



Walk 'n' Roll

KINGSTON



City of Kingston Active Transportation Master Plan

Prepared by:



Final June 2018



Table of Contents

1.0	Developing Walk 'n' Roll Kingston	5
1.1	Introduction.....	6
1.2	Context.....	7
1.3	Planning Framework	15
1.4	Guiding Principles	17
1.5	Informing the Plan.....	21
1.6	Plan Content	23
2.0	Public Engagement Summary.....	25
2.1	Introduction.....	26
2.2	Context.....	27
2.3	Engagement Objectives.....	28
2.4	Audiences Engaged	29
2.5	Engagement Activities	30
2.6	What did we hear.....	35
3.0	Kingston's AT Network.....	37
3.1	Introduction.....	38
3.2	City-wide and Neighbourhood Trips	39
3.3	Developing the Network	46
3.4	Understanding the Network.....	63
3.5	Design Enhancements.....	70
3.6	The Proposed AT Network.....	74
4.0	Kingston's AT Action Plan.....	77
4.1	Introduction.....	78
4.2	Key Audiences	79
4.3	The Five E's	79
4.4	The Proposed Strategy	81
4.5	Operations and Maintenance	88
4.6	Achieving Mode Share Targets	92
4.7	Conclusions	93
	Glossary	94

List of Figures

Figure 1 - Types of Cyclists	7
Figure 2 - Active Transportation User Considerations.....	8
Figure 3 - Kingston Walking and Cycling Trends.....	9
Figure 4 - Overview of Supportive Policies and Plans Reviewed.....	11
Figure 5 - Examples of Neighbourhood and City-wide routes in Kingston.....	40
Figure 6 - Kingston's Transportation Focus Areas	42
Figure 7 - Kingston Active Transportation Network Development Process.....	46
Figure 8 - Population Density Indicator Map.....	49
Figure 9 - Employment Density Indicator Map	50
Figure 10 - Access to Transit Indicator Map	50
Figure 11 - Access to Express Transit Indicator Map.....	51
Figure 12 - Intersection Density Indicator Map.....	51
Figure 13 - Sidewalk Density Indicator Map	52
Figure 14 - Cycling Density Indicator Map.....	52
Figure 15 - Active Transportation Mode Share by Dissemination Area	54
Figure 16 - Cycling Analysis in Kingston	56
Figure 17 - Walking Analysis in Kingston.....	57
Figure 18 - Overview of the Three Step Facility Selection Process.....	61
Figure 19 - Examples of Proposed Intersection and Crossing Enhancements	67

List of Tables

Table 1 - Potential Active Transportation Benefits	10
Table 2 - Best Practice Review.....	13
Table 3 - Walk 'n' Roll Kingston Development Process and Public Engagement Undertaken	15
Table 4 - Municipal Class Environmental Assessment Process Overview.....	16
Table 5 - Walk 'n' Roll Kingston Principles.....	18
Table 6 - Active Transportation Opportunities and Challenges in Kingston	22
Table 7 - Walk 'n' Roll Public Engagement Process Objectives	28
Table 8 - Overview of Proposed Facilities Considerations	63
Table 9 - Summary of Proposed Crossing and Intersection Improvements	68
Table 10 - Summary of Existing and Proposed Facilities.....	74
Table 11 - Estimated Walk 'n' Roll Capital Costs	75
Table 12 - The 5 E's of Outreach.....	80
Table 13 - Overview of Potential Tools and Programs for an Outreach Strategy.....	81
Table 14 - Proposed Active Transportation Initiatives	83
Table 15 - Cost Assumptions for Enhanced Seasonal and Winter Maintenance	90
Table 16 - Estimated Annual Maintenance Costs for Non-Winter Months.....	91
Table 17 - Estimated Annual Maintenance Costs for Winter Months	91

List of Technical Appendices

All technical appendices are found under a separated cover.

Technical Appendix A – Technical Policy Review
Technical Appendix B – Consultation Summary
Technical Appendix C – Transportation Focus Area Profiles
Technical Appendix D – Map of Existing and Previously Proposed Routes
Technical Appendix E – Spatial Analysis Maps
Technical Appendix F – Candidate Routes Maps
Technical Appendix G – Route Hierarchy Maps by Transportation Focus Area
Technical Appendix H – Unit Price Schedule
Technical Appendix I – Overview of Target Audiences

Acknowledgements

We would like to thank members of the public, stakeholders and members of the Technical Advisory Group who gave their time and input in the development of the City of Kingston Active Transportation Master Plan – Walk 'n' Roll Kingston. On behalf of the study team and all those who contributed to this master plan, it is our hope that Walk 'n' Roll Kingston provides the City and its partners with the tools and guidance necessary to improve conditions for active transportation and to achieve the City's active transportation mode share target of 20% by 2034.



1.0



Developing Walk 'n' Roll Kingston

1.1 Introduction

The City of Kingston’s first Active Transportation Master Plan – branded as Walk ‘n’ Roll Kingston – has been designed and developed specifically for Kingston. The plan reflects Kingston’s unique built form, road network, land use, density, green space, culture, history and key features, including its waterfront, public wants, strategic objectives and future vision. Walk ‘n’ Roll Kingston has been informed by public and stakeholder input, the City’s strategic objectives and a vision to achieve a 20% active transportation (AT) travel mode share by 2034. The plan is meant to contribute to making Kingston one of the most desirable communities to live and work in Canada.

To achieve a 20% active transportation mode share by 2034, significant investment in infrastructure, supportive programming, resources and staffing will be required from the City and its partners. This plan sets out a blueprint for staff, decision makers and stakeholders to better understand, plan, design, and implement active transportation routes and improvements throughout the City of Kingston over the next 20+ years. It builds upon the City’s Official Plan, Transportation Master Plan, Waterfront Master Plan and other on-going initiatives (e.g. Vision Zero, Kingston). Walk ‘n’ Roll Kingston builds upon existing provincial policies and directions, such as #CycleON, Ontario Trails Strategy, and the Climate Change Action Plan to support the changes that have been envisioned by residents, staff, members of Council and stakeholders.

What’s in this section?

1.2	A summary of the plan context including anticipated users, trip purposes, best practices and supportive policies
1.3	An overview of the process undertaken to develop Walk ‘n’ Roll Kingston and provincial requirements that shaped the process
1.4	The guiding principles that shaped the development of Walk ‘n’ Roll Kingston including the vision, goals and objectives
1.5	An overview of the existing socio-demographic statistics in Kingston as well as the opportunities and challenges identified over the course of the study
1.6	An overview of the plan’s content

1.2 Context

Walk 'n' Roll Kingston has been developed collaboratively with input from City staff, the Technical Advisory Group, stakeholders, residents and members of the study team. This section is intended to provide readers with an overview of the key context that was used to shape the development of Walk 'n' Roll Kingston.

1.2.1 Who

Active transportation is part of everyone's daily activities as most trips start with a walk to and from a second mode of transportation (i.e. bicycle, transit, automobile). If designed properly, active transportation infrastructure can be used by people of all ages and abilities for a range of trip types and purposes. Active transportation is a key component to support a "complete streets" approach when planning, designing, implementing, and operating a City-wide transportation system.

For the purposes of developing Walk 'n' Roll Kingston, pedestrians and cyclists are assumed to be the primary user groups. The plan focuses on accommodating these two user groups but also takes into consideration the needs of other non-motorized forms of transportation including those who require mobility-assistive devices (e.g. wheelchairs). Designing for AT users is not a one-size-fits-all approach. Users have different preferences, characteristics and interests which influence their experience including their sense of comfort and safety. Research shows that cyclists, in particular, can be organized into four categories. These categories are illustrated in Figure 1.

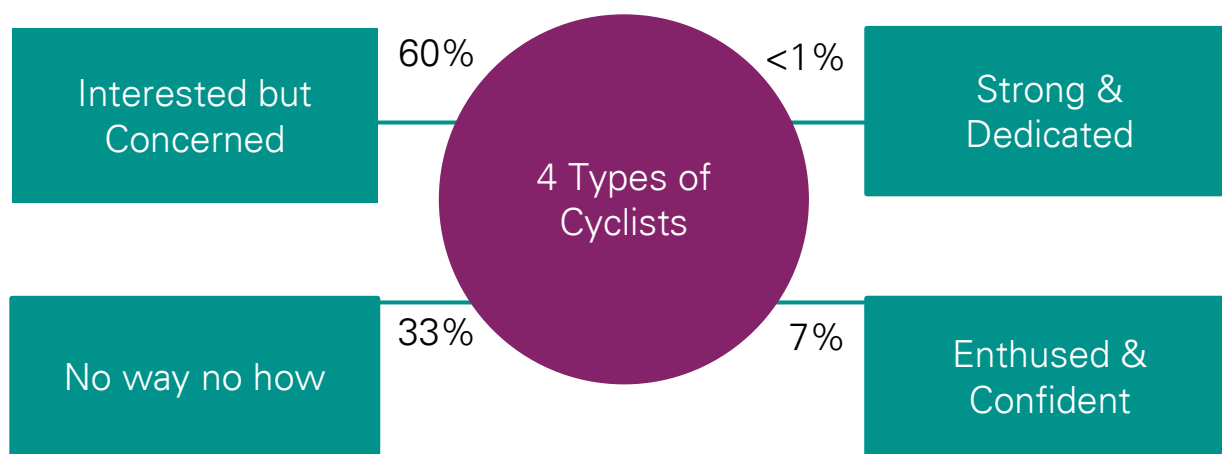


Figure 1 - Types of Cyclists
Source: Portland Bureau of Transportation, 2018

Typically, the greatest opportunity to increase the number of people cycling are those within the “Interested but Concerned” category. Users within this category generally have the greatest potential to engage in active transportation if the existing infrastructure can accommodate their need for comfort and sense of safety.

Beyond cyclists, there are a number of different considerations which can influence how people choose to engage in all forms of active transportation. **Figure 2** outlines the different user considerations and provides an example of each consideration.



Image of a walking school bus, with school-aged children being accompanied on their walk to school with walking school bus leaders.

Figure 2 - Active Transportation User Considerations

1.2.2 What

Active transportation can be used for a number of purposes and reasons. An individual should not be limited to using active transportation for solely one purpose and should perceive active transportation as a viable transportation option. As part of the engagement to develop Walk 'n' Roll Kingston, residents were asked to identify their typical walking and cycling habits.

Figure 3 identifies the existing walking and cycling habits in Kingston by trip purpose. Users indicated that they cycle and walk for a variety of trip purposes. Therefore, the findings illustrated in **Figure 3** have a sum greater than 100%. These findings are based on the information collected from the Walk 'n' Roll public opinion survey conducted in 2016.

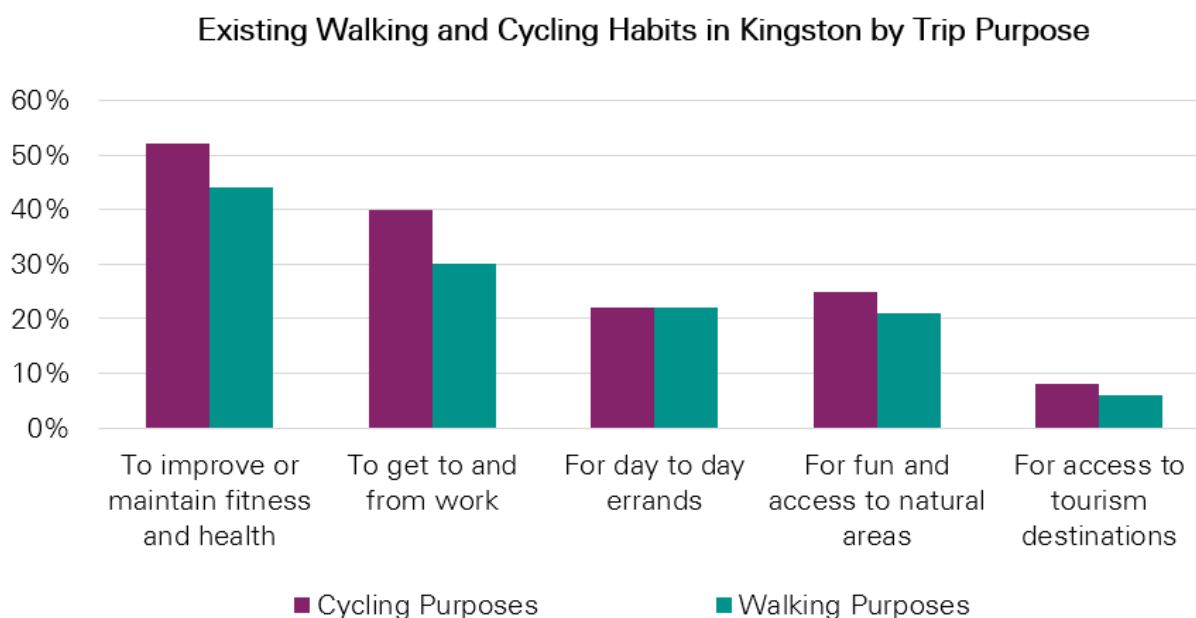


Figure 3 - Kingston Walking and Cycling Trends
Source – Walk 'n' Roll Public Opinion Survey 2016

In addition, there are a number of benefits that can be realized by planning, designing and implementing active transportation infrastructure and supportive policies and programs. These benefits can be realized at a community and individual level, and help to demonstrate the rationale for investments in active transportation infrastructure and supportive programming. To develop Walk 'n' Roll Kingston, potential active transportation benefits were reviewed. A summary of key benefits which could be realized by the City and its residents is provided in **Table 1**.

Table 1 - Potential Active Transportation Benefits

Health

- ↑ Physical and active lifestyles
- ↑ Cardiovascular health and mental health
- ↓ Health care costs
- ↓ Stress, anxiety and chronic diseases

Tourism

- ↑ Tourism and popularity of cycling and hiking
- ↑ Support for local and regional tourism

Social

- ↓ Cost of travel options and increased access to jobs / amenities
- ↑ Mobility and equity for vulnerable and low-income populations
- ↑ Independence, mobility and health for all ages including children, youth, and older adults

Environment

- ↓ Carbon dioxide emissions and overall air pollution
- ↓ Water pollution from pollutants related to driving
- ↑ Protection of green space and natural environments

Safety

- ↑ Sense of safety and livability among residents
- ↑ Motorist awareness of cyclists on road
- ↑ Sense of safety if there are other pedestrians and cyclists around
- ↓ Pedestrian-cyclist collisions on sidewalks

Economic

- ↓ Household money being spent on car related payments
- ↓ Infrastructure costs for municipal governments
- ↑ Local investment in business and community development

It is recommended that City staff, Council and stakeholders emphasize the benefits of active transportation to support future investments, decisions, commitments and priorities related to the planning, design and implementation of active transportation infrastructure and supportive programs.

1.2.3 Why

Walk 'n' Roll Kingston is the City's first comprehensive Active Transportation Master Plan. The plan was developed in response to Council approved policies and plans that outline the need to increase opportunities and investment for active transportation. The plan has been developed to address the active transportation needs of the community and provide realistic tools and strategies to guide long-term decision making and help achieve the City's active transportation goals.

Walk 'n' Roll Kingston is a strategy supported by key objectives to guide the implementation of active transportation programs, initiatives and infrastructure, while complementing current Council approved policies such as the Official Plan, Transportation Master Plan, Waterfront Master Plan, and on-going initiatives (e.g. Vision Zero: Kingston's Road Safety Plan, etc.).

1.2.3.1 Policies & Plans

All levels of government are establishing and adopting policies, plans and strategic initiatives that are intended to support healthy and active communities. Policies at the federal, provincial and municipal level shape how active transportation is planned, designed, implemented and maintained. Provincial and municipal policies in Ontario typically have the most direct influence on active transportation, and were the focus of this review. It is important to understand the strategies contained within each policy that can help to support the objectives contained in Walk 'n' Roll Kingston.

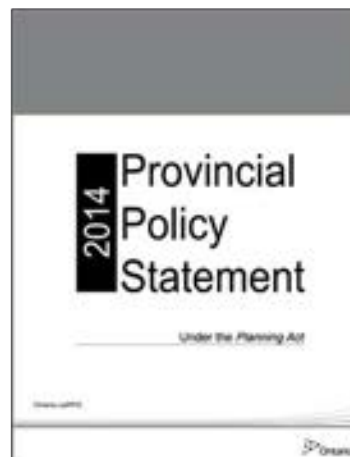
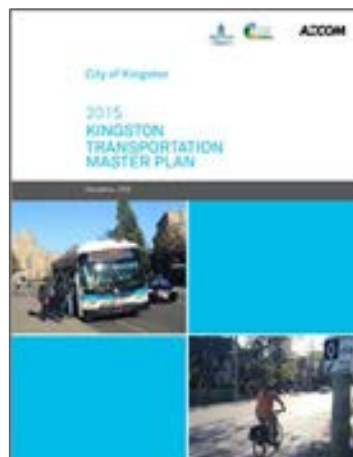
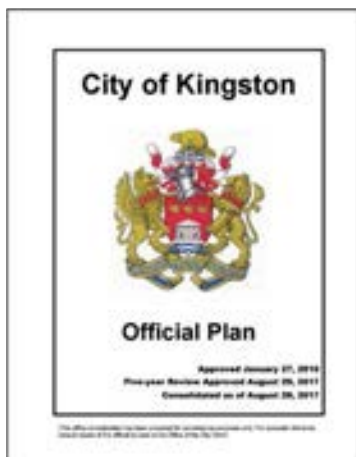
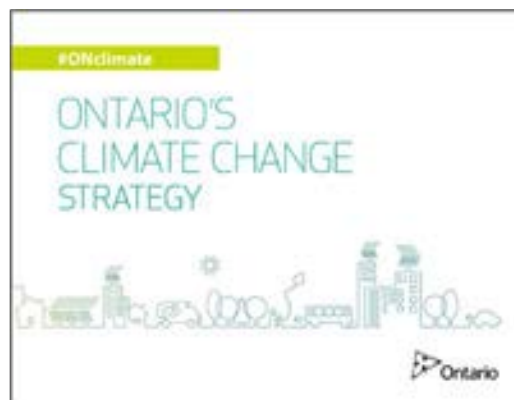
Figure 4 provides a high-level overview of the policies and plans that were reviewed during the initial stages of development for Walk 'n' Roll Kingston. A detailed summary of the policies and plans is provided in Appendix A.

Ontario	Kingston
<ul style="list-style-type: none"> » Provincial Policy Statement (2014) » Municipal Act (2001, amended) » Accessibility for Ontarians with Disabilities Act (2005, amended) » Ontario Trails Strategy (2005) » Ontario Cycling Strategy #CycleON (2013) » Places to Grow Act (2005, amended) » Ontario Climate Change Strategy (2015) 	<ul style="list-style-type: none"> » Official Plan (2017 consolidation) » Transportation Master Plan (2015) » Cycling and Pathways Study (2003) » Transportation Demand Management Strategy (2011) » Waterfront Master Plan (2016) » Kingston Transit Business Plan (2017-2021) » Kingston Climate Action Plan (2015) » Sustainable Kingston Priority Area

Figure 4 - Overview of Supportive Policies and Plans Reviewed

The following are samples of supportive statements for active transportation contained in the policies and plans outlined in **Figure 4**.

Ontario Cycling Strategy #CycleON	The government is committed to increasing the number and safety of people who cycle in the province
Ontario Climate Change Strategy	Ontario must transition as many existing drivers as possible to transit, cycling and walking
Provincial Policy Statement (1.5.1.a)	Healthy, active communities should be promoted by facilitating active transportation and community connectivity
Kingston Official Plan	Provide a built environment that is supportive of pedestrians and encourages active transportation
Kingston Transportation Master Plan	Increased active transportation mode share targets must include the implementation of infrastructure and policies
Cycling and Pathways Study	The City should adopt policies that support pedestrian and cycling travel with clearly defined positions on specific issues



1.2.3.2 Best Practices

The City of Kingston can learn from other municipalities to better understand common trends and adapt to lessons learned. Trends and best practices can be used to inform policy, program and infrastructure improvements that are intended to encourage increased active transportation use in the City of Kingston.

Best practices from eleven municipalities within and outside of Canada were reviewed to inform recommendations and strategies that could improve active transportation use and experience in Kingston. A summary of the municipalities investigated is provided in **Table 2**.

Table 2 - Best Practice Review

Location	Population	Existing AT Mode Share (Walking and Cycling)	Target Mode Share (Walking and Cycling)
Kingston	123,798	11.7% ¹	20%
Municipal Examples (Ontario)			
Ottawa	934,243	10%	15%
London	383,822	7.2%	15%
Kitchener	233,222	5.3%	12%
Hamilton	693,645	5.3%	15%
Barrie	141,434	4.8%	12%
National / International Examples			
Vancouver, British Columbia	631,486	19.8%	33%
Halifax, Nova Scotia	316,701	11.1%	25%
Madison, Wisconsin	243,244	15%	N/A
Portland, Oregon	609,456	13%	22%
Minneapolis, Minnesota	400,070	11%	20%
Copenhagen, Denmark	569,557	36%	43%

Note:

1. Source: Statistics Canada 2016 Census, Census subdivisions

In addition to the target active transportation mode shares outlined in Table 2, it is important to develop an understanding of the experiences and lessons learned from these municipalities. Based on a review of best practices, six key themes emerged that were used to inform the development of Walk 'n' Roll Kingston. These themes are summarized below.

User Focus

An understanding and consideration for the various types of users including mode, trip type, preferences and level of comfort related to route and facility selection.

Connectivity

The need for continuous and connected routes and facilities that provide access to major community destinations for a range of trip types and purposes.

Complete Streets

The approach used to design streets for individuals of all ages and abilities, and using all modes of travel. The needs of all users of the street are integral to the design of the street, rather than an afterthought.

Documentation

The need for a process to inform the identification and selection of preferred facility types based on surrounding conditions and key considerations.

Judgement

The application of sound planning and engineering judgement based on known design considerations to confirm recommendations.

Coordination

The integration of transportation planning, design and implementation into the overall land-use planning practice and other day to day decision making.

1.3 Planning Framework

Walk 'n' Roll Kingston has been developed to be consistent with key planning and engineering processes. The process is intended to build upon policy support found at all levels of government, and reflect the City's future priorities for active transportation. The following sections provide an overview of the process that was used to develop Walk 'n' Roll Kingston.

1.3.1 The Process

Walk 'n' Roll Kingston was developed between Fall 2016 and Summer 2018. The study process included five phases, each informed by City staff, committee, stakeholder and resident input. The process was shaped by the City's past successes, current best practices and lessons learned from comparable municipalities.

Effective public engagement was a key component when developing Walk 'n' Roll Kingston. Public engagement opportunities were provided during each study phase, and the input collected was assessed to inform the recommendations, strategies and tools contained in the plan. An overview of the public engagement program and input gathered over the course of the study is provided in Chapter 2.0. The detailed public feedback reports from activities are available on the website. **Table 3** illustrates the study process including the objective and consultation milestones for each phase.

Table 3 - Walk 'n' Roll Kingston Development Process and Public Engagement Undertaken

Phase	Objective	Consultation Milestones
1	<ul style="list-style-type: none"> » Seek input on how to get Kingston on the move (vision and principles). » Identify and map existing and previously planned AT conditions 	<ul style="list-style-type: none"> » Online Survey » Community Stakeholder Forum » Public Open House & Workshop #1 » Technical Advisory Meeting #1
2	<ul style="list-style-type: none"> » Develop the draft AT network, » Confirm study vision and principles » Identify 5 E's (promotion and education) of outreach 	<ul style="list-style-type: none"> » Pop up workshops » Technical Advisory Meeting #2 » Cycling Tour / Audit
3	<ul style="list-style-type: none"> » Refine the active transportation network and identify preferred facility types 	<ul style="list-style-type: none"> » Public Open House & Workshop #2 » Cycling and Walking Tours / Audits » Technical Advisory Meeting # 3
4	<ul style="list-style-type: none"> » Finalize the active transportation network and prepare cost estimates 	<ul style="list-style-type: none"> » Stakeholder Meetings » Technical Advisory Meeting # 4 » Information Open Houses
5	<ul style="list-style-type: none"> » Prepare and finalize Walk 'n' Roll Kingston and present to City Council 	<ul style="list-style-type: none"> » City Council Presentation

1.3.2 Municipal Class EA

The Municipal Class Environmental Assessment (MCEA) process consists of five phases that are intended to engage the public, consider and assess alternative solutions and apply sound engineering judgement to develop the most appropriate solutions. The MCEA process ensures that all potential environmental impacts of a project are considered and any negative impacts are addressed. For master plan projects, there are five approaches that could be used to develop a master plan.

To complete the Walk 'n' Roll Kingston, Master Plan Approach #1 was used which requires at least one point of contact with the public and the completion of Phases 1 and 2 of the MCEA process. **Table 4** illustrates the requirements of Phase 1 and 2 of the MCEA process which were used to inform Walk 'n' Roll Kingston study process.

Table 4 - Municipal Class Environmental Assessment Process Overview

Phase 1: Problem or Opportunity	Phase 2: Alternative Solutions
<ol style="list-style-type: none"> 1. Identify problem or opportunity 2. Public consultation to review 	<ol style="list-style-type: none"> 1. Identify alternative solution 2. Select EA schedule 3. Inventory of considerations 4. Evaluate alternative solutions 5. Public consultation to review* 6. Select preferred solution <p>*After this step it may be necessary to repeat Phase 1.</p>

The MCEA process was updated in 2015 to establish pre-approval for the design and implementation of active transportation projects including:

- » Construction of multi-use trails outside of existing right-of-ways;
- » Reconstruction of a roadway to include bicycle lanes, assuming no change in the number of motor vehicle lanes; and
- » Road diets such as cycling facilities where implementation includes pavement markings, signage or localized operational improvements.

Moving forward, the City should continue to use the MCEA process and pre-approved projects to expedite next steps and proceed with implementation of active transportation projects.

1.4 Guiding Principles

Walk 'n' Roll Kingston consists of high-level guiding principles that are intended to shape the strategies and recommendations contained in the plan. These principles are meant to guide future decision making as it relates to active transportation in Kingston.

1.4.1 Vision & Principles

Walk 'n' Roll Kingston is guided by a high-level vision that reflects the City's goals and priorities for active transportation. The vision was developed in partnership with City staff, stakeholders and residents, and was presented at a public open house for review. It was refined based on the input received. Simply put, the vision for active transportation in the City of Kingston is to achieve a 20% mode share by 2034. The specific vision statement for active transportation in Kingston is:

" Kingston will be a City that embraces active modes of transportation and where residents and visitors can walk, cycle and wheel using a network of accessible, safe, connected and well-maintained trails, bicycle lanes, sidewalks and pathways which will lead to 20% of all travel occurring via active modes of transportation."

The vision is supported by six key principles. These principles are specific statements that are intended to be used to achieve the active transportation vision and have been used to shape the strategies and recommendations contained in Walk 'n' Roll Kingston. The six principles are presented in **Table 5**.



Kingston Walking Tour, Source: WSP

Table 5- Walk 'n' Roll Kingston Principles

1	Safety	Kingston will have a network of active transportation facilities where people want to be, because they feel safe with more people on the street; infrastructure is well-built, well-maintained and provides a secure environment for all users; transition points between travel modes are well-designed; and conflicts between modes are reduced.
2	Connectivity	A continuous network of active transportation routes and facilities throughout the City will create greater choice for active travel for urban and rural residents; develop a network that will allow for connections between where people live and where they want to go in the City; improve links within and between neighbourhoods and City destinations; and develop a safe and continuous system of active transportation routes and facilities.
3	Equity	All residents and visitors, regardless of age, gender or social-economic background should be able to travel throughout the City using any active transportation option they choose.
4	Equality	An inclusive environment where all ages and all abilities would have access to active travel choices for all seasons and have the opportunity to participate in the active modes of their choice.
5	Accessibility	The community should have the ability to access routes that are secure, accessible, and convenient, including supporting facilities (such as bicycle parking, maintenance stands and benches), and implement universal design criteria to improve accessibility for all travel choices.
6	Promotion	Promote the use, benefits and accessibility of active modes of travel as a means to improve health, interact with others, increase freedom, and develop a sense of community. Engagement with children, youth, families and seniors will be focused on in order to encourage the use of active modes.

1.4.2 Walk 'n' Roll Kingston Goals

The vision and target of the plan and active transportation in Kingston is to achieve a 20% active transportation mode share by 2034. To help achieve this target, the City has identified a number of goals.

Goal #1

To provide a safe system where pedestrians, cyclists, transit users, and motorists can all equally participate. This may include safety training (e.g. informing the rules of the road for all road users) and safety features such as traffic calming measures (e.g. curb bulb-outs, raised crosswalks, speed humps, raised median islands, etc.).

Goal #2

To develop a connected transportation network. People's desire to engage in active transportation relies on the ability to have connected routes that link to neighbourhoods and key destinations.

Goal #3

To integrate active transportation and transit to support multi-modal travel. Multi-modal travel should be supported by programs that educate residents on the use of supportive amenities (e.g. bike racks on buses) and that encourage more people to engage in multi-modal travel for varying trip purposes. The City should also explore transportation demand management (TDM) programs to support the 20% mode share target and improve the integration of all transportation modes.






Goal #4

To develop a complete community that supports its needs, from transportation to land development and neighborhood design. Some examples of treatments found in a complete community could include pedestrian-oriented corridors, integration of bike lanes into street design, etc.

1.4.3 Walk 'n' Roll Kingston Objectives

Walk 'n' Roll Kingston is shaped by the vision, principles and goals for active transportation in the City. The objectives are tangible outcomes that are intended to help achieve the overall vision and goals for active transportation in Kingston.

The Walk 'n' Roll objectives are action oriented and reflect the City's target to increase the number of people engaging in active forms of travel and achieve a 20% active transportation mode split by 2034. The following five objectives were identified for Walk 'n' Roll Kingston:

-  **#1** Identify a comprehensive active transportation network
-  **#2** Identify corridors to encourage the use of walking and cycling
-  **#3** Identify a network that encourages and supports multi-modal travel
-  **#4** Identify facilities to support recreational and tourism trips
-  **#5** Identify programs to help achieve the City's active transportation goals

1.5 Informing the Plan

The following sections provide an overview of Kingston's profile including socio-demographics and travel trends, as well as emerging opportunities and challenges identified by City staff, committee members, stakeholders and members of the public over the course of the study.

1.5.1 City Profile

A scan of the socio-demographic and transportation trends was completed to build a better understanding of Kingston's social, demographic, economic, and transportation characteristics. The following infographic illustrates the profile developed for Kingston based on information gathered from the 2016 Census Data.



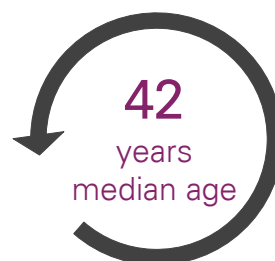
123,798
population in 2016



52%



48%



42
years
median age



92% employment
rate



58% residents received
post-secondary education



\$35,034 average
income per person



20 minutes
average commute time

Mode of transportation to work



78.7%
drive



8.3%
transit



2.4%
bike



9.2%
walk



1.2%
other

1.5.2 Challenges and Opportunities

A key component when developing any master plan is to understand the potential opportunities and to address the challenges within a community. Understanding Kingston's context through a background review, consultation with key audiences and a socio-economic review allowed the study team to identify active transportation opportunities and challenges in the City.

Table 6 summarizes the opportunities and challenges that were identified over the course of the study. The team's understanding of these considerations helped to shape the proposed recommendations and strategies contained in Walk 'n' Roll Kingston.

Table 6 - Active Transportation Opportunities and Challenges in Kingston

Opportunities	Challenges
<p>Safety</p> <ul style="list-style-type: none"> » Opportunity to address safety when implementing new infrastructure » Safety in numbers as more people engage in active travel <p>Shifting Behaviour</p> <ul style="list-style-type: none"> » Supportive programs and policies to encourage active travel » Long-term solutions <p>Encouraging Children and Youth</p> <ul style="list-style-type: none"> » School-aged children are typically more willing to try new things » Sense of independence / freedom for school-aged children walking to school » Increase physical activity in school-aged children and youth, and increase sense of community <p>Connectivity</p> <ul style="list-style-type: none"> » Provide connections to surrounding municipalities » Provide connections to communities and key destinations in Kingston <p>Tourism Initiatives</p> <ul style="list-style-type: none"> » Promotion of local and regional walking and cycling attractions » Economic benefits of cycle tourism 	<p>Reliance on Driving</p> <ul style="list-style-type: none"> » Perceived by many as the most convenient and direct option » Driver freedom and independence <p>Lack of Infrastructure</p> <ul style="list-style-type: none"> » Limited existing routes and facilities » Accommodating users of all needs, abilities and ages <p>Travel Behaviour</p> <ul style="list-style-type: none"> » Overcoming primary mode choice » Encouraging active modes of travel <p>Perception of Active Travel</p> <ul style="list-style-type: none"> » Perception that users cannot afford a vehicle » Perceived to be less direct, convenient, or efficient than driving <p>Congestion around School Zones</p> <ul style="list-style-type: none"> » Use of private vehicles for school drop-offs significantly increases air pollution around schools » Congestion and unsafe driver behaviours are common around schools during drop-off and pick-up times <p>Narrow Downtown Streets</p> <ul style="list-style-type: none"> » Limited right-of-way widths

1.6 Plan Content

Active transportation is a key component of the City's vision and goals to support multi-modal transportation, and to achieve a 20% AT mode share target by 2034. Walk 'n' Roll Kingston contains the tools, strategies, and processes to guide future decision making to improve active transportation in the City. The following is a description of the information contained in each chapter of this plan.

1.0

Walk 'n' Roll Overview

An overview of what active transportation is including uses and anticipated users, potential benefits, best practices, the study process and the guiding principles of Walk 'n' Roll Kingston.

2.0

Public Engagement Summary

An overview of the public engagement process that was used for the development of Walk 'n' Roll Kingston and a summary of key findings / input received.

3.0

Kingston's AT Network

An overview of process used to develop the City's AT network including the outcomes of each step, the different neighbourhoods contained in Kingston, the facility types that make up the AT network and additional design considerations.

4.0

Kingston's AT Action Plan

An overview of policy considerations, proposed outreach initiatives and strategies to encourage walking and cycling in Kingston and achieve mode share targets.



2.0



Public Engagement Summary

2.1 Introduction

Understanding that active transportation requires both expanding travel choices and encouraging people to change their habits to walk and cycle more, a high level of public engagement was undertaken. The plan was developed and completed consistent with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment Master Planning process.

A detailed public engagement strategy was developed for Walk 'n' Roll Kingston which focused on gathering input from those who live and work in the City as well as those who will ultimately be involved in the plan's implementation. The strategy identified public engagement techniques which engaged residents, stakeholders, and City staff. The overall goal of the public engagement was to facilitate community involvement and consensus when developing Walk 'n' Roll Kingston. A summary of the engagement activities undertaken and the input gathered over the course of the study is documented in the following sections.

What's in this section?

2.2	An overview of the public engagement program developed for Walk 'n' Roll Kingston
2.3	An overview of the public engagement objectives and approach taken
2.4	An overview of the varying audiences and groups engaged
2.5	A summary of the public engagement activities undertaken
2.6	A summary of key input received through the public engagement activities

2.2 Context

The development of Walk 'n' Roll Kingston included a comprehensive public program that consisted of four levels of engagement: inform, involve, consult and collaborate. The engagement undertaken aligns with the City's framework and best practices for fostering and ensuring an inclusive, adaptable, transparent and accountable approach for public engagement. The public engagement program developed for Walk 'n' Roll Kingston is consistent with the principles and values of the International Association of Public Participation (IAP2), a widely recognized methodology for public engagement. The process is also compliant with the Accessibility for Ontario Disabilities Act (AODA) and the City's Accessibility Guidelines.

The public engagement process began in September 2016 and included a variety of engagement activities designed to engage those responsible for day-to-day decision making related to active transportation in the City, as well as those who are anticipated to be impacted by the outcome of the plan. The input that was gathered over the course of the study was assessed and used to inform the recommendations, strategies and tools identified in Walk 'n' Roll Kingston.

The Walk 'n' Roll Kingston public engagement program was intended to be flexible and adapt to the input received over the course of the study. The engagement activities reflect the City's public engagement principles of inclusivity, early involvement, and respect, among many other principles. A detailed overview to describe how the Walk 'n' Roll Kingston consultation program achieved these principles is outlined in **Appendix B**.

A key component of the Walk 'n' Roll Kingston consultation program was to provide a transparent engagement process considerate of all feedback and input received. A detailed summary of the engagement activities and input received over the course of the study is provided in **Appendix B**. The following sections summarize the engagement objectives, audiences, activities and input received over the course of the study. As part of the public engagement, a Technical Advisory Group (TAG) was formed to guide and inform the development of Walk 'n' Roll Kingston. Members of TAG included representatives from KCAT, Cycle Kingston, KFL&A Public Health (including School Travel), Cataraqui Region Conservation Authority, Municipal Accessibility Advisory Committee, Sustainable Kingston, Tourism Kingston, Rural Cycling Representative, and City representatives including Transit, Parks and Recreation, Planning, Operations and Transportation. Four meetings were held which significantly contributed to the development of the plan. Membership was selected to include representatives from various organizations and agencies that have a role in the implementation of active transportation infrastructure, programs and initiatives in Kingston.

The City's website was used to share information, provide notification of public input opportunities and summary of feedback received. Throughout the study, members of the public had the opportunity to provide their input to the study by email (walkroll@cityofkingston.ca) and on the City's website. In addition, the City's Communication department promoted upcoming engagement opportunities and study information on the City's webpage and social media sites to increase awareness of Walk 'n' Roll Kingston and to encourage public participation.

2.3 Engagement Objectives

The overall goal of the public engagement process was to gather public input and feedback to inform the development of the City's first Active Transportation Master Plan. A key principle of the engagement process was to collect input and ideas to on how to get Kingston on the move, why active transportation is important, what is the future vision and ideas to improve options for walking, cycling, rolling, etc. that could help achieve the City's target of a 20% active transportation mode split by 2034. **Table 7** outlines the objectives of the Walk 'n' Roll Kingston consultation program.

Table 7 - Walk 'n' Roll Public Engagement Process Objectives

1	To promote awareness and create interest for Walk 'n' Roll Kingston
2	To provide meaningful information and to encourage public participation
3	To provide a balanced and inclusive discussion for increasing all modes of active transportation
4	To consult with stakeholders who have a specific interest and expertise in active transportation
5	To increase the knowledge of best practices and provide examples to spark "out of the box" thinking on potential plans and policies for active transportation
6	To identify actions and partnerships for marketing, promotion and outreach
7	To provide easy to understand and accessible information (plain language, concise text, useful visuals and maps)
8	To utilize online engagement techniques to provide opportunities for residents to share perspectives and ideas
9	To utilize interactive activities at meetings to encourage brainstorming and collaboration
10	To respond to feedback received to the best extent possible by answering questions, providing information and building consensus

2.4 Audiences Engaged

The public engagement aimed to connect with residents and stakeholders across the City to raise awareness of active transportation, to share information and to seek input. Varying engagement methods and activities were used for different audiences to create meaningful engagement that would foster the most valuable feedback from those involved. These included hosting of a Community Stakeholder Forum early in the process, hosting workshops and public open houses, meetings with stakeholders, conducting pop-up workshops to go to where people were already gathering, Technical Advisory Group Meetings, Cycling and Walking Tours and Information Open Houses in the Draft ATMP. Emails were forward to identified active transportation enthusiast and Queen's University Professors who have an interest in active transportation to ensure that they were informed about the development of the plan and to invite input. Meetings that were ongoing on other City initiatives were used to discuss active transportation including meeting with CFB Kingston.

The following is a summary of the groups and audiences that were engaged during the study.

City Representatives

- » City business units and departments (Planning, Recreation and Leisure Services, Engineering, Kingston Transit, Public Works)

Groups and Organizations

- » Trails / Cycling Interest Groups including KCAT, Cycle Kingston, Kingston Velo Club, KCAT Pedestrian Transit Working Group, Rideau Trail Association, K & P Trail
- » Municipal Accessibility Advisory Committee
- » KFL&A Public Health Unit / School Travel
- » Local Businesses Associations including Greater Kingston Chamber of Commerce and Downtown Kingston (interviews)
- » Sustainable Kingston
- » Tourism Kingston
- » Rural representatives
- » Youth Organizations such as Youth 2 Kingston (through pop-up workshop).
- » CFB Kingston (through meetings on Highway 15 EA).
- » Cataraqui Region Conservation Authority

General Public

- » Residents of Kingston

2.5 Engagement Activities

A number of different engagement activities were undertaken to reach out to the varying audiences. The following is a summary of the activities undertaken as part of the Walk 'n' Roll engagement process.

In the first phase of the engagement, the web site was established and an online survey was conducted to learn about active transportation experiences and aspirations. This was followed by a daytime community stakeholder forum and evening public visioning workshop which included a presentation by Johan Diepens, Founder and CEO of Dutch firm Mobycon on Living City, Living Streets drawing from European examples. WSP provided a review of best practices, tools and strategies across Canada. Input from the community forum and Public Open House and Workshop #1 lead to the development of a draft vision and principles. The draft network of connections and facilities evolved with significant public input over the course of the study. Promotional elements and partnerships were continually explored through open houses, workshops and TAG meetings. These were subsequently reviewed at Public Open House and Workshop #2.

A detailed summary of the public engagement activities and input collected is provided in **Appendix B**.

Public survey

A City-wide survey was conducted between October 2016 and December 2016. The survey consisted of 21 questions and asked respondents to provide information on their travel preferences, socio-demographics and input to improve active transportation in Kingston. A total of 338 participants responded to the survey.

The survey was promoted on the City's website and social media, the study's promotional materials, and on local ads / press releases. Following the survey completion, the results were summarized and posted on the City's website.

A detailed summary of the survey results is provided in **Appendix B**.



Sample of Walk 'n' Roll Kingston survey results

Technical Advisory Groups Meetings

The first TAG meeting was held on October 14, 2016. Approximately 22 people attended the meeting in addition to members of the study team and City staff. The purpose of the first TAG meeting was to:

- » Provide an overview of the study process and expectations of TAG members;
- » Complete an interactive activity to gather feedback on the vision for active transportation in the City of Kingston;
- » Complete an interactive mapping activity to identify gaps, areas of improvement and opportunities for new active transportation routes and facilities; and
- » Inform members of upcoming engagement events.

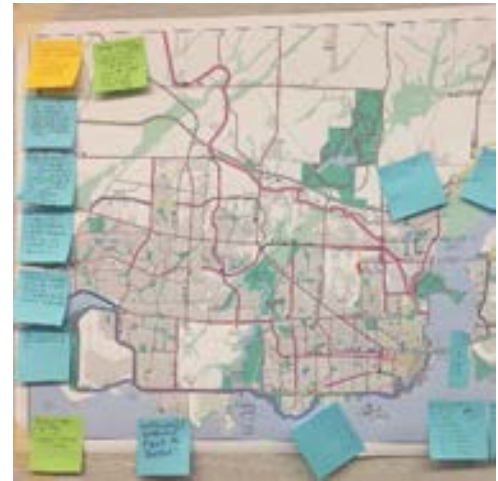


Photo of comments/ input on map board from TAG Meeting #1

The second TAG meeting was held on April 19, 2017. Approximately 17 people attended the meeting in addition to members of the study team and City staff. The purpose of the second TAG meeting was to:

- » Present key messages and input received through the initial engagement activities including a Community Forum, Public Open House, Workshop #1, Pop-Up Workshops and the survey;
- » Present the revised study vision;
- » Undertake an interactive activity to collect input on the draft active transportation network;
- » Discuss promotional and educational initiatives to be identified in the report; and
- » Discuss upcoming engagement activities.



Photo of comments/ input on map board from TAG Meeting #2

The third TAG meeting was held on October 24, 2017. Approximately 17 people attended the meeting in addition to members of the study team and City staff. The purpose of the third TAG meeting was to:

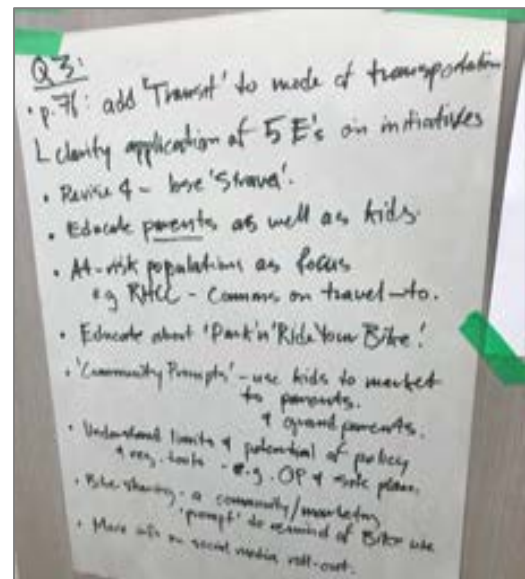
- » Review the draft Walk 'n' Roll Kingston report and recommendations that was completed and circulated to TAG members in advance of the meeting; and
- » Gather input, comments and feedback on the report content including proposed recommendations, strategies and tools identified in the plan.



TAG Meeting #3 Agenda

The fourth TAG meeting was held on April 23, 2018. Approximately 25 people attended the meeting in addition to members of the study team and City staff. The purpose of the fourth TAG meeting was to:

- » Review the updated Walk 'n' Roll Kingston ATMP (Chapters 3 and 4) and seek input on changes. Documents were circulated to TAG members in advance of the meeting;
- » Gather input, comments and feedback on the report content; and
- » Discuss the concept and approach for developing Transportation Focus Area Plans at the neighbourhood level, phasing of active transportation routes and facilities, and implementation plan considerations.



Input from TAG Meeting #4

Cycling and Walking Tours

Members of TAG and stakeholders were invited to attend two cycling tours and one walking tour over the course of the study. The cycling tours were held in November 2016 and August 2017. The walking tour was held in February 2017. The purpose of the tours was to:

- » Gather input on user experience when cycling and walking along the City's existing routes; and
- » Gather input on potential improvements and key priorities to improve active transportation conditions for users in Kingston.



Walk 'n' Roll Kingston Cycling Tour – November 2016

Active Transportation Community Forum

A Community Stakeholder Forum was held on November 2, 2016 with key City stakeholders and active transportation leaders in Kingston. Over 50 stakeholders representing active transportation, accessibility, public health, tourism, social service agencies, post-secondary students, and walking and cycling advocacy groups attended the forum. The purpose of the workshop was to:

- » Provide an overview of the study and process undertaken to develop Walk 'n' Roll Kingston;
- » Complete an interactive activity to provide input on the draft active transportation vision and network; and
- » Complete an interactive mapping activity to identify gaps and opportunities for new active transportation routes and facilities.

The forum included a presentation by Johan Diepens, Founder and CEO of Dutch firm Mobycon on Living City, Living Streets drawing from European examples.



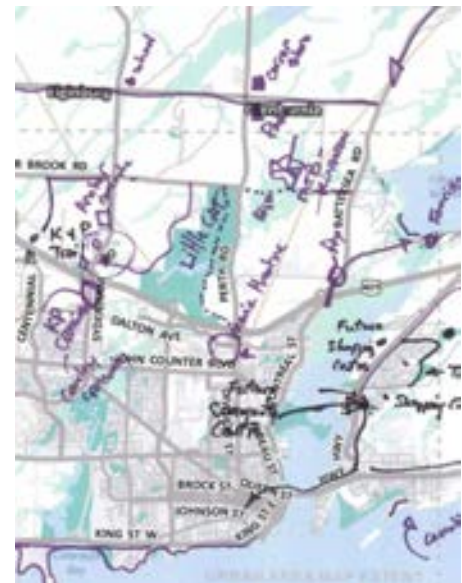
Input received at the Walk 'n' Roll Kingston community forum

Public Open Houses and Workshops

The first public open house was held on November 2, 2016. The format consisted of a drop-in informal session between 6:00 p.m. and 7:00 p.m. During this time, a number of display boards were available for public review including information on the study process, vision, objectives and the draft proposed active transportation network. A workshop was undertaken between 7:00 p.m. and 9:00 p.m., and consisted of a brief presentation from Mobycon, City staff and the study team.

The purpose of the first open house and workshop was to:

- » Provide an overview of the study process;
- » Gather input on the vision for active transportation in the City of Kingston;
- » Gather input on existing gaps in the active transportation network that should be addressed through the development of the plan; and
- » Gather input on programs and initiatives that are needed to support active transportation infrastructure.



Markups on map board from Public Open House #1

The second public open house and workshop was held on June 7, 2017. The format consisted of a drop-in informal session between 6:00 p.m. and 6:45 p.m. During this time, a number of display boards were available for public review including proposed promotional initiatives, the proposed active transportation network and facility types as well as the proposed phasing plan. A workshop was undertaken between 6:45 p.m. and 9:00 p.m., and consisted of a brief presentation and facilitated discussions.

The purpose of the second public open house and workshop was to:

- » Gather input on the proposed facility types and phasing illustrated on the maps;
- » Gather input on the proposed active transportation initiatives; and
- » Gather input on key priorities for implementation.



Attendees at Public Open House #2

Pop-Up Workshops

Five informal pop-up workshops were undertaken between October 2016 and April 2017. The pop-up consisted of an interactive display with three panels including: a future visioning exercise; selection of preferred active transportation facilities; and thoughts to improve active transportation in Kingston.

The pop-up workshops were used at the following locations / events:

- » Bath Road Bikeway public meetings (October 2016 and April 2017)
- » YGK Youth Forum (December 2016)
- » Cataraqui Town Shopping Centre (December 2016)
- » Highway 15 EA Public Meeting #3 (March 2017)



Pop-up Workshop panels with resident input

The pop-up workshop panels were an effective way to bring consultation to members of the public. By going to where the public was already gathering, residents were able to offer ideas and learn more about Walk 'n' Roll Kingston. Approximately 250 residents participated and provided their input on the pop-up workshop panels.

2.6 What did we hear

Several key themes of input emerged through the various engagement activities and were used to inform the recommendations contained in Walk 'n' Roll Kingston. The key themes and input are summarized into three categories below: infrastructure, programs and partnerships.

Appendix B provides a detailed summary that describes how the input gathered over the course of the study has been integrated into the plan.

Infrastructure

- » Build a connected, multi-modal transportation network across the City
- » Road design should better accommodate all active modes of transportation
- » Enhance intersection crossings for all users
- » Create routes for pedestrian travel with safer crossings
- » Implement protected / separated cycling routes
- » Implement end-of-trip facilities for active transportation users
- » Prioritize maintenance of all active transportation infrastructure
- » Provide local connections that link to spine routes

Programs

- » Increase awareness of the benefits of active transportation
- » Promote year round promotional events and activities
- » Target younger demographics and develop initiatives specific to youth
- » Develop promotional materials for seniors
- » Encourage employers to develop workplace programs
- » Support programs to increase equitable access to active transportation
- » Improve knowledge and comfort of public transit

Partnerships

- » Enhance information sharing and coordination between existing groups and those responsible for implementation of Walk 'n' Roll Kingston
- » Continue to work with a variety of stakeholders to capture all interests
- » Identify partners the City can work with to champion programs and initiatives
- » Identify City staff responsible for day-to-day decision making related to active transportation
- » Establish an advisory committee to help implement the plan and champion active transportation initiatives



3.0

Kingston's AT Network



3.1 Introduction

A key objective of Walk 'n' Roll Kingston is to identify a comprehensive network of on and off-road active transportation routes to support multi-modal travel and help to achieve the City's 20% active transportation mode share target by 2034.

To achieve this 20% target, it is important to understand and address the current opportunities and challenges common across the City while also allowing flexibility to address neighbourhood level issues. This chapter will identify the comprehensive, City-wide active transportation network along with the concept of neighbourhood level transportation focus areas to support the development of an active transportation network that integrates city-wide linkages with localized, neighbourhood connections. This City-wide and neighbourhood level approach formed the basis for selecting and assessing proposed routes and facilities at a local level and a spine network that together form Kingston's proposed active transportation network.

The process used to develop the network was informed from input received by the public, local stakeholders, City staff and advisory group members. The process built upon best practices and the knowledge of the study team as well as lessons learned from the City and comparable municipalities and consideration of sound engineering judgement that took into consideration a multi-faceted approach to identify and review different options and alternatives. Sound engineering judgement goes beyond the application of guidelines; the study team examined context-specific considerations including road geometry, costing implications and user safety to develop an understanding of the potential opportunities and challenges to inform the development of the City's active transportation network.

The following sections provide an overview of the steps used to identify the recommended active transportation network, the outcomes of the process, and considerations to help inform the future planning and design of active transportation infrastructure in the City of Kingston.

What's in this section?

3.2	An introduction to a City-wide and neighbourhood approach to transportation planning
3.3	A detailed overview of steps that were used to develop Kingston's AT network
3.4	The recommended active transportation network including pedestrian and cycling routes
3.5	An overview of the various facility types that are being proposed as part of Kingston's active transportation network
3.6	An overview of potential design enhancements for the City's preferred active transportation network

3.2 City-wide and Neighbourhood Trips

The City of Kingston covers a large geographic area of 452 square kilometres and is comprised of many unique neighbourhoods and hamlets, spanning the rural, urban and suburban areas of Kingston. Active transportation trips, similar to trips made in a vehicle, may travel relatively short distances within a neighbourhood or longer distances across the City. The active transportation infrastructure that supports these trips must consider how people want to travel within their neighbourhood while also providing a viable connection into the larger City-wide network.

Neighbourhood trips are those made within the boundary of a specific neighbourhood and often include trips to and from school or a local community destination such as a library or a community centre. Neighbourhood trips are typically short in distance and occur on local or collector roads that have low operating speeds and low motor vehicle traffic, relative to the City-wide network. Neighbourhood trips are served by individual systems of routes and facilities within each area while also providing connections to the City-wide transportation network.

The infrastructure requirements for a neighbourhood trip are often small in scale. Examples of local infrastructure improvements within these areas can include pedestrian crosswalks at local intersections, signed bike routes on low speed, low volume streets and bike lanes through the reallocation of space on select neighbourhood streets, through parks, and neighbourhood multi-use trails.

City-wide trips rely on a spine system of routes and facilities that provide key north-south and east-west connections through the City of Kingston. City-wide trips are typically for commuting or long-distance / touring purposes and include trips to and from work, major commercial centres, transportation hubs and other major destinations. City-wide trips typically occur on arterial and collector roads that have moderate to high operating speeds and motor vehicle traffic. Major off-road trails can also form part of the spine and City-wide network. The City-wide active transportation network is intended to address large-scale mobility concerns and issues that impact the City as a whole rather than specific issues at a local level.

The infrastructure requirements for a City-wide transportation system are typically large-scale projects that are planned in conjunction with other capital projects. Examples of infrastructure improvements that can support the City-wide transportation network are grade separated crossings for pedestrians and cyclists and planned roadway widenings / extensions with cycling facilities that are separated from motor vehicle lanes and major off-road trail links.

Examples of neighbourhood and City-wide routes and typical characteristics of these routes are provided in **Figure 5**.



Figure 5 - Examples of Neighbourhood and City-wide routes in Kingston

Recognizing the differentiation that needs to exist between the City-wide and neighbourhood level active transportation network, the following sections introduce the concept of a City-wide network along with transportation focus areas that creates a process for more detailed future analysis at a neighbourhood level.

3.2.1 City-wide Active Transportation Network

The City-wide active transportation network is intended to address large-scale mobility needs, concerns and issues that impact the City as a whole rather than specific issues at a local level. The network that is created over the long-term will ensure that the City's many different neighbourhoods and areas are connected with viable, high quality active transportation facilities.

The City-wide active transportation network includes spine routes that provide direct north-south and east-west connections through Kingston. The City-wide active transportation network facilitates the movement of people between the various transportation focus areas and aligns with heavily travelled routes in the City that connect major origins and destinations to one another. Collectively, the City-wide routes and neighbourhood routes form Kingston's active transportation network. Step 5 of the network development process addresses the route hierarchy (City-wide routes and neighbourhood routes) and presents the City-wide active transportation network map. **Section 3.3** provides an overview of the network development process and outcomes for each step.

3.2.2 Transportation Focus Areas

The dynamics that drive a City-wide network may be different for smaller areas of the City and the dynamics in one area of the City may be different from another. In developing Walk 'n' Roll Kingston, the study identified 13 urban Transportation Focus Areas intended for more detailed transportation analysis in the future.

Considering the different dynamics and characteristics contained within each area will help inform context-specific solutions and future improvements at a local level. Neighbourhood-based information is an important component for ongoing land use, development projects and policies including the City's Official Plan, Zoning By-law, Transportation Master Plan and other development related planning initiatives.

These Transportation Focus Areas have been identified based on similar transportation, natural environment, and mobility characteristics that impact how residents travel within each area and across the City. The boundaries of the focus areas are intended to be somewhat dynamic, similar to the manner in which secondary plan study areas are set. Identification of these initial areas allowed the study team to assess proposed routes and facilities at a local level and the impacts of the overall active transportation network at a City-wide scale. **Figure 6** illustrates the City's 13 Transportation Focus Areas within the City urban growth boundary. The urban growth boundary is presented on Official Plan Schedule (2).

Areas outside of the urban growth boundary are located in the City's rural extent and are recognized as a single Rural Transportation Focus Area. The active transportation requirements in the Rural Transportation Focus Area will be concentrated within the hamlets and along the roadways that have been identified as supporting City-wide or neighbourhood routes in this area. A high-level overview of each urban Transportation Focus Area is provided below. **Appendix C** provides a detailed description of each of the urban areas identified.

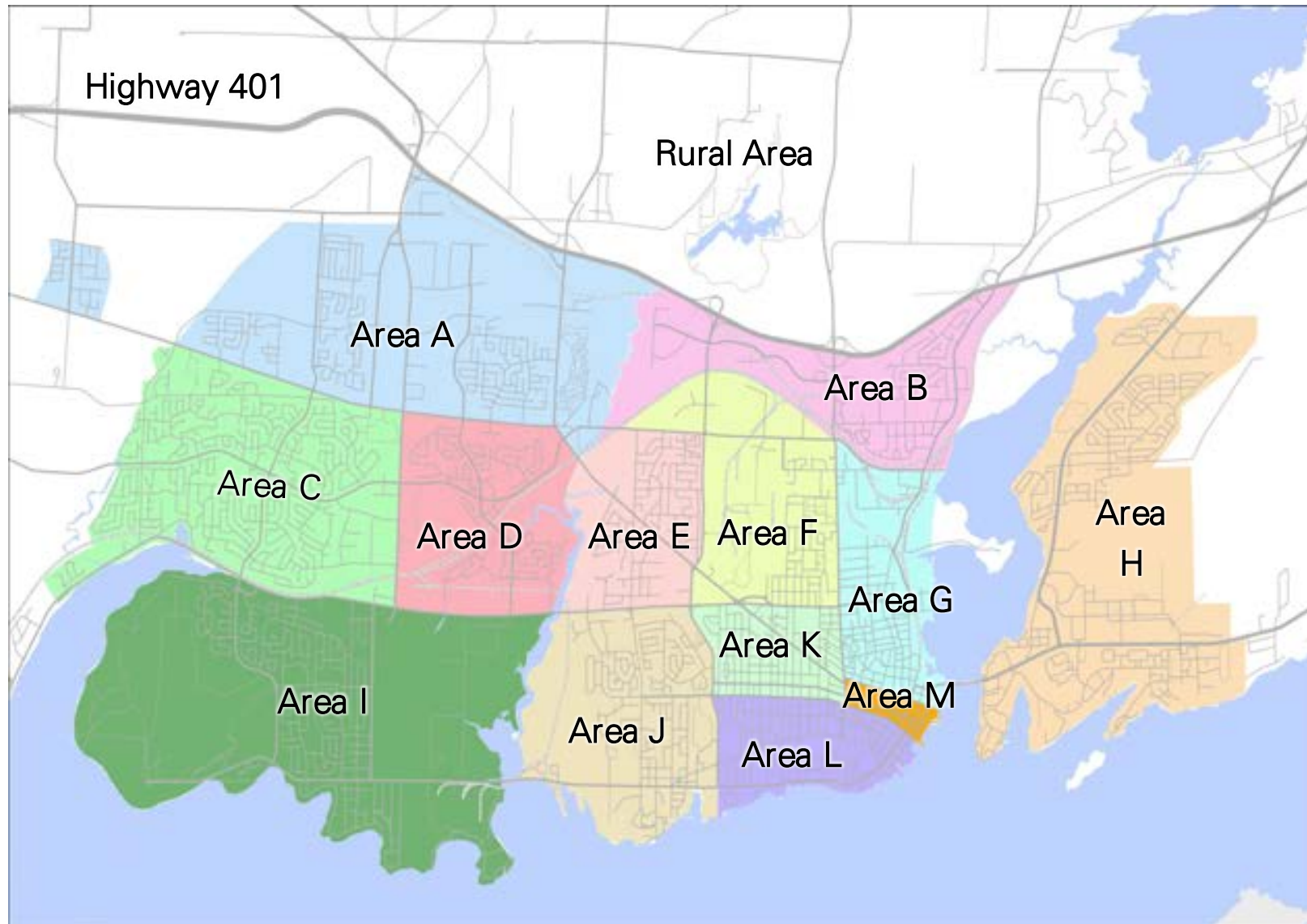


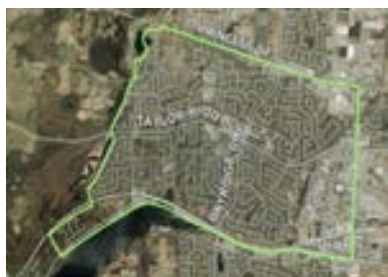
Figure 6 - Kingston's Transportation Focus Areas

**Area A**

This area is bounded by the urban growth boundary to the west and north, Little Cataraqui Creek to the east, and Princess Street to the south along with the Westbrook neighbourhood to the west. Area A contains 199 intersections of which 22 are controlled by traffic signals, 10 are controlled by all-way stops, 4 are controlled by roundabouts, and 163 are one-way stop controlled.

**Area B**

This area is bordered in the north by Highway 401, Little Cataraqui Creek to the west, Cataraqui River to the east and the CN rail line to the south. Area B contains 89 intersections of which 7 are signal controlled, 2 are controlled by all-way stops, 3 are controlled by yield signs and 77 are one-way stop controlled.

**Area C**

This area is bordered by Princess Street to the north, Gardiners Road to the east, and Bath Road to the south. The western border aligns with the City's urban growth boundary and the Collins Creek wetland area. Area C contains 266 intersections of which 26 are traffic signal controlled, 19 are all way stop controlled, 2 are controlled with yield signs, 1 intersection is unsigned, and 218 intersections are one-way stop controlled.

**Area D**

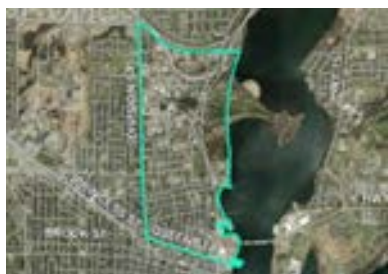
This area is bordered by Princess Street to the north, Gardiners Road to the west, Bath Road to the south, and the Little Cataraqui Creek and wetland area to the east. Area D contains 94 intersections of which 22 are controlled by traffic signals, 1 is all-way stop controlled, 4 are controlled by yield signs and 69 are one-way stop controlled.

**Area E**

This area is bordered by John Counter Boulevard and the CN rail line to the north, Sir John A. MacDonald Boulevard to the east, Bath Road to the south, and the Little Cataraqui Creek and wetland area to the west. Area E contains 90 intersections of which 9 are controlled by traffic signals, 6 are controlled by all-way stops, 4 are controlled by yield signs, 1 is unsigned and 70 are one-way stop controlled.

**Area F**

This area is bordered by the CN rail line to the north, Division Street to the east, Bath Road / Concession Street to the south and Sir John A. MacDonald Boulevard to the west. Area contains 86 intersections of which 17 are controlled by traffic signals, 8 are controlled by all-way stops, 1 is controlled by a yield sign and 60 are one-way stop controlled.



Area G

This area is bordered by John Counter Boulevard / CN rail line to the north, the Cataraqui River to the east, Queen Street to the south, and Division Street to the west. This border matches the boundary of the North King's Town secondary planning area. Area G contains 150 intersections of which 24 are controlled by traffic signals, 8 are controlled by all-way stops, 1 is controlled by a yield sign and 117 are one-way stop controlled.



Area H

This area is bordered by the Cataraqui River to the west, St. Lawrence River to the south, and the urban growth boundary to the east and north. Area H contains 226 intersections of which 11 are traffic signal controlled, 7 are controlled by yield signs, 9 are controlled by all-way stops, and 199 are one-way stop controlled.



Area I

This area is bordered by the Bath Road to the north, Little Cataraqui Creek to the east, Lake Ontario to the south and Collins Bay to the west. Area I contains 189 intersections of which 13 are controlled by traffic signals, 4 are controlled by all way stops, 1 is controlled by a yield sign and 171 are one-way stop controlled.



Area J

This area is bordered by Bath Road to the north, Sir John A. MacDonal Boulevard to the east, Lake Ontario to the south and the Little Cataraqui Creek to the west. Area J contains 143 intersections of which 13 are controlled by traffic signals, 1 is controlled by an all-way stop, 4 are controlled by a yield sign and 125 are one-way stop controlled.



Area K

This area is bordered by Concession Street to the north, Division Street to the east, Johnson Street to the south and Sir John A. MacDonal Boulevard to the west. Area K contains 140 intersections of which 28 are controlled by traffic signals, 7 are controlled by all-way stops, 4 are controlled by yield signs and 101 are one-way stop controlled.



Area L

This area is bordered by Johnson Street to the north and east, Lake Ontario to the south and Sir John A. MacDonal Boulevard to the west. Area L contains 141 intersections of which 18 are controlled by traffic signals, 14 are controlled by all-way stops, 1 roundabout, 4 are unsigned, 1 is controlled by yield sign and 103 are one-way stop controlled.



Area M

This is the downtown Kingston area bordered by Queen Street to the north, the harbour to the east, Johnson Street to the south, and Division Street to the west. Area M contains 40 intersections of which 32 are controlled by a traffic signal and 8 are one-way stop controlled.

The City envisions undertaking more detailed multi-modal transportation plans in the future for each Transportation Focus Area. These studies / plans are intended to guide future decision making and help City staff identify short and long term priorities for each neighbourhood area. Specific improvements for these focus areas would be identified and assessed in more detail through separate transportation plans tailored to the needs of the area. Each Focus Area Plan would identify specific improvements to improve conditions for all roadway users including pedestrians, cyclists, transit users and motorists.

A Transportation Plan for a focus area would assess and provide recommendations for:

- » Improvements at existing crossings to enhance pedestrian and cycling connectivity;
- » New pedestrian and cycling crossings and treatments at intersections and mid-block locations;
- » Candidate roads for road-diets, lane narrowing, curb-radius reductions, etc.;
- » Candidate streets for bike boulevards;
- » Traffic calming measures;
- » Identify locations for bike parking;
- » Programs and partnerships to increase active transportation;
- » On-street parking regulations and speed management considerations in school zones; and
- » Improved access to transit stops for pedestrians and cyclists.

These plans should be used by City staff to guide future implementation, by identifying priorities and establishing capital budgets when selecting future projects. Similar to the master planning processes, City staff should endeavour to engage and consult with residents in each focus area to develop a better understanding of local concerns and needs when completing the plans.

Recommendations

1

City staff should undertake transportation plans for each focus area to identify, review and assess neighbourhood transportation improvements for all roadway and pathway users including pedestrians, cyclists, transit users and motor vehicles.

2

The recommendations contained in focus area transportation plans should be used to guide future decision making as it relates to implementation, by identifying prioritization and budgeting for future improvements.

3.3 Developing the Network

A key objective of Walk 'n' Roll Kingston is to help the City achieve a 20% active transportation mode share by 2034. To support this objective, an active transportation network comprised of routes, facilities and supportive infrastructure has been identified. The process used to develop Kingston's active transportation network was iterative and consisted of six steps that were each shaped by input collected from residents, stakeholders and City staff during the course of the study.

A high-level overview of the process used to develop Kingston's active transportation network is presented in **Figure 7**. The details and outcomes of each step are documented in the following sections.

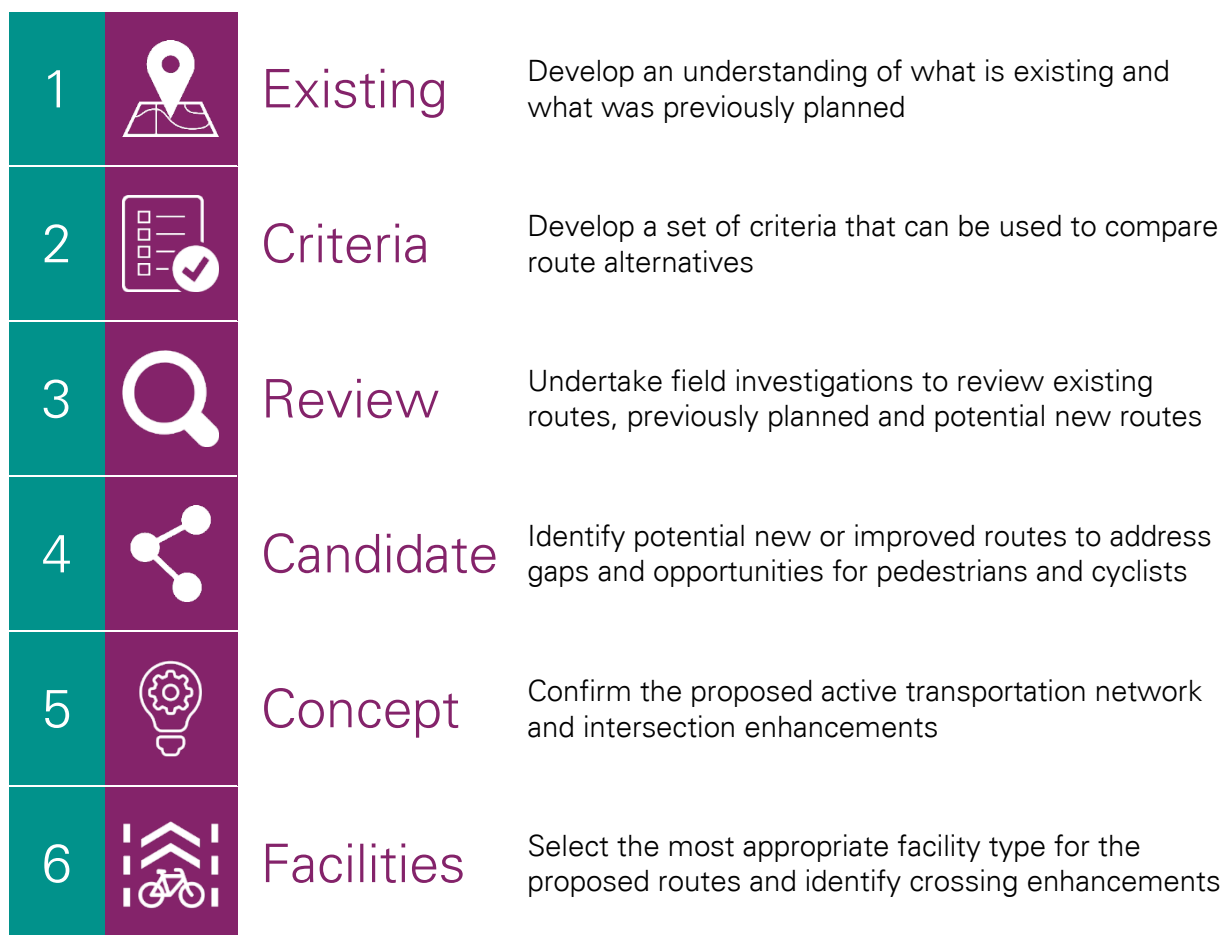


Figure 7 - Kingston Active Transportation Network Development Process

Step 1 – Map Existing and Previously Proposed Routes

Information was gathered from the City of Kingston and used to develop a geographic information system (GIS) database of existing and previously proposed routes. The GIS database was updated on an ongoing basis as part of the study process to reflect new information and input received from members of the public, stakeholders and City staff. It will serve as a valuable tool for the City to guide and monitor implementation.

The City of Kingston covers a large geographic area. To accurately represent all the areas in the City, the Walk 'n' Roll Kingston maps are organized into two categories: City-wide map including rural areas and hamlets; and areas within the urban growth boundary.

Maps 1a and 1b illustrate the existing cycling routes and facilities. **Map 1c** illustrates the existing pedestrian routes and facilities. Together, these routes and facilities present Kingston's existing active transportation network.

The following is a description of the key features included in the mapping:



Waterfront Trail: The Waterfront Trail is primarily an on-road route consisting of key linkages in rural and urban areas. The trail is located along major roads in Kingston such as Old Highway 2, King Street, Bayridge Drive and Highway 33. Off-road segments of the Waterfront Trail are located in parks and open space along St. Lawrence River and Lemoine Point Conservation Area in the City of Kingston.

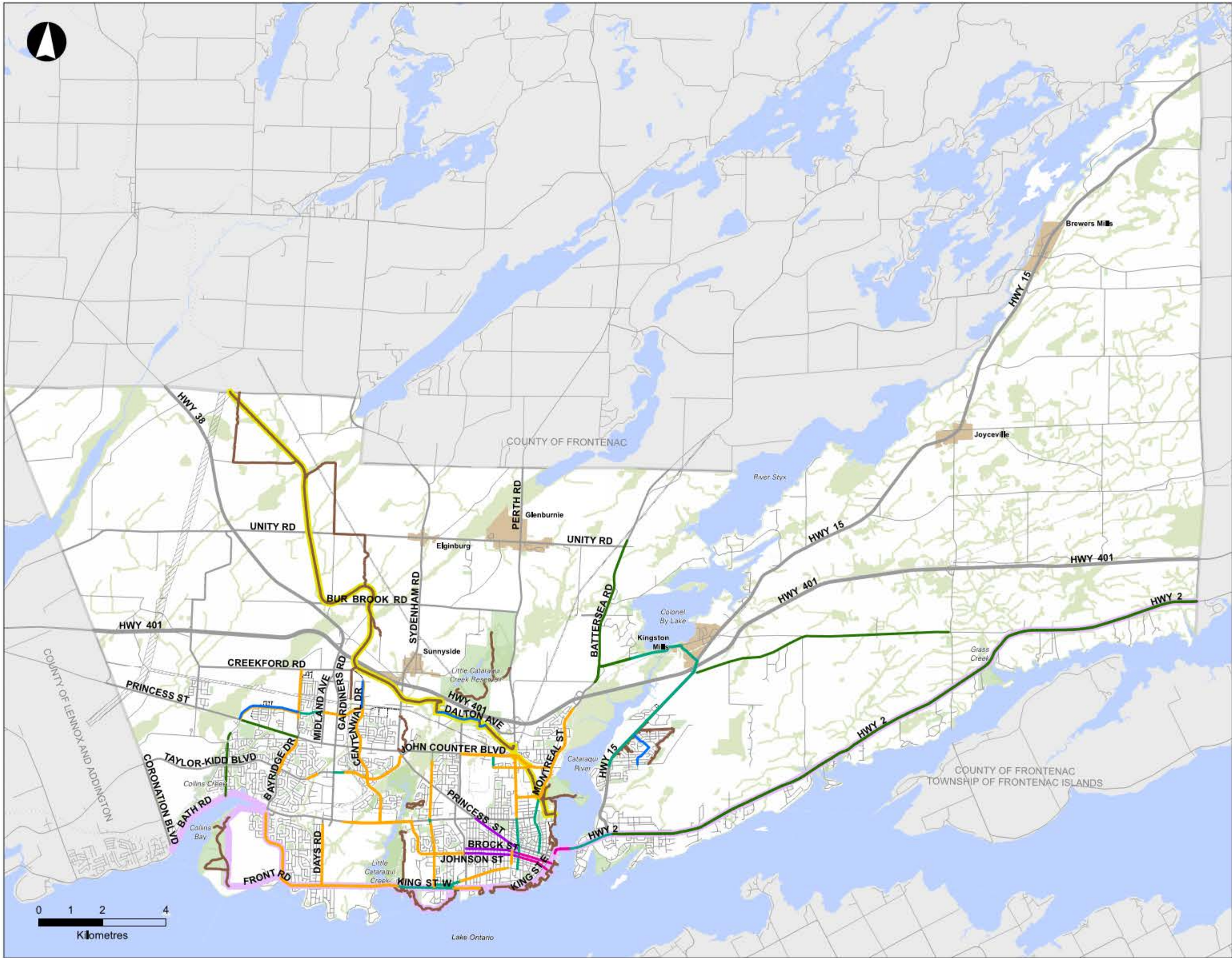


K&P Trail: The K&P Trail is a 22 kilometre off-road route along an abandoned rail corridor from Orser Road to Confederation Park in Kingston. The trail continues north to the Township of South Frontenac and connects the rural areas, hamlets and urban areas in Kingston. The trail is open all year round for non-motorized use.



Community Destinations: Connections to key community destinations such as schools, transit hubs, commercial areas and the downtown area can help increase the desirability for users to engage in active travel for daily trips and active recreation for a variety of purposes such as leisure, health and fitness.

There are a number of pedestrian and cycling routes and facilities identified in the City's Transportation Master Plan (2015), Cycling and Pathways Study (2003), Official Plan (2017), Waterfront Master Plan (2016) and other planning initiatives. These proposed routes and facilities, coupled with the existing infrastructure, provide the starting point for analysis of the City's new, long term AT network. This information has been incorporated into the mapping and GIS database developed for Walk 'n' Roll Kingston and are illustrated in maps contained in **Appendix D**.



MAP 1A
EXISTING CYCLING
NETWORK

CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

Existing Cycling Network

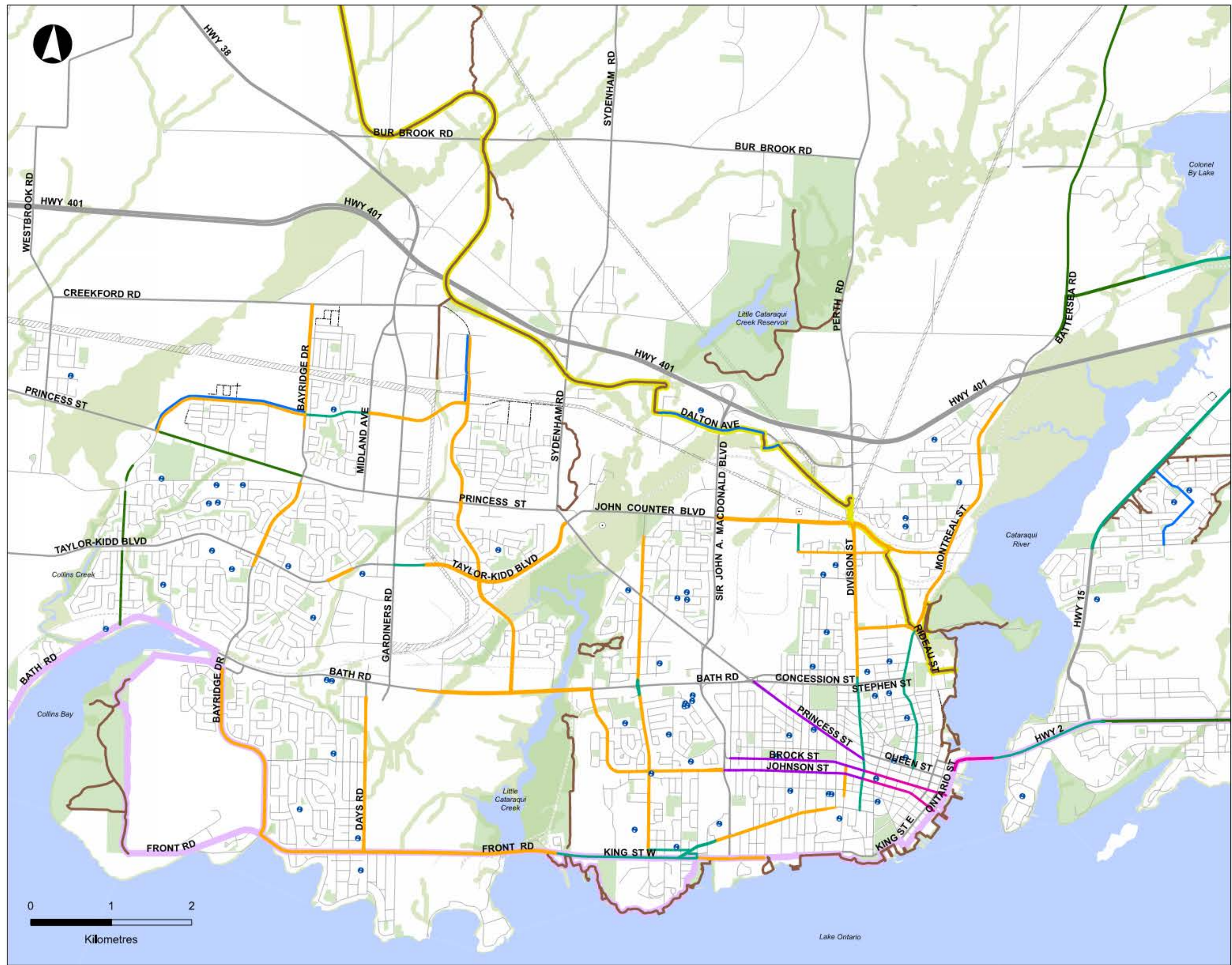
- In-Boulevard Trail
- Buffered Bike Lane
- Bicycle Lane
- Paved Shoulder
- Signed Route with Sharrows
- Signed Route
- Off-Road Trail

Regional Trail Systems

- K & P Trail
- Waterfront Trail

Reference Layers

- Highway / Freeway
- Arterial Road
- Collector Road
- Local Road
- Proposed Road
- Railway
- Hamlets
- Park
- Environmental Protection Area
- Hydro One Easement



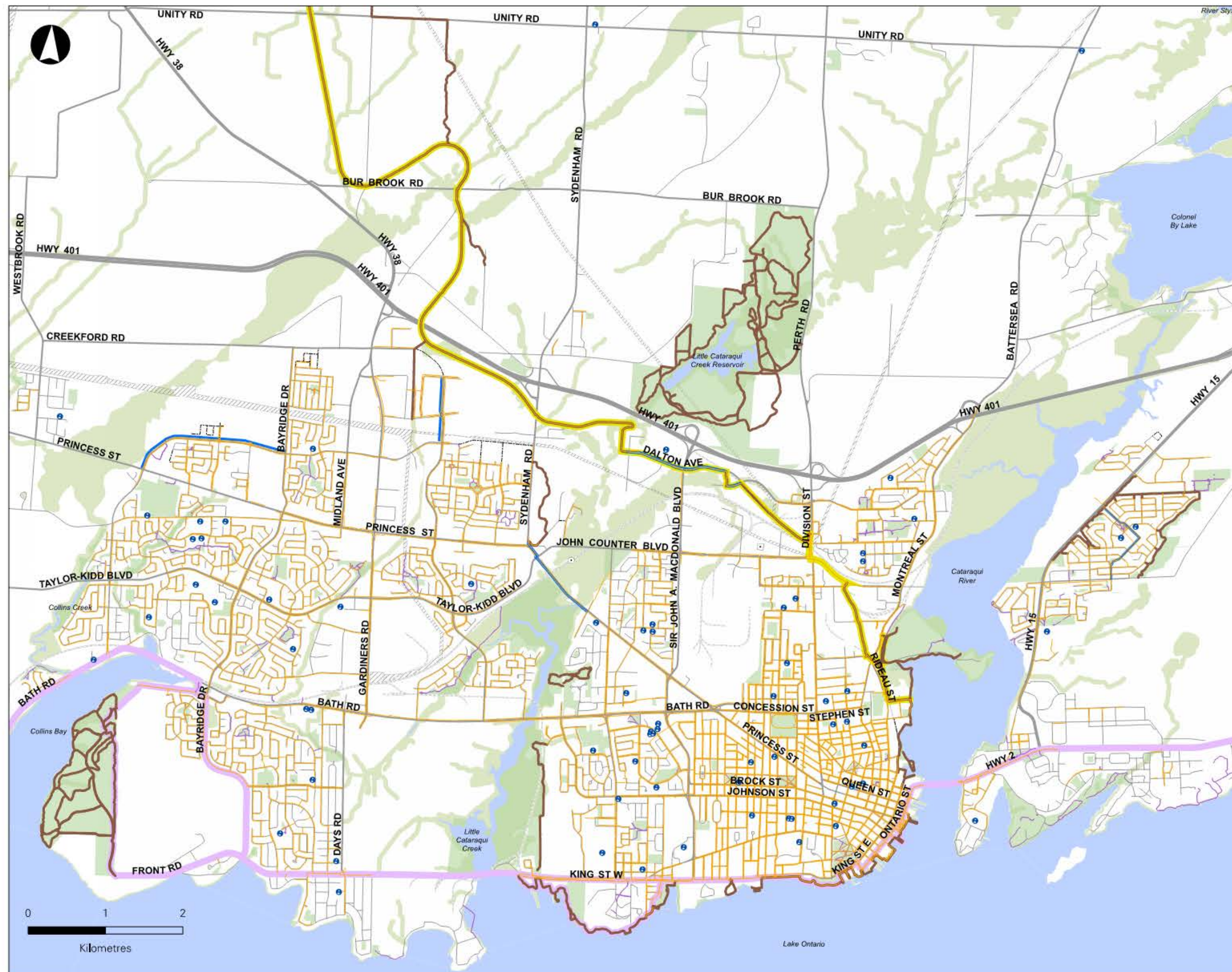
MAP 1B
EXISTING CYCLING
NETWORK
(URBAN AREA)

CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

- Existing Cycling Network**
- In-Boulevard Trail
 - Bicycle Lane
 - Buffered Bike Lane
 - Paved Shoulder
 - Signed Route with Sharrows
 - Signed Route
 - Off-Road Trail
- Regional Trail Systems**
- K & P Trail
 - Waterfront Trail
- Reference Layers**
- Bus Terminal
 - Railway Station
 - School / University
 - Highway / Freeway
 - Arterial Road
 - Collector Road
 - Local Road
 - Proposed Road
 - Railway
 - Environmental Protection Area
 - Park
 - Hydro One Easement





MAP 1C EXISTING PEDESTRIAN NETWORK (URBAN AREA)

CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

Existing Walking Network

- Sidewalk
- In-Boulevard Trail
- Off-Road Trail
- Path

Regional Trail Systems

- K & P Trail
- Waterfront Trail

Reference Layers

- Bus Terminal
- Railway Station
- School / University
- Highway / Freeway
- Arterial Road
- Collector Road
- Local Road
- Proposed Road
- Railway
- Park
- Environmental Protection Area
- Hydro One Easement

Walk 'n' Roll
KINGSTON

Step 2 – Determine Route Selection Criteria

Route selection criteria form a set of principles that are intended to reflect the vision, goals and objectives contained in Walk 'n' Roll Kingston. The criteria reflect the planning and design principles identified in plans of a similar scope and scale and those outlined in widely accepted planning and engineering guidelines.

These criteria were used over the course of the network development process to consider, review and ultimately confirm the preferred routes and facility types for Kingston's active transportation network. The following criteria and questions were used to assess each route.

Access and Potential Use

Does the route connect to significant City or local neighbourhood destinations?

Connectivity and Directness

Does the route allow users to travel long distances and / or serve local neighbourhood needs?

Environmental Sustainability

Does the route provide access to other transportation modes?

Environmental Protection

Does the route have minimal impacts on natural features? Does the route take into account the impact of natural hazards (i.e. flooding and erosion hazards)?

Attractiveness / Aesthetics

Does the route offer scenic value that enriches the experience?

Safety and Comfort

Does the route reduce potential conflict for all users?

Cost

Do the benefits offset the cost to implement the route?

Tourism

Does the route support tourism initiatives?

Step 3 – Investigating the Network

An iterative process was used to inform the selection of candidate routes for the active transportation network. This process included field investigations, indicator mapping and spatial analysis. Each process is outlined below.

Field investigations were undertaken to develop a better understanding of existing conditions, previously planned routes and potential new routes. Photos and information were documented for each route and location investigated, including traffic speed, traffic volume, roadway width, on-street parking, surrounding land uses and local destinations. These field investigations were supplemented by a desktop review allowing the team to revisit specific routes and consider the route selection criteria. The information gathered during these reviews informed the selection of potential routes for the City's active transportation network and preferred facility types. The data and photos collected were used in conjunction with the desktop review to assess the suitability of the candidate routes.

To supplement the field investigations, demographic, density and built form indicators were mapped. These indicators included: population density, employment density, walking distance to transit, intersection density, sidewalk density and cycling facility density. The data used in this mapping exercise was gathered from Land Information Ontario (LIO) and the City of Kingston. The findings were used to inform the network development process and highlight areas that could be improved with pedestrian and cycling infrastructure. The findings were also used to support the application of the route selection criteria and identify areas for new potential routes.

The outcomes of this mapping are presented in **Figures 8 to 14**. Full size maps are provided in **Appendix E**.

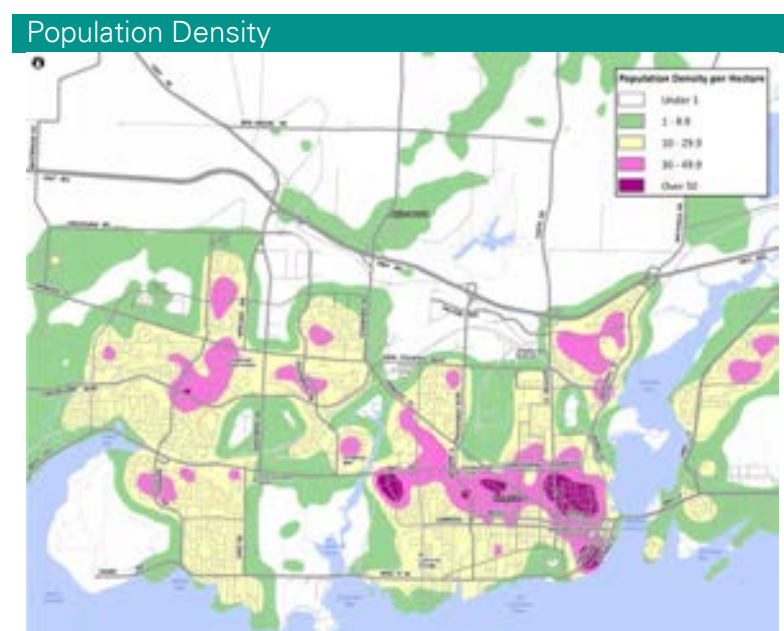


Figure 8 - Population Density Indicator Map

A key goal of developing an active transportation network is to facilitate connections between populated areas. The more densely populated an area is, the greater potential for active transportation trips if suitable infrastructure is provided. This figure displays the areas of Kingston by population density.

Employment Density

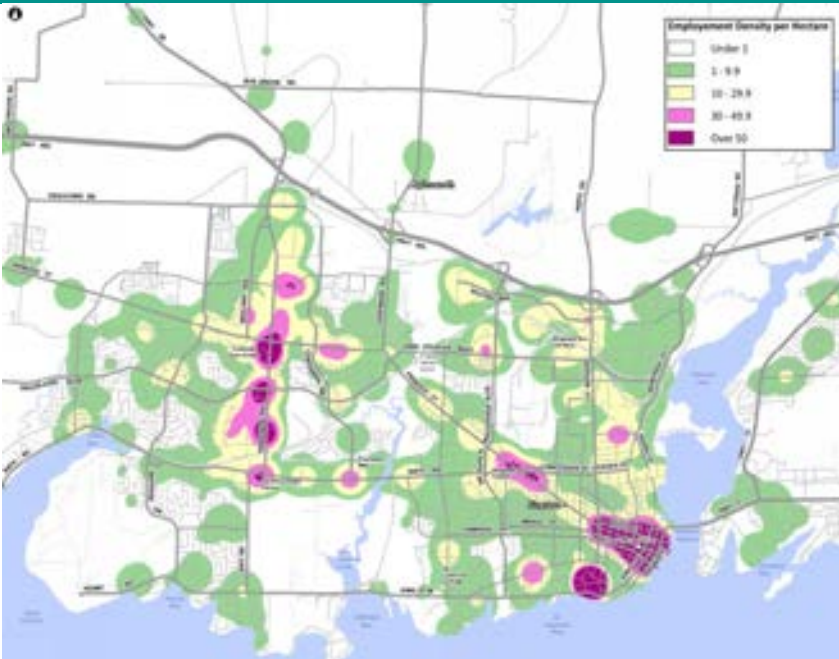


Figure 9 - Employment Density Indicator Map

In addition to connecting population centers, it is important that the active transportation network facilitates connections to employment areas. This figure illustrates the location and density of employment areas in Kingston.

Access to Transit

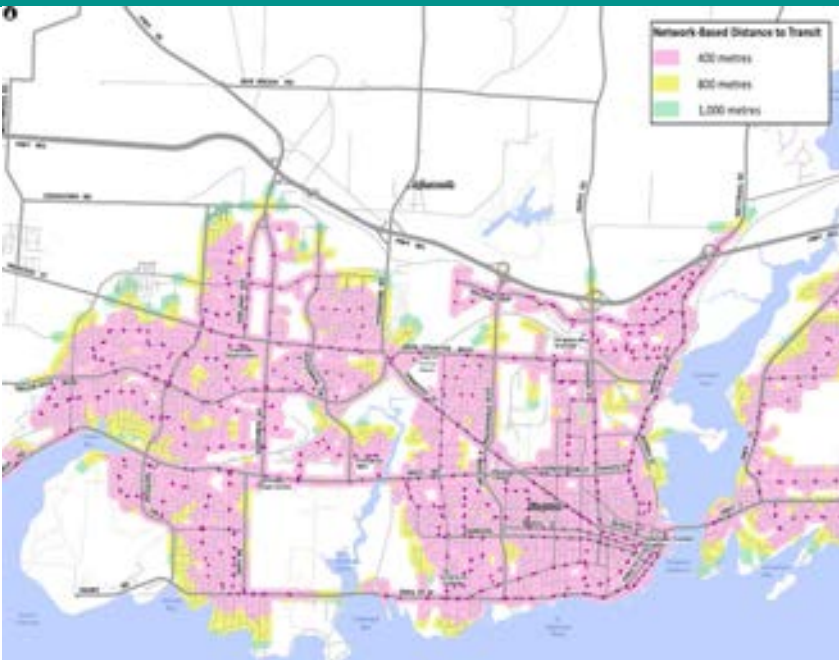


Figure 10 - Access to Transit Indicator Map

Transit is an important component of an active transportation network. The integration of active transportation routes and transit allows users to make longer distance trips and offer flexibility in mode choice. A key goal of the network development process was to reduce the walking time to transit stops. This figure illustrates the network based on walking distances to transit stops in Kingston.

Access to Express Transit Network



Figure 11 - Access to Express Transit Indicator Map

In addition to general transit access, active transportation candidate routes should provide access to transit routes that provide a high frequency of service. Figure 13 provides the access to the express backbone network in Kingston.

Intersection Density

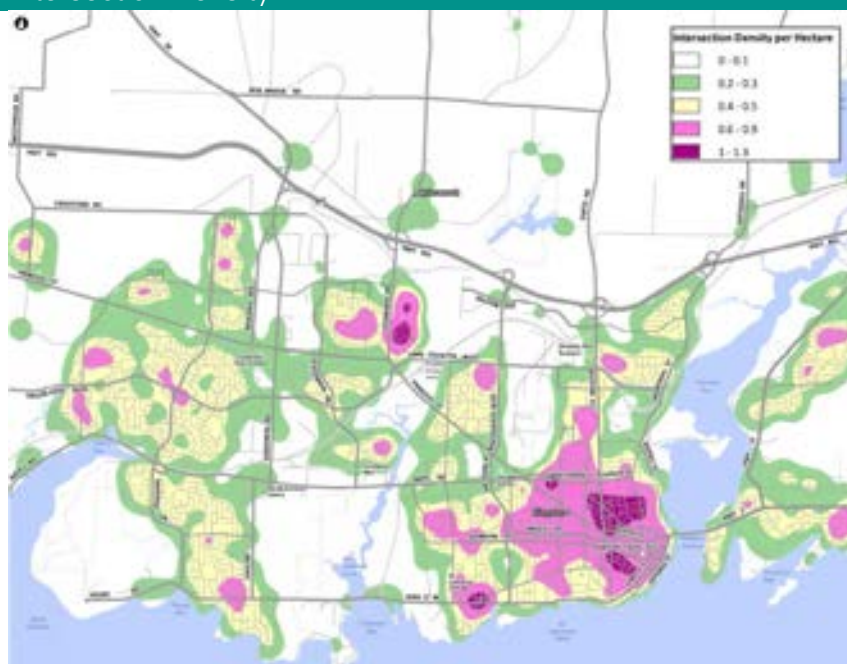


Figure 12 - Intersection Density Indicator Map

Intersection density is an important indicator of a pedestrian and cycling friendly environment. Areas with a higher density of intersections represent a dense urban environment and tend to have greater access to services and amenities and offer key crossing points. Improving access to these areas was a key goal when developing the network.

Sidewalk Density

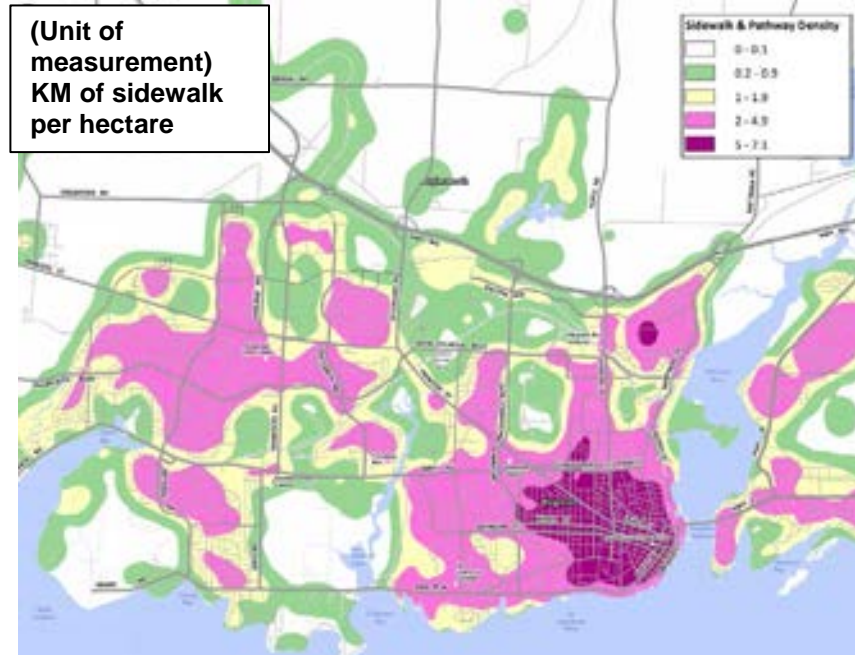


Figure 13 - Sidewalk Density Indicator Map

Sidewalk density is an important factor when identifying areas that are accessible by walking. By visualizing areas with less access to walking facilities, the study team was able to identify potential new connections to improve access for pedestrians. This figure displays the existing density of sidewalks in Kingston. The unit of measure referred to in the legend is "km of sidewalks and trails per hectare".

Cycling Facility Density

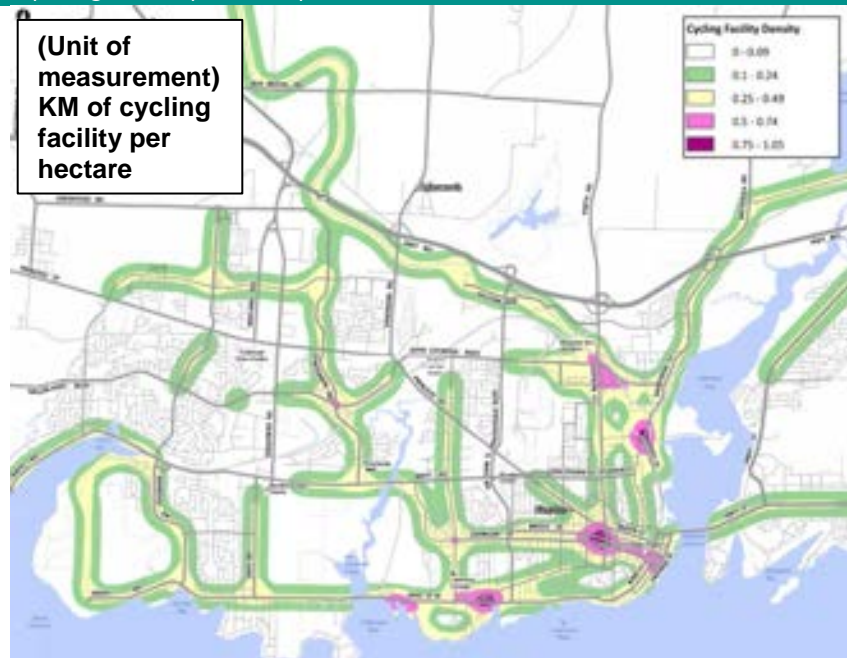


Figure 14 - Cycling Density Indicator Map

Cycling facility density is an important factor in identifying areas that are accessible by bike. By visualizing areas with less access to cycling facilities, the study team was able to identify potential network connections to improve access for cyclists. This figure displays the density of existing cycling facilities in Kingston. The unit of measure referred to in the legend is "km of cycling facilities per hectare".

Prior to undertaking the analysis used to assess areas for future walking and cycling enhancements, the study team assessed the current active transportation mode share by census dissemination area in Kingston. This information helped the study team to develop an understanding of where active transportation is a more prominent form of transportation, compared to other areas, as well as potential reasons for why this is the case.

Figure 15 illustrates the active transportation mode share in the City of Kingston by census dissemination area. The information is based on the Statistics Canada 2016 Census data for walking and cycling trips made to and from work in the City of Kingston.

The findings reveal that over 50% of the working population located in several census dissemination areas within Focus Areas G, J, K, L and M, walk and / or bike to and from work. The findings also illustrate that over 75% of the working population located in census dissemination areas within Focus Areas K and M, walk and / or bike to and from work.

The findings also illustrate that census dissemination areas with low active transportation mode shares are located in areas where population density is low, areas where residents do not live (e.g. conservation authority lands, wetlands, open spaces, etc.) and areas that are furthest from the downtown core in Kingston.

These findings help to support and rationalize the findings illustrated on **Figures 8 to 14**; areas that have the highest proportion of residents walking and / or biking to and from work are the same areas that have the highest population density, highest employment density, most direct access to transit and an express transit network as well as a highest density of sidewalks and cycling facilities. Most areas that have a low proportion of residents walking and / or biking to and from work have a low employment density and moderate-low access to transit and an express transit network. Some of these areas do however have a moderate density of sidewalks and cycling facilities. These findings may reveal potential areas for improvement to increase the City's overall active transportation mode share.

The findings in **Figure 15** were used to supplement the indicator mapping (Figures 8 to 14) and additional spatial analysis to highlight areas that could be improved with pedestrian and cycling infrastructure in an effort to help the City achieve an overall 20% active transportation mode share by 2034. These findings were also used to support the application of the route selection criteria to identify areas for new potential routes in the City of Kingston.

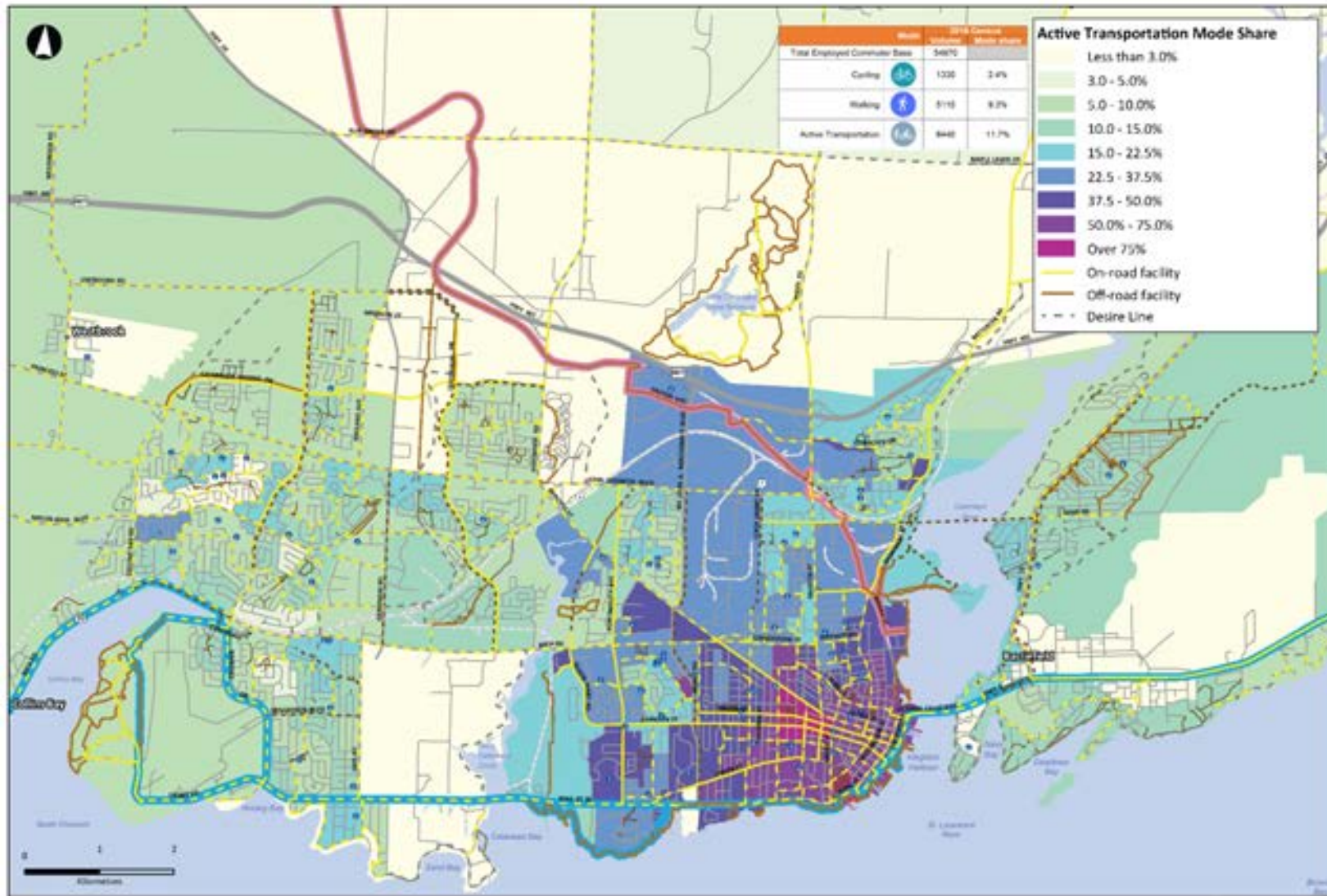


Figure 15 – Active Transportation Mode Share by Dissemination Area

Lastly, a spatial analysis was conducted using the indicators listed below (plus average slope) to identify areas in Kingston where cycling and walking enhancements would yield the greatest benefit in terms of increasing the active transportation mode share.

Walking Analysis

- » Population and business density
- » Intersection density
- » Sidewalk / pathway density

Cycling Analysis

- » Population and employment density
- » Intersection density
- » Cycling route density

Based on the study team's spatial analysis, **Figures 16** and **17** highlight areas that were identified as candidates for cycling and pedestrian infrastructure enhancements. This analysis was used to assess the existing network and inform the selection of candidate routes and facility types for the City's active transportation network. The results of the analysis are displayed using a gradient of colours to represent areas that are considered more or less suitable for enhancements.

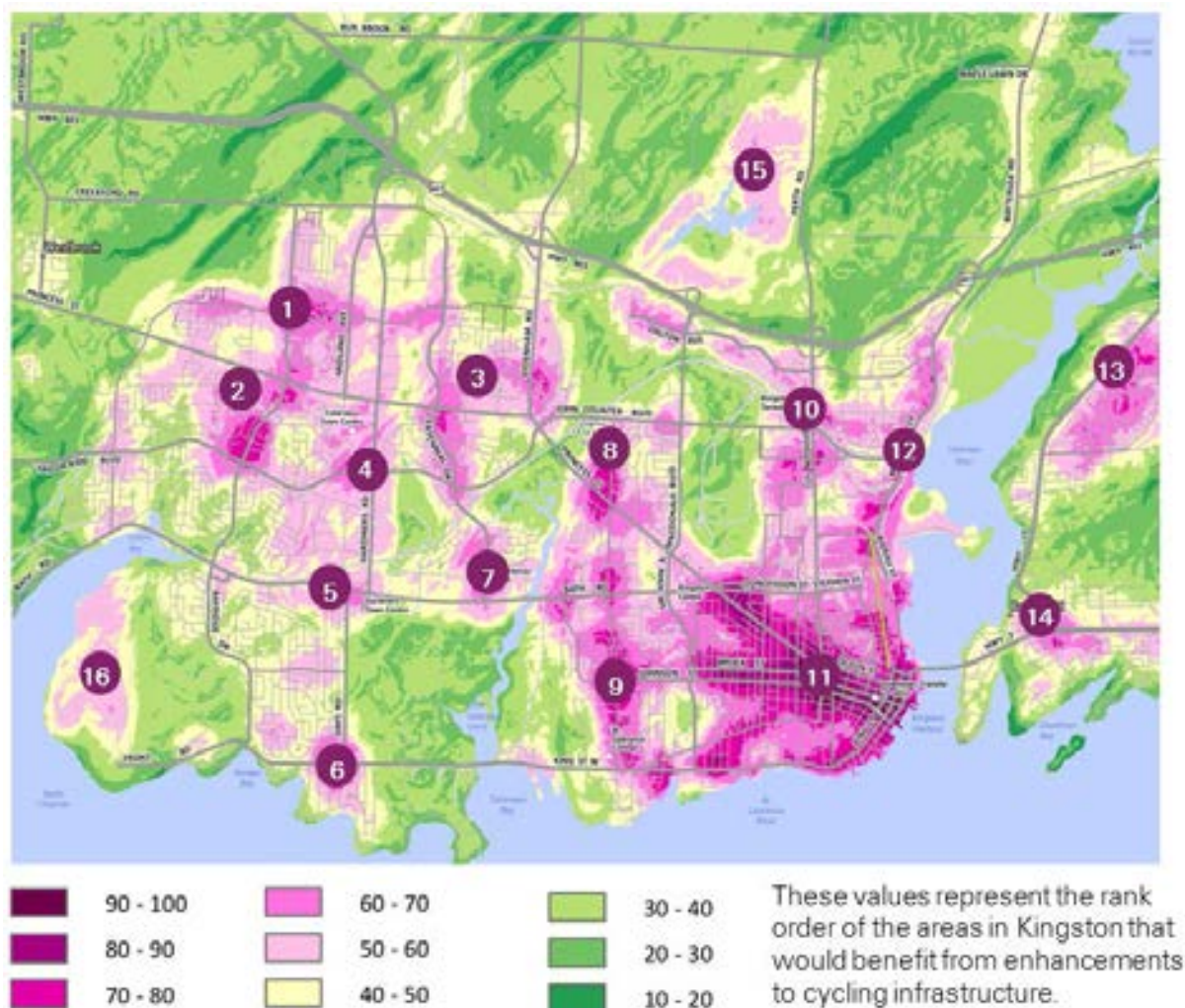


Pink / dark pink areas are considered to be more suitable for enhancements



Green / dark areas are considered to be less suitable for enhancements

Focus Areas for Cycling Enhancements

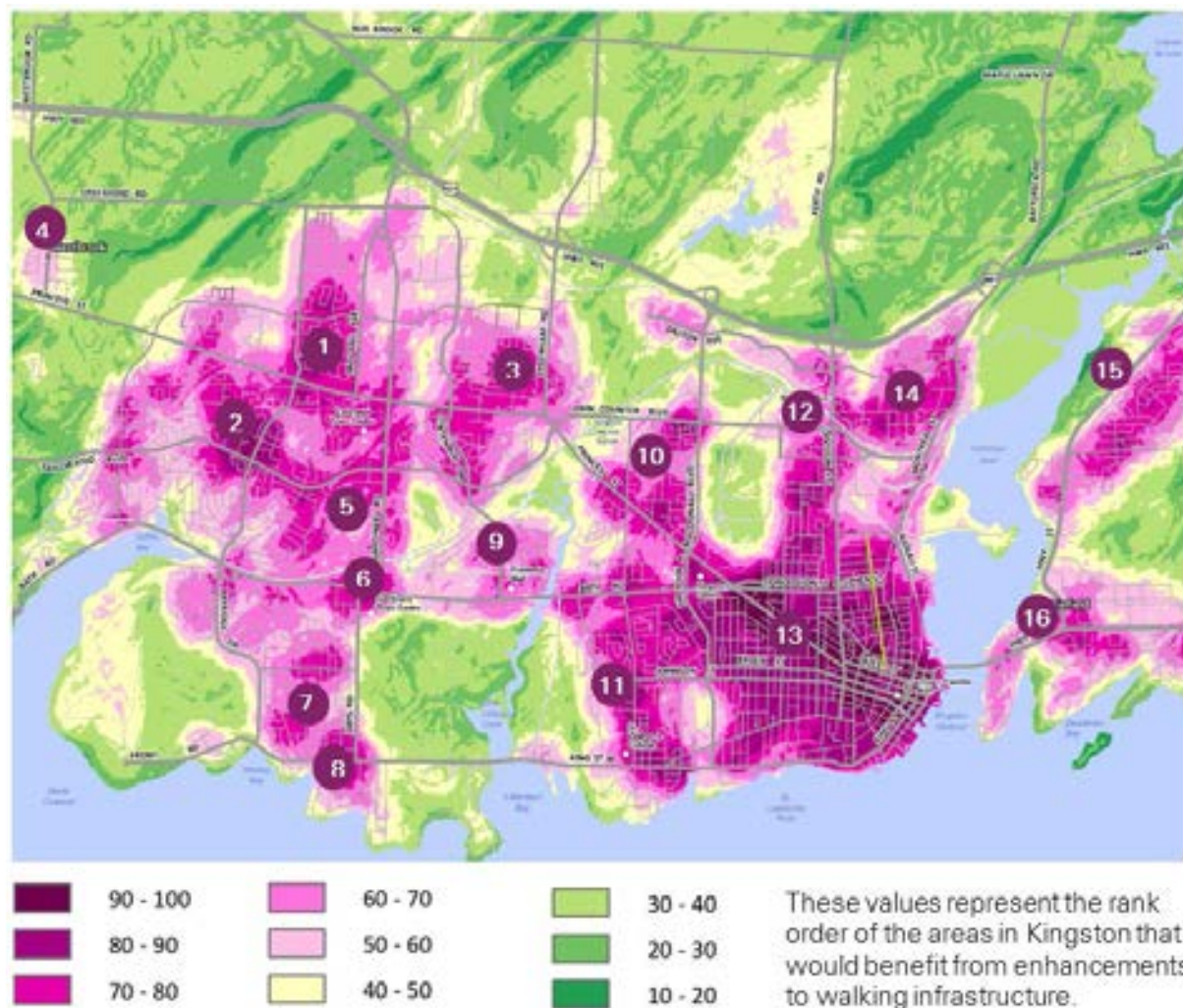


Focus Areas for Cycling Enhancements

- | | |
|---|--|
| 1. Cataraqui Westbrook | 9. Calvin Park |
| 2. Bayridge West / East | 10. Kingston Bus Terminal |
| 3. Cataraqui North | 11. Downtown / Queen's University |
| 4. Sutton Mills (Cataraqui Town Centre) | 12. Rideau Heights |
| 5. Auden Park (Gardiners Town Centre) | 13. Greenwood / St Lawrence South |
| 6. Reddendale / Henderson | 14. CFB Kingston |
| 7. Gardiners / Meadowbrook (Frontenac Mall) | 15. Little Cataraqui Creek Conservation Area |
| 8. Kingston VIA Rail Station | 16. Lemoine Point Conservation Area |

Figure 16 - Cycling Analysis in Kingston

Focus Areas for Pedestrian Enhancements



Focus Areas for Pedestrian Enhancements

- | | |
|---|-----------------------------------|
| 1. Cataraqui Westbrook | 9. Frontenac Mall |
| 2. Bayridge West / East | 10. Strathcona Park |
| 3. Cataraqui North | 11. Calvin Park |
| 4. Westbrook | 12. Kingston Bus Terminal |
| 5. Sutton Mills (Cataraqui Town Centre) | 13. Downtown / Queen's University |
| 6. Gardiners Town Centre | 14. Rideau Heights |
| 7. Henderson | 15. Greenwood / St Lawrence South |
| 8. Reddendale | 16. CFB Kingston |

Figure 17 - Walking Analysis in Kingston

The findings in **Figures 16** and **17** reveal many areas and routes that are considered to be suitable for walking and cycling enhancements. These include:



Downtown area



Montreal Street



Portsmouth Avenue



Greenwood Park area



Cataraqui Centre



Bayridge Drive

The findings also reveal areas that are considered less suitable for enhancing walking and cycling activity. This may be because of the low density and / or type of land uses (e.g. more industrial, manufacturing and motor vehicle focused) or because of challenges in improving pedestrian and cycling access relative to anticipated low demand.

These findings are intended to highlight potential areas for improvement that should be investigated and considered through the network development process. They represent the areas that are thought to benefit the most from cycling and walking enhancements and also support the City's 20% AT mode share goal. These findings should not be used exclusively or in isolation; they are intended to supplement observations documented during field investigations and trends illustrated in the indicator mapping. These results along with the input received from City staff, stakeholders and residents were used to inform the selection of candidate city-wide and local neighbourhood network routes.

Step 4 – Identify Candidate Routes

Candidate routes are potential new connections that could form part of the City's active transportation network. Building upon the information and results gathered from steps 1 to 3 of the network development process, the study team worked with City staff and members of TAG to identify potential new on and off-road routes. Candidate routes were identified and evaluated based on their ability to:

- » Complete missing links in the active transportation network;
- » Provide opportunities for neighbourhood trips within transportation focus areas;
- » Form a spine network to facilitate key north-south and east-west City-wide trips;
- » Provide opportunities for multi-modal travel e.g. link to transit hubs, to support the City's target to achieve a 20% active transportation mode share by 2034;
- » Improve connectivity between neighbourhoods;
- » Address the needs of residents, local stakeholders and City staff; and
- » Provide safe and comfortable routes to schools, major destinations, parks and open space areas.

To supplement these criterion, the study team assessed existing City policy to address gaps in the pedestrian system. Based on the City of Kingston Official Plan Policy 4.6.4, the following assumptions were applied to identify new sidewalk connections:

- » Urban arterial and collector roads: pedestrian facility on both sides of a roadway
- » Rural arterial and collector roads: pedestrian facility on at least one side of the roadway
- » Local roads near schools or other pedestrian generators: pedestrian facility on both sides of the roadway

Appendix F includes maps that illustrate the proposed candidate routes. The candidate routes were presented at the first public open house, workshop / public forum and TAG meeting in October 2016. Attendees and City staff were asked to provide their input on the candidate routes and to identify additional routes for consideration. The input collected was used to refine the selection of routes and confirm the preferred network concept (see step 5).



Example of input collected on draft candidate routes map from TAG Meeting, October 2016

Step 5 – Review and Confirm Network Concept

The selection of preferred active transportation routes was refined based on the outcomes of steps 1-4 of the network development process and input received over the course of the study. **Maps 2a and 2b** illustrate the proposed network. The preferred routes are organized into the following two categories:

- » **City-wide Spine Routes:** direct north-south and east-west routes that link to major destinations such as transit hubs and commercial centres. The routes are found on arterial roadways and typically used for commuting and long distance / touring purposes.
- » **Neighbourhood Routes:** routes within Transportation Focus Areas. These routes are typically along local roads with low motor vehicle volumes and low speeds, and may link through open spaces and parks. Neighbourhood routes provide access to local destinations, link to the spine network, or provide access to the transit network.

Appendix G includes maps that illustrate the proposed City-wide spine and neighbourhood routes in each Transportation Focus Area. The intent of these maps is to illustrate the proposed routes at a local level within each focus area and how this is integrated into the City-wide transportation system. The preferred routes form the proposed active transportation network for the City of Kingston. These routes were further investigated to determine the appropriate facility for each route – see step 6 of the network development process.

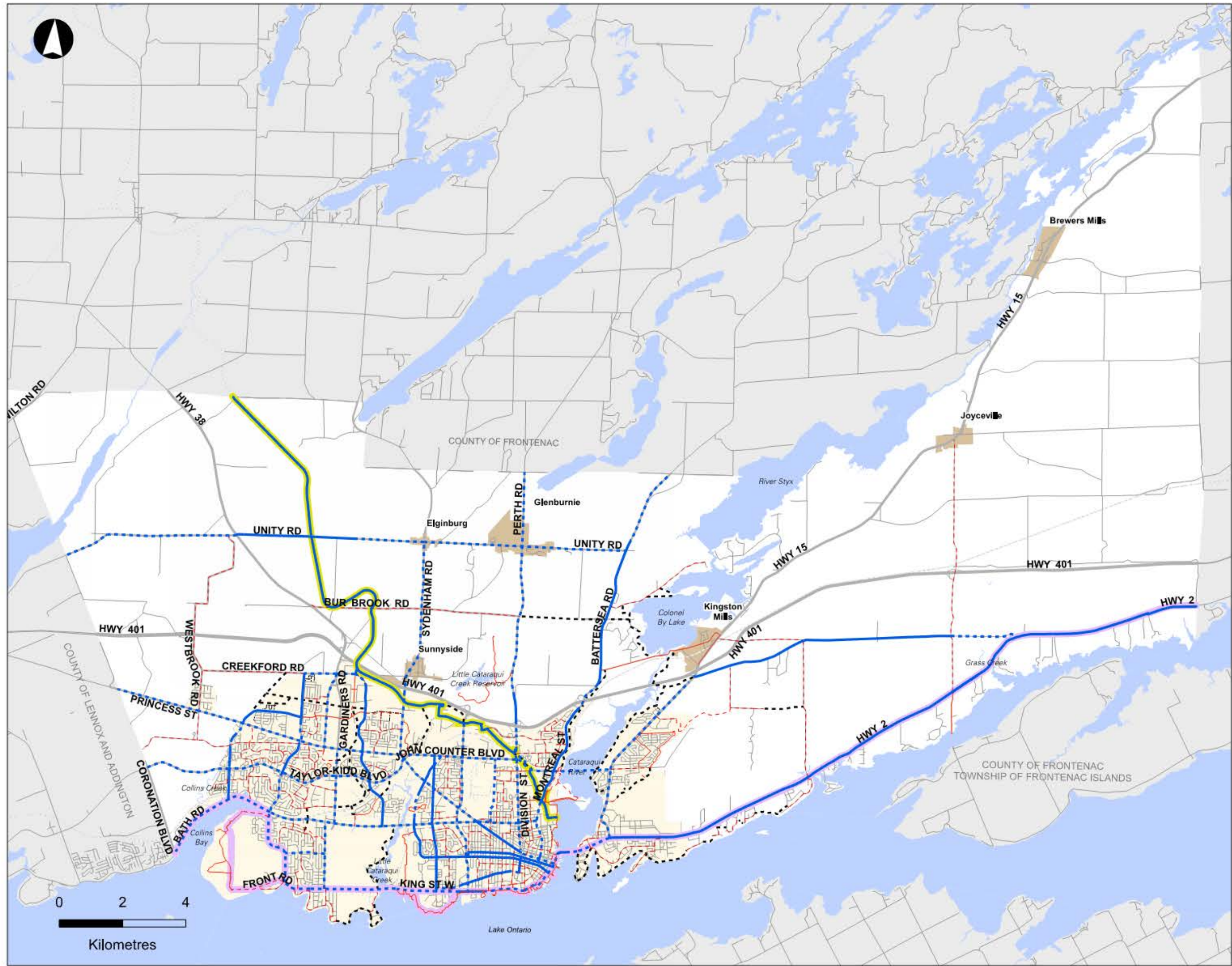
Step 6 – Confirm Facility Types and Enhancements

Based on the preferred active transportation network established in step 5, the study team undertook a three-step process to identify preferred facility types for each cycling route. The process was used to identify the appropriate facility type and ensure it was consistent with the facility selection tool outlined in Ontario Traffic Manual (OTM) Book 18: Cycling Facilities – the province's primary guidelines for cycling network planning and facility selection. The three-step process is illustrated in **Figure 18** and contains the following steps:

- » Assess operating speed and traffic volumes to predetermine a level of separation (step 1);
- » Review detailed contextual considerations (step 2); and
- » Document the rationale that supports the facility type recommendation (step 3).

Routes located outside of the road right-of-way (e.g. sidewalk connections and off-road trails) were assessed to address pedestrian connectivity and missing gaps. Missing pedestrian links were identified based on:

- » Input provided by City staff, stakeholder and public input;
- » Capital budgets / future planned projects;
- » Route selection criteria;
- » Walk 'n' Roll Kingston objectives; and
- » Conditions / location specific context observed through field work investigations, indicator mapping and spatial analysis mapping.



MAP 2A
CYCLING NETWORK
HIERARCHY

CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

Cycling Network Hierarchy

- Existing Spine Route
- Proposed Spine Route
- Existing Neighbourhood Route
- Proposed Neighbourhood Route
- Desire Line

Regional Trail Systems

- K & P Trail
- Waterfront Trail

Reference Layers

- Highway / Freeway
- Arterial Road
- Collector Road
- Local Road
- Proposed Road
- Railway
- Hamlets
- Urban Area



MAP 2B
CYCLING
NETWORK HIERARCHY
(URBAN AREA)

CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

Cycling Network Hierarchy

- Existing Spine Route
- Proposed Spine Route
- Existing Neighbourhood Route
- Proposed Neighbourhood Route
- Desire Line

Regional Trail Systems

- K & P Trail
- Waterfront Trail

Reference Layers

- Bus Terminal
- Railway Station
- School / University
- Railway
- Highway / Freeway
- Arterial Road
- Collector Road
- Local Road
- Proposed Road
- Urban Area

Walk 'n' Roll
KINGSTON

Preferred facility types were assessed and confirmed for existing, previously planned and new active transportation routes. The proposed active transportation network by facility type are presented on **Maps 3a to 3c**.

STEP 6A

Pre-Selection of Facility Type



Shared



Designated



Separated



Off-road Trail

STEP 6B

Examine other factors

On-Road Routes

- » Function of the roadway
- » Vehicle mix and speed
- » Collision history
- » Available space
- » Cost
- » Anticipated use
- » Type of improvement
- » On-street parking
- » Intersection Frequency

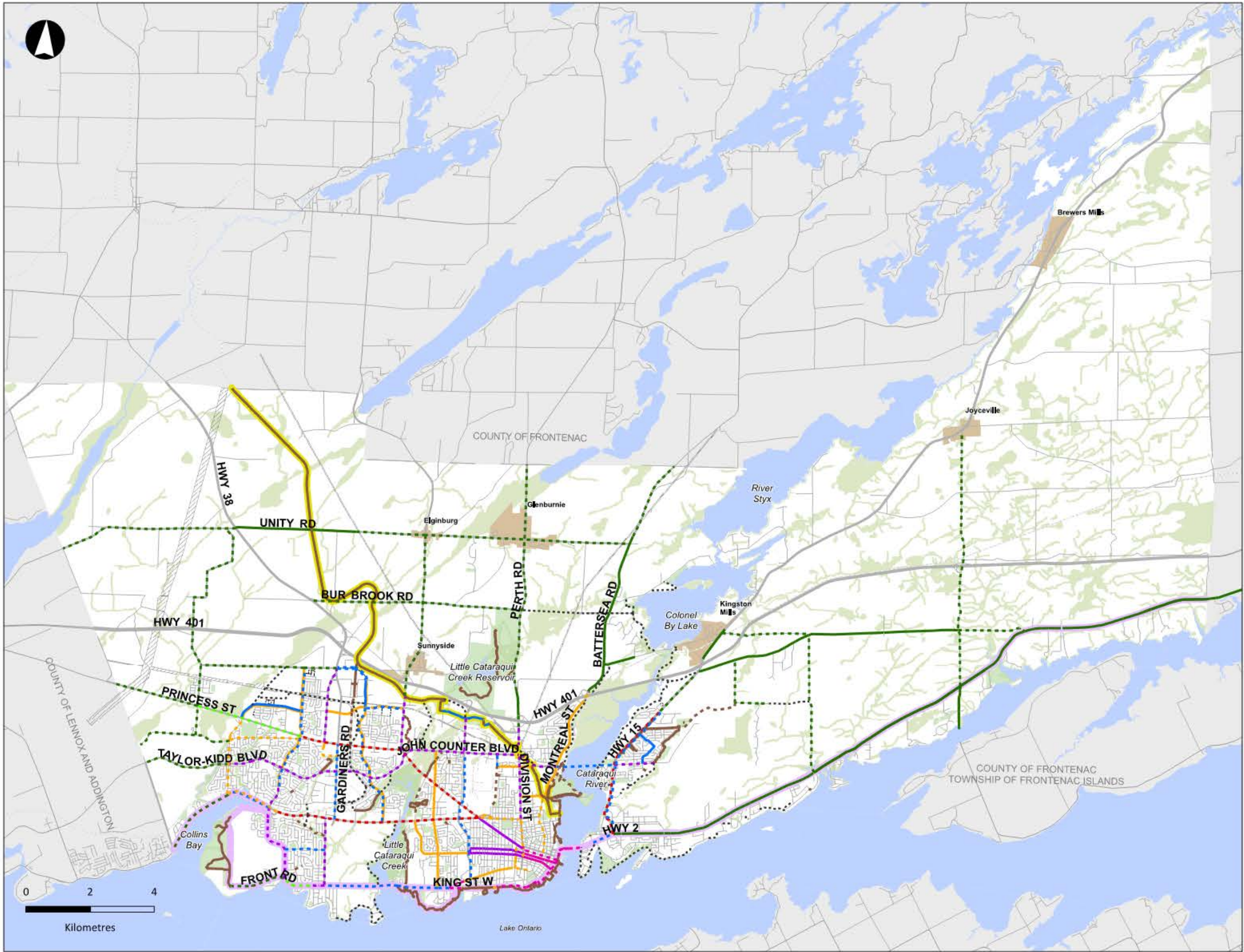
Off-Road Routes

- » Connectivity
- » Environmental Protection and regulatory process
- » Safety
- » Potential use
- » User experience
- » Topography
- » Barriers
- » Cost
- » Maintenance
- » Accessibility (AODA)

STEP 6C

Recommend and Document Results

Figure 18- Overview of the Three Step Facility Selection Process



MAP 3A
CYCLING NETWORK
BY FACILITY TYPE

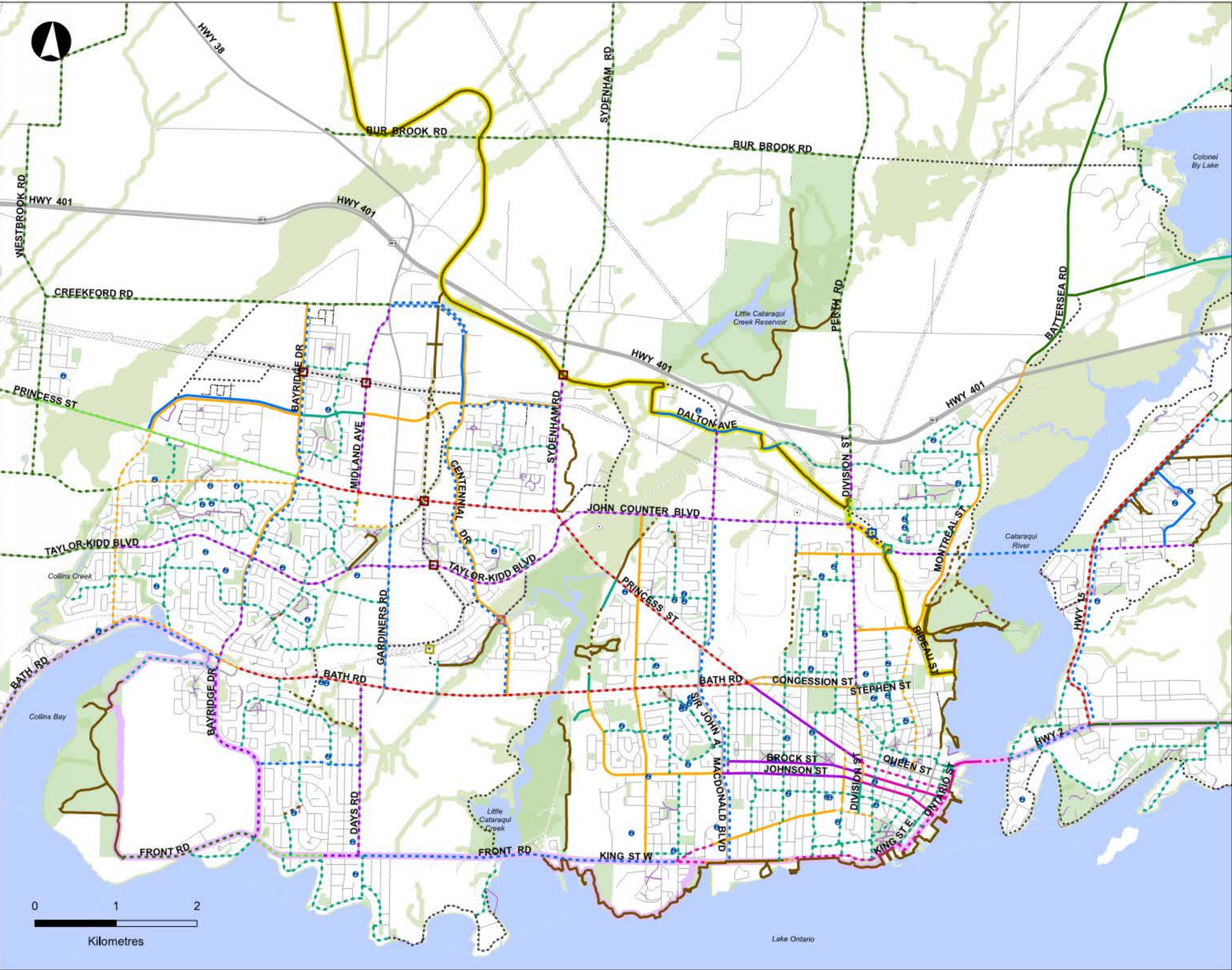
CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

Facility Types	
Existing	Proposed
In-Boulevard Trail	
Cycle Track	
Buffered Bike Lane	
Bike Lane	
Signed Route with Sharrows	
Buffered Paved Shoulder	
Paved Shoulder	
Off-Road Trail	
Desire Line	
Regional Trail Systems	
K & P Trail	
Waterfront Trail	
Reference Layers	
Highway / Freeway	
Arterial Road	
Collector Road	
Local Road	
Proposed Road	
Railway	
Hamlets	
Park	
Environmental Protection Area	
Hydro One Easement	

*Please note: Signed routes within the urban area are displayed on Map 3B





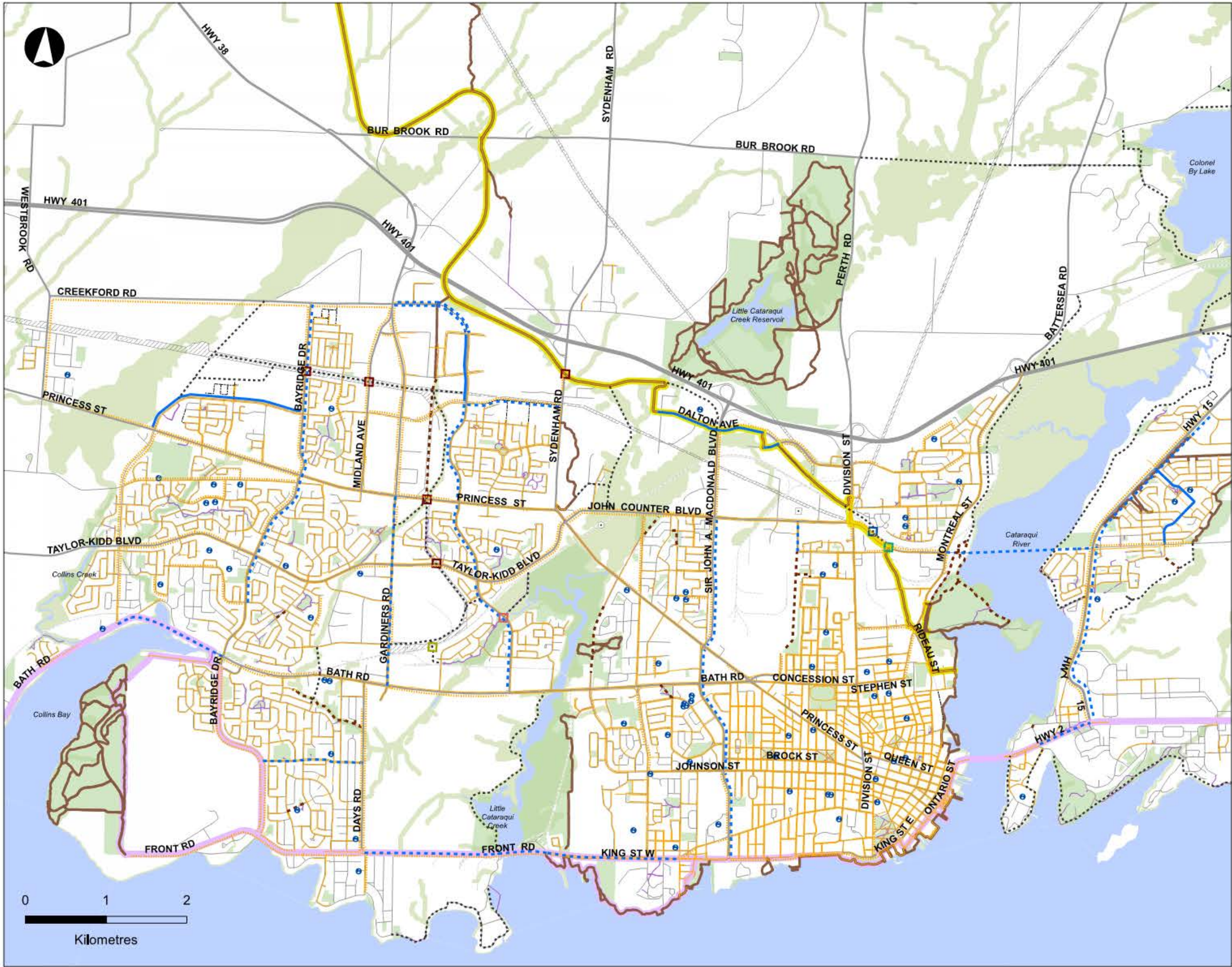
MAP 3B
CYCLING NETWORK
BY FACILITY TYPE
(URBAN AREA)

CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

- Facility Type**
- | Existing | Proposed |
|----------------------------|----------|
| In-Boulevard Trail | --- |
| Cycle Track | --- |
| Buffered Bike Lane | --- |
| Bike Lane | --- |
| Signed Route with Sharrows | --- |
| Signed Route | --- |
| Buffered Paved Shoulder | --- |
| Paved Shoulder | --- |
| Off-Road Trail | --- |
| Path | --- |
| Desire Line | --- |
- Regional Trail Systems**
- K & P Trail
 - Waterfront Trail
- Proposed Pedestrian Crossings**
- Stairway Connection
 - Intersection Crossing
 - Mid-Block Crossing
 - Desired Crossing
 - Rail Crossing
- Reference Layers**
- School / University
 - Railway Station
 - Bus Terminal
 - Highway / Freeway
 - Arterial Road
 - Collector Road
 - Local Road
 - Proposed Road
 - Railway
 - Park
 - Environmental Protection Area
 - Hydro One Easement





MAP 3C
PEDESTRIAN NETWORK
BY FACILITY TYPE
(URBAN AREA)

CITY OF KINGSTON ACTIVE
TRANSPORTATION PLAN

Walk 'n' Roll Kingston

- Facility Type**
- | Existing | Proposed |
|--------------------|--------------------|
| Sidewalk | Sidewalk |
| In-Boulevard Trail | In-Boulevard Trail |
| Path | Path |
| Desire Line | Desire Line |
- Regional Trail Systems**
- K & P Trail
 - Waterfront Trail
- Proposed Pedestrian Crossings**
- Stairway Connection
 - Intersection Crossing
 - Mid-Block Crossing
 - Desired Crossing
 - Rail Crossing
- Reference Layers**
- School / University
 - Railway Station
 - Bus Terminal
 - Highway / Freeway
 - Arterial Road
 - Collector Road
 - Local Road
 - Proposed Road
 - Railway
 - Park
 - Environmental Protection Area
 - Hydro One Easement

Walk 'n' Roll
KINGSTON

Recommendations (Continued)

3	The proposed active transportation network illustrated on Maps 3a to 3c should be adopted by the City of Kingston to guide future facility design and implementation.
4	As the active transportation network changes over time, the mapping and GIS database should be updated to reflect the most up to date conditions. The City should strive to review and revise the database and mapping on an annual basis.
5	The active transportation network is flexible. There may be opportunities for additional or alternate connections to be made in the future. These connections should be considered and the mapping and database updated.
6	The specific design treatments of the proposed crossing and intersection enhancements illustrated on Maps 3a to 3c should be reviewed and determined through separate transportation plans for the City’s Transportation Focus Areas.







Johnson Street, Kingston
Source: WSP 2016

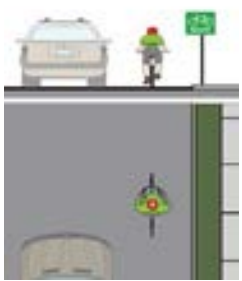




3.4 Understanding the Network

The City’s active transportation network includes different facility types, both existing and proposed. **Table 8** outlines key design considerations for each facility type included in the City’s active transportation network.

Table 8- Overview of Proposed Facilities Considerations

Facility Type	Cross Section	Description	Location		Context			Volume	Speed	Minimum Width	Signage				Pavement Markings		
			O*	W*	U*	S*	R*				Green Bike Route Sign	Bike Lane Sign	Share the Road	Multi-use Pathway	Bike Stencil	Painted Line	Chevron
In-Boulevard Trail		A separated space found within the boulevard of the roadway – in place of a sidewalk – which accommodates both pedestrians and cyclists in a shared space. Can be uni or bi-directional.		•	•	•		▲	▲	3.0m				×	×		
Cycle Track		A separate space between the motor vehicle lane and curb. Appropriate on roads with high speeds and volumes. Can be uni or bi-directional.		•	•	•		▲	▲	1.5m One-way 3.0m Two-way					×		
Buffered Bike Lane		On roads with higher volume and speed within urban and suburban areas a buffer may be implemented to provide more separation between the cyclist and motor vehicles.		•	•	•		▲	▲	Lane 1.5m Buffer 0.5m		×			×	×	
Bike Lane		Cyclists are provided with a designated space which is identified by pavement markings and signage. Bike lanes could include green painted treatment along key corridors. When approaching an intersection dash lines to allow for passing.		•	•	•		►	►	1.5m		×			×	×	

Location Notes: *O – Outside of the Road Right of Way; *W – Within the Road Right of Way
Context Notes: context pertains to the type of land-use / neighbourhood where the facility type might be more appropriate *U – Urban; *S – Semi-Urban; *R – Rural
▲ high traffic volume or speed; ► moderate traffic volume or speed; ▼ low traffic volume or speed

Facility Type	Cross Section	Description	Location		Context			Volume	Speed	Minimum Width	Signage				Pavement Markings		
			O*	W*	U*	S*	R*				Green Bike Route Sign	Bike Lane Sign	Share the Road	Multi use Pathway	Bike Stencil	Painted Line	Chevron
Signed Bike Route		Motorists and cyclists share the same vehicular travel lane. Bicycle route signs are used to provide route guidelines. Could be supplemented by a Share the Road sign in select locations e.g. poor sightlines, etc.		•	•	•	•	▼	▼	N/A	×		×				
Buffered Paved Shoulder		On roads with higher volume and speed within rural areas, in addition to the paved shoulder a buffer may be implemented. The width depends on the speed and volume of the roadway		•			•	▲	▲	Lane 1.5m Buffer 0.5m	×		×			×	
Paved Shoulder		Cyclists are provided with a designated space on the road platform. The route is signed as a bicycle route and could include supplementary share the road signage in select locations.		•			•	►	►	1.5m	×		×			×	
Off-road Trail		A separated space typically through a natural area or corridor that accommodates pedestrians and cyclists. The surface type can range from natural surface to asphalt depending on the location.	•		•	•	•	N/A	N/A	3.0m							
Sidewalk		A space within the boulevard which accommodates pedestrians.	•		•	•	•	▲	▲	1.5m							

Location Notes: *O – Outside of the Road Right of Way; *W – Within the Road Right of Way
Context Notes: context pertains to the type of land-use / neighbourhood where the facility type might be more appropriate *U – Urban; *S – Semi-Urban; *R – Rural
▲ high traffic volume or speed; ► moderate traffic volume or speed; ▼ low traffic volume or speed

3.4.1 Intersection and Crossing Improvements

Intersections can be vulnerable locations for active transportation users as this is the most common location where different modes of transportation cross paths. The integration of active transportation routes into the overall transportation network and specifically at intersections can create conflict points for pedestrians, cyclists, transit users and all other roadway users.

To maximize comfort, connectivity and sense of safety, the design of intersections should take into consideration the movement of all roadway users. Specific intersection improvements should be reviewed and determined through separate neighbourhood level Transportation Plans in an effort to address the unique challenges and opportunities experienced by a particular transportation focus area. Similar to the master planning processes, City staff should endeavour to engage and consult with residents of a focus area to develop a better understanding of the specific issues and identify context-specific solutions to improve intersection crossings. Examples of intersection improvements that may be considered in individual Transportation Focus Area Plans include but are not limited to:

- » Midblock crossing improvements for pedestrians, cyclists and transit users;
- » Reduction and / or reallocation of motor vehicle lanes;
- » Traffic control measures such as stop signs, traffic signals and roundabouts;
- » Exclusive right-turn lanes for motor vehicles;
- » Multi-purpose lanes for various road users;
- » Pedestrian refuge islands;
- » Speed management measures in school zones;
- » Review of posted speeds;
- » Road diets to allocate space for cycling facilities; and
- » Bicycle signals.

There are a number of treatments which can help to improve a user's ability to cross a roadway or intersection, and transition between facility types with greater comfort and lower risk. These include, but are not limited to:

- » **Bike boxes** are designated areas between the crosswalk and the stop bar to be used by cyclists while waiting for a green signal. The bike box is intended to increase a cyclist's visibility and allows cyclists to proceed ahead of motorists on the green traffic signal.



Bike Box, Ottawa

- » **Signage and pavement markings** increase awareness of cyclists on the road and provide cyclists with a space to use when going through an intersection or transitioning to another facility. Pavement markings can include lines to designate the space, stencils of pedestrians and cyclists or sharrows.
- » **Cross-rides** are a crossing treatment which can be used by both pedestrians and cyclists. It allows cyclists to proceed through the intersection without having to dismount and separates pedestrians and cyclists to mitigate conflict.



Super sharrow, Kitchener



Cross-ride, Oakville

Intersection and crossing improvements are expected to form a major component of future Transportation Focus Area studies for neighbourhoods and during road reconstruction projects where on-street AT facilities are being implemented as part of the City-wide spine network. The specific design treatments should be reviewed and determined as part of the individual transportation plans and during detailed design to address the unique challenges and opportunities that may exist.

As part of the City's annual budgeting process, it is recommended that the City identify budget to undertake plans for the Transportation Focus Areas and that intersection improvements be considered as part of this budgeting to address specific neighbourhood level intersection improvements. Additionally, the City should budget for AT improvements at intersections along the City-wide spine network as part of AT specific projects or in conjunction with broader City projects.

In addition to the existing facilities at the City's intersections and crossings the study identified a number of locations that represented major barriers to AT as part of the City-wide spine network. These locations do not have facilities that allow safe, accessible crossing by AT users. These locations, identified based on the City's previous planning initiatives as well as input received from City staff, members of TAG, local stakeholders and residents, were reviewed for feasibility and proposed enhancements were identified based on:

- » Right-of-way limitations;
- » Demand; and
- » Accessibility.

In total, 8 new intersection and crossing enhancements are proposed for the spine (City-wide) part of the network. The proposed enhancements are grouped into four categories and examples are presented in **Figure 19**.

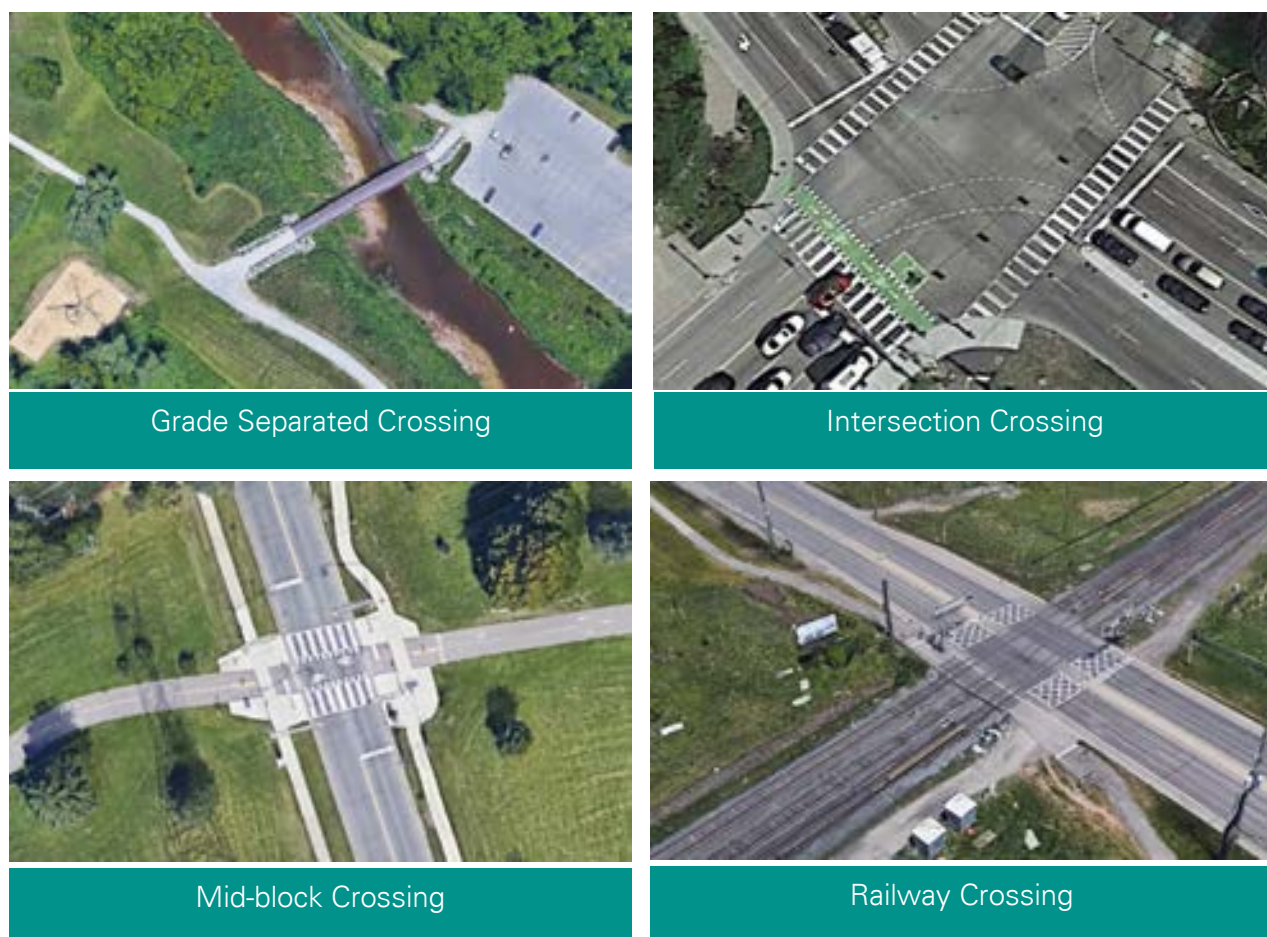


Figure 19 - Examples of Proposed Intersection and Crossing Enhancements
 Location: Lions Valley Park, Oakville (top left); Laurier Avenue and Nicholas Street, Ottawa (top right); Finch Hydro Corridor Recreational Trail at Grantbrook Street, Toronto (bottom left); Burloak Drive, Burlington / Oakville (bottom right) – Source: Google Earth

Table 9 provides an overview of the proposed new intersection and crossing improvements including location, proposed improvement and rationale as to why the improvement was selected for each location. The location of the proposed intersection and crossing enhancements are presented on **Maps 3a to 3c**.

Table 9 - Summary of Proposed Crossing and Intersection Improvements

Location	Proposed Improvement	Rationale
John Counter Boulevard at Elliot Avenue	Intersection crossing	» The KP trail will cross at this existing non- signalized intersection and therefore an upgrade to the intersection is needed to support the safe crossing of cyclists and pedestrians and support the grade separated rail crossing that is also being proposed
John Counter Boulevard and proposed connection off K&P Trail east of Division Street	Desired crossing	» This crossing has been identified as a potential crossing since it is not located on City owned land i.e. private property. Additional studies, such as an Environmental Assessment, should be conducted in the future to determine the feasibility off a crossing in this location, potential impacts and detailed costing to construct.
Bayridge Drive at Hydro Corridor	Mid-block crossing	» This off-road trail will be crossing an arterial roadway midblock and has no existing infrastructure to support the safe crossing of cyclists and pedestrians
Midland Avenue at Hydro Corridor	Mid-block crossing	» This off-road trail will be crossing an arterial roadway midblock and has no existing infrastructure to support the safe crossing of cyclists and pedestrians
Sydenham Road at K&P Trail (south of Highway 401)	Mid-block crossing	» This is an existing highly utilized trail crossing for the urban portion of the KP trail. It does not have existing infrastructure to support the safe crossing of cyclists and pedestrians.
Princess Street at existing off-road trail (east of Gardiners Road)	Mid-block crossing	» This off-road trail will be crossing an arterial roadway midblock and has no existing infrastructure to support the safe crossing of cyclists and pedestrians

Location	Proposed Improvement	Rationale
Taylor-Kidd Boulevard at Hydro Corridor	Mid-block crossing	» This off-road trail will be crossing an arterial roadway midblock and has no existing infrastructure to support the safe crossing of cyclists and pedestrians
Farnham Court extension at railway (north of Bath Road, east of Gardiners Road)	Rail crossing	» This is an existing footpath that is well travelled across an active rail line. In order to provide safe passage for pedestrians and cyclists a pedestrian rail crossing is required

Recommendations (Continued)

7	The City should integrate design features at intersections that help to increase a user's sense of comfort and encourage increased active transportation usage. These intersection improvements should be completed as part of the creation of the City-wide AT network or as other opportunities allow with other City engineering projects.
8	The City should undertake separate transportation focus area plans to determine specific intersection improvements at the local neighbourhood level.
9	It is recommended that City staff identify an annual budget to undertake Transportation Focus Area Plans to determine specific intersection improvements and that improvements required as part of the City-wide AT network be budgeted as part of the four year capital plan.

3.5 Design Enhancements

When identifying the proposed active transportation network including facilities and network enhancements, the following provincial, national and international guidelines and standards were considered:

- » Ontario Traffic Manual Book 15: Pedestrian Crossing Treatments
- » Ontario Traffic Manual Book 18: Cycling Facilities
- » Ministry of Transportation Ontario (MTO) Bikeways Design Guidelines
- » National Association of City Transportation Officials Urban Bikeways Design Guide and Urban Street Design Guide
- » American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities
- » Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads
- » Transportation Association of Canada (TAC) Bikeway Traffic Control Guideline for Canada
- » Accessibility for Ontarians with Disabilities Act – Built Environment Standards

Consideration should also be given to designing and implementing design features that help to increase a user's sense of comfort and encourage increased use of active transportation infrastructure. The following sections provide an overview of key design elements that should be considered when planning and implementing the active transportation network. This guidance should be used by City staff and its partners together with the standards / guidelines noted above.

3.5.1 Transit

Providing walking and cycling connections to transit stops can be a cost effective way to complete the first or last kilometre of a trip to work, school or other destination. When a user combines active transportation with transit, they can achieve greater access to areas of the City and reduce their overall travel times.

The City has made a significant and ongoing investment in Kingston Transit and has seen significant ridership growth, surpassing 6 million trips in 2017. The majority of service and ridership growth has occurred since 2013 when Kingston Transit introduced its first Express Routes. As of 2018 Kingston Transit operates four Express Routes that connect a significant portion of the City's urban area with fast, reliable, frequent service providing at least 15 minute service frequency during weekday peak periods.

These routes established a foundational “backbone” of the Kingston Transit network. The introduction of Express Routes fundamentally changed the Kingston Transit route structure and service levels. This backbone of service provides an excellent opportunity to encourage and expand AT opportunities within neighbourhoods that can access the high frequency service. The City should leverage the strength of the transit system by developing high quality, accessible AT connections to the backbone service and include amenities at the transit stops that support AT such as bicycle parking.

Kingston Transit has implemented the *Rack and Roll* program to equip all buses with a bike rack that can accommodate two to three bicycles. The service is available year round and makes it easier for cyclists to make use of public transit. All Kingston Transit routes are served by accessible buses with kneeling capabilities or mobility aiding ramps / lifts. Transit service is provided on arterial roads and local neighbourhood connectors to link to key destinations including schools, hospitals, commercial centres, the train station, etc.

The impact of large vehicles travelling adjacent to cyclists should be considered when implementing bicycle routes along the transit network. Large vehicles may reduce a cyclists' level of comfort and increase their risk exposure where the cycling facility is adjacent to a travel lane. Conflict between cyclists and buses also occurs at transit stops where buses stop in the bicycle lane.

In these scenarios, separated cycling facilities and alternative transit stop configurations should be considered (see section 5.4.2 in OTM Book 18 for additional design treatments). The transit system can be further enhanced to accommodate pedestrians and cyclists by providing other amenities such as route maps, wayfinding and signage markers, and / or bicycle parking at more frequently used stops.

Best Practices



Kingston Transit Bike Rack



Bayridge bike lanes and bus stop



Kingston Transit mobility ramp

Recommendations (Continued)

10

The City should build off of the success of the *Rack and Roll* program to continue promoting the benefits of coupling active transportation and public transit usage.

11

The City should leverage the Kingston Transit network as part of the work to be undertaken as part of the Transportation Focus Area Plans. All efforts should be made to connect the AT networks in the focus areas at the neighbourhood level to the transit network.

3.5.2 Signage

Signage provides important wayfinding, regulatory, etiquette and warning information. This can enhance users' awareness of routes, comfort and enjoyment and also mitigate conflict and risk. Wayfinding signage is particularly important for recreational and tourist users who typically have less familiarity with their surroundings than utilitarian users. The use of a unifying graphic element for wayfinding signage can be an effective strategy to make these signs more recognizable. The City should continue to implement the following types of signage along the network:

- » **Directional signs** are used to inform users of the direction and distance to a nearby destination. They are installed at locations where directional guidance is required.
- » **Trail Entry signs** are used at the entrances of off-road segments of the network. The sign should provide information such as difficulty, length, name and a map.
- » **Information signs** are used on off-road segments of the AT network to inform users of restricted activities. This sign should be installed below the trail entry signage presented above.
- » **Route Marker signs** are used at regular intervals or in locations where additional guidance may be needed (e.g. a change in direction). The sign is meant to provide users their distance travelled along a trail.

Best Practices



Directional signage and Route Marker for the Waterfront Trail, Kingston



Trail entry and information signage on the K&P Trail, Kingston



Recommendations (Continued)

12

The City should develop a formal wayfinding / signing strategy for AT routes in Kingston.

3.5.3 Barrier-free Access

Today, there are more than 3.8 million Canadians with some form of a disability, and the numbers are growing. In Canada, and all around the world, people with disabilities face social, attitudinal, and physical barriers. Approximately one in seven Canadians have a disability and that number will rise to one in five by 2036. The Integrated Accessibility Standards Regulation (IASR), created under the Accessibility for Ontarians with Disabilities Act (AODA), applies to all organizations in Ontario. It establishes accessibility standards, introduces requirements and establishes the compliance framework thereby increasing accessibility for all through the removal of barriers.

The Accessibility Standards for the Design of Public Spaces (DoPS) applies to pathways, trails and sidewalks. The intent is to help remove barriers to buildings and outdoor spaces. The standard only applies to new construction and significant renovation and is not mandatory for the design of on-road cycling facilities. Nevertheless, when designing and implementing off-road cycling facilities and multi-use trails, reference should be made to Part VI.1 of the DoPS standard to ensure that they are met. Sections 80.9 to 80.13 and 80.23 to 80.29 of the DoPS standard provide the technical requirements for multi-use recreational trails and exterior pathways (sidewalks).

For all projects, the AODA requirements should be met to the greatest extent possible. However, it is important to note that this may not be possible in all proposed locations within the network. Specifically, for trails, one must take into consideration the context of each trail, including but not limited to; the location, the surrounding environment, and the type of trail experience that is desired. In some locations it may not be possible to implement an accessible trail. In these cases, the City should provide sufficient information to all potential users to make them aware of the conditions and the expected experience. These exceptions to the technical requirements can be found in sections 80.14, 80.15 and 80.30 of the DoPS standard..

Best Practices



Example of drop curb with tactile strip



Example of AODA compliant trailhead sign

Recommendations (Continued)

13

The City should strive to exceed the standards outlined in the Accessibility for Ontarians with Disabilities Act as it pertains to the design and construction of active transportation facilities.

3.6 The Proposed AT Network

The outcome of the network development process is a connected and continuous network of pedestrian and cycling routes and facility types. In total Kingston's active transportation network includes 1094 kilometres of pedestrian and cycling facilities. A summary of the existing facilities and proposed facility types and costs is provided in **Table 10**. It is important to note that the length of existing facilities does not include existing routes that are proposed for modification and / or upgrades. Recommended modifications and upgrades to existing routes are captured as proposed facilities in **Table 10** below.

Table 10 - Summary of Existing and Proposed Facilities

Facility Type	Existing (km)	Proposed (km)	Total (km)	Capital Unit Cost (\$/km)	Total Capital Cost (\$)
Off-Road Trail	78.7	8.9	87.6	\$165,000 - \$350,000	\$3,121,771
In-Boulevard Trail	5.8	31.5	37.3	\$375,000	\$12,265,745
Cycle Track	0	17.3	17.3	\$1,200,000	\$20,744,234
Buffered Bike Lane	5.1	24	29.1	\$150,000 - \$365,000	\$6,943,411
Buffered Paved Shoulder	0	4.2	4.2	\$250,000	\$1,060,684
Bike Lane	25.5	15.6	41.1	\$12,000 - \$250,000	\$1,074,732
Paved Shoulder	54.7	81.3	136	\$200,000	\$16,253,648
Signed Route	14.2	91.4	105.6	\$2,000	\$182,820
Signed Route with Sharrows	2.3	5.3	7.6	\$3,500	\$18,617
Sidewalk	549.46	78.5	627.96	\$300,000	\$23,555,007
Total	735.8	358	1093.8		\$85,220,670

The estimated cost to implement Kingston's AT network is based on a unit cost per kilometer of construction per facility type as identified in **Appendix H**. Select unit prices used to cost the network are highlighted and should be used as a reference for future projects as the City moves from the master planning stage through detailed design and implementation. The unit prices used have identified based on best practices from various municipalities in southern Ontario and reflect 2018 dollars. They are a blended rate and have been reviewed by City staff.

It is recognized that the level of effort will vary on a project-by-project basis and some projects may reflect higher unit costs than others. The unit prices do not include the cost of property acquisition, utility relocations, major roadside drainage work, applicable taxes or costs associated with site-specific projects such as bridges, railway crossings, retaining walls, and stairways.

The estimated total cost to implement the proposed active transportation network and infrastructure is approximately \$127 million over 20+ years. This capital cost does not include the network components attributed to desire lines illustrated on **Maps 3a to 3c**.

A desire line represents a preferred connection on the proposed Draft Network where the City currently does not have ownership or an access agreement for the land where the proposed connection is.

Without consideration for the potential costs associated with land purchase or access agreement, implementation of all identified desire lines should be explored in the future as opportunities become available.

Capital funds for the transportation focus area studies (\$1.2M) and infrastructure improvements (\$15M) have been included as high level estimates as the details of these infrastructure components will be developed over time specific to each focus area. A summary of the estimated costs is presented in **Table 11**. This table includes conservative estimates for design and permits (15%) and a contingency (10%). These assumptions are consistent with the City's existing practice for all infrastructure construction projects in Kingston.

Table 11 - Estimated Walk 'n' Roll Capital Costs

Item	Cost
Capital Costs for AT Facilities ¹	\$85,220,670
Capital Costs for Supportive AT Infrastructure ²	\$3,855,000
Design & Permits (15%)	\$13,361,350
Contingency (10%)	\$8,907,567
Sub-Total	
Study Costs for Transportation Focus Areas and On-going City-Wide AT Planning	\$1,200,000
Transportation Focus Area Capital Cost Envelope ³	\$15,000,000
Grand Total	
Total	\$127,544,587

Notes:

1. Capital costs associated with the construction of facilities along desire lines have not been included in this estimate
2. Supportive AT Infrastructure includes estimates for new pedestrian crossings, bike parking, etc. but excludes costs associated with upgrades or reconfiguration required at existing intersections or crossings
3. Fund envelope to allow for implementation of the transportation focus area recommendations

Recommendations (Continued)

- | | |
|----|---|
| 14 | The City of Kingston should amend its Official Plan to include the recommended active transportation network as a Schedule in the Official Plan. |
| 15 | The City should use the preliminary costing to inform future budgeting decisions in developing an implementation plan for the AT network. As needed the costing should be updated to reflect more accurate estimates based on inflation and other external factors. |



4.0

Kingston's AT Action Plan



4.1 Introduction

A key objective of Walk 'n' Roll Kingston is to identify programs to help achieve the City's target of a 20% active transportation mode share by 2034. Supportive programs are needed to help influence change and encourage residents to be more active. These changes, influenced by the implementation of new infrastructure, can be supplemented through the development and implementation of outreach programs and initiatives that create a more active culture. The action plan for Walk 'n' Roll Kingston sets out a blueprint for staff, decision makers, and stakeholders to take concrete actions and help the City achieve its future vision and objectives for active transportation.

The Walk 'n' Roll Kingston action plan has been developed based on four objectives:

- » Communicating information and influencing behaviours (education, engagement, encouragement);
- » Enforcing the rules;
- » Providing supportive hard infrastructure (e.g. secure bike parking) and services (e.g. bike share); and
- » Integrating active transportation into new development areas.

What's in this section?

4.2	An overview of the key audiences for programming initiatives
4.3	An overview of the Five E's imperative to successfully creating the AT network
4.4	An overview of the proposed strategy and supportive initiatives
4.5	An overview of operations and maintenance considerations
4.6	Proposed recommendations to support the City in achieving a 20% active transportation mode share by 2034

4.2 Key Audiences

The Walk 'n' Roll Kingston action plan has been developed to shape and influence human behaviour. The strategy developed for the City of Kingston is meant to encourage more people to engage in active forms of travel and recreation. To ensure a successful action plan, it is important to understand the target audience for whom the programs / initiatives are being developed. The target audiences can be determined by a number of factors including the preferred mode of transportation, gender, age, type of trip, time of day, and other matters.

The audiences are organized into three categories – mode of transportation, age group and trip purpose. The target audiences within each category include:

Mode of Transportation	Age Group	Type of Trip
» Pedestrians	» Children (grades K-5)	» Commuters
» Cyclists	» Young Adults (grades 6-12)	» Visitors/ Recreational Users
» Motorists	» Adults and Parents	
	» Seniors	

A detailed overview including elements valued and key messaging concepts for each target audience is provided in **Appendix I**. The specific considerations for each target audience have helped to shape a set of key messages which are intended to be reviewed and used as the foundation for communication and educational messages.

It is recommended that City staff use **Appendix I** as a reference when refining and confirming potential outreach and promotion initiatives. The audience categories are not intended to be prescriptive, as there are many other audiences that will likely come forward. The City should be flexible and adaptive to address the preferences and interests of those groups / individuals.

4.3 The Five E's

The five E's – engineering, education, encouragement, enforcement and evaluation – are the key elements of the Walk 'n' Roll Kingston action plan. The proposed initiatives included in the action plan are intended to encourage more people to engage in active travel and improve their quality of life. It is recommended that the City continue to work with its partners to develop and implement a robust communication and outreach strategy based on the five E's.

To enhance active transportation and achieve a 20% active transportation mode share by 2034, additional resources and efforts are needed to educate, promote and encourage people to become more active in Kingston. **Table 12** describes the five E's in more detail including why they are effective, what types of programs and initiatives they could include and how they could be achieved in a municipal context.

Table 12 - The 5 E's of Outreach

Five E's	Why	What	How
Engineering	Engineering allows for the implementation of physical changes to the roadway as a means of facilitating active transportation.	Implementing physical changes to facilitate active transportation, such as: narrowed vehicle lanes, physically protected bike lanes, bollards, bike repair stations, raised median used as pedestrian refuge island at pedestrian crossing locations, etc.	Identify opportunities and constraints associated with different concepts, based on data collected and field visits conducted. Select and implement the facilities that are most appropriate for the proposed route based on predetermined criteria and engineering standards.
Education	Increases awareness of the network and opportunities to walk and cycle. It can have a positive influence on user behaviour to mitigate conflict.	Development of education materials, outreach at public events, social and traditional media campaigns, training courses and school programs.	Identify key issues and audiences and available resources / partnerships to implement initiatives.
Encouragement	Many individuals would like to walk or cycle more but need encouragement to change their habits, overcome perceived barriers and try something new. By encouraging these individuals, more people will use the network.	Community-Based Social Marketing (CBSM) is a practical approach that stresses direct contact among community members and focuses on removing barriers. This approach could be used to identify feasible and effective encouragement programs.	Launch a CBSM campaign with partner organizations. Begin by identifying a target audience that is interested in walking or cycling more and the perceived barriers preventing them from doing so. Consider implementing in conjunction with new facilities / routes.
Enforcement	A main goal of enforcement is to increase awareness regarding user rights and responsibilities and to encourage users to comply with these responsibilities.	Enforcement campaigns, prompt and thorough incident response protocols, channels for users to report observed infractions.	Identify site specific or behaviour specific concerns and work with partners including police to monitor affected areas and address high-risk or illegal behaviour.
Evaluation	Ongoing monitoring and evaluation of facilities, programs, and user satisfaction facilitates learning, improved decision-making and efficient use of resources.	Data collection, user surveys, online surveys, public information centres, comment tracking.	Identify performance measures, targets, data collection strategies, resources and partners.

4.4 The Proposed Strategy

Walk ‘n’ Roll Kingston identifies an active transportation network made up of pedestrian and cycling facilities that connect to key destinations and communities in the City. To enhance the implementation of new infrastructure and to help achieve the City’s 20% active transportation mode share target by 2034, residents should be encouraged to engage in active forms of travel and recreation more often. **Table 13** outlines the recommended tools, programs, events and educational opportunities that could form part of the City’s AT action plan. The information contained in the following table should be used by the City and its partners to engage members of the public, stakeholders and agencies and to support users to cycle, walk and roll more often in the City of Kingston.

Table 13 - Overview of Potential Tools and Programs for an Outreach Strategy

Tool / Program	Description	Comments
Events and Activities	<p>Host a series of events aimed at promoting the use of active transportation options and existing infrastructure or participate in on-going events where active travel can be promoted. Such events could target individual communities or City-wide populations.</p> <p>Examples include: trade shows; Canada Day celebrations; Limestone City Busker’s Festival; Princess Street Promenade; Kingston Market; HikeCRCA challenge, a Ciclovía and other community events. As well, new events could include Open Streets, activities associated with the introduction of a new piece of AT infrastructure, fun runs and other activities. Other events could include specific activities geared toward university and college students, working with CFB Kingston, delivery of school travel planning programs.</p>	<p>These activities and events can be excellent opportunities to provide information about active transportation infrastructure, the benefits of active transportation, provide educational opportunities such as bicycle rodeos, helmet checks and bike repair, and work with residents to determine how best to shift their travel to active modes.</p>
Campaigns	<p>Develop AT campaigns that last longer than one day or a week. The City of Kingston could support a month-long active transportation celebration as this will provide more support for residents and encourage long-term behaviour change. Shorter events can lead to increases in interest but without continual reminders and prompts, it is not possible to always encourage that shift in behaviour.</p>	<p>In Copenhagen, Amsterdam, New York, Vancouver, Toronto, Ottawa and the County of Essex, the delivery of longer campaigns has resulted in a greater uptake in the use of active modes and this shift has been longer-lasting.</p>
Traditional media, social media	<p>The use of a variety of outreach platforms can increase the coverage and awareness of active transportation infrastructure, the benefits of using active modes more frequently and the opportunities that are available to residents to increase awareness and confidence.</p> <p>Utilizing a variety of media and online resources can assist in promoting new infrastructure, events, bicycle-friendly businesses, pedestrian amenities, educational and training programs and materials related to the use of active transportation in the City.</p>	<p>Developing relationships with media within the City can increase the promotion of new infrastructure and events. The use of social media, email and other electronic media can help in the delivery of positive messages, achievement of goals and objectives and “free” advertising for events and infrastructure through stories, posts and interviews.</p>
Website	<p>A “one-stop” portal for all information related to active transportation should be created that will provide residents, visitors and others with information about the network, associated amenities, location of bicycle parking, trail heads, and current and upcoming infrastructure projects.</p> <p>A “one-stop” portal will make it easier to obtain information about events, provide education and safety awareness, location of bicycle parking, identification of bicycle-friendly businesses and reduce potential confusion about the long-term plans for the network, and will consider moderated input from the public for suggestions, ideas, comments</p>	<p>The website will be a collaborative initiative that provides the public with a dynamic portal for all information related to active transportation.</p>

Tool / Program	Description	Comments
Partnerships	There are a number of groups who are interested in the promotion of active travel, lifestyles and improving health within the community. These groups should be identified by the City as outreach programs, education and training opportunities. Community events and activities are more successful when delivered in a collaborative manner.	The collaborative approach will allow for expanded outreach capabilities, increase the “legitimacy” of the work being undertaken and increase public awareness and approval.
Wayfinding and Identification of Key Destinations	Current and potential users of the active transportation system may benefit from information about how to travel to key destinations and the routes to be taken. A wayfinding system should include an identifiable brand (Walk ‘n’ Roll Kingston), symbols and consistent signage. As well, distances to key destinations and directions should also be included in the wayfinding system.	The implementation of the wayfinding program will make the network easier and more enjoyable to use. This, in turn, will encourage more individuals to use the network, especially for tourism and recreational travel and support the City’s mode share target. AT network maps that also identify bicycle-friendly businesses, amenities and interesting routes are helpful wayfinding tools.
First Mile and Last Mile connections to Transit	All transit trips start with an active transportation component. Typically, this is a walking trip, though increasingly more users are also cycling to transit stops. As a result, it is important that transit stops, terminals and stations are connected through continuous sidewalks, pathways and bicycle facilities to encourage more people to combine active modes and transit for the same trip.	Connections to transit will be part of the development of the network.
Individual approach to active travel planning	Special programming initiatives such as individual travel planning can be undertaken in conjunction with the opening of new AT infrastructure. Efforts should focus on residents or employees residing / working in close proximity to the infrastructure. To really stimulate behavioural change in transportation choices, residents need inspiration (using a relatable story or example), enablement (don’t push comfort zones, expand them) and invitation (extend the invitation for participation in or trying AT travel modes).	In addition to promoting the use of new infrastructure, monitoring and evaluation of these programs should be undertaken to document how effective they are in shifting travel behaviour.
Safety Education	Safety education programs may include initiatives such as practical, hands-on training courses, programs for adults, children and youth, activity books that outline safety in an easy to understand format, pamphlets that show how to fit a helmet or the proper turn and stop signals for cyclists, and interactive videos illustrating the rules of the road.	Education is for everyone and should be delivered to increase user safety and active travel. The City should consider partnering with police, community groups, seniors’ centres and youth groups to deliver safety education, including Can-Bike programs and bicycle rodeos.

Table 14 summarizes the proposed initiatives that are meant to encourage increased use of active transportation and help the City achieve a 20% active transportation mode share by 2034. Each of these initiatives has been identified because of the role it could play in creating community awareness, demonstrating the values of active transportation, and educating residents on safe cycling and walking activities. Several of the recommendations are intended to support more than one of the five E's. These initiatives are not mutually exclusive and together create a strong approach to encourage more people to walk and cycle in Kingston.

Table 14 - Proposed Active Transportation Initiatives

Proposed AT Action Plan Initiatives ¹		The Five E's				
		Engineering	Education	Encouragement	Enforcement	Evaluation
1.	Design and develop AT specific information brochures / pamphlets (i.e. a guide to cycling facilities) that can be accessed on the City's website and social media sites or hard copies at City offices / facilities.		●	●		
2.	Develop targeted information geared towards different audience groups and distributed at locations that are popular with each user group.		●	●		
3.	Work with School Boards and KFL&A Public Health to enhance existing promotional materials, and information distribution. Continue to expand and support Active School Travel initiatives tailored to local needs. Use evidence-based research in support of Active School Travel.	●	●	●	●	●
4.	Partner with Schools Boards and Strava to undertake a pilot to encourage all students to track their routes to and from school using the running and cycling app Strava. The collected information could inform City staff of popular routes and potential routes / locations where improvements may be needed (an interesting example of this is the Town of Oakville's <i>It's Your 150! High School Challenge</i>).			●		●
5.	Develop educational materials in various languages and styles to reflect all target audiences.		●	●		
6.	Provide on-going updates regarding the implementation of Kingston's AT network. Information could include implementation status, facility type(s) and location. As new infrastructure is implemented, information could be provided to increase awareness and education of how to use facilities.		●	●		

Proposed AT Action Plan Initiatives ¹		The Five E's				
		Engineering	Education	Encouragement	Enforcement	Evaluation
7.	Engage local trail and active transportation clubs, interest groups and businesses to distribute information about the AT network and educational / promotional information.		●	●		
8.	Partner with School Boards to encourage all students to walk and cycle to school by creating and supporting an Active School Travel Charter.	●	●	●	●	●
9.	Develop, facilitate and support education initiatives to encourage children and youth to use sustainable modes of transportation such as walking, cycling, rolling and public transit.		●	●		
10.	Distribute educational / promotional materials at local events (e.g. Canada Day celebrations, Limestone City Busker's Festival, Princess Street Promenade, Kingston Market, etc.) and to key community partners including groups engaged during the development of Walk 'n' Roll Kingston.		●	●		
11.	Maintain an online hub for active transportation information and opportunities for involvement / engagement.		●	●		
12.	As new infrastructure is implemented, complete updates to the City's mapping of existing on and off-road routes and facilities.		●	●		
13.	Work with local businesses to create an incentive program. The program could include contests for employees who walk / cycle to work, or explore the development of a bicycle mentoring program that allows employees who want to cycle to work to find a colleague with whom they can share a ride.		●	●		
14.	Partner with CAN-Bike to host courses at local schools, businesses or community destinations to educate residents on safe cycling practices.		●	●		
15.	Establish a program to monitor and evaluate route usage as well as public feedback on user experience to continually improve the usage of on and off-road active transportation routes and facilities.			●		●
16.	Provide end-of-trip facilities, such as secure bike parking at key locations e.g. City buildings, community centres, etc.	●		●		

Proposed AT Action Plan Initiatives ¹		The Five E's				
		Engineering	Education	Encouragement	Enforcement	Evaluation
17.	Partner with the City of Kingston Police to undertake patrols and safety checks along routes and trails to enforce safe operating procedures for pedestrians, cyclists, and other on-road facility and trail users.		●		●	
18.	Partner with City of Kingston Police to establish a long-term plan for on-going enforcement of legal and safe cycling and walking behaviour.		●		●	
19.	Partner with the City of Kingston Police to collect accurate collision data to help identify any potential problem areas as well as safety and enforcement priorities.					●
20.	Partner with City of Kingston Police to develop a Share the Road safety campaign to educate both cyclists and motor vehicle operators on proper and safe cycling.		●		●	
21.	Develop a comprehensive data collection program that includes online data and automatic display counters that encourage higher AT use.					●
22.	Develop a formal wayfinding / signing strategy for AT routes in Kingston.	●	●	●		
23.	Supply and operate bike valet at major public events (e.g. Canada Day celebrations, Limestone City Busker's Festival, Princess Street Promenade, Kingston Market, etc.).			●		
24.	Leverage available monies through Ontario's Climate Change Action Plan to fund and implement new AT facilities as well as bike parking and end-of-trip amenities such as lockers and bike storage rooms.	●		●		
25.	Work with the key stakeholders, agencies, local employers / businesses to develop a bike parking strategy to help promote active transportation in the City of Kingston.	●		●		
26.	Update the City's zoning by-law to make references to the provision of parking in new developments and employment areas to ensure that adequate, ample and secure bike parking facilities are provided.	●		●	●	●
27.	Partner with local businesses (through the BIA) to provide bike racks at a discounted / bulk rate with a focus on businesses within the major commercial areas	●		●		
28.	Install permanent bike and pedestrian counters at key locations in the City of Kingston	●				●

Proposed AT Action Plan Initiatives ¹		The Five E's				
		Engineering	Education	Encouragement	Enforcement	Evaluation
29.	Partner with School Boards and KFL&A Public Health when building new schools to incorporate built environments to include active school travel. Rethink current designs to incorporate active school travel.	●	●	●	●	●

A total of 29 initiatives are proposed in Walk 'n' Roll Kingston. To support the planning and delivery of these initiatives, consideration should be given to increasing resources within the City. It is recommended that the City review the anticipated level of effort needed to undertake the proposed initiatives and assess whether current staffing resources are adequate to manage and oversee delivery of each initiative. Furthermore, it is recommended that the City continue working with its partners to undertake and deliver the proposed active transportation initiatives.

4.4.1 Additional Initiatives

In addition to the five E's and the proposed AT action plan initiatives, there are two programs that will play an important role in the successful implementation of Walk 'n' Roll Kingston. First, the City recently conducted a pilot bike share program. The benefits of bike share include reduced greenhouse gas emissions, improved public health outcomes, improved road safety, more affordable mobility, reduced congestion, increased tourism and a positive reflection on Kingston's reputation for innovation and environmental stewardship. These benefits are described in more detail in the City's Council Report 17-189, along with key parameters of the pilot program. Bike share provides many benefits to the city in which it operates. Benefits of bike share include, but are not limited to: increasing the availability of publicly-accessible bicycles; improving public health by encouraging the use of bike share bicycles; improving road safety through the presence of more cyclists; and reducing greenhouse gas emissions by providing residents with an active transportation option rather than a private automobile.

A comprehensive evaluation of the bike share pilot program is currently underway. Through this process, the City should make every effort to identify improvements and focus on solutions, so the pilot can evolve and expand to make cycling more accessible to more people. In a City such as Kingston, with a strong tourism industry, a large student population and a spirit of innovation, a robust bike share program is an incredibly valuable asset.

The second initiative involves planning for new development areas. The City should incorporate bicycle parking into existing zoning by-laws and / or site plan review processes for multi-unit residential, commercial, employment and institutional land uses. End-of-trip facilities such as showers and lockers should also be integrated into the zoning by-laws and / or site plan review processes for employment and institutional land uses.

In addition to these facilities, the provision of comfortable and convenient site access and connections through a site for pedestrians and cyclists should also be integrated into the site plan review process. Integrating pedestrian and cycling connections through sites that include cul-de-sacs and other non-grid street patterns is especially important as the increased trip length associated with these street patterns, if direct connections are not provided, can be a significant deterrent for active travel.

The City of Kingston undertook a review of its Development Charges strategy in 2014. Development charges can be an opportunity to obtain funding for active transportation projects, provided that the conditions noted in the 2014 Study and in the Development Charges Act are met. The 2014 Study specifically includes cycling and pedestrian infrastructure as eligible components of *Services Related to Highways*:

“The service definition for the City’s 2014 Study will consider all services within the road right-of-way that provide new servicing capacity expansion as “Services Related to Highways”. In addition to road improvements, these services would include sidewalks, cycling lanes, intelligent transportation systems and transportation demand management strategies, transit shelters and bus pads.” (p. 12 of Council Report 14-204 Council Workshop – Development Charge and Impost Fee Background Study, May 27, 2014).

City staff should consider when the next update to the development charges bylaw is scheduled to designate AT network improvements as growth related improvements and be eligible for DCs for AT projects. Similar to the approach assumed by other Ontario municipalities, the Town of Oakville being one example.

Recommendations (Continued)

16

The City should consider designating AT network improvements as growth related improvements and be eligible for development charges, as part of the next update to the development charges by-law.

17

The City should review the proposed AT initiatives outlined in **Table 14** and develop an annual action plan to fund specific initiatives and identify staff who will champion the implementation of various initiatives. It is also recommended that the City review current staffing resources to determine if additional staff are needed to undertake the proposed initiatives.

4.5 Operations and Maintenance

Maintenance is an important aspect of any active transportation network. Well-maintained facilities provide users with a predictable, comfortable and reliable experience, allow for year-round travel, mitigate users' risk exposure, mitigate conflict between users, mitigate the City's liability exposure and maximize the lifespan of the facility. Year-round maintenance of key facilities in the network should be considered a strategic investment to support the City's target of a 20% active transportation mode share by 2034. Typical maintenance practices include:

- » Sweeping;
- » Surface repairs;
- » Pavement markings and signage;
- » Vegetation management; and
- » Snow clearance / ice control.

Maintaining the active transportation network will require a financial commitment from the City. There are a number of strategies that the City may consider to achieve the greatest benefit from the resources that are available for maintenance:

- » **Winter Network:** winter maintenance of the active transportation network is necessary in order for walking and cycling to be a viable and competitive mode for utilitarian trips such as commutes to school or work. Cycling routes with lower connectivity or nearby alternates, however, may experience very low ridership during winter months. The City should consider identifying a core network to maintain during the winter and concentrate winter maintenance resources on this network.
- » **Spine Network:** the same principle can be applied to other maintenance procedures, with more resources invested into the core network with the highest ridership. In this case, other routes still require maintenance, however a higher standard for surface repairs may be applied to the spine route, and sweeping and pavement marking reapplication intervals can be more frequent on the core network relative to other routes.
- » **Facility Design:** City staff should consult with maintenance and operations staff during the design process for any new facilities. The focus of this consultation should be on maintenance options for the facility and identifying any design modifications that could reduce maintenance costs.
- » **Best Practices:** many Ontario municipalities have been experimenting with different strategies to maintain their active transportation facilities. City of Kingston staff should engage with maintenance and operations staff from other municipalities to exchange ideas, best practices and innovations.
- » **Maintenance Standards:** City staff should review the Province's Minimum Maintenance Standards to ensure City practices are consistent with them.

4.5.1 Maintenance Practices

What are the standards?

Many Ontario municipalities currently use the Provincial Minimum Maintenance Standards to inform their maintenance practices. The *Ministry of Transportation Regulations 239/02* outlines the minimum maintenance requirements. The standards are based on the potential for hazardous road conditions for motorists. Though not currently considered part of these standards, bicycles are also considered vehicles under the Highway Traffic Act (HTA) and users of the roadway. With their lower threshold for conditions and deficiencies (i.e. vulnerability to potholes and cracks), additional consideration for standards that accommodate all users, including cyclists is needed. The minimum standards outlined in the regulations include:

- » Monitoring of conditions including frequency of patrolling to check for conditions, weather monitoring and snow accumulation;
- » Addressing winter road conditions including snow accumulation and ice formation on roadways;
- » Potholes, shoulder drop-offs, cracks and debris;
- » Bridge deck spalls; and
- » Roadway and sidewalk surface discontinuities.

What is being done in Kingston?

The City's current maintenance practices are thought to be consistent with the provincial Minimum Maintenance Standards. To maintain the road infrastructure in a state of good repair, the City undertakes a variety of activities including patching and paving roadways, crack sealing, sweeping and flushing, curb and gutter repair, bridge and culvert repair, and sidewalk and pathway repair/clearing. During the winter months, the City also provides snow plowing, salting and sanding services as outlined in their Winter Operations Level of Service Policy. In this policy, varying standards are applied based on road designations (arterial, collector / bus route, residential, un-maintained). Sidewalks and pathways are designated into four categories according to their associated pedestrian traffic, proximity to high volume roadways and the ease with which they can be cleared.

- » Designation 1: Sidewalk / pathways adjacent to high volume roadways and /or sidewalks / pathways with high pedestrian volumes;
- » Designation 2: Balance of sidewalk/pathways that can be cleared with mechanized plow equipment;
- » Designation 3: Sidewalks / pathways that require a blower or hand shoveling to clear; and
- » Designation 4: Sidewalks that will not be cleared due to their destination.

Snow clearing will begin on sidewalks that have a #1 designation when accumulation is less than or equal to 2.5 centimetres, #2 and #3 designations when accumulation is less than or equal to 5 centimetres.

Future Considerations

Enhancing the maintenance of the City's active transportation network as it expands will require an increase in the budget allocation for maintenance. The overall annual cost to maintain the network will depend on how much of it has been implemented and what standards are applied. **Table 15** outlines estimated unit prices based on typical maintenance costs from comparable municipalities in southern Ontario.

Table 15 – Cost Assumptions for Enhanced Seasonal and Winter Maintenance

Item	Unit Price	Assumptions
Painted Line Markings	\$2.5 / m	Unit price is for a single 100 mm wide painted line marking, therefore assume -\$5 / m for both sides of the road. Maintenance cost assumes that painted line markings are fully replaced / renewed on an annual basis.
Cold Plastic Line Markings	\$5 / m	Unit price is for a single 100 mm cold plastic line marking, therefore \$10 / m for both sides of the road. Maintenance cost assumes that plastic line markings are replaced every 5 years (or 20% annually). See calculations below: - $\$5 / m \times 20\% + \$1 / m$
Painted Stencils	\$50 / each	Assumes stencils are placed every 75m as per OTM Book 18, therefore 26 stencils / kilometre on both sides of the road (13 signs on each side of the road). Maintenance cost assumes 30% of painted stencils will need to be replaced / renewed on an annual basis. This equates to \$400 per year. See calculations below: - $\$50 \times 26 = \$1,300$ - $\$1,300 \times 30\% = \400
Cold Plastic Stencils	\$275 / each	Assumes stencils are placed every 75m as per OTM Book 18. 26 stencils in 1 kilometre on both sides of the road (13 stencils on each side of the road). Maintenance cost assumes 30% of painted stencils will need to be replaced / renewed on an annual basis. This equates to \$2,200 per year. See calculations below: - $\$275 \times 26 = \$7,150$ - $\$7,150 \times 30\% = \$2,200$
Route Signs	\$200 / each	Assumes 26 signs per kilometre (13 on both sides of the road / route). Maintenance cost assumes 5% of all signs will need to be replaced annually. This equates to \$260 annually. See calculations below: - $\$200 \times 26 = \$5,200$ - $\$5,200 \times 5\% = \260
Sweeping Costs	\$1,200 to \$2,000 / km	Assumes sweeping frequency of 2 times a year per roadway km (uni-directional, one side of the road).
Sidewalk Maintenance	\$2,550 / km	Includes winter and summer maintenance. Sidewalks should be maintained to a bare pavement standard (regular salt usage). Includes annual inspections, rehabilitations and replacement work.

Based on the costing assumptions identified in **Table 15**, **Tables 16** and **17** summarize typical non-winter and winter maintenance costs for various facility types.

Table 16 - Estimated Annual Maintenance Costs for Non-Winter Months

Facility Type	Per km Maintenance Cost (per year)	
	Minimum	Maximum
In-Boulevard Tail	\$1,685	\$2,310
Cycle Track	\$5,450	\$6,050
Buffered Bike Lane	\$6,850	\$7,650
Bike Lane	\$5,450	\$6,050
Signed Route with Sharrows	\$1,750	\$4,410
Signed Route	\$260	
Buffered Paved Shoulder	\$6,260	\$7,660
Off-Road Trail	\$1,685	\$2,310
Sidewalks	\$2,550	

Table 17 - Estimated Annual Maintenance Costs for Winter Months

Facility Type	Per km Maintenance Cost (per year)	
	Minimum	Maximum
In-Boulevard Tail	\$6,750	\$12,500
Cycle Track	\$13,500	\$25,000
Buffered Bike Lane	\$1,000	
Bike Lane	\$1,000	
Off-Road Trail	\$6,750	\$12,500
Sidewalks	\$6,750	\$12,500

Recommendations (Continued)

18

The City should review and update their current maintenance policies to reflect the Provincial Minimum Maintenance Standards.

4.6 Achieving Mode Share Targets

Achieving a 20% active transportation mode share by 2034 will require a long-term commitment from the City and decisive action by Council and staff. Many of these actions will take time to affect mode share and implementation should therefore begin as early as possible. The following recommendations are drawn from the preceding sections of the AT action plan, and outline steps that will help the City achieve its active transportation mode share target.

Recommendations (Continued)

19	The values and key messages identified for each of the key audiences should be reviewed and considered as the City of Kingston develops future communication related to active transportation.
20	The City should consider developing a new Active Transportation Maintenance Standards Policy that is consistent with the Province's Maintenance Standards, once they have been released. As new facilities are implemented, the City should consider whether the current maintenance practices address them appropriately.
21	The City should review and revise current Winter Maintenance Level of Service Policy to include active transportation facilities where appropriate.
22	The City should review the existing and proposed active transportation network and establish a Winter Network that will be maintained year round.
23	The City should review and revise the annual maintenance budget as the active transportation network is implemented over time.
24	The City should consult with operations and maintenance staff from other municipalities on an on-going basis to share best practices.
25	The City should engage with operations and maintenance staff during the design of all new facilities to identify maintenance protocol and optimize the design.
26	City staff should review and confirm route planning, construction feasibility and consistency with current best practices during the planning / preliminary design stage of all implementation projects.
27	The City should identify an annual budget in the capital plan to implement bike parking and work together with businesses, BIAs and institutions to collaboratively expand bicycle parking options in high demand areas of the City.
28	The City should work to enhance and expand the bike share system using lessons learned and best practices over time.
29	The City should incorporate bicycle and pedestrian access, bicycle parking and end-of-trip facilities such as showers and lockers into its zoning by-laws and / or site plan review process.
30	City staff should explore the potential for development charges funding for all implementation projects.

4.7 Conclusions

A comprehensive plan requires a methodical and strategic approach to guide implementation. Walk 'n' Roll Kingston has been designed over a 20+ year timeline. This plan is meant to be flexible, adapt to future resources and opportunities, and used as a guide by City staff and its partners to inform future decision making.

Walk 'n' Roll Kingston is meant to inform the City's budgeting process to guide the implementation of City-wide AT infrastructure and initiatives identified in the plan. As a next step it is recommended that the City develop an implementation plan to inform the way that the City-wide network should be developed and a resourcing plan to support the outreach tools and initiatives.

Moving forward, it is also recommended that City staff begin undertaking separate transportation focus area plans to determine specific improvements at the neighbourhood level for each focus area. The Transportation Focus Area plans for each area would identify specific improvements to improve conditions for all users including pedestrians, cyclists, transit users and motorists. City staff should continue engaging with community groups, residents and stakeholders of each focus area to develop a better understanding of the needs and opportunities to improve transportation for all roadway users. Though it is important to develop an understanding of how residents travel within their respective focus areas, a transportation focus area plan should also take into consideration how residents travel out of their areas to work, school and other activities, the integration of local routes into the overall City-wide transportation and transit system, and the impact of all residents travelling through Kingston.

Glossary

Active Transportation:	Active Transportation means human-powered travel, including but not limited to, walking, cycling, inline skating and travel with the use of mobility aids, including motorized wheelchairs and other power-assisted devices moving at a comparable speed. (Ontario Provincial Policy Statement, 2014)
Complete Streets:	A Complete Street is designed for all ages, abilities, and modes of travel. On Complete Streets, safe and comfortable access for pedestrians, bicycles, transit users and people with disabilities is not an afterthought, but an integral planning feature. (Complete Streets for Canada, 2017)
Dissemination Area:	Small area composed of one or more neighbouring dissemination blocks, with a population of 400 to 700 persons. All of Canada is divided into dissemination areas (Statistics Canada, Census Dictionary)
Mode Share:	Mode share is the percentage of travellers using a particular type of transportation or number of trips using a particular type of transportation e.g. walking, cycling, transit.
Geographic Information System (GIS):	A Geographic Information System (GIS) is a computer technology that brings together all types of information based on geographic location for the purpose of query, analysis, and generation of maps and reports (City of Kingston, 2018)
Road Diet:	A Road Diet is generally described as removing vehicle lanes from a roadway and reallocating the extra space for other uses or travelling modes, such as parking, sidewalks, bicycle lanes, transit use, medians or pedestrian refuge islands (U.S. Federal Highway Administration, 2014)
Transit:	Transit refers to Kingston Transit, the public transit system owned and operated by the City of Kingston. Kingston Transit provides bus service within the urban area of the City of Kingston and, under contract, to the neighbouring community of Amherstview. (City of Kingston, 2018)

Vulnerable Population:

Segments of the population that may experience mobility challenges due to different factors, such as age and physical and / or cognitive ability.

Wheel:

The act of cycling or using a mobility device, such as a wheelchair.