

FINAL REPORT

RUSSELL TOWNSHIP CYCLING PLAN

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MH Project #: 1805199.00



MORRISON HERSHFIELD

TABLE OF CONTENTS

| | Page |
|--|-------------|
| 1. INTRODUCTION | 1 |
| 1.1 Study Context | 1 |
| 1.2 Study Goal and Objectives | 1 |
| 1.3 Importance of Promoting Active Transportation | 2 |
| 2. BACKGROUND | 4 |
| 2.1 Russell Township Today | 4 |
| 2.2 Relevant Studies and Policies | 5 |
| 2.3 Existing Conditions | 11 |
| 3. DEVELOPMENT OF THE CYCLING PLAN | 13 |
| 3.1 Who Are We Planning For? | 13 |
| 3.1.1 Bicycle User Characteristics | 13 |
| 3.1.2 Bicycle Operating Requirements | 15 |
| 3.1.3 Types of Bicycle Facilities | 16 |
| 3.1.4 Route Selection Criteria | 17 |
| 3.2 Network Development Process | 17 |
| 3.3 Recommended Cycling Plan | 20 |
| 3.3.1 Proposed Cycling Plan - Russell | 22 |
| 3.3.2 Proposed Cycling Plan - Embrun | 25 |
| 3.3.3 Proposed Facilities for Locations with On-Street Parking | 27 |
| 3.3.4 Proposed Commuter Cycling Network | 32 |
| 3.4 Pedestrian Crossovers (PXOs) | 33 |
| 3.4.1 Pedestrian Signal Warrant | 34 |
| 3.4.2 Pedestrian Crossover Warrant | 35 |
| 3.4.3 Potential PXO Locations in Russell Township | 36 |
| 3.4.4 Previously Completed PXO Reports | 38 |
| 3.4.5 Additional PXO Considerations | 38 |
| 3.5 Public Consultation | 40 |
| 3.5.1 Public Open House | 40 |
| 3.5.2 Summary of Public Comments | 40 |
| 4. IMPLEMENTATION AND COSTING | 45 |

TABLE OF CONTENTS (Continued)

| | Page |
|-----------------------------|-------------|
| 4.1 Implementation Schedule | 45 |
| 4.2 Capital Costs | 48 |
| 4.3 Supportive Programs | 49 |
| 4.3.1 Engineering | 49 |
| 4.3.2 Education | 51 |
| 4.3.3 Encouragement | 52 |
| 4.3.4 Enforcement | 54 |
| 4.3.5 Evaluation | 54 |
| 5. NEXT STEPS | 55 |

APPENDIX A. OTM Book 18 – Bicycle Facility Type Selection, Application Heuristics

APPENDIX B. OTM Book 15 – Pedestrian Crossing Treatment Examples

APPENDIX C. Public Open House Notices

APPENDIX D. Public Open House Comment Sheets

APPENDIX E. Detailed Cost Breakdown

1. INTRODUCTION

1.1 Study Context

Russell Township retained Morrison Hershfield to help develop a cycling plan that will build on the Township's existing cycling network and the cycling network expansion plans by adjacent municipalities. The development of this cycling plan will place the Township in a favorable position to capitalize on funding opportunities from senior levels of government as and when they become available.

In December 2017, Russell Township received funding of approximately \$75,000 from the Ministry of Transportation (MTO) under the Ontario Municipal Commuter Cycling (OMCC) Program, part of which is funding this cycling plan.

1.2 Study Goal and Objectives

The main goal of this study is to develop a connected, safe and appealing cycling network that meets current Ontario standards; fulfills policies set out in the Russell Township Official Plan (OP); promotes commuter and high-frequency cycling; and provides seamless connections to the rest of the United Counties of Prescott and Russell (UCPR) and the City of Ottawa.

The main objectives of the cycling plan are to:

1. Develop a cycling network that serves key commuter and high-frequency destinations.
2. Enhance connectivity to commuter cycling networks in adjacent jurisdictions.
3. Identify the appropriate type of cycling facility for each segment in the network.
4. Recommend implementation phasing and estimate capital requirements.
5. Recommend supportive programs to promote and encourage cycling.

It is important to note that the cycling network and recommendations presented in this study are intended as a guide to facilitate the implementation of cycling facilities within Russell Township, and are not intended to be inflexible.

1.3 Importance of Promoting Active Transportation

The sustainability of a community is inextricably tied to the sustainability of its transportation system. At the community level, sustainable transportation typically centers around the use of alternative travel modes – walking, cycling and public transit. Walking and cycling are also active modes, as they are fueled by human power.

Modes such as walking, cycling, and transit support healthy communities, and ensure that all residents are able to move safely and efficiently around the city regardless of age, income, or level of mobility. From an infrastructure perspective, sustainable modes are more efficient; one vehicle parking space can accommodate 20 bicycles, a fully loaded bus is equivalent to removing over 30 cars from the road network. Thus, a shift to alternative modes can relieve demand on existing roads, reducing the need for new or expanded infrastructure.

As shown in **Table 1**, the reasons for investing in active and sustainable modes are numerous, yet until recently, little consideration was given to promoting and enhancing sustainable options. As a result, walking, cycling, and transit remain under-utilized, and there is considerable scope for improvement. The way people move within a city is linked to the identity of its population. The role of walking, cycling, and transit will continue to evolve to reflect changing needs, attitudes, and social values. To achieve Russell Township's vision for the future, a number of actions are needed to encourage a shift towards more sustainable and active travel choices.

Table 1: Benefits of Active & Sustainable Modes

| | | |
|---------------------------|---|--|
| <p>Health</p> |  | <p>Walking and cycling increase physical activity, resulting in a healthier community with less strain on the health care system.</p> <p>Research has shown that every hour spent in a car per day is associated with a 6% increase in the likelihood of obesity, while each kilometer walked per day is associated with a 4.8% reduction in the likelihood of obesity.¹</p> <p>In another example, researchers found that people who commute at least 30 minutes daily by active modes have a 35% lower risk of developing diabetes.²</p> |
| <p>Equity</p> |  | <p>Transit and active transportation modes serve all ages and mobility levels, ensuring that all residents have access to transportation. Such modes enable an aging community to maintain independence and autonomy without the use of a vehicle, and provide an affordable alternative to driving for those on a limited income.</p> |
| <p>Environment</p> |  | <p>Active and sustainable transportation modes result in fewer emissions, fresher air, and healthier communities.</p> <p>According to Environment Canada, road transportation accounts for roughly 20% of the country's total greenhouse gas emissions³; the shift towards more sustainable modes is thus an important strategy for taking action on climate change.</p> <p>Light-duty vehicles also account for 8% of nitrogen oxide emissions and 37% of carbon monoxide emissions⁴ – two of the major contributors to air pollution. In Ontario, the economic cost of air pollution is expected to exceed \$4 billion annually by 2015, accounting for lost productivity, healthcare costs, pain & suffering, and loss of life.⁵</p> |
| <p>Liveability</p> |  | <p>Active transportation encourages people to get outside in their community, promoting social interaction and creating a sense of ownership and pride. People who commute by active modes are more likely to enjoy their commute, refuting the idea that active transportation is less desirable than driving.⁶ Research has also shown that people are willing to pay more for homes in pedestrian-friendly communities.^{7,8}</p> |
| <p>Economy</p> |  | <p>Active modes of transportation are good for business, and can help revitalize the downtown.</p> <p>In Fort Worth, Texas, restaurant business on Magnolia Street increased by nearly 200% with the installation of bike parking and conversion of two traffic lanes to bike lanes.⁹</p> <p>Pedestrians and cyclists destined to Bloor Street in Toronto spend more money per month and visit more often than those who arrive by car.¹⁰</p> <p>Bicycle tourists in Niagara spent \$164 million in 2002. Most of the region's cycle tourists stay for at least one night, and spend more money per day than other tourists.¹¹</p> |

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4. Statistics Canada. 2012. "Waste management in Canada." *Human Activity and the Environment*.
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7. Joe Cortright, Impresa, Inc. 2009. *Walking the Walk: How Walkability Raises Home Value in U.S. Cities*. Prepared for CEOs for Cities.
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11. Healthy Living Niagara. *Economic Value: Active Transportation and Tourism*. Fact Sheet.

2. BACKGROUND

2.1 Russell Township Today

Russell Township has an area of approximately 200 km² and a population of approximately 16,500. Based on data available from the Statistics Canada 2016 census, Russell Township experienced some of the highest growth in the UCPR, with a population increase of 8.3% from 2011 to 2016. The Township’s *Retail Market Demand Study* indicates that from 2018 to 2028, the expected annual growth for the Township 1.9%.

The two largest population centres located in Russell Township are Embrun and Russell, with populations of approximately 7,000 and 4,500, respectively. Both communities are located on County Road 3 (recognized as Castor Street in Russell and Notre Dame Street in Embrun), with Embrun located five kilometres east of Russell.

The *Stats Canada 2016 Census* identified the mode of transportation that residents of Russell Township use to commute to work. These results are shown in **Table 2** below.

Table 2: Russell Township Modal Split (Source: 2016 Census)

| Mode of Transportation | Users | Percentage |
|------------------------|-------------|-------------|
| Vehicle driver | 7000 | 84% |
| Vehicle passenger | 630 | 8% |
| Public transit | 285 | 3% |
| Walk | 255 | 3% |
| Bicycle | 20 | < 1% |
| Other | 105 | 1% |
| Total | 8290 | 100% |

As indicated in the table, less than 1% of the population in Russell Township identifies as someone who commutes via the cycling mode.

A study commissioned in 2012, the *Growth Forecast and Land Needs Analysis – United Counties of Prescott and Russell* determined that only 53% of the residents of the UCPR actually live and work within the UCPR. In the western portion of the county (which includes Russell Township), this percentage dropped to **32%**. This reinforces the need for not just a strong cycling plan, but a cycling plan that provides connections to nearby communities where Russell Township residents work, such as the City of Ottawa. The study shows that



64% of the working population in western UCPR work elsewhere in Ontario (i.e. outside UCPR), with the majority of them assumed to be in the City of Ottawa. The remaining 4% work in Quebec, which is assumed to mostly be Gatineau for the western portion of the UCPR.

2.2 Relevant Studies and Policies

A variety of resources were used as background information to develop the Russell Township Cycling Plan. The following lists some of the key studies and policies used during this study.

- *United Counties of Prescott and Russell Commuter Cycling Plan:* The UCPR Commuter Cycling Plan was finalized in 2018, and includes recommendations that will benefit Russell Township. These include the following recommended additions to the UCPR cycling network, complete with an implementation schedule and costs:
 - Wide paved shoulders on Castor Street, Craig Street, Notre Dame Street and South Russell Road within the urban areas;
 - Paved shoulders on Ste Marie Street;
 - Buffered paved shoulders on Castor Street, Craig Street, South Russell Road, Notre Dame Street and St Guillaume Road, outside of the urban areas;
 - An in-boulevard multi-use pathway (MUP) on the south side of Notre Dame Street, between Ste Marie Street and St Guillaume Road.
 - Russell Township participated in the development of the UCPR Commuter Cycling Plan, and while there was a general agreement on the plan, there are still some concerns for the Township regarding the plan. These include:
 - The connections to Marionville from the Village of Russell, specifically the recommendations along Route 6 and Route 32.
 - The recommendation of St Guillaume Road as the main connection to the City of Ottawa (via Frank Kenny Road), which is considered to

have heavier traffic and higher volumes of truck traffic than the nearby St Pierre Road.¹

- The lack of any short-term projects (0 – 5 years) within Russell Township.
- *United Counties of Prescott and Russell Official Plan (2017):* The Counties' OP states: "Bicycling is recognized as an alternative mode of transportation that can play a positive role in improving mobility and quality of life as part of a balanced transportation system." The OP also states the following supportive cycling policies:
 - "Where Council considers it appropriate, new development or redevelopment may be expected to incorporate bicycle facilities.
 - When undertaking public works and where appropriate, the County and the local municipalities may include the provision of bike lanes and bicycle facilities to address the needs of cyclists.
 - The County and the local municipalities may establish a cycling plan for urban, community and rural areas which identifies cycling routes. Such a plan shall encourage interconnections between bike routes and open space areas. Such a plan shall be designed to improve the viability of cycling as an alternative to car use."
- *Township of Russell Transportation Master Plan:* The Transportation Master Plan for Russell Township was completed in 2016, providing information on all modes of transportation within Russell Township, as well as recommended improvements. Some of the identified potential cycling routes from the Master Plan are listed below:
 - North Russell Road / Concession Street / South Russell Road, from Russell High School to Marionville Road;
 - St Pierre Road / Ste Marie Street, from St Guillaume Road to Marionville Road;
 - St Augustin Road / St Jacques Road, from Route 300 to Route 400;

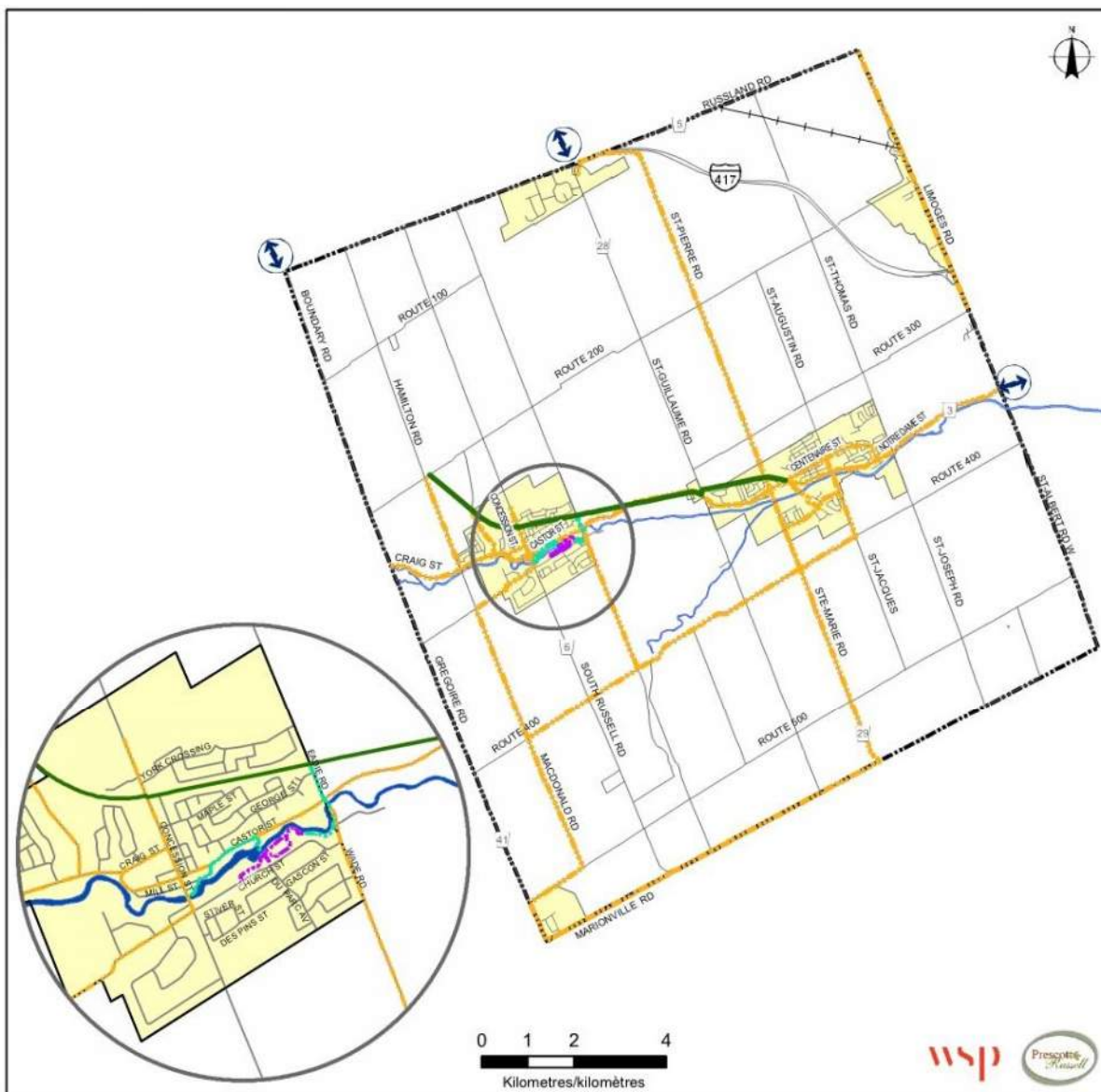
¹ It should be noted that there were numerous residents at the Public Open House (see Section 3.5) who preferred St Guillaume Road to St Pierre Road. The rationale is that the higher traffic volume on St Guillaume Road results in a lower travel speed of vehicles, which some residents is more preferable for them.

- Limoges Road, from Russland Road to Route 300;
 - Craig Street, from Boundary Road to Concession Street;
 - Mill Street, from Craig Street to Castor Street;
 - Castor Street, from Mill Street to Notre Dame Street;
 - Route 300, from St Augustin Road to Limoges Road;
 - Notre Dame Street, from Castor Street to Limoges Road;
 - Blais Street, from Notre Dame Street to St Jean Baptiste Street;
 - Centenaire Street, from St Jean Baptise Street to Notre Dame Street;
 - Route 400, from Gregorie Road to St Albert Road; and,
 - Marionville Road, from Gregorie Road to South Russell Road.
- *Township of Russell Official Plan:* The OP for Russell Township includes a variety of maps in Schedule B – Transportation, including a map showing potential cycling connections for the Township. This map is provided below in Figure 1. Additionally, Section 2 of the OP (Strategic Directions) identifies numerous policies that feed into the promotion of an active and healthy Russell Township community, including:
 - 2.2.2 - Promoting Healthy Communities: Encouraging a land use pattern which promotes non-motorized movement, including cycling and walking.
 - 3.1.2.2 - Village Structure: Residents should have the opportunity to access basic services within a reasonable walking distance (approx. 400 metres) or cycling distance (approx. 4 km) from their place of residence.
 - 5.2.4 - Traffic Calming: Potential traffic calming measures include: narrowing roads – this measure takes away width from the street to provide additional facilities for non-motor vehicle uses, and can help improve the pedestrian/cycling environment and reduce vehicle speeds. Traditional traffic engineering calls for 3.5 to 4-metres lanes, citing “traffic safety” standards but newer evidence shows that lanes as narrow as 2.75 metres can still be safe for driving.
 - 5.2.6 - Active Transportation: Walking and cycling are the most common forms of active transportation, and provide significant opportunities to connect Villages, in addition to environmental, transportation, health and economic

benefits. A logical network must be created that connects origins and destinations along direct, well-marked routes.

- 5.2.7 - Cycling Facilities: Policies mentioned in the OP include the encouragement of bicycle commuting by council, maximizing bicycle access through subdivision and site plan control approvals, the development of additional bicycle facilities along collector roads and incorporating them into road reconstruction activities, and, building upon the existing recreational trail system. Specifically mentioned are that the Township will develop on-road cycling facilities, typically on collector roads, which may be separated from general traffic by flexible bollards or other physical barriers.
- 5.2.9 - Transportation Demand Management: Policies mentioned in the OP include the creation of a Transportation Management Association (TMA), the management of parking by making users aware of the costs associated with providing parking, promoting alternative travel modes through education and marketing, and coordinating with the City of Ottawa and County to expand upon existing TDM initiatives in place.

Figure 1: Township of Russell Official Plan, Potential Cycling Connections



| Legend - Légende | | Proposed Trail Prolongation - Prolongement proposé du sentier | |
|------------------------------|--|---|--|
| Off Road - Hors-route | | Proposed Trail Prolongation | Prolongement proposé du sentier |
| | New York Central Fitness Trail Sentier récréatif New York Central | | South Nation WE Burton Conservation Area Trail Sentier de l'aire de conservation W.E. Burton de la Nation Sud |
| | Potential Trail - Sentier potentiel | Other Information - Renseignements divers | |
| On Road - Sur route | | | Road - Chemin |
| | Potential Trail - Sentier potentiel | | Railroad - Chemin de fer |
| | Potential Trail Connection to Adjacent Municipality Lien potentiel du sentier à la municipalité adjacente | | Village or 417 Industrial Park Boundary Limites du village ou du parc industriel 417 |
| | | | Township of Russell Boundary Limites de la Municipalité de Russell |

- *City of Ottawa Cycling Map (2013)*: The City of Ottawa Cycling Map is intended to help local cyclists plan an appropriate route to reach their destination. The map provides information on existing routes in the Ottawa area, including off-road paths, bike lanes, paved shoulders and signed-only routes. The map also presents suggested cycling facilities that are not currently signed. The existing cycling map shows a major potential connection is Frank Kenny Road, which is the only Ottawa roadway designated as a “spine route” for cyclists within the vicinity of Russell Township’s border with Ottawa.
- *Russell Township Traffic Calming Policy (2018)*: There are numerous references in the Russell Township Traffic Calming Policy that endorse the development and usage of cycling facilities, including:
 - Minimizing conflicts between street users
 - Reducing the speed of motorized traffic
 - Reducing the volume of traffic
 - A variety of recommendations for traffic calming measures, as well as guidance provided based on The Canadian Guide to Neighbourhood Traffic Calming (1998).
- *Russell Township Downtown Streetscape Masterplan and Urban Design Guidelines (2018)*: The Downtown Streetscape Masterplan addresses parts of Concession Street (from the New York Central Fitness Trail to the Castor River) and Castor Street (from Parallel Street to Mill Street) in Russell, and Notre Dame Street (from Benson Auto Parts to St Jacques Road) in Embrun. The goal of the Masterplan is to provide recommendations for these core streets that promote pedestrian and cyclist safety and accessibility while maintaining functionality for vehicular traffic.
 - The Masterplan identifies the lack of cycling facilities on the noted three streets, and introduces the concept of a complete street (a street that accommodates all modes of transportation). The Masterplan recommends sharrow treatments on the above noted roadways, a similar recommendation to the one provided in this report.

2.3 Existing Conditions

In addition to the planned or potential cycling connections identified in Section 2.2, there are some key existing cycling facilities within Russell Township:

- The seven kilometer New York Central Trail, which extends from Blais Street in Embrun to Forced Road in Russell is a great backbone for a cycling network to build upon. In the Township's OP, an extension of this trail to the northwest is recommended;
- The recently adopted UCPR Commuter Cycling Plan identifies two roadways within the Township with existing on-road paved shoulders to accommodate cyclists – those being South Russell Road from Route 400 to Marionville Road, and Ste Marie Street from Route 400 to Route 500.

These existing cycling facilities, as well as the recommended connections from the Township's OP, are displayed on Figure 2 below. Also shown on Figure 2 are potential missing links, which are roadways that have not been identified in previous studies, but that may provide strong cycling connections for the Township by filling in gaps in the cycling network, or providing cyclists with a more diverse set of cycling routes.

Figure 2: Russell Township Planned Cycling Facilities

3. DEVELOPMENT OF THE CYCLING PLAN

3.1 Who Are We Planning For?

The MTO's Ontario Traffic Manual (OTM) Book 18 – Cycling Facilities, identifies four key concepts to consider when planning a cycling network: bicycle user characteristics, bicycle operating requirements, bicycle facility types, and route selection criteria. This section will dive into all four factors, and how they will apply to the Russell Township Cycling Plan.

3.1.1 Bicycle User Characteristics

Factors that need to be taken into consideration for user characteristics include age, skill and comfort level, and trip purpose.

Age

The cycling plan needs to consider the various ages of potential cyclists, including adults, children, young adults and seniors. Adults are more likely to cycle for long periods of time or distance, and will have a wide variety of skill levels. Children, young adults and seniors are more likely to make shorter trips, are less likely to have developed riding skill and judge, and thus are more likely to stay on residential or low volumes streets when riding.

To get a better sense of which routes would be more likely to be used by students (i.e. children and young adult users), the maps included as part of this cycling plan identify all schools within Russell Township.

Skill and Comfort Level

OTM Book 18 states that the cycling population can generally be divided into the following main groups:

- **“Strong and Fearless”**: This group comprises only 1% of the cycling population, and consists of highly experienced cyclists who feel comfortable riding with traffic, even without separated facilities. Some of these cyclists ride year-long regardless of weather or roadway conditions.
- **“Enthused and Confident”**: This group comprises 7% of the cycling population, and is generally comfortable sharing the road with traffic, however they are more comfortable riding on lower traffic streets and prefer designated cycling facilities.

Members of this group may either be cycling regularly or on occasion. The presence of cycling facilities may encourage them to cycle more regularly.

- **The “Non-Cyclist”**: This group comprises approximately 32% of cyclists. This group are not, and may never be, interested in cycling.
- **“Interested but Concerned”**: This is by far the largest group of cyclists, and constitutes 60% of the population. These cyclists generally ride infrequently and have a preference for pathways and designated cycling facilities. The presence of cycling facilities may encourage them to cycle more regularly.

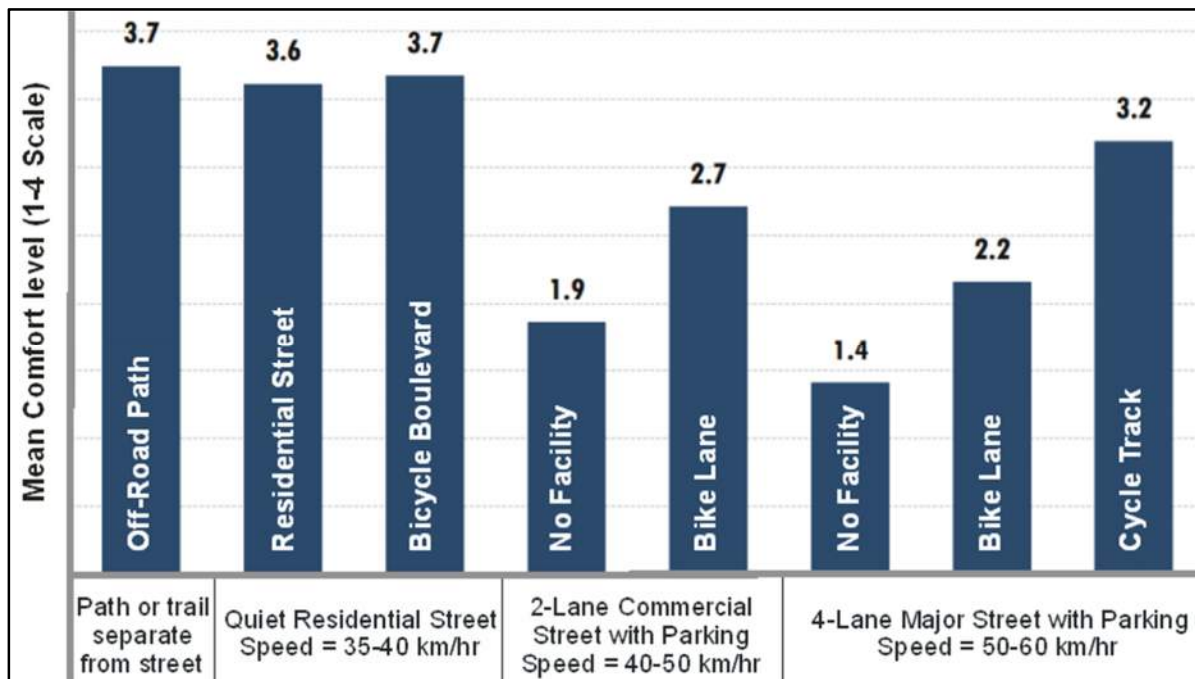
The target market for the cycling plan is the “Interested but Concerned” group of cyclists – those who may not currently cycle but who are willing and interested to cycle if safe facilities are provided. Since these individuals are interested in cycling, but are not currently doing so, this is the group with the greatest potential for increasing cycling activity.

It is also important to note that improved cycling facilities have benefits for all residents, including those who currently cycle (increasing the likelihood they will continue to cycle, or even extend their cycling season), as well as residents who are not interested in cycling (but who may become interested in cycling as they see more cyclists within the community).

However, how do we know that infrastructure makes a difference? **Figure 3** illustrates research from Portland State University which suggests that “Interested but Concerned” cyclists feel much more comfortable when dedicated facilities are provided.² Facilities also help to improve the visibility and awareness of cycling, which in turn can improve safety.

² Four Types of Cyclists?, Dill & McNeil, Portland State University, August 2012

Figure 3: Impact of Facility Type on Cyclist Comfort Level



Trip Purpose

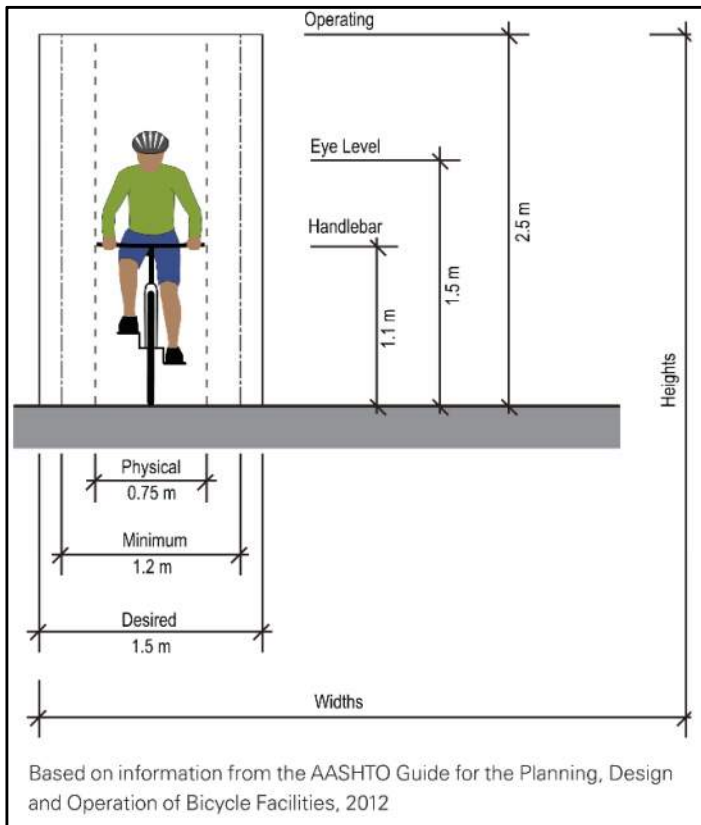
OTM Book 18 divides cycling trips into three categories: utilitarian, recreational and touring. Utilitarian trips encompasses cyclists with a destination in mind, whether that be work, school, shopping, or some other activity that they undertake regularly. These users are more concerned with taking the most direct and fastest route. Recreational trips are cyclists who are generally looking for enjoyment and scenery on their trip, and therefore avoid high speed or heavy volume roadways. Touring trips tend to be the longest trips of the three, and require more advanced planning, as trips may last longer than one day.

The focus of this cycling plan is on utilitarian trips, while also making considerations that will benefit recreational and touring trips.

3.1.2 Bicycle Operating Requirements

The minimum recommended space for a cyclist to operate a bicycle, as per OTM Book 18, is a lane 1.2 metres wide, and vertical clearance of 2.5 metres. The figure below from OTM Book 18 displays the minimum and desired space for cyclists.

Figure 4: Cyclist Operating Space



3.1.3 Types of Bicycle Facilities

Not all bicycle facilities are the same; they should be designed to accommodate the most likely users, while taking into consideration the roadway context around the facility. OTM Book 18 divides bicycle facilities into two categories, each with different types of facilities. Facilities types applicable to this study are listed below.

- **On-Road Bicycle Facilities**
 - Shared Roadways and Signed Bicycle Routes;
 - Paved Shoulders and Buffered Paved Shoulders; and,
 - Conventional Bicycle Lane.
- **Off-Road Bicycle Facilities**
 - Multi-Use Pathway.

3.1.4 Route Selection Criteria

OTM Book 18 provides a Bicycle Facility Selection Tool, which is a general outline of the process that should be used to determine a bicycle facility type on a specific roadway. The Bicycle Facility Selection Tool considers a number of factors, including the follow:

- Access and Potential Use;
- Connectivity and Directness;
- Physical Barriers;
- Attractiveness;
- Safety and Comfort;
- Cost;
- Accommodation of Existing and Future Demand;
- Consistent with Local Tourism Strategies and Goals;

3.2 Network Development Process

The cycling network was developed through an iterative process informed by input from the public, stakeholders and Russell Township staff. A summary of the key steps followed in the network development process is provided below.

Step 1: Review Existing and Planned Cycling Facilities

Background information from previously referenced studies, including the Township of Russell OP, Transportation Master Plan and UCPR Commuter Cycling Plan were used to map out existing cycling facilities as well as planned cycling facilities. Traffic volumes, posted speed limits, and road widths were also collected and reviewed from the Township and UCPR.

Locations of commuter and high-frequency destinations were identified and included in the review. Key destinations included major employment nodes, elementary and secondary schools, institutional uses including parks, libraries, sports fields and arenas, health centers, churches, transit stops, and Park and Rides.

Figure 2 above indicates the existing and planned cycling facilities, as well as key destinations, within Russell Township.

Step 2: Identify Missing Links

The existing and planned cycling facilities were reviewed by the study team to identify potential missing links in the Township, whether that be desire lines between two main roadways, a connection to a key destination, or other potential candidate routes. Missing links were refined based on input received from meetings with Township staff, and are shown on **Figure 2** above.

Step 3: Evaluate Proposed Cycling Facilities

The evaluation principles listed below were used to guide the selection and evaluation of potential cycling facilities.

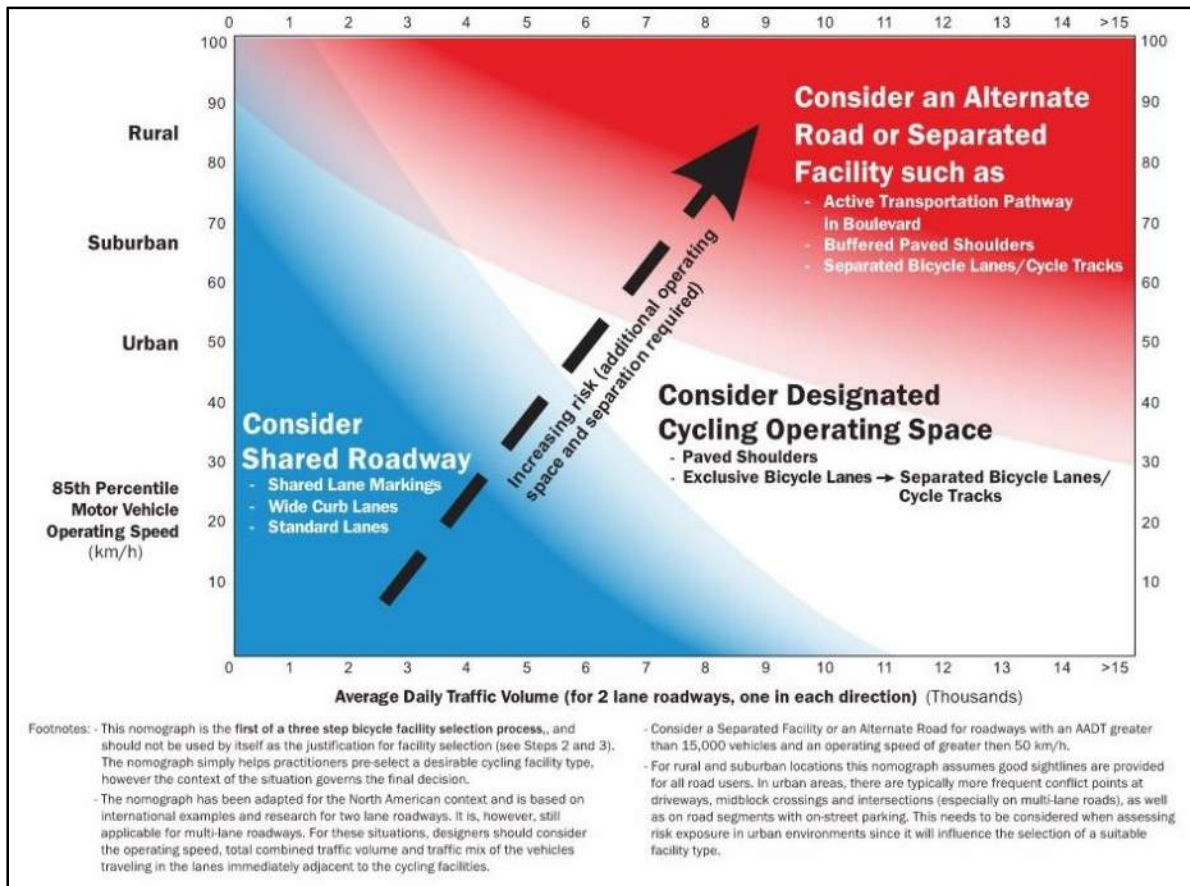
- Links to key destinations (identified in Step 1) and nearby communities (i.e. City of Ottawa, UCPR, etc).
- Spacing between parallel cycling facilities.
- Traffic volumes, truck percentages and posted speeds.
- Physical limitations (e.g. road width, topography, etc.).

In addition, the cycling facility types, including widths, were recommended for each of the proposed cycling facilities, based on OTM Book 18. The criteria used in OTM Book 18 is listed below, with key design consideration tables (excerpted from OTM Book 18) included in **Appendix A**.

- 85th percentile motor vehicle operating speeds;
- Motor vehicle volumes;
- Function of street, road or highway;
- Vehicle mix;
- Available space;
- Anticipated users in terms of skill and trip purpose;
- Level of bicycle use;
- Function of route within bicycle facility network; and,
- On-street parking.

The following figure is the pre-selection nomograph from OTM Book 18, a good tool for general use when selecting a cycling facility type. The nomograph indicates that as the average traffic volume and 85th percentile vehicle speeds increase, the need for a separated or alternate cycling facility increases.

Figure 5: Desirable Bicycle Facility Pre-Selection Nomograph



It should be noted that the cycling routes and facility types proposed in the UCPR Commuter Cycling Plan were not altered as part of this study, therefore only previously planned routes for Russell Township, or newly proposed routes as part of this study were evaluated. The recommended cycling plan, including key considerations, is presented in **Section 3.3**.

Step 4: Recommend the Implementation Schedule and Costing

This step involved preparing cost estimates and establishing implementation phasing based on a set of prioritization criteria. The recommended implementation schedule, costing estimates and cross-section diagrams are presented in Section 4.0.

3.3 Recommended Cycling Plan

The recommended cycling plan is illustrated in the following figures. The plan consists of cycling routes that provide connections to key destinations, connections between communities, and connections to surrounding municipalities.

For ease of visual presentation, the proposed Russell Township Cycling Plan was separated visually into five figures which are listed below, with highlights of each plan detailed further in the sections below.

- Figure 6: Proposed Cycling Plan – Russell
- Figure 7: Proposed Cycling Plan – Embrun
- Figure 8: Proposed Facilities for Locations with On-Street Parking – Russell
- Figure 9: Proposed Facilities for Locations with On-Street Parking – Embrun
- Figure 10: Proposed Commuter Cycling Connections

Figure 6: Proposed Russell Township Cycling Plan – Russell

3.3.1 Proposed Cycling Plan - Russell

- **Concession Street:** Given the large amount of existing on-street parking between Craig Street and St Joseph Russell Catholic Elementary School, a trade-off between providing cycling facilities and maintaining on-street parking is required here. This will be further explored in Section 3.3.3.
 - Where the on-street parking ends just north of St Joseph Russell Catholic Elementary School, paved shoulders with a 1.0 metre buffer are recommended, in order to connect to Russell High School.
- **Hamilton Road, Forced Road, Eadie Road:** These three roads are all recommended to have paved shoulders for cyclists, as all three roads provide a direct connection from the New York Central Trail to Craig Street / Castor Street, one of the main east-west connections in Russell Township. No buffer is recommended for these roads, given the limits of the existing road profile.
- **Church Street:** From South Russell Road to Bols Street, a multi-use pathway is recommended on the north side of Church Street, given the presence of the existing wide paved shoulder. A multi-use pathway here will provide a safe connection to South Russell Road for both cyclists and pedestrians within the neighbourhood, given that there is no sidewalk on Church Street through this section.
 - There is a possibility that Russell Township will install a sidewalk on Church Street in this segment. A MUP is still recommended here in lieu of a sidewalk, however if the sidewalk is installed, the cycling recommendation for this section of roadway would change from a MUP to Designated Shared Lanes.
 - Church Street east of South Russell Road is recommended to have painted bike lanes, given the curb on the north side of the street and the lack of a shoulder on the south side of the street. The bike lanes should be a minimum of 1.2 metres wide, as indicated in Section 3.1.2. East of Du Parc Avenue, and continuing to Wade Road, paved shoulders are recommended.
- **Mill Street:** Designated Shared Lanes are recommended for Mill Street, from Craig Street to South Russell Road, and from South Russell Road to Castor Street. Designated Shared Lanes don't provide any sort of separated cycling facility, however they generally are signed as cycling routes (i.e. Share the Road signs), and may have sharrows present on the roadway. Given the low volume and low traffic on

Mill Street, as well as the narrow streets and presence of on-street parking, Designated Shared Lanes are an appropriate facility type.

- This recommendation is an alternative to the cycling facilities on Castor Street (Mill Street to Concession Street) proposed in the Township of Russell OP. Since Castor Street is a one-way street westbound, with limited width and on-street parking, it was not possible to provide a safe cycling facility for cyclists in both directions.
- **Maple Street, Elm Avenue, George Street, Eldon Street:** Similar to Mill Street above, Designated Shared Lanes are recommended for this corridor. A cycling facility on these four streets will provide less confident cyclists with an opportunity to bypass the busier parts of downtown Russell, around the intersections of Concession Street with Craig Street and Castor Street. This is an important connection, given the presence of three schools at the north end of Concession Street, as this may be a preferred route for younger students. Share the Road signs and sharrows are recommended to indicate to all users that this is a Designated Cycling Route.
- **Olde Town Avenue:** There is an existing MUP connection from the east end of Olde Town Avenue to Forced Road. Additionally, there is the start of a MUP at the west end of Olde Town Avenue. It is recommended that this MUP be extended to connect to future cycling facilities on Hamilton Road.
- **Wade Road:** Paved shoulders are recommended for the length of Wade Road, despite posted speed limits (80 km/h) that would generally warrant a buffer. The existing road profile does not provide enough width for a buffer, and south of Sujack Street, Wade Road isn't expected to provide a major connection within the Township.

Figure 7: Proposed Russell Township Cycling Plan – Embrun

3.3.2 Proposed Cycling Plan - Embrun

- **Blais Street:** A multi-use pathway is recommended for the north side of Blais Street, from Notre Dame Street to St Jean Baptiste Street. Given the presence of an existing wide paved shoulder on the north side that is used for pedestrians, a MUP will accommodate both cyclists and pedestrians in this section. Additionally, a MUP will provide an easier connection to the start of the New York Central Trail, near the intersection of Blais Street and Notre Dame Street.
- **Centenaire Street:** From St Jean Baptiste Street to St Augustin Road, paved shoulders are recommended on Centenaire Street. Although the existing roadway does not have wide shoulders, the existing pavement width can accommodate paved shoulders and vehicular lanes.
 - From St Augustin Road to Notre Dame Street, Designated Shared Lanes are recommended. The road width is not wide enough for bike lanes, and the presence of curbs makes it expensive to widen the roadway. “Share the Road’ signs and sharrows are recommended through this section, given the presence of two playgrounds on this section of Centenaire Street.
 - Additionally, a traffic calming study is recommended for this section of Centenaire Street to support the implementation of the Designated Shared Lanes. Given the reported high traffic volumes and high speeds on the street, the Township should use the newly developed Russell Township Traffic Calming Policy to determine appropriate treatments for this section of Centenaire Street. Potential treatments that may be recommended from the traffic calming study could include vertical and horizontal
- **Renoir Drive:** There is a MUP at the northwest corner of Renoir Drive that recently had a bridge installed over a nearby creek in order to connect with Cologne Street. This MUP should be paved in order to provide a strong cycling connection to the developing community to the north.
 - To compliment this, the section of Renoir Drive from the MUP connection to Centenaire Street should be a Designated Shared Lane.
- **St Pierre Road:** From Notre Dame Street to its intersection with County Road 28 (just south of Highway 417), St Pierre Road is recommended to have paved shoulders with 1.0 metre buffers. This is a potential alternative route to the

recommended widening of the existing 1.2 metre paved shoulders along St Guillaume Road (County Road 28) to 2.5. Since that section of St Guillaume Road has both high traffic and high truck traffic volumes, it is not considered an ideal route for cycling, and in the UCPR Commuter Cycling Plan, St Pierre Road was identified as a preferable alternative route³.

- South of the New York Central Trail, bike lanes are recommended. It is anticipated that this section of St Pierre Road will be busier than north of the New York Central Trail, and there is adequate pavement width to accommodate vehicular lanes and bike lanes.
- **Castlebeau Street:** Designated Shared Lanes are recommended for the full extent of Castlebeau Street, due to the presence of Castor River Elementary School. The presence of “Share the Road” signs and sharrows will provide elementary students with a safer ride to school along this route. In addition, it is recommended that the Township review the potential for extending the flexible bollards further down Castlebeau Street (currently present from Blais Street to Heritage Street) to support the implementation of Designated Shared Lanes.
- **St Augustin Road:** Buffered paved shoulders are recommended along St Augustin Road from Castlebeau Street to Centenaire Street, in order to provide a connection from the Designated Shared Lanes on Castlebeau Street into the center of Embrun around Notre Dame Street.
 - South of Centenaire Street, where on-street parking is introduced, tradeoffs will have to be made between cycling facilities and on-street parking. Refer to Section 3.3.3 for further details.
- **St Jacques Road:** Buffered paved shoulders (1.0 metre buffer) are recommended on St Jacques Road from Notre Dame Street to Carriere Street, in order to provide a safer facility for any students of Ecole Secondaire Catholique Embrun looking to cycle to school. South of Carriere Street a narrower buffer can be provided.

³ It should be noted that there were numerous residents at the Public Open House (see Section 3.5) who preferred St Guillaume Road to St Pierre Road. The rationale is that the higher traffic volume on St Guillaume Road results in a lower travel speed of vehicles, which some residents is more preferable for them.

- **Ste Therese Boulevard:** In order to provide an east-west connection between the proposed cycling facilities on St Jacques Road and Ste Marie Street, painted bike lanes are recommended on Ste Therese Boulevard.
- **Cloutier Drive and Castor River Crossing:** The Township of Russell OP indicates a potential river crossing that would connect to Cloutier Drive. Although the status of this potential river crossing is unclear, it is assumed that it would be a crossing for pedestrians and cyclists only. If this is the case, then a more formalized MUP connection is recommended to the potential bridge, from Notre Dame Street in the north and from Cloutier Drive in the south.
 - The section located on Cloutier Drive is recommended as Designated Shared Lanes, given the low traffic volumes and low speeds on Cloutier Drive.

3.3.3 Proposed Facilities for Locations with On-Street Parking

Within urban areas, the implementation of cycling routes can be more challenging due to limited roadway width and presence of on-street parking. For recommended routes within the urban area, one of the following approaches is recommended.

1. Widen the road at the time it is scheduled for rehabilitation to add wider paved shoulders that accommodate both parking and bike lanes, or alternatively wider travel lanes with sharrows. However, right-of-way restrictions may make this infeasible in most, if not all, locations.
2. Restrict on-street parking on one or both sides of the road and re-paint to add paved shoulders for cycling. Modifications to on-street parking may require further public consultation. Parking may either be restricted at all times, or only during weekday morning and afternoon peak hours (e.g. between 7:30 AM and 9:30 AM, and 4:00 PM and 6:00 PM).
3. In situations where roadway width is limited and restricting on-street parking is not possible due to high parking demand, “Share the Road” signs and sharrows may be implemented along travel lanes to help reduce vehicle speeds and increase awareness of cyclists.
4. Implement bike lanes and maintain existing parking if existing roadway can accommodate.

Figures 7 and 8 indicates the recommended treatments at locations in Russell Township where cycling facilities and on-street parking come into conflict, including location of existing on-street parking, reasons to maintain or remove the on-street parking.

Figure 8: Proposed Facilities for Locations with On-Street Parking - Russell

Figure 9: Proposed Facilities for Locations with On-Street Parking - Embrun

Figure 10: Proposed Commuter Cycling Plan

3.3.4 Proposed Commuter Cycling Network

The recommended cycling plan also includes recommendations for regional connections to adjacent jurisdictions. In general, regional connections were selected based on the location of roads most conducive to cycling (e.g. roads with wide paved shoulders) and locations that provide direct connections to surrounding communities. The recommended commuter cycling plan, including the recommended regional connections is shown in **Figure 9**.

The majority of these connections were captured as part of the UCPR Commuter Cycling Plan, however it is important to highlight those connections here, so as to be aware of how they can tie into the Russell Township Cycling Plan. In addition, there are recommendations from the UCPR Commuter Cycling Plan that will benefit commuters who travel internally within Russell Township. The following are recommendations for commuter cycling connections within the Township:

- **Russell / Embrun:** Notre Dame Street / Castor Street / Craig Street (County Road 3), which runs east-west across the Township, is recommended for cycling facilities in the UCPR Commuter Cycling Plan. This will provide connections to both urban areas of Russell and Embrun. Additionally, Route 400 will have paved shoulders for cycling in the future, connecting to numerous north-south routes into both Russell and Embrun.
- **Limoges:** Limoges Road (County Road 5) is recommended for cycling facilities in the UCPR Commuter Cycling Plan, which will provide a connection to Limoges.
- **Marionville:** South Russell Road (County Road 6) and Marionville Road (County Road 7) are both recommended to have cycling facilities in the UCPR Commuter Cycling Plan. In addition, as part of the Russell Township Cycling Plan, MacDonald Road, Leclerc Road and Route 500 are recommended to have cycling facilities. This will provide two cycling routes to Marionville in the future.
- **417 Industrial Park:** As previously mentioned, the UCPR Commuter Cycling Plan recommended St Pierre Road as an alternative connection to the 417 Industrial Park and the City of Ottawa (via Frank Kenny Road). This recommendation is carried forward through the Russell Township Cycling Plan.

The following are the connections to three external municipalities provided as part of this plan and the UCPR Commuter Cycling Plan:

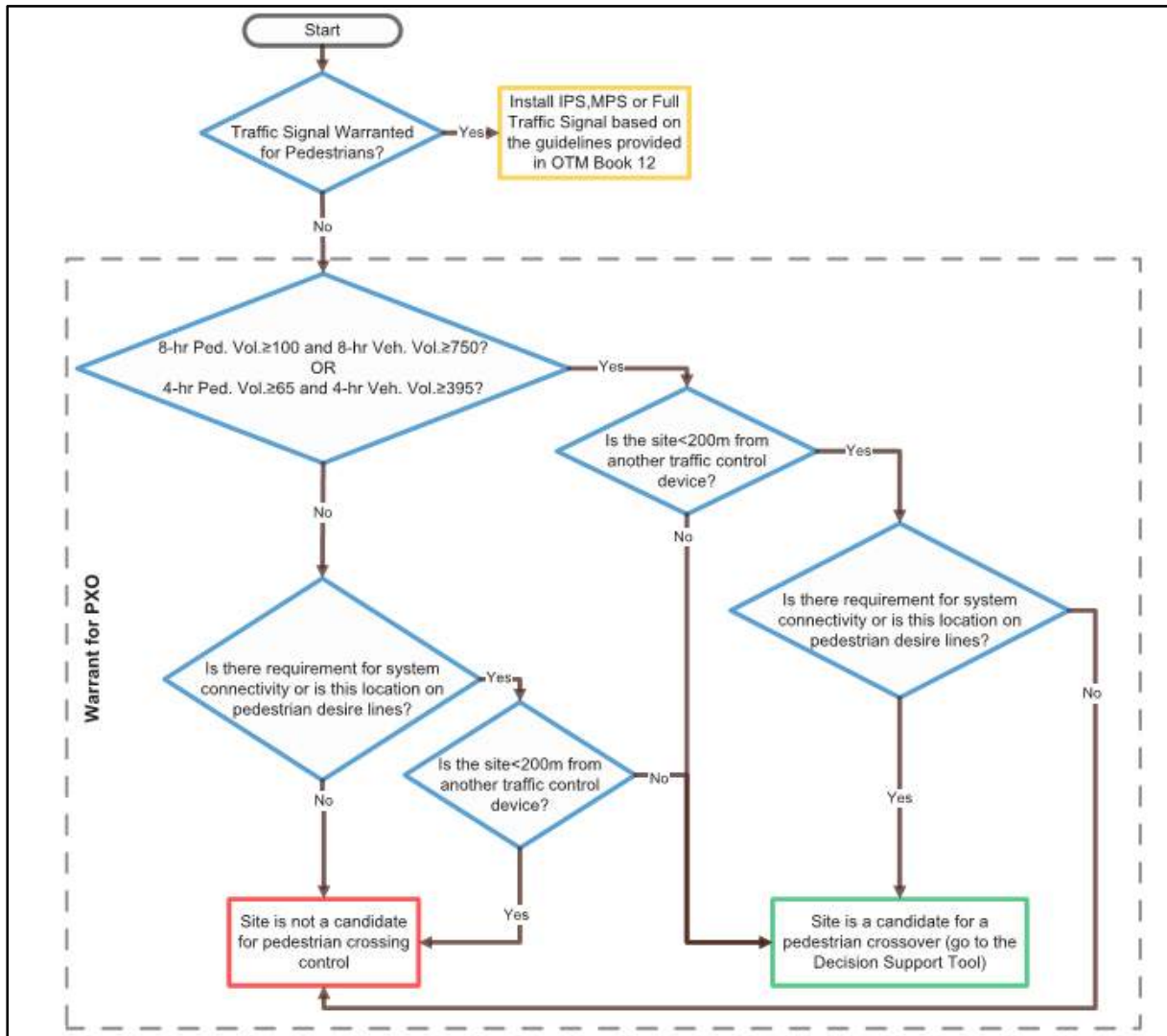
- **City of Ottawa:** The proposed St Pierre Road cycling facility will connect to the City of Ottawa at Frank Kenny Road. In addition, Craig Street will connect to the City of Ottawa at Victoria Street. 55% of commuter trips from Russell Township are to the City of Ottawa
- **The Nation / UCPR:** Notre Dame Street provides a connection to The Nation, as well as to UCPR, where 7% of commuter trips from Russell Township are destined to.
- **Stormont, Dundas and Glengarry (SDG):** South Russell Road connects with Stormont, Dundas and Glengarry County Road 7 at Marionville Road. 5% of commuter trips from Russell Township are destined for SDG.

3.4 Pedestrian Crossovers (PXOs)

Although cycling plans do not typically get into pedestrian crossings requirements and treatments, it was felt that a high level assessment would prove to be beneficial in moving the Township towards an attractive and seamless network.

In January 2016, the MTO approved an updated version of the OTM Book 15 – Pedestrian Crossing Treatments. Part of the update included evaluation standards for new and existing pedestrian crosswalk locations. OTM Book 15 includes a Decision Support Tool, provided in Figure 11, which provides guidance on pedestrian crossing treatments.

Figure 11: Pedestrian Crossing Decision Support Tool



3.4.1 Pedestrian Signal Warrant

The first step in the evaluation is to determine if a traffic signal is warranted for pedestrians at the location. This process is taken from OTM Book 12 – Traffic Signals. According to Section 4.9 of OTM Book 12, a traffic control device at an intersection or mid-block location must be considered if both the following minimum pedestrian volume and delay criteria are met:

- The total eight-hour pedestrian volume crossing the main road at an intersection or mid-block location during the highest eight hours of pedestrian traffic fulfills the

justification requirement. A tabular form of the justification values is provided in Table 3.

- The total 8-hour volume of pedestrians experiencing delays of ten seconds or more in crossing the road during the highest eight hours of pedestrian traffic fulfills the justification requirement. A tabular form of the justification values is provided in Table 4.

Table 3: Pedestrian “Volume” Justification (6A)

| 8 Hour Vehicular Volume (V8) | Net 8 Hour Pedestrian Volume | | | | |
|------------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|---------------|
| | < 200 | 200 - 275 | 276 - 475 | 476 – 1000 | > 1000 |
| < 1400 | NOT JUSTIFIED | NOT JUSTIFIED | NOT JUSTIFIED | NOT JUSTIFIED | NOT JUSTIFIED |
| 1440 – 2600 | NOT JUSTIFIED | NOT JUSTIFIED | NOT JUSTIFIED | SEE EQUATION 1 ⁴ | JUSTIFIED |
| 2601 – 7000 | NOT JUSTIFIED | NOT JUSTIFIED | SEE EQUATION 2 ⁵ | JUSTIFIED | JUSTIFIED |
| > 7000 | NOT JUSTIFIED | SEE EQUATION 3 ⁶ | JUSTIFIED | JUSTIFIED | JUSTIFIED |

Table 4: Pedestrian “Delay” Justification (6B)

| Net Total 8 Hour Volume of Total Pedestrians | Net Total 8 Hour Volume of Delayed Pedestrians | | |
|--|--|--|---------------|
| | < 75 | 75 - 130 | > 130 |
| < 200 | NOT JUSTIFIED | NOT JUSTIFIED | NOT JUSTIFIED |
| 200 - 300 | NOT JUSTIFIED | JUSTIFIED IF VOL. OF DELAYED PEDS > (240-(0.55 X VOL OF TOTAL PEDS)) | JUSTIFIED |
| > 300 | NOT JUSTIFIED | JUSTIFIED | JUSTIFIED |

3.4.2 Pedestrian Crossover Warrant

If the location does not meet the criteria for an intersection or mid-block pedestrian signal, then the crossing is evaluated for a pedestrian crossover treatment. To fulfill the warrant for a pedestrian crossover, the location must meet the following thresholds:

⁴ Equation 1: Justified if net 8-hour ped vol. > $(1650 - 0.45V_8)$

⁵ Equation 2: Justified if net 8-hour ped vol. > $(0.00001V_8^2 - 0.146V_8 + 800)$

⁶ Equation 3: Justified if net 8-hour ped vol. > $(340 - 0.0094V_8)$



- 8-hour vehicular volume ≥ 750
- 8-hour pedestrian volume ≥ 100

If the location meets the warrant for a PXO, then the OTM Book 15 standards specify appropriate PXO treatments based on the Pedestrian Crossover Selection Matrix, indicated in Figure 12 below.

The criteria used to select appropriate PXO treatments are:

- 8-hour or 4-hour two-way vehicular volume at the location of the crosswalk;
- Posted speed limit;
- Total number of lanes for the entire roadway cross section; and,
- Presence of raised pedestrian refuge (i.e., refuge island or median).

3.4.3 Potential PXO Locations in Russell Township

As part of the Russell Cycling Plan, a preliminary review was undertaken of the locations where the New York Central Trail crosses roadways within Russell Township. Currently the majority of these locations are controlled with standard crosswalks and are therefore candidates to be upgraded to full PXOs.

It should be noted that technically a PXO is for pedestrians, not cyclists, and according to the Highway Traffic Act cyclists are required to dismount at PXOs. In order for cyclists to be able to cross a roadway without dismounting a crossride is required, which is a significantly higher cost than a PXO.

Figure 13 below indicates the recommended PXO treatments for each roadway crossing of the New York Central Trail within Russell Township. **Appendix B** illustrates the various installation details for the recommended PXO treatments, from PXO 'B' to PXO 'D'.

Figure 12: PXO Selection Matrix

| Two-way Vehicular Volume | | | Speed Limit (km/h) | Total Number of Lanes for the Roadway Cross Section ¹ | | | |
|--------------------------|-------------|-------------|--------------------|--|--------------------|-------------------------|---------------------------|
| Time Period | Lower Bound | Upper Bound | | 1 or 2 Lanes | 3 lanes | 4 lanes w/raised refuge | 4 lanes w/o raised refuge |
| 8 Hour | 750 | 2,250 | ≤50 | PXO D | PXO C ³ | PXO D ² | PXO B |
| 4 Hour | 395 | 1,185 | | | | | |
| 8 Hour | 750 | 2,250 | 60 | PXO C | PXO B | PXO C ² | PXO B |
| 4 Hour | 395 | 1,185 | | | | | |
| 8 Hour | 2,250 | 4,500 | ≤50 | PXO D | PXO B | PXO D ² | PXO B |
| 4 Hour | 1,185 | 2,370 | | | | | |
| 8 Hour | 2,250 | 4,500 | 60 | PXO C | PXO B | PXO C ² | PXO B |
| 4 Hour | 1,185 | 2,370 | | | | | |
| 8 Hour | 4,500 | 6,000 | ≤50 | PXO C | PXO B | PXO C ² | PXO B |
| 4 Hour | 2,370 | 3,155 | | | | | |
| 8 Hour | 4,500 | 6,000 | 60 | PXO B | PXO B | PXO C ² | PXO B |
| 4 Hour | 2,370 | 3,155 | | | | | |
| 8 Hour | 6,000 | 7,500 | ≤50 | PXO B | PXO B | PXO C ² | PXO A |
| 4 Hour | 3,155 | 3,950 | | | | | |
| 8 Hour | 6,000 | 7,500 | 60 | PXO B | PXO B | | |
| 4 Hour | 3,155 | 3,950 | | | | | |
| 8 Hour | 7,500 | 17,500 | ≤50 | PXO B | PXO B | | |
| 4 Hour | 3,950 | 9,215 | | | | | |
| 8 Hour | 7,500 | 17,500 | 60 | PXO B | | | |
| 4 Hour | 3,950 | 9,215 | | | | | |

¹The total number of lanes is representative of crossing distance. The width of these lanes is assumed to be between 3.0 m and 3.75 m according to MTO Geometric Design Standards for Ontario Highways (Chapter D.2). A cross sectional feature (e.g. bike lane or on-street parking) that extends the average crossing distance beyond this range of lane widths may need to be considered as an additional lane in this table.

²Use of two side mounted signs per direction (one on the right side and on the median).

³Use PXO B for one-way streets.

3.4.4 Previously Completed PXO Reports

In 2016, the Russell Township Council approached the United Counties of Prescott and Russell to undertake a study to install more pedestrian crossovers within the Township. The results of the study indicated that no new crossovers were required, however the study also reviewed all existing crossings on County Roads. In a report to Russell Township Council on October 1, 2018, it was recommended that the crossings of the New York Central Trail at Castor Street (between Russell and Embrun) and at Notre Dame Street (just east of the roundabout) be upgraded to meet PXO 'C' standards, with the costs of the upgrades shared equally between the Township and the UCPR.

These recommendations fall in line with those presented in Figure 13 below, which recommend PXO 'C' on County Road 3 at the same locations.

3.4.5 Additional PXO Considerations

It is recommended that all PXO upgrades be undertaken in the Short-Term (0-5 years) horizon identified in Section 4.1. The priority for installation of PXOs is listed below, and is based on comments from users at the Public Open House, as well as the traffic volumes:

1. Notre Dame Street (at roundabout) & Castor Street.
2. Concession Street, St Pierre Road & Bay Street.
3. Eadie Road and Forced Road.

Below are some additional items that the Township should give consideration to at certain PXOs prior to upgrading the crossings. These items come from public comments at the Public Open House (see Section 3.5).

- Adjust the angle of the PXO for the crossing at Castor Street / Notre Dame Street and consider a review of the illumination of the crossing.
- Undertake a review of the location of the PXO at the roundabout to determine if the crossing should be moved away from the roundabout, or if treatments are required to slow cyclists on approach to the crossing.

Figure 13: New York Central Trail Recommended PXO Treatments

3.5 Public Consultation

A key component of this project is the coordination and integration of consultation. Various forms of communication were utilized to inform the residents of the Township of the Public Open House (POH), including:

- Russell Township website;
- Russell Township social media accounts (Facebook, Twitter, Instagram);
- The television and the LED sign at the Town Hall; and,
- Le Reflet (May 27, 2019).

A copy of the online and Le Reflet advertisements can be found in **Appendix C**.

3.5.1 Public Open House

One POH was organized in order to facilitate communication and receive feedback from members of the public. The POH was held on Wednesday, June 5, from 6:30 PM to 8:30 PM at the Russell Township Town Hall, located at 717 Notre Dame Street in Embrun. Twenty-two (22) attendees signed in to the POH, and eleven (11) comments were received by Wednesday, June 12.

The POH provided a chance for the public to identify issues and provide feedback related to the cycling network, comment on candidate cycling routes, preferred destinations, and to review the recommended cycling network, facility types, implementation phasing.

3.5.2 Summary of Public Comments

At the Public Open House, members of the public were asked to provide their feedback via comment sheets, or mail/e-mail their comments at a later date. A total of eleven comments were received from the Public Open House by Wednesday, June 12. All comment sheets, letters and e-mails received are provided in **Appendix D**.

The comments received through written, verbal, and email discussions both during and following the POHs were generally in support of the proposed cycling network and implementation plan.

One recurring issue mentioned is the safety of the roundabout for cyclists, specifically the crossing of the New York Central Fitness Trail at the roundabout. As indicated in Section 3.4 above, a PXO 'C' treatment is recommended at this crossing. Given the volume of

comments received regarding the roundabout, it would also be beneficial for the Township to undertake a safety review of the crossing at this roundabout prior to implementation of the PXO. Such a review may indicate that the crossing should be moved away (i.e. further east) from the roundabout, or for a chicane treatment be installed to reduce cyclist speeds on approach to the roundabout.

A summary of the answers provided on the comment sheets is provided below:

1. What key destinations would you like to cycle to (e.g. industrial parks, offices, schools, community centres, village centres, transit stops, etc)?
 - All of the above. Though connect to Ottawa and Montreal;
 - Village centres, library;
 - United Counties Recreational Trail;
 - From Russell to Embrun;
 - Community centre, library, shops;
 - Recreation and refreshment stops are important;
 - Park n Ride in Vars;
 - Independent (Embrun);
 - City of Ottawa bike paths;
 - Pool.
2. Of the potential connections identified on the maps presented, please identify or highlight your top 3 to 5 connections to improve the cycling in Russell Township.
 - Keep St-Guillaume as the main cycle path to Frank Kenny;
 - Church Street, South Russell to Wade;
 - Roundabout, crossing at the dog park;
 - I like the idea to pave the quiet roads (Route 200, Route 400, St Augustin) to do a big rectangle and come back home in Embrun;
 - As I cycle for recreation and not commuting, I cannot prioritize inter-municipal connections. I do not know anyone who desires to cycle commute inter-municipally;

- Ottawa, Metcalfe, Greely, Vars, Navan.
3. Please identify or highlight any existing areas of concern or barriers to cycling.
- Add signs before the stops (at the crossings) advising that cars have right of way and that cyclists have to stop;
 - Keep crossing close to roundabout, not further;
 - Roundabout crossing too close to roundabout;
 - Roundabout curbs make lane too narrow to share (used when trail is snow covered);
 - The crossing at the traffic circle;
 - Traffic along Notre-Dame / Castor / Concession / Craig, as well as their parking lanes in the villages must be addressed as these routes are used by teenagers / young adults commuting to jobs in our commercial areas;
 - I've heard of a lot of people who do not like sharing the road with cyclists so I don't think implementing shared lanes would go over well. As a cyclist, I would likely not use such a lane for the fear of drivers not sharing the road. The risk would not be worth it for me. Paved shoulders or separate bike lanes, although more work, would be a lot more safe and a lot more used;
 - The traffic circle in Embrun. It is very dangerous to have the bike path cross at the circle. Some cars stop when they should not and I have seen some near accidents since the next car is not expecting a stopped car in the circle. The other problem is one car going in one direction will stop and signal to the cyclist to go however the car from the opposite direction is not aware. I think it should be moved away from the circle and a light installed;
 - I think designated bike lanes and a light at the pool so that children can safely cross the road to get to the pool.
4. Please identify any cycling routes that you would like to see implemented earlier than the timing proposed in the Implementation Strategy. Please provide reasoning.
- St-Guillaume to Frank Kenny to improve accessibility to Ottawa;
 - Safety issues with the Castor crossing at dog park and at roundabout;

- I would prioritize recreational inter-village cycling routes connecting Marionville, Russell, Embrun and Limoges;
 - Vars Park n Ride. Would give access to the OC Transpo bus system for those who don't drive and provide an easy way to exercise for those who commute into Ottawa.
5. Are there any modifications to the plan you would like to see?
- I would like to see defined bike routes;
 - The roundabout is dangerous, maybe modify it;
 - Water fountain near school in Russell, and at beginning of the path in Embrun;
 - I would like to see routes accommodating longer distance recreational cycling;
 - Again, paved shoulders or separate bike lanes, although more work, would be a lot more safe and a lot more used, versus shared lanes;
 - I think any paved roads being repaved should include a paved shoulder for cyclists (I think this would help to keep the pavement from breaking on the edge due to large machinery);
 - I think it would be nice to have some signage at a roadway of what is near the bike path (i.e. food, restaurants, bike shop, parks, or a map of the area).

Some additional comments were provided that did not fall into any of the questions asked on the comment sheets. Those are listed below:

- My main priority as a cyclist is the main street Notre Dame and making it as safe possible for cyclists. I'd like there to be sharrows at a minimum along the road, and green line indicators at intersections with stoplights along the street showing traffic and cyclists where the cyclist should be during stopped traffic and when crossing. I have a vision for a vibrant main street with small shops, mature trees and shrubs, pedestrian and cycling-friendly traffic management measures. I love our trail but it completely bypasses our main street and keeps community away from it rather than making our main street an enjoyable gathering spot. So, Notre Dame is my main cycling priority in every sense. I bike from St. Andre to the Independent and other shops further east on Notre Dame. I sometimes avoid it though and decide not to stop at the shops on the way to and from Yahoo Park for example because of the

noise, heat (no shade) and heavy traffic along Notre Dame. I also frequently bike to Russell for the library and enjoy the trail very much.

- Basically, I think that the plan is excellent and that it includes a complete overview of the issues. Given that the plan develops all the options and options, I think it would be good if the presentation to council first focuses on the recreational component 'within' the boundaries of the municipality. Recommendations for Ottawa connections, etc. should then be seen as longer-term options. As far as the options within the boundaries of the municipality are concerned, my comments were that we should focus on recommendations that would increase the use of the trail to areas that are suitable for a larger population of users: schools, playgrounds, parks, the Sports Dome, soccer fields, ball, Fitness Trail, etc. I also make the comment that the use of the OPP for what is described in the plan as "enforcement" is unlikely to be the best use of police services and that the "Bi-Laws" Department would be more apt to contribute to this need. That being said, it is rather the "Education" component that should be the focus of this initiative.

4. IMPLEMENTATION AND COSTING

4.1 Implementation Schedule

This section presents the recommended implementation schedule for the cycling network. Details regarding the estimated costing for implementation are provided in Section 4.2 below. The implementation schedule consists of the following three phases: short-term (0-5 years); medium-term (6-10 years); and long-term (11+ years).

The following key considerations were used in developing the proposed implementation schedule:

- a) Locations where there is a high potential for commuter cycling demand (e.g. routes to employment areas, schools, parks, etc).
- b) Urgency of need (e.g. safety).
- c) Timing of alternate routes by municipalities, where such alternate routes exist (i.e. County Road 28 versus St Pierre Road).
- d) Potential utilization for both commuter and recreational cycling.
- e) Coordination with the Township's five year paving program where possible, to allow integration with other capital projects. **Table 5** below indicates the recently paved roadways, and planned future paving projects that include sections of the Russell Cycling Plan.
 - o It should be noted that a road condition assessment will be undertaken by the Township in 2019 in order to review the five year paving plan. It is recommended that any changes to the paving plan be reflected in the Implementation Schedule of the Cycling Plan as well.

Table 5 Russell Township Paving Projects

| Road | Section | Cost | Year |
|---------------|---------------------------------|--------|------|
| Forced Rd | Craig St to Nature Trail | \$110k | 2018 |
| Route 400 | Ste Marie to St Andre | \$140k | 2018 |
| | MacDonald to Gregorie | \$140k | 2018 |
| St Pierre Rd | Entire length | \$380k | 2018 |
| St Jacques Rd | Carriere to Route 400 | \$86k | 2018 |
| Hamilton Rd | Route 200 to Route 100 | \$480k | 2019 |
| Church St | South Russell Rd to Du Parc Ave | \$84k | 2021 |
| Blais St | Entire length | \$90k | 2021 |

The suggested phasing of the cycling network is illustrated in **Figure 14**, with each phase shown in a separate colour. It is important to note that the proposed implementation schedule is intended to be used as a guide, with actual implementation being dependant on available funding and opportunities.

In implementing the cycling network, a flexible approach is needed. The cost of implementing cycling infrastructure is generally lower when undertaken in conjunction with other infrastructure projects. As a result, it may be necessary to adjust the timing and priority of cycling projects to take advantage of opportunities that arise.

Figure 14: Russell Township Cycling Plan Implementation Schedule

4.2 Capital Costs

The cost of the cycling network was estimated for different types of facilities based on unit costs provided by UCPR staff, or City of Ottawa costs where no UCPR cost could be provided. A summary of the estimated costs by facility type and phase is provided in **Table 6** below, with a more detailed breakdown of costing provided in **Appendix E**.

Table 6 Estimated Cost of Cycling Plan Implementation

| Horizon | Russell | Embrun | Rural | Total Cost | Cost / Year |
|---------------------|-----------|-----------|-------------|-------------|-------------|
| Short (0-5 years) | \$306,500 | \$136,700 | \$0 | \$443,300 | \$88,600 |
| Medium (6-10 years) | \$126,000 | \$77,700 | \$0 | \$203,600 | \$40,700 |
| Long (11+ years) | \$120,200 | \$331,800 | \$3,084,800 | \$3,536,800 | \$353,700 |
| Ultimate Network | \$552,700 | \$546,200 | \$3,084,800 | \$4,183,700 | |

A summary of the key assumptions used to reach the cost estimates is provided below:

- Construction of paved shoulders incorporated with road rehabilitation / resurfacing projects for cost efficiency;
- Cost estimates do not include cost of bridge construction or bridge widening;
- Costs do not include the cost of property acquisition, design and approvals for construction;
- Costs of embankment widening for rural roadways assume existing lane widths can be narrowed down to 3.5 metres;
- Cost per km for new facilities varies depending on facility type and width;
- Costs do not include maintenance; and,
- Costs do not include PXO costs.

As shown in Table 6, the ultimate cycling network is expected to cost approximately \$4.2 million to implement in its entirety, which amounts to \$209,000 annually. This figure is largely weighted towards the high cost for rural cycling facilities, which comprises 73% of the

budget for the ultimate network. When considering only the short and medium horizons, the average cost per year is \$64,700.

One way to put the network implementation cost into perspective is to contrast it with the 10-year infrastructure budget for the Township. The cost for the short- and medium-term horizons amounts to \$646,900, or approximately 6.2% of the \$10.4 million dollar 10-year infrastructure budget.

A more equalized annual cost could be attained by shifting the recommended cycling facilities on St Pierre Street (from Route 300 to St Guillaume Road) from the long term horizon to the medium term horizon. This adjustment would increase the average cost per year for the short and medium term horizons to \$191,700 annually. However, this is not recommended as the road was paved in 2018, and therefore is not expected to be paved anytime in the next ten years, slotting it into the long-term horizon.

Unit costs related to additional items recommended in Section 4.3, Supportive Programs, are provided below:

- Signage: approximately \$250 each
- Sharrows: \$215 each
- Bike rack: approximately \$250 each (holds 2 bicycles)
- Flexible bollard: \$100 each (placed at 10 metre intervals)

4.3 Supportive Programs

The cycling plan includes a set of supportive actions that Russell Township could implement as they move forward with the implementation of the proposed cycling plan.

The proposed actions fall within five key approaches which are considered key to a successful cycling strategy. These are often referred to as the “Five E Approach”, and include Engineering, Education, Encouragement, Enforcement and Evaluation. These approaches are presented in more detail below.

4.3.1 Engineering

- **Design and Implementation of Cycling Routes:** It is recommended that the selection, design and implementation of the cycling routes be consistent with the Ontario Traffic Manual (OTM) Book 18 – Cycling Facilities. The OTM Book 18 Guidelines were developed by the Ontario Traffic Council and are intended to be

used to facilitate the selection, design, implementation and maintenance of both on- and off-road facilities.

- **“Share The Road” signs:** It is recommended that “Share the Road” signs be implemented to increase driver awareness of cyclists. These signs are official signs approved by the Ministry of Transportation of Ontario. The Township should use Ontario Traffic Manual Book 6 – Warning Signs and Ontario Traffic Manual Book 18 – Cycling Facilities (in section 4.0) as the primary references for the application of “Share the Road” signs. An example of a “Share the Road” sign is shown in the adjacent figure.



- **Implement Traffic Calming:** High traffic speeds can be a significant deterrent for many cyclists, and road segments within urban areas with speed limits of 50 km/h are potential candidates for traffic calming measures and may encourage more cycling within urban areas. Flexible delineator signs separating cycling facilities and general travel lanes hold significant promise, as they have the benefit of not only slowing down traffic speeds, but also provide physical separation between cycling facilities and travel lanes. It is recommended this measure be considered within school zones in order to provide additional safety and comfort to one of the most vulnerable road users, being children and youth, and help encourage increased cycling to school. The implementation of “Share the Road Signs” and sharrow markings may also help to reduce traffic speeds.
 - As mentioned in Section 2.2 of the report, the Township recently released a Traffic Calming Policy, which should be used to advise traffic calming projects.
- **Accessibility Considerations:** The Accessibility for Ontarians with Disabilities Act (AODA) promotes the goal of making Ontario accessible for people with accessible for people with disabilities by 2025. The Accessibility Standards for the Built Environment applies to pathways, trails and sidewalks. The intent is to help remove barriers to buildings and outdoor spaces. The standard only applies to new construction and extensive renovation and is not mandatory for the design of on-road cycling facilities. That said, when designing and implementing off-road cycling facilities and multi-use trails, Russell Township should refer to the guidelines outlined

in the Built Environment Standards to ensure that the needs of all user groups are accommodated.

4.3.2 Education

Education and promotion can help encourage the use of cycling. Residents should be informed on the Russell Township Cycling Plan for both commuting and recreational cycling, and education programs should be implemented to teach safety cycling and raise awareness of the benefits of cycling. Proposed initiatives include:

- **CAN-BIKE and Active and Safe Routes to School (ASRTS):** CAN-BIKE is a cycling program, organized through Cycling Canada, to promote safe and enjoyable cycling for all ages and cycling abilities through a series of progressive cycling courses. Through the progression of the cycling course offered, a participant will gain the skills and knowledge to be comfortable when cycling in traffic. Furthermore, the CAN-BIKE program is the only nationally recognized safe cycling program in Canada that can certify riders to ride safely should their duties at work require riding a bicycle. There are many ways to access CAN-BIKE programs, which include local cycling clubs, municipal departments, community associations and independent instructors. The UCPR recently carried a CAN-BIKE training program, and it is recommended that Russell Township pursues such opportunities to increase understanding of safe cycling practices.

The Ontario Active School Travel program is organized by Green Communities Canada to promote safe, easy and enjoyable active modes of transportation to school each day. Their activities and outreach range from local, regional and provincial projects targeted at providing appropriate resources, training, coaching, campaigns and partnerships in the effort to support community initiatives throughout Ontario. The goal of the program is to encourage more students to commute to school using active, safe and sustainable modes of transportation using their "Five E's" steps to success approach of Education, Encouragement, Engineering, Enforcement and Evaluation. Having recently received funding from the Government of Ontario, Green Communities Canada has started the Ontario Active School Travel Fund to fund community initiatives to promote active school travel initiatives.

In general, school boards are a key stakeholder, and can provide education to children about safety cycling and the benefits to cycling. This can also help result in

children choosing more active modes of travel as adults. It is recommended that Russell Township partner with CAN-BIKE, ASRTS and local school boards to incorporate active transportation education within the schools and implement programs to encourage cycling to and from school.

- **Educational Materials:** Russell Township should explore existing educational programs available and work towards developing a guide that addresses the key concerns related to cycling. This includes cyclist safety, rules and regulations for cyclists, winter cycling, vulnerable groups (e.g. the elderly or young children), training information, intermodal connections (e.g. between cycling and transit), and the benefits of cycling. This information should be posted on the Russell Township website. Pamphlets can also be developed and made available at community facilities (e.g. community centres, libraries, etc) or distributed at events.
- **Advertisement and Communication:** The cycling network should be advertised on the Russell Township website and on social media (e.g. the Russell Township Facebook page), in addition to relevant publications (e.g. “Ontario By Bike”). The use of social media in particular will continue to grow and is a key source of information and method of communication for youth especially. Hard copies of maps should also be made available throughout community facilities.

Information on the cycling map should include on- and off-road cycling routes, key attractions and destinations, and locations of bike racks.

4.3.3 Encouragement

Encouragement programs aim to help facilitate the use of cycling, and have a wider scope than education initiatives. The following initiatives should be considered to help encourage cycling within Russell Township.

- **Cycling Amenities:** Since each walking or cycling trip ends at a destination, it is important to consider the needs of users once the trip ends. A cyclist requires safe and convenient bike storage, and may also need shower or change room facilities. Long-term storage options (offering covered/secure parking such as bike lockers) are important at workplaces and schools, while short-term options (bike racks, post-and-rings) may be used for commercial areas. To ensure an appropriate amount of short- and long-term parking, it is recommended that requirements for end-of-trip facilities be defined in zoning by-laws. Such requirements should address both the type and

amount of bicycle parking to be provided as a function of the development type, size, and location.

Overall, secure and convenient bicycle racks should be provided at schools and key employment destinations throughout Russell Township. Bicycle racks at these key destinations will improve the awareness of cycling as a viable mode of travel and may help reduce vehicular trips to and from these destinations. This can be achieved through partnerships between Russell Township, the local school boards and key businesses.

- **Intermodal Connections:** Facilitating intermodal connections, including between cycling and transit, is an important way for encouraging cycling. Longer trips may not be feasible by cycling alone, but may be completed by incorporating both cycling and transit (i.e. cycling to a transit stop). Trips can also incorporate cars and cyclists, such as a person cycling to a Park and Ride to get a ride with a carpool.
- **Programs and Local Events:** Russell Township should work collaboratively with local stakeholders and interest groups to continue to support local events that promote cycling. Russell Township should also promote cycling at local events throughout the Township, such as distributing brochures about the cycling network. National events that Russell Township could promote include:
 - **Bike to Work:** Day and weekly events that takes place during the first week of June. For more information, visit www.smartcommute.ca.
 - **Walk to School:** Day events and month-long programs that are held in October For more information, visit www.saferoutestoschool.ca.
 - **Bicycle Friendly Community Designation:** The Bicycle Friendly Community Designation recognizes municipalities that have the conditions that support cycling. A designation also exists for Walk Friendly Communities. Municipalities that apply are evaluated by a panel of cycling experts based on five factors including Engineering, Education, Encouragement, Enforcement and Evaluation. The Bicycle Friendly Community Designation program is run by the Share the Road Cycling Coalition, which is an Ontario based cycling advocacy organization. It is recommended that Russell Township pursue a bicycle friendly community designation through the “Share the Road” program. The application for

Bicycle Friendly Communities can be found on the “Share the Road” website at [www.sharetheroad.ca/files/BFC Checklist.pdf](http://www.sharetheroad.ca/files/BFC%20Checklist.pdf)

4.3.4 Enforcement

It is recommended that Russell Township work with the local Ontario Provincial Police to increase enforcement of proper driver and cyclist behavior. In particular, it is recommended that increased enforcement of speed limits and appropriate driver behavior near cyclists be implemented along key cycling routes to help improve cyclist safety, in addition to increased enforcement of cyclist behavior to ensure that cyclists adhere to proper rules and regulations. It is also recommended that Township enforcement activities be supplemented by local township by-laws to ensure appropriate use of cycling facilities.

4.3.5 Evaluation

It is recommended that data be collected via a cycling count program to monitor the usage and effectiveness of the cycling plan. Data collection could potentially be incorporated with screen line counts or intersection counts, and could be collected bi-annually. It is also recommended that cycling operations be monitored on a regular basis, and that all reports received from cyclists related to safety be investigated.

With regards to future updates to the cycling plan, it is recommended that Russell Township consider an update in congruence with the Russell Township Transportation Master Plan in order to incorporate changes in cycling behaviours and usage, in addition to changes in population and employment growth patterns.

5. NEXT STEPS

The ultimate goal of the Russell Township Cycling Plan is to serve the community by providing attractive cycling routes to key destinations across the Township, as well as convenient cycling connections to nearby municipalities. Since this is Russell Township's first cycling plan, there will be opportunities for it to evolve and change as the network is developed in the future, and new infrastructure is built. Furthermore, the following next steps are recommended to ensure successful implementation of the cycling plan:

- **Policy Updates:** It is recommended that Russell Township approve the cycling plan and incorporate it into the Township of Russell OP when it is next updated.
- **Communication:** As cycling facilities are constructed, it is recommended that Township develop a readily accessible Township cycling network map that is updated on an on-going basis and that this information be posted on the Township website and other materials, as appropriate.
- **Address Barrier Effect on Bridges:** Include horizontal clearance in future bridge reconstruction / rehabilitation projects to accommodate cycling and active travel, where feasible. In most cases, this will require bridge widening. It is also recommended that guardrail heights be reviewed to ensure that they provide the appropriate vertical protection for cyclists, as specified in the applicable bridge design guidelines.

**APPENDIX A: OTM Book 18 – Bicycle Facility Type Selection,
Application Heuristics**

3.2.2.2 Step 2: A More Detailed Look

A tool such as the nomograph in **Section 3.2.2.1** may aid a practitioner in pre-selecting the desirable bicycle facility type. However, this facility type may not always be the most appropriate solution for a given situation due to other design factors. A set of **application heuristics** or knowledge-based rules, have been developed to aid practitioners in Step 2 of the bicycle facility type selection process. These heuristics link specific site conditions to appropriate facility types and supplementary design features.

Primary determining criteria, not in any specific order, include:

1. 85th percentile motor vehicle operating speeds;

2. Motor vehicle volumes;
3. Function of street, road or highway;
4. Vehicle mix;
5. Collision history; and
6. Available space.

Secondary criteria include:

7. Costs;
8. Anticipated users in terms of skill and trip purpose;
9. Level of bicycle use;
10. Function of route within bicycle facility network;
11. Type of roadway improvement project;
12. On-street parking; and
13. Frequency of intersections.

Tables 3.1 through to **3.13** provide key design considerations for the 13 application heuristics.

Table 3.1 – 85th Percentile Motor Vehicle Operating Speeds

| As the speed differential between motorists and cyclists increases, so does the collision risk for cyclists using that roadway. Therefore, when selecting a bicycle facility type, the 85 th percentile operating speed should be considered. Higher motor vehicle speeds may negatively influence a cyclist’s ability to control their bicycle. | |
|---|--|
| Site Characteristics | Design Considerations and Application Heuristics |
| Low (30 to 49 km/h) | Speed differential between bicycles and motor vehicles is within 30 km/h, suggesting integration of the two modes as mixed traffic, in standard or wide curb lanes, may be appropriate. |
| Moderate (50 to 69 km/h) | Exclusive operating space for both bicycles and motor vehicles, in the form of paved shoulders, bicycle lanes or separated facilities is recommended. |
| High (70 to 89 km/h) | Speed differential between bicycles and motor vehicles exceeds 40 km/h, suggesting physical separation of the two modes is most appropriate such as buffered paved shoulders. |
| Very high (90 km/h and greater) | Physical separation is preferable, particularly in an urban environment. In rural areas of the province, it may not be practical to provide physically separated facilities on very high speed roadways where bicycles are currently allowed. A painted buffer between the roadway and the paved shoulder is an alternative treatment for such cases. If this is not feasible, provision of a parallel bicycle route should be explored. |

Table 3.2 – Motor Vehicle Volumes

As motor vehicle volume increases, so does the collision risk for cyclists using that roadway. For planning purposes, the future year traffic volumes should be used when selecting an appropriate bicycle facility type for a given roadway section. Where AADT volumes are unavailable, rush hour volumes may be used. Some municipalities suggest that as a rule of thumb, rush hour volumes typically represent 10% of the daily volume.

| Site Characteristics | Design Considerations and Application Heuristics |
|---|---|
| Very Low Volume: where two-way daily average volume is less than 500 vpd on a two-lane road | No facility type is typically required. |
| Low Volume: where two-way daily average volume is 500 to 2,000 vpd on a two-lane road | Mixed traffic may be appropriate if vehicle speeds are low. Lanes should be wide enough to comfortably accommodate shared use by cyclists and motorists. If speeds are moderate, paved shoulders or bicycle lanes should be considered. |
| Moderate Volume: where two-way daily average volume is 2,000 to 10,000 vpd on a two-lane road | Some level of formal bicycle facility such as a conventional bicycle lane is recommended. If this is not feasible, a signed bicycle route with a paved shoulder may be considered. |
| High Volume: where two-way daily average volume is greater than 10,000 vpd on a two-lane road | Physical separation of motor vehicle and bicycle traffic may be most appropriate. |
| Hourly one-way volume in the curb lane exceeds 250 vph | Some level of formal bicycle facility such as a 'signed only' bike route with a paved shoulder or bicycle lanes are recommended. |

Table 3.3 – Function of Street or Road or Highway

While generally reflected in motor vehicle volumes, the function of a roadway should also be considered in bicycle facility decisions. The significance of this factor will be higher in cases where volume or speed data are unavailable.

| Site Characteristics | Design Considerations and Application Heuristics |
|--|---|
| Access roads such as local roads and residential streets | Mixed traffic may be appropriate if speeds and volumes are low. Where feasible, design features associated with Bicycle Priority Streets should be applied, as described in section 5.1 . Otherwise, curb lanes should be wide enough to comfortably accommodate shared use by cyclists and motorists, with dimensions as indicated in Table 4.1 for a Wide Signed Bicycle Route. |
| Both mobility and access roads such as minor collectors plus similar roads and streets | Some level of formal bicycle facility such as a signed bike route with paved shoulder or bicycle lane is appropriate. A Narrow Signed Bicycle Route may be implemented, with dimensions as indicated in Table 4.1 . |
| Mobility roads such as arterials and major collectors | Some level of formal bicycle facility such as a bicycle lane or separated facility is appropriate. |
| Motor vehicle commuter route | Separated bicycle facilities should be considered to minimize conflicts with aggressive drivers on the roadway. |

Table 3.4 – Vehicle Mix

| <p>Heavy vehicles, such as transport trucks and buses have a greater influence on cyclists than passenger vehicles. This is partly due to the larger difference in mass between cyclists and heavy commercial vehicles, and the increased severity of any resulting collision. Air turbulence generated by these high-sided vehicles also has a more significant impact on the difficulty of controlling a bicycle, which requires both greater skill and more caution on the part of the cyclist than in the presence of passenger vehicles. As the volume of heavy vehicles increases, so too does the desirability of providing buffers or physical separation of cyclists from motorized traffic. Stationary trucks and buses may also interfere with cyclist movements, creating a need for lane changes on the part of cyclists. This increases the interaction with vehicular traffic, and at times may obstruct other drivers' view of the cyclist on the road at inopportune moments.</p> | |
|--|---|
| Site Characteristics | Design Considerations and Application Heuristics |
| More than 30 trucks or buses per hour are present in a single curb lane | Separated bicycle facilities may be preferred by many cyclists. If paved shoulders, wide curb lanes or bicycle lanes are considered, additional width should be provided as a buffer. |
| Bus stops are located along the route | Facilities should be designed to minimize and clearly mark cyclist conflict areas with buses or pedestrians at stop locations. See Section 5.4.2 for more details. |

Table 3.5 – Collision History

| <p>Where there is evidence of the involvement of cyclists in collisions, historical patterns can sometimes provide valuable indicators of the factors that are present and pose particular challenges for the accommodation of cycling facilities, as well as the mitigating measures that can help resolve them.</p> | |
|---|--|
| Site Characteristics | Design Considerations and Application Heuristics |
| Bicycle collisions are relatively frequent along the route | A detailed safety study is recommended. Alternate routes should be considered. Separated facilities may be appropriate to address midblock conflicts. If on-road facilities are considered, the operating and buffer space provided to cyclists should be considered. |
| Bicycle collisions are relatively frequent at specific locations | Localized design improvements should be considered to address contributing factors at high-collision locations, often near intersection and driveway locations. |
| Noticeable trends emerge from bicycle collisions | The proposed facility and its design should attempt to address noticeable collision trends. For each facility type, safety countermeasures* can be developed. These can be based on road user behaviour and manoeuvres that resulted in the collision, or specific design and policy objectives. |
| Conflict areas exist between cyclists and motor vehicles or pedestrians | Facilities and crossings should be designed to minimize conflict between different types of users and the conflict area should be clearly marked. |

*For detailed scenario-based information, refer to the Bicycle Countermeasure Selection System in the FHWA's BikeSafe guide.

Table 3.6 – Available Space

| <p>The space available to serve all functions and users of a roadway is finite. Consequently, practitioners should consider the constraints imposed by curbs, pinch points and physical barriers when choosing the most appropriate facility for a particular section of roadway. Once the facility type has been selected, the adequacy of sightlines, both at intersections and continuously along a roadway should be considered. Please refer to Section 5.4 for more details.</p> | |
|---|--|
| Site Characteristics | Design Considerations and Application Heuristics |
| <p>Sufficient curb-to-curb width exists to adequately accommodate motorists and cyclists.</p> | <p>Redistribute roadway space to accommodate bicycle lanes by narrowing or eliminating parking lanes, narrowing travel lanes, or eliminating unnecessary travel or turn lanes. Where bicycle lanes are not feasible, wide curb lanes may be provided. Please refer to Section 5.2 for guidance on integrating bicycle facilities through road retrofits.</p> |
| <p>Sufficient curb-to-curb width exists, but pinch points are created where turn lanes are developed at intersections.</p> | <p>There is a higher risk of collisions at intersection compared to other sections of road and less confident cyclists may be deterred by a lack of designated bicycle facilities on the immediate approach to an intersection. Where feasible, localized widening should be undertaken to provide continuous bicycle facilities of constant width entering, through and exiting the intersection. Where this is not possible, bike lanes may be discontinued with appropriate positive guidance or warning measures upstream of the merge point or intersection. Practitioners should carefully and practically consider the way in which cyclists and general traffic will merge. Pavement markings and signage should encourage cooperative merging of cyclists and motorists into a single traffic lane. Sharrow markings can be used to denote a desirable cyclist path, particularly through narrow or atypical intersections. Refer to Section 4.2.1.4 for design recommendations.</p> |
| <p>Physical barriers include those created by steep grades, rivers, freeways, railways, narrow bridges.</p> | <p>Separated facilities should be considered to bypass or overcome barriers.</p> |
| <p>Curb-to-curb width is not adequate to provide sufficient operating space for both motorists and cyclists.</p> | <p>Provide separated facilities adjacent to the roadway or within an independent right-of-way, provide paved shoulders, widen roadway platform to accommodate bicycle lanes. Where this is not feasible, wide curb lanes may be considered or alternate routes may be investigated. If on-street parking is present, explore opportunities for it to be eliminated or reduced.</p> |
| <p>Adequate sightlines for road users including both motorists and cyclists on rural roads given design and operating speeds.</p> | <p>Horizontal and vertical curves along the roadway as well as roadway width should be considered when providing adequate sightlines for road users. Regular maintenance of vegetation is also important in preserving sightlines throughout the year.</p> |
| <p>Sight distance is limited at intersections, crossing locations or where cyclists and motor vehicles share limited road space.</p> | <p>Improve sightlines by improving roadway geometry, removing or relocating roadside furniture and vegetation; provide adequate space for cyclists either on or off the roadway. Design intersection crossings to minimize and clearly mark conflicts, and restrict parking in close proximity to intersections.</p> |

Table 3.7 – Costs

| <p>In reality, provisions for cyclists on roadway projects will be affected by the availability of funding. Designers should seek to ensure that their solutions are cost-effective, meet project objectives and are appropriate for the intended users given the characteristics of the site. However, cost should not eliminate the need for due diligence in providing safe and effective cycling facilities that encourage use.</p> | |
|---|--|
| Site Characteristics | Design Considerations and Application Heuristics |
| More than one type of bicycle facility appears appropriate | Benefit/cost analysis of alternatives should be conducted.* |
| Funding levels are not available to provide preferred type of facility | Consider alternate routes or focus on cost-effective improvements to existing facilities such as improved maintenance, pavement and drainage rehabilitation as well as removal of barriers. Poorly designed or constructed facilities may result in increased safety risks for cyclists, and are unlikely to encourage additional use. |

*Refer to NCHRP Report 552 - Guidelines for Analysis of Investments in Bicycle Facilities.

Table 3.8 – Anticipated Users in Terms of Skill and Trip Purpose

| <p>It is important to consider different user skill levels and trip purposes in the design of bicycle facilities. Therefore, providing a variety of facility types, whose distinguishing feature is the presence of different degrees of separation between motorists and cyclists, helps encourage new or less experienced cyclists. This in turn improves overall cyclist safety within a road network. Research shows that one of the most effective measures for doing this is increasing the number of cyclists using the system. The appropriateness of the existing provision on a particular link can be assessed by undertaking cyclist counts. In addition to recording the number of cyclists, the hourly and daily profile will give an indication as to trip purpose; for example, peaks in use during weekday periods demonstrate commuter demand whereas high volumes on the weekend suggests recreational use.</p> | |
|--|---|
| Site Characteristics | Design Considerations and Application Heuristics |
| Experienced cyclists (commuter or other utilitarian) | This group generally prefers direct, continuous facilities with minimal delay as is generally provided by the arterial road network. Experienced cyclists may be comfortable on shared use roadways with low motor vehicle volumes and speeds. However, users in this group typically prefer on-street bike lanes or separated facilities where the context warrants it. |
| Novice cyclists (recreational / beginner utilitarian) | This group generally prefers routes on residential streets with light traffic and low speeds. Bicycle lanes, paved shoulders (with or without buffers) and separated facilities should be considered. |
| Child cyclists | This group generally requires separated facilities free of conflicts with motor vehicle traffic. Separated facilities should be considered near schools, parks and neighbourhoods. Children under the age of 11 should be permitted to cycle on sidewalks since they may not have the cognitive ability or experience to ride on roads with motor vehicles by themselves. |

Table 3.9 – Level of Bicycle Use

| As cyclist volumes increase, so does the risk of interactions with motor vehicles. Therefore, as cyclist volume increases, practitioners should consider increased separation between motorists and cyclists. | |
|---|--|
| Site Characteristics | Design Considerations and Application Heuristics |
| Low bicycle volumes (< 10 cyclists per hour) | Wide curb lanes may be adequate in some cases. However, practitioners should carefully consider whether the low bicycle volumes represent a lack of cyclist demand or inadequate existing facilities. As improvements are made to cycling infrastructure, bicycle volumes tend to increase. |
| High bicycle volumes (> 50 cyclists per hour) | Paved shoulders, bicycle lanes or separated facilities may be appropriate. The width provided for urban bicycle facilities should accommodate bicycle volumes during peak periods both midblock and at intersections. |
| Significant bicycle traffic generators are nearby | Latent bicycle demand may exist if there are employment centres, neighbourhoods, schools, parks, recreational or shopping facilities along the route. Transit nodes also provide the opportunity for multi-modal travel, with bicycle trips to and from the node where appropriate end-of-trip facilities are provided (see Section 7). Bicycle lanes and separated facilities should be considered to accommodate the anticipated volume of cyclists. |

Table 3.10 – Function of Route within the Bicycle Facility Network

| The function of the route within the bicycle facility network is very important. Bicycle facilities depend on accessibility and connections between routes, major destinations, residential areas and recreational services. Route segments should be identified as primary or secondary routes, and ease of access to and from such facilities should be a major planning and design consideration. | |
|--|--|
| Site Characteristics | Design Considerations and Application Heuristics |
| Parallel bicycle routes already exist with bicycle facilities present | Redundancy of bicycle routes may provide an opportunity to provide different types of bicycle facilities within the same travel corridor. This would give cyclists with different skill levels and trip purposes the opportunity to choose the facility most appropriate to their needs. |
| New route provides a connection between adjacent existing facilities | Facility selection should provide continuity with adjacent bicycle facilities to the extent possible. |
| New route provides access to a neighbourhood, suburb or other locality. | Bicycle lanes and separated facilities should be considered to encourage cycling for all users. |

Table 3.11 – Type of Roadway Improvement Project

The type of roadway improvement project can and most often does affect the type of bicycle facility that is appropriate for a given context. For example, retrofitting existing roads and intersections, platform width and other existing constraints will play a role in selecting the appropriate bicycle facility type. Therefore, consideration must be given to the type of roadway improvement project whether it is new construction, reconstruction or a retrofit. Combining works in this way allows bike facilities to be installed while achieving cost efficiencies. However, practitioners should consider the completeness of the resulting bikeway network. The implementation of small sections of disconnected bicycle facilities is unlikely to provide meaningful connections for cyclists since those facilities may suffer from low cycling volumes. Practitioners should consider using some the resources saved through the aforementioned synergies to provide additional links which will properly integrate the new facilities into the network.

| Site Characteristics | Design Considerations and Application Heuristics |
|-----------------------------|---|
| New construction | Appropriate bicycle facilities should be planned and integrated with the design and construction of new roads and communities. |
| Reconstruction | Major roadway reconstruction provides an opportunity to improve provisions for cyclists through the redistribution of existing road space (if reconstruction only involves work between the curbs) or increased roadway width or off-road space. Efficiencies where the two projects overlap will reduce the cost of providing context-appropriate bike facilities. |
| Resurfacing | Affordable solutions may be limited to redistributing existing road space. Fully paved shoulders may be considered along rural arterials or collectors used by cyclists. |

Table 3.12 – On-Street Parking (for urban situations)

| <p>The presence of on-street parking has a considerable influence on both the safety and comfort of a cyclist using a bicycle facility. In particular, the configuration of on-street parking, its degree of utilization and its separation from the bicycle facility are of concern selecting a bicycle facility type. Sound engineering judgement must be applied in the design of these facilities. The designer must assess the potential for conflict between cyclists and motor vehicles as a result of vehicles entering or leaving parking spaces. The potential severity and number of conflicts will vary based on the volume of cyclists as well as the parking demand and turnover. In each case, the objective should be to avoid or mitigate conflicts to the extent possible, while recognizing parking needs and alternatives.</p> | |
|--|---|
| Site Characteristics | Design Considerations and Application Heuristics |
| Parallel on-street parking is not permitted | Opportunities to provide bicycle lanes or, if not feasible, wide curb lanes should be explored and their appropriateness should be evaluated. |
| Parallel on-street parking is permitted in localized areas along the route | Consistent bicycle lanes may prove difficult to provide since available roadway width is likely to change where parking is provided. Wide curb lanes may be a compromise solution. |
| Parallel on-street parking is permitted but demand is low | Opportunities to remove, restrict or relocate parking in favour of providing bicycle lanes should be considered. |
| Parallel on-street parking is permitted but turnover is low | Bicycle lanes may be appropriate. Additional buffer space between bicycle and parking lanes should be provided. |
| Parallel on-street parking is permitted; turnover and demand is high | Separated bicycle facilities between on-street parking and the edge of the roadway may be most appropriate. Bicycle lanes between vehicle travel lanes and on-street parking are not desirable in this situation. This is due to the frequent occurrence of conflicts between cyclists and vehicles manoeuvring in and out of the parking area. Where separated facilities cannot be accommodated, potential provision for cyclists on alternate routes should be investigated. |
| Perpendicular or diagonal parking is permitted | On-road facilities are not appropriate unless parking is reconfigured or removed. Alternate routes or opportunities to provide a separated facility should be explored. |

Table 3.13 – Frequency of Intersections (for urban situations)

| <p>The more intersections and access points along a bicycle route, the more conflict points that are present. Therefore, locations with increased intersection and access density require careful consideration when selecting a bicycle facility type for the area. Sound engineering judgement must be applied to determine the characteristics of a particular site and a corresponding facility design. The designer must assess the potential for conflict between cyclists and motor vehicles as a result of vehicles entering and exiting the road. The potential severity and number of conflicts will vary based on cyclist and vehicle turning movement volumes. In each case, the objective should be to avoid or mitigate conflicts to the extent possible. This may involve the application of conflict pavement markings, as described in Section 4.2.1.4 and 4.2.2.4.</p> | |
|--|---|
| Site Characteristics | Design Considerations and Application Heuristics |
| Limited intersection and driveway crossings are present along the route | Separated facilities or bicycle lanes are well suited to routes with few driveways and intersections. |
| Numerous low volume driveways or unsignalized intersections are encountered | Bicycle lanes may be more appropriate than separated facilities since motorists are more likely to be aware of cyclists on the roadway rather than adjacent to the road. If bicycle lanes are not feasible, wide curb lanes may be provided. |
| Numerous high volume driveways or unsignalized intersections are present along the route | Separated facilities are generally not preferred in this situation; bicycle lanes may be more appropriate. Crossings should be designed to minimize conflicts; additional positive guidance should be considered to warn cyclists and motorists of conflicts. If bicycle lanes are not feasible, wide curb lanes may be provided. |
| Major intersections with high speed and traffic volumes are encountered | Consider provision of bicycle lanes, bike boxes, intersection and conflict zone markings as well as special bicycle signal phases at major intersections. Consider indirect left-turn treatments if there is significant bicycle left turn demand conflicting with through motor vehicle traffic. If a separated facility is being considered, crossings should have bicycle traffic signals with exclusive phases, and conflicts should be clearly marked. |

3.2.2.3 Step 3: Justify Your Rationale

Step 3 provides a consistent means of documenting and defending the bicycle facility type selected. Once site conditions have been investigated and the appropriate application heuristics from Step 2 have been examined and documented, the compatibility of the bicycle facility identified in Step 1 with the heuristics identified in Step 2 should be determined. If the site conditions from Step 2 do not support the result of Step 1, then attention should be given to another facility type that may be more compatible with site conditions. Once all factors are considered, it is possible to

make a final decision regarding the appropriateness of the facility type for the specific roadway section being considered. At this point additional design features or enhancements should be considered in the design phase.

It is imperative that the practitioner document each decision made during the bicycle facility type selection process. The steps taken to reach each decision and the rationale behind the selection should be documented. This will assist the designer should they be required to defend any compromises they may have chosen for operational, cost or other reasons based on their engineering judgement.

**APPENDIX B: OTM Book 15 – Pedestrian Crossing Treatment
Examples**

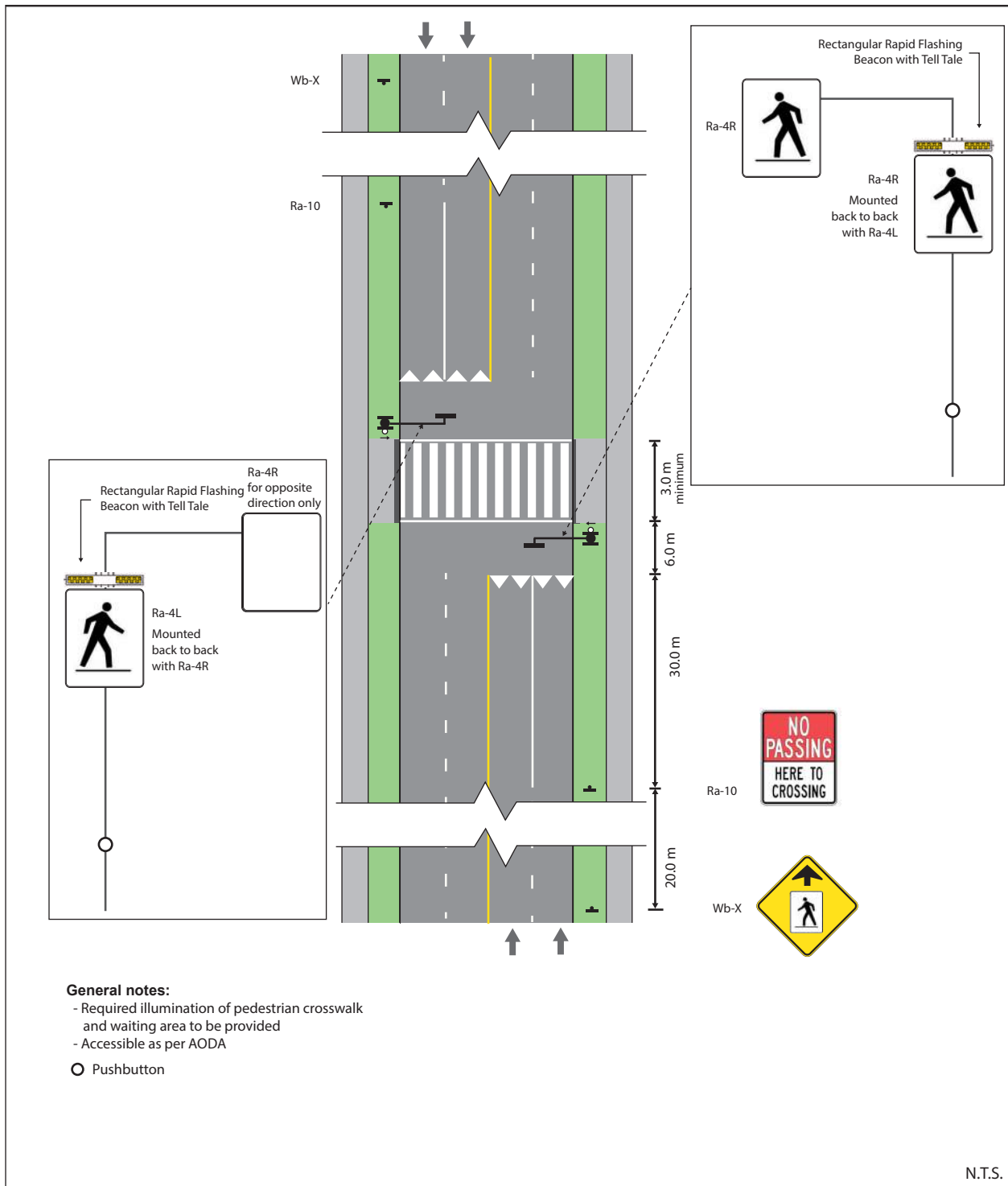


Figure 24: Pedestrian Crossover Type B – Mid-block (4-lane, 2-way)

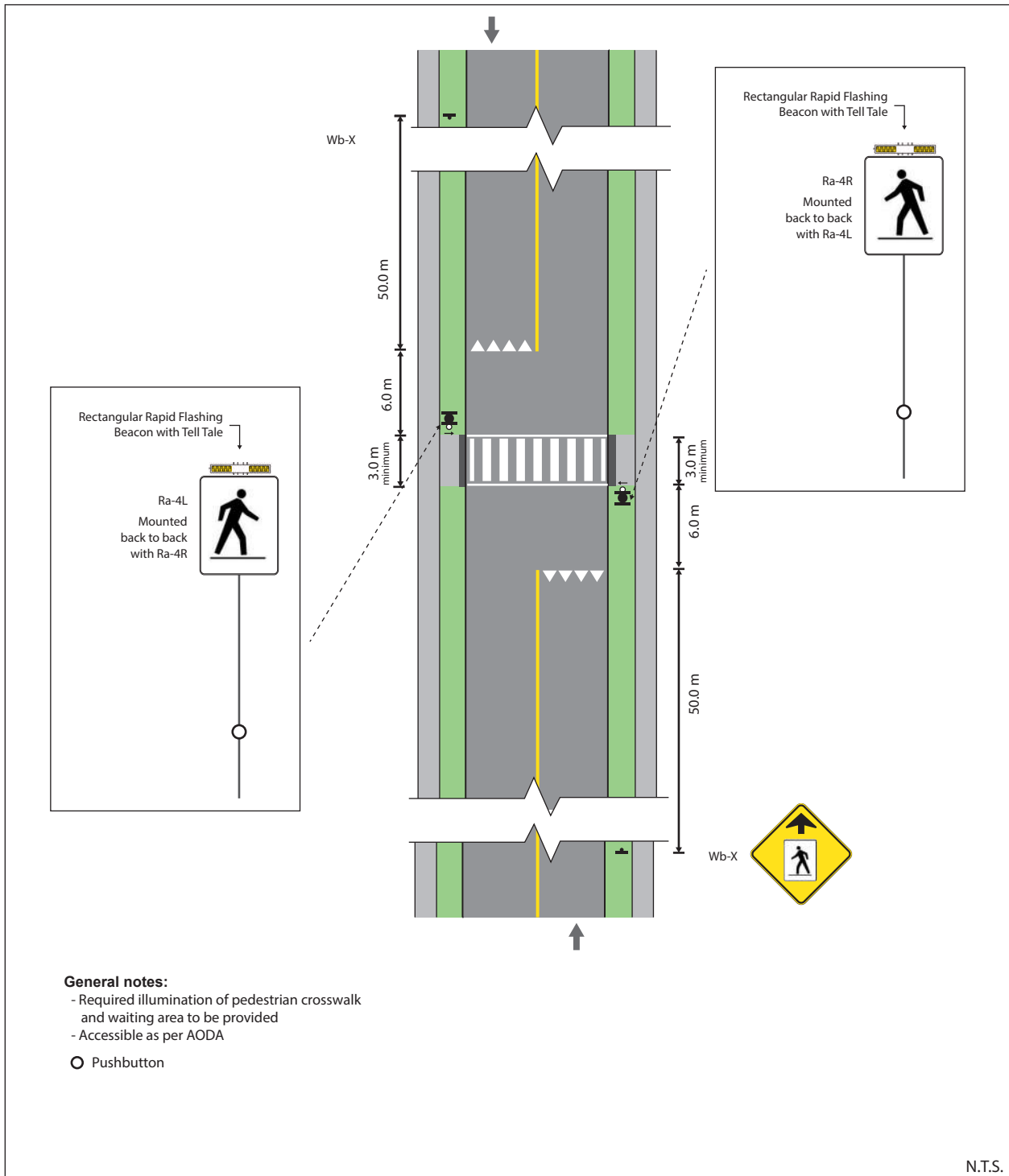


Figure 31: Pedestrian Crossover Type C – Mid-block (2-lane, 2-way)

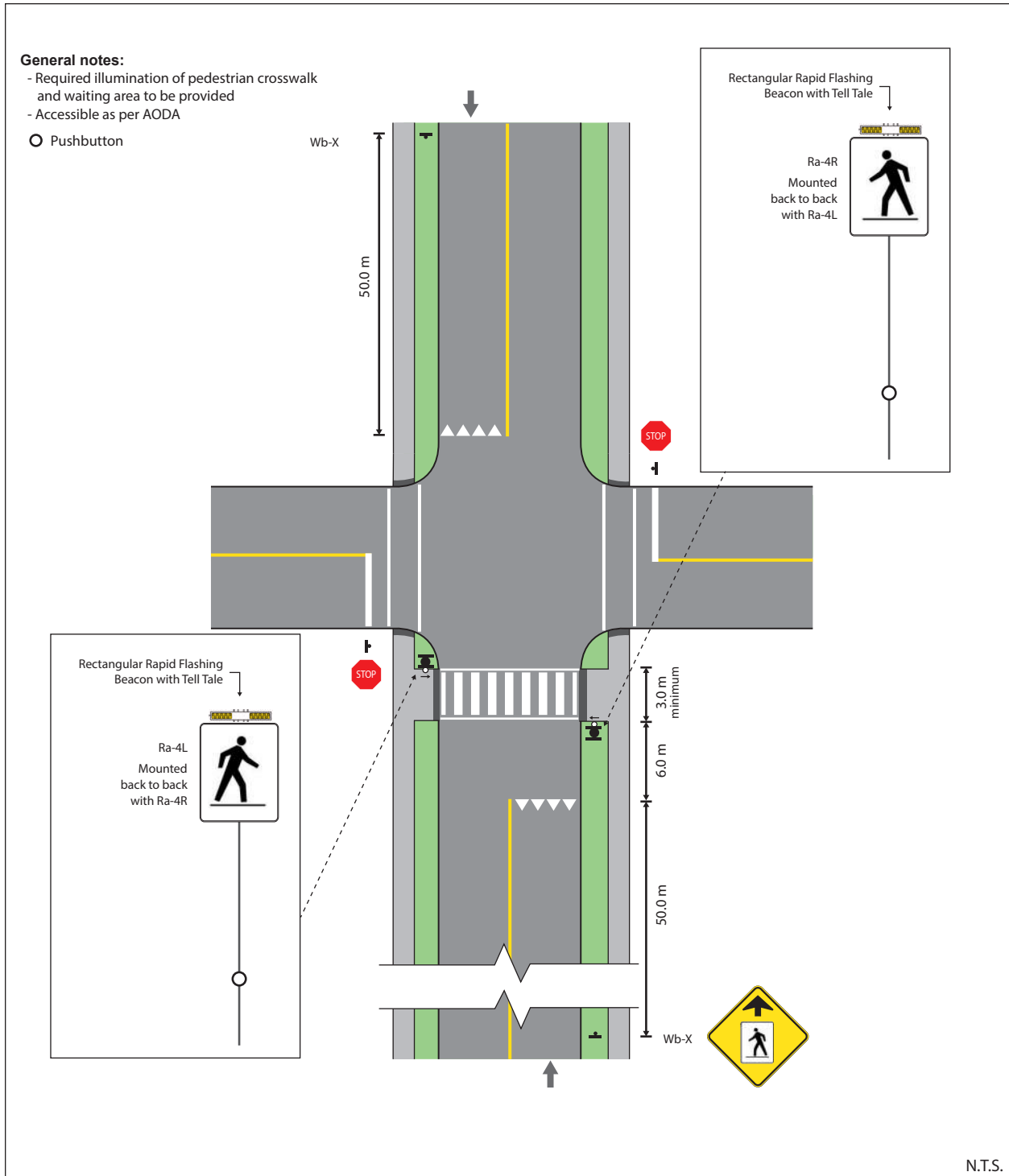


Figure 37: Pedestrian Crossover Type C – Intersection (2-way)

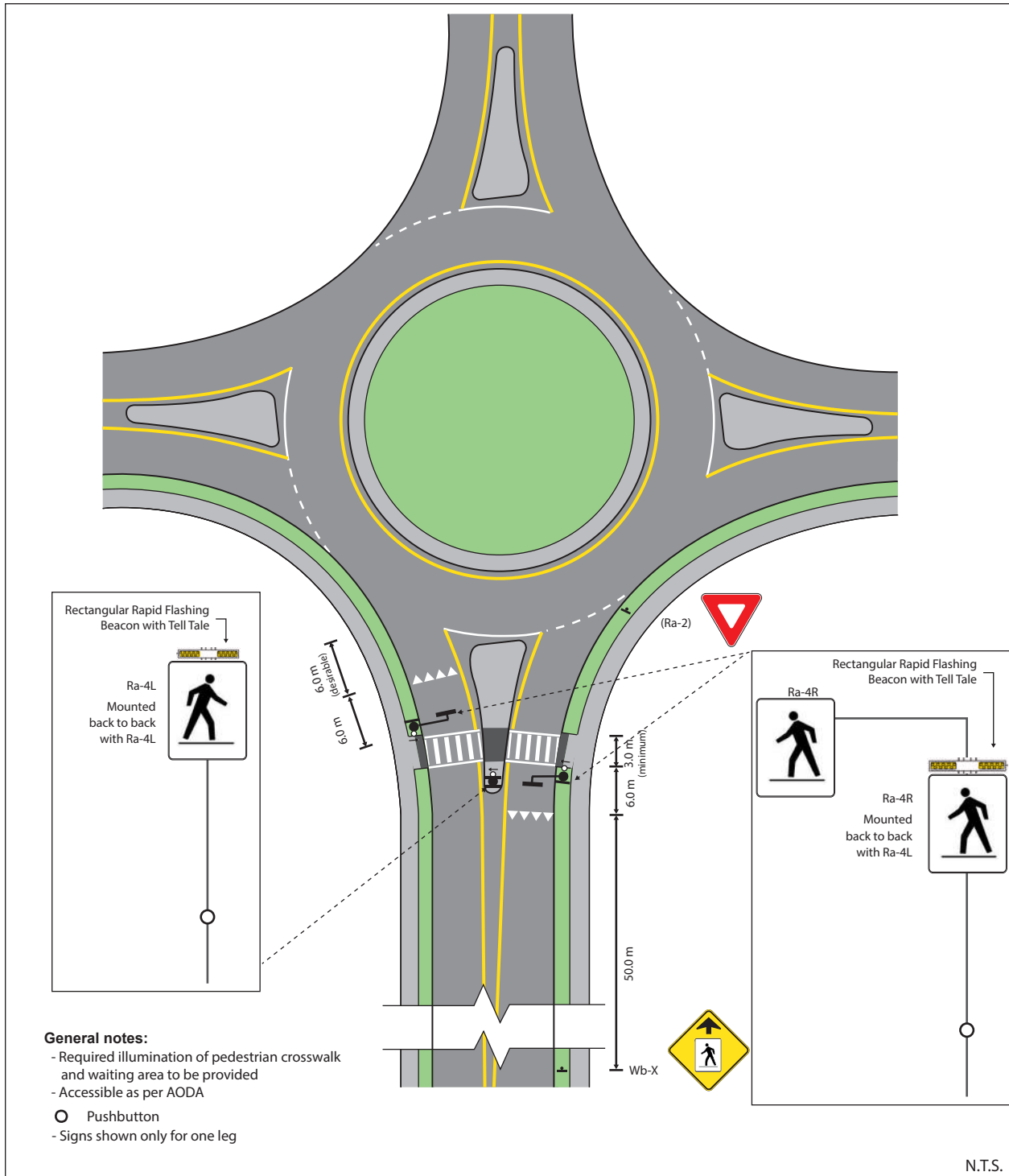


Figure 38: Pedestrian Crossover Type C – Single-Lane Roundabout

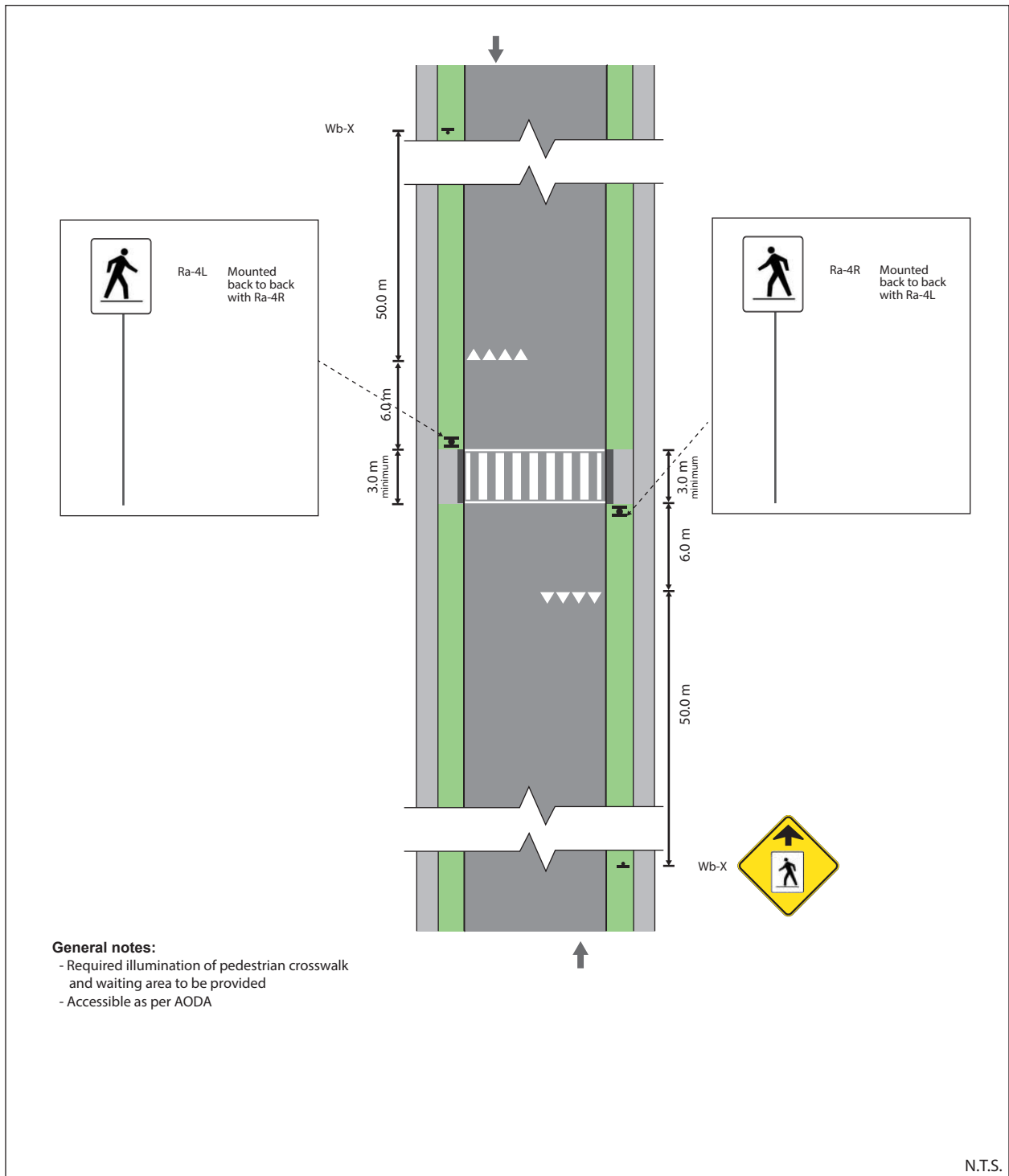


Figure 40: Pedestrian Crossover Type D – Mid-block (2-lane, 2-way)

APPENDIX C: Public Open House Notices

Etude sur le cyclisme

Consultation publique



MORRISON HERSHFIELD

Municipalité de
RUSSELL
Township

Cycling Study

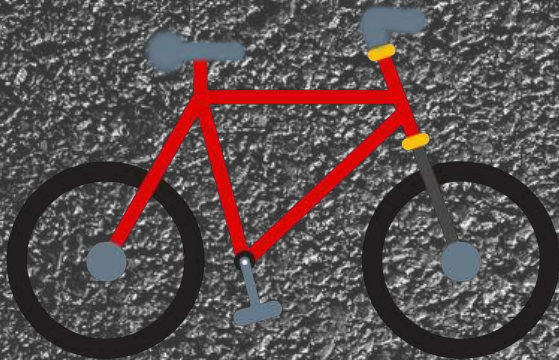
Public Consultation

**5 juin 2019
18 h 30 à 20 h 30
Salle Gaston Patenaude,
717 Notre-Dame, Embrun**

**June 5, 2019
6:30 to 8:30 p.m.
Gaston Patenaude Hall,
717 Notre Dame, Embrun**

Vous êtes invités à venir partager vos idées!

You're invited to share your ideas!



recreation.loisirs@russell.ca      

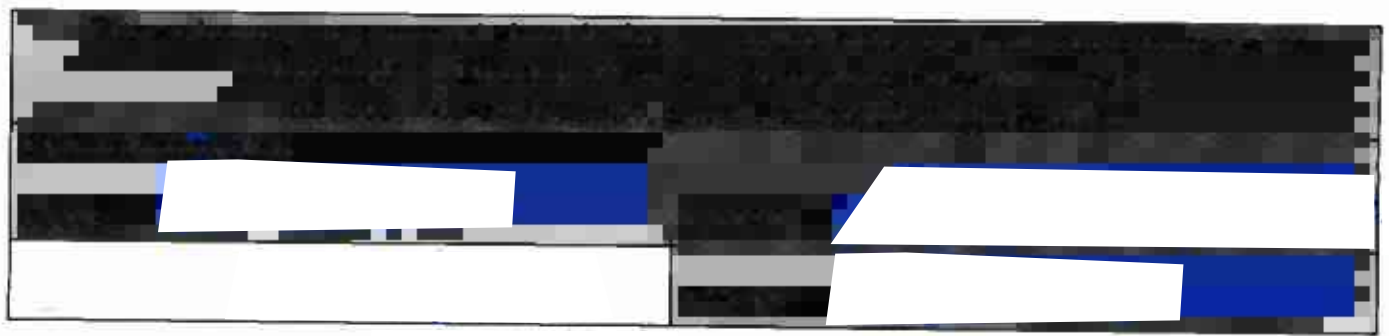
APPENDIX D: Public Open House Comment Sheets

all of the above. ^{n re} though, ^g connect to ^a ^p Hawa 14

1) ~~_____~~
Frank Kenner.
~~_____~~ that

^{as} keep crossing ^{ist} close ^{ea: f} to ^{ba:} roundabout, not further

~~_____~~ ^d to improve
access to Hawa



ns would you
[redacted]

B y

Roundabout

H H TH

B G T CLOS AB
NDAB U S A
(WH TRA IS)

th t



6 The Corposional Trail

R d ab +
c g the dog park

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af y
about

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F

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N/A

Pl

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Passing at the Tr e.

th t

Be to l + s e de d



Community center, ~~at~~, ~~at~~

I like the idea to put the quiet road (route
4, ~~at~~ ~~at~~ I like to do a big rectangular
an back from in Embury

The road about is dangerous. My ~~modify~~

Water fountain at ~~at~~ in Russell (Near school)
at the beginning of the path in Embury

h
s ety . to

Tell Us What You Think... / Dites-nous ce que vous pensez...

Public Open House / Portes ouvertes publiques

What key destinations would you like to cycle to (e.g. industrial parks, offices, schools, community centres, village centres, transit stops, etc.)? / À quelles destinations clés souhaitez-vous vous rendre à vélo (par exemple, parc industriel, bureau, écoles, centres communautaires, centre du village, arrêts de transports en commun, etc.)?

I cycle for recreation. Recreation and refreshment stops are important.

Of the potential connections identified on the maps presented, please identify or highlight your top 3 to 5 connections to improve cycling in Russell Township. / Parmi les connexions potentielles identifiées sur les cartes présentées, veuillez identifier ou mettre en évidence vos 3 à 5 meilleures connexions pour améliorer le cyclisme dans le canton de Russell.

As I cycle for recreation, and not commuting, I cannot prioritize inter-municipal connections. I do not know anyone who desires to cycle commute inter-municipally.

Please identify or highlight any existing areas of concern or barriers to cycling. / Veuillez identifier ou mettre en évidence tout sujet de préoccupation ou obstacle au cyclisme.

Traffic along Notre-Dame/Castor/Concession/Craig streets, as well as their parking lanes, in the villages, must be addressed as these routes are used by teenagers/young adults commuting to jobs in our commercial areas.

Please identify any cycling routes that you would like to see implemented earlier than the timing proposed in the Implementation Strategy. Please provide reasoning. / Veuillez identifier toutes les pistes cyclables que vous souhaiteriez voir mises en place plus tôt que le calendrier proposé dans la stratégie de mise en œuvre. S'il vous plaît, fournir un raisonnement.

I would prioritize recreational inter-village cycling routes connecting Marionville, Russell, Embrun and Limoges.

Are there any modifications to the plan you would like to see? / Est-ce qu'il y a des modifications au plan que vous aimeriez voir?

I would like to see routes accommodating ~~the~~ longer distance recreational cycling.

Please send your comment sheet by e-mail before June 13, 2019, to:
Veuillez envoyer votre fiche de commentaire par courriel avant le 13 juin 2019 à :
Céline Guitard, Director of Parks & Recreation / Directrice des parcs et loisirs
Russell Township / Municipalité de Russell
Tel: (613) 443-3066 x3501, E-mail / Courriel : celineguitard@russell.ca

Optional information:

NAME:

E-MAIL :

ADDRESS :

PHONE :

Personal Information on this sheet is collected under the authority of the Planning Act, R.S.O. 1990, c. P.13 and may be used by Russell Township to contact attendees for the purpose of providing further information about the Russell Township Cycling Plan. If you have any questions about the collection and use of your information, please contact Céline Guitard, Director of Parks & Recreation, Russell Township, (613) 443-3066 x2327, celineguitard@russell.ca

To:

Subject:

RE: Cycling study comments

Hi,

Here are my comments on the cycling study:

What key destinations would you like to cycle to (e.g. industrial parks, offices, schools, community centres, village centres, transit stops, etc.)?

Park n Ride in Vars

Independent (Embrun)

City of Ottawa bike paths

Of the potential connections identified on the maps presented, please identify or highlight your top 3 to 5 connections to improve cycling in Russell Township.

Ottawa, Metcalfe, Greely

Ottawa, Greely

Ottawa, Vars, Navan

Please identify or highlight any existing areas of concern or barriers to cycling.

I've heard of a lot of people who do not like sharing the road with cyclists so I don't think implementing shared lanes would go over well. As a cyclist, I would likely not use such a lane for the fear of drivers not sharing the road. The risk would not be worth it for me. Paved shoulders or separate bike lanes, although more work, would be a lot more safe and a lot more used.

Please identify any cycling routes that you would like to see implemented earlier than the timing proposed in the Implementation Strategy. Please provide reasoning.

Vars park n ride. Would give access to the OC transpo bus system for those who don't drive and provide an easy way to exercise for those who commute into Ottawa.

Are there any modifications to the plan you would like to see?

Again, paved shoulders or separate bike lanes, although more work, would be a lot more safe and a lot more used, versus shared lanes.

Looking forward to having more ways to bike around town!

To:

Subject:

RE: Cycling consultation

Bonjour Madame Guitard,

J'aimerais partager ci-dessous mes pensées au sujet de l'étude sur le cyclisme pour le canton de Russell.

Just before I start may I recommend next time having the sheet as a digital survey as well as PDF? I am having to refer back to the static document as I type this, it's quite onerous.

Thank you very much for consulting the public on this matter.

My main priority as a cyclist is the main street Notre Dame and making it as safe possible for cyclists. I'd like there to be sharrows at a minimum along the road, and green line indicators at intersections with stoplights along the street showing traffic and cyclists where the cyclist should be during stopped traffic and when crossing.

I have a vision for a vibrant main street with small shops, mature trees and shrubs, pedestrian and cycling-friendly traffic management measures. I love our trail but it completely bypasses our main street and keeps community away from it rather than making our main street an enjoyable gathering spot.

So, Notre Dame is my main cycling priority in every sense :)

I bike from St.Andre to the Independent and other shops further east on Notre Dame. I sometimes avoid it though and decide not to stop at the shops on the way to and from Yahoo Park for example because of the noise, heat (no shade) and heavy traffic along Notre Dame. I also frequently bike to Russell for the library and enjoy the trail very much.

Mes sincères remerciements,

To:
Subject:

Bonjour,

Tel que demandé par Céline hier soir, pourrais-tu svp lui faire parvenir les commentaires suivants par rapport au "Cycle Plan".

En gros, je crois que le plan est excellent et qu'il comprends un aperçu complet des enjeux. Étant donné que le plan élabore toutes les possibilités et options, je crois qu'il serait bon que la présentation au conseil se concentre, dans un premier temps, sur le volet récréatif 'à l'intérieure' des limites de la municipalité. Les recommandations pour les connections à Ottawa (etc.) devraient alors êtres vues comme des options à plus long terme.

En ce qui concerne alors les options à l'intérieure des limites de la municipalité, mes commentaires d'hier soir étaient que nous devrions nous concentrer sur les recommandations qui augmenteraient l'utilisation de la piste en direction des endroits propices à une plus grande population d'utilisateurs: les écoles, les terrains de jeux, les parcs, le Sports Dome, les terrains de soccer, de balle, la 'Fitness Trail', etc.

J'ai aussi fais le commentaire, que l'utilisation de l'OPP pour ce qui est décrit dans le plan comme "enforcement" n'est vraisemblablement pas la meilleure utilisation des services policiers et que le Département des "Bi-Laws" serait plus apte à contribuer à ce besoin. Ce étant dit, c'est plutôt le volet "Éducation" qui devrait être le focus de cette initiative.

Bonne journée,

To:

Subject:

RE: Russell Township Cycling plan

Good morning Céline,

This e-mail is my feedback for the cycling plan.

I would like to start by saying thank you to the township for having the amazing cycling path we currently have. We are very fortunate to such well maintained path.

I was not able to type into the feedback document.

I think it would be good to be able to safely cycle to the pool, soccer fields, baseball fields, schools, libraries, grocery stores, town centres and parks. We live in Russel and our girls are working in Embrun for the summer and use the current bike path to get to and from work. They also bike to the pool on a daily basis. My husband and I like to go out cycling several times a week after work or on the weekends. We would love to have more options of safe routes. In the evenings we like to do a 20K and on weekends 40K.

Priorities :

1) cycling lanes to the pool

Areas of concern:

1) is the traffic circle in Embrun. It is very dangerous to have the bike path cross at the circle. Some cars stop when they should not and I have seen some near accidents since the next car is not expecting a stopped car in the circle. The other problem is one car going in one direction will stop and signal to the cyclist to go however the car from the opposite direction is not aware. I think it should be moved away from the circle and a light installed.

2) I think designated bike lanes and a light at the pool so that children can safely cross the road to get to the pool.

Other feedback

1) I think any paved roads being repaved should include a paved shoulder for cyclists (I think this would help to keep the pavement from breaking on the edge due to large machinery.

2) I think it would be nice to have some signage at a roadway of what is near the bike path (i.e. food, restaurants, bike shop, parks, or a map of the area ...)

APPENDIX E: Detailed Cost Breakdown

RUSSELL

| Name | From | To | Class | Recommendation | Horizon | Length (m) | Existing Pavement Width (m) | Unpaved R Shoulder (m) | Unpaved L Shoulder (m) | Total (m) | OTM Min Width (m) | OTM Rec Width (m) | Buffer (m) | Curbs | Sidewalk | Parking | Cost per unit | | | | | Paving Cost | Paint Cost | Embankment Cost | Total Cost | |
|---|----------------|---------------|-----------|--|----------|-------------------------|-----------------------------|------------------------|------------------------|-----------|-------------------|-------------------|------------|-------|-----------|----------|-----------------------|----------|-------------------|-------------|--------------|----------------------|--------------|-----------------|---------------|---------------|
| | | | | | | | | | | | | | | | | | Paving/m ² | Paint/m | Embank/m of width | Sharrows | Signs | | | | | |
| Short Term Recommendations (0 - 5 years) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Church Street | South Russell | Stiver | Local | Painted Bike Lane (North) | Short | 230 | 8.1 | 0.3 | 0.5 | 8.9 | 1.5 | - | - | N | (C) 1.5 | - | \$ - | \$ 2.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 460.00 | \$ - | \$ 960.00 | |
| | | | | Paved Shoulder (South) | | 230 | 8.1 | 0.3 | 0.5 | 8.9 | 1.2 | - | - | - | - | - | \$ 15.00 | \$ 2.00 | \$ - | \$ - | \$ 250.00 | \$ 4,140.00 | \$ 460.00 | \$ - | \$ 4,850.00 | |
| | Stiver | Du Parc | | Paved Shoulder (North) | | 270 | 7.1 | - | 1.2 | 8.3 | 1.2 | - | - | - | - | - | \$ 15.00 | \$ 2.00 | \$ - | \$ - | \$ 250.00 | \$ 4,860.00 | \$ 540.00 | \$ - | \$ 5,650.00 | |
| | | | | Painted Bike Lane (South) | | 270 | 7.1 | - | 1.2 | 8.3 | 1.5 | - | - | S | (C) 1.5 | - | \$ - | \$ 2.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 540.00 | \$ - | \$ 1,040.00 | |
| Church Street | Du Parc | Gascon | Local | Paved Shoulders | Short | 440 | 7.2 | 0.8 | 0.8 | 8.8 | 1.2 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 15,840.00 | \$ 1,760.00 | \$ - | \$ 18,100.00 | |
| | Gascon | Wade | | 145 | | 7.2 | 1.1 | 0.8 | 9.1 | 1.2 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 5,220.00 | \$ 580.00 | \$ - | \$ 6,300.00 | | |
| Church Street | Bols | Drentex | Local | Multi-Use Pathway on north side (Separated Facility) | Medium | 140 | 7.4 | 0.6 | 0.5 | 8.5 | - | 3.0 | 0.5 | - | (A)1.9 | S | \$ - | \$ 6.00 | \$ - | \$ - | \$ - | \$ - | \$ 840.00 | \$ - | \$ 840.00 | |
| | Drentex | Heritage | | | | 200 | 6.9 | 0.7 | 0.6 | 8.2 | - | 3.0 | 0.5 | - | (A)1.9 | S | \$ - | \$ 6.00 | \$ - | \$ - | \$ - | \$ - | \$ 1,200.00 | \$ - | \$ 1,200.00 | |
| | Heritage | South Russell | | | | 200 | 6.8 | 0.7 | 0.6 | 8.1 | - | 3.0 | 0.5 | - | (A)1.9 | S | \$ - | \$ 6.00 | \$ - | \$ - | \$ - | \$ - | \$ 1,200.00 | \$ - | \$ 1,200.00 | |
| Concession Street | Craig | Maple | Collector | Share the Road / Sharrows | Short | 163 | 16.1 | 0.5 | 0.5 | 17.1 | - | - | - | Both | (C) 1.4 | Both | \$ - | \$ - | \$ - | \$ 467.27 | \$ 250.00 | \$ - | \$ - | \$ - | \$ 717.27 | |
| Concession Street | Maple | Nature Trail | Collector | Paved Shoulder (West) | Short | 271 | 11.7 | 2.2 | 2.3 | 16.2 | - | 1.5 | 1.0 | - | - | - | \$ 15.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 10,162.50 | \$ 1,084.00 | \$ - | \$ 11,746.50 | |
| | | | | Painted Bike Lanes w/Parking (East) | | 271 | 11.7 | 2.2 | 2.3 | 16.2 | - | 1.5 | 1.0 | - | (C) 1.4 | E | \$ - | \$ 6.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 1,626.00 | \$ - | \$ 2,126.00 | |
| | Nature Trail | Campbell | | Paved Shoulder (West) | | 161 | 10.6 | 2.2 | 2.3 | 15.1 | - | 1.5 | 1.0 | - | - | - | \$ 15.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 6,037.50 | \$ 644.00 | \$ - | \$ 7,181.50 | |
| | | | | Painted Bike Lanes w/Parking (East) | | 161 | 10.6 | 2.2 | 2.3 | 15.1 | - | 1.5 | 1.0 | - | (C) 1.4 | E | \$ - | \$ 6.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 966.00 | \$ - | \$ 1,466.00 | |
| Concession Street | Russell High | Campbell | Collector | Buffered Paved Shoulders (1.5m + 1.0m) | Short | 356 | 7 | 1.5 | 1.2 | 9.7 | - | 1.5 | 1.0 | - | - | - | \$ 30.00 | \$ 8.00 | \$ 33.00 | \$ - | \$ - | \$ 26,700.00 | \$ 2,848.00 | \$ 27,020.40 | \$ 56,568.40 | |
| Eadie Road | Castor | Nature Trail | Collector | Paved Shoulders | Short | 300 | 6.1 | 0.9 | 1.7 | 8.7 | 1.2 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 10,800.00 | \$ 1,200.00 | \$ - | \$ 12,500.00 | |
| Maple Street | Concession | First Ave | Local | Designated Shared Lanes | Short | 78 | 7.8 | 0.7 | 0.5 | 9 | - | - | - | - | (C-A) 1.3 | - | \$ - | \$ - | \$ - | \$ 223.60 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 723.60 | |
| | First Ave | Elm | | | | 132 | 8 | 0.4 | 0.4 | 8.8 | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 396.00 | \$ - | \$ - | \$ - | \$ - | \$ 396.00 | |
| Elm Avenue | Maple | George | Local | | | 303 | 9 | - | - | 9 | - | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 909.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 1,409.00 |
| | | | | | | George Street | Elm | Birch | Local | 64 | 9 | - | - | 9 | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 192.00 | \$ 500.00 | \$ - |
| Birch | Warner | 101 | 8.8 | | | - | - | 8.8 | | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 303.00 | \$ - | \$ - | \$ - | \$ - | \$ 303.00 | | |
| Warner | Hay | 277 | 8.2 | | | 0.6 | 0.6 | 9.4 | | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 831.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 1,331.00 | | |
| Hay | Eldon | 100 | 8.1 | | | 0.6 | 0.6 | 9.3 | | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 300.00 | \$ - | \$ - | \$ - | \$ - | \$ 300.00 | | |
| Eldon Street | George | Castor | Local | | | 156 | 7.2 | 0.6 | 0.5 | 8.3 | - | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 468.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 968.00 |
| Hamilton Road | Route 200 | Craig | Collector | | | Paved Shoulders | Long | 2100 | 6.9 | 0.7 | 0.8 | 8.4 | 1.2 | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 63,000.00 | \$ 8,400.00 | \$ 62,370.00 | \$ 133,770.00 |
| Mill Street | Castor | Concession | Local | | | Designated Shared Lanes | Short | 300 | 9.1 | - | 0.5 | 9.6 | - | - | - | Both | (C) 1.5 | Both | \$ - | \$ - | \$ - | \$ 900.00 | \$ 500.00 | \$ - | \$ - | \$ - |
| | | | | Concession | Parallel | | | 120 | 9.1 | - | - | 9.1 | - | - | - | Both | (C) 1.5 | N | \$ - | \$ - | \$ - | \$ 360.00 | \$ - | \$ - | \$ - | \$ - |
| | Parallel | Castor | | 310 | 9.2 | | | - | - | 9.2 | - | - | - | N | (C) 1.4 | S | \$ - | \$ - | \$ - | \$ 930.00 | \$ - | \$ - | \$ - | \$ - | \$ 930.00 | |
| | Castor | Craig | | 200 | 7.8 | | | - | - | 7.8 | - | - | - | E | (C) 1.4 | S | \$ - | \$ - | \$ - | \$ 600.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 1,100.00 | |
| Wade Road | Castor | Sujack | Collector | Paved Shoulders | Short | 600 | 6.5 | 1.8 | 1.8 | 10.1 | - | 1.5 | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ 1,000.00 | \$ 27,000.00 | \$ 2,400.00 | \$ - | \$ 30,400.00 | | |
| Total Cost (Short Term Recommendations) | | | | | | | | | | | | | | | | | | | | | | \$ 306,528.27 | | | | |
| Medium Term Recommendations (6 - 10 years) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Olde Towne MUP | Olde Towne Ave | Hamilton | N/A | Multi-Use Pathway | Medium | 390 | - | - | - | - | - | 3.0 | - | - | - | - | \$ 225.00 | \$ 6.00 | \$ - | \$ - | \$ - | \$ 87,750.00 | \$ 2,340.00 | \$ - | \$ 90,090.00 | |
| Route 300 | MacDonald | Bols | Collector | Paved Shoulders | Medium | 600 | 6.8 | 1.0 | 0.8 | 8.6 | 1.2 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 21,600.00 | \$ 2,400.00 | \$ 11,880.00 | \$ 35,880.00 | |
| Total Cost (Medium Term Recommendations) | | | | | | | | | | | | | | | | | | | | | | \$ 125,970.00 | | | | |
| Long Term Recommendations (11+ years) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Forced Road | Craig | Nature Trail | Collector | Paved Shoulders | Long | 1450 | 6 | 0.7 | 0.4 | 7.1 | 1.2 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 52,200.00 | \$ 5,800.00 | \$ 62,205.00 | \$ 120,205.00 | |
| Total Cost (Long Term Recommendations) | | | | | | | | | | | | | | | | | | | | | | \$ 120,205.00 | | | | |

| Costs | Source | | |
|---------------------|--------|------------------|----------------|
| MUP | \$225 | /m | UCPR plan |
| Sharrows | \$215 | each | City of Ottawa |
| Line painting | \$2 | /m | City of Ottawa |
| Paved shoulders | \$15 | /m ² | UCPR plan |
| Embankment widening | \$33 | /m | UCPR plan |
| Signs | \$250 | each | UCPR plan |
| Flex posts | \$100 | each (every 10m) | UCPR plan |

Bicycle Route = every 400 to 800m Bike Lane = 200m and every intersection

EMBRUN

| Name | From | To | Class | Recommendation | Horizon | Length (m) | Existing Pavement Width (m) | Unpaved R Shoulder (m) | Unpaved L Shoulder (m) | Total (m) | OTM Min Width (m) | OTM Rec Width (m) | Buffer (m) | Curbs | Sidewalk | Parking | Cost per unit | | | | | | | | | | Total Cost |
|---|--------------------|--------------------|-----------|--|---------|------------|-----------------------------|------------------------|------------------------|-----------|-------------------|-------------------|------------|-------|----------|---------|---------------|----------|-------------------|-----------|-------------|---------------|---|-----------------|----------------------|--------------|-------------|
| | | | | | | | | | | | | | | | | | Paving/m2 | Paint/m | Embank/m of width | Sharrows | Signs | Paving Cost | Paint Cost | Embankment Cost | | | |
| Short Term Recommendations (0 - 5 years) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blais Street | Notre-Dame | St-Jean Baptiste | Local | Multi-Use Pathway | Short | 710 | 9.2 | 0.3 | 0.3 | 9.8 | - | 3.0 | 0.5 | - | - | - | \$ 15.00 | \$ 6.00 | \$ - | \$ - | \$ - | \$ 37,275.00 | \$ 4,260.00 | \$ - | \$ 41,535.00 | | |
| Centenaire Street | St-Augustin | La Croisee | Local | Designated Shared Lanes | Short | 200 | 8.5 | 1.0 | 1.0 | 10.5 | - | - | - | Both | - | - | \$ - | \$ - | \$ - | \$ 600.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 1,100.00 | | |
| | La Croisee | Louis Riel | | | | 169 | 8.5 | 0.5 | 0.5 | 9.5 | - | - | - | - | Both | - | - | \$ - | \$ - | \$ - | \$ 507.00 | \$ - | \$ - | \$ - | \$ - | \$ 507.00 | |
| | Louis Riel | Notre-Dame | | | | 990 | 8.5 | - | - | 8.5 | - | - | - | - | Both | - | - | \$ - | \$ - | \$ - | \$ 2,970.00 | \$ 1,000.00 | \$ - | \$ - | \$ - | \$ 3,970.00 | |
| Renoir Drive | Centenaire | Renoir MUP | Local | Designated Shared Lanes | Short | 100 | 8.5 | - | - | 8.5 | - | - | - | Both | - | - | \$ - | \$ - | \$ - | \$ 300.00 | \$ 500.00 | \$ - | \$ - | \$ 800.00 | | | |
| St-Augustin Street | Notre-Dame | Forget | Collector | Painted Bike Lane (East) | Short | 107 | 13.2 | 1.4 | 1.4 | 16 | - | 1.5 | - | - | (C) 1.5 | - | \$ - | \$ 2.00 | \$ - | \$ - | \$ 250.00 | \$ - | \$ 214.00 | \$ - | \$ 464.00 | | |
| | Notre-Dame | Forget | | Parking w/Bike Lane (West) | | 107 | 13.2 | 1.4 | 1.4 | 16 | - | 1.5 | 1.0 | - | (C) 1.5 | West | \$ - | \$ 6.00 | \$ - | \$ - | \$ 250.00 | \$ - | \$ 642.00 | \$ - | \$ 892.00 | | |
| | Forget | Centenaire | | Painted Bike Lane (East) | | 195 | 12.9 | 1.4 | 1.4 | 15.7 | - | 1.5 | - | - | (C) 1.5 | - | \$ - | \$ 2.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 390.00 | \$ - | \$ 890.00 | | |
| | Forget | Centenaire | | Parking w/Bike Lane (West) | | 195 | 12.9 | 1.4 | 1.4 | 15.7 | - | 1.5 | 1.0 | - | (C) 1.5 | West | \$ - | \$ 6.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 1,170.00 | \$ - | \$ 1,670.00 | | |
| St-Jacques Road | Notre-Dame | Carriere | Collector | Buffered Paved Shoulders (1.5m + 1.0m) | Short | 732 | 10.2 | 0.8 | - | 11.0 | - | 1.5 | 1.0 | - | (C) 1.5 | - | \$ 30.00 | \$ 8.00 | \$ 33.00 | \$ - | \$ - | \$ 54,900.00 | \$ 5,856.00 | \$ 24,156.00 | \$ 84,912.00 | | |
| | | | | | | | | | | | | | | | | | | | | | | | Total Cost (Short Term Recommendations) | | \$ 136,740.00 | | |
| Medium Term Recommendations (6 - 10 years) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Castlebeau Street | Blais | Richelieu | Local | Designated Shared Lanes | Medium | 96 | 9.4 | - | - | 9.4 | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 288.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 788.00 | | |
| | Richelieu | Heritage | | | | 155 | 8.6 | - | - | 8.6 | - | - | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 465.00 | \$ - | \$ - | \$ - | \$ - | \$ 465.00 |
| | Heritage | St-Jean Baptiste | | | | 576 | 9.4 | - | - | 9.4 | - | - | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 1,728.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 2,228.00 |
| | St-Jean Baptiste | Pilon | | | | 222 | 10.2 | - | - | 10.2 | - | - | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 666.00 | \$ - | \$ - | \$ - | \$ - | \$ 666.00 |
| | Pilon | St-Augustin | | | | 113 | 9.4 | 1.2 | 1.2 | 11.8 | - | - | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 339.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 839.00 |
| St-Augustin Street | Centenaire | Daze | Collector | Buffered Paved Shoulders (1.5m + 0.5m) | Medium | 292 | 10.1 | 1.4 | 1.4 | 12.9 | - | 1.5 | 0.5 | - | (C) 1.5 | - | \$ 30.00 | \$ 8.00 | \$ - | \$ - | \$ - | \$ 17,520.00 | \$ 2,336.00 | \$ - | \$ 19,856.00 | | |
| | Daze | Castlebeau | | | | 157 | 8.7 | 1.4 | 1.4 | 11.5 | - | 1.5 | 0.5 | - | - | - | - | \$ 30.00 | \$ 8.00 | \$ - | \$ - | \$ - | \$ 9,420.00 | \$ 1,256.00 | \$ - | \$ 10,676.00 | |
| St-Pierre Street | Notre-Dame | New York Trail | Collector | Painted Bike Lanes | Medium | 274 | 12.7 | 0.7 | 0.7 | 14.1 | - | 1.8 | - | - | (C) 1.5 | - | \$ - | \$ 4.00 | \$ - | \$ - | \$ 1,000.00 | \$ - | \$ 1,096.00 | \$ - | \$ 2,096.00 | | |
| Ste Thérèse Boulevard | St-Jacques | Bourdeau | Local | Painted Bike Lanes | Medium | 73 | 7.8 | 1.5 | 1.5 | 10.8 | - | 1.8 | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 3,942.00 | \$ 292.00 | \$ - | \$ 4,734.00 | | |
| | Bourdeau | Louise | | | | 108 | 7.1 | 0.7 | - | 7.8 | 1.5 | - | - | - | - | - | - | \$ - | \$ 4.00 | \$ 33.00 | \$ - | \$ 500.00 | \$ - | \$ 432.00 | \$ 7,840.80 | \$ 8,772.80 | |
| | Louise | Angele | | | | 253 | 8.1 | 0.8 | 0.8 | 9.7 | - | 1.8 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 13,662.00 | \$ 1,012.00 | \$ - | \$ 15,174.00 | |
| | Angele | Cloutier | | | | 144 | 8.5 | 1.6 | 1.6 | 11.7 | - | 1.8 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ 7,776.00 | \$ 576.00 | \$ - | \$ 8,852.00 | |
| | Cloutier | Marseille | | | | 161 | 8.0 | - | - | 8.00 | 1.5 | - | - | - | - | - | - | \$ - | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 644.00 | \$ - | \$ 1,144.00 | |
| | Marseille | Ste-Marie | | | | 219 | 11.0 | - | - | 11.00 | - | 1.8 | - | - | - | Both | (c) 1.5 | - | \$ - | \$ 4.00 | \$ - | \$ - | \$ 500.00 | \$ - | \$ 876.00 | \$ - | \$ 1,376.00 |
| | | | | | | | | | | | | | | | | | | | | | | | Total Cost (Medium Term Recommendations) | | \$ 77,666.80 | | |
| Long Term Recommendations (11+ years) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cloutier Drive | Ste Thérèse | 234m N Ste Therese | Local | Designated Shared Lanes | Long | 234 | 8.2 | - | - | 8.2 | - | - | - | - | - | - | \$ - | \$ - | \$ - | \$ 702.00 | \$ 500.00 | \$ - | \$ - | \$ - | \$ 1,202.00 | | |
| Cloutier Drive | 234m N Ste Therese | Notre-Dame | N/A | Multi-Use Pathway | Long | 800 | - | - | - | - | - | - | - | - | - | - | \$ 225.00 | \$ 6.00 | \$ - | \$ - | \$ - | \$ 180,000.00 | \$ 4,800.00 | \$ - | \$ 184,800.00 | | |
| St-Pierre Street | New York Trail | Route 300 | Collector | Buffered Paved Shoulders (1.5m + 1.0m) | Long | 937 | 8 | 0.7 | 1.1 | 9.8 | - | 1.5 | 1.0 | - | (C) 1.5 | - | \$ 30.00 | \$ 8.00 | \$ 33.00 | \$ - | \$ - | \$ 70,275.00 | \$ 7,496.00 | \$ 68,026.20 | \$ 145,797.20 | | |
| | | | | | | | | | | | | | | | | | | | | | | | Total Cost (Long Term Recommendations) | | \$ 331,799.20 | | |

| Costs | Source | | |
|---------------------|--------|------------------|----------------|
| MUP | \$225 | /m | UCPR plan |
| Sharrow | \$215 | each | City of Ottawa |
| Line painting | \$2 | /m | City of Ottawa |
| Paved shoulders | \$15 | /m2 | UCPR plan |
| Embankment widening | \$33 | /m | UCPR plan |
| Signs | \$250 | each | UCPR plan |
| Flex posts | \$100 | each (every 10m) | UCPR plan |

Bicycle Route = every 400 to 800m Bike Lane = 200m and every intersection

Rural Roadways

| Name | From | To | Class | Recommendation | Horizon | Length (m) | Existing Pavement Width (m) | Unpaved R Shoulder (m) | Unpaved L Shoulder (m) | Total (m) | OTM Min Width (m) | OTM Rec Width (m) | Buffer (m) | Curbs | Sidewalk | Parking | Cost per unit | | | | | | | Total Cost | | | |
|---|---------------|---------------|-----------|--|---------|------------|-----------------------------|------------------------|------------------------|-----------|-------------------|-------------------|------------|-------|----------|---------|---------------|---------|-------------------|----------|----------|---------------|------------------------|---------------|-----------------|--------------|---------------|
| | | | | | | | | | | | | | | | | | Paving/m2 | Paint/m | Embank/m of width | Sharrows | Signs | Paving Cost | Paint Cost | | Embankment Cost | | |
| Long Term Recommendations (11+ years) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leclerc Road | Route 400 | Route 500 | - | Paved Shoulders | Long | 3100 | 6 | - | - | 6 | 1.2 | - | 0 | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 111,600.00 | \$ 12,400.00 | \$ 245,520.00 | \$ 369,520.00 | | |
| MacDonald Road | Route 300 | Route 400 | - | Paved Shoulders | Long | 3100 | 8.2 | - | - | 8.2 | 1.2 | - | 0 | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 111,600.00 | \$ 12,400.00 | \$ 122,760.00 | \$ 246,760.00 | | |
| Route 400 | Gregoire | MacDonald | Collector | Paved Shoulders | Long | 1400 | 6.6 | 1.1 | 1.1 | 8.8 | 1.2 | - | 0 | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 50,400.00 | \$ 5,600.00 | \$ 9,240.00 | \$ 65,240.00 | | |
| | MacDonald | South Russell | | | | 1600 | 6.4 | 0.7 | 0.8 | 7.9 | 1.2 | - | 0 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 57,600.00 | \$ 6,400.00 | \$ 47,520.00 | \$ 111,520.00 |
| | South Russell | Wade | | | | 1200 | 7.2 | 0.8 | 1.1 | 9.1 | - | 1.5 | 0 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 54,000.00 | \$ 4,800.00 | \$ 35,640.00 | \$ 94,440.00 |
| | Wade | Ste-Catherine | | | | 1500 | 7 | 1.3 | 1.1 | 9.4 | - | 1.5 | 0 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 67,500.00 | \$ 6,000.00 | \$ 29,700.00 | \$ 103,200.00 |
| | Ste-Catherine | St-Andre | | | | 1300 | 7.2 | 1.4 | 1.6 | 10.2 | - | 1.5 | 0 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ - | \$ - | \$ - | \$ 58,500.00 | \$ 5,200.00 | \$ - | \$ 63,700.00 |
| | St-Andre | Ste-Marie | | | | 1400 | 6.7 | 1.3 | 1.2 | 9.2 | - | 1.5 | 0 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 63,000.00 | \$ 5,600.00 | \$ 23,100.00 | \$ 91,700.00 |
| | Ste-Marie | St-Jacques | | | | 1400 | 6.6 | 0.8 | 0.9 | 8.3 | 1.2 | - | 0 | - | - | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 50,400.00 | \$ 5,600.00 | \$ 32,340.00 | \$ 88,340.00 |
| Route 500 | Leclerc | Gregoire | Local | Buffered Paved Shoulders (1.5m + 0.5m) | Long | 1400 | 6.4 | 0.5 | 0.6 | 7.5 | 1.2 | - | 0.5 | - | - | - | \$ 30.00 | \$ 8.00 | \$ 33.00 | \$ - | \$ - | \$ 71,400.00 | \$ 11,200.00 | \$ 106,260.00 | \$ 188,860.00 | | |
| St-Jacques Road | Carriere | Route 400 | Collector | Buffered Paved Shoulders (1.5m + 0.5m) | Long | 854 | 6.9 | 1.2 | 1.1 | 9.2 | 1.2 | - | 0.5 | - | - | - | \$ 30.00 | \$ 8.00 | \$ 33.00 | \$ - | \$ - | \$ 43,554.00 | \$ 6,832.00 | \$ 31,000.20 | \$ 81,386.20 | | |
| St-Pierre Street | Route 300 | St Guillaume | Collector | Buffered Paved Shoulders (1.5m + 1.0m) | Long | 8163 | 8 | 0.7 | 1.1 | 9.8 | - | 1.5 | 1.0 | - | (C) 1.5 | - | \$ 30.00 | \$ 8.00 | \$ 33.00 | \$ - | \$ - | \$ 612,225.00 | \$ 65,304.00 | \$ 592,633.80 | \$ 1,270,162.80 | | |
| Wade Road | Sujack | Route 400 | - | Paved Shoulders | Long | 2600 | 5.3 | - | - | 5.3 | 1.2 | - | 0 | - | - | - | \$ 30.00 | \$ 4.00 | \$ 33.00 | \$ - | \$ - | \$ 93,600.00 | \$ 10,400.00 | \$ 205,920.00 | \$ 309,920.00 | | |
| Total Cost (Long Term Recommendations) | | | | | | | | | | | | | | | | | | | | | | | \$ 3,084,749.00 | | | | |

| Costs | | | Source |
|---------------------|-------|------------------|----------------|
| MUP | \$225 | /m | UCPR plan |
| Sharrows | \$215 | each | City of Ottawa |
| Line painting | \$2 | /m | City of Ottawa |
| Paved shoulders | \$15 | /m2 | UCPR plan |
| Embankment widening | \$33 | /m | UCPR plan |
| Signs | \$250 | each | UCPR plan |
| Flex posts | \$100 | each (every 10m) | UCPR plan |