Regional Cycling Plan 2021

Durham Region

Acknowledgments

The Regional Cycling Plan 2021 (RCP 2021) is intended to provide the Regional Municipality of Durham and its area municipalities with the tools and guidance necessary to support the planning, design, implementation and promotion of a connected, safe and accessible cycling network that accommodates people of all ages and abilities.

A great deal of effort has been taken in completing the RCP 2021. However, completing this project would not have been possible without the support and guidance of a lot of individuals and groups. The RCP project team would like to extend our sincere thanks to all of you.

Our thanks and appreciation extend to the leadership and staff from the Region of Durham, Town of Ajax, Township of Brock, Municipality of Clarington, City of Oshawa, City of Pickering, Township of Scugog, Township of Uxbridge and Town of Whitby for your support in developing this plan.

We would also like to express our gratitude to the Ontario Ministry of Transportation, Metrolinx, Mississaugas of Scugog Island First Nations, local conservation authorities, Durham district school boards, Durham Active Transportation Committee, local cycling groups and active transportation committees, residents who participated in engagement and public meetings, and all others who provided invaluable feedback.

RCP 2021

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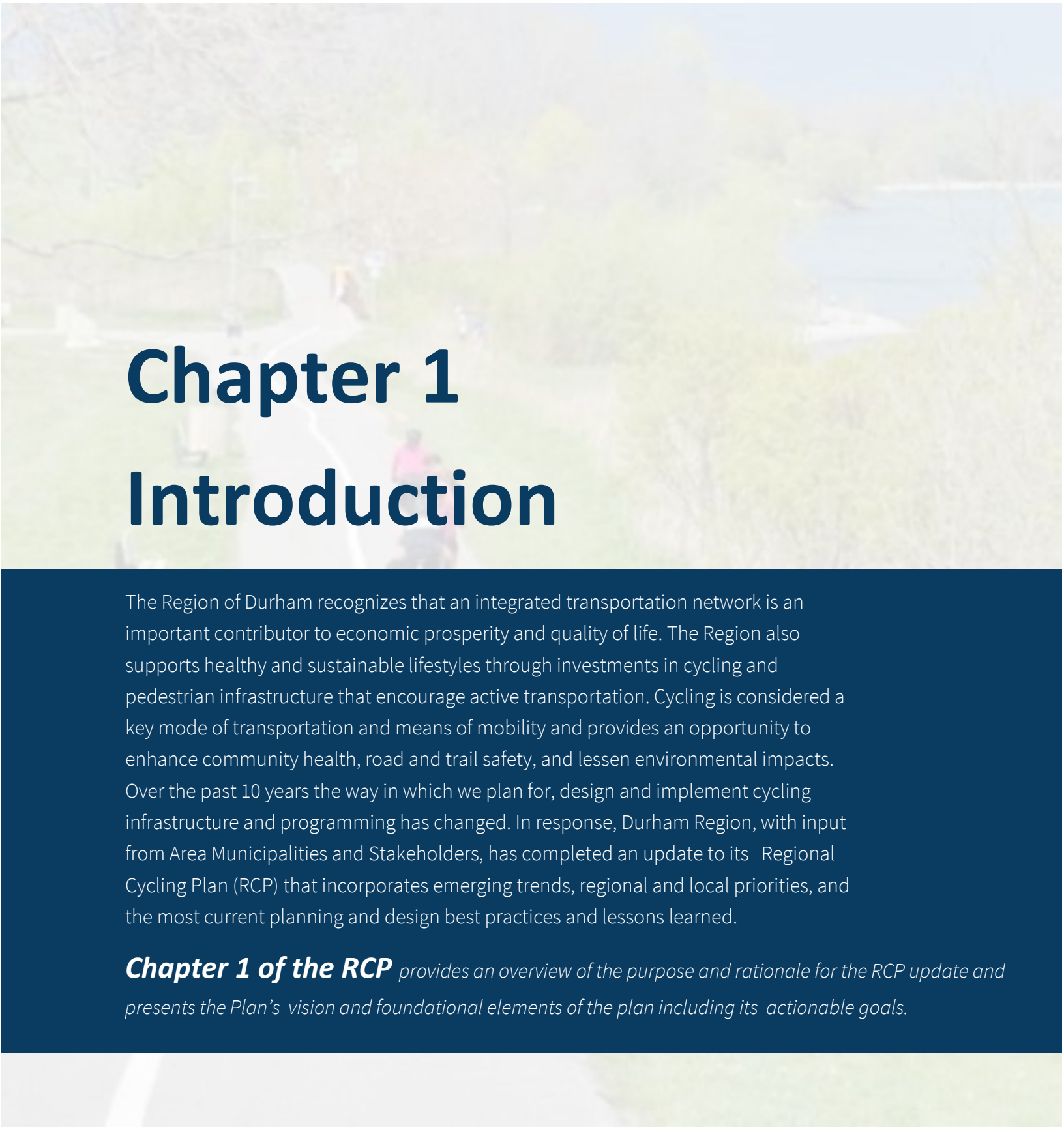


Chapter 1
Introduction

The Region of Durham recognizes that an integrated transportation network is an important contributor to economic prosperity and quality of life. The Region also supports healthy and sustainable lifestyles through investments in cycling and pedestrian infrastructure that encourage active transportation. Cycling is considered a key mode of transportation and means of mobility and provides an opportunity to enhance community health, road and trail safety, and lessen environmental impacts. Over the past 10 years the way in which we plan for, design and implement cycling infrastructure and programming has changed. In response, Durham Region, with input from Area Municipalities and Stakeholders, has completed an update to its Regional Cycling Plan (RCP) that incorporates emerging trends, regional and local priorities, and the most current planning and design best practices and lessons learned.

Chapter 1 of the RCP *provides an overview of the purpose and rationale for the RCP update and presents the Plan's vision and foundational elements of the plan including its actionable goals.*

1.1 Project Purpose

A Master Plan is a functional planning tool that provides high-level policy and guidance on a specific municipal area of interest or topic. It provides a greater level of detail compared to an Official Plan and builds upon the significant structure set-out by more substantial planning policy documents at the provincial, regional and local level.

Planning policy is typically meant to be revisited every 5 – 10 years to ensure that the policies and recommendations still "hold true" relative to the changing socio-demographic trends, planning directions and best practices. This also includes updating other policies and plans adopted by Council, major stakeholders and partners.

Durham Region's inaugural Regional Cycling Plan (RCP) was developed in 2008 and updated in 2012. Since that time, the Region and its area municipalities have experienced significant growth and development. The RCP provides planning, design and implementation guidance on cycling routes and infrastructure on regional roadways, regionally held public lands and connectivity to area municipal on and off-road cycling networks.

Since the 2012 RCP, Durham Region has updated its Transportation Master Plan (TMP), which introduced the idea of a Primary Cycling Network (PCN).

Area municipalities have also developed and adopted their own Transportation and Active Transportation Master Plans. These planning initiatives have led to significant efforts to advance cycling programming and outreach by area partners such as Durham Region Public Health, Committees of Council, Interest Groups, School Boards and Conservation Authorities. Cycling is an important component of an equitable, accessible, safe and sustainable transportation network. Cycling is not only a recreational activity and mode of transport but, holds the opportunity to support Durham Region to be a leader of…

Healthy community development

Safe road conditions

Improved personal mobility

Economic development & tourism

Reduced carbon emissions

In response, Durham Region has updated its Regional Cycling Plan (RCP), a flexible blueprint for the next 10+ years to guide cycling infrastructure planning and design, programming and outreach, behaviour change and policy development.

The RCP has been developed with the intent of aligning with and providing support for some of the Region's strategic goals as identified in the 2020 – 2024 Strategic Plan. The Strategic Plan outlines an underlying vision of achieving "A healthy, prosperous community for all" with five overarching goals. More specifically, of the five strategic pillars outlined within the document (listed below in **Figure 1-1**), the Regional Cycling Plan aligns with / supports three in a direct manner.

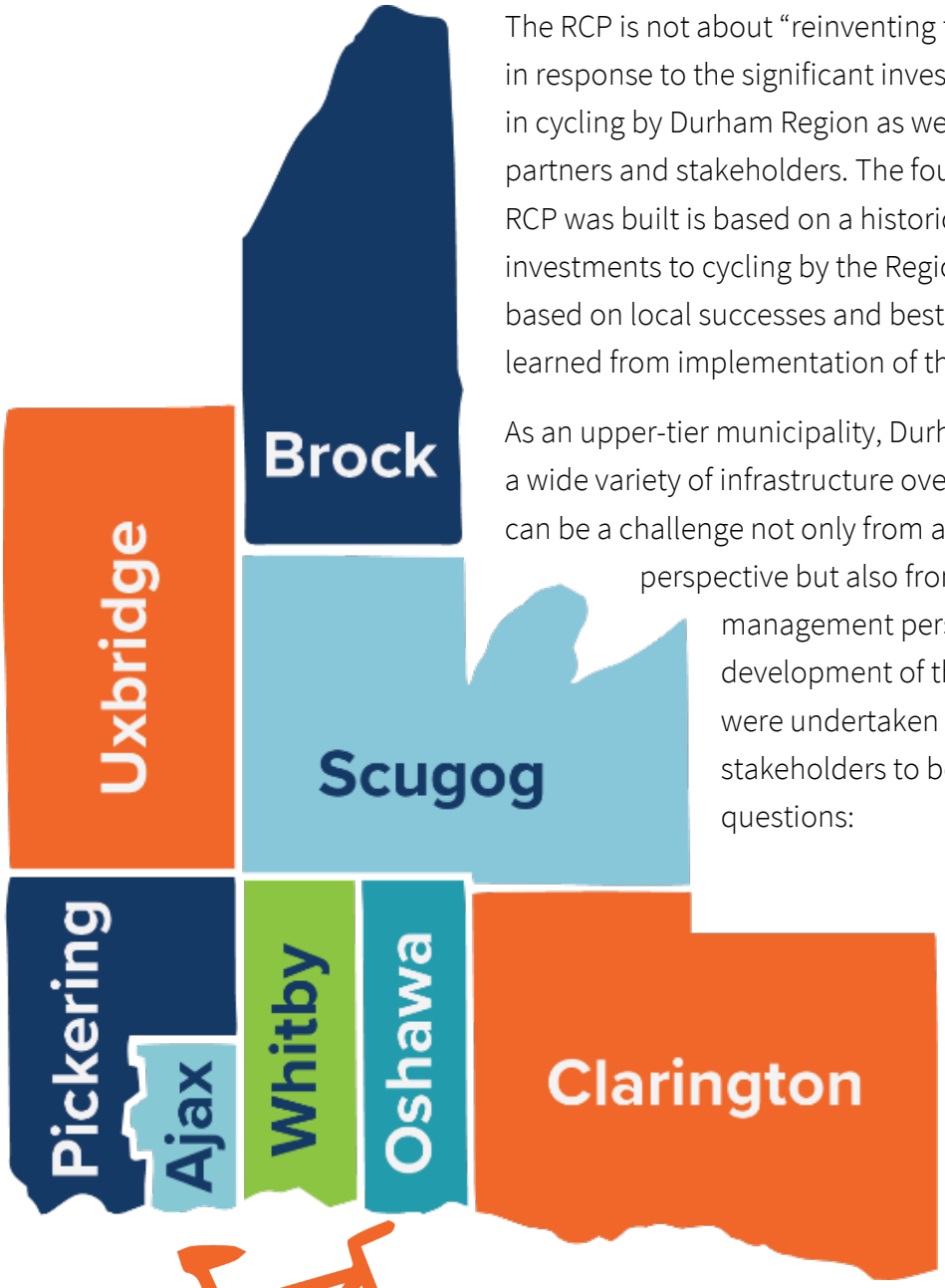
Figure 1-1. Relevant goals from Durham's 2020-2024 Strategic Plan

These pillars provide a significant amount of support for the update to the RCP and help to frame the intent and purpose of the RCP process and technical tasks.

2021 RCP Purpose:

- Revise segments of the proposed cycling network to reflect changes in cycling activity and technical guidance;
- Provide guidance on a wider range of cycling topics that underline a complete and comprehensive cycling strategy;
- Outline a suite of cycling programs and initiatives which leverage the Region's (and its partners) existing institutional and community infrastructure;
- Clarify the roles and responsibilities of area municipalities and stakeholders in delivering the Plan;
- Update the implementation horizon for proposed cycling initiatives and facilities based on current capital plans, community priorities and the availability of internal and external funding tools and resources; and
- Ensure the Region's approach to cycling planning and design is based on a renewed understanding of local concerns and objectives and improving access and equity in transportation.

Based on these considerations, the update has provided a Plan that is aspirational and respectful of Durham Region's goals and unique context.



The RCP is not about "reinventing the wheel". It was developed in response to the significant investments and advancements in cycling by Durham Region as well as its area municipal partners and stakeholders. The foundation upon which the RCP was built is based on a historic approach of strategic investments to cycling by the Region and its partners. It is also based on local successes and best practices and lessons learned from implementation of the 2012 RCP.

As an upper-tier municipality, Durham Region is responsible for a wide variety of infrastructure over a diverse geography. This can be a challenge not only from a resource and capacity perspective but also from a coordination and management perspective. As part of the development of the RCP, several interviews were undertaken with Regional staff and stakeholders to better understand two questions:

What has already been done?

How can we improve?

The outcomes of the interviews provided a detailed assessment of the cycling strengths, weaknesses, opportunities and threats for Durham Region. Strengths and opportunities are aspects of cycling that either need to be supported, enhanced or leveraged to further the profile of and involvement in cycling in Durham Region. Weaknesses represent aspects of existing efforts that require consideration and improvement and threats are potential risks to success. These are presented in **Table 1-1**.

Cycling in Durham...

Strengths

+ Growing collaboration between Durham Region and Area Municipalities, fostered and supported by the creation of the Durham Active Transportation Committee (DATC)
+ Funding supports that have been leveraged to secure external funding to build new infrastructure
+ Implementation of a paved shoulder policy

Opportunities

+ Regional funding could support development of new infrastructure to connect the Regional Cycling Network to local networks
+ Connecting cycling to transit hubs with dedicated and context appropriate cycling infrastructure
+ Enhanced support for infrastructure on Regional Roads in built-up urban areas
+ Enhanced focus on marketing and promoting cycling with more Regional AT Staff resources

Weaknesses

+ Lack of dedicated funding for standalone cycling projects, resulting in significant missing gaps in the network and poor connectivity
+ Emphasis on long-term projects results in long timelines to complete corridors or networks
+ Lack of integration between off-road and on-road cycling facilities
+ No cohesive cycling “brand” around Durham Region
+ Infrastructure gaps near major trip generators in Durham Region such as educational institutions, downtown areas, transit hubs and more

Threats

+ High cost to overcome physical barriers including rail lines and 400 series highways
+ Jurisdictional challenges and the need to coordinate with multiple agencies to ensure the development of a connected network
+ Reluctance to revisit past planning and design decisions, especially on corridors with existing but not context appropriate cycling facilities

Table 1-1 . Cycling Strengths, Weaknesses, Opportunities and Threats in Durham

1.2 Process

The development of the RCP was initiated in December 2019 and subsequently completed in May of 2021. Led by Regional staff, with support from a consultant team, work was structured within a three-phased process underlined by engagement with Regional staff, area municipal staff, key stakeholders and members of the public. This approach (as illustrated in **Figure 1-2**) was chosen to be both iterative and comprehensive, ensuring outcomes reflected leading technical expertise and remained accountable to local priorities and considerations.

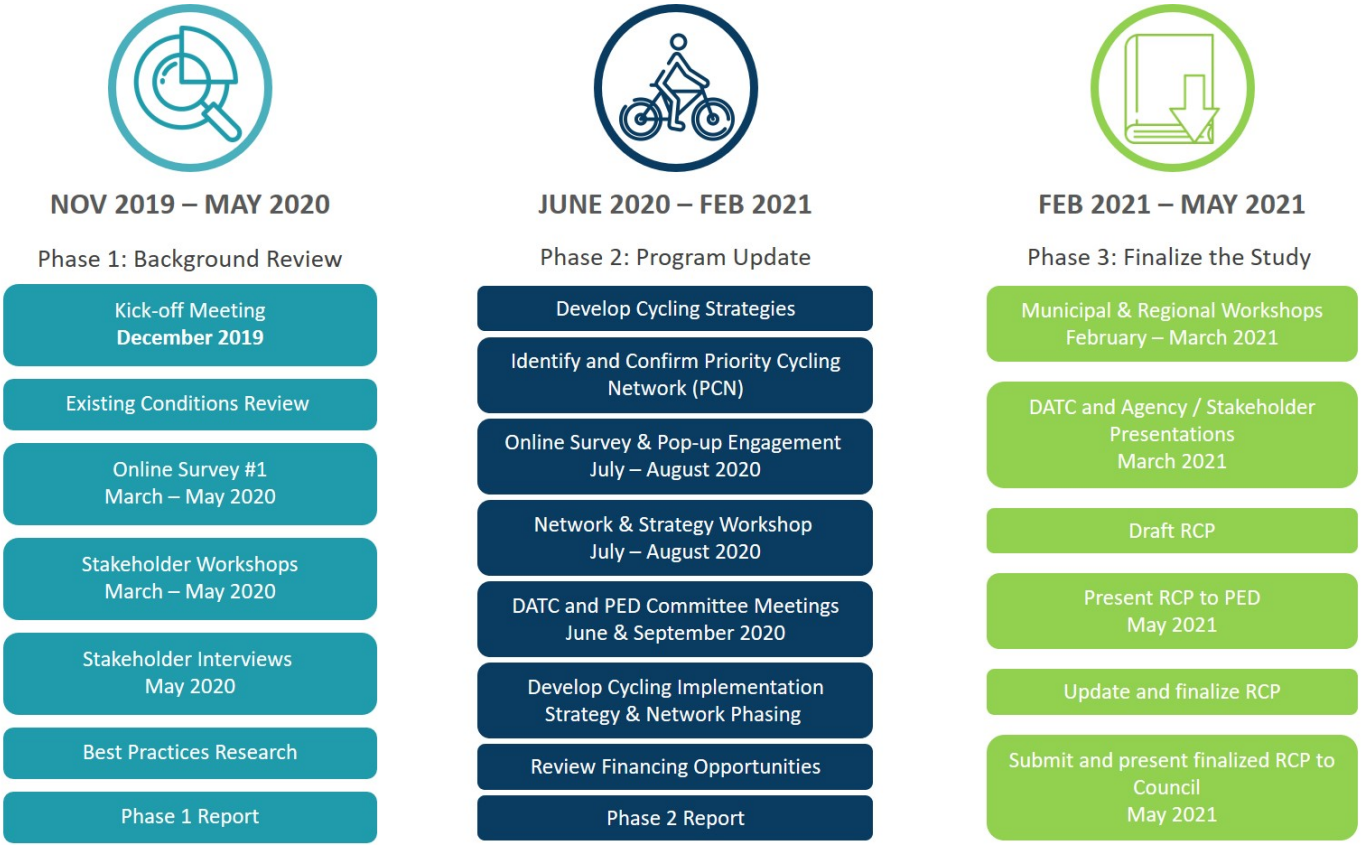


Figure 1-2.
Overview of Durham RCP Project Process & Key Milestones

Considering the timeframe in which the RCP was completed, considerable efforts were made to respond to the impacts of COVID-19 on the process of the Plan. The Region adapted the engagement program and tactics to reflect the necessary virtual engagement requirements and restrictions while also fulfilling the commitments to the various audiences. A more detailed summary of the engagement program and input received is provided in Chapter 3 of the RCP.

1.3 Vision & Goals

The foundation of any functional master plan is typically a vision or opportunity statement, that articulates the desired future that the plan strives to achieve.

> *"The Region of Durham, in partnership with its area municipalities, supports the planning, design, implementation and promotion of a connected, safe and accessible region-wide primary cycling network. The network accommodates people of all ages and abilities while considering the unique trip types and preferences of those who live, work and play within the Region."*

The vision statement is meant to capture both existing successes as well as the aspirational outcomes. It should describe the Region's cycling future 10 to 20+ years from the point of development and adoption. A vision statement is wide reaching and aspirational. To achieve the vision statement in practice, a set of goals are typically identified to further articulate what success will look like.

The early stages of developing the RCP focused on identifying the project vision and goals based on staff and stakeholder input. The statement and supporting goals are presented below (**Figure 1-3**) with a more detailed description of each and their application in the RCP update process in **Table 1-2**.

Figure 1-3. Durham RCP Vision and Goals

Table 1-2 . Summary of Durham RCP Project Goals

	Support strategic directions at the regional level	Integrating new cycling trends and lessons learned	Establishing support for coordination between upper and lower tier	Alignment with accepted design guidelines and standards	Establishing public buy-in to determine local priorities and needs
What is this?	Municipal directions and adopted statements that reflect the values and priorities of Durham Region and its area municipalities	Topics and knowledge derived from past experiences that could be integrated into the plan	On-going coordination between the region and its area municipalities and key partners to implement strategic recommendations	Nationally and provincially accepted design standards, and guidelines that should be applied when planning and designing cycling infrastructure	A sense of support and commitment to the outcomes of the project based on a comprehensive and meaningful engagement strategy
Where is this articulated?	Planning policy documents or in more visionary strategic plans	Lessons learned are identified from best practices and locally through communications media (print, online) to visualize cycling trends	Implementation strategies to clearly outline roles and responsibilities as well as processes to facilitate implementation	Master plans, engineering guidelines / standards / drawings as well as provincially accepted guidelines and standards	In-person events, online engagement tools, social media, hard print materials
Who will use this?	Regional staff, members of council and committee representatives	Regional staff and area municipalities	Regional staff, area municipalities and members of council	Regional staff, municipal staff, technical agencies and interest groups	Members of the public, stakeholders, local groups and organizations, businesses
When is this used?	When annual budgets are being established to rationalize expenditures that support the Region's strategic directions	In annual reports to council to document progress of the RCP implementation	On-going basis to ensure coordination between the region and its area municipalities	During the planning and design stages of a project to ensure consistency with guidelines and standards	To complete master plans consistent with phases 1 and 2 of the municipal class environment assessment process
Why is this relevant to Durham Region?	To ensure all Regional initiatives help achieve one or more of the Region's strategic directions	To identify and measure how cycling changes over time due to ongoing efforts of the Region and its partners	To facilitate and establish a long-lasting relationship between the Region and its partners and to built trust and collaboration	To ensure cycling design is founded upon the most up to date engineering standards and planning guidelines	To provide meaningful options for people to provide their input on proposed infrastructure / projects that directly impact them

1.4 Summary of Recommendations

The RCP is considered effective when the recommendations adopted as part of the planning document are appropriate, implementable and manageable. The culmination of the RCP update process is a set of actions and recommendations that, when adopted by Durham Region as part of the RCP, will serve as the framework to support implementation and next steps undertaken by Regional staff in partnership with key stakeholders.

A summary of recommendations found within the RCP has been prepared by chapter. Except for the recommendations associated with the cycling strategies, the intent is for these recommendations to be initiated once the RCP has been adopted. For example, the implementation tools presented in Chapter 6.0 are intended to be used to support the implementation of the PCN presented in Chapter 4.0. Deferring implementation of these recommendations may result in a reduction of necessary support, resources and capacity at the Regional level and impact success. The cycling strategy recommendations are made up of several actions and tools that together form an independent approach to four cycling specific topics (see Chapter 5.0 for more details). The implementation of the strategies will require additional consideration and investigation by Regional staff in partnership and collaboration with internal and external stakeholders to build upon and support the recommendations included within the RCP.

The following summary has been prepared for the benefit of Council and staff as a consolidated reference which should be reviewed in the context of the detailed technical work that has been documented and adopted through the Phase 1 and 2 Technical Reports of the RCP.

Chapter 2.0

Chapter 2.0 summarizes the foundation upon which the RCP has been developed with a focus on the existing conditions and current context that frames and shapes the recommendations found throughout the RCP. Unlike other chapters of the RCP, Chapter 2 captures the current socio-economic, cultural, geographic and behaviour "state" of Durham Region as it relates to cycling and demonstrates how these considerations impact or influence the future of cycling Region-wide.

Recommendation 2.1

Durham Region should incorporate – where appropriate – the primary, secondary and tertiary terminology as well as cycling trend considerations into other Regional policies and plans with a focus on the Official Plan and Transportation Master Plan when next updated.

Recommendation 2.2

Durham Region should continue to monitor cycling demand through external sources of data such as Strava and should prioritize investing in cycling trip data collection sources.

Recommendation 2.3

Durham Region should continue to research comparable best practices – with a focus on upper-tier municipalities – as it relates to the future implementation of the RCP and reach out to contacts at other upper-tier municipalities on an annual or bi-annual basis to compare lessons learned and successes.

Chapter 3.0

Chapter 3.0 summarizes the engagement process and the input received. More importantly, it provides a record of the decision-making process and the approach to consensus building as the RCP was developed.

Recommendation 3.1

Durham Region should use the online surveys prepared for the cycling strategies as the basis for information gathering once the strategies and actions have been implemented.

Recommendation 3.2

Durham Region should use the database of contacts developed for the RCP as the basis for future outreach and partnership and should monitor and update the contact information as needed.

Recommendation 3.3

Durham Region should continue to prioritize engagement and use the necessary input from the RCP update process to provide context to future cycling infrastructure and programming projects.

Chapter 4.0

Chapter 4.0 provides an overview of the process and the outcomes related to the Primary Cycling Network (PCN) and outlines the recommended infrastructure improvements, timeline considerations and design applications. The intent of the chapter is to provide the Region with a blueprint and framework with which the Region can make annual decisions about cycling infrastructure enhancements.

Recommendation 4.1

Durham Region should adopt the proposed Primary Cycling Network as illustrated in Map 1 to serve as the blueprint / guide for the design of the proposed cycling network including route alignment and facility types.

Recommendation 4.2

Durham Region should, when appropriate, upgrade the existing facilities found along Regional Road 8 / Reach Street and Regional Road 2 / Simcoe Street to include additional separation to be consistent with design guidelines and best practices.

Recommendation 4.3

Durham Region should refer to and utilize the proposed phasing as identified on Map 2 and in Table 4-3 of the RCP as the guide to support the implementation of the proposed primary cycling network.

Recommendation 4.4

Durham Region should utilize provincially accepted cycling and related design guidelines and standards to guide the design and implementation of the proposed primary cycling network with specific reference to Ontario Traffic Manual Book 18 and Ministry of Transportation's Bikeways Design Manual.

Recommendation 4.5

Durham Region should update regional design guidelines and standards to align with the accepted cycling guidelines and should work with area municipalities to ensure consistent design is applied Region-wide.

Recommendation 4.6

In addition to the design and implementation of proposed routes, Durham Region should provide appropriate and cycling supportive design treatments for major barriers such as grade separated crossings, rubber track guards and bridges as well as at key points of transition such as intersections.

Chapter 5.0

Chapter 5.0 is a summary of the rationale for the four Regional Cycling Strategies which are bicycle parking, signage and wayfinding, education and encouragement, and maintenance. These strategies have been developed with the intent of providing the Region with the sufficient background and research to move forward with Region-led actions which focus on advancing these four key topics at a Regional scale with strategic coordination at the local level and with regional partners.

Recommendation 5.1

Durham Region should proceed with the development of a Bicycle Parking implementation plan based on the next steps identified within the strategy.

Recommendation 5.2

Durham Region should move forward with aspects of the data driven approach for bicycle parking including the development and distribution of a bicycle parking survey and neighbourhood needs survey.

Recommendation 5.3

Durham Region should proceed with the development of a Region-wide Signage and Wayfinding Plan building upon the existing conditions and best practices / guidelines outlined within the strategy.

Recommendation 5.4

Durham Region should work with area municipalities and key stakeholders to develop a regional cycling brand and signage concept.

Recommendation 5.5

Durham Region should identify two new designated positions for Active Transportation Coordinators to advance and monitor the implementation, facility design and safety of the RCP.

Recommendation 5.6

Durham Region should move forward with the design and implementation of cycling supportive programming consistent with the approach outlined within the education and encouragement strategy.

Recommendation 5.7

Durham Region should continue to support the Active and Sustainable School Travel Program on an annual basis including investments of staff resources and funding where possible.

Recommendation 5.8

Durham Region should continue to conduct an inventory of existing maintenance equipment and vehicles to identify procurement needs relative to the maintenance of the primary cycling network on an annual basis.

Recommendation 5.9

Durham Region should coordinate with area municipalities regarding the clearance and maintenance of cycling facilities required beyond current practices as per the recommended facilities identified as part of the primary cycling network, in relation to existing funding responsibilities, with an aim to provide select winter maintained cycling routes.

Recommendation 5.10

Durham Region should coordinate with area municipalities, stakeholders and members of the public to identify the opportunity and potential routes to form a winter maintained cycling network throughout the Region.

Chapter 6.0

Chapter 6.0 identifies the tools and strategies to support long-term implementation as well as day to day coordination of the RCP by Regional staff as well as area municipal partners. It clearly outlines the cost and resource assumptions associated with the RCP recommendations to inform Regional cycling infrastructure investment and staff resources. Chapter 6.0 also focuses on providing applicable implementation supports – both internally and externally – including funding support, roles and responsibilities, partnership opportunities as well as management and coordination tools.

Recommendation 6.1

Durham Region should refer to the information contained within Appendix A of the RCP to support and inform project costing and timing in future annual business plans and budgets regarding cycling infrastructure.

Recommendation 6.2

Durham Region should proceed with maintaining the existing funding streams including the identification of improvements through capital and operating budgeting processes.

Recommendation 6.3

Durham Region should adapt the Regional Cycling Plan Funding Formula to further clarify cost-sharing elements and responsibility for multi-use pathways and infill projects.

Recommendation 6.4

Durham Region should continue to explore external funding opportunities including provincial and federal funding programs.

Recommendation 6.5

Durham Region should explore opportunities to include additional cycling infrastructure for development charge financing as part of the renewal of the Regional Development Charge (DC) Background Study.

Recommendation 6.6

Phasing of capital expenses and financing strategies for Regional cycling infrastructure should be determined through the Region's annual long-term capital planning process. Operating budget impacts of education and safety initiatives should also be considered through the Region's annual business planning and budgets process.

Recommendation 6.7

Durham Region should support the implementation of proposed infrastructure and policies by adopting the five-step implementation process consistent with the practices outlined in Ontario Traffic Manual Book 18.

Recommendation 6.8

Durham Region should support the implementation of proposed education and encouragement programs by adopting the five-step implementation process consistent with the accepted practices of Community Based Social Marketing.

Recommendation 6.9

Durham Region should work with internal stakeholders, external stakeholders as well as municipal stakeholders to support and facilitate the implementation of the RCP including all recommendations and actions.

Recommendation 6.10

Durham Region should review, confirm and communicate the expected roles and responsibilities between the Region, Area Municipalities, MTO and Conservation Authorities to facilitate and support implementation.

Recommendation 6.11

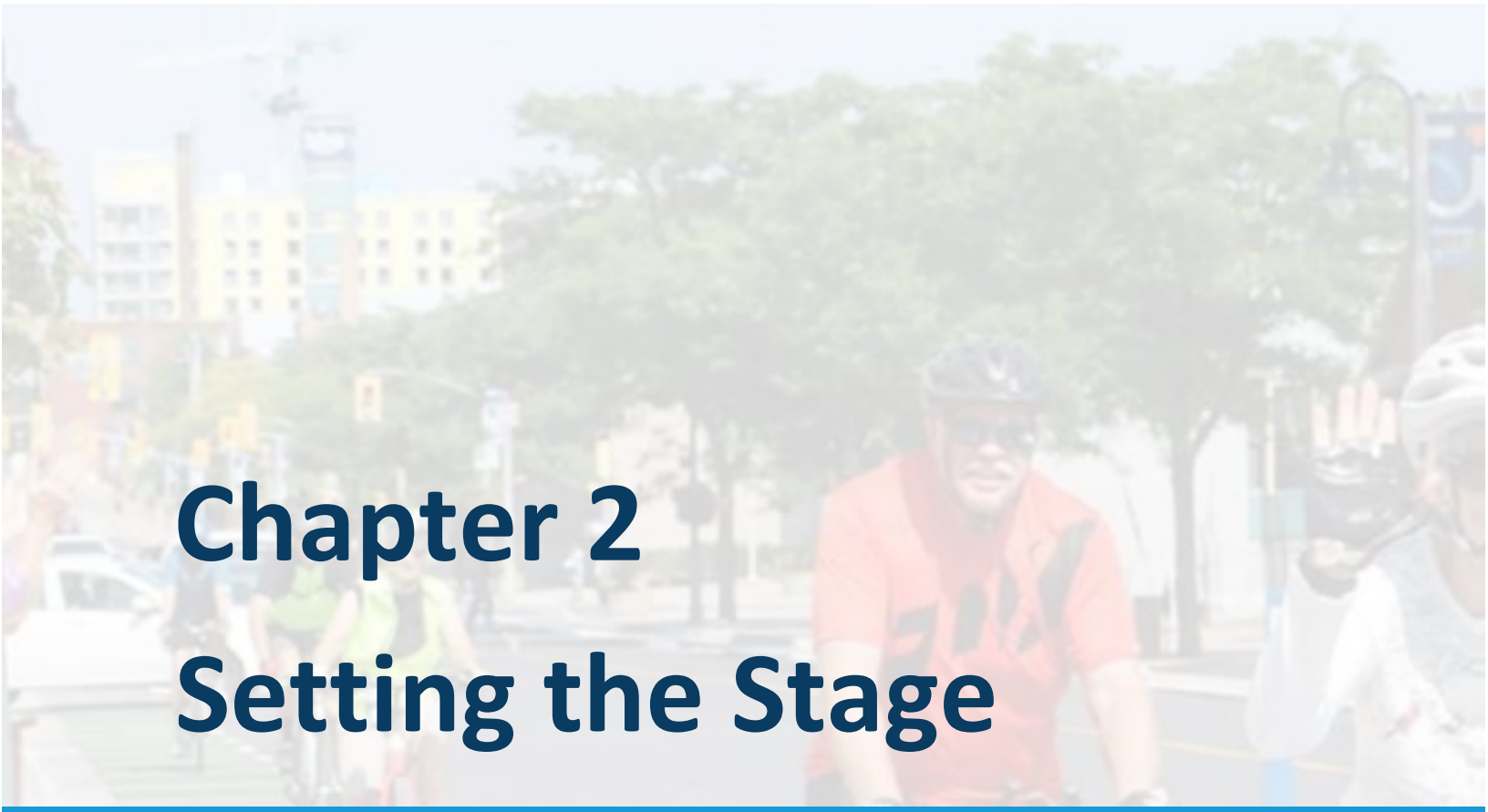
Durham Region should utilize the proposed implementation and management tools including the comprehensive Geographic Information Systems (GIS) database to support the implementation of the PCN.

Recommendation 6.12

Durham Region should work with area municipal staff and partners to identify and confirm a set of indicators to form a monitoring and evaluation program.

Recommendation 6.13

Durham Region should proceed with data collection and information gathering to inform the monitoring program after 1-2 years of implementation and should update the information annually with public communication on the successes and next steps.



Chapter 2
Setting the Stage

The rationale for updating the Regional Cycling Plan has been documented in Chapter 1.0 which prioritizes building upon the considerable investment and successes in cycling by the Region and area municipal partners. Improvements are wide ranging and can include policies, programs, infrastructure, partnerships and strategies, among others. The RCP is based on the Region's history of cycling, lessons learned and the unique context specific conditions, including but not limited to, the physical and socio-demographic profile of Durham Region, comparable best practices and policy support and guidance. These considerations "set the stage" for the future of cycling in the Region.

Chapter 2 of the RCP *provides an overview of the history of cycling in Durham Region since the 2012 RCP was adopted, as well as an overview of influencing factors and considerations regarding how cycling infrastructure is planned, designed and implemented.*

2.1 Durham's Cycling History

The Region of Durham's initial formal commitment to cycling started in October 2008 when Durham Regional Council adopted its first official Regional Cycling Plan (RCP), which identified a Region-wide network of cycling routes and facilities serving the Region's urban and rural areas. This plan was later updated in 2012, to include a more refined and focused network of cycling routes defined as the "Primary Cycling Network".

The intent of identifying a Primary Cycling Network (PCN) for Durham Region was to strategically focus on a network of core cycling facilities servicing key travel destinations. Since the development and adoption of the 2012 RCP, the Region of Durham has been strategically investing in the build-out of the PCN with annual incremental investments through to 2019 when the RCP update was initiated (see **Figure 2-1**).

2012 PCN

22.0 km
Existing Routes

218.6 km
Proposed Routes

2019 PCN

59.2 km
Existing Routes

167.8 km
Proposed Routes

Only includes regional roads on the primary cycling network as this is the only information available.

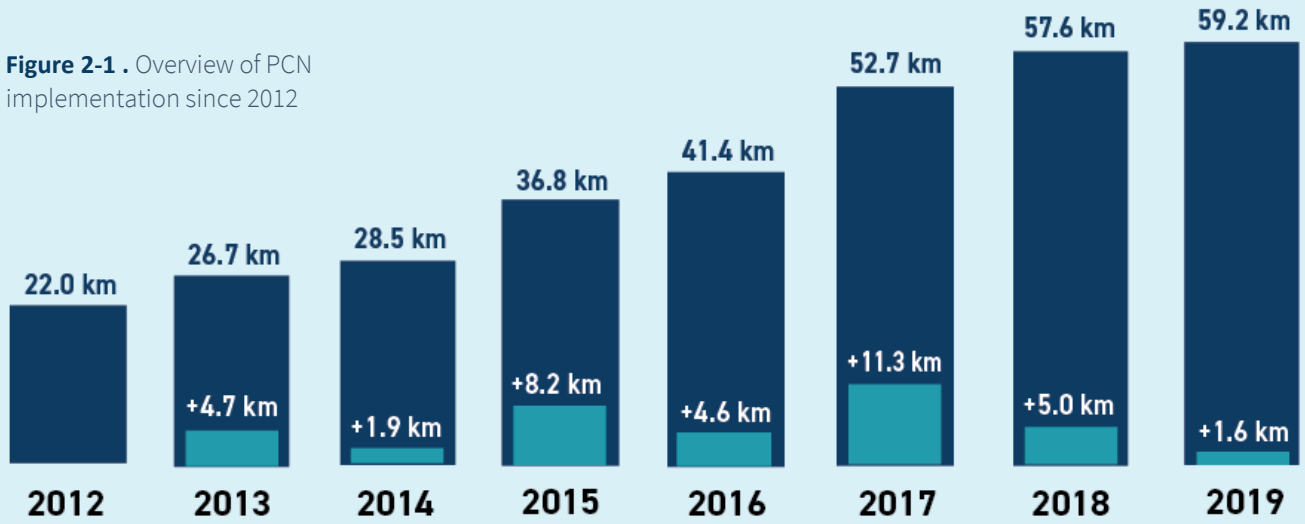


Figure 2-1 . Overview of PCN implementation since 2012

Implementation has taken place at both the regional and local level; however, the coordination of those improvements has been varied depending on jurisdiction and type of cycling facility.

Originally, the PCN was recommended for implementation over two horizons - the short-term (5 years) and longer term (6-20 years) to align with the Regional Capital Road Program's 9-year forecast along with additional financial tools. To complement the PCN, the 2012 RCP outlined a broad communications strategy that recommended education, promotion and enforcement practices to support cycling. These measures expanded upon existing resources, recognizing the importance of establishing a well-informed safe cycling community through a variety of communication channels and supportive programming. To understand the basis from which the RCP update is being developed it is important to understand what has been achieved. Below is a summary of the 2012 recommendations and their implementation "status" and relevance.

2012 RCP Financial Recommendations	Implementation Status...
+ Region remains 100% responsible for providing the platform for multi-use pathways within Regional Road rights-of-way contained in the Primary Cycling Network.	Maintained as part of existing Regional practice.
+ Region remains 100% responsible for the maintenance of all on road cycling facilities and paved shoulders on Regional Roads listed within the Primary Cycling Network.	Maintained as part of existing Regional practice.
+ Area municipalities remain 100% responsible for the maintenance and repair of multi-use pathways on Regional Roads listed within the Primary Cycling Network which fall under their municipal boundaries.	Maintained as part of existing Regional practice.
+ Region assumes 100% of the capital costs for all on-road cycling facilities and paved shoulders along Regional Roads that are listed within the Primary Cycling Network.	Adopted as Regional practice since 2012.
+ Region to consider constructing facilities outside of the Region's road constructing program, in accordance with area municipal sidewalk programs and the funding formula, to establish connections or close gaps within the Primary Cycling Network.	Not adopted as a Regional practice and considered a key weakness based on input received.
+ Region to consider partnering with other funding agencies with area municipalities to eliminate existing gaps in the Lake Ontario Waterfront Trail and Lake Scugog Waterfront Trail.	Partnerships established and select missing sections built.

Promotional

Recommendations

+ Print materials (brochures, posters, letters and mapping).
+ Online resources (regional cycling webpage).
+ Outreach opportunities (presentations and lunch 'n' learn sessions among interested partners).
+ Educational resources (courses and workshops provided region-wide).

Implementation

Status...

The Region has worked with cycling clubs, committees and interest groups to develop promotional materials; however, a consistent and coordinated effort across the Region has not yet been achieved.

Programming

Recommendations

+ Empowering local cycling clubs to increase their membership and programming.	Formalized committee and supported local clubs.
+ Producing a Cycling Tourism Map that highlights cyclist friendly destinations and routes.	Cycling tourism map prepared but not consistently updated.
+ Establishing a "Cycling Ambassadors" program, which hires summer students to visit local camps and recreational centers to teach about proper bicycle safety and practices.	Training undertaken for select staff and rolled out at local events but not consistently applied.
+ Incentivizing businesses that partake in active commuter programs by issuing "Bicycle Friendly Business" or "Healthy Workplace" award.	Bicycle Friendly Businesses rolled out within the Region in partnership with external partners.
+ Expanding existing cycling programming, including: schools programming (Helmet Safety, Kids Safety Village and Active and Safe Route to School program), workplace programming (Smart Commute) and community bike events.	Localized programs have been encouraged through Regional initiatives.

Implementation

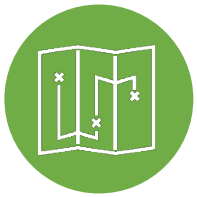
Status...

2.2 Regional Cycling Context

"Cycling context" can be defined by several indicators. Indicators refer to specific types of information which help to frame the conversation. They are selected specifically because of the "story" they tell relative to the overall project objectives. For the Durham RCP, five indicators were selected to help define the Regional cycling context including…

Community profile.

Represents the socio-demographic conditions of the Region of Durham that have an impact on how people use transportation for day-to-day trips.



Geographic profile.

Represents the spatial conditions including but not limited to the existing cycling routes as implemented by the Region and its partners.

Policy.

Represents the adopted policies as well as planning strategies and documents that provide the structure and foundation for decision making related to cycling and / or transportation.

Cycling demand.

Represents the current cycling patterns within the Region of Durham based on social media participation which indicates the location of use, frequency and time of day as well as route preferences – not based on exiting routing.

Cyclist needs.

Represents the "categories" of cyclists which include a broad spectrum of design and experience preferences which help to frame potential improvement needs for cycling routes.

The outcomes of the assessment and key context considerations are presented below.

Community Profile...

In May 2020, Durham Region prepared and published a demographic and socio-economic profile which provides a detailed overview of Durham's unique community profile. The document was reviewed during the RCP update process and relevant profile indicators which have an impact – both directly and indirectly – on cycling have been highlighted and summarized below.

As will be demonstrated in Chapter 5 of the RCP, understanding the unique socio-economic and demographic considerations for a community is necessary when creating tailored and targeting programming. It should focus on a deeper understanding of the existing needs to determine the desired behaviour change. The following is a summary of those key considerations:

71%

Are immigrants (2011-2016)

This creates a significant need for programming that addresses the needs of New Canadians including but not limited to language or societal differences.

20%

Are Visible Minorities.

These populations need to be represented in public facing materials for cycling including marketing and promotional materials for cycling.

14%

Are over 65 in 2016.

This generates a significant need for accessible as well as age-friendly communities.

50%

Of households are 1 or 2 people.

These households have higher degrees of transportation flexibility if they have options (e.g. likely not to be families with children).

81%

Of trips made stay in Durham

There is a large potential for inter and intra-municipal connections through cycling, especially as E-Bikes become more widely available.

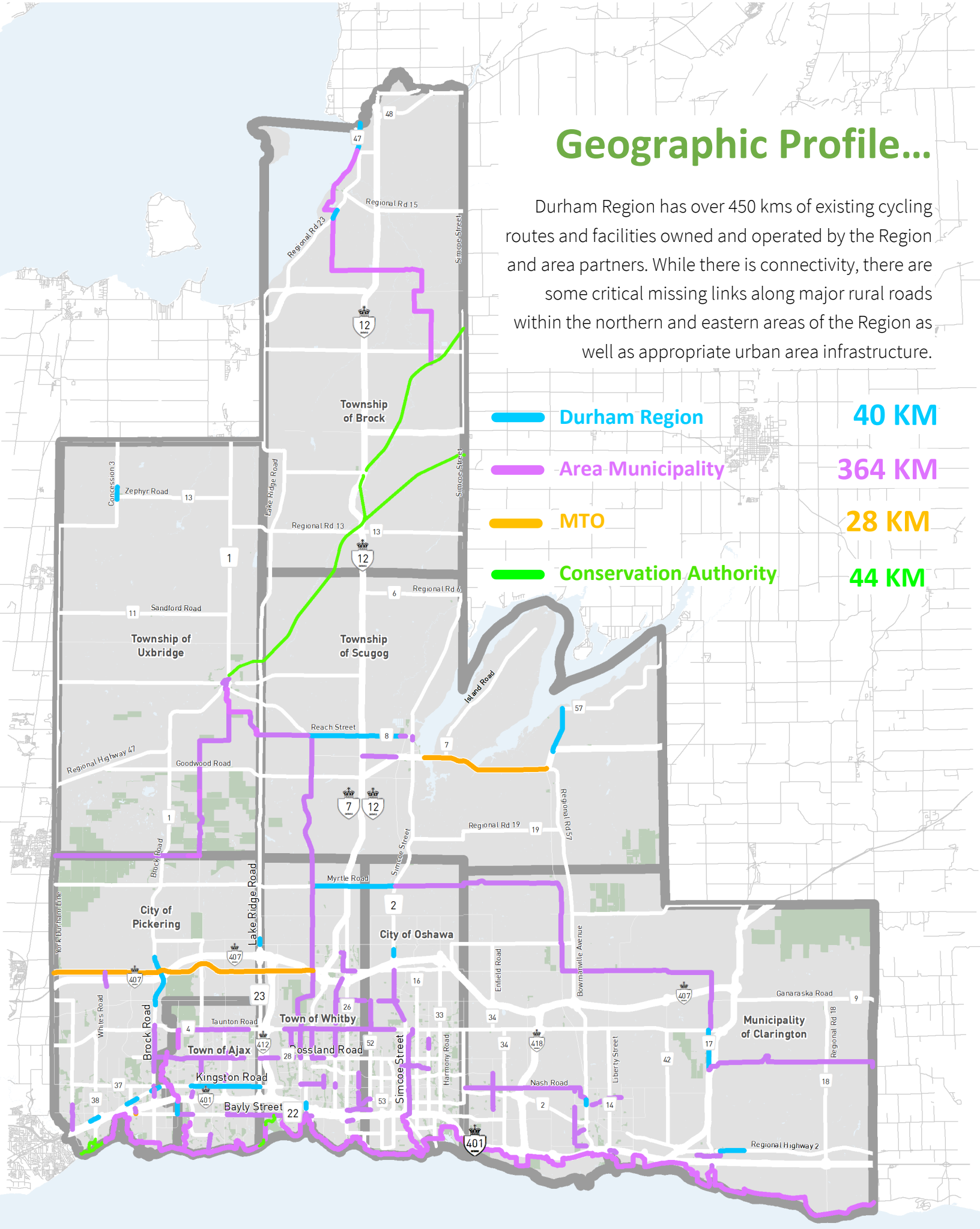
Nearly 50%

Of renters spend over 30% of income on housing

There is a need to focus investments in affordable transportation near areas where proportion of renters is higher to help improve affordability.

Geographic Profile...

Durham Region has over 450 kms of existing cycling routes and facilities owned and operated by the Region and area partners. While there is connectivity, there are some critical missing links along major rural roads within the northern and eastern areas of the Region as well as appropriate urban area infrastructure.



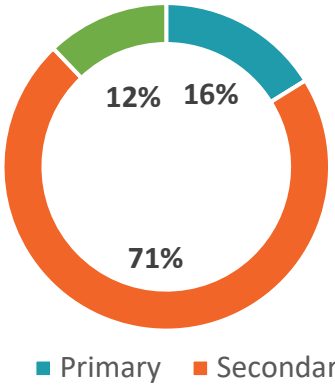
Policy...

Policies and plans are tools that guide government decision-making at the municipal, regional and provincial level. The RCP will serve as a functional master plan which means that while there is policy guidance, ultimately the Region is responsible for adhering to statutory and regulatory policies such as the Provincial Policy Statement and the Region's Official Plan. As an upper-tier municipality, Durham Region must adopt policies that pertain to lands and infrastructure under its jurisdiction while adhering to the applicable Provincial policies. It also has area municipalities that have their own context specific planning policy documents that must adhere to Regional policy / directives. In the current context, there are over 30 policies and plans that have the potential to influence cycling within Durham Region.

As part of the RCP, Regional plans and policies were reviewed and assessed to determine their current level of support for cycling. A key term assessment was completed of Regional policies showing a relatively high level of support for key cycling terms.

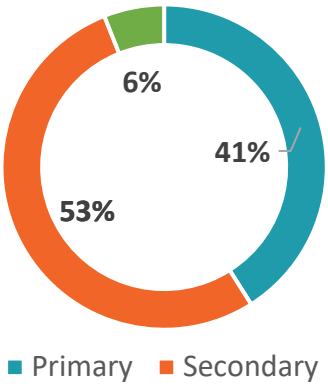
The following is a summary of the outcomes of the policy scan and evaluation which are detailed in section 3.1 of the Phase 1 report.

Regional Official Plan (ROP)



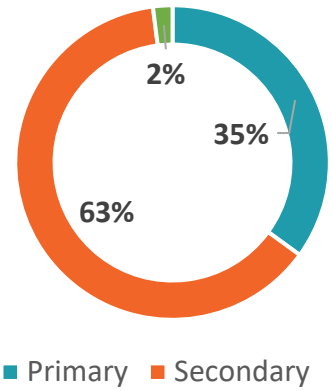
With over 200 references to key terms, the ROP should strive to have a balance of cycling specific policies.

Transportation Master Plan (TMP)



With over 900 references to key terms, the TMP does not have regulatory authority but should provide enough detail to engrain cycling as a key part of the transportation system.

Durham Vision Zero Road Safety Action Plan



As an action plan, there is no policy guidance that impacts cycling; however, the values, principles and actions outlined within the plan provide context and actions to improve cyclist safety.

Cycling demand...

Cycling demand is a valuable tool to help determine where cycling improvements and possible investments may generate the greatest "return". It also helps to clarify when to accommodate current cycling demand or identify opportunities to improve cycling in underserved areas. As such, a review of "cycling demand" should not be limited to the location of cycling trips themselves but their time of day, duration, length and the conflicts or concerns commonly encountered.

Durham Region conducts annual cycle counts and it also acquired GPS travel data generated by the mobile application Strava as part of the RCPU.

This information was spatially depicted based on a series of "heat maps" to provide information about the volume and frequency of routes travelled. The heat maps are detailed in section 2 of the Phase 1 Report. The mapping shows distinct "hot spots" of high frequency used throughout various areas of the Region. **Figure 2-2** illustrates the Region-wide outcomes of the Strava heat-mapping as well as an overview of the highest frequency "hot spots" for existing cycling activity and demand.

The following is an overview of these locations:

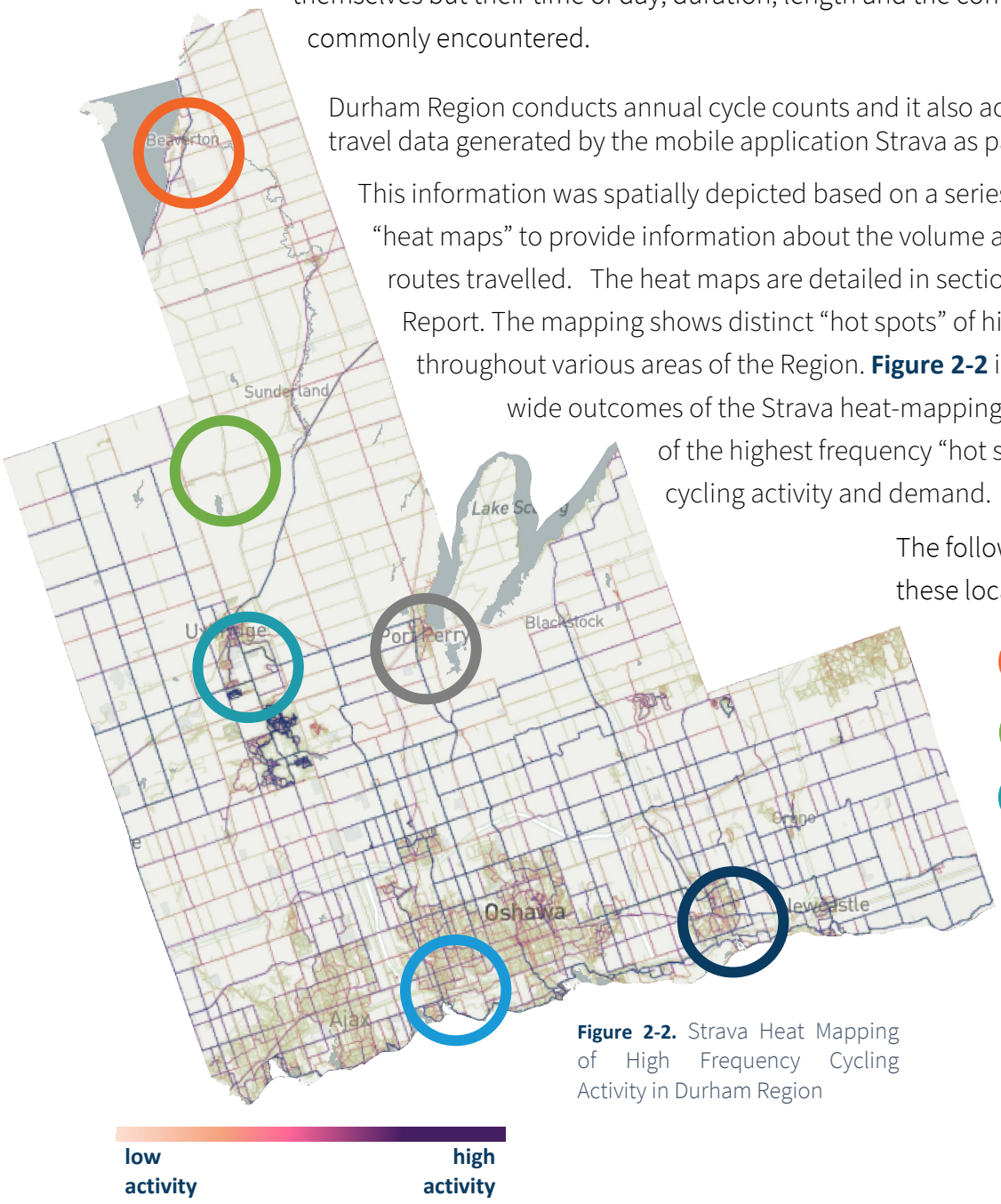


Figure 2-2. Strava Heat Mapping of High Frequency Cycling Activity in Durham Region

- **Beaverton**
- **The Great Trail**
- **South Uxbridge**
- **South Whitby; Oshawa**
- **Bomanville; Clarington**
- **Scugog; Port Perry**

Cyclist needs...

Not all cyclists are the same. They consider different factors when deciding whether to take a trip by bicycle such as the weather, the destination, the time of day and the purpose of the ride. The reasons why an individual chooses to cycle can vary significantly. A user-focused approach and lens has been used to update the RCP which means that throughout each stage of planning, design and development, considerable thought has been given to the "type of cyclist" to accommodate the widest group of participants regardless of their age, skill level, trip purpose, or physical abilities. To do this, there needs to be a more robust understanding of cyclist types and the needs associated with those "types of cyclists". Based on national and international research, five categories of cyclists are typically identified and designed for. An overview of the cyclist types and the application within the Durham context is provided in **Table 2-1**.

Cyclist Type		Speed	Volume	Context	Route	Example
Everyday Cyclist	Cyclist trying to get to and from work or school using a direct route, undisturbed.	Moderate	Moderate	Regional	On-road	
Sport Cyclist	Cycling for sport in laps or groups for long distances, moving quickly	Moderate to high	Moderate to high	Regional Local	On-road Off-road	
Recreational Cyclist	Cycling for enjoyment alone or with others needing good signage for direction	Low to moderate	Low to moderate	Regional Local	On-road Off-road	
Attentive Cyclist	Cyclists who want to cycle safely but understand and want to follow the rules of the road with instruction	Moderate	Moderate	Regional Local	On-road Off-road	
Vulnerable Cyclist	Cyclists who want low traffic, peaceful cycling environments, with minimal to no conflict	Low	Low	Local	On-road Off-road	

Table 2-1 . Overview of cyclist types and design considerations

2.3 Cycling Trends

The RCP looks to learn from past experiences and community needs and aims to align with future trends. When referring to “cycling trends”, reference is being made to high-level planning values, principles and considerations that when reinforced in Regional policy, can support a shift to a more cycling-friendly culture. In doing so, the intent is that the Region will be better positioned to holistically approach cycling-supportive policy, planning, design and implementation.

Cycling trends, though future focused, are also the foundation for the strategic identification of cycling infrastructure and programming improvements. They serve as a consistent set of criteria from which potential improvements are compared and preferred improvements are selected. These are not considered quantitative criteria but qualitative considerations which are used to assess overall value and community benefit.

For the purposes of the RCP, four cycling trends were identified and researched. The trends reflect the Regional strategic priorities as well as emerging areas of focus provincially, nationally and internationally. A detailed investigation of these future cycling trends and suggested considerations and improvements are outlined in section 3.1.2 of the Phase 1 Report.

The trends and considerations should be a point of reference when moving forward with the implementation of the RCP as well as with other Regional policies such as the Official Plan and functional master plans such as the Transportation Master Plan. Where appropriate it may be effective to integrate these considerations into community design guidelines and implementation tools.

Future Cycling Trends

AT-Oriented Development

Active transportation-oriented development maximizes the amount of residential, commercial, employment, and recreational space which can be accessed by alternative modes of transport, including cycling, walking and transit.

+ Short-distance trips less than 5km
+ Medium to high density development
+ Trip end facilities at mobility hubs
+ Retrofitted intersections to accommodate cyclists
+ Comprehensive maintenance programs

Climate Change

Climate change is defined as a change in global or regional climate patterns, largely attributed to increased levels of atmospheric carbon dioxide produced by fossil fuels.

+ Enhance transportation infrastructure durability and climate resiliency
+ Promotion of low carbon travel, including cycling
+ Transportation infrastructure scaled to dense, less land-intensive urban form

Health and Social Equity

Health, economic, or social equity is reached when individuals in a community have the fair opportunity to reach their fullest health potential. It involves reducing barriers, addressing environmental factors, and being integrated into decision making and planning.

+ Improved air quality through reduced auto dependency
+ Offer low-cost mobility solutions to combat existing inequities
+ Engage and empower traditionally under-serviced communities

Vision Zero and Safety

Strategic Road Safety Action Plan, Vision Zero is a road safety concept that originated in Sweden in 1997 that works to achieve no loss of life because of motor vehicle collisions.

+ Crime Prevention Through Environmental Design
+ Traffic calming
+ Intersection retrofitting and road dieting
+ Multi-modal traffic planning and modelling

2.4 Cycling Best Practices

Durham Region aims to be both inspirational and realistic when it comes to its RCP. There is a lot that can be learned from other municipalities as it pertains to cycling planning, design and implementation. As part of the update of the RCP, a detailed review of aspirational and comparable best practices from municipalities within Ontario and Canada was undertaken. The intent was to understand their current practices including their successes, lessons and challenges with focus on solutions and strategies. A detailed overview of the approach and outcomes is provided in section 3.2.1 of the Phase 1 Report. **Table 2-2** provides an overview of the outcomes of the assessment relative to the key components / objectives of the Durham RCP. As this is not an exhaustive list of best practices, Durham Region is encouraged to continue researching comparable best practices as it relates to the future implementation of the RCP. The most applicable "best practices" are upper tier municipalities who have similar opportunities and constraints associated with jurisdiction. It is important to review these best practices in the context of other considerations such as number of kilometres of cycling infrastructure, partnership and programming supports which is discussed later in the RCP.

Table 2-2. Summary of Cycling Best Practices

Master Plan Elements	York Region	Halton Region	Peel Region	Niagara Region	County of Essex	City of Mississauga	City of Surrey	District of North Vancouver	City of Edmonton
Signage Standards	√	√		√	√			√	√
Data collection strategy		√	√	√	√	√	√	√	√
Equity focus in network development			√						
Integration with cycling networks of neighboring jurisdictions	√	√		√			√	√	
Winter maintenance strategy	√	√	√		√	√	√		√
Funding sources and strategies	√	√	√	√	√	√	√		√
Costing of proposed network by facility type	√	√	√		√	√			
Links ATMP/CMP goals to broader sustainability objectives	√	√	√	√		√	√	√	
Policy and bylaw strategies to improve cycling implementation	√	√	√		√	√			√
Cycle tourism as an action item or goal	√	√	√	√	√	√			
Addressing political opposition to cycling				√					
Use of action-orientated language	√	√	√	√	√	√		√	√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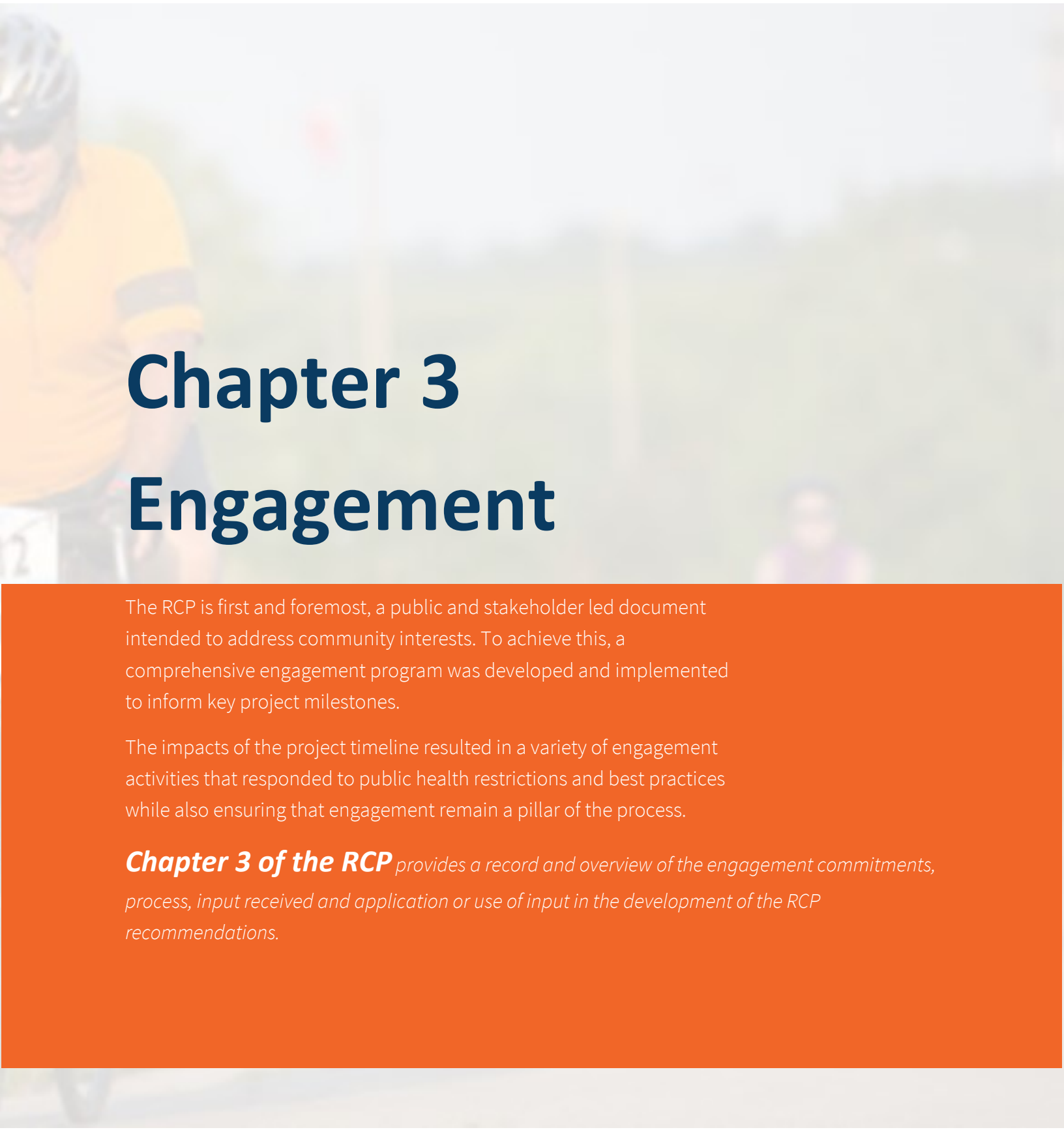


Chapter 3
Engagement

The RCP is first and foremost, a public and stakeholder led document intended to address community interests. To achieve this, a comprehensive engagement program was developed and implemented to inform key project milestones.

The impacts of the project timeline resulted in a variety of engagement activities that responded to public health restrictions and best practices while also ensuring that engagement remain a pillar of the process.

Chapter 3 of the RCP *provides a record and overview of the engagement commitments, process, input received and application or use of input in the development of the RCP recommendations.*

3.1 Engagement Approach and Tactics

Meaningful consultation is essential to establishing a long-range strategic and functional plan that is based on community support. Engagement helps inform key milestones and ensures that outcomes reflect the values and needs of decision makers, staff, stakeholders, interest groups and residents.

The consultation and engagement program designed to inform the RCP was based on a detailed understanding of the key audiences, the engagement values and foundations adopted by Durham Region and the principles of the International Association of Public Participation (IAP2) process. Engagement and communication tactics were intended to be intuitive, creative, innovative, collaborative, accessible and equitable. The intent was to:

+ Generate interest and a sense of empowerment and commitment to the RCP;
+ Build a common understanding of the key challenges, benefits, opportunities and constraints along with other considerations of the cycling network;
+ Increase participation and input among stakeholders within Durham; and
+ Demonstrate the Region's commitment to meaningful and innovative collaboration and coordination approaches.

The following are the audiences that were engaged over the course of the RCP process:

Regional staff: those who work for Durham Region and have direct role in the implementation of the RCP.

Regional council: those who sit on Council and are ultimately responsible for approval of the RCP.

Area municipal staff: those who work for the Region's local area municipalities and have a direct role in cycling.

Advisory Committee members: those who sit on the Durham Active Transportation Committee (DATC) and have a role in enhancing and promoting cycling in Durham Region.

Agencies and interest groups: those that are part of external groups or agencies and provide ancillary support.

Members of the public: those who work, live and play within Durham Region and have a personal interest in cycling.

Engagement milestones and tactics were defined based on the engagement interests, preferences and level of commitment of each of the groups noted on page 2. The intent was to design a program with a range of engagement options and alternatives at key project milestones to generate buy-in and commitment to project outcomes (as shown in **Figure 3-1**).

While structured, an engagement plan needs to remain flexible to external impacts and unanticipated audience requests. To that point, in March 2020 the Greater Toronto and Hamilton Area (GTHA) started to experience the travel impacts and physical distancing restrictions associated with COVID-19. These impacts meant that the original engagement approach and planned engagement activities needed to be adapted to include virtual opportunities that complied with public health guidelines.

While not the intended approach, effective engagement was still able to occur, and a considerable amount of input was gathered throughout the project process. **Table 3-1** is an overview of all engagement objectives and RCP milestones.

Figure 3-1. Overview of Engagement Tactics

Overview of

Engagement Milestones

Objectives	Activities	Timeline
Phase 1 Objective: To define the vision and objectives of the RCP and to gain a high-level understanding of the current conditions and future needs of the community.	+ Kick off Meeting + Stakeholder Workshop #1 + Online Survey #1 + PED Committee Meeting #1 + Stakeholder Interviews + DATC Meeting #1	March - June 2020
Phase 2 Objectives: To develop and design the proposed primary cycling network and to determine strategic and recommendations that address key topics that reflect community priorities.	+ Online Survey #2 + Stakeholder Workshop (Regional) #2 + Stakeholder Workshop (Municipal) #3 + PED Committee Meeting #2 + DATC Meeting #2 + Stakeholder Workshop (Regional Finance & Public Works) #4	July 2020 – January February 2021
Phase 3 Objectives: Develop and confirm the Regional Cycling Plan and establish buy-in to the output and the outcomes of the process.	+ Stakeholder Workshop (Regional) #5 + Stakeholder Workshop (Municipal) #6 + PED Committee Meeting #3 + DATC Meeting #3	March – May 2021

Table 3-1. Overview of Project Engagement Tactics

3.2 Informing the Process and Input Received

The input received over the course of the update to the RCP serves as a formal documentation of the decision making and development process. Extensive input and feedback were provided by the various stakeholders engaged using the methods previous described. These insights informed the decisions taken at different intermediate milestones, which directed the RCP's cumulative recommendations. A high-level summary of the input received has been prepared and provided following the project process and sequence of engagement events as well as the key input that emerged through the discussions and facilitated activities that took place. **Figure 3-2** summarize the major engagement milestones and some preliminary themes from the input received. A more detailed overview is provided in the Phases 1 and 2 technical reports of the RCP.

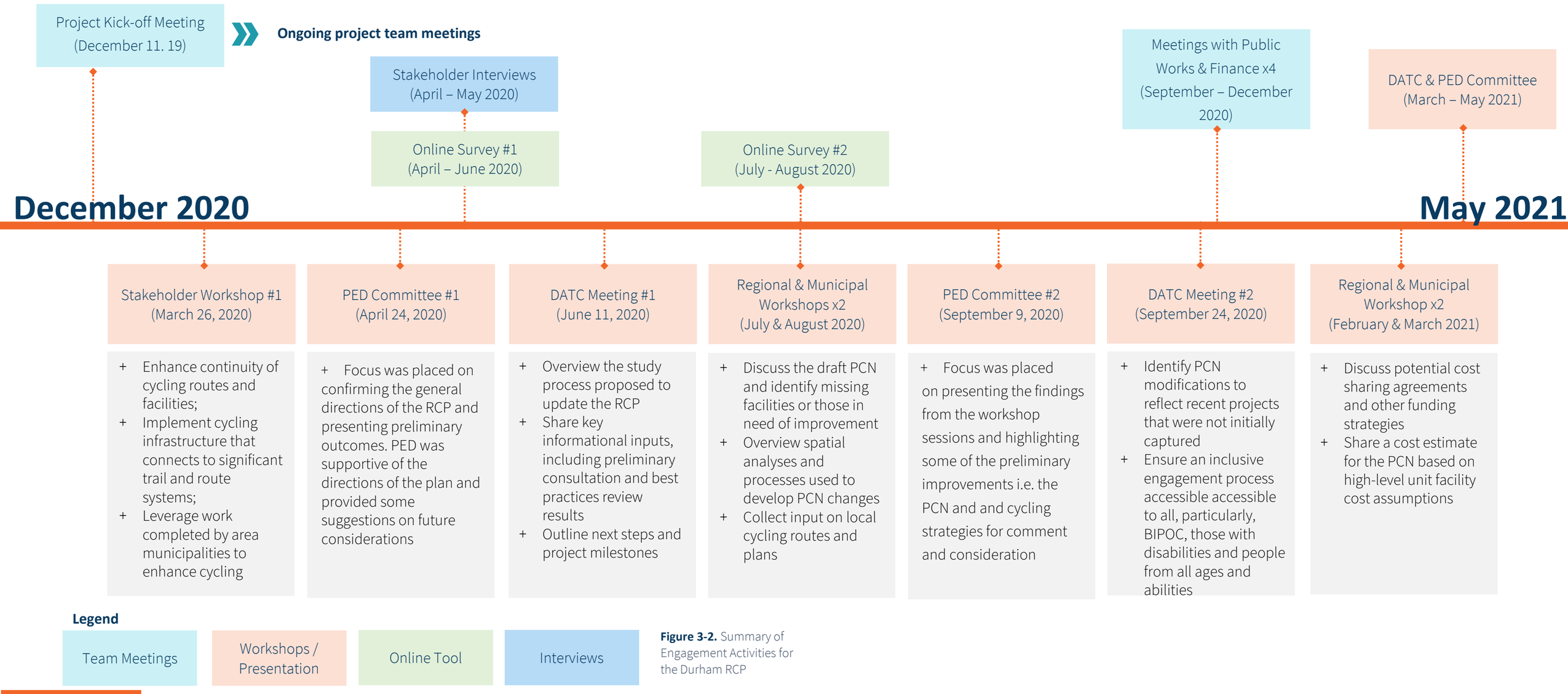


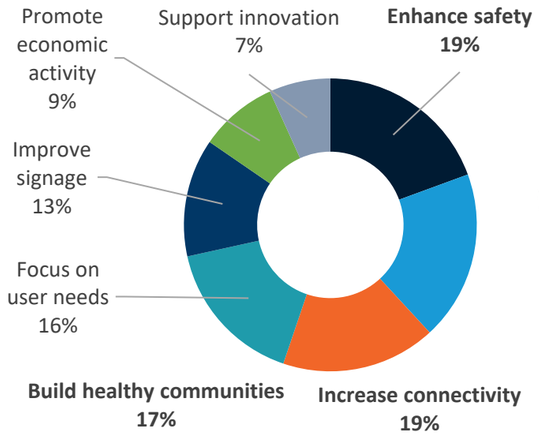
Figure 3-2. Summary of Engagement Activities for the Durham RCP

The online engagement tools developed and deployed as part of the RCP update process gathered the largest amount of input from the widest audience, the public. The following is a summary of the key themes that emerged from the survey deployed in Phase 1 and Phase 2 of the RCP update.

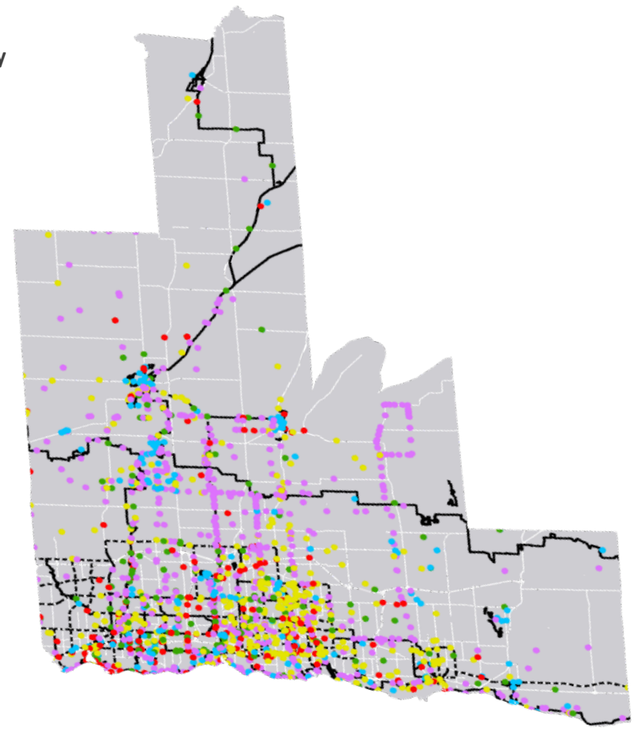
Online Survey #1

RCP Priorities, Needs & Preferences

Question #1. What do you think are the top RCP priorities?



Question #2. Where can cycling be improved?



210 Barriers **468** Missing links

661 Favorite routes **236** Destinations

Question #3. What are your preferred cycling facilities and events?

	Urban Facilities	Rural Facilities	Events
Strongly Like	In-boulevard Pathways Separated Bike Lanes	Off-road Trail	Cycling Events Touring Routes
Somewhat Like	Urban Shoulder Bike Lane	Paved Shoulder Buffered Paved Shoulder	Group Rides Bike Valet

Online Survey #2

Informing the Cycling Strategy

Topic #1. Bicycle Parking **393**	Gathering input on the use of existing bicycle parking, potential improvements, preferences and locations for implementation.	+ 40% of respondents NEVER use bicycle parking within Durham Region. + 36% of respondents were somewhat or very dissatisfied with the availability of bike parking. + 51% of respondents are concerned about bike theft. + 52% of respondents think availability of safe, secure bike parking is important.
Topic #2. Signage and Wayfinding **323**	Identifying opportunities to enhance navigation and use of the network through network signage and branding.	+ 66% of respondents think there is inconsistent wayfinding / signage. + 95% of respondents think the Region should work together with stakeholders. + 83% of respondents think there should be branding for signage / wayfinding. + Top sites where network signage should be improved: trails, transit stations, cycling routes and key commercial areas.
Topic #3. Education and Encouragement **276**	Establishing a profile of cycling education and encouragement preferences to generate more tailored community-based programming and messaging.	+ 98% of respondents own at least one bike. + 83% of respondents bike at least once weekly. + 93 of respondents biked within the last month. + 95% of respondents have maintained their bicycle. + Respondents preferred to ride their bikes for recreational trips and leisure, compared to commuting.
Topic #4. Cycling Facility Maintenance **354**	Determining how maintenance procedures affect seasonal cycling patterns and how they can be improved to increase seasonal ridership.	+ 72% of respondents would rather have a higher standard of maintenance than an approach that focuses on clearing routes. + Respondents were more likely to bike during the winter if cycling routes were maintained and cleared with the same level of priority as roadways. + 96% of respondents bike monthly and 94% biked weekly in the summer, compared to 22% and 16% in the winter, respectively.

3.3 Shaping the RCP

The value of engagement is not only the input that is generated but how it is used to inform, shape and confirm project outcomes. Each of the engagement activities was undertaken with a distinct purpose in mind and the input generated from the engagement activities were used in one of three ways: adopted, adapted, or not considered (as noted to the right).

The following is an overview of some of the key themes that emerged, where they were sourced from and how it was addressed based on the three categories noted above.

"Adopted" used to inform the development of a recommendation.

"Adapted" slightly altered as the basis of a recommendation.

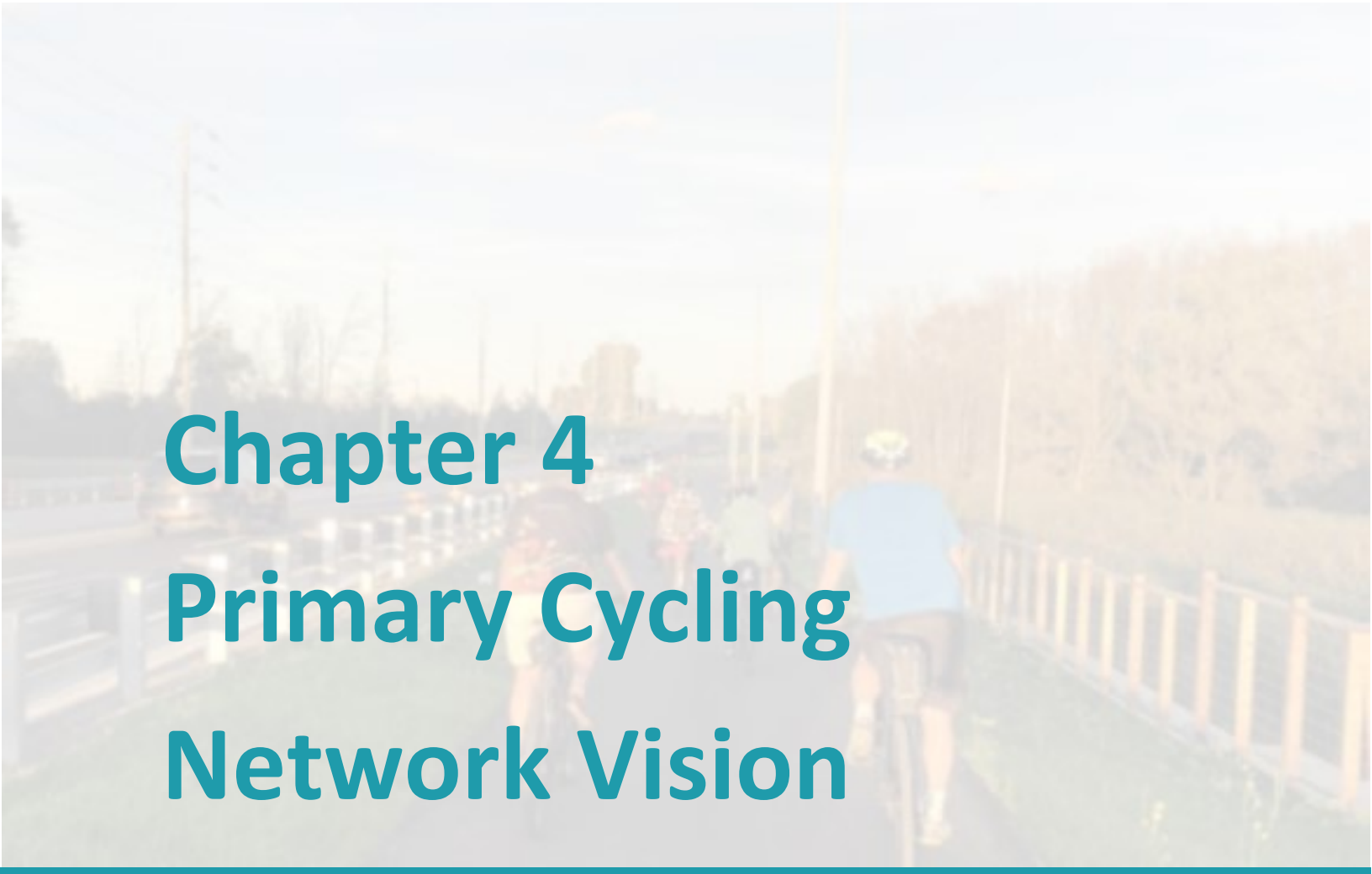
Not considered, because it was deemed to be out of scope for the project or outside of the Region of Durham's jurisdiction.

Comment	Source	Approach
Enhance focus on high-quality, physically separated cycling facilities that reflect the context of Regional roads	Online Survey #1, Stakeholder conversations	
Enhance connectivity and continuity of cycling routes, especially along regionally and provincially significant routes	Stakeholder Workshop	
Leverage work completed by local municipalities to enhance connectivity across Durham Region	Stakeholder Workshop	
Standalone cycling projects need to be included in this update to be able to accommodate the construction of a complete network. Current practices of including cycling facilities only when a road is being widened or reconstructed is resulting in disconnected networks across Durham Region	Stakeholder Interviews, Public Comments	

Comment	Source	Approach
The RCP should focus on early implementation of the PCN rather than a "back end loaded" plan where implementation is pushed to a longer-term horizon	Stakeholder Interviews and Workshops	
The RCP should include enhanced support for municipal connections that enhance the Regional network, especially in instances where an identified project on the Regional network is deemed not to be feasible	Stakeholder Interviews	
The RCP should integrate on and off-road infrastructure to better consider how the Region's Multi-Use Trails and pathways can connect cycling routes	Stakeholder Interviews	
The PCN should focus on connecting existing trip generators in Durham Region – transit hubs, post-secondary institutions, commercial areas, schools, major employment areas	Stakeholder Interviews, Online Survey	
Durham Region should increase its financial contribution to the construction of high-quality cycling routes on Regional roads, even if they are outside the roadway.	Stakeholder Interviews	
The Regional Network should also include Municipal Roads where it makes more sense – for example, where a Regional Road would not be the most desired facility due to high traffic volumes and speeds, but a municipal road is adjacent and parallel	Stakeholder Interviews	
The RCP should consider implementing a "signature project" similar to York Region's Lake to Lake Route to build excitement and focus on one priority corridor	Stakeholder Interviews	

Comment	Source	Approach
The RCP should focus on outreach and engagement as well as the development of new physical infrastructure	Stakeholder Interviews and Workshops	
Increase outreach to key demographics within Durham Region – women, seniors, new Canadians, young families, people with disabilities etc.	Stakeholder Interviews and Online Engagement #2	
Enhance support for Active School Travel Programs and improve connections between Durham Region's Schools and its active transportation efforts	Stakeholder Interviews	
Create more opportunities for connections between Regional, Area Municipality and External Stakeholders to connect on active transportation by creating dedicated staff resources focused on active transportation at Durham Region	Stakeholder Interviews and Workshops	
Expand support for private landowners to be able to install high-quality bike parking in shopping and business areas	Online Survey #2	
Introduce Regional Bicycle Parking Guidelines to ensure that all installed bike parking meets the needs of all people on bikes	Stakeholder Interviews	
Create a cohesive signage and branding strategy for Durham Region's cycling routes to help inform riders of key destinations and primary routes	Stakeholder Interviews and Online Survey #2	
Deliver Regionally-significant active transportation events, including festivals, Open Streets events and community rides to help encourage new riders to get back on their bikes	Stakeholder Interviews and Online Survey #2	

Comment	Source	Approach
Enhance the Region's capacity to develop materials to promote cycling that can be distributed by area municipalities	Stakeholder Interviews and Online Survey #2	
Develop a Regional winter maintenance network and a set of maintenance standards for those routes	Stakeholder Interviews and Regional Feedback	
Ensure that Regional Routes on local roads can be adequately maintained by the area municipalities by supporting them with additional resources or equipment	Stakeholder Interviews	



Chapter 4
Primary Cycling Network Vision

One of the focal points of any transportation related functional master plan is the recommended infrastructure improvements in the form of a continuous and connected network. The Region's existing Primary Cycling Network (PCN) is the foundation upon which future improvements have been identified. Since the adoption of the 2012 PCN, new best practices have emerged, lessons learned and Provincial guidance on cycling network planning and design have been updated. The vision for the PCN is a fully connected and continuous system of safe and comfortable cycling facilities that links major communities and destinations in Durham.

Chapter 4 of the RCP *provides an overview of the PCN, its proposed routes and facilities and jurisdictional considerations.*

4.1 Development Process

The Primary Cycling Network (PCN) is a blueprint for the planning, design and implementation of a regional-scale network of cycling facilities across the Region and area municipalities. Its foundation is built on identifying and connecting key cycling routes from active transportation master plans at the provincial, regional and area municipal levels to establish a logical and continuous network. Historically, the Regional PCN routes and facilities have focussed on implementation based on feasibility relative to achieving a comprehensive network within an overall timeframe. This approach has been counter-intuitive to prioritizing cycling infrastructure where it is needed most to achieve a cohesive network. As part of the RCP update process, the PCN was revisited to reflect the community's needs, interests and priorities as documented through the engagement process as well as the wider strategy objectives identified by the Region including:

+ Enhancing connections between local and Regional cycling facilities;
+ Enhancing safety and comfort of all users;
+ Integrating realistic solutions that reflect Durham-specific conditions;
+ Adopting consistent design guidelines and standards; and
+ Providing implementation guidance for area municipalities.

To review and refine the PCN, a three-step process was used:

1. Existing Routes

Updated existing routes to reflect routes that had been constructed on Regional roads and area municipal connections and reviewed existing routes relative to new design guidelines to determine if enhancements needed to be made.

2. Update PCN

Reviewed the PCN focusing on a 10-year implementation horizon and updated the horizons to reflect "shifts" in phasing based on update d timeline and identified and confirmed missing links or new connections to complete the network.

3. Confirm Facilities

Reviewed proposed links and applied the Ontario Traffic Manual (OTM) Book 18 facility selection tool to identify preliminary preferred cycling facilities based on accepted guidelines and standards.

Underpinning the three-step process are a set of assumptions., which are fixed considerations that provide the foundation for the refinement and build-out of the cycling network. The nine assumptions that were identified through discussions with Regional staff and stakeholders are presented in **Table 4-1.**

Figure 4-1 illustrates all cycling routes that are intended to form part of the PCN, and the extent of these routes at full built-out within Durham Region.

1.	The RCP builds upon the PCN and supporting strategies proposed within the 2012 RCP as well as the 2017 Durham Transportation Master Plan, as well as existing programs and initiatives at the local and regional level.
2.	Where possible, area municipal networks (as adopted through plans and policies) and planned projects have been incorporated into the PCN.
3.	The RCP assumes that the Region is most suited to play a coordinator role when it comes to the implementation of Region-wide cycling infrastructure as well as programming and outreach.
4.	The approaches proposed within the RCP build upon the best possible guidelines and standards available, providing interpretation in the Durham context where appropriate.
5.	The Greenbelt cycling Route is considered existing and is assumed to be part of the PCN. In select locations strategic improvements may be identified to align with current guidelines and standards.
6.	The MTO Province-wide cycling network is assumed as part of the proposed PCN on both Regional and local roadways and are consistent with recommendations outlined in the strategy.
7.	The PCN focuses primarily on Regional roads except for strategic local connections and parallel routes which are based on locally adopted plans and/or proposed additions.
8.	Recommendations for proposed facilities for routes along the MTO Province-wide cycling network are based on preliminary provincial recommendations except for routes proposed in local municipal plans.
9.	A 10-year short-term horizon has been assumed for the implementation of the short-term PCN linkages starting in 2021.

Table 4-1 Primary Cycling Network Development Assumptions

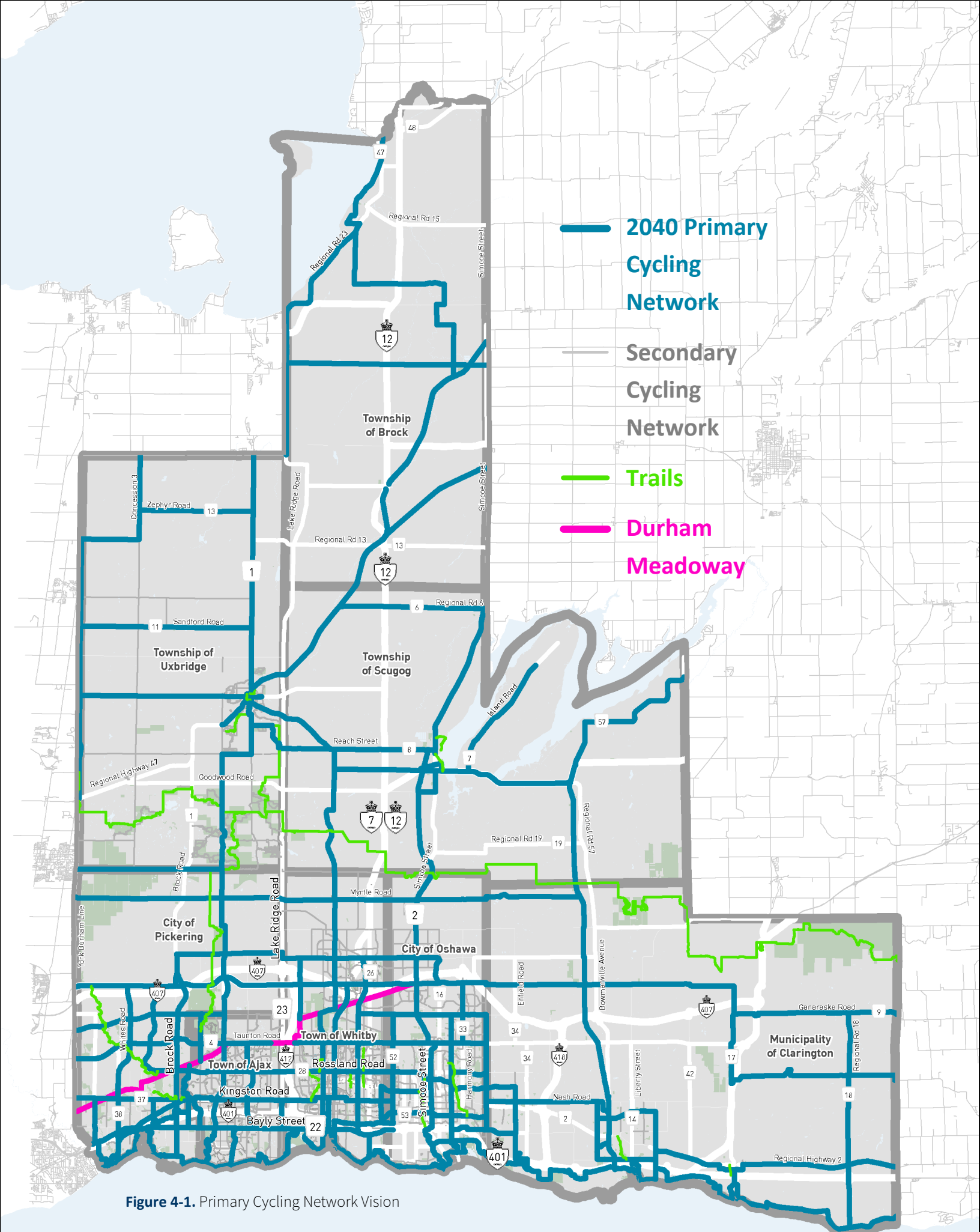


Figure 4-1. Primary Cycling Network Vision

4.2 Proposed Primary Cycling Network

The PCN provides approximately 1,000 kilometres of cycling infrastructure of varying facility types of routes and facility types that directly corresponds to the cycling user experience, its geographic location and hierarchy within the road right-of-way through the provision of creating a safe and accessible region-wide cycling network that accommodates people of all ages and abilities while considering the unique trip types and preferences of those who live, work and play with the Region. The PCN facility types and its corresponding phasing to achieve the full-build out of the RCP are summarized in **Table 4-2.** The detailed outcomes of the process are also illustrated on **Map 1** which shows proposed PCN segments by Facility Type.

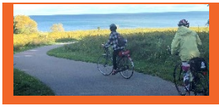
Facility Type	Description	Existing	Short Term Capital Projects	Short Term Infill Projects	Long-term Projects	Total
 Off road Trail	An off-road trail is a multi-use facility that is located outside of the roadway and typically found within a park, open space and or hydro / utility corridor.	133.6	0.0	0.0	0.0	133.6
 In boulevard multi use pathway	This facility provides multi-use two-way travel and is horizontally and vertically separated from motor vehicle traffic by a curb and a hard surface or strip of grass within the road right-of-way.	57.5	44.7	47.6	63.9	213.6
 Cycle track	Cycle tracks are a physically separated facility that is horizontally and vertically separated from the travelled portion of the roadway by a curb plus a horizontal buffer.	0.0	6.2	17.8	0.0	24.0
 Buffered bike lane	A buffered bike lane is separated from adjacent motor vehicle lanes by a horizontal buffer and vertical elements within the buffer such as flex bollards or a barrier curb.	8.3	3.0	9.4	29.3	50.0
 Buffered paved shoulder	Buffered paved shoulders are like paved shoulders but are typically implemented on rural roads that have moderate to high traffic volume and speed. The facility is delineated using two 100-millimetre solid white lines.	1.4	3.9	11.3	66.6	83.2
 Bike lane	A bike lane is a portion of a roadway which has been designated by pavement markings and signage for preferential or exclusive use by cyclists.	37.1	0.0	14.4	17.4	68.9
 Paved shoulder	A paved shoulder is a portion of a road which is contiguous with the travelled way and provides lateral support for the pavement structure. It is often used by cyclists since it provides an area that is adjacent to but separate from the motor vehicular traffic.	68.9	18.1	15.5	151.9	254.5
 Signed route	Signed routes are implemented on low volume, low speed roads. Generally, there are no other provisions needed beyond signing (Bicycle Route Marker sign – OTM sign code M511).	136.9	0.0	23.4	32.2	192.6

Table 4-2. Summary of the Existing and Proposed PCN

Notes:

1. Current proposed PCN = 591 km. This includes: 365.6 KM = Previously identified routes (251.3 KM = 2012 RCP / 2017 TMP PCN & 114.3 KM = Routes identified in local municipal plans that form part of the PCN and the MTO Province-wide cycling network); 225.4 KM = New proposed PCN routes
2. The Durham Meadoway is intended to form part of the Region's PCN, however, it is not included in this table (future design studies will be undertaken to determine the preferred alignment and facility types / design for the Durham Meadoway).

Map 1 — Primary Cycling Network by Facility Types

Regional Cycling Plan | April 2021

0 3 6 12 km

Durham Region

Lake Simcoe

York Region

Township of Brock

Township of Uxbridge

Township of Scugog

Lake Scugog

City of Kawartha Lakes

City of Pickering

City of Oshawa

Town of Whitby

Town of Ajax

Municipality of Clarington

Lake Ontario

Regional Rd 15

Regional Rd 23

Regional Rd 13

Regional Rd 6

Regional Rd 19

Regional Rd 57

Regional Rd 18

Regional Highway 47

Regional Highway 2

Simcoe Street

Lake Ridge Road

Concession 3

Zephyr Road

Sandford Road

Reach Street

Goodwood Road

Island Road

Brock Road

Myrtle Road

York Durham Line

Whites Road

Taunton Road

Rossland Road

Kingston Road

Bayly Street

Harmony Road

Nash Road

Liberty Street

Enfield Road

Bowmanville Avenue

Ganaraska Road

Legend

Primary Cycling Network

Existing	Proposed
N/A	Cycle track
	In-boulevard multi-use pathway
	Buffered cycle lane
	Buffered paved shoulder
	Cycling lane
	Paved shoulder
	Shared roadway
	Off-road facility

* Facility types are to be confirmed through environmental assessments and other design studies.

Other Routes

Existing	Proposed
	Secondary Cycling Network (local routes)
	* Trails

* Refer to Durham Transportation Master Plan, 2017, Maps 2A and 2B

Other Features

- Provincial Highway
- Regional Road
- Municipal Road
- Provision for cycling facilities in partnership with MTO at highway interchanges or crossings
- Protected corridor for potential future facility
- GO Transit Station
- Future GO Transit Station
- Park, Greenspace and Conservation Authority Land
- Waterbody

4.3 Existing Conditions Update

Existing PCN routes are considered the foundation from which the PCN is being "built", however, many of these routes were implemented several years ago. The RCP process provides an opportunity to re-confirm their route design relative to new cycling standards and user expectations. The Region's intent to provide cycling routes and facilities that provide safe and comfortable options for "All Ages and Abilities" is evident in the implementation of facilities such as in-boulevard multi-use pathways in urban and suburban locations, and paved shoulders and buffered paved shoulders in rural locations.

Since the development of the 2012 RCP, several new cycling design guidelines have emerged. In addition to reviewing new potential routing, existing routes and facilities were reviewed with regards to these new guidelines to determine if the implemented facility is still "appropriate" for the conditions of the Regional roadway and context.

Overall, most of the existing cycling routes found within the Regional right-of-way were deemed to be consistent with current guidelines. The review identified two locations where the existing cycling facility could be upgraded, when these road segments are due for future rehabilitation, to reflect current guidelines and best practices. In these two locations additional separation in the form of a 'paved shoulder with buffer' should be provided to appropriately accommodate and address cyclist needs. A summary of these two locations and the proposed improvements is illustrated below.

Location #1. Regional Road 8 / Reach St (Marsh Hill Rd / Sherrinton Dr)

Existing Facility: Paved Shoulder **AADT:** 7,580 **Posted Speed:** 50, 80

OTM Step 1 Results: Paved Shoulder with Buffer

Consideration: Future improvements (e.g. adding a buffer) could be phased in the long-term since the road has been recently reconstructed.

Location #2. Regional Road 2 / Simcoe Street (Hwy. 407 to Westview Dr / Steepleview Crt)

Existing Facility: Paved Shoulder **AADT:** 14,840 **Posted Speed:** 60, 80

OTM Step 1 Results: Paved Shoulder with Buffer

Consideration: Consider implementing a buffer in the long-term (when the road is next reconstructed) to provide a facility that is consistent with the recommended level of separation based on the OTM Book 18 facility selection process.

4.4 PCN Phasing Details

The PCN "phasing" builds upon the 2012 RCP and the 2017 TMP approach that established two planning horizons – short-term – spanning the first 10 years and long-term – projects beyond these 10 years of implementation.

A summary of the phasing horizons and a detailed overview of the types of routes – previously identified or new by jurisdiction is provided in **Table 4-3.** The PCN phasing is also illustrated in **Map 2**.

	Short Term Capital Projects (0 to 10 years)			**Short Term Infill Projects (2 to 10 years)**			**Long Term Routes (10+ years)**		
	Projects identified in the Region's Capital Plan (2020-2029).			Previously proposed short-term routes still within the 10- year horizon, new short-term routes and previously long-term links now in the short-term horizon.			Previously proposed long-term links and new links which require more discussion and consideration to identify a potential solution.		
	Previously Identified	New*	Total	Previously Identified	New*	Total	Previously Identified	New*	Total
Durham	21.2	10.0	31.2	28.2	25.4	53.6	84.8	121.1	205.9
Local	38.0	6.7	44.7	72.2	13.6	85.9	107.7	25.2	132.8
MTO	0	0	0	0	0	0	7.6	15.0	22.6
Total	59.2	16.7	75.9	100.4	39.1	139.5	200	161.3	361.3

Table 4-3. Summary of Durham RCP PCN Phasing

Map 2

Primary Cycling Network by Phase

Regional Cycling Plan | April 2021

0 3 6 12 km

Durham Region

Lake Simcoe

York Region

Township of Brock

Township of Uxbridge

Township of Scugog

Lake Scugog

City of Kawartha Lakes

City of Pickering

City of Oshawa

Town of Whitby

Town of Ajax

Municipality of Clarington

Lake Ontario

Legend

Primary Cycling Network

- Existing Route
- Short-Term Capital Project (2022-2029)
- Short-Term Infill Project (2022-2029)
- Long-Term Project (2030 and beyond)

Regional Rd 15
Regional Rd 23
Simcoe Street
Concession 3
Zephyr Road
Lake Ridge Road
Regional Rd 13
Regional Rd 6
Sandford Road
Island Road
Reach Street
Regional Highway 47
Goodwood Road
Regional Rd 19
Regional Rd 57
Brock Road
Myrtle Road
York Durham Line
Enfield Road
Bowmanville Avenue
Ganaraska Road
Regional Rd 18
Whites Road
Taunton Road
Rossland Road
Kingston Road
Bayly Street
Harmony Road
Liberty Street
Nash Road
Regional Highway 2

4.5 Understanding the Changes

The PCN was originally envisioned as part of the 2012 RCP which outlined the Region's vision and goals for cycling at that time. Since 2012, the PCN has been refined through subsequent plans including the 2017 TMP and integrated into area municipal plans as well as the Province-wide Cycling Network. Additionally, new best practices have emerged, lessons have been learned and provincial guidance on cycling network planning and design has been updated. By integrating this new information and guidance, the PCN has been revised through the RCP update process to include several missing linkages, facility upgrades and new opportunities.

The following two figures provide a snapshot of how the PCN has evolved over time. These two figures include:

Durham's PCN: 2012 vs now

Figure 4-2 illustrates PCN routes that are being carried over from the 2012 RCP, the 2017 TMP, area municipal plans and the MTO-Province Wide Cycling Network Study. It also shows new and revised PCN routes that have been identified through this study process. Simply put, this map shows what the PCN was, and what it is now

Exiting, revised and planned PCN routes

Figure 4-3 illustrates routes that are currently on the ground now (existing) and routes that are planned for future implementation including new routes that have been identified through the RCP update process as well as proposed revisions to facility types previously identified in the 2012 RCP and 2017 TMP.

Practice #3. Monitoring Approach

To maximize the RCP's efficacy, all actions and strategies should be routinely and comprehensively evaluated – consistent with Step 5 in the proposed infrastructure and policy implementation process. The implementation of a monitoring approach is essential to the overall success of the RCP. Listed below in **Table 6-4** are some proposed indicators that could be used to monitor progress of the RCP. Additional indicators will be ic entified through the development of the Bicycle Parking Guidelines and Signage and Wayfinding Strategy, and through the integration of cycling maintenance into the Region's asset management plan. Like all other RCP recommendations, they should be modified based off understandings of reporting capabilities and priorities, as determined by the Region.

PCN	Bicycle Parking	Signage & Wayfinding	Encouragement & Education	Facility Maintenance	Financing
Percentage of short-term infill projects completed (%)	Number of short-term bike parking spots (#) on Regional property	Installation of signage features (#)	Number of participants in Regional AT events (#)	Km of bike facilities with winter maintenance (#)	Annual budgetary allocation towards cycling projects ($)
Number of short-term capital projects completed (#)	Use of short-term bike parking spots (#)	Number of network wayfinding complaints (#)	Number of schools with School Travel Plans (#)	Number of bike facility surface pothole repairs (#)	Forecasted cycling investment from the Regional nine-year capital forecast ($)
Percentage of long-term capital projects complete (%)	Number of long-term bike parking spots (#) on Regional property	Opinion of different user groups (Likert scale)	Number of cycling tourists (#)		
Number of cyclists (#)	Use of long-term bike parking spots (#)		Number of Bike Friendly Businesses in Durham Region (#)		

Table 6-4 . Proposed Evaluation Indicators for the Durham Region Cycling Plan

Existing, revised and planned PCN routes

In addition to existing PCN routes, it's equally important to understand what is proposed for future implementation. As part of proposed PCN routes, this includes "planned" routes (both previously identified and new routes), as well as "revised" routes which include modifications to existing and previously planned facility types.

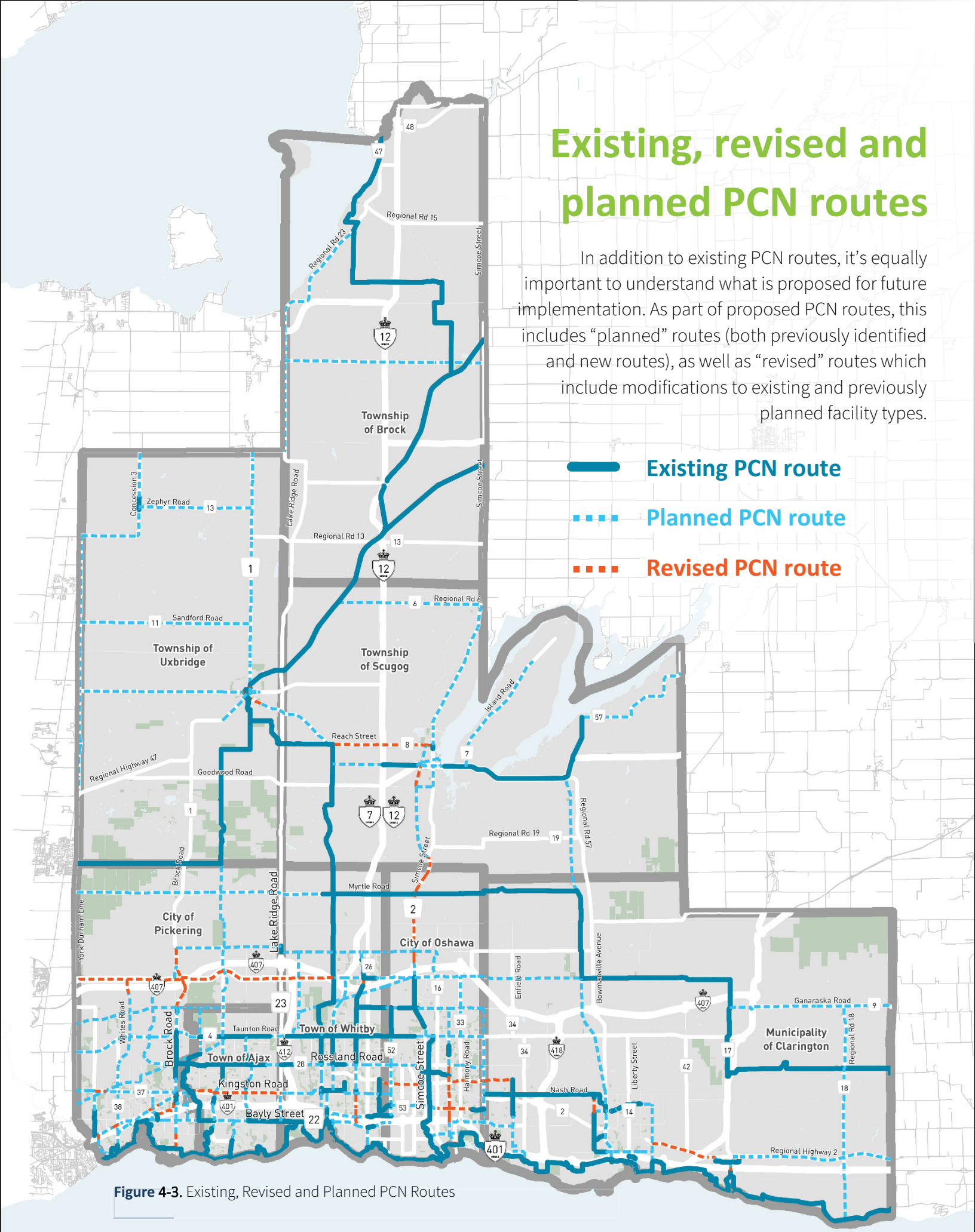


Figure 4-3. Existing, Revised and Planned PCN Routes

4.6 Designing the Network

The RCP is meant to provide high-level direction on proposed infrastructure improvements. Following the adoption of the RCP and as the Region moves forward with the implementation of proposed cycling routes, there is additional work that is required to be undertaken to confirm, the preferred cycling facility design.

As part of a typical municipal infrastructure project, the specific design of a cycling route and facility will need to be determined and validated through future assignments such as feasibility assessments, functional designs and detailed designs. At a master plan level, such as the RCP, it is most appropriate to follow Regional, provincial or nationally accepted guidelines and standards for cycling facility design to provide design guidance.

Following the completion of the 2012 RCP, two provincially significant design manuals were developed and are now considered the foremost set of guidelines for cycling facility design in Ontario. Considering two of the RCP goals are to "align with accepted design guidelines and standards" and "integrate new cycling trends and lessons learned", a comprehensive review of facility design guidance was undertaken relative to the contents of Ontario Traffic Manual Book 18 and MTO's Bikeways Design Manual.

In addition to providing a broad range of facility design treatments, these guidelines integrate considerations for comfort, safety and designing for all ages and abilities. They place more emphasis on designing for various contexts – urban, suburban and rural - leading to a reduced threshold or separated facilities and the need for higher order cycling facilities on higher order roadways such as Regional roads. In applying these guidelines and principles to the PCN review process, more contextually appropriate recommendations have been identified and recommended.

The information contained within the RCP is not meant to recommend or prescribe the ultimate design for all PCN routes. The Region will also refer to the provincially and nationally accepted guidelines and standards noted above as the primary reference for cycling facility design and decision making.

The RCP is not meant to provide a detailed overview of all design considerations and applications. **Table 4-4** has been developed which summarizes the relevant design consideration highlights from Ontario Traffic Manual (OTM) Book 18 based on the proposed facilities identified as part of the Region's PCN.

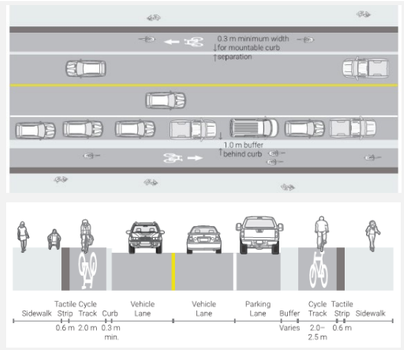
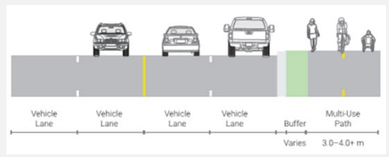
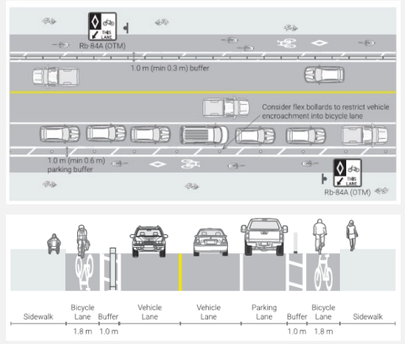
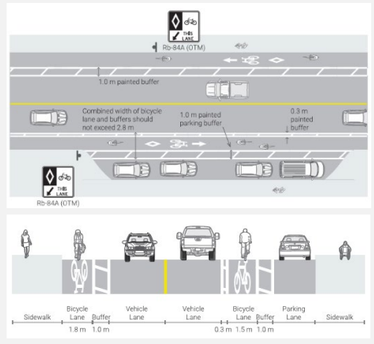
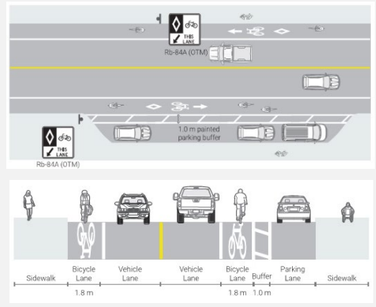
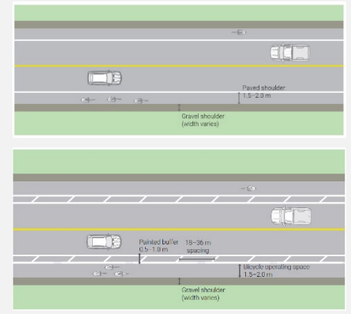
	Cycle tracks	In-boulevard multi-use pathways	Physically separated cycling lanes	Buffered cycling lanes	Conventional cycling lanes	Paved shoulders
OTM Book 18 Cross-section						
OTM Book 18	Section 4.3.3.	Section 4.3.4.	Section 4.3.2	Section 4.4.2	Section 4.4.1	Section 4.5.4
Application	Roadways with moderate to high motor vehicle speeds and volumes.	Roadways with moderate to high traffic volumes and speeds.	Roadways with moderate to high motor vehicle speeds and volumes.	Roadways with motor vehicle speeds of 40 to 50 km/h and moderate volumes of motor vehicle traffic.	Roadways with motor vehicle speeds of 50km/h or less and low-to-moderate volumes of traffic.	Typically found on rural roads but can implemented on urban / suburban roads e.g. urban shoulders.
Durham Classification	Arterial A and B	Arterial A, B and C	Arterial A and B	Arterial A, B and C	Arterial B and C	Arterial A and B
Geometry	**Desired:** 2.0 – 2.5m lane + 1.0 m buffer (up to 4.0 m two-way) **Minimum:** 1.5 m lane, 2.4m (two-way) (reduced width to avoid utilities poles or other infrastructure that may be costly to relocate)	**Desired:** 3.5 m width **Minimum:** 3.0 m (2.4 m may be suitable in constrained areas to avoid utilities poles or other infrastructure that may be costly to relocate)	**Desired:** 1.8 m lane + 1.0 m buffer (up to 2.5m for higher cyclist volumes) **Minimum:** 1.5 m lane + 0.3 m buffer (consider gaps in the separation treatment; and where parking lane is adjacent)	**Desired:** 1.8 m lane + 1.0 m buffer **Minimum:** May be reduced to 1.5 m width with 0.3 m buffer (either on travel or parking lane in constrained corridors)	**Desired:** 1.8 m lane + 1.0 m buffer (or 1.5 m if less space is available) **Minimum:** May be reduced to 1.2 m width in constrained corridors	**Paved shoulders** **Desired:** 1.5 – 2.0 m **Minimum:** 1.2 m width **Buffered paved shoulders** **Desired:** 1.5 – 2.0 m + 0.5 – 1.0 m buffer **Minimum:** 1.5 m + 0.5 m buffer
Level of Separation	**Physically separated bikeways** offer the highest degree of protection for people on bikes and are typically placed of multi-lane arterial roads that have a volume of motor vehicle traffic. In OTM Book 18, there are three types of physically separated bikeways, all three have been identified as part of the PCN.			Bike lanes provide a **designated space** for cyclists on a road but no physical separation from other road users. This includes conventional bikes lanes and those with some form of spatial separation.		**Shared facilities** do not provide a distinct operating space for but can offer other support such as traffic calming and wayfinding.

Table 4-4. PCN Facility Types Overview

There are critical points within the network that require additional design consideration to reduce the potential for conflict or to appropriately accommodate for cyclist' needs. The following is a summary of those locations and suggested design applications.

Barrier amenities are components of a network that minimize the restriction of major physical features, including intersecting infrastructure and natural constraints.

Transitional amenities components of a network which ease travel between different cycling facilities or intersections and help to improve user safety and comfort during any aspect of their bike ride.

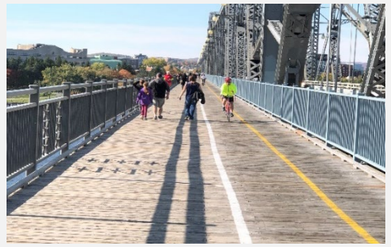
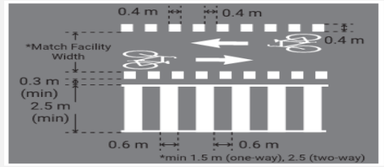
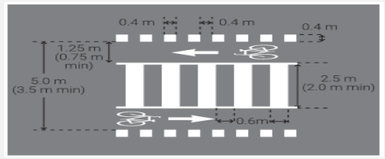
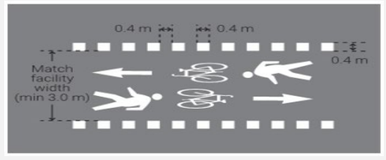
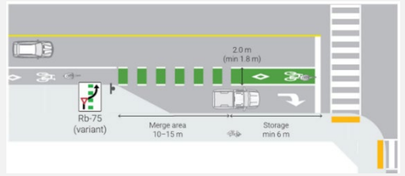
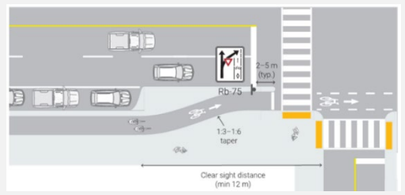
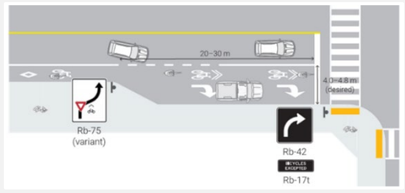
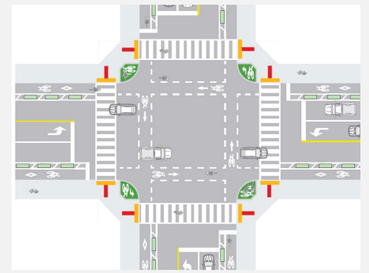
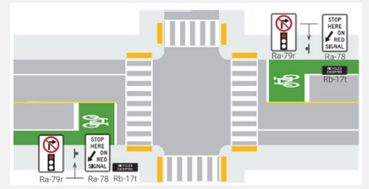
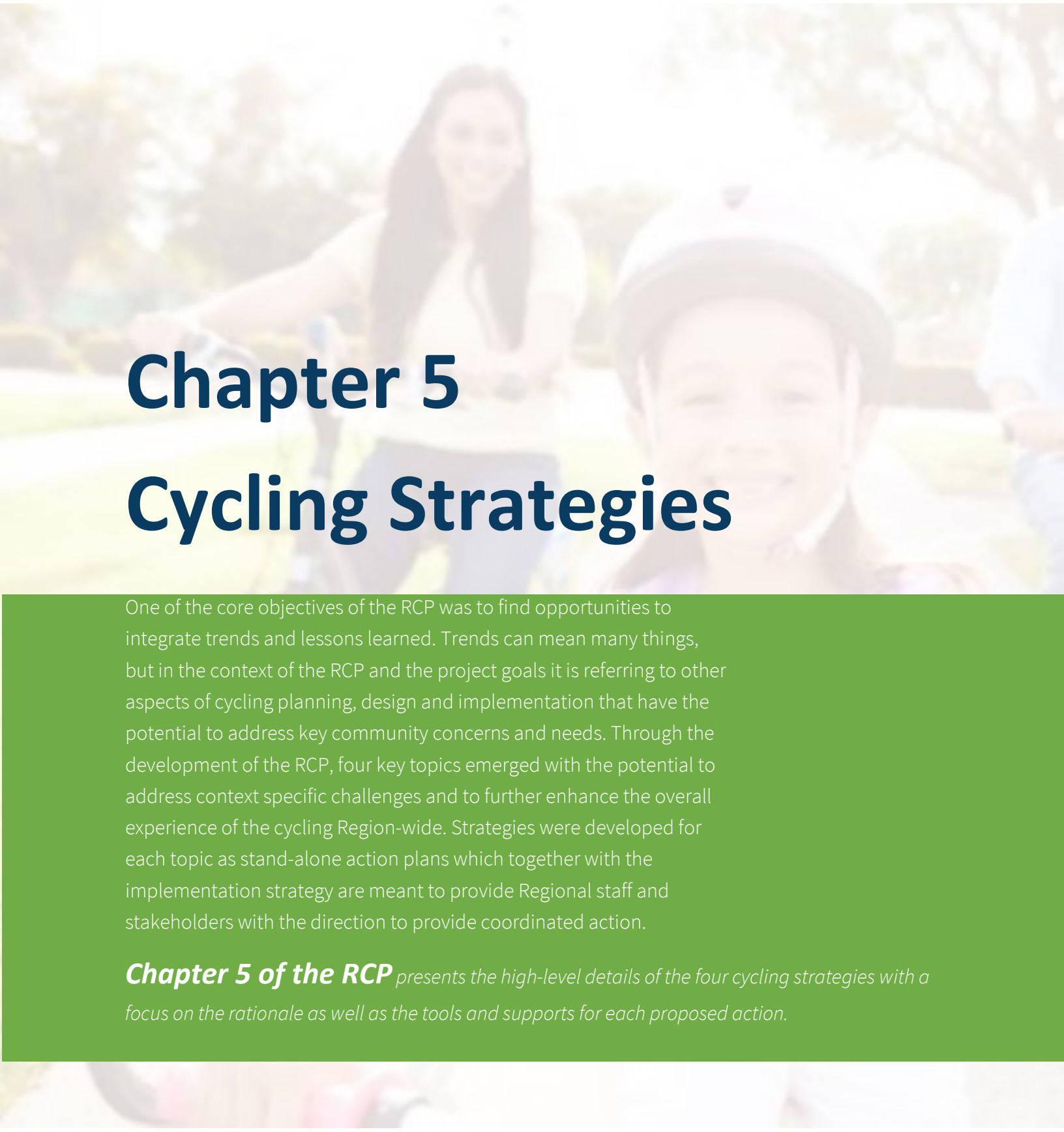
	Grade separated crossings	Rubber track guards	Bridges	Pavement markings	Intersection treatments	Bicycle left turn treatments
Description	  **Grade separated crossings** remove cyclists from potential conflict, by re-routing them onto new infrastructure. Structures should be designed in accordance with the MTO Structural Manual and Bridge Office Design Bulletins and Guidelines, and the Canadian Highway Bridge Design Code (CHBDC) (CAN/CSA-S6-06).	  **Rubber track guards** consist of a rubber surface placed between exposed rail tracks, along an at-grade crossing. They improve the friction between tires and exposed rail along at-grade railway crossings, making it more comfortable and safer for cyclists to cross. Guards are usually accompanied by advisory signs and pavement markings.	  **Bridges** are separated structures built to facilitate cyclist travel over barriers imposed by natural features to improve overall network connectivity. Bi-directional cyclist bridges should feature a width of 4-4.5 metres (3.0 metre minimum while shared cyclist and pedestrian bridge should feature a width of 4-5 metres (3.6 metres minimum).	 **Separated cross-ride:** separate space for people on bikes and pedestrians  **Combined cross-ride:** cyclists cross on either side of the crosswalk  **Mixed cross-ride:** cyclists and pedestrians cross in a shared space	 **Setback Crossing** (OTM Book 18 s. 6.3.2)  **Bike lanes** (OTM Book 18 s. 6.3.4)  **Adjacent Crossing** (OTM Book 18 s. 6.3.3)  **Mixing zones** (OTM Book 18 s. 6.3.5)	 **In-boulevard Two-Stage Queue Box**  **Bike box, Typical intersection**
Durham Region Application	Underpasses or overpasses of major highways such as the 401 or crossings of major infrastructure such as the railway	At grade crossing of railway tracks	Crossing of major natural or physical barriers that require a separated facility to accommodate cyclists	Treatments placed on top of the pavement to delineate space for cyclists and pedestrians to cross – either at mid-block or at the intersection	The location of crossings within both a shared and designated space at the intersection – dependent on the approaching facility type	Designated spaces for cyclists to wait to accommodate a left turn movement within traffic – dependent on the facility type on the intersecting road

Table 4-5 Design Considerations for Barriers and Transitions along the PCN



Chapter 5
Cycling Strategies

One of the core objectives of the RCP was to find opportunities to integrate trends and lessons learned. Trends can mean many things, but in the context of the RCP and the project goals it is referring to other aspects of cycling planning, design and implementation that have the potential to address key community concerns and needs. Through the development of the RCP, four key topics emerged with the potential to address context specific challenges and to further enhance the overall experience of the cycling Region-wide. Strategies were developed for each topic as stand-alone action plans which together with the implementation strategy are meant to provide Regional staff and stakeholders with the direction to provide coordinated action.

Chapter 5 of the RCP *presents the high-level details of the four cycling strategies with a focus on the rationale as well as the tools and supports for each proposed action.*

5.1 Identifying & Developing the Strategies

There are four cycling strategies specifically developed for the Region of Durham. While there are a considerable number of other cycling planning, design and implementation trends and considerations which could have been, discussed in the context of Durham Region, within the scope of the RCP, it was determined that four topics would be focussed on.

The topics were chosen based on their alignment with project objectives, community priorities and best practices. The selection of the four topics began as part of the preliminary stakeholder workshops to identify key emerging trends, tools and topics that should be addressed throughout the study process.

This provided the Region with a "long-list" of broad reaching topics which were determined to be candidates for inclusion. With this long-list, additional engagement with regional and municipal staff and stakeholders was undertaken to select the four preferred topics. Both the long-list as well as the preferred topics are presented to the right. Once the topics had been confirmed, a process to develop the strategy content and action plan was undertaken. An overview of the steps in the process is presented in **Figure 5-1**.

The implementation of the strategies will require additional consideration and investigation by Regional staff in partnership and collaboration with internal and external stakeholders to build upon and support the recommendations included within the RCP.

Facility Maintenance

Impacted by the network recommendations and requires coordinated approach

Internal & External Funding
*addressed in the Implementation Strategy

Safety & Vision Zero
*addressed in network and policy development

Monitoring & Evaluation
*addressed in the Implementation Strategy

Bike Share
*considered outside of the scope of the project

Complete Streets Design
*addressed in network and policy development

Health & Equity
*addressed in network and policy development

Micro-mobility & e-bikes
*policy still in development

Signage & Wayfinding

Impacted by the network recommendations and requires coordinated approach

Cycling Tourism
*part of wider regional strategies

Education & Programming

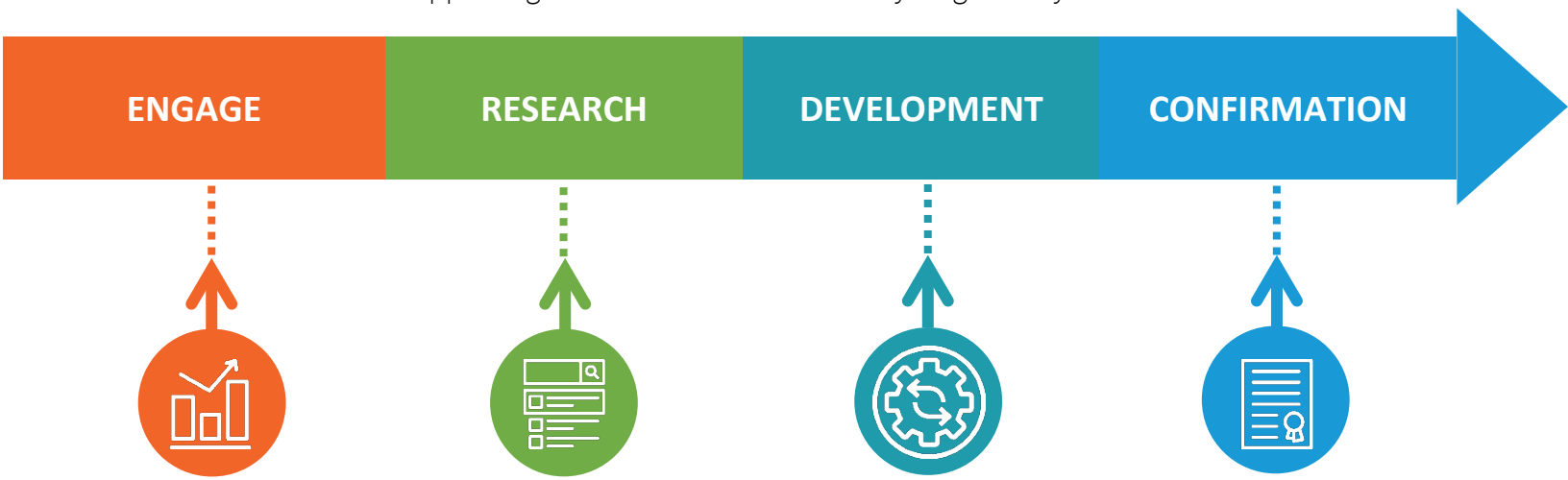
Provides greater understanding and encouragement for cycling

Bicycle Parking

Complements infrastructure improvements

Develop Durham Cycling Strategies

Develop four stand-alone strategies that provide the necessary research, guidelines and tools to support a greater shift towards a more cycling friendly culture.



Step 1.

+ The gathering of input to inform the identification of needs and preferences related to each cycling topics through an online public survey and stakeholder workshops

Step 2.

+ The review of current conditions at the Regional and area municipal level to work is currently being explored or undertaken
+ Research of relevant best practices, policies and guidelines

Step 3.

+ The identification of strategy specific actions and supporting tools to guide work associated with the specific cycling topic

Step 4.

+ The review and finalization of strategy content based on input from Regional staff and stakeholders

Figure 5-1. Strategy Development Process

As noted in Step 1, a considerable amount of engagement was undertaken regarding the cycling strategies. To inform the development of the strategy actions and supporting tools and as noted in Chapter 3.0 of the Mater Plan, a survey was prepared and promoted in the summer of 2020 to gather input specifically on the cycling strategies. The following is a summary of the input that was received which was used to inform the development of the action plans. The details of each of the strategies are presented in the following sections of Chapter 5.

1. » Bicycle parking.

11 questions 393 responses

36% somewhat or very dissatisfied with the availability of bike parking in Durham Region

51% are concerned about bike theft

52% think availability of safe, secure bike parking is important

High needs locations for bike parking include:

+ Shopping and business areas
+ Downtown / town centres
+ Parks and trails
+ Community facilities

2. » Signage and wayfinding.

5 questions 323 responses

66% think there is inconsistent wayfinding and signage throughout the Region

95% think the Region should work together with stakeholder to address signage

83% think there should be consistent branding for signage / wayfinding Region-wide

High needs locations where signage should be improved:

+ Trails and bike routes such as Waterfront Trail
+ Transit stations
+ Major destinations (town centres, downtown cores)
+ Connected cycling routes

3. » Education and programs.

9 questions 276 responses

98% own at least one bicycle

83% bike at least one weekly

Want to cycle for... recreational trips, errands and visiting friends / social

Suggested programs include:

+ Programs for children and seniors
+ Funding programs
+ Bike awareness and safety programs for both cycling and motorists
+ Cycling festivals and events

4. » Cycling facility maintenance.

10 questions 354 responses

72% would rather have a higher standard of maintenance than an approach that focuses on clearing routes

Respondents were more likely to... bike during the winter if cycling routes were maintained and cleared with the same level of priority as roadways.

Perception of current maintenance practices in Durham Region...

1	Vegetation management	Good
2	Sweeping / debris removal	Fair
3	Surface repair potholes	Fair / Poor
4	Snow clearance	Fair
5	Ice removal / prevention	Fair / Poor

5.2 Bicycle Parking Strategy

The bicycle parking strategy addresses the inherent need for cyclists to safely store their bikes for either short or long periods of time between different trips. The availability and quality of bicycle parking at destinations can have a considerable impact on an individual's willingness to cycle.

Durham Region and its partners have historically provided bicycle parking on public lands. Bike racks are also provided on all Durham Region Transit (DRT) and GO Transit buses, and in 2019 the Region of Durham implemented the post-and-ring initiative which supports the implementation of short-term bicycle parking at various locations. However, the approach to designing and locating bicycle in Durham Region has not been consistent. Improving the quality of bicycle parking can help address this important barrier to cycling

Guidelines and best practices for selecting, designing, locating and implementing bicycle parking that are considered appropriate for the Regional context include:

+ Association of Pedestrian & Bicycle Professionals (APBP) Bicycle Parking Guidelines
+ Ontario Traffic Manual Book 18 – Bicycle Parking Guidelines

Considering this:

The goal of Durham Region's Bicycle Parking Strategy is…

To provide residents and visitors with a range of ample accessible, conveniently located bicycle parking options in areas of need throughout Durham Region.

There are four actions that have been identified to achieve this vision. They are presented on the following page.

Action #1:

Develop and adopt a data-driven approach to determine where bicycle parking facilities are needed.

By making the best use of data collection and analysis tools, the Region and its partners can work to provide bicycle parking in the highest-value areas in the Region, expanding the visibility and availability of bicycle parking and enhancing the Region's attractiveness to those who ride bicycles. There are several tools that the Region could use to determine where bicycle parking will provide the highest level of service to users, as well as the processes that can be used to streamline the implementation process.

Tool #1. **Bike & Land Suitability Mapping**

Mapping which highlights spatial characteristics that appear to be correlated with relatively higher cycling use. This can include rates of car ownership, population density or proximity to cycling infrastructure, as informed either by census tract data or household transportation surveys. Another key spatial characteristic to examine are land use classifications, specifically, areas identified for intensification or development where additional bicycle parking will likely be needed.

Tool #2. **Bicycle Parking Inventory Management Tool**

A robust inventory of current bicycle parking supply to better understand existing conditions and inform future investments accordingly.

Tool #3. **Bike Shed Analysis**

Mapping which spatially depicts the coverage area of existing bike parking facilities and allows potential gaps in coverage to be identified.

Tool #4. **Household Transportation Survey**

Data collection method among local agencies and residents to better understanding the nature and needs of local cycling behaviour. Survey questions should inform where bicycle parking is prioritized and what types of units are procured to accommodate demand.

Action #2:

Develop updated Bicycle Parking Guidelines

A consistent set of guidelines which offer detailed guidance related to bicycle parking based on applicable best practices. Guidelines should be a resource that support not only the selection of appropriate bicycle parking types but also provide processes and practices that can be consistently applied Region-wide. The tools to support the development of bicycle parking design guidelines should reflect context specific considerations as well as uniform application.

Tool #1. **Formalize and clarify the decision-making process**

A 5-step framework to deliver bicycle parking recommendations in a manner that is efficient and aligns with the RCP's overarching vision and objectives.

Tool #2. **Bicycle Parking Design Criteria**

Detailed design criteria which ensure that all bicycle parking units bare a design that is both functional, cost-effective and contextually appropriate.

Tool #3. **Bicycle Parking Options**

Inventory of different unit types, designed for both long-term and short-term use.

Tool #4. **Bicycle parking Transit Integration**

High level planning guidance and site-specific design specifications which inform the installation of bicycle parking within transit facilities (i.e. mobility hubs and along rapid transit corridors.

Tool #5. **Bicycle parking selection guidance**

List of planning policy considerations to secure appropriate provisions of short-term and long-term bicycle parking at strategic locations across the Region.

Tool #6. **Bicycle parking policies**

Provisions within the land use policy regimes of the region and area municipalities that secure additional bicycle parking units from private and public developments.

Action #3:

Establish funding mechanisms for bicycle parking

No bicycle parking initiative can be implemented without the necessary level of financial support. During Phase 1, multiple stakeholders indicated a lack of awareness about effective bicycle parking designs, and the financial and human resources necessary to implement effective bicycle parking within their jurisdictions. Regional coordinating efforts could support area municipalities in the implementation of bicycle parking infrastructure. The following approach is recommended to proceed with the formalization of funding supports and structures around the planning, design and implementation of bicycle parking at the regional level:

+ Regional bicycle parking should be considered as a candidate project (see chapter 6 of the RCP report for details).
+ Potential cost saving opportunities should be reviewed and considered including but not limited to the potential bundling of nearby capital works and site redevelopments and streetscaping efforts, where enhancements to existing bicycle parking may be easily inserted.
+ Funding options and opportunities should be reviewed and confirmed on an annual basis as part of future annual business plans and budgets.

Opportunities for external partnership and funding opportunities should be explored. Common suggestions include available pools of funding provided by senior levels of government. The availability of these funding sources should not be assumed as static but rather continuously evolving. The Federal government has provided an increasing amount of financial support towards municipal projects, including new cycling facilities and amenities.

Next steps to facilitate the strategy…

In the future, Durham Region should consider creating a more robust Regional Bicycle Parking Implementation Plan that:

+ Builds upon existing Regional programs, as outlined in section 1.1.1 of the Strategy, and is based on an inventory of what has been implemented at the time the Plan is initiated.
+ Where appropriate, the Plan should incorporate best practices from leading municipalities:
    - Jurisdictional scan of relevant bicycle parking best practices (see Phase 1 report)
    - Findings from the Bicycle Parking Survey (Action #1)
    - Findings from the Bicycle Parking Neighbourhood Survey to document needs (Action #1)
    - Application and Context specific considerations (Action #2)
    - A Region-specific bicycle parking facility selection tool and design overview (Action #2)
    - Phased approach to recommended improvements (Developed as part of Action #3)
    - Costing overview and funding suggestions (Action #3)

Image 5-1. Bike Parking; Source: Ryerson.ca

5.3 Signage and Wayfinding Strategy

A signage and wayfinding system is made of signs, pavement markings and other tools that support cyclists by helping them understand how to use cycling facilities, their location in the network and how to navigate between destinations. Wayfinding systems can also play an important role marketing cycling networks and key destinations. Across Durham Region there are examples of cycling-related signage and wayfinding applications including:

+ Signage along the Waterfront Trail, Greenbelt Route;
+ Signs directed towards the Ajax GO mobility hub;
+ Existing signage schemes for area municipal trail systems; and
+ Municipal wayfinding strategies currently under development.

Some types of signage and wayfinding are determined by federal and provincial regulatory requirements, while other types can function as branded communication tools that educate and build awareness while promoting cycling and major community destinations. Either way, signage is best applied in a consistent manner that effectively calls attention to the information that is essential to understanding the appropriate use and function of the route or facility.

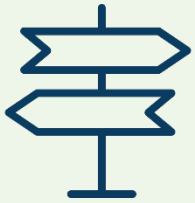
The following guidelines and best practices can help the Region of Durham develop a consistent and effective approach to selecting, designing, and implementing signage:

+ Regional Tourism Office #7 Wayfinding Signage Standards and Specifications (2017) and The County of Brant Wayfinding Strategy (2018)
+ Ontario Traffic Manual Book 18 (Chapter 9)

Considering this:

The goal of Durham Region's Signage and Wayfinding Strategy is…

To provide residents and visitors with clear and consistent information regarding cycling routes, destinations and facility use to encourage safe and comfortable use of the PCN.



There are two actions that have been identified to achieve this vision. They are presented on the following page.

Action #1:

Develop Region-wide wayfinding signage design guidelines.

Effective wayfinding is consistent, recognizable and reliable. Currently in Durham Region, individual area municipalities and provincial bodies like the Waterfront Regeneration Trust and the Greenbelt Route have their owng signage systems This has resulted in discrepancies in the quantity and quality of navigational support found across jurisdictional boundaries. Providing unified design guidelines can help create a coordinated wayfinding system that is intuitive to users and supports the development and marketing of a region-wide cycling network.

Tool #1. **Develop Selection & Implementation Process**

Framework developed collaboratively with key stakeholders, to ensure wayfinding and signage decisions align with the RCP's vision and its accompanying objectives.

Tool #2. **Adopt Core Design Principles**

Set of design principles based on best practices from comparable municipalities and provincially accepted guidelines, to coordinate signage under one cohesive region-wide navigation system.

Tool #3. **Prepare Technical Standards**

Signage specifications related to panel size, font, colours, icons and text as required under applicable provincial legislation and guidebooks.

Tool #4. **Adopt Destination Hierarchy**

Framework which hierarchizes the placement of different directional signage to provide a logical pathway of information that helps users travel to their destinations.

Tool #5. **Adopt Installation Approach**

Set of instructions on how and where signage should be placed relative to the locations they are directing cyclists towards and aspects of their surrounding environment.

Action #2:

Develop a cycling wayfinding plan for Durham Region.

An effective Durham Region Cycling Wayfinding Plan would provide the guidance necessary to ensure wayfinding is well-designed and implemented in a consistent, cohesive manner across Durham Region. While led by the Region, the plan would hinge on the cross-collaboration of multiple stakeholders. The plan should also be closely coordinated with input from Durham Tourism as part of a wider branding exercise for Durham Cycling and should explore virtual engagement and information sharing platforms supporting access beyond the boundaries of Durham Region.

Tool #1. **Update Regional Policies**

Update Regional policies, to reflect current provincial standards and guidelines. Notable changes that should be considered as part of this exercise include:

+ Consolidate all pre-existing cycling wayfinding signage direction and guidance into one stand-alone document;
+ Ensure all new and updated policies refer to the newly adopted cycling wayfinding plan, where applicable; and
+ Communicate the role and contents of the cycling wayfinding plan to all relevant stakeholders, including area municipalities, public servants and local developers.

Tool #2. **Bulk Purchase of Regulatory Signage**

Explore the possibility of purchasing some types of wayfinding signage in bulk.

Tool #3. **Enhance Cycling Branding**

Investigate opportunities to implement a wider branding exercise for Durham Cycling along PCN routes.

Next steps to facilitate the strategy…

It is recommended that the Region undertake the proposed actions in tandem, and that both actions begin in the near term. Wayfinding and signage can be a relatively quick win for the Region as the RCP is implemented, highlighting the Region's ongoing support for active transportation in a conspicuous, visible way. In the future, Durham Region should consider developing a more prescriptive Regional Signage and Wayfinding Plan. Should the Region wish to pursue the creation of such a document, it is suggested that:

- The RCP would showcase the proposed "Durham Region Cycling Brand" which ought to be adapted from existing local brand templates and confirmed through public input and review; and
- The RCP should build upon the Actions and Tools presented in this section, but should elaborate on branding, design and locations in a way that is beyond the scope of the RCP including:
- Jurisdictional Scan of relevant signage and wayfinding Best Practices (Phase 1 report content)
- Principles of the developed wayfinding and signage design guidelines (Action #1)
- Catalogue of templates for key signage types (Action #1)
- Placement guidelines related to the signage scheme's defined destination hierarch (Action #1)
- Adequate inventory of provisional regulatory signage as required under the Ontario Highway Traffic Act (Action #2)
- Phased approach to recommended improvements (to be developed)
- Costing overview and funding suggestions (to be developed)

5.4 Education and encouragement strategy.

To effectively leverage investments in infrastructure, the Region and its partners must focus on programming that supports culture change. Simply providing residents with information about the benefits of cycling alone is not enough to achieve behaviour change. A successful Education and Encouragement Strategy must work to change social norms and behaviours while also creating opportunities for residents to connect with active transportation on an individual level.

Across the Region there are currently programs in support of cycling education and encouragement including:

+ Annual cycling promotive events, such as Bike Month and Open Streets Whitby;
+ Participation in the Smart Commute and Active School Travel programs, regionally and locally;
+ Active local cycling community, featuring a variety of riding clubs and advocacy groups; and
+ Existing 'regional cycling brand' developed by Tourism Durham.

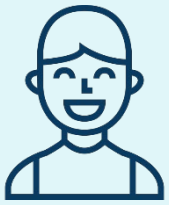
Programming should be unique to the community and audience; however, there are resources that are considered appropriate for the Regional context including:

+ Best Practices: Nudging the Commute: Using Behaviourally Informed Interventions to Promote Sustainable Transportation in US Cities (2020)
+ Changing Transportation Behaviours: A Social Marketing Planning Guide (2010)

Considering this:

The goal of Durham Region's Education and Encouragement Strategy is…

To provide a robust, effective suite of cycling education and encouragement programs to promote cycling as a safe, efficient and enjoyable mode of transportation to the public, key stakeholders and community decision-makers.



There are four actions that have been identified to achieve this vision. They are presented on the following page.

Action #1:

Develop a clear set of messages to effectively promote and educate cyclists about cycling in Durham Region.

Underlying the Education and Encouragement Cycling Strategy is an understanding that investments in "hard" cycling infrastructure must be paired with supportive programming that addresses underlying cultural barriers against cycling head on and illuminates its potential as a viable form of transportation. Emphasis is placed on changing individual actions and understandings as well as debunking existing social perception which may discourage cycling use.

Achieving the necessary level of engagement to change the cycling culture will require a comprehensive public engagement program that reaches a wide range of people using a variety of communication mediums. All messaging must remain clear and consistent when promoting the benefits of cycling and generating awareness of the network and how to safely cycle throughout the Region. The intent is to achieve this by pursuing the implementation of two core tools.

Tool #1. **Establish and Implement Communication Principles**

Best practices related to the design and implementation of effective communications including leveraging networks, ensuring sustainability of the message, expanding audiences and strengthening collaboration and connections within the geographic area.

Tool #2. **Incorporate Community Based Social Marketing (CBSM)**

Procedural framework to tailor cycling programming in accordance with progressive stages of behaviour change including selecting the preferred behaviour to promote, identifying barriers and benefits, developing strategies, piloting the strategy, implementation and evaluation.

Action #2:

Develop and implement education and encouragement initiatives targeted at the five types of cyclists.

The Education and Engagement Strategy positions Durham Region as the creator of promotional and educational materials, which are then distributed among its area municipal partners and other key stakeholders. The intent of the RCP is to develop a long-range strategy that addresses the needs and concerns of different types of cyclists who either currently cycle or could potentially explore cycling in the future. In Phase 1, five types of cyclists were highlighted and referenced when engaging the community and assessing existing conditions. Any materials or initiatives developed by the Region should be tailored to the five types of cyclists. Since the adoption of the 2012 Regional Cycling Plan, the Region of Durham has developed many existing tools. Materials and programs to help promote cycling in the Region include:

Tool #1. **Enhancement and Support of Smart Commute Durham**

A key administrator of the Region's transportation demand management (TDM) programs with a focus on attentive, everyday and vulnerable cyclists

Tool #2. **Development of Youth Cycling Guides**

A printed and digital resource designed to educate youth on safe cycling practices within the Region focusing on everday, recrational and vulnerable cyclists.

Tool #3. **Support of the Active Sustainable School Travel (ASST) Program**

Program designed to assess, evaluate and encourage active and sustainable travel to and from schools within Durham Region focusing on everday, recreational and vulnereable cyclists.

Tool #4. **Development of Cycling Videos**

Series of promotional videos developed by the Region which showcase cycling facilities within the Region and its overall appeal focusing on everday, sport, recretional, attentive and vulnerable cyclists.

Action #3:

The Region of Durham should establish a standardized approach to materials and delivery.

While many programs remain best delivered by local stakeholders and external groups, the Region plays a key role in guaranteeing their success. This includes developing and distributing unified materials which support a consistent standard of delivery and implementation Region-wide.

Tool #1. **Expanding Capacity**

Ensuring sufficient staffing resources to implement recommended programs. The Region should maintain between 1 and 2 full time staff specifically for the RCP.

Tool #2. **Strengthening DATC's mandate**

DATC's strengthened mandate should include advising on annual cycling route priortization and programming, cycling safety and awareness education and other public outreach and promotional event coordination with Durham Region staff.

Tool #3. **Building a Brand**

Establish a stronger 'regional cycling brand' in collaboration with key stakeholders to build awareness, credibility, reputation and customer satisfaction.

Tool #4. **Marketing**

Develop a marketing campaign to support the shift of pre-existing views on cycling by providing humanizing campaigns, wayfinding as a marketing tool and public advertising.

Tool #5. **Identify & Segment Audiences**

Focus groups for Women, Seniors, New Canadian, students and members of other affinity groups should be used to test and refine messaging.

Tool #6. **Monitoring & Reporting**

This involves tracking changes in attitudes and behaviour towards cycling after the implementation of different programs. Key metrics to consider as part of this tracking, including daily cycling trip totals; Ssurveyed attitudes and opinions; and personal testimonies from residents concerning changing perceptions about cycling.

Action #4:

Establish the Region as the program coordinating agent and champion.

Ideally, most education and encouragement programs in Durham Region will be delivered by local stakeholders with the support of the Region. However, to maintain strong connections and visibility within local communities, it is recommended that the Region initially assist in the delivery of at least one program in every municipality as the starting point from which they can establish themselves as a committed and strategic delivery agent. The two suggested examples listed below, reflect those which received regular praise during the RCP's public engagement, making them events that many new cyclists will likely attend.

Tool #1. **Facilitating Open Streets Events**

The Region has a significant role to play since the ideal location for most Open Streets Events are on prominent streets including Regional roads. Events should strive to provide adequate space for activities and movement and would highlight the opportunity to integrate cycling and other active modes into day to day activities.

Tool #2. **Coordinating Community Bike Tours**

The Region can support routine community bike tours that provide residents with the opportunity to engage in an enjoyable, social activity and learn how to navigate Durham Region by bicycle. Community bike tours provide a significant opportunity to highlight the various cycling and community locations and experiences that Durham Region has to offer.

Tool #3. **Establishing and Distributing Program Toolkit**

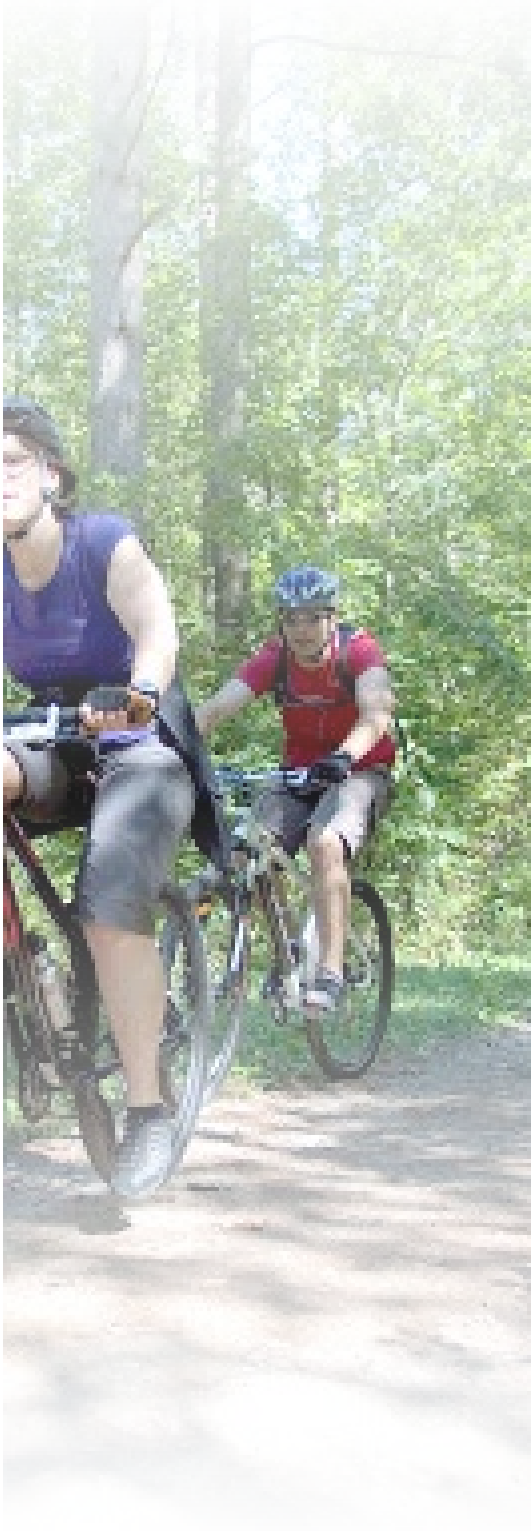
Additional programs the Region can support include: bike maintenance workshops, bike rodeos or active school travel intiatives. The intent is for the Region to work with stakeholders to establish a toolkit of "Do it Yourself" programming options which can be distributed and coordinated Region-wide.

Next steps to facilitate the strategy...

The actions outlined within the strategy are intended to be prioritized by the Region in the medium term; however, there are some more immediate next steps that should be prioritized to ensure early success and generate momentum. Key among those next steps is the hiring of two Active Transportation Coordinators for the Region of Durham (see Chapter 6). Without these positions, it is difficult to achieve the goals set out in this section.

For Durham Region to build a successful foundation, it will be necessary to build local capacity through targeted investment and support. The Region has the potential to continue to serve as a central resource for the development and delivery of new cycling programs and to show clear leadership as the culture of cycling continues to grow. For Durham Region to begin to generate momentum, it is recommended that the Region:

+ Periodically update the branding strategy for cycling communications and messaging. The process should be informed by Regional stakeholders, including area municipalities, and should focus on the input of the DATC.
+ Integrate Active Transportation projects into the Region's nine-year capital forecast and future business plans and budgets.
  With amplified interest in cycling and active transportation, there is an opportunity to generate new ideas and undertake small scale pilot projects that could be brought into the programming process to support the Region's ongoing efforts. The Region should identify programs that could potentially be scaled up in future years and commit to helping fund cycling-supportive programs.
+ Continue to support Active School Travel Programs on an annual basis. Consistent investments in Active School Travel is needed to ensure that school travel plans are utilized to help increase active and sustainable school travel.



5.5 Maintenance Strategy.

The appropriate maintenance of cycling facilities supports user safety and comfort and can help extend the lifespan of infrastructure. Seasonal maintenance can also unlock additional value from investments in cycling infrastructure by making it possible for cyclists to ride their bicycles throughout the year. The development of a robust, year-round maintenance strategy is therefore critical to the success of the PCN.

As with all other cycling strategies, facility maintenance lies within a complex web of overlapping jurisdictions. To ensure a coordinated approach that it is both cost-efficient and consistent, all maintenance activities must be predicated on a clear delegation of responsibilities and roles. Equally essential in developing the facility maintenance strategy are underlying cost considerations.

No formal maintenance strategies have been proposed in Durham Region for cycling facilities beyond the current MMS Requirements. However, the Active Transportation Master Plan of Oshawa and Transportation Master Plans of the Municipality of Clarington and Town of Whitby both underscore the importance in maintaining a well operated cycling network.

The most applicable and widely accepted guidelines and standards related to cycling facility maintenance in Ontario are as followed and are deemed to be the most appropriate in a Regional context:

+ O. Reg. 239/02 Minimum Maintenance Standards for Municipal Highways (MMMS)
+ Ontario Traffic Manual Book 18 – Cycling Facilities (Revised Draft 2021)

Considering this:

The goal of Durham Region's Maintenance Strategy is...

To work with area municipalities to communicate and provide a preferred approach to maintenance of the PCN, which encourages year-round cycling activity and is consistent with existing funding responsibilities.

There are six actions that have been identified to achieve this vision. They are presented on the following page.

Action #1:

Establish tools to effectively communicate maintenance activities to the public.

Beyond planning for the routine maintenance activities should be clearly communicated with members of the public to improve traffic safety and minimize disruption. This streamlined approach not only improves traffic safety but minimizes disruption, by giving road users notice of the temporary site conditions and allowing them to reroute their trip accordingly. With an increasing amount of information shared digitally, it is advised that Region leverage its website, social media accounts and other online communicative tools to broadcast these messages. Suggested communication actions are distinguished between winter and non-winter maintenance activities. This information as well as other relevant information to increase awareness and understanding should be provided as part of a dedicated webpage for cycling on the Region's website and maintained for relevance and to respond to questions that are provided by members of the public.

Action #2:

Strengthen the integration of Regional cycling infrastructure maintenance into the Region's Asset Management Planning process and update as needed.

A necessary precursor to developing a robust maintenance program is an effective asset management plan which proactively manages cycling facilities over the span of their forecasted life span. Asset management processes and practices serve two key goals, including an outline of all monitoring, inspection and maintenance activities required post facility implementation. Additionally, it also means that activities are appropriately scheduled so that all identified deficiencies are resolved promptly, and defined levels of service standards are upheld. This not only preserves the operations of a cycling network but also maximizes its longevity and mitigates against potential cost inefficiencies. Overall, asset management processes seek to preserve, rehabilitate and replace all relevant infrastructure, based on relevant level of services and the municipality's resource availability.

Action #3:

Work with area municipalities to update year-round maintenance standards, where possible, maintaining existing funding responsibilities.

Given Durham Region's governance structure as a two-tier municipality, maintenance responsibilities vary per facility type based on the defined jurisdictions of Regional and Area Municipalities. Hence, there is a greater need and coordinated emphasis amongst municipalities to ensure that residents have transportation options all-year round that are reliable, accessible and predictable. A cycling maintenance strategy looks at strategies to promote four-season cycling and the creation of a winter cycling network with planning predictable prioritized routes with a high level of road surface maintenance to ensure comfortable and safe bicycle mobility.

Tool #1. **O. Reg. 239/02 – Minimum Maintenance Standards for Municipal Highways (MMS)**

The standards set out minimum standards for road and highway maintenance. These standards are optional for municipalities, but many municipalities choose to adopt them as policy. The MMS was updated in 2018 to include updated definitions of bicycle facilities and lanes, standards and regulations for addressing snow accumulation on bicycle lanes and clearance during extreme weather events. The standards focus on end results and are not prescriptive about how the results are achieved, giving municipalities the freedom to adapt maintenance practices based on local conditions.

Tool #2. **Ontario Traffic Manual Book 18: Cycling Facilities**

Ontario Traffic Manual Book 18 (OTM Book 18) is another important technical resource for practitioners. OTM Book 18 recognizes the important role that maintenance plays in ensuring that cycling facilities are safe and comfortable and encourages a proactive maintenance approach that includes considering how to mitigate maintenance issues at the design stage.

Tool #3. **Industry leading facility estimates**

Estimated annual replacement rate based on North American supplier information.

Action #4:

Work with area municipalities to update year-round maintenance standards for cycling facilities that make-up the PCN and is consistent with existing funding responsibilities.

Many cyclists shift to motorized transportation modes in the winter not because of the climate but because of a lack of road surface maintenance. Maintaining cycling facilities can therefore help make cycling a safe, viable and accessible transportation option year-round.

Tool #1. **Develop a detailed set of winter maintenance standards**

Specific standards related to winter maintenance within bicycle lanes and multi-use pathways are prescribed within the Minimum Maintenance Standards for Municipal Highway (O. Reg 239/02).

Tool #2. **Develop a priority winter maintenance network for the PCN.**

Where the winter maintenance is preformed depends on various factors, including the structure of the cycling network, observed cycling trends, major trip generators and resources available for maintenance. Many municipalities develop a priority network of routes to be maintained over the winter. Another approach is to develop a tiered approach, with some routes provided a higher level of maintenance over standard maintenance of others.

Action #5:

Review maintenance practices and modify or purchase necessary equipment.

While most maintenance activities can be completed with equipment designed for general road works, some types of facilities, particularly barrier-separated facilities, may need specialized equipment. This includes multi-use pathways, cycle tracks and other physically separated facilities which feature physical delineators, or rights-of-ways which are too narrow to accommodate conventional plows, sweepers vehicles used for maintenance. Durham Region should leverage and coordinate its procurement services with area municipalities to acquire the equipment and fleet necessary to maintain the PCN. Additional outreach and engagement with key stakeholders – specifically area municipalities – should be undertaken to communicate and confirm the preferred level of maintenance and to identify opportunities for coordination along the PCN.

Next steps to facilitate the strategy…

In addition to the longer-term actions noted in the strategy, there are several more immediate measures the Region can take in fulfillment of similar objectives which include:

+ In coordination with the area municipalities, continue to conduct a complete inventory of existing maintenance equipment and vehicles to identify where additional procurements are required to undertake all proper maintenance of Durham Region's Primary Cycling Network (PCN).
+ Initiating discussions between the Region and area municipalities, in relation to existing funding responsibilities, to identify and action issues pertaining to the clearance and maintenance of cycling facilities which transcend municipal jurisdictions including routine maintenance and those specific to snow and ice prevention and clearance.
+ Commencing preliminary planning work to identify an appropriate winterized cycling network across the Region. This process should be based upon extensive consultation with residents, members of the local cycling community and in close partnership with the area municipalities and other relevant stakeholders.

Once these immediate measures have been exercised, the Region should then pursue the various actions recommended, based on their associated guidance and considerations provided. As with all other RCP strategies, these measures should be equally guided off the more universal practice and process related actions listed within Chapter 6.

Chapter 6

Coordination

The intent of the RCP is to provide Durham Region with a strategy that is linked to achievable, measurable and attainable tools and tactics that allow for long-term growth and implementation. Ensuring the Region has adequate resources to achieve and implement the recommendations identified in the RCP is essential to the RCP.

The recommendations identified in the RCP require the Region to enhance coordination between Regional staff, municipal staff and key stakeholders to help facilitate implementation of infrastructure and programming as well funding of the RCP.

Chapter 6 of the RCP *presents the potential funding opportunities and discusses related financial issues to help with implementation of the Regional Cycling Plan for Durham Region.*

6.1 RCP Financial Strategy

The inclusion of a detailed financial strategy is critical to delivering the proposed Primary Cycling Network (PCN) and actions identified within the four cycling strategies. There are three key components of an effective financial strategy:

+ Identifying the potential cost implications of the RCP recommendations – both infrastructure and strategy actions;
+ Understanding the existing funding approaches currently being used by Durham Region and best practices from comparable municipalities based on documented needs and interests; and
+ Identifying opportunities for potential internal funding sources as well as additional funding supports through external sources to support the implementation of actions.

An effective financial strategy provides high-level cost estimates and is not meant to provide detailed construction and coordination costs. It is not a commitment of capital monies, operating or otherwise, and is not meant to address all potential costs. The Financial Strategy is meant to provide the Region with the necessary information to inform inform multi-year operating and capital planning processes and create a flexible tool to adapt as they proceed with implementation.

When reviewing the contents and recommendations of the Durham RCP Financial Strategy it is important to note that:

RCP Costs are based on...

+ Unit prices gathered from recent tenders and projects of similar scope in Ontario.
+ The costs of installation of facilities and should not be used for functional design purposes.
+ A preliminary estimate of the potential implementation costs.
+ Assumption that facilities are implemented across typical conditions and topography.
+ Best practices from past initiatives completed by comparable municipalities.

Costs do not consider...

+ Costs incurred from property acquisitions, signal modifications, utility relocations, major roadside draining works, or site-specific projects such as bridges, railway crossings, retaining walls, and stairways, unless otherwise noted.
+ Voluntary efforts made by staff or supports “in kind” from community members and partners.

Table 6-1 provides a sample of the unit prices that were used to develop cost estimates for the PCN. **Appendix A** provides a more comprehensive list of unit prices for various elements of a cycling network that may also be considered when implementing the PCN. Additional confirmation will be required once the Region moves forward with implementation and when additional project context and details are available.

	Description	Price range per linear km	Comments/Assumptions
	Conventional bicycle lanes by adding markings and signs	$29,000	+ Price for both sides of the road + Includes signs, stencils and edge line
	Buffered bicycle lane with road diet	$70,000	+ Price for 1.5 m bike lanes with 1.0 m hatched buffer + Includes lane line removal (soda blasting) + Price varies on markings to be removed
	Signed bike route with paved shoulder in conjunction with existing road project	$100,000 to $200,000	+ 1.5 m paved shoulder on both sides of the road. + Assumes cycling project pays for additional granular base, asphalt and painted line + Price may vary depending on work needed to improve platform
	Signed bike route buffered paved shoulder in conjunction with existing road project	$200,000 to $250,000	+ 1.5 m paved shoulder + 0.5-1.0 m paved buffer on both sides of the road + Assumes cycling project pays for additional granular base, asphalt, painted edge lines and signs
	In-boulevard multi-path within road right-of-way	$275,000 to $426,000	+ 3.0 m wide hard surface pathway (asphalt) within road right of way (no utility relocations) + Price depends of scale / complexity of project and if existing sidewalk is being removed
	Uni-directional cycle tracks: raised and separated - in conjunction with road project	$250,000 to $500,000	+ Both sides of the road + Assumes cycle track will be implemented as part of road construction + Other components such as bike signals, bike boxes etc. are project specific and will impact unit price

Table 6-1. Summary of Unit Costing Assumptions for Cycling Infrastructure Improvements

How much will the network cost?

Based on the unit prices contained in **Appendix A,** capital cost estimates have been established for the PCN. Since municipal planning documents are typically updated every 5 to 10 years (consistent with the Municipal Planning Act), the focus of implementation for the PCN is the short-term horizon (within 10 years). When the RCP is next updated, it is recommended that Regional staff review and, where appropriate, bump up the phasing of routes that are currently identified for long term implementation in this plan. The estimated cost to implement the PCN in the short term is presented in **Table 6-2** as follows.

	Durham Region				Area Municipalities				MTO				Total	
	Previously Identified		New		Previously Identified		New		Previously Identified		New			
	$	KM	$	KM	$	KM	$	KM	$	KM	$	KM	$	KM
Short-term Capital Projects	$12,300,000	21	$3,600,000	10	$15,800,000	38	$2,800,000	7	$0	0	$0	0	$34,800,000	76
Short-term Infill Projects	$15,200,000	29	$6,400,000	25	$22,000,000	73	$3,000,000	14	$0	0	$0	0	$46,700,000	141
Total	**$27,800,000**	**50**	**$10,000,000**	**35**	**$37,800,000**	**111**	**$5,800,000**	**21**	**$0**	**0**	**$0**	**0**	**$81,400,000**	**217**

Table 6-2. Short Term Cost for the PCN

Notes:

1. Estimated prices in both tables include contingency (24%), design and approvals (13%) and HST (1.8%). 18.7 km of the PCN network is proposed within the short term (infill) through the DSBRT project at an approximate cost of $10 million, which may be eligible to receive funding from federal or provincial funding sources.
2. Estimated figures are rounded to the nearest 100,000 place value.

The total cost of short-term PCN facilities to the Region is $37.8 million. This includes 21.2 kilometres at a cost of $12.7 million for routes which were previously identified on the PCN and included as part of the Region's 2020 nine-year capital forecast, which are re-evaluated on an annual basis as part of the budget process. This also includes 10 kilometres of new PCN routes at a cost of $3.6 million which are identified in the Region's 2020 nine-year capital forecast but not previously identified to form part of the PCN i.e. these are new routes being proposed for the PCN as part of the RCP. Infill projects currently have no monies allocated within the 2020 nine-year capital forecast. However, 28.2 kilometres at a cost of $15.2 million were identified in previously adopted master plans and strategies. This means that $12.7 million of the total short term $37.8 million has been considered. Therefore, $25.1 million ($3.6 million for "new" short term capital + $15.2 million for "previously identified" short term infill + $6.4 million for "new" short term infill) should be considered within the short-term horizon (reflecting an addition of 63.6 kilometres). **Appendix A** contains additional costing details for the entire PCN including long term routes, route by each area municipality, and by each segment that forms part of the PCN.

Figure 6-1 illustrates the facility jurisdiction for all routes (existing and proposed) that form part of the PCN. In addition to facility jurisdiction, this figure illustrates PCN routes that are also located along the MTO Province-wide Cycling Network – information that can be used to help inform future discussions related to funding. These routes are in an excellent position to receive funding through Provincial and Federal funding programs / grants since they have already been identified in a provincial strategy and through consultation with Regional staff, area municipal staff, decision makers and stakeholders. Though the jurisdiction of these routes still falls on the respective road / land agency, Figure 6-1 uses different line types to illustrate routes on the MTO Province-wide Cycling Network (for example: lines identified as *MTO Province-wide Cycling Network: Durham Region* and *Durham Region* in Figure 6-1 are contained in the 'Durham Region' column within Table 6-12).

A financial strategy is not just about identifying how much investment is required to support the implementation of the recommended improvements. An effective financial strategy should look to past practices to determine where successes have been achieved and where there are opportunities for improvement. Historically, Durham Region has used two avenues of funding to support the implementation of cycling infrastructure and initiatives which leverage both internal and external funding options. An overview of the existing funding sources is provided in **Table 6-3**.

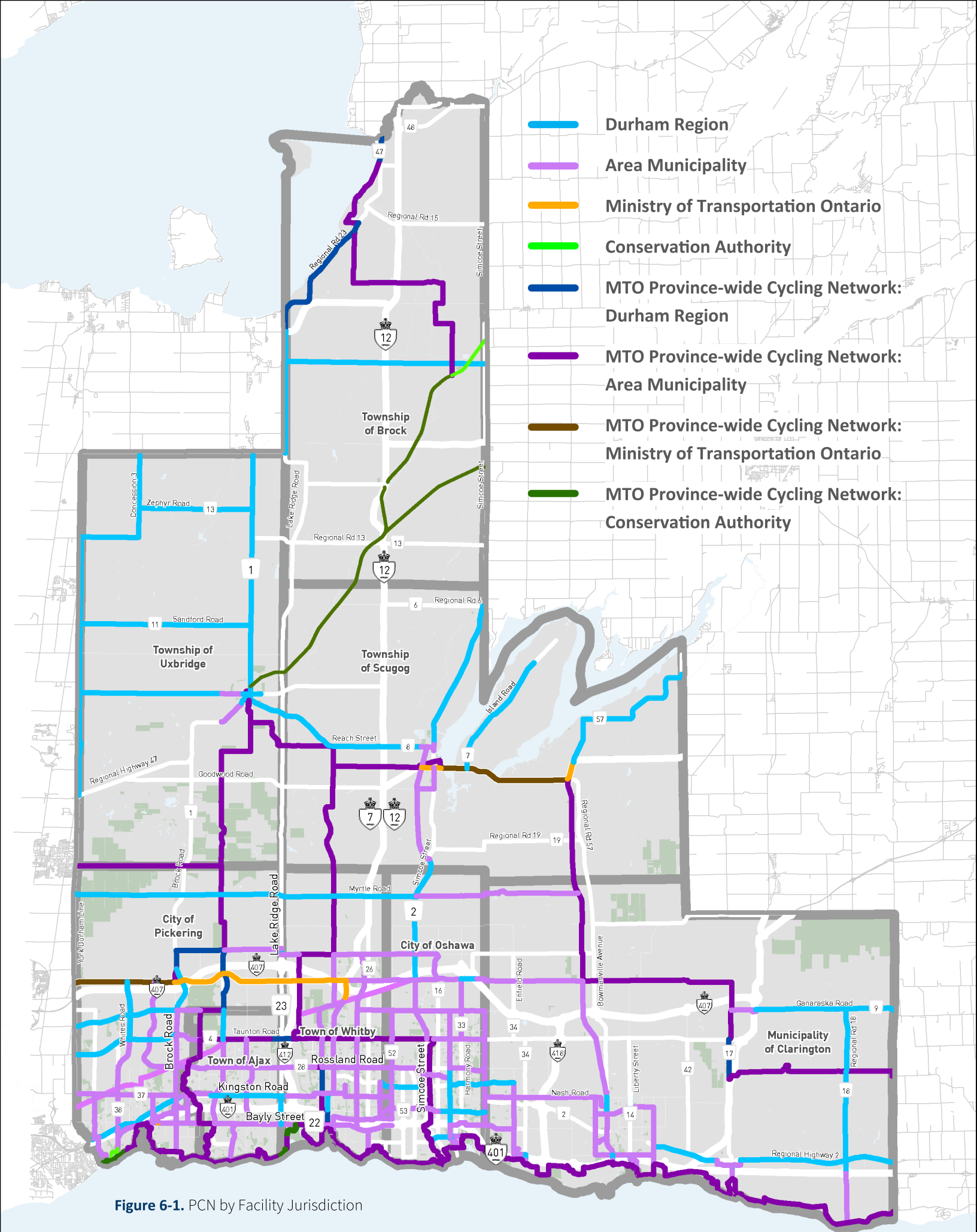


Figure 6-1. PCN by Facility Jurisdiction

Internal Funding...

Refer to funding mechanisms that are typically provided or coordinated by Durham Region in support of strategies priorities and projects.

Capital & Operating Budget

Funding through the Region's annual budget for large-scale capital projects as well as operations including:

+ **Public Works & Roads and Bridges Departments:** the design and implementation of on-road cycling routes and fleet and facility maintenance;
+ **Public Health Department:** Cycling related programming and community education through healthy living services; and
+ **Planning, Economic Development and Administration Departments:** Policy and program development and implementation.

Regional Cycling Planning Formula

Durham Region currently employs a cost sharing and funding formula applied in implementing the Primary Cycling Network.

Funding Projects in New Development Areas

Opportunities to facilitate implementation of cycling facilities which are triggered or achieved through the development process.

External Funding...

External funding sources typically include provincial or federal government grants and programs that can be multi-year or a one-time opportunity. The following are examples of sources of funding that have been used in the past to support the implementation of cycling infrastructure. The availability of these funding sources is subject to change and is considered to be continuously evolving.

Federal & Provincial Funding Mechanisms

+ The Provincial Ontario Municipal Commuter Cycling Program (OMCC)
+ Public Transit Infrastructure Fund (PTIF)
+ Investing in Canada Infrastructure Program (ICIP)
+ Canada 150 Community Infrastructure Program

Table 6-3 . Overview of Existing Funding Sources

Currently, cycling infrastructure and programming is financed using various sources. Based on existing practices, stakeholder interests and needs as well as best practices from comparable municipalities and stakeholder input, three funding options are being recommended for consideration by Durham Region. The proposed funding approach for Durham Region's RCP aims to leverage existing tools which have already demonstrated success and, to modify or adopt new tools where necessary to create an effective funding model that maximizes the Region's return on investments in cycling. The intent is not for the Region to pick "one approach" but to consider all three options for adoption and implementation to ensure that the actions contained within the RCP are appropriately supported from a monetary perspective.

Option #1.

Maintain Current Funding Mechanisms

The funding mechanisms currently employed by Durham Region to support cycling projects should be maintained to continue the implementation of the PCN and other RCP recommendations. This includes the annual operating and capital budget funding sources under applicable Regional departments.

The continued support through capital and operating budgets would ensure that the short-term capital project component of the PCN would continue to be achieved along with support for the maintenance of cycling infrastructure (see Chapter 5 under the Maintenance Cycling Strategy).

Implementing the RCP's recommendations will require additional funding. New funding mechanisms should be considered.

Option #2.

Adapt Current Funding Mechanisms

While all existing funding streams should be maintained, there are some that should be updated to reflect changing circumstances and emerging best practices.

Regional Cycling Plan Formula

The Region may look to expand the funding coverage beyond the cost of the multi-use pathway platform to a portion of the consulting design cost, in regards to infill / stand-alone MUP projects.

External Funding Sources

Durham Region should actively monitor announcements related to the Federal Government's development of an active transportation fund, to invest in new and expanded pathways, bike lanes, trails and pedestrian bridges. The Region should continue to monitor Federal and Provincial funding opportunities.

Development Charges

The renewal of the Regional Development Charge Study in 2022 / 2023 should consider additional cycling infrastructure within the list of costs eligible for DC funding, including on and off-road infrastructure.

Option #3.

Adopt New Funding Mechanisms

Additional measures have also been identified to supplement implementation of the RCP – specifically with the expansion of the PCN and the development of the four cycling strategies.

Funding of Active Transportation

Integrating active transportation into the nine-year capital forecast and business plans and budgets would help advance cycling infrastructure projects; including standalone projects, within the appropriate phasing of the plan. Funds could also be used towards Regional cycling education and safety infrastructure initiatives, as identified in the RCP through the cycling strategies to increase the effectiveness of cycling-supportive amenities and initiatives the Region can deliver.

6.2 Implementation Strategy

An implementation strategy is only considered effective if it can answer the day-to-day questions and support seamless coordination and collaboration between the lead agency and its partners. With a horizon of 10+ years, the Region will require a robust set of processes, practices and partnerships to support and facilitate the implementation of the plan.

Process...

refers to the steps involved in moving a project from conception to reality. Its guidance is not intended to be prescriptive but more of a setting of expectations of the work that is needed to proceed with next steps.

Partnerships...

refers to the coordination that will be needed to facilitate the implementation of proposed recommendations and actions between the Region, area municipal staff and other key stakeholders.

Practice...

refers to the day-to-day coordination that is required to facilitate the implementation of the RCP.

The Implementation Strategy has been designed to support the implementation of the RCP in the most efficient and effective manner. The content of the chapter builds upon provincially and municipally accepted guidelines and industry best practices which have been adapted and tailored to the unique needs of Durham Region including its upper-tier structure and the robust set of existing partnerships that are in place Region-wide.

Implementation Process

There are two types of actions – infrastructure actions associated with the PCN and programming / initiative actions which are associated with the cycling strategy. The implementation of the RCP actions should be facilitated and supported through the development and application of a set of clear and pragmatic procedures to ensure consistent coordination. While the implementation of each action should be uniquely tailored to the desired outcome, there are steps that can be universally applied which form two distinct implementation processes. These processes have been adopted from leading industry references and are verified upon the success of comparable precedence. They are presented below.

Process #1. Infrastructure & Policy

The intent of the infrastructure and policy implementation process is to provide a distinct set of steps that moves a project from the master planning phase through to detailed design, implementation and monitoring. The process identified for Durham Region is consistent with the updated processes and practices outlined in Ontario Traffic Manual Book 18 including the five-step network implementation process. This process has long been replicated by many municipalities across Ontario, as the gold standard in guiding infrastructure recommendations through to design and construction. The following is an overview of each of the steps presented in **Figure 6-2**, Additional details on the implementation process are provided in OTM Book 18.

Phase 1. Strategic Planning

+ Project is selected based on alignment with network and priorities outlined within master plan.
+ Project is informed by a locally adaptive approach guided by a statement of community values.
+ Project is coordinated with other major and minor capital projects to minimize redundant expenses.

Phase 2. Feasibility Assessment & Functional Design

+ A complete understanding of the local community's existing conditions, both physical and cultural.
+ Project location is visited and experienced from the perspective of cyclist.
+ A public consultation strategy is developed to acquire a comprehensive public understanding.
+ A feasibility study is undertaken.

Phase 3. Design- Project's detailed design based on three stages of percentage completion:

30% Detailed Design

+ Builds upon the pre-functional design, project illustrated at a higher-level plan view.
+ Defining details: parking, travel lanes, areas of constraint and cross-sectional designs.

60% Detailed Design

+ Concept is refined, and construction activities are refined.
+ Defining details: Curb radii, traffic signal layouts, landscaping plans and signage layouts.

90%/100% Detailed Design

+ Draft 100% submission with all details necessary to construct.
+ Defining details: item specifications, quantities, cost estimates, a complete drawing package, all necessary permits, licenses and supportive plans and post construction monitoring program.

Phase 4. Construction

+ Project is tendered out and implemented.
+ Construction related activities are tailored to the conditions of the project site.
+ Contingency plans are devised to mitigate potential schedule cost overruns and delays.
+ Construction activities are routinely monitored to ensure compliance with project guidelines.

Phase 5. Post-Completion

+ Monitoring and evaluation of through a select group of indicators.
+ Documentation of any changes that occur in travel behaviour and demand.

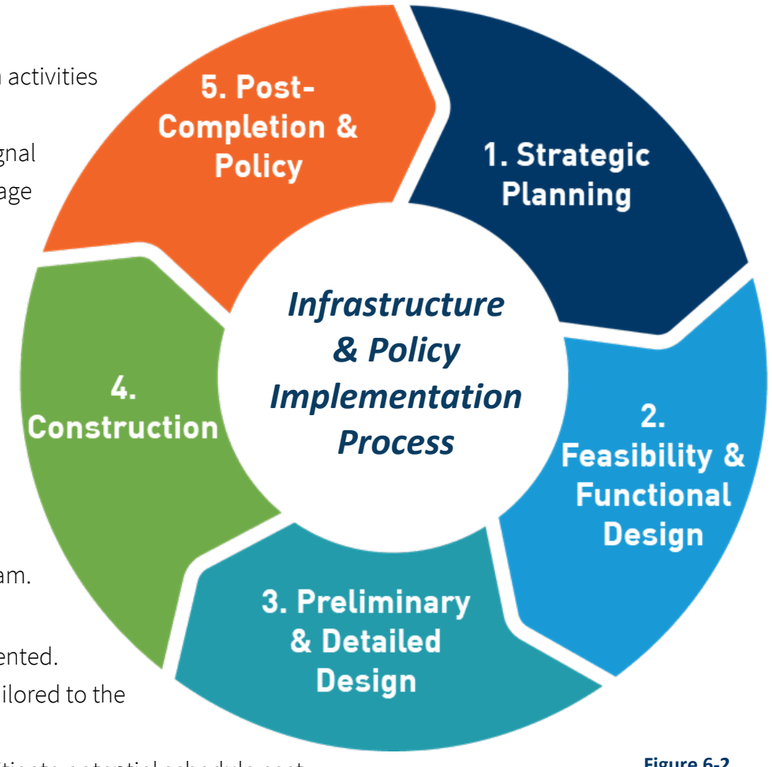


Figure 6-2. Infrastructure & Policy Recommended Implementation Process

Process #2. Programming & Education

Actions outlined in Chapter 5 of the RCP have been developed with the intent of fulfilling the Region's mandate to increase the viability of cycling. Increasing the viability of cycling is about providing the appropriate routes and facilities as well as implementing programs and supportive communication and outreach tactics that aim to influence and adapt the behaviour of regional residents and visitors.

The influencing of behaviour through programming is driven by a widely accepted approach of Community Based Social Marketing (CBSM). CBSM is a process by which the appropriate actions are determined with the purpose of tailoring them to the needs of the intended audiences and the intended outcomes related to a shift in their behaviour. CBSM is recognized as a proven best practice in maximizing the degree that an initiative is received by a target audience.

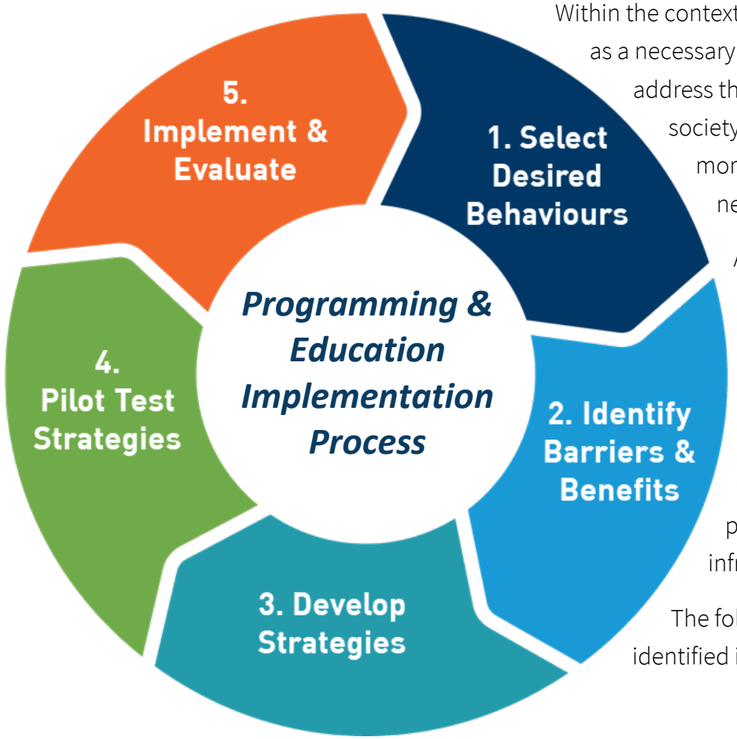


Figure 6-3. Programming and Education Implementation Process

Within the context of Durham's RCP, CBSM has been identified as a necessary approach and process which is meant to address the expected car-centric sentiments of our society and support the Region in the creation of a more multi-modal and sustainable transportation network through cycling initiatives.

Although most applicable to actions listed as part of the Education and Encouragement Strategy, the framework can equally be used to improve the delivery of programs listed under other cycling strategies and considered for future outreach and communication associated with those programs in addition to policy updates and infrastructure improvements.

The following is a detailed description of the steps identified in **Figure 6-3**.

Step 1. Select Behaviours to Promote

Identifying the change or shift that the Region wants to see made in terms of a specific cycling behaviour. This envisioned shift should be articulated in close consultation with relevant stakeholders, including the DATC, applicable regional departments and area municipalities.

Step 2. Identify Barriers & Benefits

Identify and communicate / address the potential barriers that could prevent the shift in behaviour as well as the benefits that could be realized by the community through engagement. These considerations can be revealed based on the outcomes of past engagement activities as well as other related responses from the community.

Step 3. Develop Strategies

Identify specific strategies that address and leverage social science principles as well as context specific considerations. Beyond tailoring the context of Durham Region, attributes of your target audience, including their location, communication preferences and outreach methods should also be considered in developing an effective approach.

Step 4. Pilot Test Strategies

Identify a specific area within the Region where the strategy or program can be tested based on the target audience. The scale of this test area can vary depending on the availability of funds and should be prioritized in areas where public support has been expressed.

Step 5. Implement & Evaluate More Broadly

Implement the strategy and provide opportunities for feedback and learning. Document lessons learned and successes. While kept as an indicator of their success, results of the post implementation monitoring scheme should also inform subsequent improvements and future expansions elsewhere.

Before embarking on the program and education process, it is important to note that human behaviour change is considered extremely complex. The CBSM approach identifies a sequence of behavioural progressions, which actions should be uniquely tailored towards to achieve a collective cultural change in favour of cycling. These behaviour progressions are inherent among all target audiences and should be considered when identifying the appropriate format and expected level of engagement, that a cycling program should be designed around two key considerations, the audience that is intended to be engaged and the objectives or the intended outcomes.

Implementation Partnerships

The successful identification, development and delivery of the actions presented within the RCP is reliant on strong, active partnerships with the many stakeholders with ties to cycling in Durham Region. Though the RCP will be administered by Regional staff, its success relies on the collective efforts and support of the community at large.

Stakeholders can help shape the appropriate scale and scope of measures that should be undertaken and provide knowledge, resources, involvement and information that is crucial to their successful delivery.

Failing to activate this potential through the engagement of coordinated and collaborative partnerships, risks both the financial viability of these actions as well as the punctuality of the RCP's implementation timeline.

The intent is to provide some direction and clarification around where and how Regional partners are meant to be engaged. A summary of key stakeholders is presented in **Figure 6-4**.

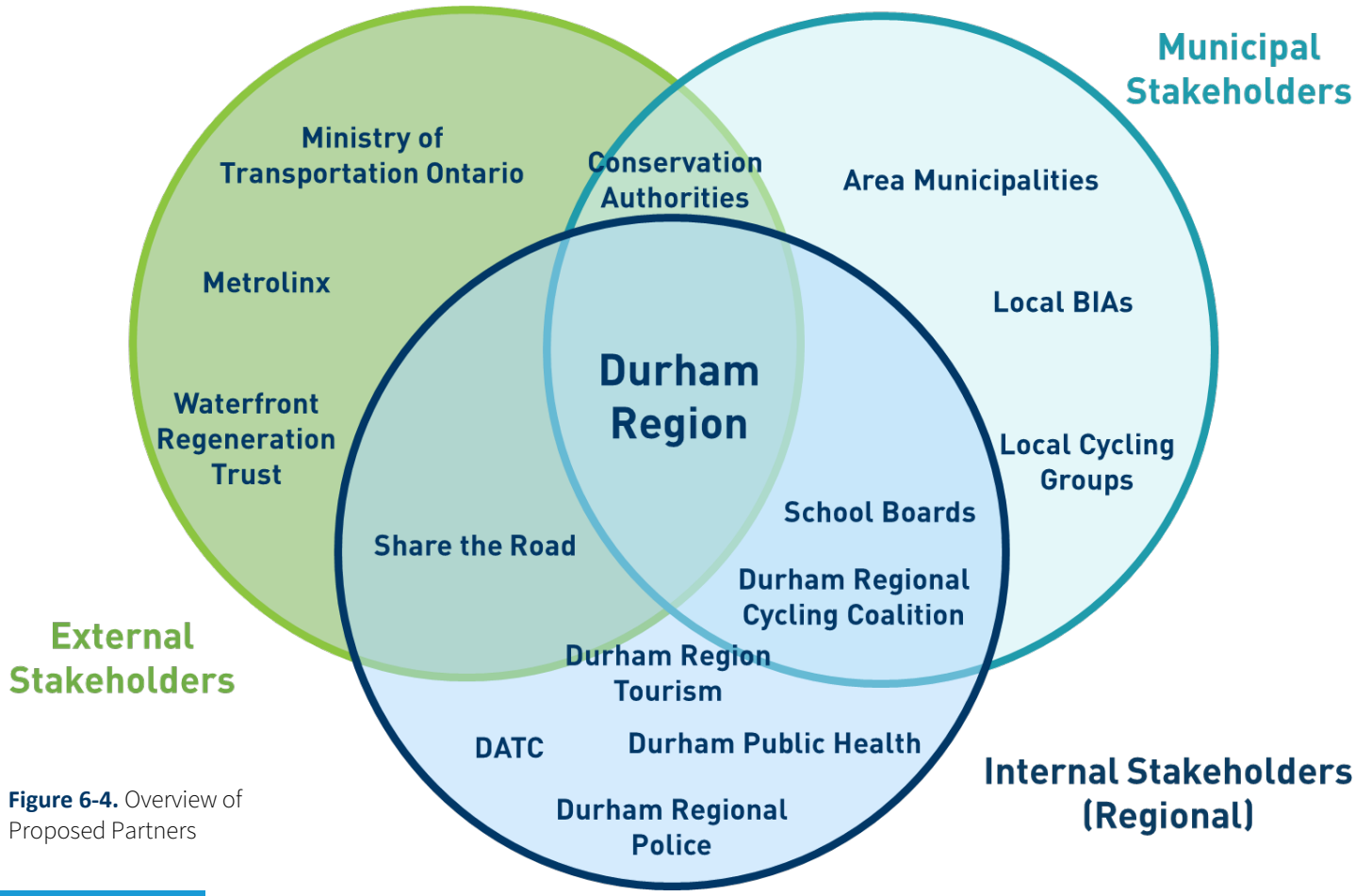


Figure 6-4. Overview of Proposed Partners

Implementation Practice

Practice refers to how staff undertake the day-to -day coordination, management and implementation of the RCP. Outlining a universal set of practices to guide the implementation of all RCP actions guarantees greater consistency and predictability in their outcomes. The intent of a clear implementation practice is to provide tools and strategies that are considered useable and adaptable no matter the level of technical ability and understanding. To support the implementation of the RCP, three "practice" related actions have been identified which are described in detail below.

Practice #1. Roles & Responsibilities

Implementing all actions and recommendations recommended in the RCP must be guided by a pragmatic and comprehensive organizational structure where roles are clearly identified. This structure should not only be clear and efficient but tailored to the individual capacities and competencies of each involved. While not prescriptive, the structure offers a suggested governance structure to effectively administer the development and implementation of all RCP recommendations and actions. This framework is adapted from the Region's current organization structure, while also featuring the inclusion a new separate Regional Active Transportation (AT) programs coordinator(s). The structure is illustrated in **Figure 6-5**, and a more detailed overview of the proposed roles and responsibilities is provided following.

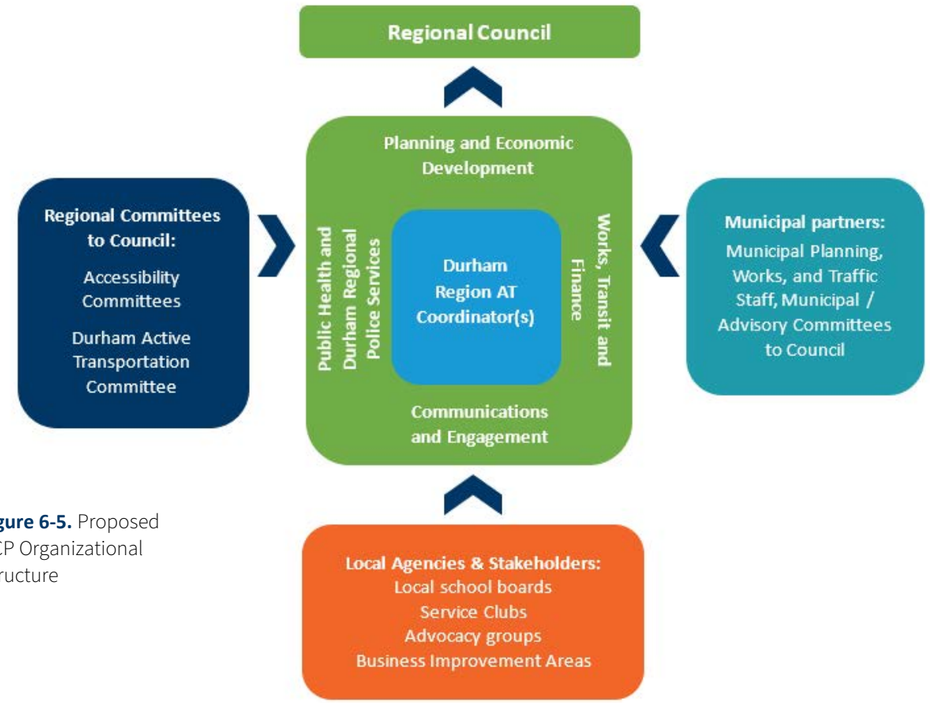


Figure 6-5. Proposed RCP Organizational Structure

Proposed RCP roles and responsibilities...

Regional

+ Regional Council: Responsible for approving all cycling related decisions presented by staff, including the RCP itself.
+ Public Works: Administers the design, construction, maintenance and post-implementation review data collection, involved with new cycling infrastructure on Regional roads.
+ Transit Agencies (Metrolinx & DRT): Considers the role regional transit services play in supporting/feeding into cycling trips. Responsible for approving cycling initiatives found near or on transit sites or those which directly support multi-modal travel.
+ Public Health: Advocate for cycling recommendations based on their potential benefits to broader public health
+ Planning Division: Formulates policy, develops frameworks for land use and transportation (e.g. AT facilities), and manages AT-related programming and initiatives.
+ Corporate Communications Office: Assist in the development and distribution of promotional materials for cycling initiatives and provide support for evaluation and monitoring efforts, such as resident surveys.
+ Finance: Assists in the development of capital plans as well as exploring funding opportunities.

Area Municipal

+ Municipal Planning Divisions: Advances localized land use and policy decisions with relevancy to cycling.
+ Municipal Traffic Staff: Manages the traffic operations of local roads, including with respect to cyclist movement.
+ Municipal Public Works Departments: Administers the planning, construction, maintenance and post-implementation review, involved with new cycling infrastructure on local roads.

Committees

+ Durham Active Transportation Committee (DATC): Representatives from each of the eight area municipalities who have an interest in active transportation and which advocates and informs projects to Regional staff and Council in their decision making.
+ Durham Accessibility Advisory Committee: Public body which advises the Region on how to make Regional programs more accessible to those with disabilities.

What is an AT program coordinator?

As noted above, a critical component of RCP coordination is the development and implementation of a dedicated AT coordinator role. To ensure an adequate provision of human resource and attention is dedicated to RCP actions, the Region is advised to hire or identify potential reassignment of existing staff for one or two designated AT program coordinators. These can be either full or part time positions and should directly support the implementation of the RCP with a specific focus on coordinating the day to day implementation of the RCP. While hired as Regional staff, the role should also provide support and direction to their counterparts within the various area municipal governments. Having the Region as the key coordinator on cycling matters would also allow different stakeholders to relate to each other, fostering a more collaborative cycling culture. The assigned duties and expectations of this position should not be static but should adapt to the changing needs and organization structures of all stakeholders they work with. The AT Program Coordinator(s) would fulfill the roles of a coordinator, administrative assistant and program delivery agent, by completing the following tasks:

+ Liaison between the various stakeholders involved in administering different cycling initiatives. Specific tasks can include but are not limited to assisting with scheduling and obtaining the necessary permits and clearances from relevant departments to deliver scheduled programs;
+ Provide input on yearly programming and whether funding and could support programs delivered by supporting agencies / stakeholders;
+ Offer direct support to both area municipal and Regional staff involved in the identification, development and planning of cycling initiatives. This can include efforts that prepare for the delivery of programs, arrange necessary financial or human assistance to run workshops and activities or, promotional activities;
+ Identify potential funding sources and assisting with the preparation of grant proposals on the Region's behalf;
+ Assist in the more immediate, day-to-day planning and implementation of all cycling initiatives. This includes securing a location / venue, obtaining funds to run programs and ensuring program remain on time and within budget; and
+ Ensure all efforts uphold the RCP's vision and guiding objectives.

Practice #2. Implementation Tools

In addition to a robust procedural framework, a cycling project can also be enabled using a variety of supportive tools including devices and methods that improve the effectiveness and efficiency of network components and programs. Depending on their cost and degree of sophistication, certain tools may need to be selectively owned and developed by only certain RCP stakeholders. This constraint underscores the importance of establishing and maintaining strong active relationships with partners, to ensure the necessary sharing of these cost prohibitive resources. Although it is important to leverage the unique capacities of resources of all stakeholders, the Region should maintain a key role in orchestrating this coordination and should, where possible, adopt supportive tools to do so. The following are two such tools that have been developed through the RCP process and are recommended to support coordination, management and implementation of the RCP actions.

GIS Database

One effective and relatively cost-efficient implementation tool is a GIS database of up-to-date information pertaining to the RCP's PCN. This database should include proposed routes, facility types and phasing as well as existing facilities. GIS databases provide a useful way to inventory features of the PCN, and help to visualize them, both independently and overlapped with other relevant information. Using a GIS program, for instance, can allow the Region to map different network segments based on their implementation horizon. This information, overlaid with the location of other scheduled road works projects, can identify opportunities to coordinate related construction activities and save costs.

Excel Database

Another suggested implementation tool are Excel data-tables, to disseminate information contained in a GIS database, among other datasets related to implementation. Excel data-tables can either be a substitute or compliment of a GIS database, to record, visualize or broadly share information pertaining to the PCN's implementation. As the GIS database is managed and updated, the Excel spreadsheet should be updated in tandem. Due to its flexible formatting, the Excel database can be used to store additional details descriptive of proposed routes, including costing, utility relocates and road dimensions. This makes the tool versatile in guiding annual budgeting, maintenance schedules and other activities related to project implementation.

Practice #3. Monitoring Approach

To maximize the RCP's efficacy, all actions and strategies should be routinely and comprehensively evaluated – consistent with Step 5 in the proposed infrastructure and policy implementation process. The implementation of a monitoring approach is essential to the overall success of the RCP. Listed below in **Table 6-4** are some proposed indicators that could be used to monitor progress of the RCP. Additional indicators will be identified through the development of the Bicycle Parking Guidelines and Signage and Wayfinding Strategy, and through the integration of cycling maintenance into the Region's asset management plan. Like all other RCP recommendations, they should be modified based off understandings of reporting capabilities and priorities, as determined by the Region.

PCN	Bicycle Parking	Signage & Wayfinding	Encouragement & Education	Facility Maintenance	Financing
Percentage of short-term infill projects completed (%)	Number of short-term bike parking spots (#) on Regional property	Installation of signage features (#)	Number of participants in Regional AT events (#)	Km of bike facilities with winter maintenance (#)	Annual budgetary allocation towards cycling projects ($)
Number of short-term capital projects completed (#)	Use of short-term bike parking spots (#)	Number of network wayfinding complaints (#)	Number of schools with School Travel Plans (#)	Number of bike facility surface pothole repairs (#)	Forecasted cycling investment from the Regional nine-year capital forecast ($)
Percentage of long-term capital projects complete (%)	Number of long-term bike parking spots (#) on Regional property	Opinion of different user groups (Likert scale)	Number of cycling tourists (#)		
Number of cyclists (#)	Use of long-term bike parking spots (#)		Number of Bike Friendly Businesses in Durham Region (#)		

Table 6-4 . Proposed Evaluation Indicators for the Durham Region Cycling Plan

Appendix A:
Network Management Tool

Appendix A - Network Management Tool
Durham Regional Cycling Plan, 2021: Table 1 - Unit Price Schedule

This table provides an overview of the estimated unit costs for active transportation and cycling facilities, structures and crossings and other elements of an active transportation / cycling network. All unit prices exclude tax, contingency, design and approvals costs.

ITEM	DESCRIPTION	UNIT	UNIT PRICE RANGE	CALCULATION	COMMENTS/ASSUMPTIONS
1.1	Signed Bike Route in Urban Area	linear KM	$1,200	$1,200	Price for both sides of the road, assumes one sign a minimum of every 500 metres in the direction of travel. Price assumes that signs will be mounted on an existing post. Price includes: - $300 per sign x 4 signs (2 signs on each side of the road)
1.2	Signed Bike Route in Rural Area	linear KM	$1,000	$1,000	Price for both sides of the road, assumes one sign a minimum of every 2 kilometres in the direction of travel. Price assumes that signs will be mounted on a new post. Price includes: - $500 per sign x 2 signs (1 sign on either side of the road)
1.3	Signed Bike Route with Sharrow Lane Markings *Intended to supplement a signed bike route in specific locations. Not intended to be a stand-alone facility type.*	linear KM	$11,600	$11,600	Price for both sides of the road, includes route signs every 500 metres and sharrow stencils every 75 metres as per OTM Book 18 guidelines. Price includes: - $300 per sign x 4 signs (2 signs on each side of the road) - $400 per stencil marking x 26 (13 stencils on each side of the road)
1.4	Signed Route with Edgeline	linear KM	$12,200	$12,200	Price for both sides of the road, includes signs and painted edgeline (100mm solid white line). Price includes: - $300 per sign x 4 signs (2 signs on each side of the road) - $5.5 per metre for painted solid white line
1.5	Signed Bike Route with Paved Shoulder in conjunction with existing road reconstruction / resurfacing	linear KM	$100,000 to $200,000	$150,000	1.5 metre paved shoulder on both sides of the road. Assumes cycling project pays for additional granular base, asphalt and painted line. Price may vary from $100,000 to $200,000 depending on work needed to improve platform. Price includes: - $300 per sign x 4 signs (2 signs on each side of the road) - $5.5 per metre for painted solid white line (both sides of the road) Price may be higher if road platform needs to be widened.
1.6	Signed Bike Route with Buffered Paved Shoulder in conjunction with existing road reconstruction / resurfacing project	linear KM	$200,000 to $250,000	$225,000	1.5 metre paved shoulder + 0.5-1.0 metre paved buffer on both sides of the road. Assumes cycling project pays for additional granular base, asphalt, painted edge lines and signs (buffer zone framed by white edgelines). Price may vary from $200,000 to $250,000. Price includes: - $300 per sign x 4 signs (2 signs on each side of the road) - $5.5 per metre for painted solid white line (both sides of the road)
1.10	Conventional 1.5m-1.8m Bicycle Lanes by Adding Bike Lane Markings and Signs	linear KM	$29,000	$29,000	Price for both sides of the road, includes signs, stencils and edge line. The price assumes: - $11,000 for painted lane line ($5.5 per metre multiply 2 for both sides of the road) - $10,400 for painted bike symbols (assumes $250 per symbol, 13 symbols per linear km multiply by 2 for both side of the road) - $2,500 for bike lane signs (assumes $350 per sign and tab, 5 signs per linear km - spaced every 200 metres - multiply by 2 for both sides of the road) - $3,900 for 'No Parking' signs (assumes $150 per sign, 13 signs per linear km multiply by 2). Signs to be mounted on existing and new posts. Price depends on number of stencils and signs used.
1.11	Conventional 1.5m-1.8m Bicycle Lanes through Lane Conversion from 4 lanes to 3 lanes	linear KM	$53,000	$53,000	Price for both sides. Includes grinding of existing pavement, markings, signs, painted markings. Assumes road is not be surfacing. The price assumes: - $11,000 for painted lane line ($5.5 per metre multiply 2 for both sides of the road) - $10,400 for painted bike symbols (assumes $400 per symbol, 13 symbols per linear km multiply by 2 for both side of the road) - $2,500 for bike lane signs (assumes $350 per sign and tab, 5 signs per linear km - spaced every 200 metres - multiply by 2 for both sides of the road) - $3,900 for 'No Parking' signs (assumes $150 per sign, 13 signs per linear km multiply by 2). Signs to be mounted on existing and new posts. Price depends on number of stencils and signs used. - $6 to $8 per linear metre for lane line removal (soda blasting). Price varies on markings to be removed on a multi-lane roadway. Remove soda-blasting cost component if the road is being resurfaced. The cost for resurfacing to be part of resurfacing project.
1.12	Conventional 1.5m-1.8m Bicycle Lanes in Conjunction with a New Road, or Road Reconstruction / Widening Project	linear KM	$390,000	$390,000	Price for 1.5m bike lanes on both sides of the roadway (1.5m x 2 sides = 3.0m). The price assumes: - $14,000 for catch basins and leads ($350 per lead x 40 catch basins per linear km) - $360,000 for asphalt and sub-base ($55/m2 = 120 x 1.5m BL x 1000 x 2) - $16,000 for signs, stencils and edge line The roadway project funds all other improvements.
1.13	Conventional 1.5m-1.8m Bicycle Lanes that require a road widening /reconstruction	linear KM	$700,000	$700,000	Price for both sides of the road, includes the cost for excavation, adjust catch basins, lead extensions, new curbs/driveway ramps, asphalt and sub-base, painted markings and signs. All costs associated with widening or reconstructing the road for the purposes of adding bike facilities is born by the bike project i.e. no economies of scale of adding a bike facility in conjunction with a planned roadway project.

Appendix A - Network Management Tool
Durham Regional Cycling Plan, 2021: Table 1 - Unit Price Schedule

ITEM	DESCRIPTION	UNIT			COMMENTS/ASSUMPTIONS
1.14	Buffered Bicycle Lane with Hatched Pavement Markings - No Road Construction / Widening or Road Diet required	linear KM	$49,000	$49,000	Price for 1.5m bike lanes with 1m hatched buffer. The price assumes: - $30,000 for painted lines ($6 x 5000 metres of line paint) - $1,000 for hatching paint (1000 metres) - $10,400 for painted bike symbols (assumes $400 per symbol, 13 symbols per linear km multiply by 2 for both side of the road) - $2,500 for bike lane signs (assumes $350 per sign and tab, 5 signs per linear km - spaced every 200 metres - multiply by 2 for both sides of the road) - $3,900 for 'No Parking' signs (assumes $150 per sign, 13 signs per linear km multiply by 2). Signs to be mounted on existing and new posts. Price depends on number of stencils and signs used
1.16	Buffered Bicycle Lane with Hatched Pavement Markings with Road Diet	linear KM	$70,000	$70,000	Price for 1.5m bike lanes with 1m hatched buffer. The price assumes: - $30,000 for painted lines ($6 x 5000 metres of line paint) - $1,000 for hatching paint ($1000 metres) - $10,400 for painted bike symbols (assumes $400 per symbol, 13 symbols per linear km multiply by 2 for both side of the road) - $2,500 for bike lane signs (assumes $350 per sign and tab, 5 signs per linear km - spaced every 200 metres - multiply by 2 for both sides of the road) - $3,900 for 'No Parking' signs (assumes $150 per sign, 13 signs per linear km multiply by 2). Signs to be mounted on existing and new posts. Price depends on number of stencils and signs used. - $6 to $8 per linear metre for lane line removal (soda blasting). Price varies on markings to be removed on a multi-lane roadway.
1.26	Uni-directional Cycle Tracks: Raised and Curb Separated - In conjunction with existing road reconstruction / resurfacing project	linear KM	$250,000 - $500,000	$375,000	Both sides. Assumes cycle track will be implemented as part of road construction. Could include minor utility / lighting pole relocations. Other components such as bike signals, bike boxes etc. are project specific and will impact unit price.
1.29	Two Way Active Transportation Multi-use path within road right-of-way	linear KM	$275,000 - $426,000	$426,000	3.0m wide hard surface pathway (asphalt) within road right of way (no utility relocations). Price depends of scale / complexity of project and if existing sidewalk is being removed (i.e. crushing of existing sidewalk and compacting for trail base).
1.30	Concrete Splash Strip placed within road right-of-way between Active Transportation Multi-Use Path and Roadway	m²	$150	$150	Colour Stamped Concrete
1.31	Hard Surfaced Off-Road Multi-Use Trail Outside of Road Right-of-Way in an Urban Setting (New)	linear KM	$300,000 - $400,000	$350,000	3.0m wide hard surface pathway (asphalt) within park setting (normal conditions) 90mm asphalt depth. Price depends of scale / complexity of project.

Notes:

1. Unit Prices are for functional design purposes only, include installation but exclude contingency, design and approvals costs (unless noted) and reflect 2021 dollars, based on projects in southern Ontario.
2. Estimates do not include the cost of property acquisitions, signal modifications, utility relocations, major roadside drainage works or costs associated with site-specific projects such as bridges, railway crossings, retaining walls, and stairways, unless otherwise noted.
3. Assumes typical environmental conditions and topography.
4. Applicable taxes and permit fees are additional.

Appendix A - Network Management Tool
Durham Regional Cycling Plan, 2021: Estimated PCN Cost and Facility Breakdown

Table 2a - Estimated Captial Costs by Facility Type and Phase (inclusive of all jurisdictions - Region, Local and MTO)

Facility Type	Short Term - Capital			Short Term - Infill			Long Term			Total (Full Build out)		
	Length (km)	% of ST capital network	Estimated Cost	Length (km)	% of ST infill network	Estimated Cost	Length (km)	% of LT network	Estimated Cost	Length (km)	%	Estimated Cost
Proposed Off-Road Trail	0.0	0%	$0	0.0	0%	$0	0.0	0%	$0	0.0	0%	$0
Proposed In-Boulevard Multi-Use Path	44.7	59%	$26,416,744	47.6	34%	$29,615,506	63.9	84%	$37,767,424	156.1	27%	$93,799,675
Proposed Cycle Track	6.2	8%	$3,205,408	17.8	13%	$8,969,807	0.0	0%	$0	24.0	4%	$12,175,215
Proposed Buffered Bike Lane	3.0	4%	$202,747	9.4	7%	$640,750	29.3	39%	$2,061,964	41.7	7%	$2,905,461
Proposed Buffered Paved Shoulder	3.9	5%	$1,227,158	11.3	8%	$3,530,649	66.6	88%	$20,788,239	81.8	14%	$25,546,045
Proposed Bike Lane	0.0	0%	$0	14.4	10%	$557,400	17.4	23%	$662,457	31.8	6%	$1,219,857
Proposed Paved Shoulder	18.1	24%	$3,776,575	15.5	11%	$3,219,115	151.9	200%	$32,354,873	185.5	32%	$39,350,562
Proposed Signed Route	0.0	0%	$0	23.4	17%	$39,011	32.2	42%	$115,458	55.7	10%	$154,469

	Short Term - Capital			Short Term - Infill			Long Term			Total (Full Build out)		
Total	**75.9**		**$34,828,631**	**139.5**		**$46,572,238**	**361.3**		**$93,750,414**	**576.7**		**$175,151,284**
Percent of network totals	13%		20%	24%		27%	63%		54%			

Notes:

1. The estimated capital cost to implement Durham Region's PCN is based on unit prices (refer to the red highlighted rows in Tab 1). Costs for Contingency (24%) and Design and Engineering (13%) have been factored into the total network costs. Unit prices reflect 2020 dollars, but will vary based on current market demand, inflation and pricing.
2. This table does not include the estimated length or estimated cost for the Durham Meadoway (22.7 km).

Table 2b - Estimated Captial Costs by Facility Type and Phase (REGION ONLY)

Facility Type	Short Term - Capital			Short Term - Infill			Long Term			Total (Full Build out) - **REGION ONLY**		
	Length (km)	% of ST capital network	Estimated Cost	Length (km)	% of ST infill network	Estimated Cost	Length (km)	% of LT network	Estimated Cost	Length (km)	%	Estimated Cost
Proposed Off-Road Trail	0.0	0%	$0	0.0	0%	$0	0.0	0%	$0	0.0	0%	$0
Proposed In-Boulevard Multi-Use Path	44.1	59%	$7,817,691	32.9	38%	$6,118,054	50.5	20%	$8,954,505	127.4	22%	$22,890,250
Proposed Cycle Track	6.2	8%	$3,205,408	17.0	20%	$8,566,682	0.0	0%	$0	23.2	4%	$11,772,089
Proposed Buffered Bike Lane	3.0	4%	$202,747	5.3	6%	$362,518	18.2	7%	$1,287,825	26.5	5%	$1,853,090
Proposed Buffered Paved Shoulder	3.9	5%	$1,227,158	11.3	13%	$3,530,649	59.1	23%	$18,458,387	74.4	13%	$23,216,194
Proposed Bike Lane	0.0	0%	$0	5.2	6%	$176,555	3.5	1%	$117,233	8.7	2%	$293,788
Proposed Paved Shoulder	18.1	24%	$3,776,575	13.5	16%	$2,801,826	123.1	48%	$26,352,596	154.7	27%	$32,930,997
Proposed Signed Route	0.0	0%	$0	1.3	1%	$2,092	2.0	1%	$3,328	3.3	1%	$5,420

	Short Term - Capital			Short Term - Infill			Long Term			Total (Full Build out)		
Total	**75.3**		**$16,229,578**	**86.4**		**$21,558,376**	**256.4**		**$55,173,874**	**418.1**		**$92,961,828**
Percent of network totals	18%		17%	21%		23%	61%		59%			

Notes:

1. The estimated capital cost to implement Durham Region's PCN is based on unit prices (refer to the red highlighted rows in Tab 1). Costs for Contingency (24%) and Design and Engineering (13%) have been factored into the total network costs. Unit prices reflect 2020 dollars, but will vary based on current market demand, inflation and pricing.
2. This table does not include the estimated length or estimated cost for the Durham Meadoway (22.7 km).
3. The estimated costs for proposed in-boulevard multi-use paths in Table 3b represents 30% of the total cost which is assumed to be the Region's share / cost.

Appendix A - Network Management Tool
Durham Regional Cycling Plan, 2021: Regional Cycling Plan Funding Formula

Regional Cycling Plan Funding Formula:

For In-Boulevard Multi-Use Path (MUP) projects that are part of a Regional road widening or reconstruction project on the Primary Cycling Network (PCN), the Region covers the consultant design fees as per current practice. The 2012 Regional Cycling Plan funding arrangement for these MUPs will be maintained as part of the 2021 RCP, which includes the cost of utility relocation, grading, and platform and customized bridge structures as Regional expenses. The cost of the granular base, asphalt, signage, markings and other amenities is the responsibility of the area municipality. The area municipality is also responsible for ongoing maintenance and repair after the MUP facility is constructed.

For any proposed infill[1] In-Boulevard Multi-Use Path (MUP) project that is advanced by an area municipality on a Regional road right-of-way that is part of the PCN, upon the Region's approval, the Region commits to reimburse proponent area municipalities for a percentage share of the consultant design fee incurred. The Region's share of the consultant design fee will be equal to the percentage that the Region's construction cost expenses represent as part of the overall MUP project cost. This percentage share is based on the 2012 Regional Cycling Plan funding arrangement for these MUPs that will be maintained as part of the 2021 RCP. This includes the cost of utility relocation, grading, and platform and customized bridge structures as Regional expenses, and the cost of the granular base, asphalt, signage, markings and other amenities as area municipal expenses. Final invoices of all capital costs will be required by the Region from the area municipality for reimbursement of the Region's portion of the consultant design fee.

In the event that the design and construction for an infill project is led by the Region, the area municipality will reimburse the Region for the consultant design fee as per the area municipal share of the overall construction costs, consistent with the 2012 Regional Cycling Plan funding arrangement noted above.

[1] Infill or "standalone" projects are cycling facilities to be constructed that are not part of a road widening or reconstruction project under the Region's capital budget and nine-year forecast.