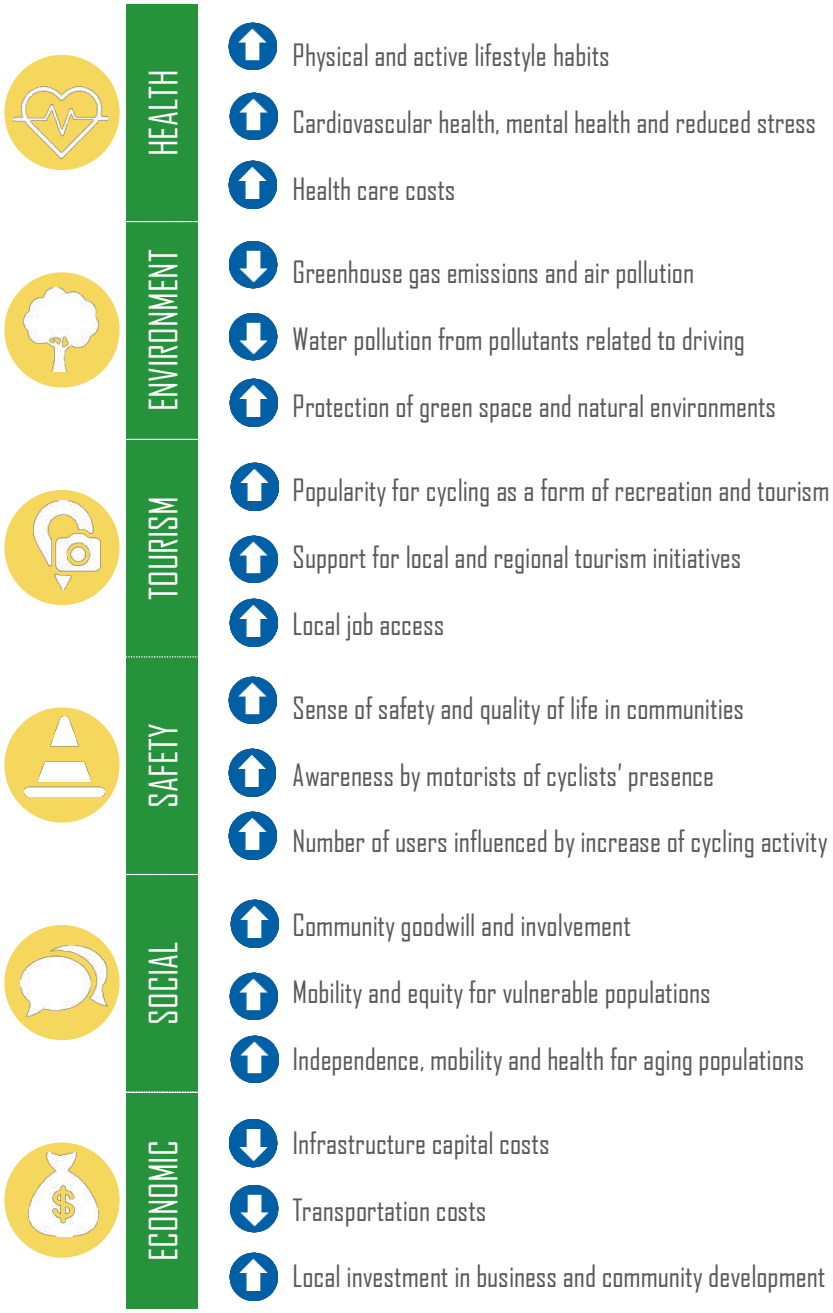


Figure 4 – Overview of Cycling Benefits

1.4 How was the Cycling Strategy Developed?

The Middlesex County Cycling Strategy was developed between February 2017 and June 2018 following a three-phase process. The process and some of the key milestones are noted in **Figure 5**.

1. INITIATION

Timeline: March – June 2017

Initiating the project and making the public aware of the study. Focused on understanding the current state of cycling and identifying potential cycling routes for field investigation.

2. NETWORK

Timeline: July – November 2017

Developing the cycling network including the identification of preferred routes and how they will be designed. The proposed network was reviewed by the public and stakeholders.

3. STRATEGY

Timeline: December 2017 – June 2018

Documented the outcomes of the Cycling Strategy's development and identified an implementation strategy. The report was reviewed by the public, stakeholders and Council.

Figure 5 – Middlesex Cycling Strategy Development Process

Cycling on Rural Roads in Middlesex County; Source: Middlesex.ca

A key component to the development of the Cycling Strategy was consultation and engagement. Each phase of the process offered opportunities for public and stakeholder engagement, communication and information gathering.

There were a total of five (5) types of consultation and engagement activities that were undertaken as part of the strategy development process. **Figure 6** illustrates the engagement activities as they relate to the study process and provides highlights from those activities.

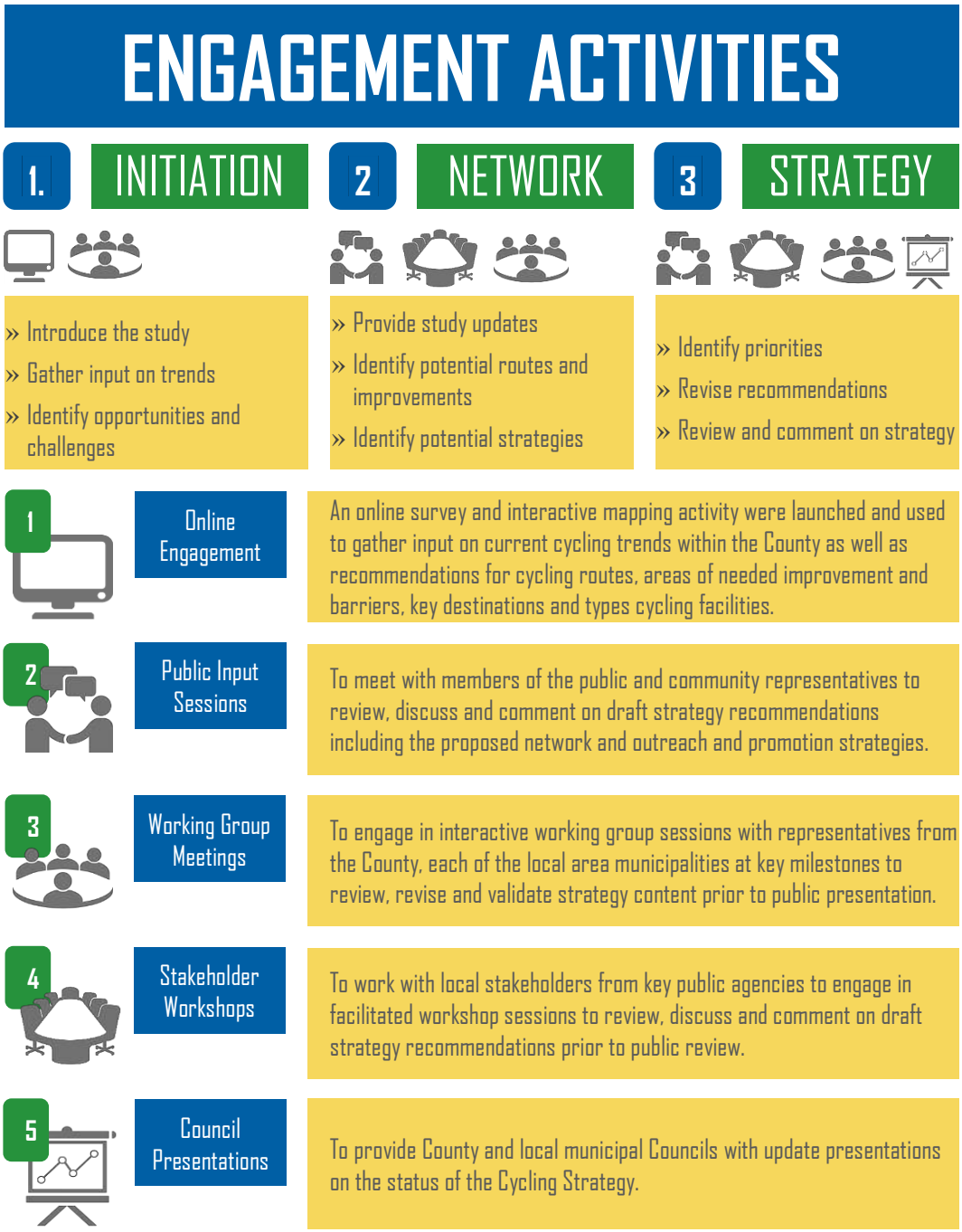


Figure 6 – Overview of Engagement Activities for the Middlesex Cycling Strategy

A more detailed overview of the consultation process and the input received during these events was summarized in **Technical Appendix A**. **Table 3** provides some high level details from each of the consultation / engagement activities.

	Date	#	Outcomes
ONLINE	June to October 2017	238	» Current cycling trends & conditions in the County » Opportunities & Challenges » Candidate routes & facility types
PUBLIC	June 29 & October 17, 2017	30	» Opportunities & Challenges » Candidate routes & alternatives » Facility type recommendations
STAKEHOLDER	June 29 & October 17, 2017	8	» Vision & project objectives » Candidate routes & alternatives » Facility type & implementation recommendations
WORKING GROUP	February 2, 2017 May 30, 2017 August 31, 2017	8-10 per session	» Comments and revisions to draft study deliverables prior to presentation to the public » Opportunities & challenges » Existing conditions & missing links » Priorities & facility types » Initiatives & strategies
COUNCIL	TBD	N/A	» Support for the Middlesex County Cycling Strategy and clarifications to specific content.

Table 3 – Summary of Consultation and Engagement Activities and Attendance

1.5 The Vision for Cycling in Middlesex County

Using the input received and the county context - both past and present – an opportunity statement, vision and set of goals for the future of cycling was created for Middlesex County. The principles of the Cycling Strategy establish the foundation from which the initiatives, strategies, policies and recommendations included in this report were generated.

OPPORTUNITY

The opportunity statement sets the stage for the strategy and its outcomes, recommendations and what is aimed to be achieved. The following opportunity statement was identified for Middlesex County:

> *The municipalities / townships of Thames Centre, Lucan Biddulph and Middlesex Centre have each developed policies / plans which speak to improvements to cycling, trails and active transportation. Building on these planning policies the County will work with its municipal partners and stakeholders to identify a cycling network, supportive policies and programs that reflect the unique geographies and characteristics of each municipality while also achieving County-wide connectivity and continuity in planning and design.*

VISION

The following vision represents the aspirational outcomes which reflect the values, priorities and principles of residents and visitors to Middlesex County.

> *"Middlesex County to be made up of communities and destinations that are connected by a continuous system of cycling routes and facilities, which provide opportunities for people to bicycle for transportation, fitness, fun, or as part of a longer bicycle tour. Cycling is encouraged County-wide and is supported by the local area municipalities making it attractive to both residents and visitors."*

GOALS

The vision is supported by the following seven goals, which are meant to provide clarification on how the vision will be achieved and help shape the policies, actions and recommendations identified in the Cycling Strategy.

CONNECTIVITY

Chapter 3 Section 3.1

WHAT
Make recommendations in support of a continuous and connected system of cycling routes.

WHY
To provide access to major communities, destinations, surrounding areas, areas of natural significance and cultural interest.

ACCESSIBILITY

Chapter 3 Section 3.2

WHAT
Provide opportunities and design for different types of cyclists by integrating on and off-road routes in various locations.

WHY
To encourage cyclists ranging in age and ability to choose cycling as a form of transportation.

MAINTENANCE

Chapter 4 Section 4.6

WHAT
Provide cyclists with well-maintained infrastructure that is coordinated and clear.

WHY
To help ensure safety and encourage year-round cycling opportunities.

AWARENESS

Chapter 4 Section 4.3

WHAT
Encourage the use of cycling as a form of transportation as well as for recreational purposes.

WHY
To help generate a greater interest in cycling while also supporting public health initiatives and healthy community development.

TOOLS

Chapter 4
Section 4.6

WHAT
Develop a set of tools which can be used to integrate cycling into the day to day decision making.

WHY
To support the implementation of cycling into the planning, design and construction of community services and infrastructure.

PLANS & POLICIES

Chapter 3
Section 3.3

WHAT
Establish policies and plans that strongly support and provide priority for cycling.

WHY
To help guide decision making and inform the identification of cycling infrastructure, programs and initiatives throughout the County.

PARTNERSHIPS

Chapter 4
Section 4.4

WHAT
Create a foundation of committed and involved partners including community interest groups and decision-making bodies/agencies.

WHY
To help facilitate the implementation of different components of the plan in a collaborative and coordinated manner.

On-road Cycling; Source: Ontario by Bike

1.6 Organization of the Strategy Report

The Middlesex County Cycling Strategy report is organized into the following five chapters.

1. INTRODUCTION

Describes the purpose of the Strategy, the different types of cyclists, the benefits of cycling and the vision for cycling in Middlesex County.

2. CURRENT STATE

Provides a summary of existing cycling conditions throughout the County, and key themes and ideas expressed by stakeholders and the public through the consultation process.

3. CYCLING NETWORK

Outlines the cycling network development process, the proposed cycling network at the county-wide and local municipal level and design considerations to cycling facilities.

4. IMPLEMENTATION

Outlines suggested cycling network implementation priorities in the short and long term, including network development costs, and supporting programs and promotional initiatives.

5. CONCLUSION

Includes a summary of recommendations found throughout the report and suggested next steps.

The Middlesex County Cycling Strategy includes recommendations which are intended to support planning, design, implementation, operation, maintenance and use of cycling infrastructure, as well as programs and promotional initiatives to support cycling. The recommendations fall under the themes of processes, policies, resources, tools and programs. Recommendations are highlighted throughout the report and also summarized in Chapter 5. Each of the themes are described below and the symbols are used throughout the report to highlight each of the recommendations.

PROCESSES

Proposed processes which are intended to be used to facilitate planning and implementation.

POLICIES

Suggested policy considerations.

RESOURCES

Cycling design guidelines and standards for consideration when implementing the proposed cycling network and supporting amenities.

TOOLS

Tools to assist with the management and implementation of the Cycling Strategy to provide consistency in approach.

PROGRAMS

Proposed initiatives and programs which will help to encourage and educate people on how to safely and comfortably cycle throughout Middlesex County.

Cycling Supportive Economy and Businesses; Source: Ontario by Bike

Chapter 2.0 Current State

Development of the Cycling Strategy was informed by current demographic and geographic conditions across the County, the current state of cycling infrastructure, the opinions and ideas of residents and stakeholders. The Strategy is a "made in Middlesex" guiding document, considerate of the wants and needs of the people who live, work and play within the County and building upon the current policies / plans and infrastructure which have been adopted and implemented by the County and local municipal partners.

Contents of chapter 2.0 include...

Purpose of chapter 2.0...

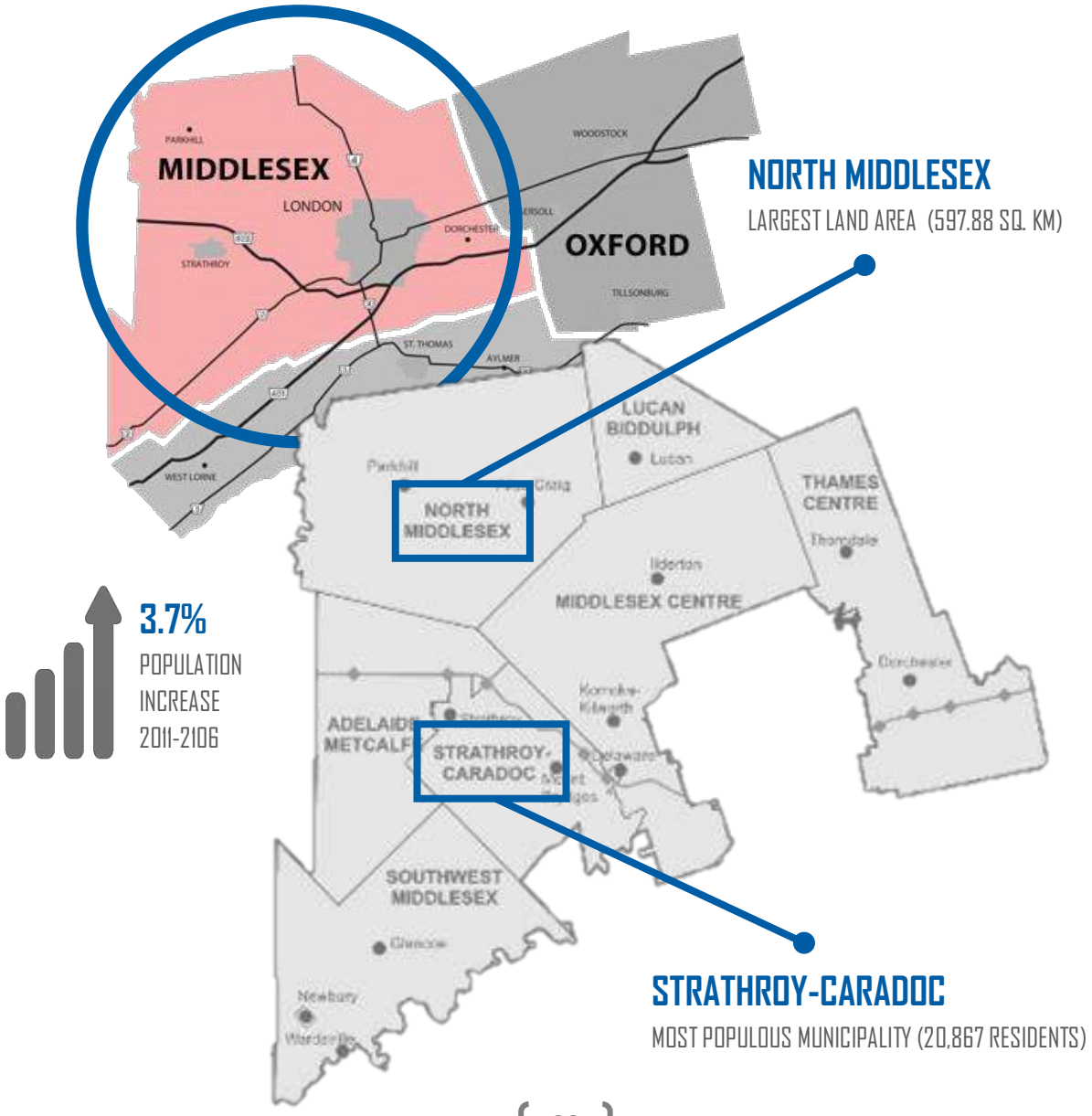
Chapter 2.0 is intended to be used as a means of:

COMMUNICATING	The current environment – social, geographic and demographic – that the Strategy is responding to.
EDUCATING	Readers on the "successes" of the County and its partners related to cycling.
DOCUMENTING	Current policies and plans as well as the existing infrastructure which the Strategy is building upon.

2.1 Environment

Middlesex County is located in Southwestern Ontario and composed of eight municipalities – Strathroy-Cardoc, Middlesex Centre, Thames Centre, North Middlesex, Southwest Middlesex, Lucan Biddulph, Adelaide Metcalfe and the Village of Newbury. Each municipality has their own distinct set of communities, values and political wants and needs. Generating a cohesive and comprehensive direction regarding cycling needs to consider those interests and must also be cognizant of the broad geography of the County.

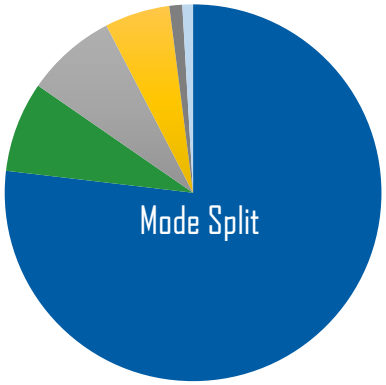
As noted in chapter one, cycling habits and preferences are shaped by a number of socio demographic factors. The following is a high level overview of the socio-demographic profile of the Middlesex County. The following images provide some high-level facts to provide an understanding of the area, the residents, and their transportation habits.



71, 551 2016 POPULATION

15% 0-14 YEARS
66.7% 15-64 YEARS
16.8% 65 + YEARS
2.4% 85 + YEARS

40.7 AVERAGE AGE



77% Drive
8% Passenger
8% Public Transit
6% Walk
1% Bike
1% Other

44% 15 – 29 MINUTE COMMUTE

27% COMMUTE BETWEEN 7 -8AM

On-road Cycling; Source; Simcoe County

2.2 Policy

The Middlesex County Cycling Strategy is supported by current policies and plans. One of the first steps in preparing the Cycling Strategy was developing an understanding the policies and plans that are in place, the ways in which they influence cycling planning, design and implementation and the areas where they need to be enhanced and / or improved to address the objectives of the strategy. A detailed review of the policies and plans which have influenced and guided the development of the cycling strategy can be found in **Technical Appendix B**. At a high level there is strong support for cycling as a strategic priority; however, few of these documents provide specific policy support or direction to guide future planning and design of cycling infrastructure in the County of Middlesex. Of the policies and plans reviewed, **Table 4** outlines some of the supportive policy statements that help to pursue and encourage cycling.

		PROVINCIAL	COUNTY	MUNICIPAL
1.	The government is committed to increasing the number and safety of people who cycle in the province.	✓		
2.	Ontario must transition as many existing drivers as possible to transit, cycling and walking.	✓		
3.	Healthy, active communities should be promoted by facilitating active transportation and community connectivity.	✓		
4.	Develop trails on both private and public lands to promote health through outdoor activities and promote inclusivity and accessibility.			✓
5.	Encourage active transportation between areas of housing and employment through the provision of facilities such as bicycle parking/storage and changeroom/shower facilities by local employers.			✓
6.	Establish policies that support active transportation choices for pedestrians and cyclists, including the development of a municipal wide trail system and regional cycling route network.			✓

Table 4 – Summary of Cycling Supportive Policies

Strong policies result in coordinated change. Though cycling related policies have been strengthened there is still room for improvement. By adopting the Middlesex Cycling Strategy and amending existing policy, the County and its partners will be better-positioned to pursue future external funding for implementation of infrastructure, supportive programs and promotion.

2.3 Interests

Community interest and preferences are a key piece of input to the development of the Strategy. Community interests and preferences were identified and assessed using two approaches:

1. CONSULTATION

Consultation activities were used to gather input on community preferences of facilities, key destinations, areas for improvement and new cycling links that should be added, priorities for implementation and potential policy and program suggestions.

2 ONLINE

The use of publicly available online route tracking information which helped to illuminate areas of interests, high volume cycling routes (existing), trip length and primary destinations and places or origin.

The input gathered from each of these engagement activities was documented and summarized in detail in **Technical Appendix A.** The following is a high-level overview of key themes and preferences that emerged related to cycling preferences and interests within Middlesex County from these investigations.

1. REASONS FOR CYCLING

84% FITNESS

32% TO SCHOOL

28% TO WORK

29% TO AN EVENT

While residents and visitors are becoming more interested in using cycling as a means of getting to and from work and school; the focus still remains on the use of cycling for fitness and for recreational purposes. Many respondents cited the distance between work and home as a key deterrent as well as the lack of “safe” cycling routes for school aged children.

2. REASONS FOR STRATEGY

Residents were asked to review and rank a number of reasons for developing a cycling strategy for Middlesex County. Of the options provided the following were noted as "most important" by respondents (ordered by number).

1. *Provide places to cycle throughout various communities*
2. *Improve quality of life and health of citizens*
3. *Improve cycling as a transportation option*
4. *Connect existing parkland and recreational facilities*
5. *Connect various municipalities in the County*
6. *Connect surrounding regions and municipalities*
7. *Connect youth and seniors to key locations*
8. *Provide access to historical destinations and support tourism*

3. PREFERRED ROUTES

There are existing and informally used routes throughout the County. Respondents used the interactive mapping tool developed for the study to provide suggestions for new routes and route improvements. The online interactive mapping tool "Strava" was also used to gather input on existing high demand routes throughout the County where improvements may be needed. The following are some of the routes identified for improvement and addition as part of the County-wide cycling network.

FAVOURITE ROUTES

- Sharon Dr.
- Mt. Carmel Drive
- Cassidy Rd.
- Maguire Rd.
- McGillvary Rd.
- Ilderton Rd.
- Brigham Rd.
- Pack Rd.
- Elviage Dr.
- Coursey Ln.

IMPROVEMENTS NEEDED*

- Elginfield Rd.
- Nairn Rd.
- Denfield Rd.
- Vanneck Rd.
- Westdel Bourne

*In these locations the suggested improvement by respondents was the addition of a paved shoulder

4. SPECIFIC AREAS

As part of the interactive mapping tool provided, respondents also submitted comments regarding other potential improvements which could be made throughout the County to enhance cycling. A total of 76 comments were submitted. The following is an illustration of the final submission of comments – their location and type. Also included are some highlights from the comments submitted.

"Providing a connection to St. Thomas would be incredible. There are people who work and live in London and St. Thomas who could use it to commute. It also offers a link for recreational cyclists to access Lake Erie and the Waterfront Trail. I think connecting this gap should be a priority in the plan. I also think it's important to work with the City of London to have this link connect to the Thames Valley Parkway."

"More signage indicating the 3-Foot Rule for cycling safety as well as designated colour coded cycling lanes would promote safer roads."

"Fanshawe Lake provides an opportunity for Mountain Biking. This is an important cycling destination (both the main entrance and this north parking lot) and should have quality on- road access to both points."

"Oxbow between the Komoka water tower and Gainsborough should have the asphalt extended instead of the terribly uneven/loose/dangerous tar & chip. This would be a nice safe alternative to the ever dangerous Vanneck Rd."

"It would be nice to see improvements that allow better cycling between Komoka / Kilworth area and London. That area is rapidly growing, and I bicycle both ways and am certain more people might do the same if the roads improved, especially the bridge just to the east of Kilworth on Glendon Dr. which bottlenecks quite easily."

"This Provincial Park (Komoka) is my primary destination in Middlesex County. With the new cost to park here, it provides an excellent opportunity to encourage cycling to the park. This would require the park being a connected destination within the larger network as well as having cycling facilities (places to lock a bike securely) once here."

"Gainsborough is one of the only ways west out of London into Middlesex County - especially for people living in the northwest. The shoulder of the road is crumbling, which leaves cyclists to be on the road side of the white line. There are many hills on this stretch of the road, which makes sharing space on the road with vehicles very dangerous. Even when seen by cars, they risk passing cyclists on hills. This road severely needs a paved shoulder at a minimum."

"(Parkhill Road) Less busy road to Lake Huron. This would offer an opportunity to head west and join up with the off-road path that already goes along the Pinery, up to Grand Bend."

"A common destination for people traveling through Middlesex County is the beach (i.e. Grand Bend). Having a safe and convenient cycling connection between Lake Huron and London would be incredible. It would also allow towns along the way, like Parkhill, to cater to cycle tourism."

5. CHALLENGES

As part of the first round of engagement, stakeholders and members of the public were asked to provide their thoughts on the cycling challenges that need to be addressed through the development of the strategy. The following are the key challenges that were identified as well as some of the solutions that were proposed for consideration.

CHALLENGES

- Topography
- Safety between cyclists and motor vehicles
- Lack of paved shoulders on some country roads
- Lack of defined connections between the London urban area and routes in the county
- Unsafe rail and bridge crossings
- Motor vehicles using bike lanes for parking

SOLUTIONS

- Better signage to indicate to motor vehicles where the designated cycling lanes are
- Education on cycling etiquette for both cyclists and drivers
- Paved country shoulders to allow for longer trips, touring, and better connection between the communities
- Prioritize filling in the gaps in the network
- "Adopt a trail" system for maintenance and clean-up after the winter months
- Design safe routes for children to cycle to and from school
- Provide end of trip facilities to encourage more commuter cycling

Ride Don't Hide Cycling Event Source: CMHA

6. KEY THEMES

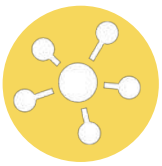
As a result of the consultation and engagement that was undertaken and the review of past engagement efforts and publicly available online information five (5) key themes emerged which were considered by the team when developing the cycling ne twork and proposed strategies for Middlesex County. The themes and some key considerations are highlighted below.

EDUCATION & ETIQUETTE

- A more comprehensive educational strategy needs to be implemented with a range of tools and materials geared towards different audiences and for different purposes.
- More education is needed regarding properly passing cyclists and bike safety including helmet use and use of lights.

FACILITY TYPES

- The facilities provided are shaped by the comfort level felt by cyclists. Paved shoulders, at the very least, should be implemented.
- Other preferred facilities include cycle tracks, bike lanes, buffered paved shoulders, and in-boulevard multi-use trails.



CONNECTED

- Routes need to be continuous and connect riders to destinations.
- Routes must provide the opportunity for both long and short trips.
- Routes need to connect all the communities in the county to encourage tour type riding.

SAFETY & COMFORT

- Routes need to minimize the potential for conflict with other modes.
- Routes need to be attractive to encourage all cyclist types.
- With the increase of the aging population, the routes need to be designed to accommodate the need of this more vulnerable demographic.

EXPERIENCE

- 50% of respondents highlighted the enjoyment of cycling throughout the county however, 76% strongly agreed that improvements to the cycling network were needed.

2.4 Existing and Previously Proposed Cycling Facilities

One of the key goals of the strategy is to build on the work that has already been completed and the cycling facilities / initiatives that have already been implemented. Understanding the existing and previously proposed cycling facilities found within Middlesex County was the starting points from which the network was developed.

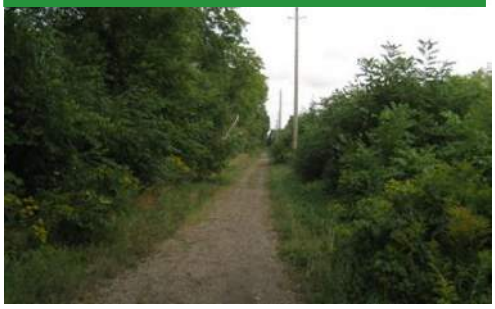
To establish the existing conditions database, background information was collected from the County and Local Municipalities regarding existing cycling facilities and those previously proposed in approved master plans. As noted in **section 2.2** and elaborated upon in **Appendix B** some of the local municipalities had completed their own trail and/or active transportation master plans prior to the commencement of the Middlesex County Cycling Strategy. In addition to these policies and plans, additional background information was reviewed including:

- Digital GIS data made available from the County and Local Municipalities;
- Hard copy trail mapping (e.g. some of the conservation areas in rural parts of the county);
- Secondary plans; and
- Applicable Environmental Assessments recently completed or currently underway.

Existing and previously proposed cycling and trail facilities documented at the outset of the Cycling Strategy are illustrated in **Maps E-1** through **E-9** which can be found in **Technical Appendix C.**

ON-ROAD (153.9 km)

OFF-ROAD (134 km)



287.9 km of existing cycling facilities

Table 5 provides a summary of the existing as well as previously proposed cycling facilities found within Middlesex County. All of the information gathered was amalgamated into a GIS database of existing and previously proposed conditions which was updated as the study progressed to reflect the iterative approach of the network development process (see Chapter 3 for the network development process and outcomes).

CATEGORY	LENGTH (KM)
EXISTING	
Trails [1]	134.0
Paved Shoulders on Local Municipal Roads [2]	1.9
Paved Shoulders on County Roads [2]	23.1
Cycling Routes on Local Municipal Roads [3]	55.6
Cycling Routes on County Roads [3]	73.3
SUBTOTAL EXISTING	**287.9**
PREVIOUSLY PROPOSED	
Trails [4]	76.4
On-Road [5]	0
SUBTOTAL PREVIOUSLY PROPOSED	**76.4**
GRAND TOTAL	**364.3km**

Table 5 – Summary of Existing Cycling Facilities in Middlesex County

Notes:

(1) Includes trails outside of road rights-of-way on local municipal, conservation authority, and Province of Ontario lands (i.e. Provincial Parks).

(2) Includes those that may require upgrading (i.e. additional width to meet OTM Book 18 recommendation for buffered paved shoulder based on traffic volume and speed).

(3) Includes routes that may require upgrading (i.e. addition of a paved shoulder or buffered paved shoulder to meet OTM Book 18 recommendation based on traffic volume and speed).

(4) Based on data provided to WSP at the study outset, and includes proposed trails outside of road rights-of-way on local municipal, conservation authority, and provincial park lands, and trails within road rights-of-way (e.g. in boulevard spaces along County and Local Municipal roads).

(5) Includes signed cycling routes, paved shoulder routes and bike lanes.

Chapter 3.0 Cycling Network

The intent of the Cycling Strategy is to provide the County and its partners with a tool which can be used to guide future decision making related to cycling. A "successful" strategy should include three key components:

1. A comprehensive network of proposed routes and facilities that are connected and continuous and supportive guidelines to help with the design and implementation of those facilities.
2. An overview of planning and policy considerations for various land-uses and contexts to help inform future updates to policies.
3. Suggested programming and outreach initiatives which address the education of key audiences, identify encouragement approaches, address safe use of facilities and evaluation of successes and outcomes.

Contents of chapter 3.0 include...

Purpose of chapter 3.0...

Chapter 3.0 is intended to be used as a means of:

COMMUNICATING	Communicating the steps and outcomes of the network development process and highlighting the planning considerations throughout.
EDUCATING	Key audiences of the different tools and approaches which can be used to educate, encourage, enforce and evaluate the future of cycling.
DOCUMENTING	The process which was used to develop the connected and continuous network of cycling facilities throughout the County.

3.1 Network Development

3.1.1 Network Development Process

The network development process included seven steps and was shaped by the input collected from members of the public, stakeholders, County and local municipal staff over the course of the study. An overview of the cycling network development process is presented below in **Figure 7**. The details and outcomes of each step are documented in the following sections, specifically related to the approach; consultation input; technical input; and output / results.

Figure 7 – Network Development Process Overview

1. EXISTING

APPROACH

Background information was collected from the County and local municipalities regarding existing cycling facilities and previously proposed cycling facilities approved master plans.

Information gathered was used to prepare a GIS database of existing and previously proposed cycling routes. The database became the starting point for subsequent steps in the cycling network development, and was updated on an ongoing basis to reflect the iterative approach of the network development process.

CONSULTATION

County and local municipal representatives from the Municipal Working Group provided input on existing and previously approved routes in the early stages of the study, and as any new information became available during the study. Members of the public were invited to provide input through the interactive online platform and during the first round of Public Information Centres (PICs).

TECHNICAL

Sources of information included:

- GIS databases from the County and local municipalities (where available);
- Hard copy trail mapping such as conservation area trails, municipally or County endorsed trail and cycling maps available to the public;
- Secondary plans and plans of subdivision
- Approved cycling routes in neighbouring municipalities, as documented in approved Master Plans.

OUTPUT

A set of nine maps (E-1 to E-9) in Appendix C illustrate existing and previously proposed cycling routes. The mapping includes a county-wide map for overall context and connections to surrounding municipalities as well as individual maps for each of the local municipalities. Individual municipal maps include enlargements of built-up / urban areas where appropriate.

2. ROUTE SELECTION

APPROACH

Route selection criteria were identified based on strategy goals and objectives as well as best practices and lessons learned from comparable projects. Route selection criteria are intended to reflect the priorities of the County and local municipalities related to cycling while also considering cycling and active transportation planning principles identified in provincial policies and guidelines.

They were used during the development of the Cycling Strategy to identify and select preferred routes that comprise the recommended cycling network, and are also intended to be a reference tool for County and Local Municipal staff in future when new cycling route opportunities arise, when feasibility of individual routes is being undertaken at the time of implementation, and / or when changes to the cycling network are being contemplated.

CONSULTATION

The criteria were developed by the WSP team, reviewed and confirmed by the County and local municipal representatives from the Municipal Working Group. Members of the public were also invited to provide input through the interactive online platform and during the first round of Public Information Centres (PICs).

TECHNICAL

- Project goals and objectives.
- Best practices from other municipalities' cycling and active transportation master plans.
- Cycling guidelines and standards such as Ontario Traffic Manual Book 18 – Cycling Facilities (OTM Book 18) and the Ministry of Transportation Bikeways Design Manual.

OUTPUT

A set of route selection criteria were developed and used to review and assess the potential cycling routes identified throughout Middlesex County. The route selection criteria as well as the considerations / questions posed as part of the assessment are documented on the following pages. The intent is for these route selection criteria to be used by the County and its partners as the network is implemented to confirm that the route is appropriate and as additional routes are considered for inclusion and implementation.

CONNECTIVITY & DIRECTNESS

- How directly or circuitously does the route connect to important destinations?
- Is the candidate route intersected by other cycling routes?
- Does the route form part of a corridor that enables cyclists to travel a significant distance through the County?
- Does the route provide access to other modes of transportation throughout the County?
- Are the connectivity and directness of the route compromised by barriers that may deter some cyclists?

ACCESS & POTENTIAL USE

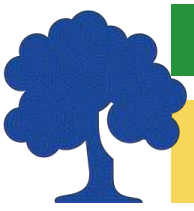
- Does the route connect significant origins, destinations or nodes such as residential neighbourhoods, employment areas, commercial, recreational or institutional destinations?
- Do cycling routes already exist to these destinations?
- Are there cycling routes already established along the corridor?

ATTRACTIVE & AESTHETIC

- Is there scenic value that enriches the cycling experience along the route?
- Is there potential for the route to provide access to historic or cultural areas of interest within and outside of the County?

USER SAFETY & COMFORT

- Can an appropriate facility be implemented that would appeal to a broad range of cyclist experience and abilities?
- Does the route reduce potential conflict for all users?



ENVIRONMENTAL IMPACT

- Can the route be implemented in such a way that impact to adjacent natural heritage features can be appropriately mitigated?

ROAD CLASSIFICATION

- Based on the roadway class and conditions, is it reasonable that it will be conducive to cycling when an appropriate facility is implemented?

COST

- Do the social, economic, environmental, and health benefits of providing a route in this location offset the cost to implement the route?

ATTRACTING FUTURE USERS

- Is there significant potential to increase the volume of cyclists using the candidate route in the future?
- Are there sufficient routes and are the proposed facility types appropriate for all types of cyclists?

TOURISM

- Does the route support local and / or regional tourism initiatives?
- Does the route provide access to tourism destinations in municipalities adjacent to Middlesex County?

Glendon Drive, Middlesex County; Source: London Free Press

3. CANDIDATE

APPROACH

Candidate routes were identified and mapped using information collected from the County and local municipalities as well as through the application of the route criteria. The candidate routes were refined based on missing gaps in the existing network and key connection to destinations within the County and to adjacent municipalities.

CONSULTATION

County and Local Municipal representatives from the Municipal Working Group provided input on potential candidate routes, gaps, attractions and barriers in advance of the WSP team's field investigations. Members of the public were invited to provide input through the interactive online platform and during the first round of Public Information Centres (PICs).

TECHNICAL

- GIS database and mapping of existing and previously proposed and approved cycling and trail routes developed as part of Step 1 of the network development process
- Desktop investigation of potential routes using high resolution aerial imagery provided by the County, aerial and ground level imagery available through Google Earth.

OUTPUT

A set of nine maps (C-1 to C-9) in Appendix C illustrate candidate cycling routes. The mapping includes a county-wide map for overall context and connections to surrounding municipalities as well as individual maps for each of the Local Municipalities. Individual municipal maps include enlargements of built-up / urban areas where appropriate.

4. INVESTIGATION

APPROACH

To better understand the current conditions, the project team completed field investigations throughout the over a period of several days in July and August of 2017. Investigation of on-road routes focused on the conditions such as traffic speed and volume, roadway platform and right-of-way width, on-street parking, surrounding land uses, existing routes and local destinations.

Investigation of candidate off-road routes considered factors such as connectivity, topography, landscape features and characteristics. The field investigations were supplemented by additional spatial analysis and a desktop review.

The information gathered was used to inform the selection of potential routes and appropriate facility types. Additional select field investigations were undertaken revisit specific locations and routes as needed.

CONSULTATION

Input received during the candidate route step and from the public during the first PIC round helped to inform the study team's field investigations

TECHNICAL

» GIS database and mapping of existing, previously proposed and candidate routes.

OUTPUT

Field notes and select measurements, GPS waypoints and digital photography at select locations.

The database of waypoints and photos is intended to be used as a means of communicating context specific conditions related to the cycling network as the strategy is implemented. It can also be used as a support for future communication and outreach initiatives related to cycling in the future.

5. PREFERRED

APPROACH

Using the information gathered in the field and documented through consultation with County and Local Municipal representatives of the Municipal Working Group preferred cycling routes were refined through an iterative process, ultimately resulting in the preliminary preferred cycling network.

CONSULTATION

County and Local Municipal representatives from the Municipal Working Group provided input on potential during the process of selecting preferred cycling routes. Routes were reviewed by stakeholders and the public as part of the second Public Information Centre, which took place following the selection of preferred facility types (Step 3.1.7).

TECHNICAL

- GIS database and mapping of existing, previously proposed and candidate routes.
- Results of field investigations and application of route selection criteria
- Additional desktop investigation using high resolution aerial imagery and Google Earth.

OUTPUT

Working mapping illustrating the preliminary recommended cycling route network.

Comments from Consultation & Photos from Field Investigation; Source: WSP

6. FACILITIES

APPROACH

Based on the preferred cycling network established in Step 5, the study team identified a preferred facility type for each on-road cycling route using the guidelines described in Ontario Traffic Manual (OTM) Book 18: Cycling Facilities – the Province's primary guidelines for cycling facility design. This included consideration of the following:

- Operating speed and traffic volume to determine a level of separation of a cycling facility type (where data was available);
- Observations of surrounding context and consideration of other heuristics as described in OTM Book 18 such as street function, function of the route in the context of the overall network, consideration of the types of users and their skill / experience level, available space and relative / high-level cost to implement the route.

CONSULTATION

County and local municipal representatives from the Municipal Working Group provided input on the cycling route network and facility types. Members of the public were invited to provide input through during the second round of Public Information Centres (PICs). Input received was used to refine the recommended network and facility types following the PIC.

TECHNICAL

Technical considerations used in the selection of preferred cycling facility types focused on vehicle operating speeds and volumes, as set out in OTM Book 18. Where data was available these two technical considerations featured most prominently, given their influence over the cyclist safety and comfort.

OUTPUT

A set of nine maps (3-1 to 3-9) in section 3.2 illustrate the recommended cycling network with facility types. The mapping includes a county-wide map for overall context and connections to surrounding municipalities as well as individual maps for each of the Local Municipalities. Individual municipal maps include enlargements of built-up / urban areas where appropriate.

7. COSTS & PHASING

APPROACH

The Phasing Plan attempts to balance the interests of the four types of cyclists, along with the three different cycling trip types, referenced earlier in this report. The principles of recreational and leisurely travel, connectivity to schools, and cycling tourism considerations featured prominently in the development of the phasing plan. Feedback from the Municipal Working Group, as well as suggestions that stakeholders and the public made during the second PIC helped to inform the development of the phasing plan.

CONSULTATION

County and local municipal representatives from the Municipal Working Group provided input on the suggested short and long term routes. Members of the public were invited to provide any initial suggestions regarding priorities for implementation / phasing as part of the second Public Information Centre. Input received was used to refine the recommended network and facility types following the PIC.

TECHNICAL

- GIS database and mapping of network routes and facility types
- Unit pricing for the various facility types (refer to Appendix D)
- Prioritization principles described in section 4.1
- Results of field investigations and further desktop investigation using high resolution aerial imagery and Google Earth.

OUTPUT

A set of nine maps (4-1 to 4-9) in section 4.1 illustrate the recommended phasing plan. The mapping includes a county-wide map for overall context and connections to surrounding municipalities as well as individual maps for each of the Local Municipalities. Individual municipal maps include enlargements of built-up / urban areas where appropriate.

3.2 Network & Design

The following sections provide an overview of the proposed cycling network for Middlesex County as well as some of the design guidelines and considerations which will need to be utilized when implementing the various routes and facilities.

3.2.1 The Recommended Cycling Network

The recommended cycling network is illustrated in maps 3-1 through 3-9. The mapping includes a county-wide map for overall context and connections to surrounding municipalities as well as individual maps for each of the Local Municipalities. Individual municipal maps include enlargements of built-up / urban areas where appropriate.

The recommended network is intended to be a guiding document / blueprint for the implementation of cycling facilities throughout Middlesex County, and is intended to be used as a guide for future decision-making by those responsible for the plan's implementation at the County and local municipal level.

The network is also intended to be flexible so new opportunities that arise in the future can be accommodated in the Plan. This flexibility is also intended to accommodate the addition of routes in local areas that tie into the network as communities change and grow.

At full build-out the recommended network consists of just under 1000km of facilities, which includes signed routes, paved shoulders, buffered paved shoulders, bike lanes, cycle tracks and trails. There are two key components of the draft cycling network – the County's proposed network identified on both local roads and County roads and the new Provincial Cycling Network. **Table 6** provides a summary, and a detailed breakdown based on facility type and jurisdiction can be found in **Appendix D**.

Kate Pace Way; Source: Ontario by Bike

A. COUNTY NETWORK

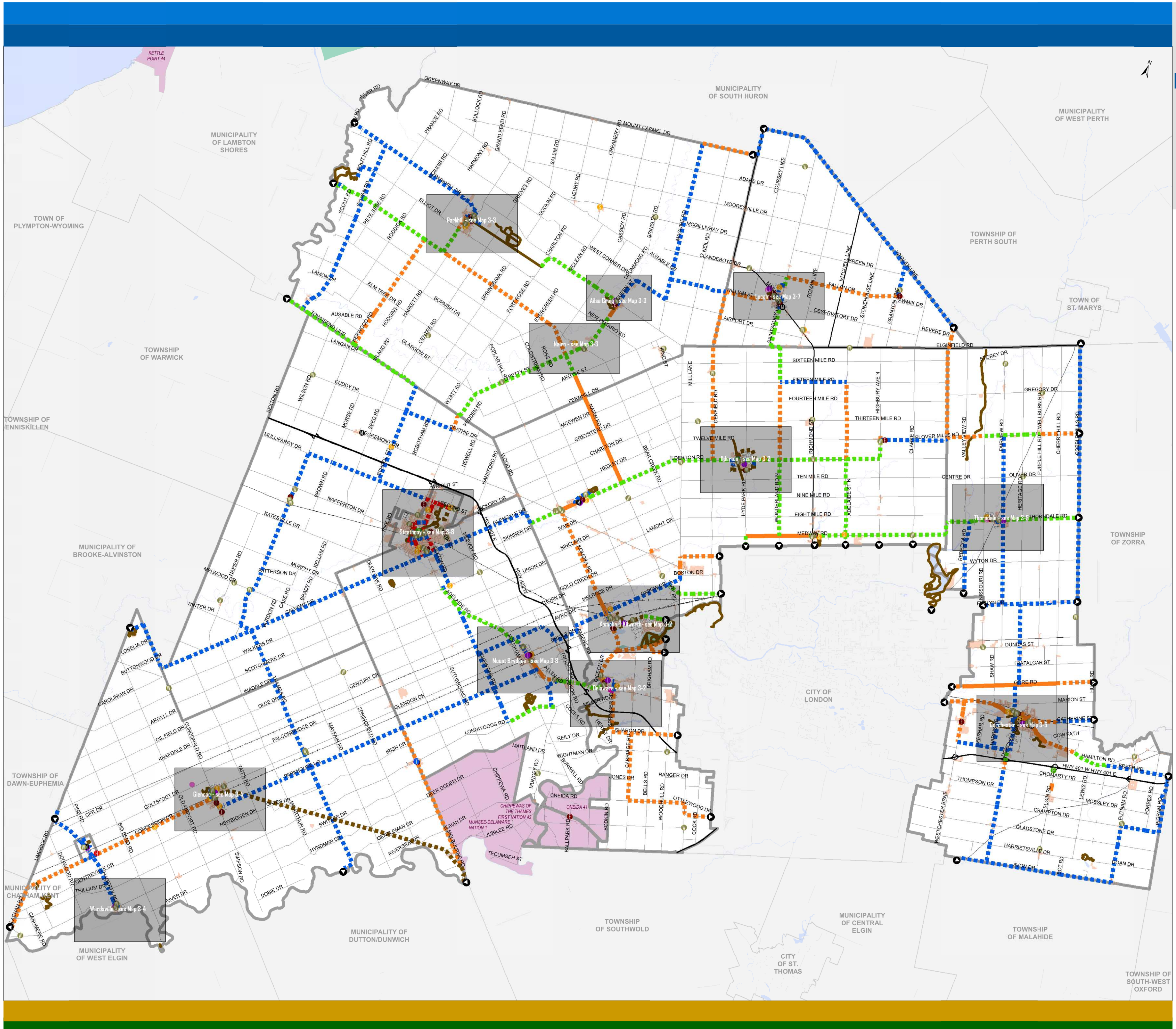
FACILITY TYPE	EXISTING (km)		PROPOSED (km)		TOTAL (Existing & Proposed)
	County	Local[3]	County	Local[3]	
Signed Route[1]	73.3	55.6	105.2	257.1	491.2
Paved Shoulder[2]	23.1	1.9	126.5	34.6	186.1
Buffered Paved Shoulder	0.0	0.0	127.2	9.2	136.4
Bike Lane	0.0	0.0	3.4	5.1	8.5
Cycle Track	0.0	0.0	0.8	0.0	0.8
Trails[4][5]	0.0	134.0	4.1	29.6	167.7
SUBTOTAL	96.4	191.5	367.2	335.7	GRAND TOTAL
TOTAL	287.9		702.9		990.8

Notes:
(1) Includes routes that may require upgrading (i.e. addition of a paved shoulder or buffered paved shoulder to meet OTM Book 18 recommendation based on traffic volume and speed).
(2) Includes those that may require upgrading (i.e. additional width to meet OTM Book 18 recommendation for buffered paved shoulder based on traffic volume and speed).
(3) Includes all eight Local Area Municipalities (on and off-road), plus conservation authorities and Province (off-road only).
(4) Based on data provided to WSP at the study outset, and includes proposed trails outside of road rights-of-way on local municipal, conservation authority, and provincial park lands, and trails within road rights-of-way (e.g. in boulevard spaces along County and local municipal roads).
(5) Includes trails within and outside of road rights-of-way.

Table 6 – Summary of Existing and Proposed Facilities in the Recommended Cycling Network

R1 Adopt the recommended cycling network as a guide for the development of a connected and linked network throughout Middlesex County, and to surrounding municipalities.

R2 Recognize that the recommended cycling network is flexible, and that adjustments will need to occur from time to time to respond to local priorities and opportunities. Use the route selection criteria to help guide decision-making when changes to the recommended route network are being considered.



MAP 3-1

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

MIDDLESEX COUNTY

JUNE 2018

Legend

Proposed Facility Types
- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 2.5 5 10 Km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in August 2017 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.
 Additional data from the Ontario Ministry of Natural Resources, Queens Printer 2017. Note: Map is not intended for navigation.

wsp middlesex county

MAP 3-2

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

MUNICIPALITY OF MIDDLESEX CENTRE

JUNE 2018

Strathroy - see map 3-8

Ilderton - see inset map

Komoka & Kilworth - see inset map

Mount Brydges - see map 3-8

Delaware - see inset map

Ilderton

Komoka & Kilworth

Delaware

Legend

Proposed Facility Types
- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

MIDDLESEX COUNTY CYCLING STRATEGY

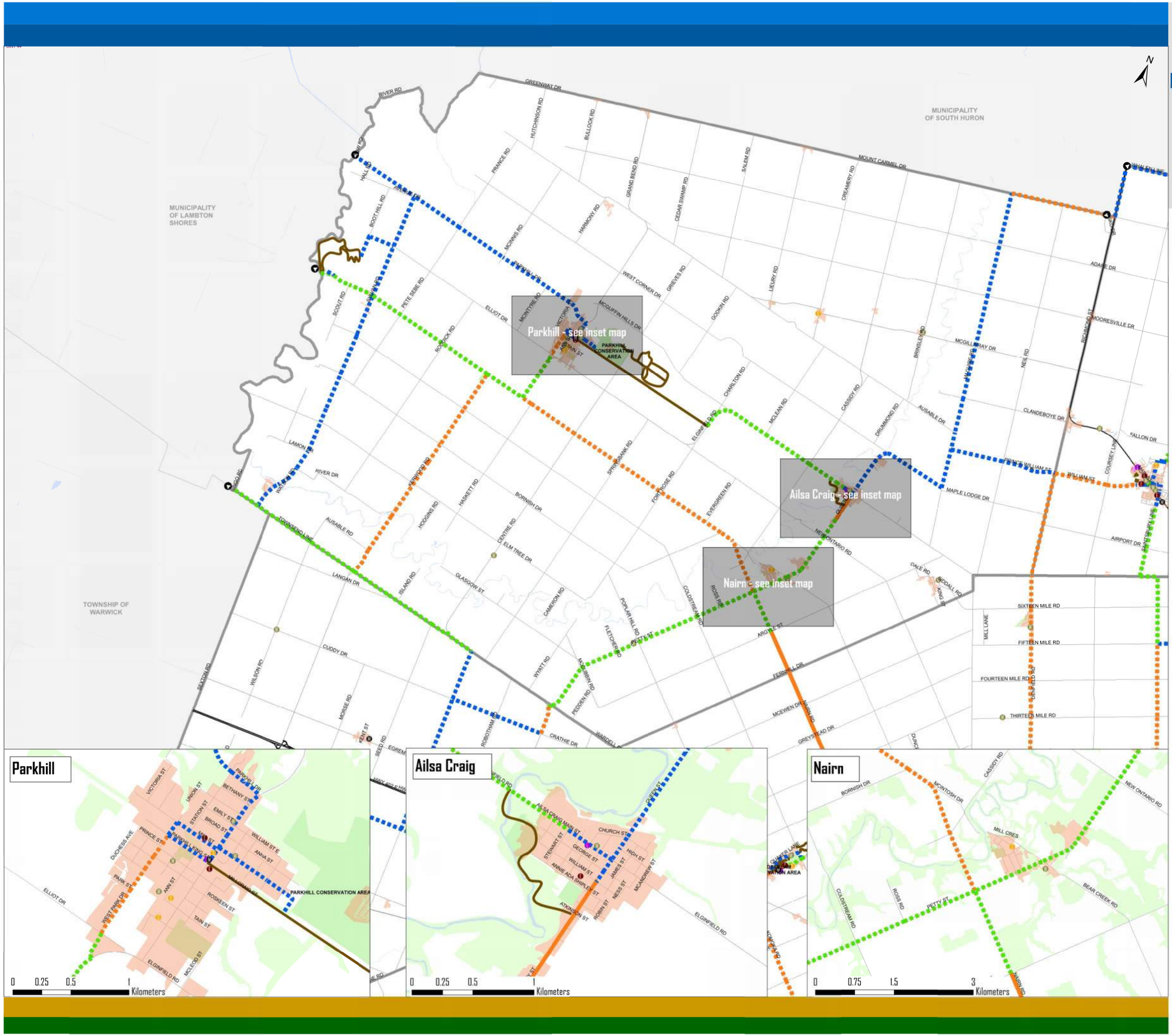
Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

MAP 3-3

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

MUNICIPALITY OF NORTH MIDDLESEX

JUNE 2018



Legend

Proposed Facility Types

- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails

- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations

- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features

- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other

- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1.25 2.5 5 Km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

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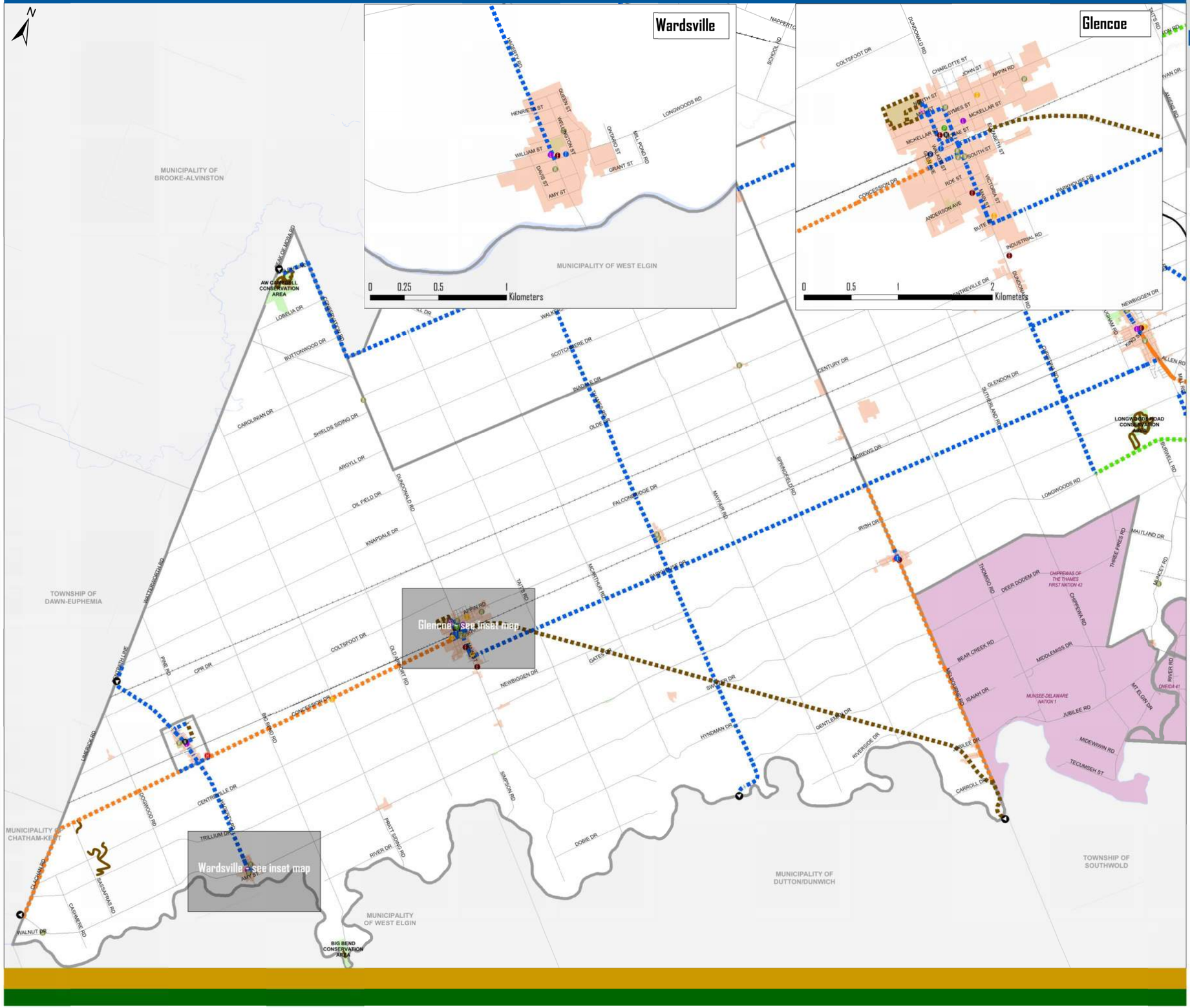
MAP 3-4

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

MUNICIPALITY OF SOUTHWEST MIDDLESEX

JUNE 2018



Legend

Proposed Facility Types

- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails

- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations

- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features

- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other

- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

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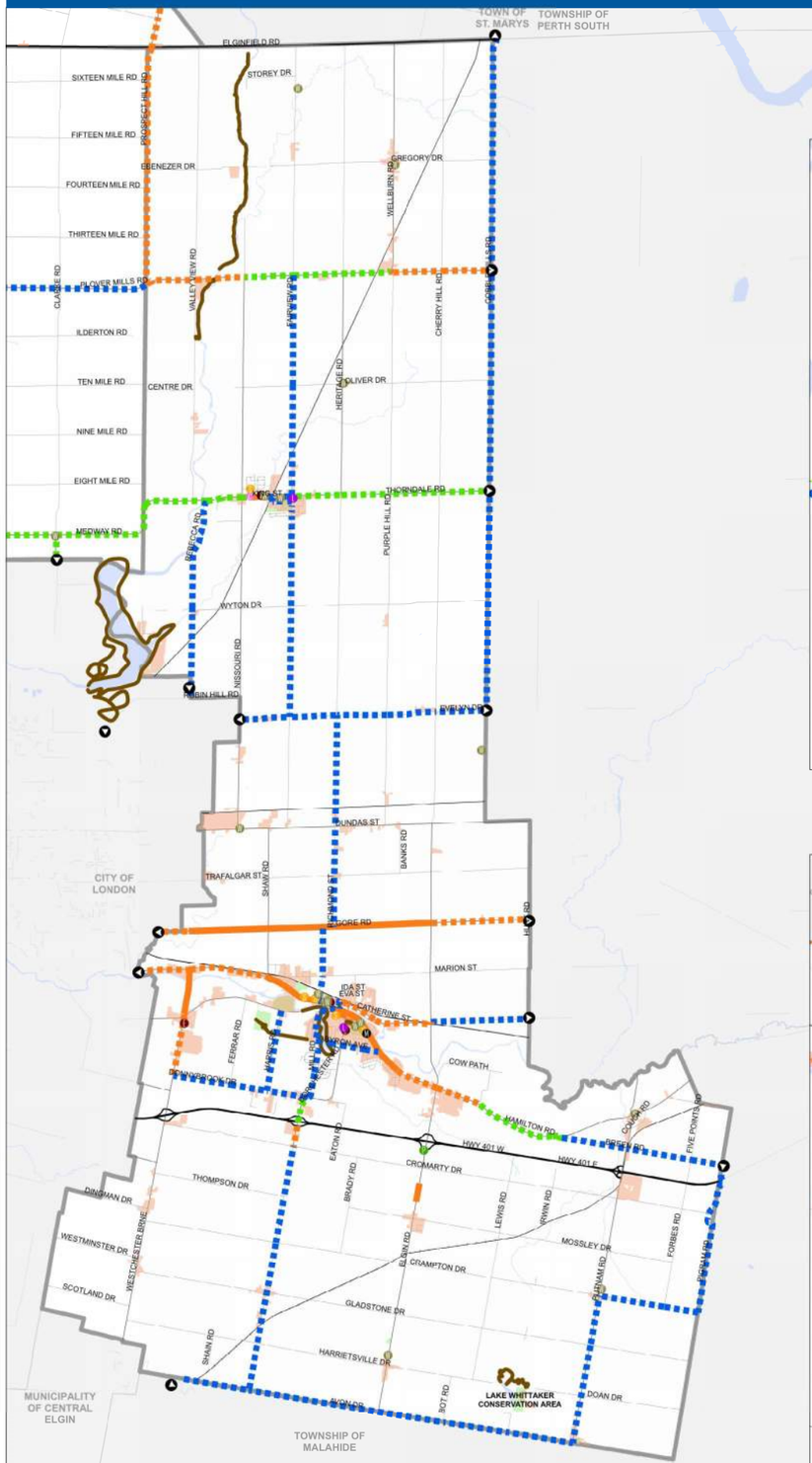
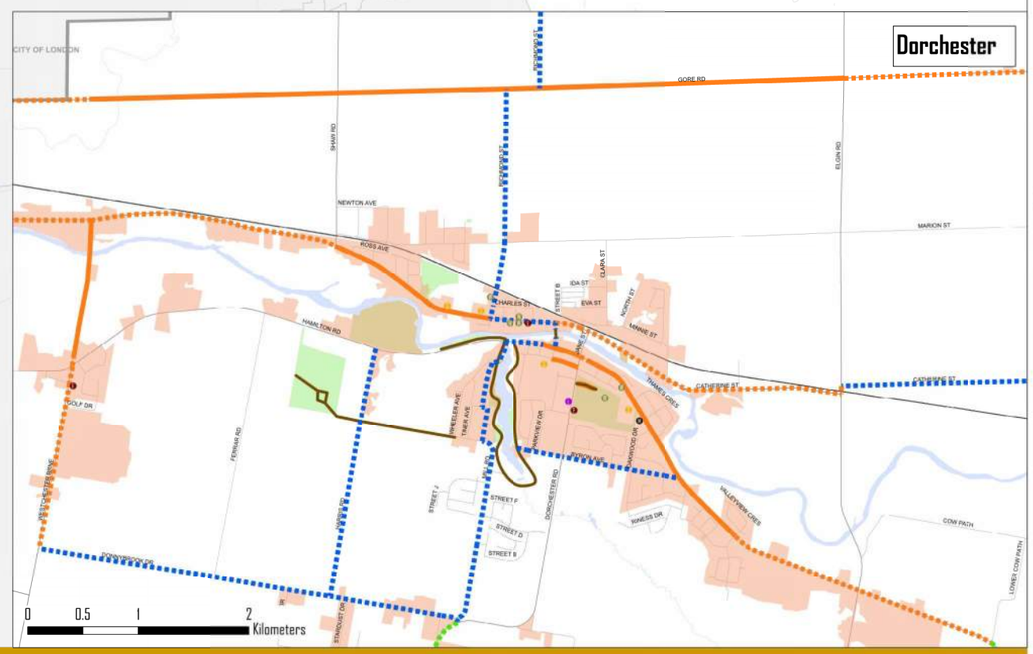
MAP 3-5

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

MUNICIPALITY OF THAMES CENTRE

JUNE 2018





Legend

Proposed Facility Types

- Proposed Multi-use Trail
- Proposed Bike Lane
- Propcsed Buffered Paved Shoulder
- Propcsed Cycle Track
- Propcsed Paved Shoulder
- Propcsed Signed Route

Existing Trails

- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations

- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features

- Provincial Highway
- County Road
- Local Road
- Propcsed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other

- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1.5 3 6 km

MIDDLESEX COUNTY CYCLING STRATEGY

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Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.
Parcel data © Teranet Enterprises Inc. and its suppliers.

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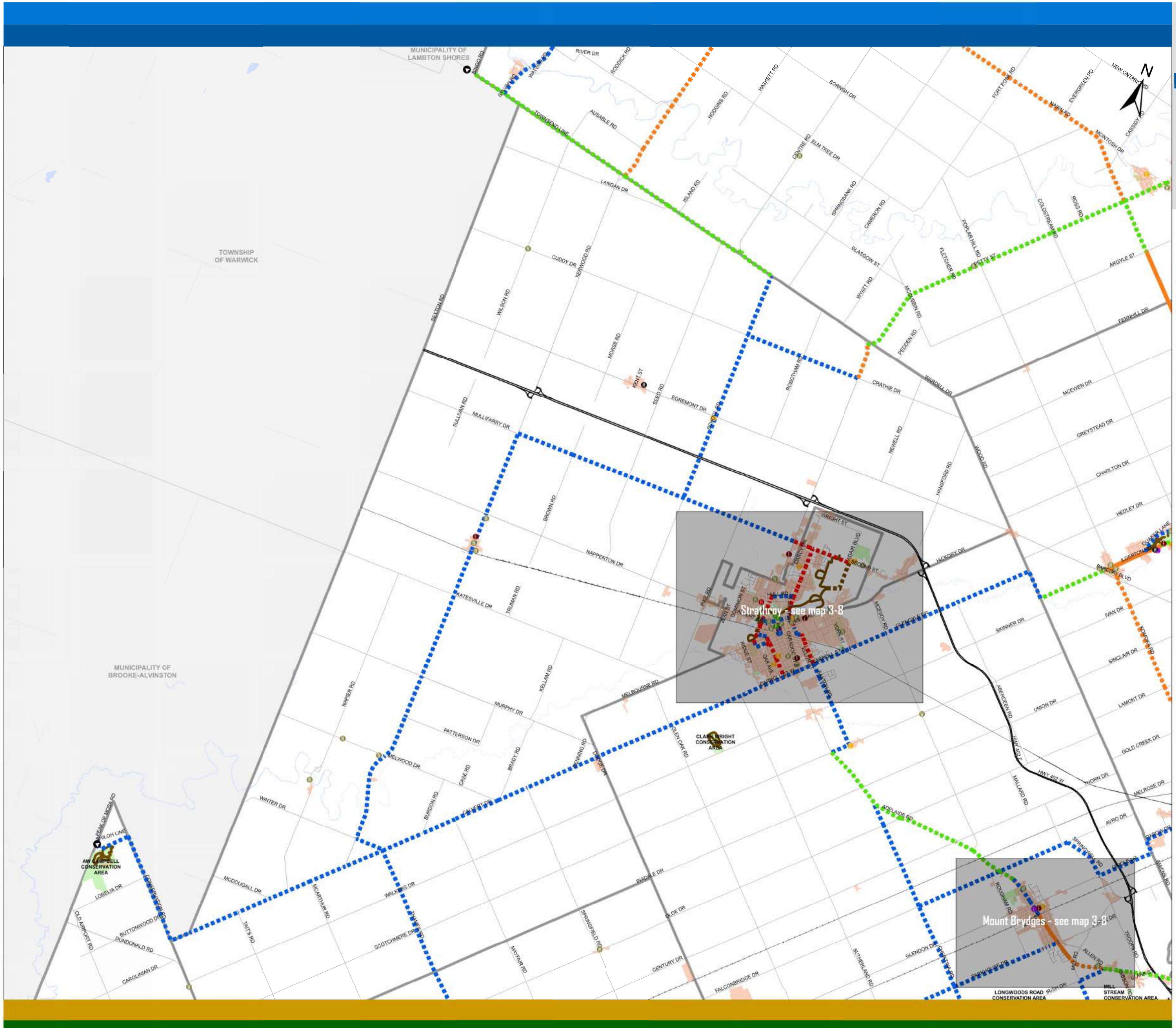
MAP 3-6

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

TOWNSHIP OF ADELAIDE-METCALFE

JUNE 2018



Legend

Proposed Facility Types
- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
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- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1 2 4 Km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983. Map Created in April 2018 by WSP Canada. Spatial data provided by the County of Middlesex, 2017. Parcel data © Teranet Enterprises Inc. and its suppliers. Not a plan of survey. 2015 Image includes material © 2016 of the Queen's Printer for Ontario. Additional data from the Ontario Ministry of Natural Resources, Queens Printer 2017. Note: Map is not intended for navigation.

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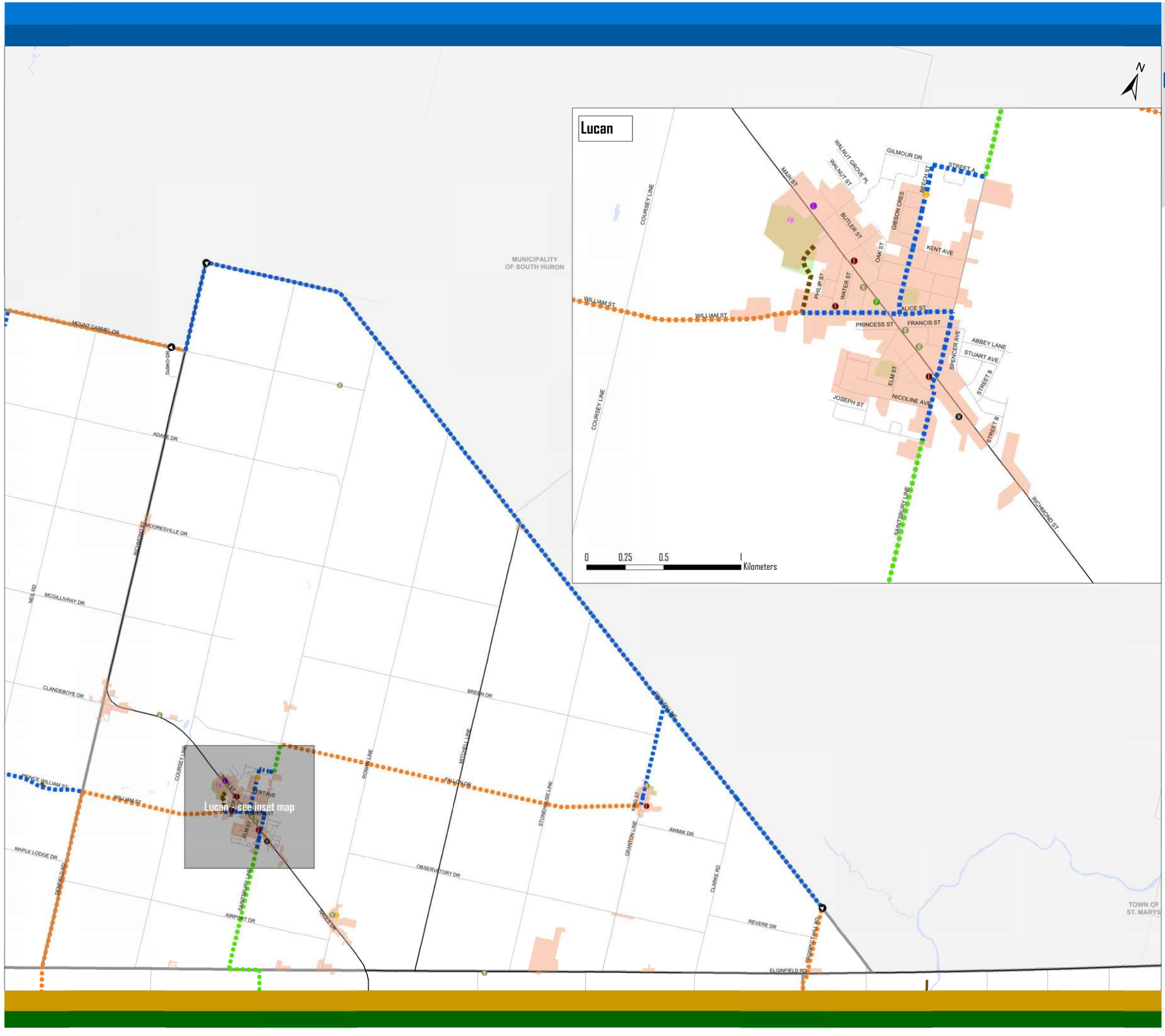
MAP 3-7

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

TOWNSHIP OF LUCAN BIDDULPH

JUNE 2018



Legend

Proposed Facility Types
- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 0.75 1.5 3 Km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

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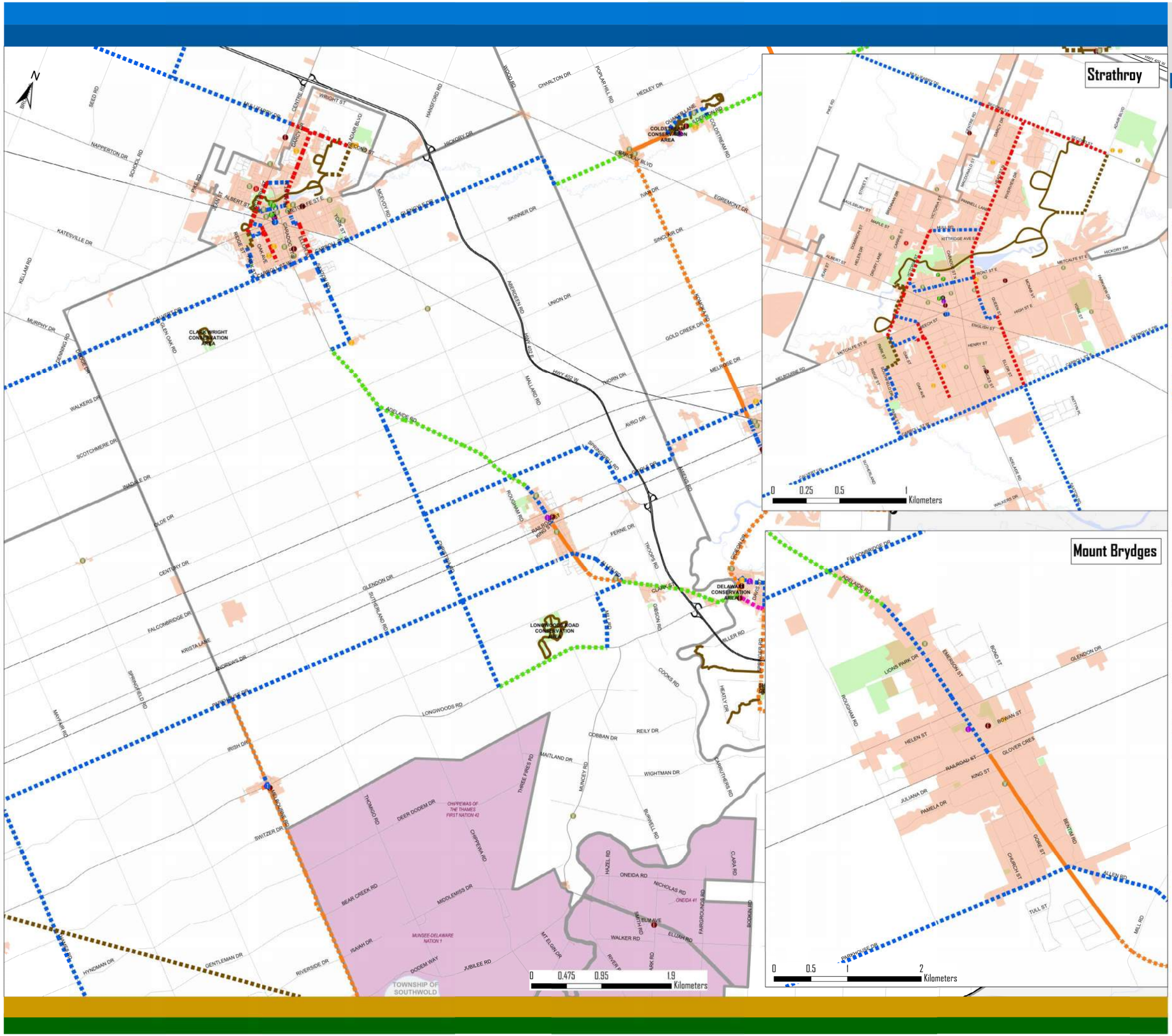
MAP 3-8

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

TOWNSHIP OF STRATHROY-CARADOC

JUNE 2018



Legend

Proposed Facility Types

- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails

- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations

- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features

- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other

- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1 2 4 km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

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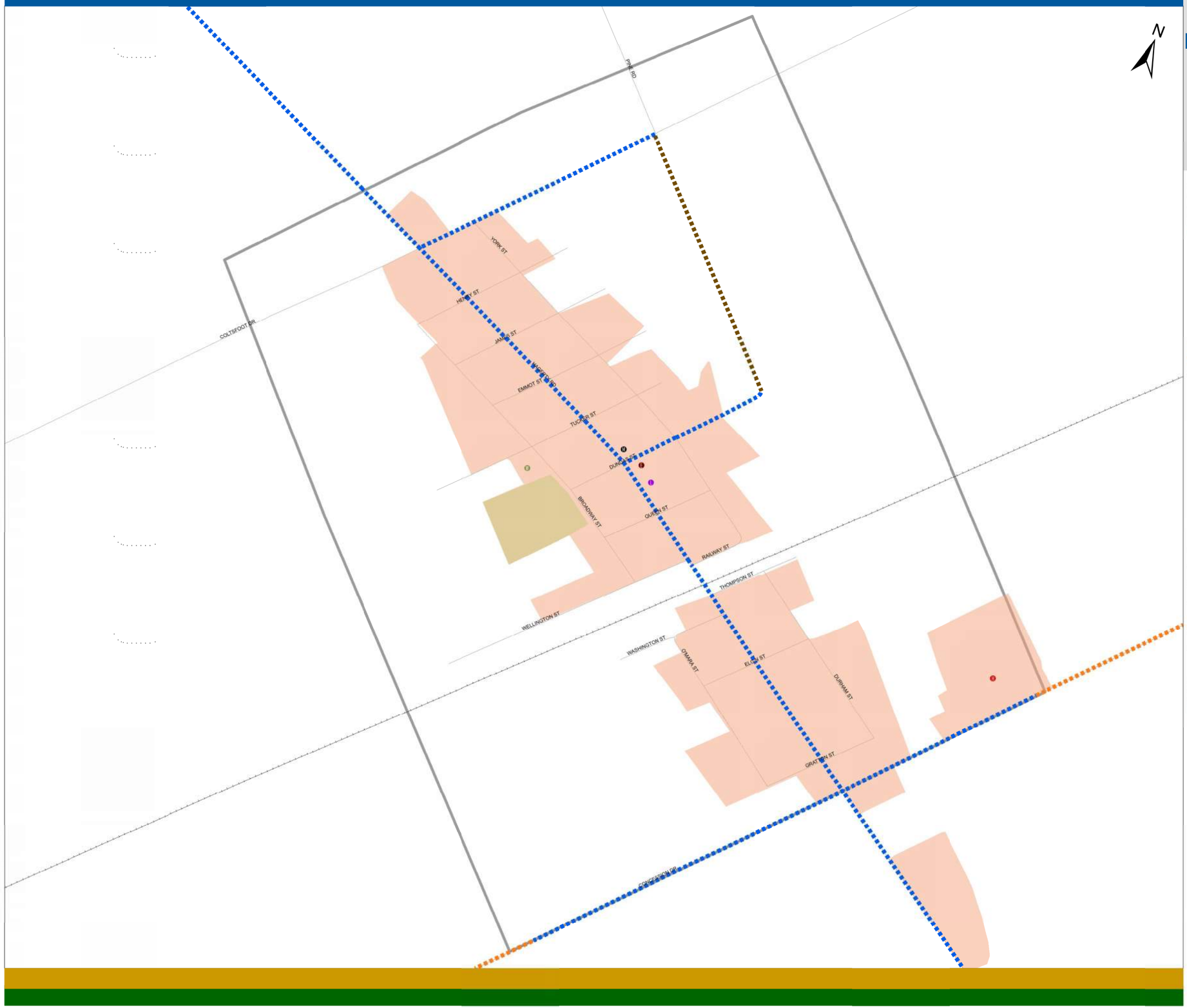
MAP 3-9

DRAFT CYCLING NETWORK WITH PROPOSED FACILITY TYPES

VILLAGE OF NEWBURY

JUNE 2018



Legend

Proposed Facility Types

- Proposed Multi-use Trail
- Proposed Bike Lane
- Proposed Buffered Paved Shoulder
- Proposed Cycle Track
- Proposed Paved Shoulder
- Proposed Signed Route

Existing Trails

- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations

- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features

- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other

- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 0.05 0.1 0.2 km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N, Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

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B. PROVINCIAL NETWORK

In 2013, the Ministry of Transportation (MTO) released #CycleON: Ontario's Cycling Strategy. The strategy looks ahead 20 years and outlines what needs to be done to promote cycling across the province as a viable mode of transportation. It was followed by #CycleON Action Plan 1.0 in 2014, which sets out recommendations to increase and support cycling tourism opportunities in the province. It provides a framework to design healthy, active and prosperous communities; improve cycling infrastructure; make highways and streets safer; promote cycling awareness and behavioural shifts; and increase cycling tourism in Ontario.

In May 2018 the Ministry of Transportation (MTO) published the Province-wide Cycling Network Study, one of the key initiatives identified in the Province's cycling strategy (CycleON). The Province-wide Cycling Network Study identifies a network of on and off-road cycling routes throughout Ontario that connect key destinations, regional and national trails and routes (e.g. The Waterfront Trail and the Trans Canada Trail -"The Great Trail").

The Province-wide Cycling Network was developed through extensive consultations with municipalities and key cycling stakeholders throughout the province. It is envisioned as a series of interconnected spine routes flowing through many of Ontario's municipalities. Where the network flows through various municipalities it is intended to connect with existing or planned local routes. In more densely populated areas of the province the proposed Province-wide Cycling Network is denser and caters to commuter and touring cyclists, whereas in less densely populated areas the network is focused more on cycle tourism/touring routes. In some regions this network is composed of significant sections of off-road multi-use trail including many kilometres of former railway corridors.

Middlesex County is directly connected to the Provincial Cycling Network. In terms of regional context, two routes meet in London:

- One coming from the Lake Erie shoreline at Port Stanley, through Elgin County and into London along the Wonderland Road corridor; and
- One coming from Woodstock through Dorchester and into London following the Thames Valley Parkway.

Heading north from London the two routes make their way towards the Lake Huron shoreline via Strathroy, Ailsa Craig and Parkhill. All Provincial Cycling Network routes coincide with routes in the recommended Middlesex County cycling network as illustrated in **Figure 8**.

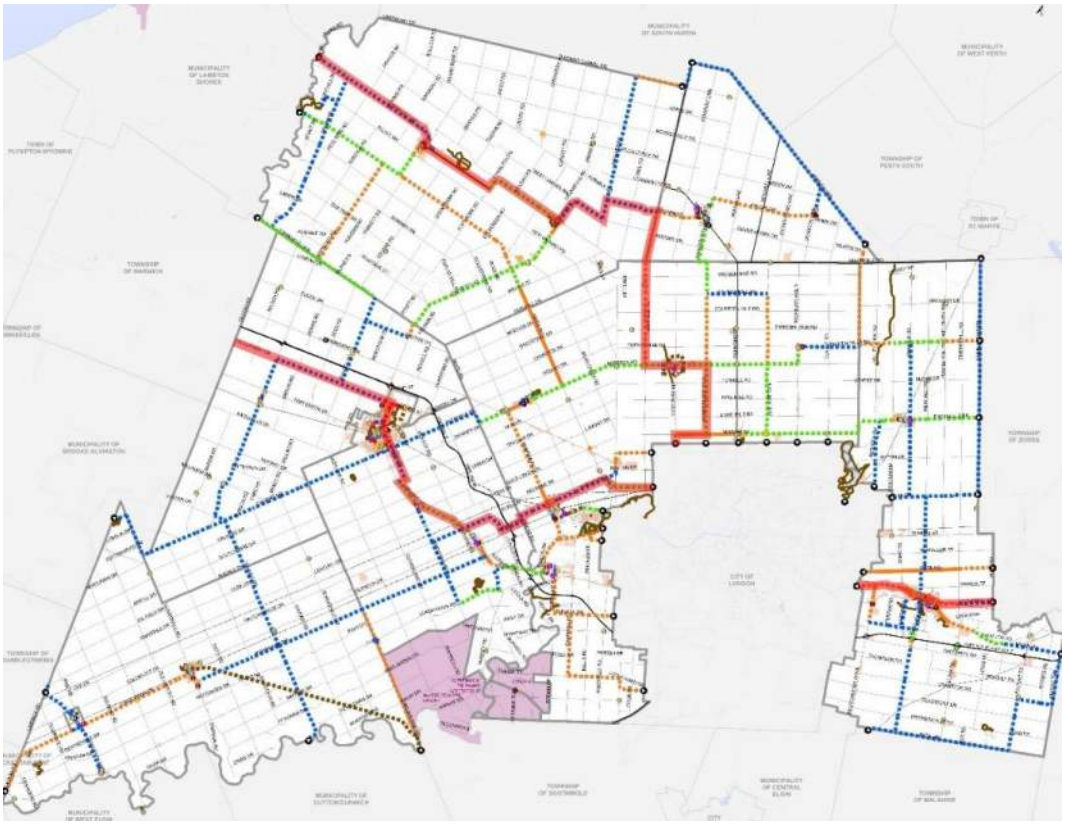


Figure 8 – Provincial Cycling Network Route; Source: WSP

Southwest Ontario Tourism Corporation

3.2.2 Cycling Facility Design

The Middlesex County Cycling Network is made up of both on-road and off-road cycling facilities highlighting opportunities for recreational, tourism, utilitarian and fitness riders. The way in which these facilities are designed should not be considered a one-size-fits-all approach.

Context specific considerations should be identified and addressed as the network is implemented. However, there are design guidelines which can be used as a reference as the County as its partners pursue implementation. The following sections provide an overview of these guiding documents and select design guidelines for consideration as the network is designed and built.

1. ON-ROAD

Consistency in the application of facility design alternatives is paramount. In April 2014, the Ontario Traffic Council (OTC) completed and MTO published the provincially endorsed design guidelines – Ontario Traffic Manual Book 18 - Cycling Facilities (OTM Book 18).

The guidelines were developed by the OTC collaboratively with representatives from the MTO and a number of contributing municipalities from across Ontario. They are intended to be used by municipal staff to facilitate the selection, design, implementation and maintenance of both on and off-road cycling facilities. In addition, the Ministry of Transportation has also developed a set of cycling specific design guidelines which are intended to be used by MTO when designing facilities on highways found under the Ministry of Transportation's jurisdiction. Where appropriate, both OTM Book 18 and the MTO Bikeway Design Manual should be used to guide the selection, design and implementation of cycling facilities within Middlesex County.

The facilities identified in **maps 3-1** through **3-9** were selected based on the facility selection criteria described in OTM Book 18-Cycling Facilities and information that was available at the time the Strategy was being developed. As such the facility type recommendations outlined in the Cycling Strategy are intended to be used as a guide for future consideration by staff and Councils. As part of the implementation process individual segments that comprise the network that the facility type must be confirmed as part of the detailed design process, so that the final facility type reflects the full extent of information pertaining to the corridor and best practices in cycling facility design at the time of the review.

Proposed routes are identified in urban, suburban and rural areas throughout the County, and local municipalities. In urban and suburban areas, users typically live closer to their destinations which increases the possibility of making day-to-day short trips by bicycle.

These areas may require a higher order of infrastructure, however, the selection of a preferred facility type for these areas should also take into consideration other characteristics including roadway speed, surrounding land uses or traffic volumes. Where practical and possible, off-road linear trails should be provided.

Rural linkages may have fewer designated routes. With the exception of several key rural off-road corridors the majority of network connections will utilize the road network. On-road facility types include signed bicycle routes and signed cycling routes with a paved shoulder.

Adding or improving existing paved shoulders can be the best way to accommodate cyclists in rural areas and benefit motor vehicle traffic. Where funding is limited, adding or improving shoulders on uphill sections will give slow moving cyclists needed maneuvering space and will decrease conflicts with faster moving motor vehicle traffic.

Paved shoulders offer other significant advantages including:

- Extending the service life of the road surface through improving the lateral support for the roadway structure and reducing edge deterioration
- Reducing time and maintenance costs associated with the grading of gravel shoulders and topping up granulars that have been swept away where the asphalt meets the granular edge;
- Serving as a refuge for disabled vehicles;
- Accommodating emergency vehicles;
- Reducing vehicle run-off-the-road incidents; and
- Improving accommodation of farm vehicles which often travel along roadway shoulders with one set of wheels on the shoulder and the other on the asphalt. Paved shoulders improve travel for farm vehicles and allow for safer passing.

Agricultural Vehicles Using the Road Network; Source: WSP

Guidance regarding Signed Routes, the width, type and application of Paved Shoulders for cycling is provided in OTM Book 18. The application of these guidelines and/or variation from them should be informed by the local context and engineering judgement. The following excerpt from OTM Book 18 and **Figure 9** provide some guidance regarding rural paved shoulders and cycling:

> "Signed bicycle routes with paved shoulders should typically have shoulders between 1.5 and 2.0 metres in width depending on the volume, speed and mix of vehicular traffic. As motor vehicle volumes increase, practitioners may consider wider paved shoulders or a buffered zone, as indicated in Table 4.2. However, in situations where the facility type selection process has identified the need for a paved shoulder within a constrained corridor, practitioners may consider providing a minimum paved shoulder width of 1.2 metres after applying good engineering judgement and consideration of the context specific conditions. Where a signed bicycle route with paved shoulders has a shoulder width of 2.0 metres or wider, the shoulder must include a minimum 0.5 metre wide buffer zone. The buffer zone may consist of a marked buffer or a rumble strip on rural roads. On roadways where the speed or volume of motor vehicles in the adjacent travel lane is high, the shoulder width and buffer zone may be increased to provide greater separation between motorists and cyclists."

Motor Vehicle AADT[b]	Desired Width[c]	Suggested Minimum Width
701 – 1,500	1.5 m	1.2 m[d]
1,501 – 3,000	1.5 m	1.2 m
3,001 – 4,500	1.5 m	1.2 m
> 4,500	2.0 m[e]	1.2 m

[a]This table provides general guidance for roadways where bicycle volumes are at least 25 per day (existing or expected) or that are on routes recommended in an Active Transportation Plan. Practitioners should consider undertaking more detailed analysis when preparing a bicycle plan or where site specific roadway conditions warrant it.

[b]Paved shoulders are not required on rural roads with a motor vehicle AADT of 700 or less.

[c]Practitioners should consider providing a buffer (desired width 1.0 m; suggested minimum width 0.5 m) alongside the paved shoulder if rumble strips exist or are proposed, the road experiences truck volumes of at least 30 trucks per hour or sight lines are poor. Additional separation between cyclists and heavy vehicles reduces the aerodynamic impact of passing trucks on cyclist stability.

[d]On very low volume roads, a paved shoulder of any width should be considered. Shoulder widths that are less than the suggested minimum of 1.2m, however, should typically be applied only where sight lines are good and truck volumes are low.

[e]Where a width of 2.0 m or more is available, a paved shoulder of 1.5 m should be provided and the remaining width should be allocated to a buffer.

Figure 9 – Suggested Width of Paved Shoulder based on Motor Vehicle AADT

2. OFF-ROAD

The current version of OTM Book 18 does not include comprehensive guidelines regarding the design of off-road trails for cycling use, though it is anticipated the update to OTM Book 18, currently underway will include an off-road trail chapter. In the meantime, planners and designers are relying best practice industry guidelines for the design of multi-use trails.

Figure 10, Figure 11 and **Figure 12** are suggested for consideration by the County and local municipalities when designing off-road multi-use trails within active road rights-of-way and outside of road rights-of-way through parks, along former railway corridors and through public open space.

Trails intended specifically for mountain cycling, such as destination trails at Fanshawe Lake and Komoka Provincial Park should rely on best practice guidelines developed by the International Mountain Bike Association (IMBA) which can be obtained at https://www.imbacanada.com/resources/trail-building.

R3 Use Ontario Traffic Manual (OTM) Book 18 – Cycling Facilities as the primary guide for facility selection, assessment and design when proceeding with the detailed design and implementation of the on-road cycling network.

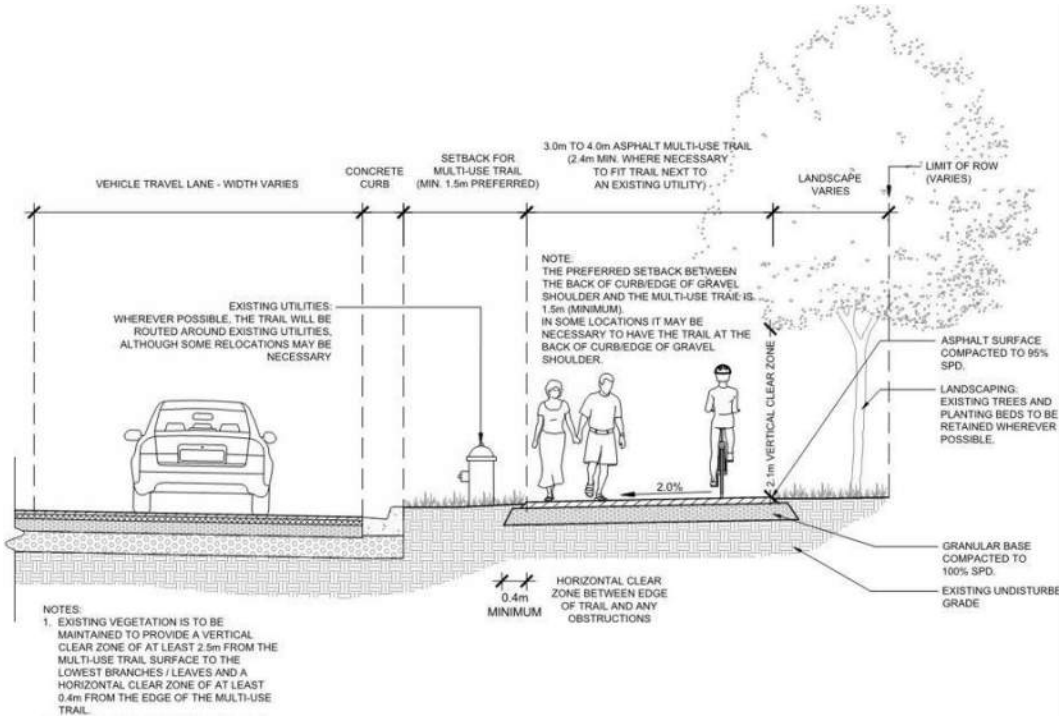


Figure 10 – Design Considerations for Multi-use Trails within Active Road Rights-of-Way

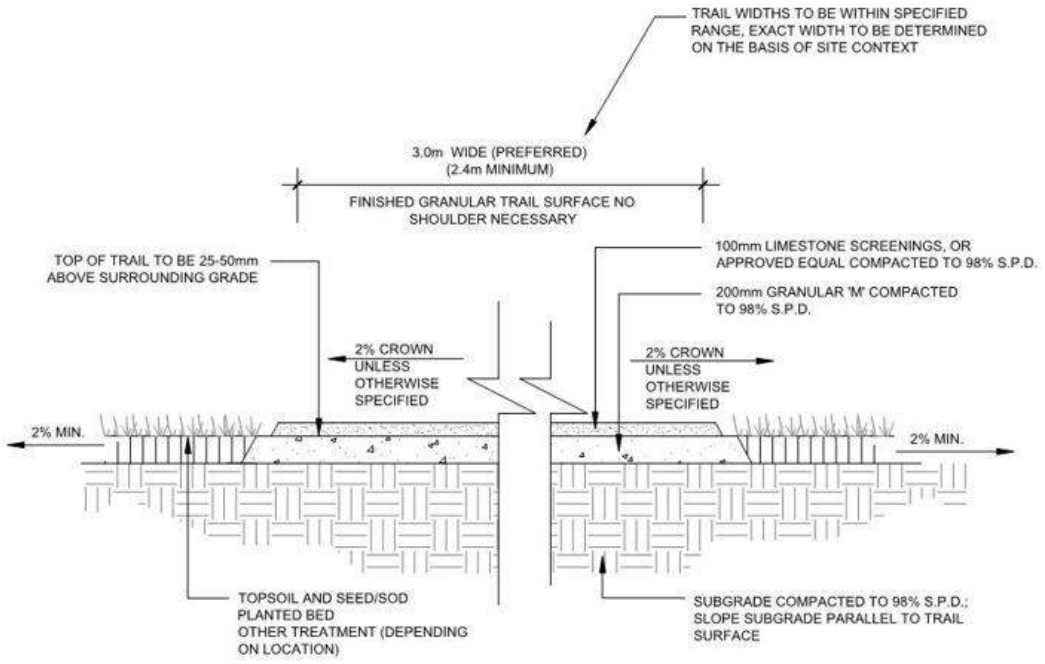


Figure 11 – Design Considerations for Granular Surfaced Multi-use Trails Outside of Active Road Rights-of-Way

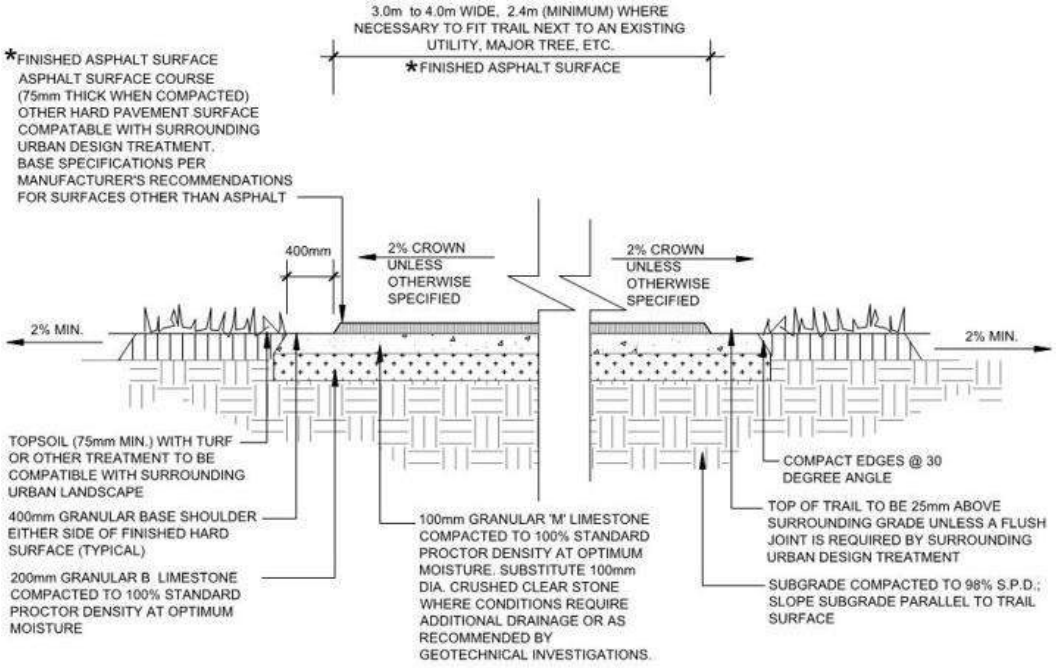


Figure 12 – Design Considerations for Hard Surfaced Multi-use Trails outside of Active Road Rights-of Way

3.2.3 Other Considerations

There are a number of other design elements which will need to be considered when implementing a connected, continuous and accessible cycling network. The following is a summary of some of those design considerations and select design guidelines for use when addressing them.

PAVEMENT MARKINGS

Section 182 of the Highway Traffic Act of Ontario provides the legal authority regarding roadway signs and markings and states that "Every driver or operator of a vehicle or street car shall obey the instructions or directions indicated on any sign so erected." (HTA, Section 182(2), 2002). Guidance regarding road signs and pavement markings are provided through the Ontario Traffic Manuals; a series of guidelines published by the Ministry of Transportation of Ontario.

Ontario Traffic Manual Book 11: Pavement, Hazard and Delineation Markings is the primary source for guidance on pavement markings in Ontario. Pavement markings are advisory and do not have legal force on their own but are used to complement other regulatory traffic control devices, including OTM Book 5: Regulatory Signs and OTM Book 6: Warning Signs.

The following is an excerpt from OTM Book 11: "Provincial legislation provides that markings may be placed by the road authority having jurisdiction for the purpose of regulating, warning or guiding traffic" (Section 182 of the Highway Traffic Act (R.S.O.1990)). Pavement and curb markings, being exclusively within the boundaries of public highways, should only be placed by the road authority. Delineators and object markers that are within the highway right-of-way are subject to the same jurisdictional regulations.

Markings and delineation serve an advisory or warning function, and do not have legal force of their own. They may be used to complement other traffic control devices enforceable under the HTA, its Regulations, or a municipal by-law, but their enforceability derives from the main regulatory traffic control device, not from the markings or delineation.

> "To avoid possible conflict or confusion, the meaning of markings and delineation should be checked against the prevailing traffic laws and regulations before they are installed or removed."
>
> (OTM Book 11 (2000) pg. 13)

SIGNAGE

REGULATORY FOR ON-ROAD PORTIONS OF THE NETWORK

OTM Book 5: Regulatory Signs, is the primary reference in Ontario for regulatory type signs, such as stop signs, speed limit signs and designated bike lane signs. As stated on OTM Book 5, “Regulatory signs are intended to instruct road users on what they must or should do (or not do) under a given set of circumstances”. The term regulatory sign describes a range of signs that are used to indicate or reinforce traffic laws, regulations or requirements which apply either at all times or at specified times or places upon a street or highway, the disregard of which may constitute a violation. The regulatory signs described in this Book have different levels of legal status, enforcement regime and penalties for violation, depending on their individual governing authority.

Some signs are enforceable directly under specific sections of the Highway Traffic Act (HTA) or other legislation, others under more general provisions of the HTA and its Regulations and still others only under duly enacted municipal by-laws. Some of the regulatory signs in this Book are not directly enforceable themselves but are used to reinforce regulatory conditions contained in legislation, such as Rules of the Road. The term “prescribed signs” refers to signs described in HTA Regulations, while the term “official signs” refers to signs not included in the HTA Regulations, but approved by the Ministry of Transportation of Ontario and appearing in the Ontario Traffic Manual. (OTM Book 5 (2000) pg. 11.

Figure 13 – Examples of Active Transportation Regulatory Signage Source: Ontario.ca

WARNING FOR ON-ROAD PORTIONS OF THE NETWORK

Warning signs inform road users of dangerous or unusual conditions ahead such as a curve, turn, dip or side road. They are usually diamond-shaped and have a yellow background with black letters or symbols. OTM Book 6: Warning Signs, is the primary reference for the application of warning signs in Ontario. Warning signs are considered “official signs” approved by the Ministry of Transportation of Ontario and include the Share the Road sign.

Additional details regarding signage types and potential application can be found in section 4.0 of OTM Book 18 and should be considered. In addition to the guidelines, Middlesex County and its local municipalities should use the following considerations to guide decision-making regarding the application of Share the Road signs throughout the County:

- The route is identified in the Middlesex County Cycling Strategy;
- Signs should be erected in locations where:
  - Sightlines are limited, for example where there are changes to the horizontal or road vertical alignment (hills and/or curves);
  - The cycling facility transitions, for example where a bike lane transitions to a shared use lane;
  - Busy street activity such as on-street parking occurs which has the potential to distract motorists, such as on-street parking;
  - Unusual road characteristics exist, such as very narrow lanes or where a road configuration or cross section changes;
  - The signs may serve to provide motorists with advance notice of the presence of cyclists beyond the motorist’s immediate line of sight
  - Regular cycling activity is observed on rural roads and paved shoulders are absent.

Share the Road signs should not to be used in substitution of any other provincially recognized regulatory sign or as wayfinding/ route markers.

Figure 14 – Examples of Cycling Specific Warning Signs; Source Ontario.ca

OFF-ROAD PORTIONS OF THE NETWORK

For the off-road portions of the cycling network the County and local municipalities should incorporate a "family" of signs with unifying design and graphic elements, materials and construction techniques that become immediately recognizable to the user. The following are sign types typically found in family of signs.

ORIENTATION & TRAILHEAD

- Typically located at key arrival and destination points, and when transitioning across the County boundary.
- Provide orientation to the network through mapping, network information and rules and regulations.
- Useful landmark where network nodes are visible from a distance.
- Can be used as an opportunity to sell advertising space. May help to offset the cost of signs and/or trail.
- Must comply with AODA regulations regarding information provided to users to enable them to make their own decision to use the trail or not before beginning their journey.

USER ETIQUETTE

- Should be posted at public access points to clearly articulate permitted uses, regulations and laws that apply, as well as trail etiquette, safety and emergency contact information.
- At trailheads, this information can be incorporated into trailhead signs.
- In other areas, this information can be integrated with access barriers.

ROUTE MARKER & DIRECTION

- Should be located at key network intersections and at regular intervals along long, uninterrupted sections of network.
- Purpose is to provide a simple visual message to users that they are travelling on the designated trail.
- May include the network logo or "brand" and communicate other information to users such as directional arrows and distances in kilometres to major attractions and settlement areas.

INTERPRETIVE

- Should be located at key trail features having a story to be told. These features may be cultural, historical, or natural. Interpretive signs should be highly graphic and easy to read.
- Should be located carefully in highly visible locations to minimize the potential for vandalism.

REGULATORY

- Required throughout the system. Where traffic control signs are needed (stop, yield, curve ahead etc.), it is recommended that recognizable traffic control signs be used (refer to the Ministry of Transportation for Ontario's (MTO) Ontario Traffic Manual series.
- Signs should be considered for implementation along proposed multi-use trails or in locations where conditions may change and users should be made aware.
- Warning signs are used to highlight bicycle route conditions that may pose a potential safety or convenience concern to network users.

R4 Establish a consistent signage and wayfinding strategy approach for both on and off-road cycling routes throughout the County.

TRANSITIONS

Though it is most desirable to utilize the same facility type over long distances, the reality of roadway conditions and surrounding context necessitate transitions from one facility type to the next where conditions change. OTM Book 18 provides guidance on transitions from one cycling facility type to the next and guidance on transitioning facilities through challenging locations such as bridges, overpasses and underpasses, and through road intersections.

The current version of OTM Book 18 provides limited guidance regarding trail crossings though it is anticipated the update, currently underway will provide more substantial guidance. In the interim, designers need to rely on industry best practices. **Figure 15, Figure 16** and **Figure 17** are suggested for consideration by the County and local municipalities when designing off-road multi-use trail crossings at roadways.

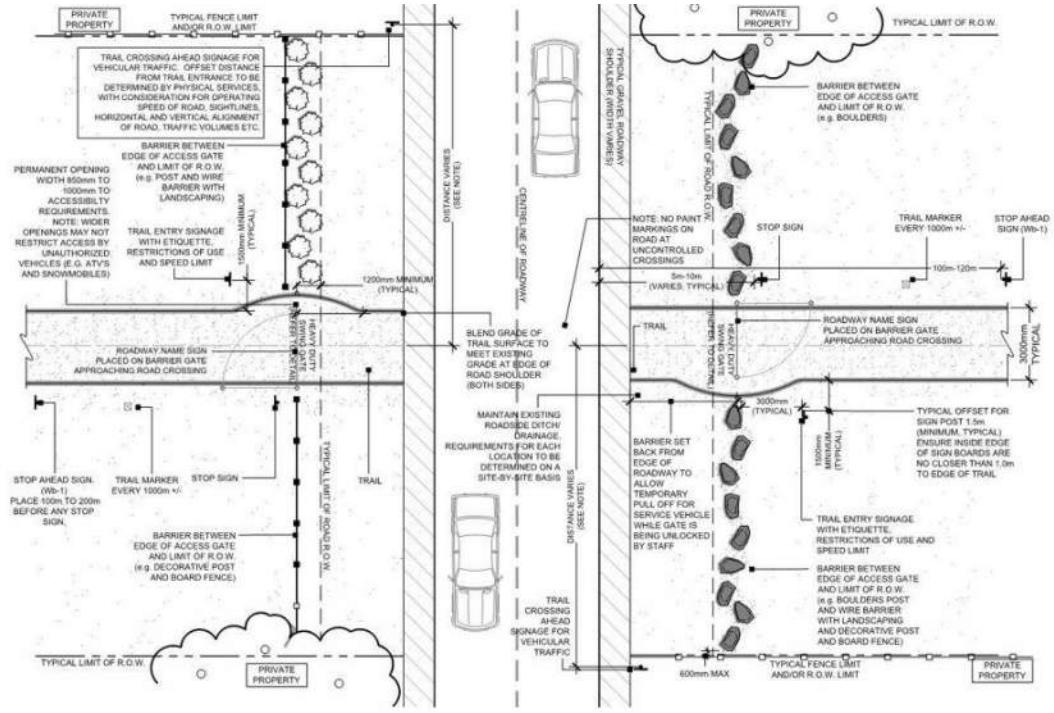


Figure 15 - Design Considerations for Trail Crossings of Rural Roads

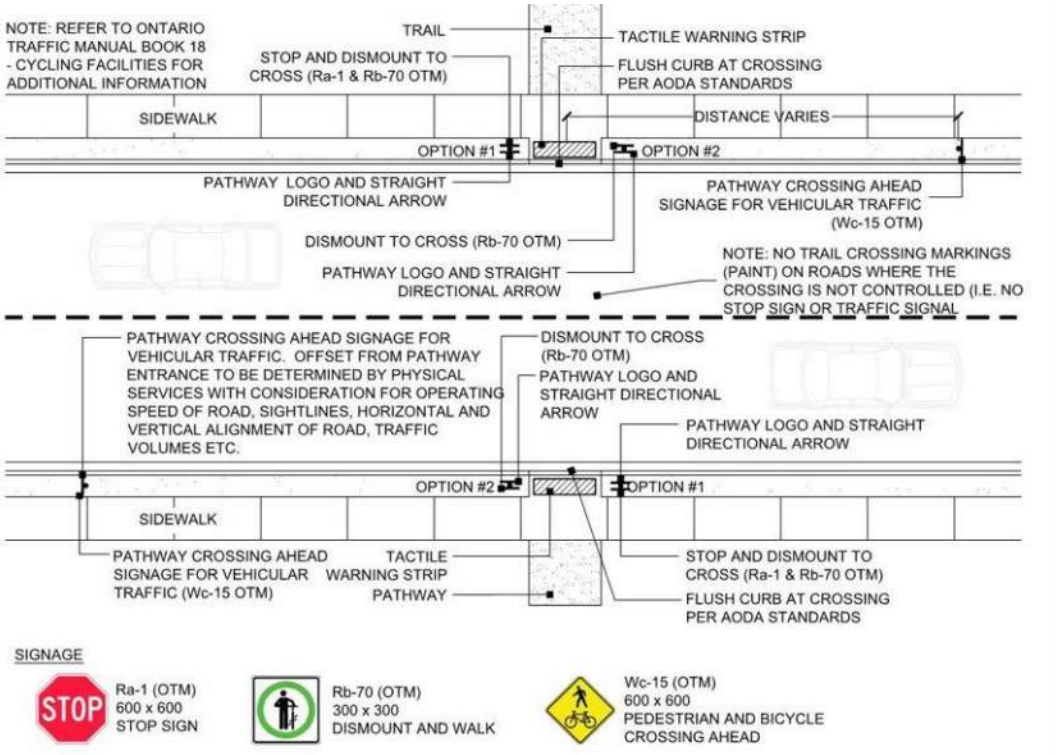


Figure 16 - Design Considerations for Uncontrolled Mid-block Trail Crossings of Urban Roads

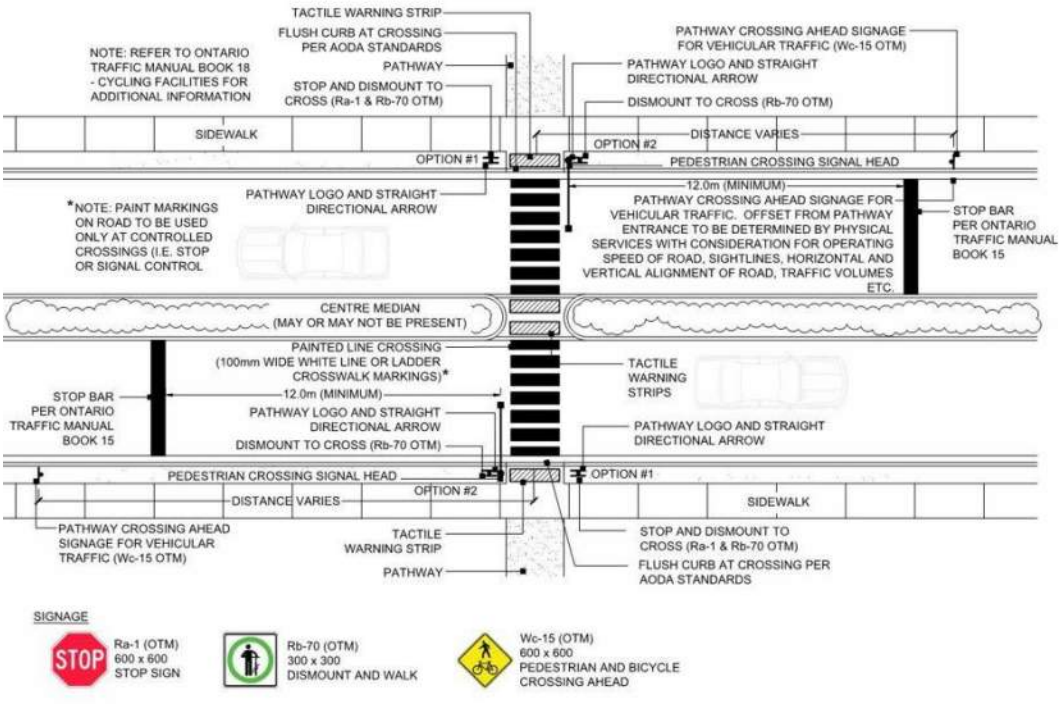


Figure 17 - Design Considerations for Controlled Mid-block Trail Crossings of Urban Roads

Signal controlled trail crossings may include incorporation of the crossride, which enables a cyclist to cross without being required to dismount and otherwise be in violation of the Highway Traffic Act.

Key features of the crossride at a signal-controlled location include a separate dedicated zone for pedestrians and cyclists to use while crossing, and a bicycle signal which is integrated into the signal control system at the intersection. With the addition of the crossride the space occupied by the crossing is between 5.0 and 6.0m in width as illustrated in the image of the Finch Hydro Corridor Trail in Toronto (below left).

For low volume crossings, such as at stop-controlled intersections where the cyclist and pedestrian volumes are low the mixed crossride may be used. The mixed crossride occupies 4.0 to 5.0m. Additional details regarding the crossride is included in OTM Book 18.

The recent update to OTM Book 15 – Pedestrian Crossing Treatments introduced the Pedestrian Crossover (PXO). The PXO provides designers with additional tools for addressing sidewalk and trail crossings of roads which provide a higher level of control than the simple signed crossing as illustrated in **Figure 16**, and can be applied where crossing demand is lower and at a lower cost than the Mid-block Pedestrian Signal. Typically used in urban locations, some municipalities are exploring their use in rural locations for major trails. The image to the right below illustrates a PXO along the Trans Canada Trail in Essex County. It is important to note that the PXO cannot include the addition of the crossride, and as such, cyclists are legally obligated to dismount and walk their bicycles from one side of the road to the other.

R5 Use other Ontario Traffic Manuals as a supportive resource for the design and marking of on-road cycling routes, and best industry practices for the design of the off-road portions of the cycling network.

BICYCLE PARKING

Bicycle parking facilities are an important element of the cycling system. For some users, reliable and secure parking facilities can be the key factor in their decision to make a trip by bicycle or not. Basic bicycle racks can be provided for short term parking, while bike lockers or bike cage style parking facilities are more appropriate for long-term parking. Some key design features of good bicycle parking facilities include the following:

- They support the bicycle upright by its frame in two places and prevent the wheel of the bicycle from tipping over;
- Enable the frame and one or both wheels to be secured;
- Support bicycles without a diamond-shaped frame with a horizontal top tube
- Allow a U-lock to be used to lock the front wheel and the down tube of an upright bicycle; or the rear wheel and seat tube of the bicycle; and
- The rack element should also be designed to resist being cut or detached by common hand tools such as bolt and pipe cutters, wrenches and pry bars which can easily be concealed in backpacks.

Where bicycle parking demand is higher and the single basic post and ring style rack which accommodates up to two bicycles is not sufficient, there are units available which can be mounted to a common base or arranged in a regular array and fastened to a common mounting surface. **Figure 18** illustrates some of these examples.

Figure 18 – Bicycle Parking Types

An option for longer term parking is the bicycle locker, which is weather-protected, enclosed and operated by a controlled access system that may use keys, swipe card (key fob) or an electronic key pad located on a locker door. Some locker systems are set up for multiple users (i.e. coin operated or secured with personal locks). On average, two standard car parking spaces (of 5.6 m x 2.6 m each) can accommodate 10 individual bicycle locker spaces but this may differ depending on the locker model. Because the cost per bicycle and the footprint of the unit is significantly higher than the bicycle rack, lockers are usually more appropriate for locations such as train or bus stations where users may be leaving their bicycle for an entire day or longer.

The following are some of the key considerations to address when implementing bicycle parking.

1. Bicycle racks should be placed as close as possible to the entrance of the building that it serves, but not in a location where they would inhibit pedestrian flow. Where possible rack areas should be no more than 15 m from an entrance, and should be clearly visible along a major building approach line.

2. Bicycle rack areas that are hard to find or that are located far from a building entrance are generally perceived as vulnerable to vandalism and will generally not be used by cyclists. The parking site should be clearly visible and well lit.

3. Large bicycle rack areas with a high turnover rate of arriving and departing cyclists should have more than one entrance to help facilitate user flow.

4. If possible, the rack area should be sheltered to protect the bicycles from the elements by placing awnings and overhangs above the rack area.

Where racks are grouped together the recommended minimum width between aisles should be 1.2 m to provide enough space for one person to walk with one bicycle. Aisle widths of 1.8 m are recommended in high traffic areas where many users may be retrieving their bicycles at the same time.

R6 Develop an approach and policies at the County and local municipal level to provide bicycle parking at appropriate locations throughout Middlesex.

3.3 Planning

The future development and implementation of cycling infrastructure and programming will require the support of policy and strong planning principles. As noted in section 2.2 there is already a strong foundation of policy and planning support for cycling at the provincial and municipal level; however, at the County level there is still some room for improvement and enhancement. The following are some emerging planning trends which are intended to be considered when County and local municipal policies are reviewed, revised or developed.

i COMPLETE STREETS

Complete Streets are designed to be safe for all users; pedestrians, cyclists, transit users, motor vehicle drivers, and people of all ages and abilities. The Complete Streets approach ensures that transportation planners and engineers consistently design and operate the entire street network for all road users, not only motorists. The concept of Complete Streets is based on the principle that streets are designed for everyone.

Complete Streets are meant to be designed and operate to allow for safe access by all potential users including pedestrians, cyclists, motorists, transit users, etc. depending on the content and function of the street.

The key to Complete Streets is that their design accommodates people of various ages and abilities. Complete Streets can be implemented in both urban and rural environments and support streets as public spaces and destinations rather than just transportation corridors.

R7 The County and local municipalities should consider a Complete Streets approach when redeveloping roads.

ii NEW DEVELOPMENT AREAS

Cycling network routes are an integral part of the community fabric and an important part of the land development process. Developers should be expected to work through an iterative process with municipal staff, beginning early in the planning stages to create appropriate cycling network routes within their development area that reflects the intent of the Cycling Strategy. Providing the development industry with information about the cycling network, including desired connections and design expectations will help to improve communication among all parties involved. Proposed networks should provide routes that overcome physical barriers, and make appropriate connections to important destinations and enhance connectivity with the existing and planned system surrounding the development area.

Ideally, in new development areas routes should be constructed prior to or concurrently with the construction of other infrastructure and homes. When construction / implementation is deferred until homes are built there can be conflict when residents adjacent to planned cycling and trail corridors claiming that they were not aware of plans for construction even if this intention has been clearly indicated in municipal planning documents. Developers and home builders are encouraged to be proactive about notifying prospective buyers where routes are to be located at the time they are selling lots to help alleviate challenges at a later date.

Where trails are associated with new community development, planning for them early in the development process also ensures that linkages are in the best locations and that they are implemented outside of sensitive and protected environmental features wherever possible. One solution to the challenge of trails within environmental buffers is to dedicate linear trail blocks parallel to buffers that are established specifically for trails. This eliminates the challenge of construction within sensitive areas where the limit of the trail block coincides with the limit of construction/grading, enabling construction of the trail as part of the development of the neighbourhood. Dedicated blocks also allow prospective homebuyers clearly understand planned trail locations and think about implications the trail may have on their personal enjoyment / privacy prior to making a purchase.

R8 The County and local municipalities should develop appropriate policies to ensure that on-road cycling routes and off-road trails are incorporated into new neighbourhoods and communities as an integral part of the land development process.

NATURAL AREA TRAILS

Some of the off-road trail links proposed in the Middlesex Cycling Strategy pass through or nearby natural areas. Striking the balance between providing public access and protecting the natural resource can be difficult to achieve, in particular locations where trails are located near or within or adjacent to urban areas.

Proper planning, designing and construction of trails, coupled with public education can assist in creating the balance between use and protection.

Where a proposed trail route passes near or through an environmentally sensitive area an Environmental Impact Study (EIS) should be completed to assess the potential trail impact and to identify design and construction mitigation measures early in the design and approval process. Regular post-construction monitoring will alert trail managers to locations where users may be straying off the trail, so that mitigation strategies can be developed before significant damage to natural features occur.

Cyclists on the Thames Valley Parkway Trail; Source: WSP

iv LINEAR CORRIDORS

Pipeline and hydro corridors, are examples of linear corridors that provide excellent opportunities for trail development and should be considered for the development of cycling routes in urban centres. Utility lines in urban areas often have a substantial easement, and in many cases are used informally as trail routes as they tend to provide direct connections to a variety of destinations over and long distance.

When the alignment and design details are properly considered trails can also serve as emergency and service access routes to assets within the corridor. For example, some municipalities have adopted policies and practices to make emergency service access to manholes mandatory along sanitary sewer lines in river valleys in the event of an emergency such as a sewer line blockage.

Unopened road allowances and former railway corridors offer similar opportunities in rural areas. In the case of former railway corridors, these can often serve as linkages between communities given that railways historically were key transportation corridors between communities.

R9 Recognize that linear corridors such as hydro and utility corridors, unopened road allowances and former railway corridors offer excellent opportunities as cycling network routes. Ensure that opportunities to utilize these type of corridors as part of the cycling network are carefully explored so they can be capitalized on wherever feasible.

Pine Road unopened road allowance south of Coltsfoot Drive, Newbury provides an off-road cycling route link opportunity. Source: WSP

Chapter 4.0 Implementation

The Strategy is intended to be used as a long-term guide and blueprint that provides support and tools to address the key aspects related to cycling planning and design. A comprehensive and phased implementation strategy is the primary tool which can be used to achieve this, identifying an approach to implementation which is integrated with current decision making at County and local level. Understanding the wider impact on planning is vital to future planning. A phased implementation strategy for Middlesex County includes both infrastructure and program initiatives, as well as associated costs. The implementation plan is intended to be integrated with the County and local municipal initiatives and programs and complement infrastructure works.

Contents of chapter 4.0 include...

Purpose of chapter 4.0...

Chapter 4.0 is intended to be used as a means of:

COMMUNICATING — Suggested timelines for implementation which can be utilized by the County and Local Municipal partners.

EDUCATING — Staff and stakeholders on the operations and maintenance considerations which will need to be addressed beyond implementation.

DOCUMENTING — Strategies to support implementation including the overall cost as well as funding strategies and partnership opportunities.

4.1 Phasing

The implementation of cycling infrastructure described in the Cycling Strategy is intended to be flexible in nature to enable the County and local municipalities to make adjustments to the recommended routes and timing for implementation based on changing conditions, opportunities that were not known at the time the Strategy was developed and potential outside funding sources. The proposed network phasing is based on a short-term of 0-10 years, and a long-term phase beyond 10 years. A flexible implementation timeline gives County and Municipal Councils ample time to allocate funding over a time horizon that allows for the integration of cycling projects into capital plans.

Implementation of the cycling network can be guided by a number of key principles. They were used to inform the identification of priority linkages for the cycling network. With the adoption of the Cycling Strategy, the County and its local municipalities should review and adapt these principles to help prioritize additional network opportunities as they arise. The following key principles were used in the development of the phasing plan:

1 ALIGNING

Aligning implementation of cycling infrastructure with known infrastructure development or improvement projects.

2 ACCESS

Establishing cycling connections and corridors to improve access between settlement areas within the County and to important community destinations.

3 QUICK WINS

Capitalizing on "quick win" low implementation cost opportunities.

4 CLOSE GAPS

Closing gaps in the existing network, where the completion of a small missing link results in the creation of a significantly longer, continuous connection.

5 SPINE

Providing spine connections between the City of London and settlement areas within the County.

6 INTEREST

Building where local interest is strong, where funding is available and / or where partnerships have already been established.

7 VOLUME

Focusing on areas where current cycling volumes are highest, and/or where the highest demand is anticipated.

8 CONSIDER

Considering opportunities as they arise, which were not known at the time the Cycling Strategy was completed, and requests from stakeholders and the public.

Implementation consists of two phases over a twenty year plus time period; a short term (0-10 years) and long term (beyond 10 years). The recommended phasing is illustrated in **maps 4-1** through **4-9**. The mapping includes a county-wide map for overall context and connections to surrounding municipalities as well as individual maps for each of the local municipalities. Individual municipal maps include enlargements of built-up / urban areas where appropriate.

4.1.1 Short Term Network

The short-term phase includes the implementation of just over 205 km of cycling facilities, broken out by facility type as described in **Table 7**. **Appendix D** provides further detail on a route-by-route basis, and organized based on jurisdiction.

FACILITY TYPE	TOTAL DISTANCE (km)
Proposed Multi-use Trail	4.5
Proposed Buffered Paved Shoulder	22.3
Proposed Paved Shoulder	20.2
Proposed Signed Route	155.7
Proposed Cycle Track	0
Proposed Bike Lane	3.9
TOTAL SHORT TERM	206.5 km

Table 7 – Proposed Network Length by Facility Type in the Short Term

A significant portion of the cycling network is proposed to be signed cycling routes. Signed routes constitute the bulk of the proposed cycling network due to the relatively low vehicle volumes on which these routes are proposed. They cater to experienced cyclists as well as recreation and leisure cyclists by virtue of their location on relatively low-volume roads. Share-the Road signage should be implemented to advise motorists to expect to encounter cyclists on these roads.

Following signed routes, an emphasis has been placed on introducing buffered paved shoulders and paved shoulders to corridors with higher vehicle volumes. Buffered paved shoulders and paved shoulders provide a greater degree of horizontal separation between motorists and cyclists where it is recommended as per the facility selection criteria as outlined in OTM Book 18. These roads with higher vehicle volumes are generally those that that connect settlement areas to one another and represent corridors that represent the most direct route.

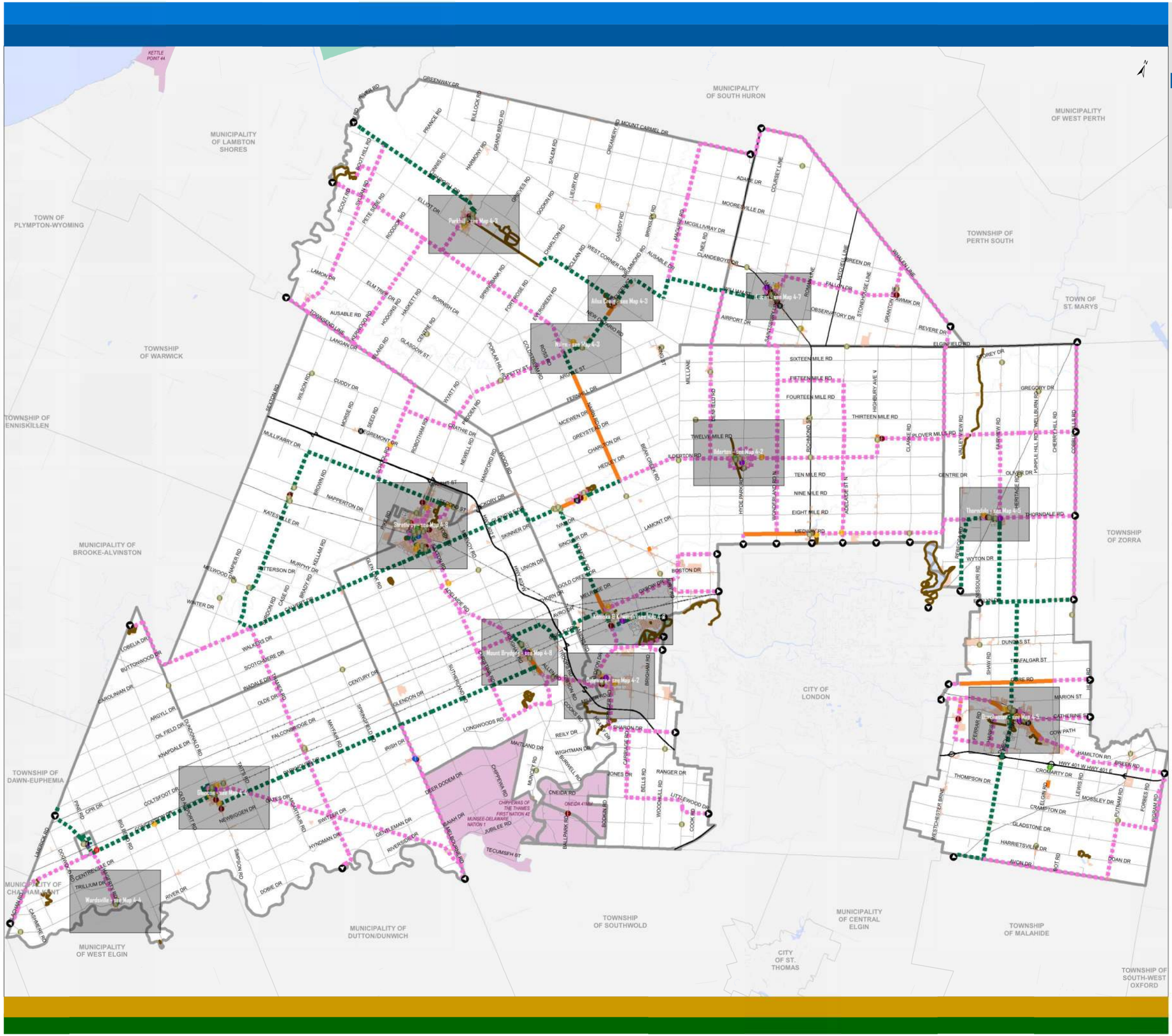
The routes identified in the short-term as candidates for buffered paved shoulders and paved shoulders are generally those that fill gaps in the cycling network and represent “low hanging fruit” relative to other cycling corridors.

MAP 4-1

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

MIDDLESEX COUNTY

JUNE 2018



Legend

Network Phasing
- Short Term
- Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 2.5 5 10 Km

MIDDLESEX COUNTY CYCLING STRATEGY

wsp middlesex county

MAP 4-2

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

MUNICIPALITY OF MIDDLESEX CENTRE

JUNE 2018

Strathroy - see map 4-8

Ilderton - see inset map

Komoka & Kilworth - see inset map

Mount Brydges - see map 4-8

Delaware - see inset map

Delaware

Ilderton

Komoka & Kilworth

Legend

Network Phasing
- Short Term
- Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.
Parcel data © Teranet Enterprises Inc. and its suppliers.

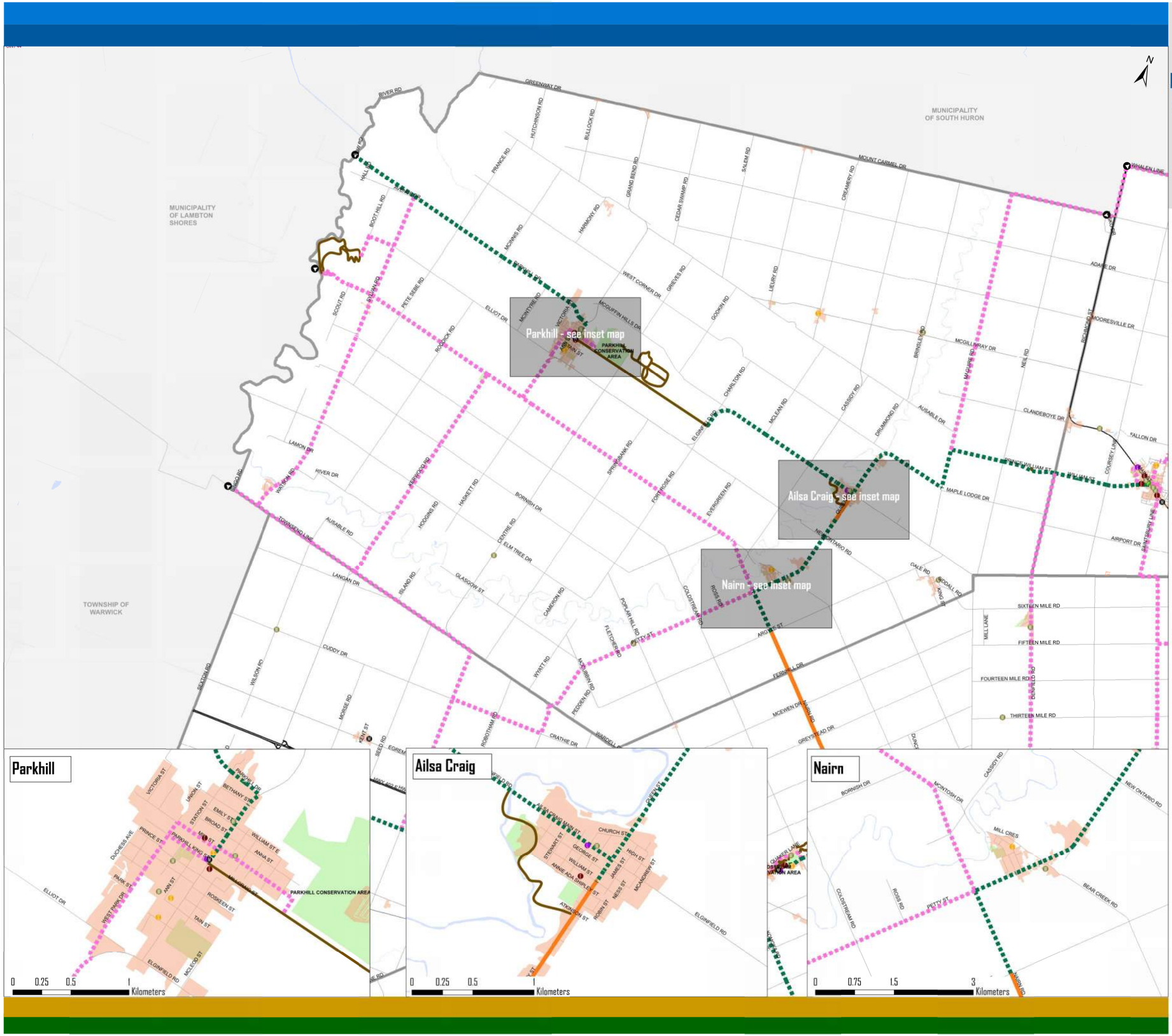
wsp middlesex county

MAP 4-3

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

MUNICIPALITY OF NORTH MIDDLESEX

JUNE 2018



Legend

Network Phasing
- Short Term
- Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1.25 2.5 5 km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

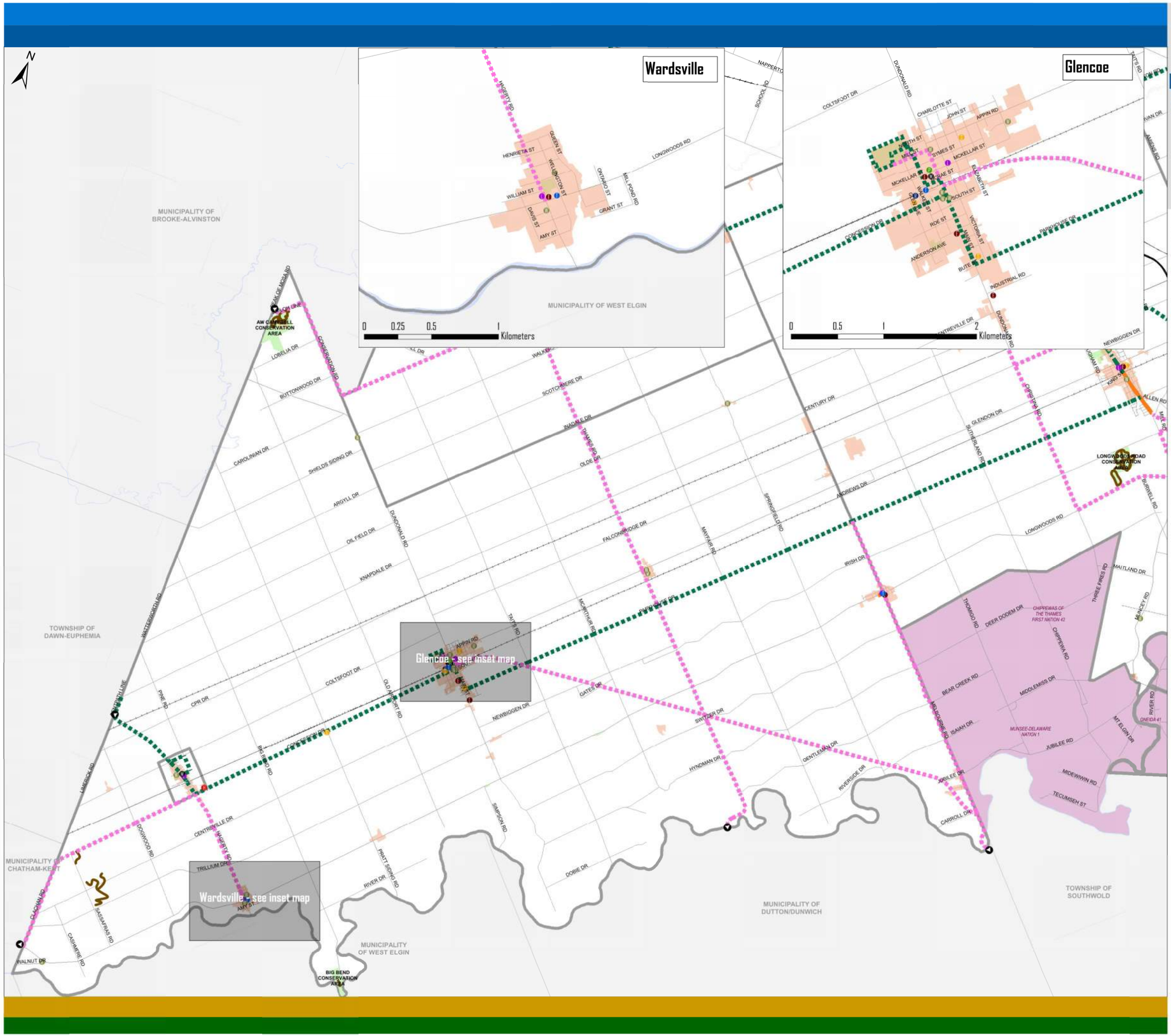
wsp middlesex county

MAP 4-4

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

MUNICIPALITY OF SOUTHWEST MIDDLESEX

JUNE 2018



Legend

Network Phasing
- Short Term
- Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1 2 4 Km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

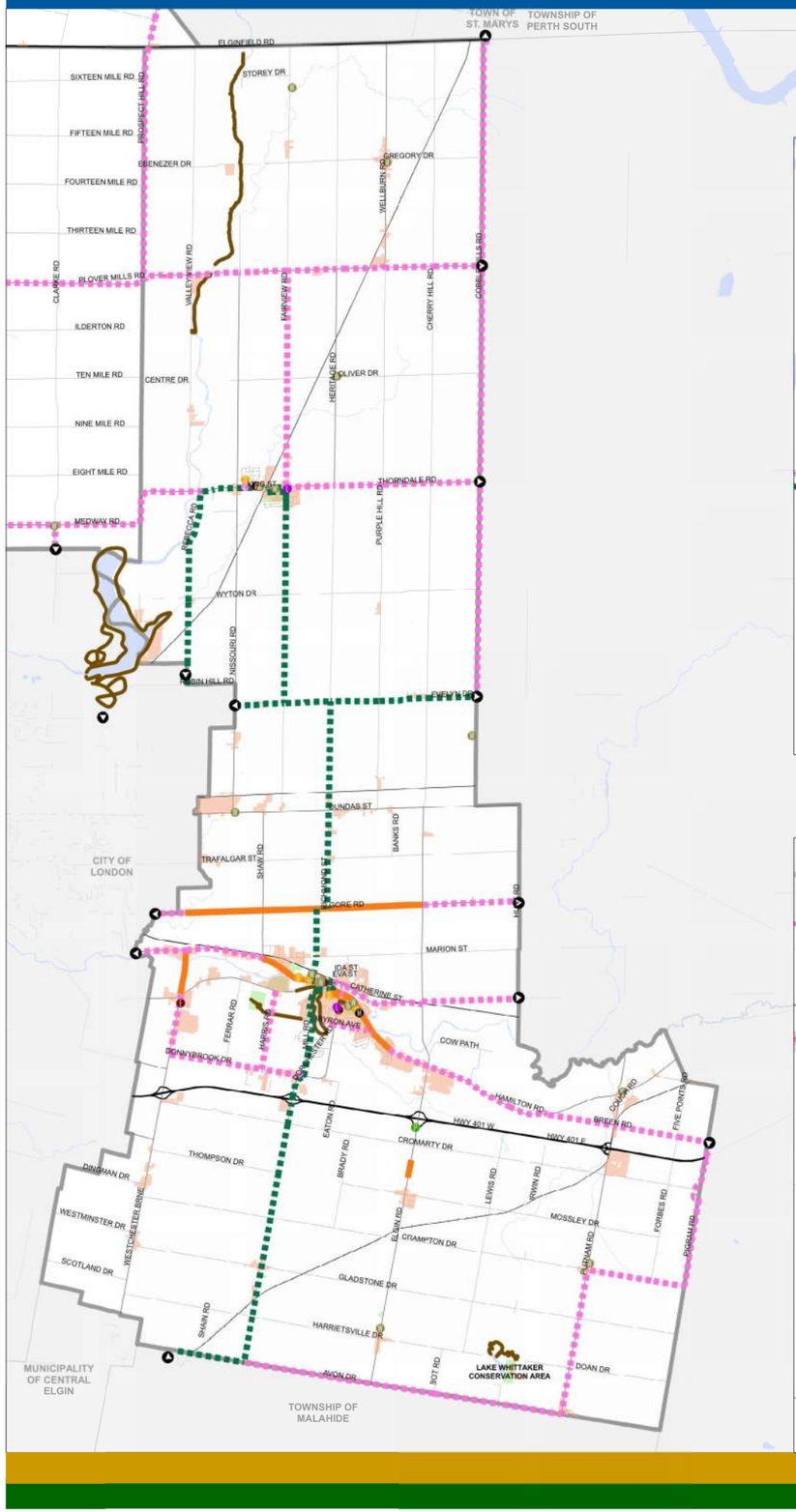
wsp middlesex county

MAP 4-5

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

MUNICIPALITY OF THAMES CENTRE

JUNE 2018



Legend

Network Phasing
- Short Term
- Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1.5 3 6 km

MIDDLESEX COUNTY CYCLING STRATEGY

MAP 4-6

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

TOWNSHIP OF ADELAIDE-METCALFE

JUNE 2018

Legend

Network Phasing
- Short Term
- Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1 2 4 Km

MIDDLESEX COUNTY CYCLING STRATEGY

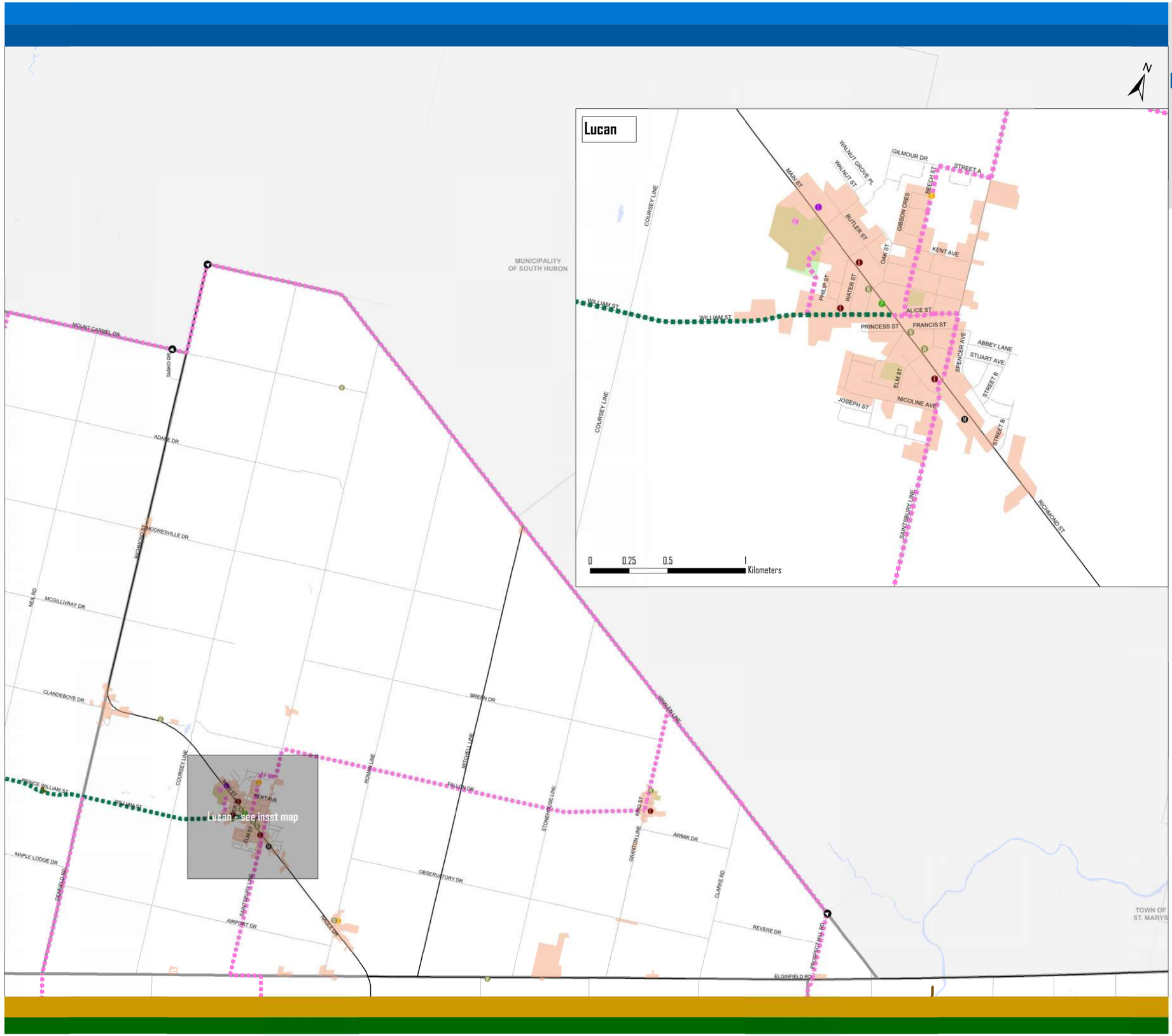
wsp middlesex county

MAP 4-7

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

TOWNSHIP OF LUCAN BIDDULPH

JUNE 2018



Legend

Network Phasing
- Short Term
- Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 3.75 7.5 15 Km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

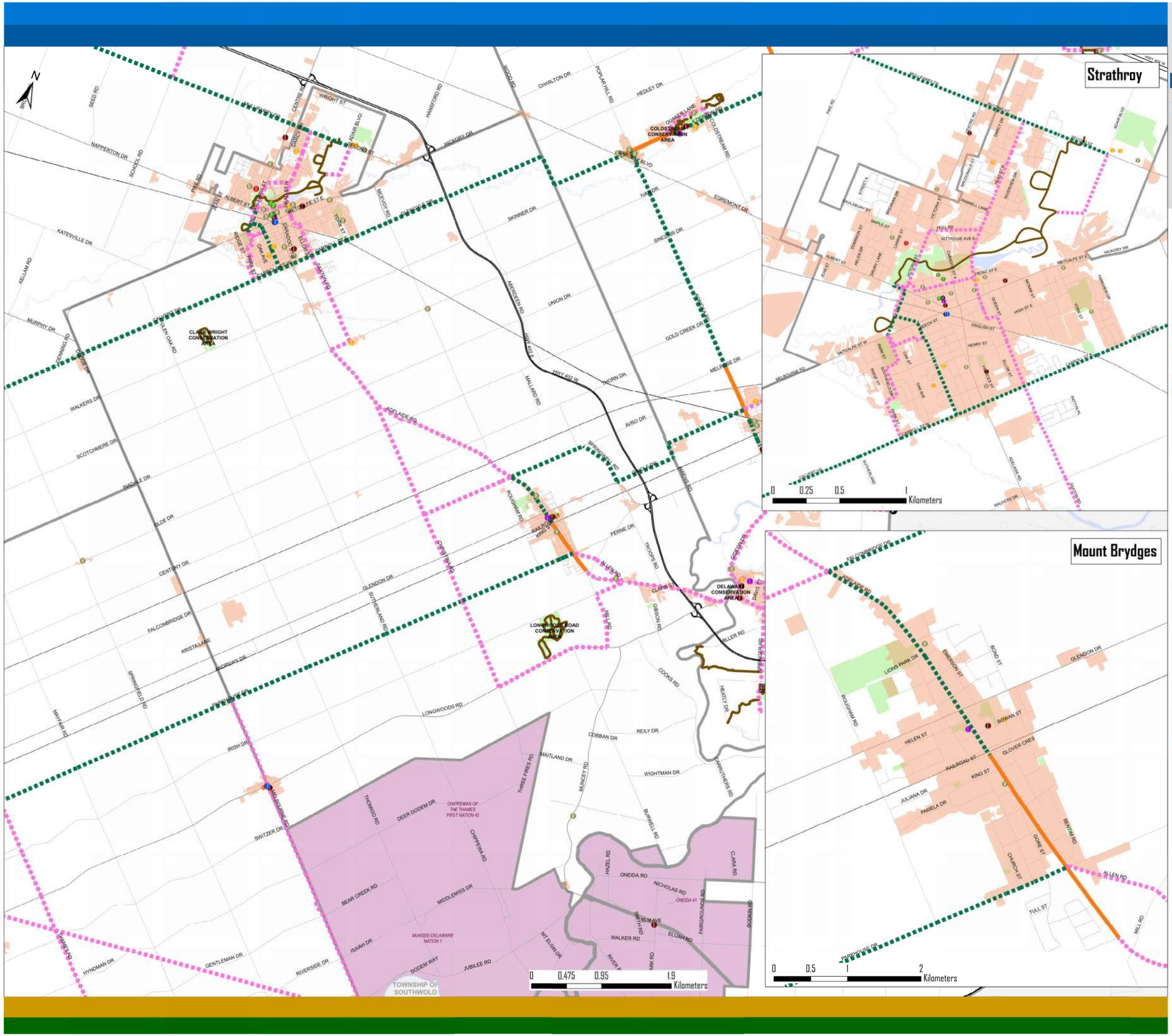
wsp middlesex county

MAP 4-8

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

TOWNSHIP OF STRATHROY-CARADOC

JUNE 2018



Legend

Proposed Network Phasing
- Proposed Short Term
- Proposed Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
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- Community / Recreational Centre

Transportation Features
- Provincial Highway
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- Proposed Road
- Discontinued Railway
- Operational Railway
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Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 1 2 4 km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

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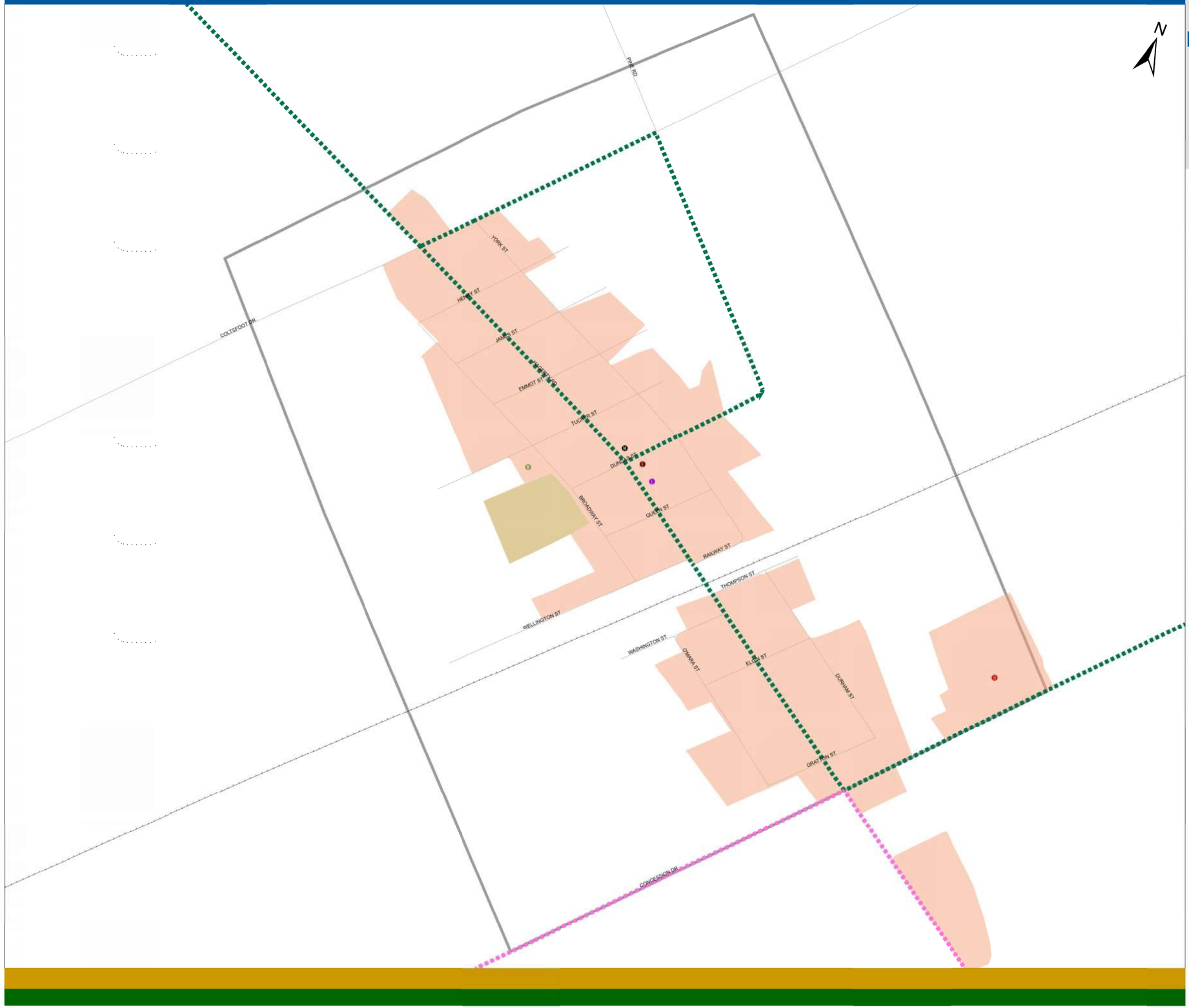
MAP 4-9

DRAFT CYCLING NETWORK WITH PROPOSED NETWORK PHASING

VILLAGE OF NEWBURY

JUNE 2018



Legend

Proposed Network Phasing
- Proposed Short Term
- Proposed Long Term

Existing Trails
- Existing Off-Road Trail
- Existing Paved Shoulder

Key Community Destinations
- Hospital
- Libraries
- Municipal Office
- Place of Worship
- Public Parking
- Transit Station
- Emergency Service
- School
- Railway Station
- Community / Recreational Centre

Transportation Features
- Provincial Highway
- County Road
- Local Road
- Proposed Road
- Discontinued Railway
- Operational Railway
- Cycling Connection to Surrounding Municipality

Other
- Municipal Boundary
- Built Up Area
- Provincial Parkland
- First Nations Land
- Natural Heritage System
- Local Parkland

0 0.05 0.1 0.2 km

MIDDLESEX COUNTY CYCLING STRATEGY

Projection: UTM Zone 17 N. Datum: NAD 1983.
Map Created in April 2018 by WSP Canada.
Spatial data provided by the County of Middlesex, 2017.

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Lastly, multi-use trails, and bike lanes are proposed in the settlement areas and are intended to provide cycling opportunities for residents who want a recreational or utilitarian cycling experience within or near the urban centres. These routes connect residents with local amenities, such as parks, schools, and community centres, and commercial destinations among others.

The following sections provide a brief description of the suggested short-term priorities for each of the local municipalities. In addition, a set of maps have been prepared and inserted into the chapter.

1. MIDDLESEX CENTRE

Map 4-2

1 London, Komoka & Kilworth Connection

Location: Glendon Drive

- This connection utilizes the existing planned investment for Glendon Drive, which is planned to be reconstructed with a boulevard multi-use trail.
- The proposed connection continues into the Municipality of Strathroy Caradoc via Komoka Road and Oxbow Drive, which both provide additional connectivity to the residents of Middlesex Centre, specifically those living in Komoka and Kilworth.
- A recurring comment received as part of the public engagement was the lack of connectivity to and from London, with participants citing that they often drive to London for recreational and leisurely cycling.
- The prioritized connection to the City of London, addresses a key comment received from the public engagement, and prioritizes the recreational connection into London.

2 Komoka to Poplar Hill

Location: Komoka Road

- A second connection is prioritized along Komoka Road, between Oxbow Drive and Ilderton Road.
- This link connects Komoka with the settlement area of Poplar Hill, which gives cyclists the option of continuing west toward Strathroy, or east toward Nairn Road enroute to Lucan.
- By prioritizing the implementation of cycling facilities on Ilderton Road between Komoka Road and Nairn Road, the County is able to fill in a gap in the cycling network and extend the overall length of the cycling network in Middlesex Centre.

2. NORTH MIDDLESEX

Map 4-3

1

Middlesex Centre Connection

Location: Nairn Road

» By adding cycling facilities on Nairn Road between Argyle Street and Petty St, the County can add on to the cycling facilities already in place, thereby extending the length and function of Nairn Road as a cycling linkage.

2

Settlement Connection

Location: Petty Street

» The second priority proposes providing a cycling connection along Petty Street between Nairn and Ailsa Craig, thereby connecting two settlement areas within the municipality.

3

Provincial Network

Location: Parkhill Drive, Parkhill Main Street, Elginfield Road & Existing Off-road Trail

» The third priority involves implementing the Provincial Cycling Network through the municipality. This involves implementing cycling facilities along Parkhill Drive, Parkhill Main Street, the existing off-road trail east of Parkhill, and Elginfield Road leading into Ailsa Craig.

» The Provincial Cycling Network extends east of Ailsa Craig on Queen Street, W., Corner Drive, Maguire Road, and Prince William Street, where it ends at Denfield Road.

» The Provincial Cycling Network is prioritized through the municipality given its function as a major recreation and cycle tourism route with connections to regional routes.

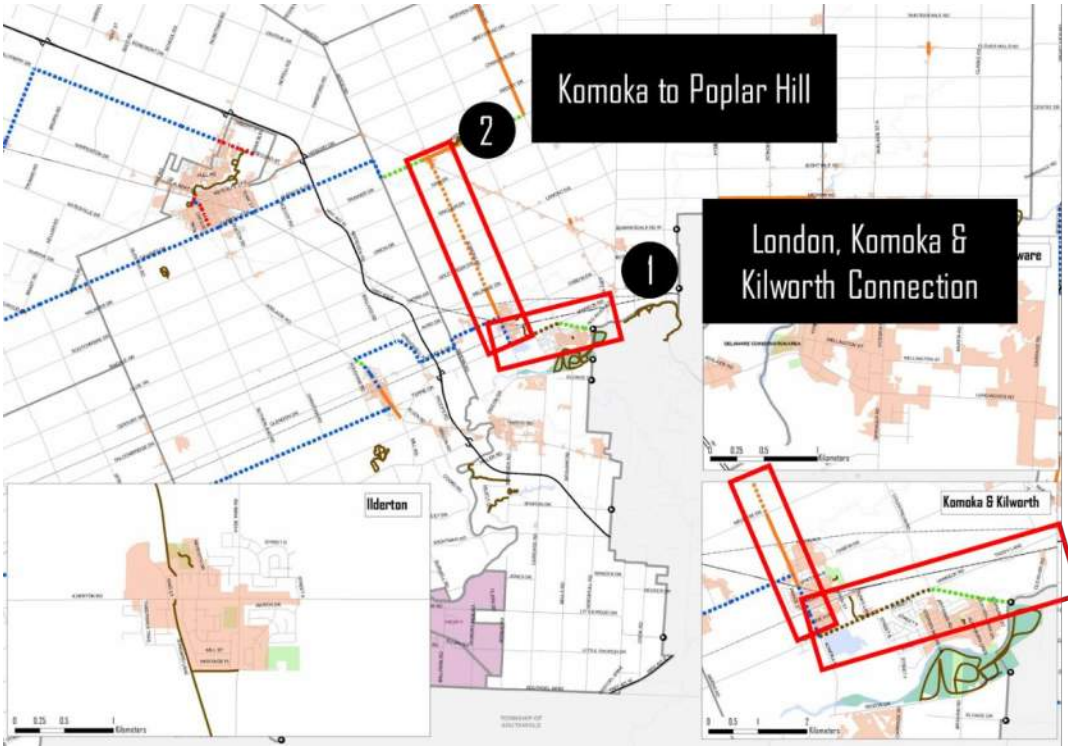

Figure 19 – Short Term Priorities for Middlesex Centre

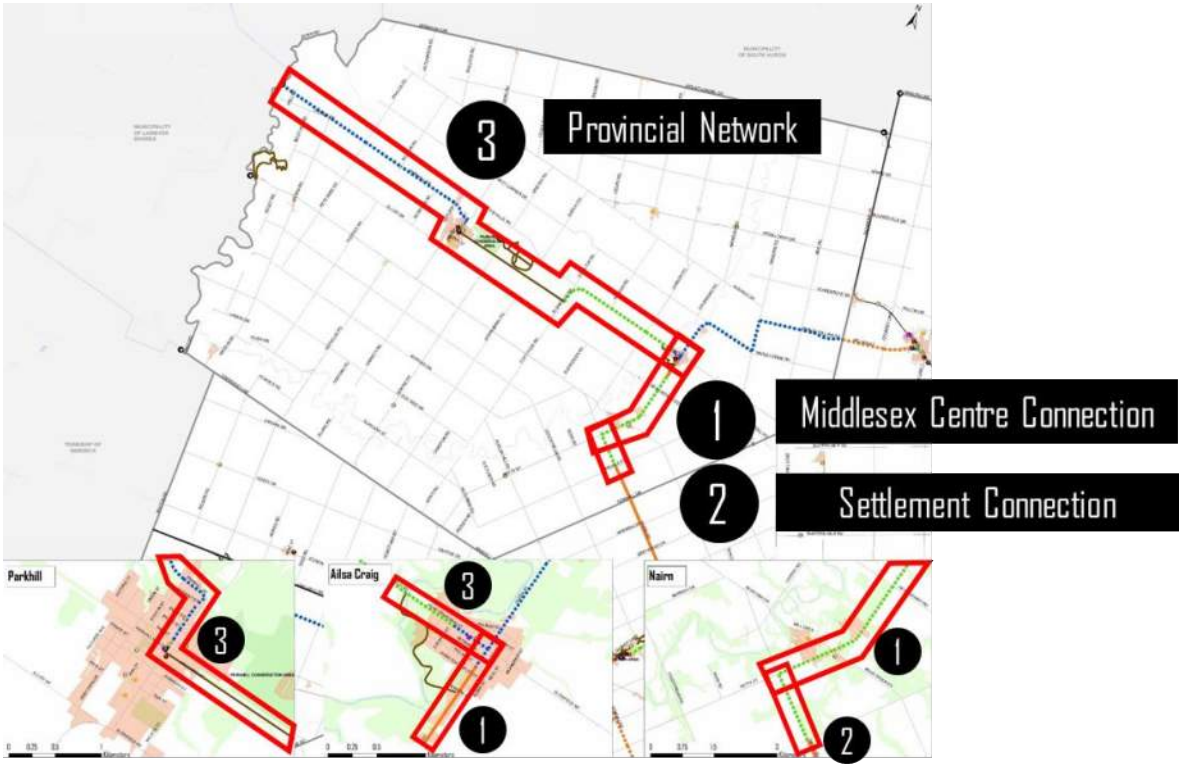

Figure 20 – Short Term Priorities for North Middlesex

3. SOUTHWEST MIDDLESEX

Map 4-4

1 East-West Connection

Location: Parkhouse Drive, Main Street (Glencoe) and Concession Drive

- The priorities influencing the implementation of cycling facilities in the Municipality of Southwest Middlesex include ensuring there was equitable access provided in the form of an east-west route that spanned the entire municipality.
- This east-west route has been identified on Parkhouse Drive, Main Street through Glencoe, and Concession Drive.
- A link is provided from the Village of Newbury to neighbouring Lambton County via Haggerty Road.

2 Settlement Connections

Location: Glencoe

- Within the settlement area of Glencoe, a number of signed routes and multi-use trails have been identified as priorities, giving residents to enjoy cycling infrastructure within their local neighbourhood.

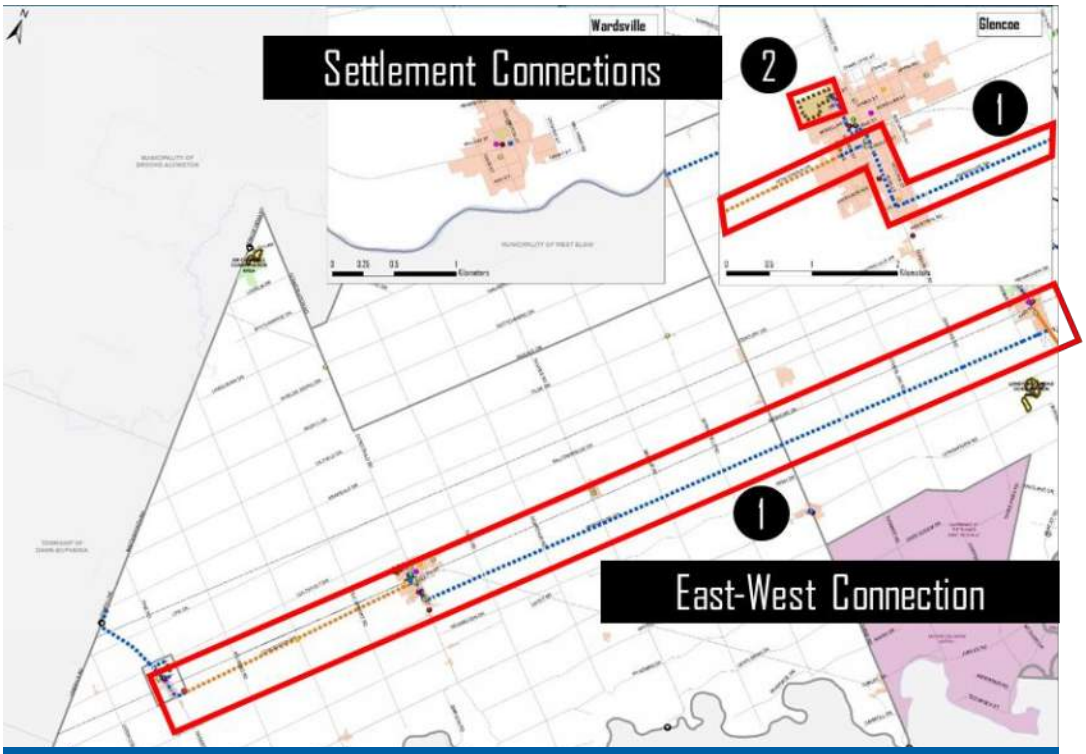

Figure 21 – Short Term Priorities for Southwest Middlesex

4. THAMES CENTRE

Map 4-5

1 North-South Connection

Location: Fairview Street, Richmond Street, Mill Road, Dorchester Road & Rebecca Road

- The north-south corridor involves utilizing a number of different street segments to ultimately link Thorndale with Dorchester, and into the Township of Malahide.
- A second north-south connection which facilitates a cycling connection between the City of London and Thorndale, while also providing a connection to Fanshawe Lake.

2 East-West Connection

Location: Thorndale Road, Evelyn Drive, Catharine Street, Hamilton Road & Avon Drive

- East-west connections are provided as a means of connecting sections of the north-south spine network. Thorndale Road is proposed to have cycling infrastructure that will link up the proposed facilities on Rebecca Road and Fairview Street. This will allow for a direct cycling link through the settlement area and connect the two facilities.
- Evelyn Drive provides a connection between the City of London and Oxford County, as well as connecting segments of the north-south spine network.
- Short segments of Catherine Street and Hamilton Road in Dorchester are proposed, given the gaps that these street segments close as part of the greater north-south network.
- Avon Drive is an east-west link that is prioritized due to its connective function between the cycling facilities along Dorchester Road and the Township of Malahide.

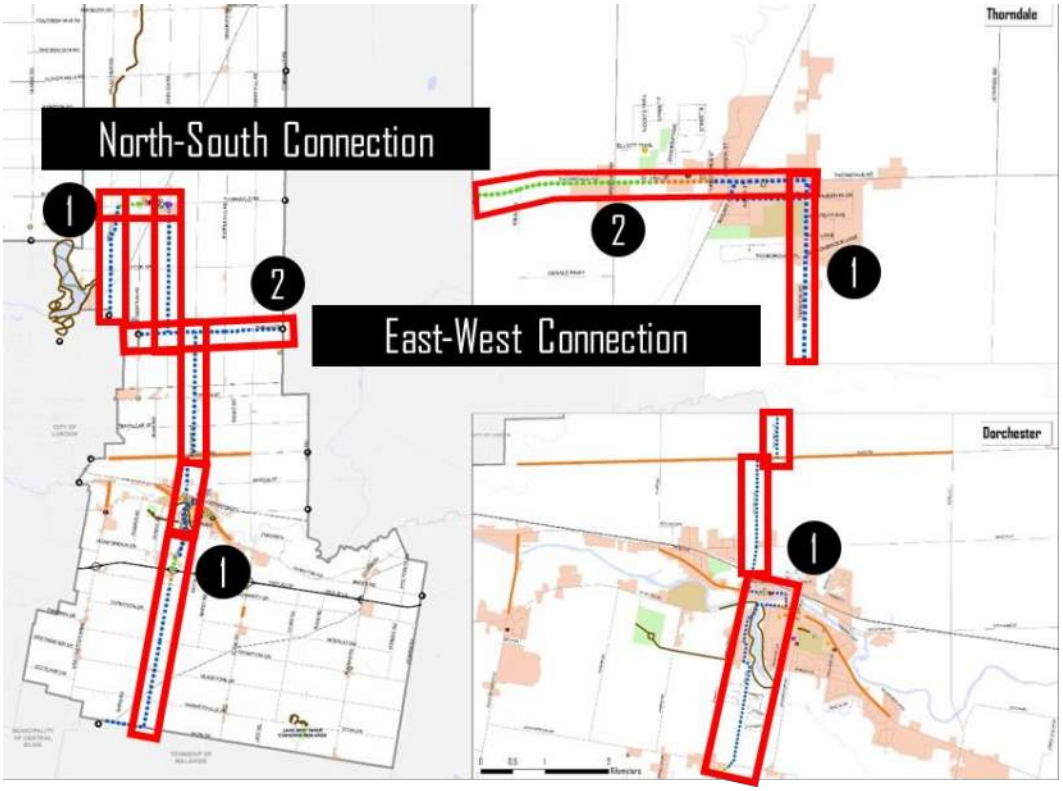

Figure 22 – Short Term Priorities for Thames Centre

Figure 23 – Short Term Priorities for Adelaide Metcalfe

5. ADELAIDE METCALFE

Map 4-6

1

Recreation & Touring Connection

Location: Mullifarry Drive, Kerwood Road, Winter Drive & Calvert Drive

- Cycling facilities prioritized in the Municipality of Adelaide Metcalfe are provided to address recreational and touring cycling within the municipality. The resulting network is a loop that provides for recreational cycling opportunities by utilizing Mullifarry Drive, Kerwood Road, Winter Drive, and Calvert Drive.

6. LUCCAN BIDDULPH

Map 4-7

1

Local Provincial Network Connection

Location: William Street, Denfield Road & Main Street

- The cycling facilities proposed for the short-term in Lucan Biddulph include establishing a connection along William Street, from Denfield Road to Main Street in Lucan.
- This provides Lucan residents and tourists with a cycling connection to the Provincial Cycling Network, which continues south along Denfield Road at William Street.
- This cycling connection seeks to establish a connection between settlement areas within the County, which is established by linking the settlement area of Lucan with the Provincial Cycling Network.

7. STRATHROY CARADOC

Map 4-8

1 Inter-Municipal Cycling Connection

Location: Adelaide Road, Falconbridge Drive, Railroad Street, Springwell Road, Oriole Drive & Amiens Road

- Within Mount Brydges, the addition of cycling facilities along Adelaide Road, between Falconbridge Drive and Railroad Street, is suggested in the short-term to extend the existing cycling facilities already in place south of Railroad Street. The cycling facilities on Adelaide Road are proposed to connect with a route extending into North Middlesex. This connection is provided via Falconbridge Drive, Springwell Road, Oriole Drive, and Amiens Road. This connection between Mount Brydges and Komoka provides a crossing over highway 402 without having to travel through a highway interchange.
- Further, a second inter-municipal cycling connection is prioritized via Parkhouse Drive, which connects with the existing cycling facilities along Adelaide Road in Mount Brydges and extends to the municipal boundary.

2 North-South Connection in Strathroy

Location: McKellar Street, Duke Street, Victoria Street, Albert Street

- Within Strathroy, the addition of cycling facilities on McKellar Street is prioritized, in accordance with the municipality's capital works plan. Duke Street is proposed to connect to McKellar Street, and will provide a link to Victoria Street.
- Victoria Street between Metcalfe Street W., and Albert Street, and Albert Street between Victoria Street and the Strathroy Rotary Memorial Trail in Alexandra Park are also suggested for shorth-term implementation. The routes along Victoria Street and Albert Street will allow for a seamless north-south connection along the west side of Strathroy and creates a continuous cycling network once connected with the Strathroy Memorial Rotary Trail.

3 East-West Connection in Strathroy

Location: Second Street, Calvert Street & Glengygle Drive

- On the north side of Strathroy, Second Street, between Adair Boulevard and the municipal boundary, is prioritized to receive cycling facilities.
- To the south of Strathroy, Calvert Street, Carroll Street and Glengygle Drive are all intended to serve as an east-west priority corridor, providing inter-county cycling options to the east and west. This link will allow for a seamless cycling connection to Middlesex Centre to the east, and Adelaide Metcalfe to the west.

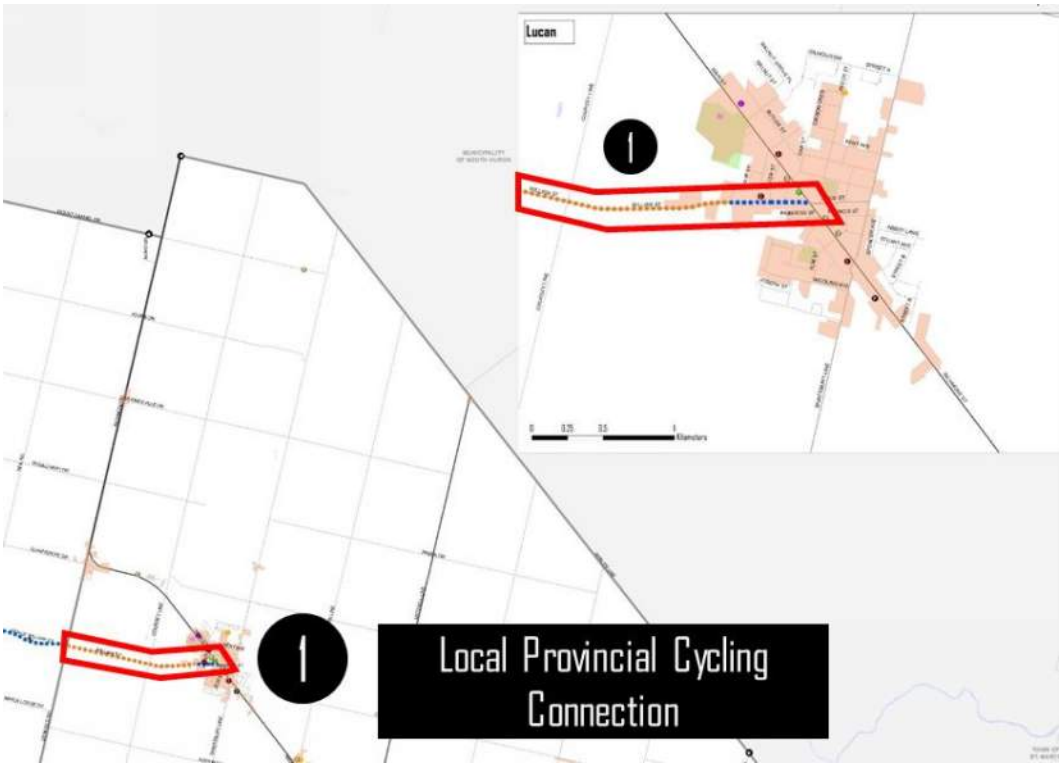

Figure 25 – Short Term Priorities for Lucan Biddulph

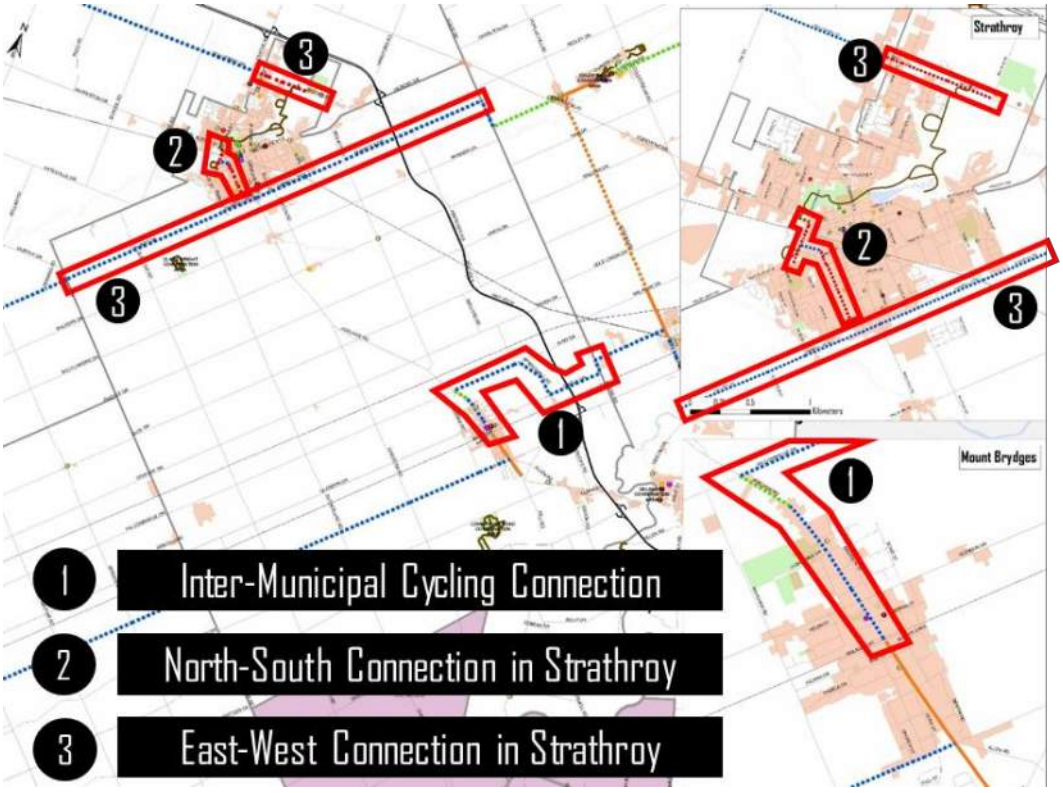

Figure 24 – Short Term Priorities for Strathroy Caradoc

8. NEWBURY

Map 4-9

1 Connection to Southwest Middlesex

Location: Concession Drive & Hagerty Road

- The cycling network within the Village of Newbury is intended to prioritize the cycling connections to Southwest Middlesex, as well as provide cycling opportunities within the village itself.
- In terms of prioritizing the connectivity of the Village, cycling facilities are intended to be implemented on Concession Drive to the south of the Village, and connect with proposed cycling facilities along Hagerty Road. The cycling facilities along Hagerty Road are intended to span the entire length of the Village from north to south, connecting with Southwest Middlesex to the north.

2 Cycling Loop

Location: Coltsfoot Drive, Dundas Street & Unopened Road Allowances on Pine Street

- Within the Village, a cycling loop is proposed, utilizing Coltsfoot Drive and Dundas Street, in addition to a proposed north-south off-road trail connecting the two using the unopened Pine Street road allowance.
- This cycling loop will enable Newbury residents to have a short, local cycling loop available without having to travel to an adjacent municipality for cycling opportunities.

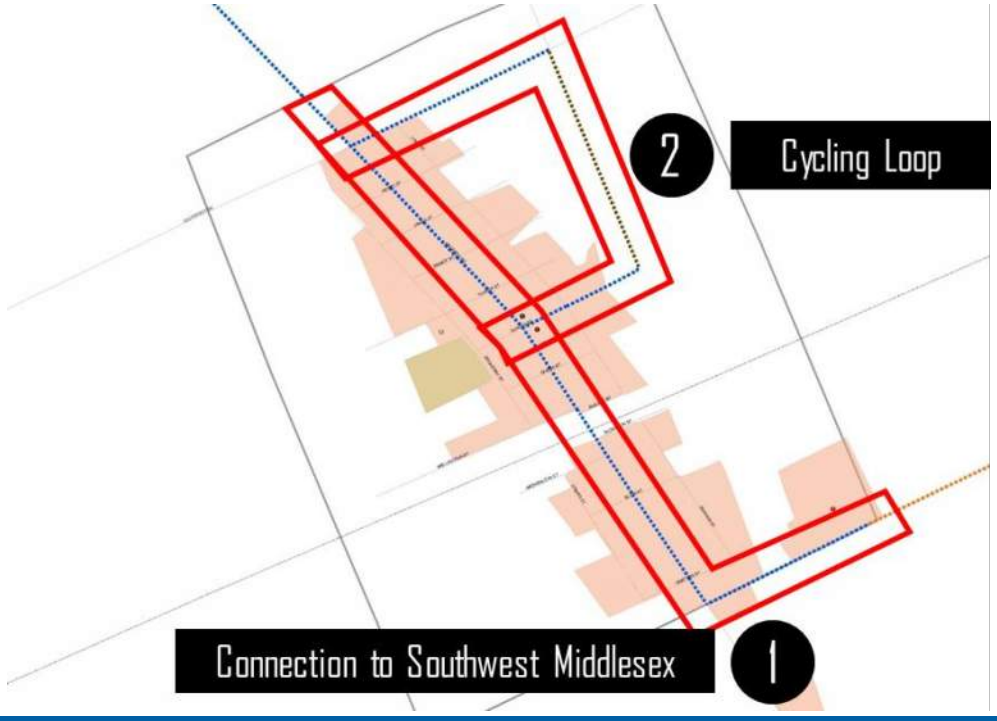

Figure 26 – Short Term Priorities for the Village of Newbury

4.1.2 Long-term Network

The long-term phase includes the implementation of just under 500 km of cycling facilities, broken out by facility type as described in **Table 8**. **Appendix D** provides further detail on a route-by-route basis, and organized based on jurisdiction.

FACILITY TYPE	TOTAL DISTANCE (km)
Proposed Multi-use Trail	29.2
Proposed Buffered Paved Shoulder	114.1
Proposed Paved Shoulder	140.9
Proposed Signed Route	208.6
Proposed Cycle Track	0.8
Proposed Bike Lane	4.6
TOTAL LONG TERM	498.2 km

Table 8 - Proposed Network Length by Facility Type in the Long Term.

The infrastructure as proposed in the long-term network constitutes the balance of the cycling network, following the implementation of the proposed short-term network. As is the case with the short-term phase, a significant portion of the long term cycling network is proposed to be comprised of signed routes.

Buffered paved shoulders and paved shoulders also feature prominently on corridors with higher vehicle volumes. These roads with higher vehicle volumes are generally those that that connect settlement areas to one another and represent corridors that represent the most direct route. Buffered paved shoulders and paved shoulders proposed in the long-term network are routes where significant investment will be required, and the roads are not likely to require / be scheduled for reconstruction in the short term.

The majority of the cycling facilities under the jurisdiction of the local municipalities such as proposed multi-use trails, cycle tracks, and bike lanes, are proposed as being long-term projects. This is meant to provide the local municipalities with ample flexibility when it comes to funding and integrating these proposed projects within their future capital works plans.

R10 Use the network phasing maps as a guide for the implementation of the cycling network, and as a base to assist with the preparation of annual budgets related to cycling infrastructure.

4.1.3 Implementation Process

There are two key processes which should be considered and referenced when implementing the proposed Cycling Strategy for Middlesex County. These processes are described below.

FIVE STEP PROCESS

Figure 28 illustrates the step-by-step process for implementation of individual projects as they move from the planning phase to the design and implementation phase. It is based on the process described in Ontario Traffic Manual Book 18.

Figure 27 – Proposed Five Step Implementation Process

A more detailed description of each of these steps in included in **Table 9**.

STEP 1: PRELIMINARY REVIEW

The first step in implementing segments of the Cycling Strategy is to identify and communicate opportunities. All County and local municipal road projects scheduled in the county should be monitored including the capital roads forecast. When a project involving a corridor or road proposed for a cycling route identified in the Cycling Strategy is advanced to the planning stage, or an opportunity to establish a new route not included in the Cycling Strategy is identified a preliminary review should be completed by the authority having jurisdiction over the road.

This review should:

- Identify the jurisdictions involved in a project;
- Compare the timing of the project to the short and long-term implementation priorities identified in the Middlesex Cycling Strategy;
- Assess whether the nature of the project may permit implementation of the preferred cycling facility in a cost effective manner; and
- Inform the project lead and affected departments whether or not a feasibility assessment should be undertaken to confirm the feasibility and costs for implementing the proposed cycling route as part of the subject project.

STEP 2: FEASIBILITY ASSESMENT

If a cycling project is confirmed through the preliminary review process a facility type assessment should be completed. This is intended to be brief and confirm the feasibility of the route based on a review of Cycling Strategy and supporting route selection and planning and design criteria, as well as other relevant information.

- Collect or confirm current roadway characteristic information including AADT volumes, collision data and the commercial vehicle percentage.
- Conduct a field check for both on and/or off-road route segments to identify any other issues that should be considered and to measure sight line distances (if applicable).
- Undertake a preliminary functional design for the on or off-road cycling facility segment and estimate implementation costs
- Prepare a cost/benefit analysis statement which comments on the following:
  - The timing for implementing the proposed pedestrian or cycling facility;
  - Costs and efficiencies achieved;
  - Identify any less costly alternatives and how they may fit within the overall cycling network plan;
  - Provide recommendation on how to proceed.
- This process may take place in conjunction with, or as input to a Class EA or functional design process whereby design alternatives are prepared, or as an independent review. It is at this stage that consideration may be given to context sensitive solutions.

STEP 3: DETAILED DESIGN, TENDER & IMPLEMENTATION	Once approval has been obtained to implement a cycling route segment, the necessary detailed design should be completed. This step is typically done as part of the detailed design for the primary capital roads project, such as a road widening and does not require additional resources. The third part of the process should also include confirming details with regard to partners (if any). The project should then be scheduled into the County or local municipal capital roads program with a suitable budget allocated. The final step involves tendering and constructing the project. It is also possible that following detailed design the decision is made not to proceed with the facility or preferred facility type because of the cost, other constraints that arise through the detailed design process or based on direction from Council. If this occurs, the network should be updated and an alternative route should be proposed.
STEP 4: MONITOR & EVALUATE	Once cycling facilities have been constructed, their design and use should be monitored to ensure they function in the intended manner. Where necessary, the facilities should also be upgraded and maintained to ensure continued safe use by cyclists.
STPE 5: UPDATE POLICY	Where applicable, the fifth step includes updating any relevant County or local municipal policy such as an Official Plan, Transportation Master Plan, Recreation or Trail Master Plan. Alternatively, the updates should be tracked so they can be considered during the next scheduled update of the relevant policy plans. changes in cycling /AT policy and network routes.

Table 9 – Five Step Implementation Process Overview

R11 The County and Local Municipalities should review, adapt and apply the five-step network development process to guide the implementation of the cycling network.

MUNICIPAL CLASS EA

Many large-scale infrastructure projects require the completion of an Environmental Assessment. Further assessment and potential environmental impacts will need to be discussed in the future stages of implementation to determine next steps on a project-specific basis. A number of updates have been made to the Municipal Class Environmental Assessment (MCEA) which pre-approves the construction or operation of walking and cycling facilities both within and outside of the road right-of-way.

The following are examples of the changes that were made by the Province:

- Normal or emergency operation and maintenance of linear facilities now includes multi-use trails, and are pre-approved;
- Construction or removal of multi-use trails within existing or protected rights-of-way are pre-approved; and
- Construction or removal of multi-use trails including water crossings outside existing rights-of-way.

Schedule A and A+ projects are considered pre-approved and do not require a full Class EA. Pre-approved projects include those where the proposed project does not require significant changes to the roadway or where traffic impacts have been studied and mitigated.

Projects valued between $3.5 and $9.5M should adhere to Schedule B, and over $9.5M should adhere to Schedule C. The exemption is maintained for smaller projects and larger projects are to follow a well-accepted and proven process.

Cycling on-road in Middlesex County; Souce: WSP

4.2 Costing

A high-level opinion of cost has been developed for the implementation of the network based on a set of unit costs derived from recent design and construction projects across Ontario. **Appendix D** provides a list of unit costs for the construction of various elements of the cycling network, and guideline unit costs for amenities that may also be considered for implementation on a project by project basis.

The costs are presented in 2018 dollars and are based on normal / average conditions for construction but do not include:

- Cost of property acquisition or utility relocation;
- Design and engineering costs, permits or approvals;
- Annual inflation including increased cost of labour, materials, fuel, etc.;
- Applicable taxes;
- Potential economies of scale that may be realized through combining cycling infrastructure implementation with future capital projects; and
- Potential savings which could be realized through external funding opportunities and partnerships.

Based on these assumptions as well as the unit costs presented in Appendix D, an opinion of cost has been established – consistent with full build-out of the network and the phases identified in section 4.1. **Table 10** summarizes the costs by facility type and phase for the Middlesex County cycling network.

FACILITY TYPE	SHORT-TERM		LONG-TERM		TOTAL	
	KM	$	KM	$	KM	$
Multi-use Trail	4.5	$1,113,433	29.2	$7,289,272	33.7	$8,402,705
Buffered Paved Shoulder	22.3	$4,685,879	114.1	$24,024,471	136.4	$28,710,350
Paved Shoulder	20.2	$2,222,405	140.9	$15,499,645	161.1	$17,722,050
Signed Route	155.7	$155,720	208.6	$208,551	364.3	$364,271
Cycle Track	0	$0	0.8	$809,096	0.3	$809,096
Bike Lane	3.9	$1,447,363	4.6	$1,733,828	8.5	$3,181,191
TOTAL	206.5	$9,624,800	498.2	$49,564,863	704.7	$59,189,633

Table 10 – Cost by Facility Type and Phase for Middlesex Cycling Network

The overall cost of the entire cycling network is estimated at $59,189,633. This cost can be further broken down between the short - term cost of $9,624,800 and the long-term cost of $49,564,863, of which $43,866,880 is Middlesex County's share and $15,343,120 is the local share, divided amongst the local municipalities. **Appendix D** contains costing details by individual municipality, facility type, phase and individual route/link.

4.3 Programming

There are a number of other aspects that should be addressed to develop and implement a successful cycling strategy. In order to generate increased interest and involvement by residents and visitors of Middlesex County, clear directions related to engineering, encouragement, education, evaluation and enforcement should be considered and pursued.

The following section provides an overview of the proposed initiatives which have been identified for consideration by Middlesex County and its municipal partners to help achieve the goals of the Cycling Strategy within the categories of the "Five E's". In addition to a description of each of the categories, a set of best practices have also been included for consideration by the County and its partners. Best practices are intended to be used as potential inspiration for future initiatives undertaken by the County but would need to be adapted for the Middlesex context.

1. ENGINEERING

DESCRIPTION

Creating, building, designing safe and convenient places to cycle and designing land uses which are supportive of cycling and other active forms of transportation. Simply put, engineering is the physical infrastructure to support cycling and active transportation.

1. Design cycling facilities with comfort and safety in mind.
2. Design network linkages to provide access to communities within each of the area municipalities.
3. Identify network linkages to encourage recreational travel and trips.
4. Design cycling infrastructure to address major physical barriers including provincial highways, County roads, railways and waterways.
5. Improve access to surrounding municipalities by designing continuous and consistent facilities and communicating connection points.
6. Establish a consistent signage and wayfinding strategy approach for both on and off-road linkages throughout the County.
7. Implement effective and well-designed transitions between different facility types.
8. Identify design solutions for high conflict areas.
9. Provide and strategically locate end-of-trip facilities such as rest areas, washrooms, bike lockers, showers, etc.

2. ENCOURAGEMENT

DESCRIPTION

Providing incentives and partnerships to produce a strong, vibrant and inclusive culture of cycling – for a range of purposes and trip types – throughout the County. Methods to influence behavior resulting in people becoming more involved in active forms of transportation and recreation. Encouragement tactics should be tailored to various target audiences i.e. youth and seniors should have distinct objectives such as increased number of students walking and biking to / from school, increased number of seniors walking on trails, etc.

1. Identify staging areas for recreational cycling throughout the County and implement cycling amenities at those locations e.g. bicycle parking, fix-it stations, etc.
2. Coordinate an annual ride which highlights different cycling infrastructure throughout the County including both on and off-road facilities.
3. Establish and manage a bike valet program to be launched and utilized at appropriate public events throughout the County.
4. Work with local area municipalities to pursue bicycle friendly community designation through the Share the Road program.
5. Formalize a cycling specific working group for the County which meets on quarterly or semi-annual basis to discuss the implementation of the cycling strategy and to identify progress and next steps.
6. Target downtown cores of towns and villages and work with local businesses to implement cycling amenities i.e. bicycle parking.
7. Create programs, and prior to implementation, identify desired behavior changes and the barriers to those changes.
8. Create incentive programs and contests to challenge residents to cycle more often.
9. Ensure amenities and access points are designed to accommodate users of all ages and abilities.
10. Work with local employers and businesses to pilot programs related to encouraging and supporting cycling.
11. Work with agencies (i.e. UTRCA and Ontario Parks) to promote and market mountain cycling destinations as part of County-wide tourism.

3. EDUCATION

DESCRIPTION

Providing incentives and partnerships to produce a strong, vibrant and inclusive culture of cycling – for a range of purposes and trip types – through teaching people of all ages and abilities the skills and confidence they need to cycle safely. Education is the increase of knowledge and understanding regarding the opportunities, practices and processes related to active transportation facilities and programs. Similar to encouragement, there are a number of education tactics including but not limited to online resources, media outreach, hard copy promotional tools, etc. Education tactics should be tailored to the preferred audiences and intended outcomes. Methods to influence behavior resulting in people becoming more involved in active forms of transportation and recreation. Encouragement tactics should be tailored to various target audiences i.e. youth and seniors should have distinct objectives such as increased number of students walking and biking to / from school, increased number of seniors walking on trails, etc.

1. Prepare and distribute educational information related to cycling in partnership with local area municipalities and other stakeholders i.e. OPP.
2. Develop a dedicated website and / or "app" specifically addressing cycling within the County which is updated on an annual basis with relevant information.
3. Prepare audience specific educational information i.e. for youth or in different languages distributed throughout the County.
4. Work with OPP and City of London staff to offer and host Bike Rodeos at special events.
5. Prepare and distribute cycling route mapping including cycling safety information as well as relevant information about cycling within the County i.e. destinations, supportive businesses, etc.
6. Make information easily accessible.
7. Partner with not for profit organizations and local agencies.
8. Utilize existing materials and make updates to reflect local needs.
9. Utilize existing platforms such as local newsletters, City webpages, social media platforms, etc.
10. Partner with local schools to host "rediscover your bike" events including learn to ride courses and simple bike maintenance. Programs could also be delivered at local events.

4. EVALUATION

DESCRIPTION

Monitoring the "success" of the Cycling Strategy – infrastructure, programs and planning – and undertaking complementary initiatives to reinforce cycling. Includes tools and techniques to help gain a better understanding of how infrastructure and programs are used and how well they achieve their desired outcomes. They can be an effective tool to gauge the success of a plan and to help inform future selection of programs, infrastructure and improvements.

1. Identify and implement a monitoring and evaluation program to assess the implementation and impact of Cycling Strategy recommendations.
2. Document input gathered and trends / changes that occur and the action taken by the County and the local area municipalities as a result of the information gathered.
3. Establish a maintenance approach which addresses / considers cycling facilities.
4. Invest in and utilize technologies to support data collection / gathering.
5. Work with local clubs and interest groups to undertake data collection along cycling linkages.
6. Establish a database of information needed to facilitate the monitoring program and identify an individual to update and gather information as needed.
7. Application of ongoing and continuous evaluation tactics to gauge potential change and influence.
8. Establish partnerships with local agencies, stakeholders, clubs / organizations.
9. Develop and apply of a range of measures including planning, engineering and design considerations.
10. Integrate digital technology and manual documentation.

5. ENFORCEMENT

DESCRIPTION

Ensuring cyclists safety by applying existing roadway laws and regulations. The safe use of active transportation infrastructure is a significant influence on user behavior. Working with partners as well as local enforcement is important to encourage the application of safe practices and the appropriate use of active transportation facilities. Typically, enforcement is driven by local by-laws and provincial guidelines and regulations. Enforcement is undertaken by by-law enforcement officers and police officers but can also be undertaken in partnership with local stakeholders.

1. Work with local OPP to undertake annual safety blitzes along key cycling corridors throughout the County.
2. Invest in technology to supplement manual count programs at key locations along on and off-road cycling corridors.
3. Work with local clubs and interest groups to establish trail safety and stewardship programs to encourage safe cycling.
4. Prepare an annual enforcement report documenting outcomes of safety blitzes and other enforcement activities as well as lessons learned and changes.
5. Provide safety materials e.g. lights and reflective stickers at local events on behalf of the County and its partners.
6. Enforcement is typically geared towards sidewalks, roads and trails for all users.
7. Make regulations available and clearly communicated.
8. Establish partnerships between key delivery agencies.
9. Implement patrols and safety blitzes, as well as Share the Road campaigns by the municipality and its partners.
10. Provide a means of documenting enforcement concerns and issues raised i.e. an email or portal and an information sharing mechanism.

The five E's are intended to encourage a more active and healthy community and influence change in behaviour and attitude toward cycling as a means of transportation. The County and local municipalities should review and consider potential programs and initiatives under the five E's with the goal of developing and implementing a set that are tailored to Middlesex.

R12 The County and local municipalities should review and consider potential programs and initiatives under the five E's with the goal of developing and implementing locally appropriate programs and initiatives.

4.4 Partnerships

Implementation of the Cycling Strategy and supportive programs will be accomplished through short and long-term actions and partnerships. Potential partners have been identified that could be involved in the implementation of the plan. They have been organized into primary and secondary partners based on the level of involvement and input they may have on a project by project basis.

Some may be involved as a regulatory or approval body and others may be responsible for providing input based on context sensitive considerations / issues. **Table 11** lists potential primary and secondary partners that could contribute to the implementation of various elements of the Cycling Strategy.

	PRIMARY PARTNERS	SECONDARY PARTNERS
FIVE E ROLE	Review and provide input to projects that directly or indirectly impact lands under their jurisdiction. Generally a lead role related to Engineering, and a supporting role related to Encouragement, Education and Enforcement. A shared lead role related to Evaluation.	Engaged primarily for 'soft' elements of the Strategy. Generally a lead role related to Education, Encouragement and Enforcement (OPP), and a supporting role related to Engineering. A shared lead role related to Evaluation.
KEY PARTNERS	» Middlesex County » Local Municipalities (Middlesex Centre, North Middlesex, Southwest Middlesex, Thames Centre, Aylmer, Bayham, Lucan Biddulph, Strathroy-Caradoc, Adelaide Metcalfe, Newbury) » Middlesex County Tourism » Middlesex-London Public Health	» OPP – Middlesex Detachment » Conservation Authorities » Ministry of Transportation » School Boards » Local Businesses » Cycling Clubs and Cycling Interest Groups » Council Committees » Citizens

Table 11 - Potential Partners to Facilitate Implementation

The County should establish and chair an Inter-Municipal Working Group comprised of Primary Partners identified above including; County and local municipal staff representatives, representatives from Middlesex County Tourism and Middlesex-London Public Health. This group would be similar in composition to the Municipal Working Group created for the development of the Cycling Strategy, with a mandate to:

- Share information related to capital project plans that may include a cycling component, and coordinate where feasible to realize potential efficiencies and optimize implementation of continuous and seamless cycling routes;
- Coordinate on external funding opportunities and priority setting

- Develop and deliver cycling encouragement, education and promotion programs;
- Share experiences and lessons learned from construction, operation and maintenance of cycling facilities; and
- Keep up to date on emerging trends in planning and design of cycling facilities.

R13 The County and local municipalities should form a working group which meets on a regular basis (e.g. quarterly, semi-annually) to discuss project priorities and coordination related to the implementation of the Cycling Strategy.

4.5 Funding Opportunities

Funding to implement the cycling network and supportive programs is intended to be a collaborative effort. It should not be the sole responsibility of the County or local municipalities. Potential external funding and partnership opportunities should be explored regularly and pursued wherever feasible to offset local costs. **Table 1212** highlights potential external funding sources that could be explored to support the implementation of the Cycling Strategy. The funding programs highlighted were available at the time the Cycling Strategy was prepared, however, they are subject to change, therefore potential funding programs should be monitored regularly.

FUNDING OPPORTUNITIES	ADDITIONAL DETAILS
Ontario Cycling Strategy Funding	» For additional details regarding the #CycleON strategy refer to: http://www.mto.gov.on.ca/english/publications/ontario-cycling-strategy.shtml » http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR017150
Federal / Provincial Gas Tax	» For the federal program please refer to: https://www.infrastructure.gc.ca/plan/gtf-fte-eng.html » For the provincial program refer to: http://www.mto.gov.on.ca/english/service-commitment/gas-tax-program.shtml
Transport Canada's MOST (Moving on Sustainable Transportation)	» For details on the MOST program and the projects that fall in-line with their funding alternatives refer to: http://data.tc.gc.ca/archive/eng/programs/environment-most-menu-711.htm

FUNDING OPPORTUNITIES	ADDITIONAL DETAILS
ecoMobility (TDM) Grant Program	» For details on the ecoMobility Grant Program refer to: http://data.tc.gc.ca/archive/eng/programs/environment-ecomobility-menu-eng-144.htm
Federation of Canadian Municipalities Green Municipal Fund	» For additional details regarding the Green Municipal Fund and potential funding alternatives refer to: https://fcm.ca/home/programs/green-municipal-fund.htm
Healthy Communities Fund	» For additional details regarding the Healthy Communities Fund refer to: http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR006918
Federal and Provincial Infrastructure / Stimulus Programs	» For Federal Government infrastructure stimulus fund details refer to: https://www.canada.ca/en/office-infrastructure.html » For Provincial Government infrastructure stimulus fund details refer to: https://www.ontario.ca/page/ministry-infrastructure
Ontario Trillium Foundation	» For details regarding potential funding alternatives refer to: https://otf.ca/
Ontario Rural Economic Development Program	» For details refer to: http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR006918
Ontario Sport and Recreation Communities Fund	» As part of the Ontario Sport and Recreation Communities Fund: http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR006918
Tourism Development Fund	» For additional details regarding the Tourism Development fund refer to: http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/OSAPQA005130
Service Club Support	» Lions, Rotary and Optimist clubs who often assist with highly visible projects at the community level.
Corporate Environmental Funds (e.g. Shell and MEC)	» For example refer to: https://www.shell.ca/en_ca/sustainability/communities/funding-guidelines-process.html for Shell Canada's Social Investment Program

FUNDING OPPORTUNITIES	ADDITIONAL DETAILS
Private Citizen Donation / Bequeaths	» Can also include tax receipts for donors where appropriate.

Table 12 - Potential Funding Opportunities for Cycling Infrastructure and Programming

R14 The County and local municipalities should investigate and pursue external funding opportunities to offset cycling network implementation and programming costs.

4.5.1 Pilot Partnership Funding Program

To encourage local municipalities to invest in cycling, it is recommended that the County consider a pilot Cycling Strategy municipal partnership program, over set period of time such as 5 years. Similar Active Transportation partnership programs have been successful in other two-tier jurisdictions in Ontario including Essex County and York Region. Under these programs the upper tier municipality commits an annual amount to assist local municipalities in implementing cycling infrastructure and outreach programs that are under their jurisdiction, and local municipalities submit proposals to the County for consideration under the program. Under a municipal partnership program, local municipalities would prepare proposals containing the following information:

- The details of the project;
- The funding request (i.e. how much the County is being asked to fund);
- A demonstration of why this is a priority for the local municipality;
- Confirmation of the funding commitment by the local municipality; and
- Demonstrate how this project is consistent with the Cycling network and phasing described in the Cycling Strategy.

For example, the County could establish a budget of $100,000 per year for a total of $500,000 over the 5-year period for cycling related projects, and local municipalities would be eligible for funding of up to 50% provided there is commitment by the local municipality for the remaining 50%. This program would be intended for funding capital expenditures of cycling facilities or education/ outreach initiatives and not for ongoing operation and maintenance cost of the same facilities. The County would take a balanced approach with the goal of providing funding under this program to all local municipalities who apply for it.

R15 The County should explore the development of a pilot municipal partnership program to encourage local municipalities to invest in cycling.

4.6 Management and Monitoring

4.6.1 Network Management Tool

The proposed Cycling Strategy was developed using the County's Geographic Information System (GIS) data as well as GIS information provided by the local municipalities. The digital GIS based network provided to the County as part of the Cycling Strategy can also be used as a facility implementation and management tool. A database is associated with project mapping includes a number of different attributes. For example, the network has been divided into segments, each specifying a length of the segment and the facility type proposed, as well as the phase in which the route and facility is proposed to be implemented.

During the implementation process, County and local municipal staff can use this tool to assist in confirming the feasibility of cycling and trail routes and facilities and the proposed schedule (short or long term) for implementation. The GIS tool can also be used to track and document new segments as they are implemented. Updating the facilities component of the Cycling Strategy on a regular basis will significantly reduce the effort and cost to update the entire Strategy when it is next needed (e.g. every 5 years) and will provide background information for reporting on the progress of network implementation.

Implementation of the Middlesex Cycling Strategy will require ongoing support and coordination between the County and the local municipalities. The phased approach to implementation described in this report is intended to be flexible and adapt to ongoing changes and available resources. The following describes the proposed strategies and tools to help guide future decision making to support the implementation of the Middlesex Cycling Strategy.

Cycling on a Trail in Simcoe County; Source: Ontario by Bike

MANAGEMENT TOOL

The management of the Cycling Strategy will require on-going coordination and tools to support and facilitate future implementation, operations and maintenance.

A network management tool has been prepared for Middlesex County which includes two components which together can be used by the County and local municipal staff following completion of the Cycling Strategy study.

1. GEOGRAPHIC INFORMATION SYSTEM

The management of active transportation related information is contained within a GIS database. The database was developed based on information provided by the County and local municipalities and contains updated information including the proposed routes, facility types, phasing, etc. that make up the active transportation network. Following the completion of the Cycling Strategy, the County and local municipal partners are encouraged to use the GIS database to effectively manage municipal assets and communicate project outcomes.

2. EXCEL BASED DATABASE

An Excel based network management spreadsheet has been created to contain the same information as the GIS database. The spreadsheet is meant to be as a tool for those who do not have access to GIS software. As the GIS database is managed and updated so should the spreadsheets. It contains additional information related to costing for each of the proposed routes and can be used as an additional implementation resource. The Excel-based Network Management Database Tool can be found in Appendix D.

R16 The County and local municipalities should review, adapt as necessary, and apply the cycling network management tool.

4.6.2 Risk Management & Liability

The way in which cycling routes are designed and maintained can have a direct influence on liability. On-road facilities are compared against the same liability criteria as roadways and sidewalks, which means the County and local municipalities may be partially liable if the facility is improperly designed, constructed or maintained. Given that the bicycle is legally defined as a vehicle, trails where cycling is permitted may need to adhere to the same requirements as a roadway / highway. This further reinforces the importance of adhering to provincial and national design guidelines and standards as they provide the greatest legal protection.

In addition to using guidelines and standards to mitigate risk and liability issues, the County and local municipalities should also consider the following when designing, implementing and maintaining cycling facilities:

- Improve the physical environment, increase public awareness of the rights and obligations of users, and improve access to educational programs;
- Select and design facilities in compliance with the highest prevailing standards, and ensure that designs comply with any applicable laws and regulations;
- Conform to acceptable standards, and if hazards cannot be removed, they should be isolated with a barrier or notified by clear warning signs;
- Monitor on and off-road facilities through regular patrols, document the physical conditions and operations, and promptly respond as needed;
- Keep written records of all monitoring and maintenance activities;
- Avoid using descriptions such as “safe” or “safer” for routes;
- Maintain proper insurance coverage;
- When considering new cycling routes or modifications to the system, document the assessment using the OTM Book 18 facility selection process.

Bike Lane Maintenance; Source: NYC DOT

4.6.3 Operations and Maintenance

The Middlesex Cycling Strategy is meant to be a guide for implementation as well as operations. County and local municipal resources, time and funding should be allocated not only for the design and implementation of each active transportation projects, but also for the operation of maintenance of these links. The following sections are intended to be used as a reference as the cycling network is implemented. The information contained within these sections has been developed based on the available resources comparable municipalities in Ontario including best practices and lessons learned.

Maintenance of on and off-road active transportation routes should be part of a commitment to provide high-quality routes and facilities to users in Middlesex County. Maintenance practices vary by municipality and the requirements are typically different for routes found within the road right-of-way and those found outside of the road right-of-way.

The appropriate maintenance of active transportation facilities can leverage capital investments, support user safety and comfort while also increasing the lifespan of the infrastructure. There are maintenance practices for all seasons including:

- Sweeping;
- Surface repairs;
- Pavement markings & signage;
- Vegetation management;
- Snow clearance / ice control; and
- Drainage improvements and drainage grates.

As the cycling network expands, the maintenance practices and level of service will need to be adapted to address new facilities, expectations of the public and minimum standards. In principle, priority should be given to routes and roads where there is a high volume of automobile, pedestrian and cyclist traffic. It is important to note that municipalities currently use the Provincial Minimum Maintenance Standards (MMS) to inform maintenance practices, including those for active transportation facilities (found within the road right-of-way). These have recently been updated by the Province. The County and local municipalities should proceed to update on and off-road route maintenance practices (consistent with the MMS) and assess the impact to operating budgets, equipment needs and resources.

COST

To support year-round use of the cycling network, consideration should be given to enhancing maintenance of on and off-road active transportation facilities. The table below summarizes typical annual maintenance costs for various elements that comprise the cycling network.

ITEM	UNIT PRICE	ASSUMPTIONS / NOTES
Painted Line Markings	$2.40 / linear metre	Unit price is for a single 100 mm wide painted line marking, therefore assume - $5 / m for both sides of the road. Maintenance costing typically assumes that painted line markings are fully replaced / renewed on an annual basis. This equates to 5,000/km/year for two sides of the road.
Painted Stencils (i.e. Sharrow and / or bike lane symbols)	$50 / each	Assumes stencils are placed every 75m as per OTM Book 18, therefore 26 stencils / kilometre on both sides of the road. Maintenance cost typically assumes 30% of painted stencils will need to be replaced / renewed on an annual basis. This equates to $400 /km / year. (i.e. $50 x 26 /km = $1,300/ km; $1,300 x 30% = $400 / km/ year for two sides of the road).
Cold Plastic Line Markings	$5 /linear m	Unit price is for a single 100 mm wide cold plastic line marking, therefore $10 / m for both sides of the road. Maintenance cost assumes that plastic line markings are replaced every 5 years (or 20% annually) (i.e. $10 / m x 20% = $2,000 /km/year for two sides of the road).
Cold Plastic Stencils	$275 / each	Assumes stencils are placed every 75m as per OTM Book 18, therefore 26 stencils / kilometre on both sides of the road. Maintenance cost typically assumes 30% of painted stencils will need to be placed / renewed on an annual basis. This equates to $2,200 /km/year (i.e. $275 x 26 = $7,150 /km; $7,150 x 30% = $2,200 /km/year for two sides of the road)
Route Signs	$200 / each	Assumes 26 signs per kilometre (13 on both sides of the road / route). Maintenance cost typically assumes 5% of all signs will need to be replaced annually. This equates to $260 /km/year (i.e. $200 x 26 = $5,200; $5,200 x 5% = $260 for two sides of the road)
Sweeping (on road routes)	$2,400 to $4,000 / km	Assumes sweeping frequency of 6 times a year per roadway km (unidirectional, one side of the road).
Multi-use Trail	$4,000 to $6,000 / km	Assumptions are for a 'mature' off-road multi-use trail in greenway or park (e.g. 3.0 m wide), depending on the level of service standard. Annual maintenance typically includes drainage, topping-up and grading of granular surface trails clearing of debris, trash removal, vegetation management, mowing of grass along shoulders, minor surface repairs, repairs to trail fixtures (benches, signs). Does not include repair or replacement of major structures such as bridges. Maintenance of rural off-road trails (i.e. rail-trails) can be considerably lower.

R17 

The County and local municipalities should review the risk management and maintenance considerations described in the Cycling Strategy and update existing practices as necessary based on best practices and the Provincial Minimum Maintenance Standards (MMS).

R18 

As the County and local municipal portions of the cycling network are expanded, annual maintenance and operations budgets must be increased accordingly.

Chapter 5.0 Conclusion

The following is a summary of the recommendations that have been made throughout the Cycling Strategy Report along with the page number where they can be found.

R#	RECOMMENDATION	TYPE OF RECOMMENDATION	P#
1	Adopt the recommended cycling network as a guide for the development of a connected and linked network throughout Middlesex County, and to surrounding municipalities.	✓	45
2	Recognize that the recommended cycling network is flexible, and that adjustments will need to occur from time to time to respond to local priorities and opportunities. Use the route selection criteria to help guide decision-making when changes to the recommended route network are being considered.	✓	45
3	Use Ontario Traffic Manual (OTM) Book 18 – Cycling Facilities as the primary guide for facility selection, assessment and design when proceeding with the detailed design and implementation of the on-road cycling network.	✓	51
4	Establish a consistent signage and wayfinding strategy approach for both on and off-road cycling routes throughout the County.	✓	57

R#	RECOMMENDATION	TYPE OF RECOMMENDATION					P#
							
5	Use other Ontario Traffic Manuals as a supportive resource for the design and marking of on-road cycling routes, and best industry practices for the design of the off-road portions of the cycling network.			✓			60
6	Develop an approach and policies at the County and local municipal level to provide bicycle parking at appropriate locations throughout Middlesex.		✓				62
7	The County and local municipalities should consider a Complete Streets approach when redeveloping roads.		✓				63
8	The County and local municipalities should develop appropriate policies to ensure that on-road cycling routes and off-road trails are incorporated into new neighbourhoods and communities as an integral part of the land development process.		✓				64
9	Recognize that linear corridors such as hydro and utility corridors, unopened road allowances and former railway corridors offer excellent opportunities as cycling network routes. Ensure that opportunities to utilize these type of corridors as part of the cycling network are carefully explored so they can be capitalized on wherever feasible.		✓				66
10	Use the network phasing maps as a guide for the implementation of the cycling network, and as a base to assist with the preparation of annual budgets related to cycling infrastructure.				✓		80

R#	RECOMMENDATION	TYPE OF RECOMMENDATION					P#
11	The County and Local Municipalities should review, adapt and apply the five-step network development process to guide the implementation of the cycling network.	✓					83
12	The County and local municipalities should review and consider potential programs and initiatives under the five E's with the goal of developing and implementing locally appropriate programs and initiatives.					✓	90
13	The County and local municipalities should form a working group which meets on a regular basis (e.g. quarterly, semi-annually) to discuss project priorities and coordination related to the implementation of the Cycling Strategy.	✓					92
14	The County and local municipalities should investigate and pursue external funding opportunities to offset cycling network implementation and programming costs.	✓					94
15	The County should explore the development of a pilot municipal partnership program to encourage local municipalities to invest in cycling.	✓					94
16	The County and local municipalities should review, adapt as necessary, and apply the cycling network management tool.				✓		96

R#	RECOMMENDATION	TYPE OF RECOMMENDATION	P#
17	The County and local municipalities should review the risk management and maintenance considerations described in the Cycling Strategy and update existing practices as necessary based on best practices and the Provincial Minimum Maintenance Standards (MMS).	✓	100
18	As the County and local municipal portions of the cycling network are expanded, annual maintenance and operations budgets must be increased accordingly.	✓	100