LET'S CONNECT

ACTIVE TRANSPORTATION MASTER PLAN

City of Brampton

FINAL REPORT

July 2019

Prepared by IBI Group

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Introduction

1.1 WHAT IS THE ACTIVE TRANSPORTATION PLAN?

Active transportation refers to the movement of people and sometimes goods using non-motorized modes. Common active transportation methods include walking and cycling, in-line skating and travel with the use of mobility aids and other power assisted devices moving at comparable speeds.

Vision 2040, "Living the Mosaic" (2018) sets out the long term vision for the City of Brampton. Living the Mosaic identifies seven target vision statements and accompanying actions to transform Brampton by 2040. The target vision for transportation and connectivity in 2040 is "a mosaic of safe, integrated transportation choices and new modes, contributing to civic sustainability, and emphasizing walking, cycling and transit." Actions identified under this vision include those related to active transportation such as prioritizing active mobility through an Active Mobility Charter, and implementing complete streets. These actions support a future with more integrated transportation choices that prioritizes walking and cycling. This Active Transportation Master Plan (ATMP) is an evolution from Living the Mosaic, providing the network plans, policies and programs to support that vision.

As Brampton grows, getting around becomes more challenging.

As Brampton grows and intensifies, the City will continually need to address the challenges of managing increasing travel demand and automobile congestion, and finding better ways to move people and goods that does not compromise the livability of Brampton's communities.

Encouraging Active Transportation is a crucial part of Brampton's Transportation Solution and a part of Brampton's 2040 Vision.

Accommodating the urban transportation needs of citizens through active transportation is energy efficient, space efficient, generates no carbon emission, and promotes a healthy and active lifestyle. The benefits of promoting walking and cycling as a transportation mode choice are numerous, not just from an urban mobility perspective, but from an economic, social, and public health perspective as well (refer to Section 1.5 for more detail on these benefits).

More broadly, the importance of encouraging active transportation in Brampton is emphasized and reflected in several supporting planning documents that were developed prior to this ATMP (refer to Section 1.2).

By 2041, Brampton is expected to be home to over 900,000 people. This represents a population increase of over 50% from today.

Bike Brampton is a "group of volunteers who encourage, promote and advocate for increased safe transportation and recreation cycling in Brampton."

The Brampton Cycling Advisory Committee is a citizen advisory committee that advises City Council on matters pertaining to cycling in Brampton.

1.1.2 Recent Active Transportation Program Achievements

The City of Brampton has achieved a number of recent active transportation accomplishments, which were recognized by a "Bronze" Bicycle Friendly Community Program designation. Accomplishments noted by the Bicycle Friendly Communities Program include:

- Good and growing network of cycling infrastructure with many new connections planned for 2019 and beyond
- Excellent community partnerships in place to support cycling
- Very strong cycling education and encouragement efforts, spearheaded by citizen groups, such as Bike Brampton, and by the Brampton Cycling Advisory Committee
- A strong and growing culture of cycling in the City

Since the 2015 update of the Transportation Master Plan, the City has been installing infrastructure to improve conditions for walking and cycling. This includes:

- The installation of signage and markings on 4km of low volume roadways highlighting "shared roadway" cycling routes
- The installation of urban shoulders on 23km of Brampton's roadways. In the short term, urban shoulders help to calm traffic by narrowing travel lanes to moderate travel speeds. Allocating space for urban shoulders provides opportunities to designate bike lanes on these sections of roadway
- Developing standards for pedestrian crossovers
- Improvements to school crossings, including the introduction of curb depressions
- Installation of key trail connections: a crossing over Highway 410, north of Williams Parkway (Franceschini Bridge); the extension of the Etobicoke Creek Recreational Trail under Highway 410 and the 407ETR into Mississauga; and an extension of the same trail north into Caledon

1.2 STUDY VISION, GOALS & OBJECTIVES

The City of Brampton's Active Transportation Master Plan (ATMP) is intended to define existing opportunities, consider and evaluate solutions, and identify a recommended active transportation system that provides comfortable and attractive pedestrian and bicycle facilities, in addition to supporting policies and programs.

The **vision** for the ATMP was developed early in the process to guide plan development:

Through developing an integrated, attractive, and accessible system of sidewalks, cycling facilities and trails, Brampton will be a liveable city where all members of the community can safely and conveniently access places, goods and services and connect to transit using active modes of transportation.

The following are considered to be **key goals** that inform the Active Transportation Master Plan:

- Improve the safety of walking and cycling
- Provide options to all residents, including enhancing the accessibility of the transportation network
- Maximize the value (usage) of existing infrastructure
- Invest efficiently in an expanding network
- Improve access to transit and provide viable active transportation options for the first / last mile

The **objectives** of the Active Transportation Master Plan, created at the onset of the study, are to:

- Establish a broad and well connected Active Transportation Network that will make travel by bike and on foot a safe and desirable option for school, work, recreation and other trips;
- Create a multi-year implementation strategy to deliver an active transportation network;
- Develop active transportation policies that reinforce the importance of cycling and walking to building a viable, safe and attractive city;
- Improve, expand and develop new programing to educate, encourage, and support a cycling and walking culture in Brampton; and
- Create a framework to measure and assess the progress of active transportation in Brampton.

1.3 STUDY PROCESS

The ATMP was developed through an iterative process, summarized in Exhibit 1.1.

Exhibit 1.1: Brampton ATMP Study Process

Additional detail for each step of the study is presented below:

- **Background Review** – This stage of the study involved reviewing existing plans, policies and programs to identify the context for the Active Transportation Master Plan. The existing network was also mapped and reviewed, including site visits to document and explore on-the-ground conditions.
- **Demand Analysis & Network Development** – In this step of the study, exploratory mapping and analysis was completed considering key criteria such as population and employment density, existing short trips and major destinations to identify areas of existing and potential walking and cycling demand throughout the City. For further detail refer to Section 3.3.3. Various networks were identified, including upgrades to the existing network (the "Fix-it Program") and proposed future networks.
- **Network Feasibility Review** – In this step of the study, the cycling network corridors were reviewed against various pertinent criteria (such as road volumes, speed, land use context, etc.) to identify a recommended facility type and/or implementation strategy.
- **Network Phasing** – In this step of the study, the network corridors were assigned to short, medium or long-term phases to guide investment.
- **Programs & Policy Development** – In this step of the study, new programs and policies were identified to complement the City's existing offerings.

1.4 CONSULTATION

The multi-faceted consultation effort for the Active Transportation Plan included internal and intergovernmental meetings, meetings with the City's Cycling Advisory Committee, two Public Information Centers (Exhibit 1.2) and an online digital consultation program.

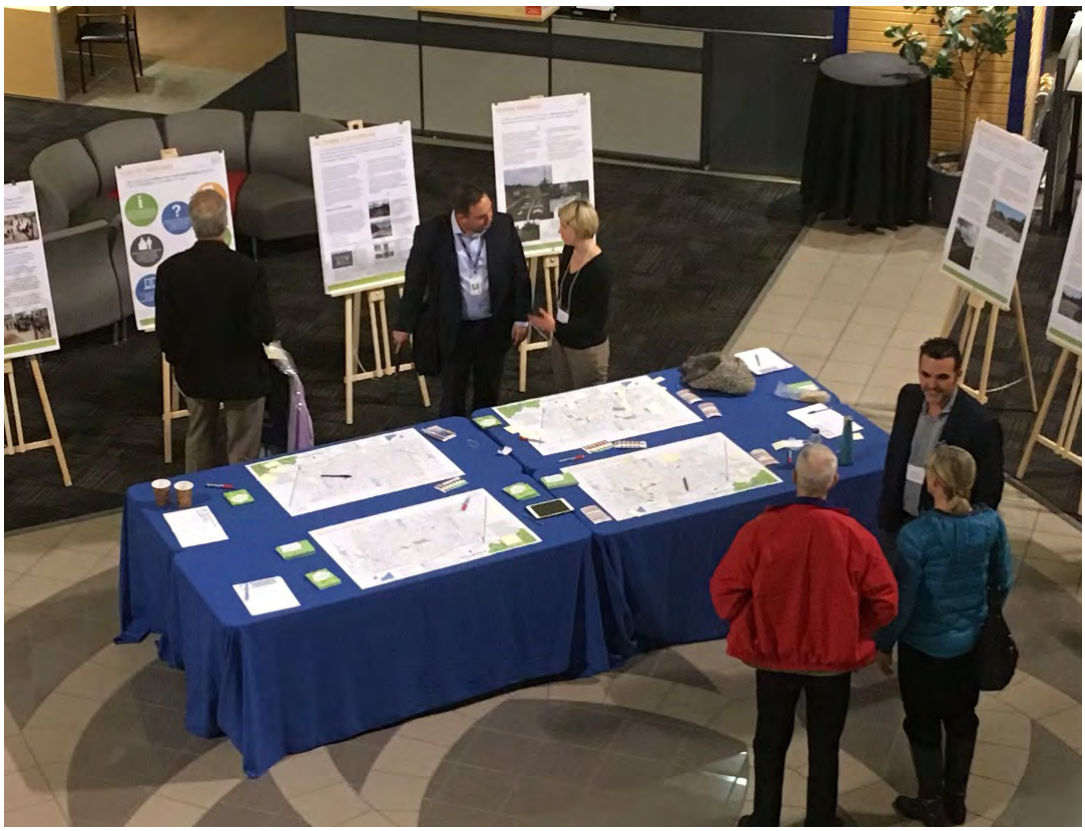
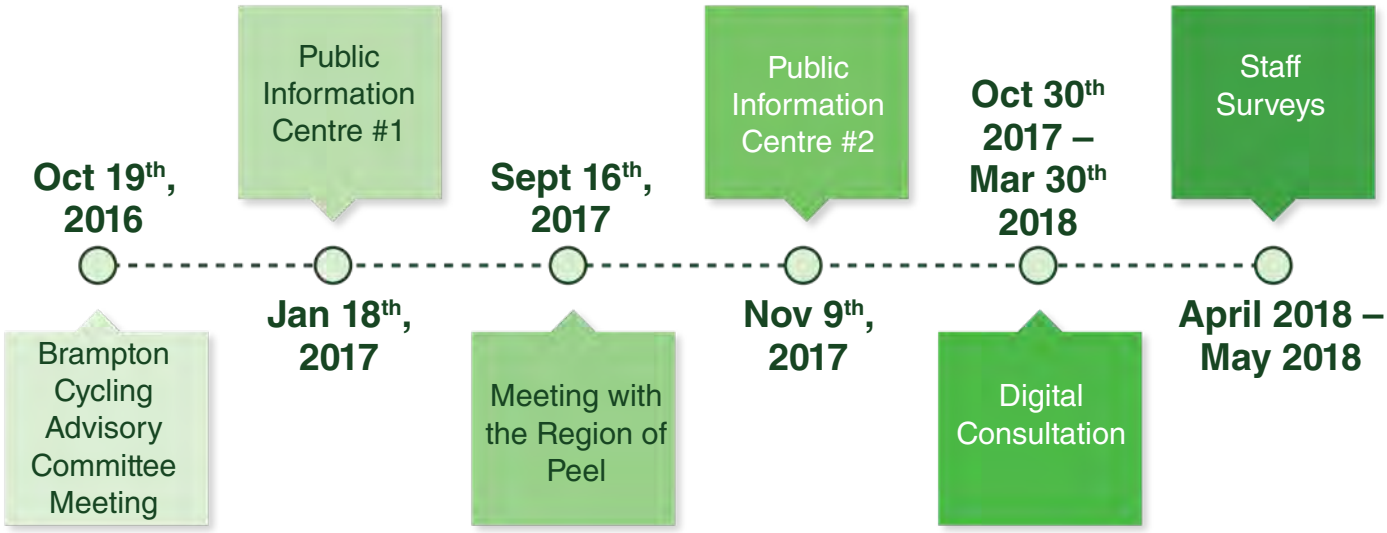


Exhibit 1.2: Public Information Centre 2

In addition to public consultation, two online surveys were circulated to City of Brampton staff to garner feedback on planning & design as well as maintenance of active transportation facilities. Staff and the consulting team also met with Peel Region to coordinate between the Brampton ATMP & Peel Region's Sustainable Transportation Strategy.

An overview of consultation activities is summarized in Exhibit 1.3.

Exhibit 1.3: Summary of Consultation Activities



1.5 BENEFITS OF ACTIVE TRANSPORTATION

The many benefits of active transportation have been documented and quantified in research studies spanning various sectors. They include recreational and health benefits, transportation benefits, environmental benefits, and economic benefits. This section outlines a few of these key benefits for Brampton.

1.5.1 Recreational and Health Benefits

Sedentary lives are a major contributor to increasing rates of cardiovascular diseases, obesity, and diabetes. It is important to design communities and transportation systems that provide opportunities for people to choose active modes. Dedicated active transportation infrastructure increases opportunities for recreation, including increased potential for tourism. Infrastructure that supports the use of active modes improves mobility and accessibility for all users, and promotes healthy and liveable communities.

1.5.2 Transportation Benefits

As Brampton grows, travel demand will need to be accommodated more efficiently. Active modes can reduce the traffic congestion that is inevitable from an increase in travel demand on the existing transportation system. Active modes can also help to reduce the need for surface parking and additional lanes to accommodate more vehicles on the road.

1.5.3 Environmental Benefits

Transportation emissions contribute to nearly 35% of Ontario's Greenhouse Gas emissions, and on-road passenger vehicles make up a significant portion of that contribution. Our travel choices can have a significant impact on the liveability of our communities, and choosing active modes can reduce air pollution, greenhouse gas emissions, and noise pollution.

1.5.4 Economic Benefits

The recreational, health, transportation, and environmental benefits of active transportation can also translate into economic benefits. Improving the health of residents results in fewer health care costs and increased productivity; existing infrastructure can be used more efficiently by accommodating active modes; and improving the environment improves quality of life for residents. Better mobility options and improved accessibility also encourage people to age in place, making communities more vibrant.

Improving access by walking and cycling can have an economic benefit study to local businesses. For example, several studies of commercial districts have shown that pedestrians and cyclists spend more per capita than those arriving by car.

Additionally, encouraging and attracting visitors through cycling tourism can have a significant benefit on the local economy.

1.6 WHAT'S INSIDE

This report has been broadly structured around the key themes and areas of the Active Transportation Master Plan.

*More detailed design guidance is provided in the **Active Transportation Master Plan Design Compendium**, a standalone reference for practitioners

2

Context

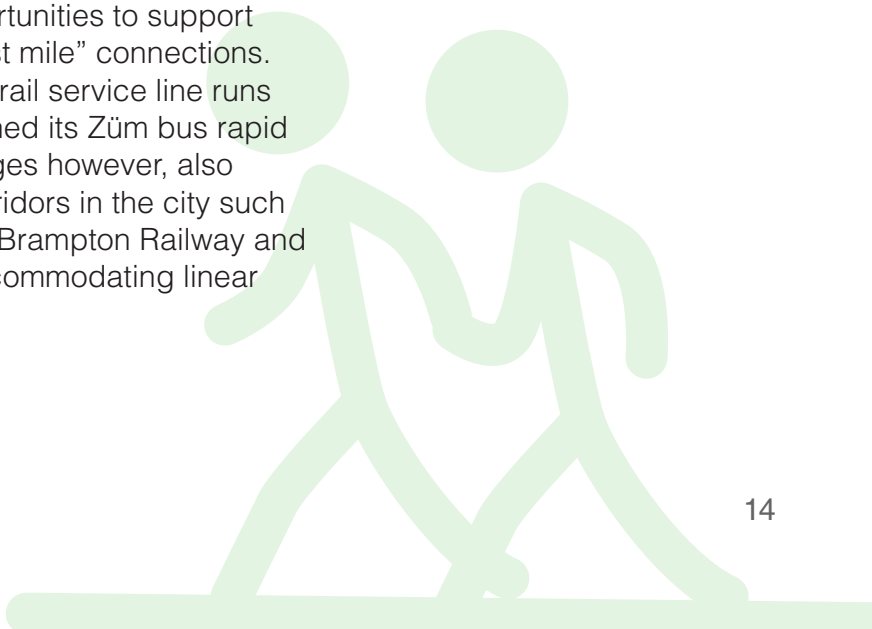
2.1 COMMUNITY OVERVIEW

Brampton is a diverse, multicultural community which includes residents from 209 distinct ethnic backgrounds speaking 89 different languages. Brampton has experienced rapid growth over the past four decades. The current population is approximately 630,000, and is expected to surpass 890,000 by 2041. For the most part, this growth has materialized as a typical automobile oriented suburban form, characterized by separated land uses, low density residential communities, large format retail centres, abundant parking, and a transportation network made up of wide arterial roadways. This urban form is not naturally conducive to walking and cycling, making access to these employment areas by active modes challenging due to separated land uses. This urban form is in part a result of Brampton's main employment types. Approximately 1 in every 4 jobs in Brampton is in either Transportation and Warehousing, or Manufacturing. These industries require large plots of land across vast spaces and a road network that can accommodate trucking.

The City of Brampton is the 4th largest City in Ontario and the 9th largest City in Canada.

In addition to these challenges related to urban form, Brampton has other physical challenges including two 400-series highways, two rail corridors, and a number of watercourses and utility corridors. These physical features can act as major barriers for active transportation users, unless specific network connectivity along and across them can be accommodated.

Despite these challenges, there are significant opportunities in Brampton for active transportation. The City has an established network of recreational trails, identified through the 2002 Pathways Master Plan, including a number of north-south recreational trails within the Mimico Creek, Etobicoke Creek and Humber River watersheds. These trails provide a solid foundation for the active transportation network. Supporting east-west links to connect to these trails can significantly expand access to the facilities across much of the City. There are also opportunities to support major transit investment through "first and last mile" connections. The Kitchener to Toronto regional GO Transit rail service line runs through Brampton, and the City has established its Züm bus rapid transit network. Some of the network challenges however, also present opportunities. A number of utility corridors in the city such as the TransCanada Pipeline, Orangeville-to-Brampton Railway and Hydro Corridor present a great option for accommodating linear active transportation infrastructure.



Based on data from the 2016 Canada Census, just 2% of journeys to work by the employed labour force in Brampton are made by walking or cycling. Despite the low use of active modes today, data collected by the 2016 Transportation Tomorrow Survey Study suggests there is great potential for more active mode usage based on the number of trips that are within comfortable walking or cycling distance. Some key statistics include:

- More than half (53%) of the trips to work and school are **shorter than 5 km in distance.**
- About one third (35%) of short work and school trips **(less than 2 km in length) are currently taken by automobile.**
- Of the trips that measure 2 to 5 km long, 61% are taken by **automobile.**

Where cycling travel speeds are typically around 15 to 18km/h, distances of 5 km represent a 15-20 minute cycling trip. From a travel time perspective, cycling for short trips under 5 km can often be as practical as the door-to-door time required to drive and park a motor vehicle.

Moving forward, Brampton's Vision 2040 and Official Plan include several high level strategic objectives regarding the growth of Brampton in a way that fosters sustainable land-use policy that enables a balanced transportation system where residents can comfortably walk or bike to work, shop, and play.

2.2 EXISTING POLICIES AND INITIATIVES

Improving active transportation is a mandate of the City of Brampton's Official Plan and Transportation Master Plan. Several regional plans identify active transportation as a crucial component of the transportation system. The goals and objectives of these plans are outlined below, starting at the Federal level, down to the Provincial, Regional and Municipal levels. Appendix A includes a summary of pertinent policy excerpts from these various plans.

2.2.1 Federal

The federal strategies that support active transportation and guide provincial, regional, and local initiatives include:

- The **Draft Federal Sustainable Development Strategy** (2018) identifies modern, sustainable, and resilient infrastructure that supports clean economic growth and social inclusion as a long-term goal. This goal includes a $26.9B commitment to fund green infrastructure initiatives that reduce greenhouse gas emissions and improve climate resilience and environment quality.
- The **Transportation Association of Canada's (TAC) Active Transportation in Canada: a Resource and Planning Guide** (2011) provides city builders with a strategic planning framework that can be adapted to different contexts to accommodate and promote active transportation in current and long-range planning and development.
- TAC's **Strategies for Sustainable Transportation Planning** (2005) outlines 12 principles for effective sustainable transportation planning. They include integrating transportation and land use planning, considering all modes in the planning process, managing transportation demand and supply to maximize the capacity of the existing infrastructure, and involving the public in the planning process.

2.2.2 Province of Ontario

The provincial legislation, policies and strategies working together to support active transportation and guide regional and local policies and initiatives are included in the list below.

- The **Planning Act** (last amendment 2018) is the primary legislative framework for land use planning in Ontario. It outlines provincial planning policy through the **Provincial Policy Statement** (PPS) and grants municipalities the authority to use various planning tools to direct growth and develop transportation systems. The documents support land uses that promote safe and efficient multimodal transportation systems. Bill 51, known as the **Planning and Conservation Land State Law Amendment Act** is an amendment to the Planning Act that provides municipalities with more power and flexibility to implement transit supportive and pedestrian-oriented development.

A key objective of the **Provincial Network** is to enhance recreational and tourism cycling opportunities, which may also be used for active transportation. Supporting cycling for recreation and tourism is an important part of the strategy to help **build the culture of cycling** in the province.

Regionally significant cycling facilities are those that:

- Support first mile/last mile connections to transit by improving cycling infrastructure on approach of rapid transit stations, or
- Cross municipal boundaries to link Urban Growth Centres, or
- Provide infrastructure that facilitates cycling for longer distances.

- The **Growth Plan for the Greater Golden Horseshoe (GGH) (2017)** provides the framework for all planning and infrastructure decisions within the GGH, with the intent of creating complete communities to improve quality of life. The plan encourages compact built forms and intensification to encourage more effective transit and active transportation networks. Downtown Brampton is identified as an Urban Growth Centre in the Growth Plan, and as such, is planned to accommodate significant intensification.
- The **Greenbelt Plan** (2017) identifies where urbanization is restricted in the GGH in order to protect the agricultural land base and ecological and hydrological features. It encourages the development of publicly accessible parkland, open space and trails to connect communities within the Greenbelt.
- The **Highway Traffic Act** outlines responsibilities for all road users in the province and **Bill 31 – Making Ontario's Roads Safer Act** is an amendment to the Act with supporting regulations to make roads safer for all users, including changes to fines and enforcement practices.
- The **Municipal Act** grants local municipalities the authority to pass by-laws for roads within their jurisdiction, including standards of maintenance and speed limits.
- **CycleON** is Ontario's first cycling strategy, which looks ahead 20 years and outlines what is needed to promote cycling across the province. It also includes a proposed Provincial Cycling Network that emphasizes established off-road trails and important connections to link existing facilities. The intent is for new infrastructure projects to create a cohesive province-wide network.

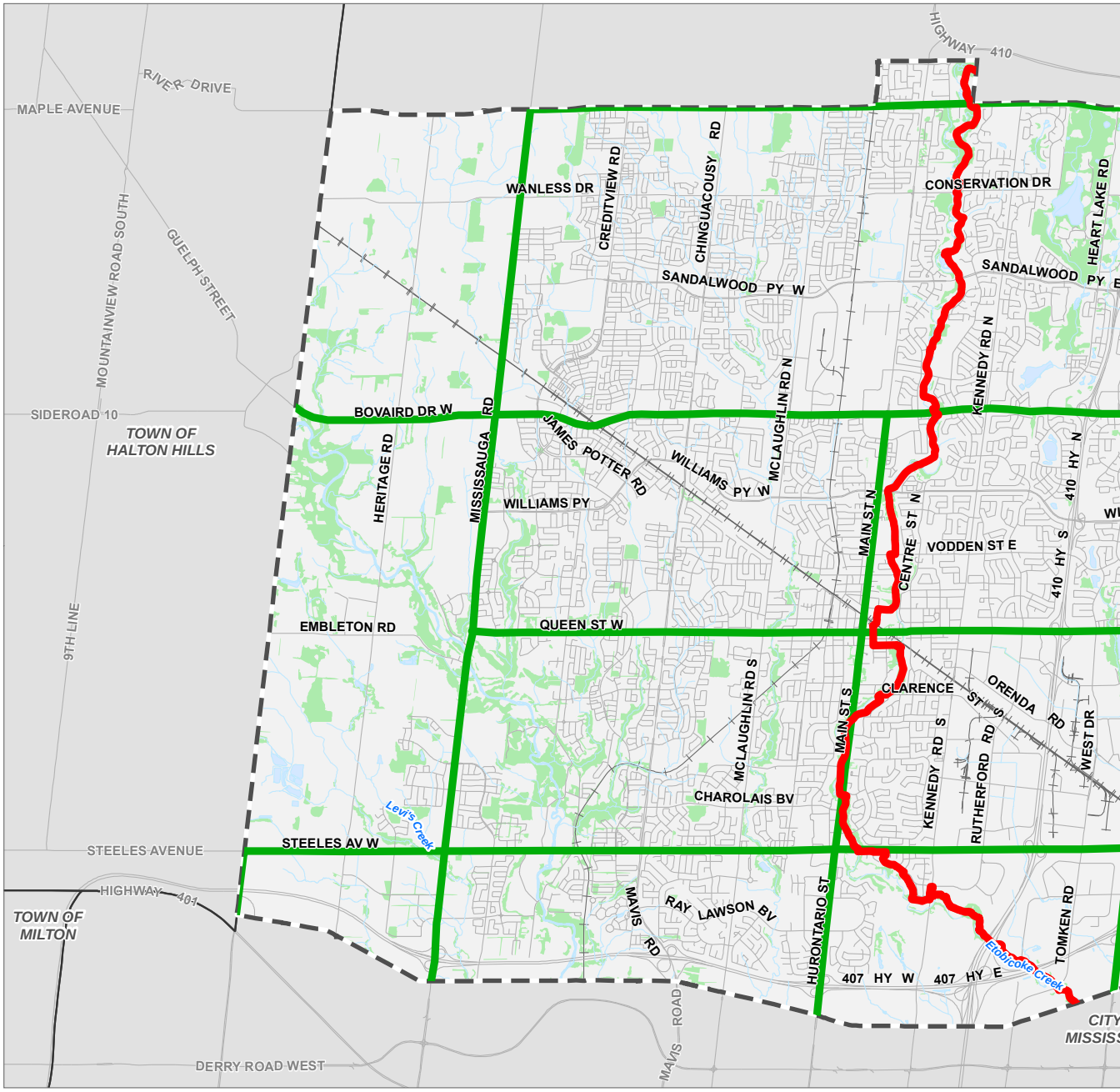
2.2.3 Metrolinx

On March 8, 2018, the Board of Metrolinx adopted the Greater Toronto and Hamilton Area's **Regional Transportation Plan** (RTP). The RTP outlines strategies to build an integrated transportation system in the Greater Toronto and Hamilton Area (GTHA) over the next 25 years. The RTP aims to deliver the outstanding projects from Metrolinx's first regional planning vision "The Big Move", and optimize the region's rapid transit network to build an integrated transportation system focused on its users.

The RTP identifies corridors and principles for a regional cycling network. The premise of this network is to support existing municipal cycling plans by identifying corridors that are regionally significant for transportation cycling. Infrastructure on these regionally significant corridors would help to link shorter local cycling network facilities across the GTHA. Regional cycling facilities would represent the highest order within a functional network hierarchy for transportation cycling.

A map illustrating the proposed cycling networks within Brampton from both the RTP and the #CycleON networks is included in Exhibit 2.1

Exhibit 2.1: Provincial Cycling Networks Proposed within Brampton



Provincial Networks

- CycleON Network Link
- Regional Transportation Plan Network Link

- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N

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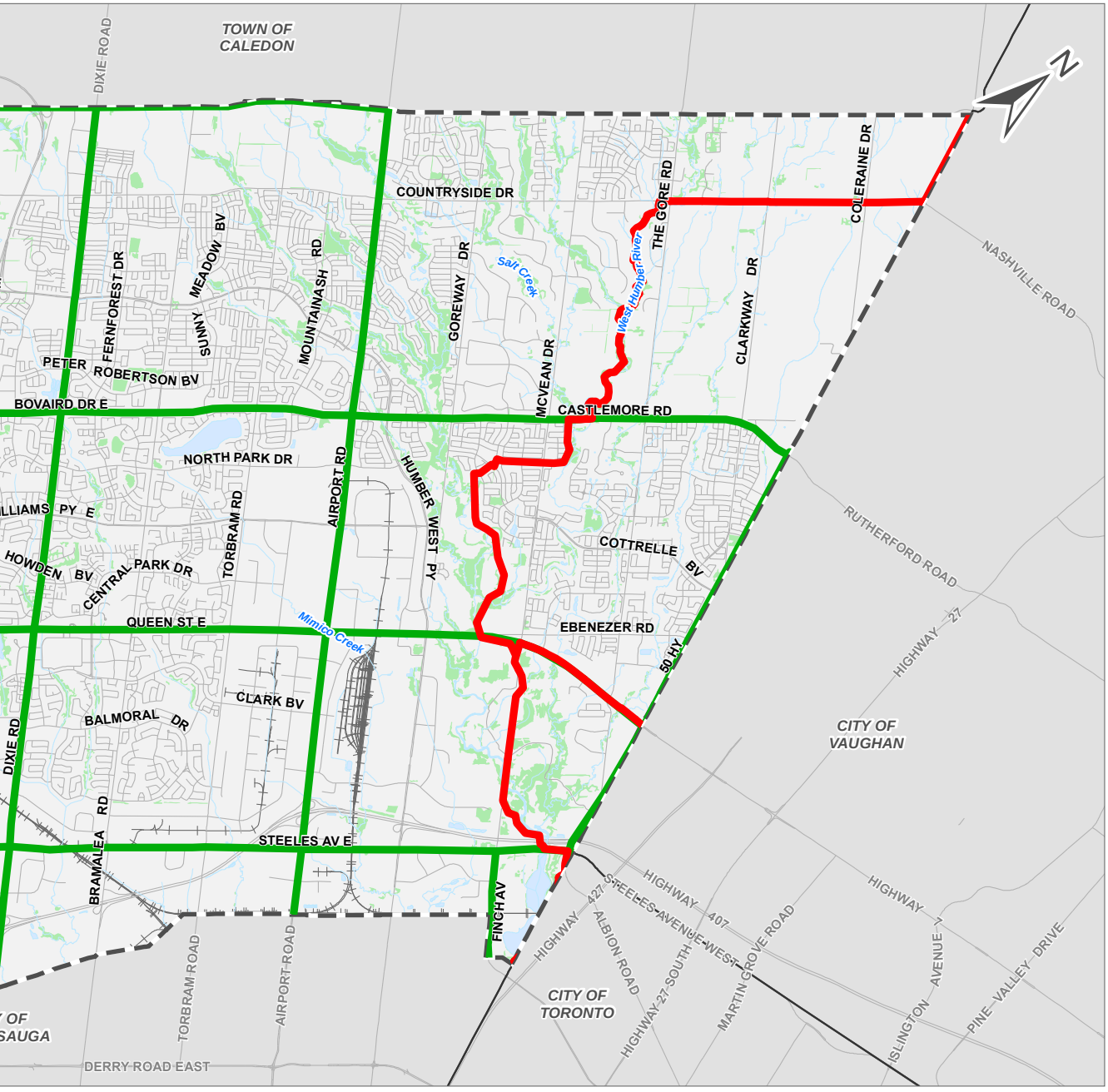

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Provincial Networks

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City of Brampton

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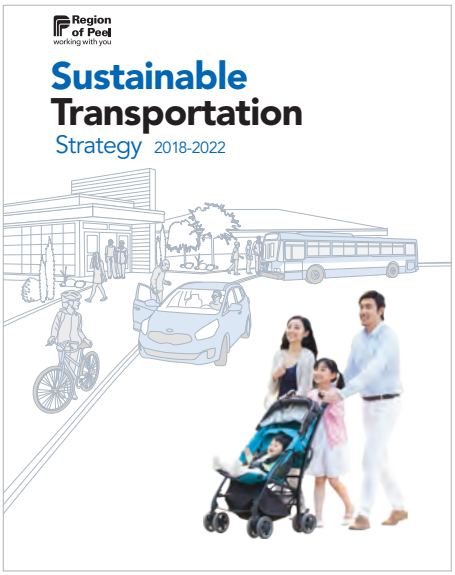


2.2.4 Region of Peel

The **Region of Peel Official Plan** (ROP) (2016) provides long term land use policy direction for growth and development in the Region, in keeping with provincial policy directions. It encourages prioritizing transit, carpooling, active transportation and goods movement in planning for the development, optimization ad/or expansion of new or existing Regional transportation corridors. Its objectives include increasing the share of trips made using active modes, and encouraging the development of safe, attractive, accessible and integrated bicycle and pedestrian facilities.

The **Region of Peel Long Range Transportation Plan Update** (2012) is a long-term strategic plan that defines the policies, programs and infrastructure to address the long term transportation needs of Peel Region. It emphasizes the need to promote sustainable and active modes to minimize environmental.

The **Sustainable Transportation Strategy** (STS) (2018) approved in February 2018 outlines the Region's course of action in addressing long-term transportation and growth related issues in a manner that emphasizes the need for environmental, societal, and economic sustainability.

The STS builds on the 2011 Region of Peel Active Transportation Study (PATS), the first such study for the Region. The study recommended making all Regional roads accessible, walkable and bikeable for everyone. This includes residents and visitors of Peel communities, from youth to seniors, and for people with disabilities. New comprehensive polices were established by this plan to make Peel communities more walkable and bikeable. The policies strive to build knowledge, implement a cycling and pedestrian network, create designs in balance with other modes, clarify responsibilities, and influence developments that are more walkable and bike-friendly.

The STS identifies the Region's roles and responsibilities relating to 'sustainable' transportation modes - walking, cycling, carpooling, transit, and teleworking. This role is defined within the context of the Region's jurisdictional responsibilities, but also considers policies and plans of the local municipalities, Metrolinx and the Province of Ontario.

The Strategy identifies mode share targets for active transportation for the year 2041 and recommends actions for achieving these targets through walking and cycling infrastructure improvements on the Regional Road Network, an improved winter maintenance program, improved facilities, and a Regional promotion program.

2.2.5 City of Brampton

Brampton Vision 2040: Living the Mosaic (2018)

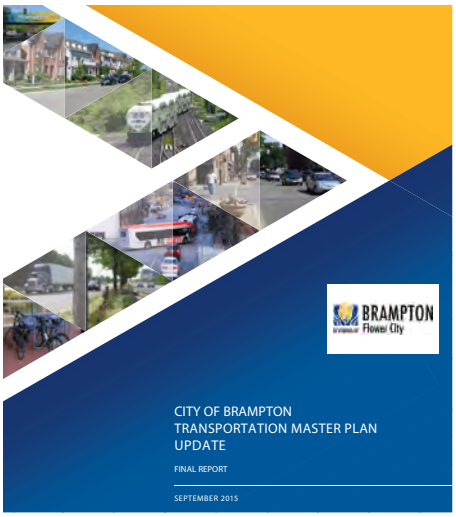
The City of Brampton has set out the community's vision for the next quarter century in Living the Mosaic. The Vision outlines 10 transformations to Brampton realized through 7 vision statements, along with lenses of success and actions to make it happen. "Everything connected" is one of the transformations with the vision that Brampton will be a mosaic of safe, integrated transportation choices and new modes, contributing to civic sustainability, and emphasizing walking, cycling and transit.

Supporting walking and cycling are themes that arise throughout the vision. Two specific actions are as follows:

- Action #4-1 Active Transportation Charter: Redirect circulation in Brampton's centres and neighbourhoods into local networks that feed transit, with walking and cycling emphasized
- Action #4-3 Complete Streets: Design and retrofit Brampton streets to be people-friendly and environmentally compatible places

City of Brampton Official Plan (2006)

Brampton's Official Plan includes several high level strategic objectives regarding the growth of Brampton in a way that fosters sustainable land-use policy that enables a balanced transportation system where residents can comfortably walk or bike to work, shop, and play. These objectives are consistently addressed in sections throughout the Official Plan through land-use policies that promote access by active transportation and the inclusion of bicycle parking at employment nodes, road planning objectives that encourage road design that incorporates active transportation infrastructure where feasible, and with the support of commuter transit through the development of pedestrian and bicycle connections to major transit hubs.



City of Brampton Transportation Master Plan (2015)

The City's Transportation Master Plan (TMP) was updated in 2015 and provides strategic direction for the development of Brampton's transportation network to support the City's growth over the next 25 years.

A key focus of the plan is to implement a truly multi-modal transportation system that supports sustainable growth. This focus is outlined in three of the plan's objectives:

- Ensure that continuing transportation decisions and investments for an integrated transportation network can be made with confidence and with regard to current best practices for sustainable transportation and land-use planning
- Plan for a coordinated and comprehensive approach in dealing with multimodal transportation issues in Brampton
- Review the strategy to optimize the role of transit and active transportation and update the transportation network needs to the year 2041
- The TMP sets several goals, including modal split targets for peak travel periods in the 2041 horizon year. The mode share targets for active transportation are:
  - 6% of trips by 2021;
  - 8% of trips by 2031; and
  - 10% of trips by 2041.

City of Brampton Pathways Master Plan (2002)

The Pathways Master Plan focused on the development of an off-road and on-road network that caters to all users (including cyclists of multiple skill levels and pedestrians). Although the network in this plan is predicated on establishing connections between recreational and utilitarian destinations in the city, there were limited mechanisms available for City staff to implement the on-road network at the time of plan development. This plan has informed the ATMP and will be superseded by it.

3

Designing for Safety & Comfort

The provision of safe, high quality and connected active transportation infrastructure is essential to encourage the use of active modes and to build sustainable and livable communities. It is therefore critical that the design of active transportation infrastructure be carefully considered as a part of all transportation projects, to maximize the value and attractiveness of the investment.

A variety of design guidance for practitioners implementing pedestrian and cycling facilities has been included in a supplementary **Design Compendium**. The following sections provide a brief overview of the design philosophy presented in the compendium.

Recommendation:

Use the ATMP Design Compendium to inform the design of complete streets and the active transportation network presented in the Active Transportation Master Plan.

3.1 PEDESTRIAN FACILITIES

The design of pedestrian facilities needs to reflect universal accessibility standards and should exceed them where appropriate (to address higher volume pedestrian spaces, urban design and streetscaping opportunities). The City of Brampton encourages the development of sidewalks widths which exceed minimum Accessibility for Ontarians with Disabilities Act (AODA) requirements of 1.5m.

In addition to considering AODA requirements, the City will aim to provide sidewalk widths that accommodate side-by-side walking whenever possible and ensure appropriate clearances to fixed objects / furnishing zones in the design of pedestrian facilities.

The following dimensions for sidewalks are recommended:

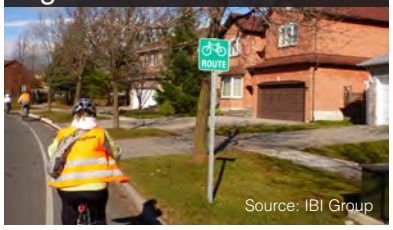
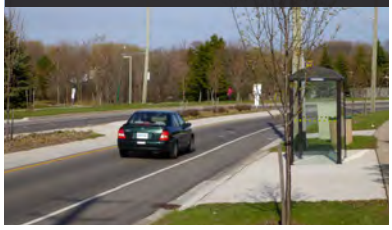
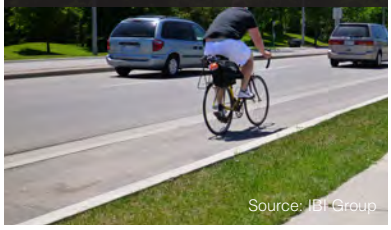
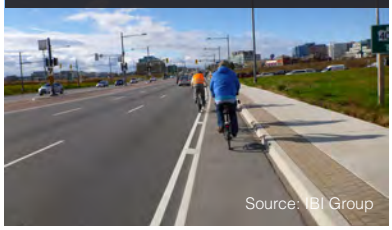
- Minimum sidewalk width of 1.5m
- Desired sidewalk width of 2.1m in urban areas and 1.8m in residential areas

Please refer to the **Design Compendium** for additional guidance on the design of pedestrian facilities.

3.2 CYCLING FACILITIES & SHARED-USE FACILITIES

As presented in Section 4, the City's cycling network is proposed to include a variety of facility types (refer to Exhibit 3.1).

Exhibit 3.1: Cycling Facility Types

SHARED FACILITIES	DESIGNATED FACILITIES	SEPARATED FACILITIES
Signed Route	Bike Lane	Protected Bike Lane
		
Source: IBI Group		Source: IBI Group
Bicycle Boulevard	Buffered Bike Lane	Cycle Track
		
Source: Payton Chung	Source: IBI Group	Source: IBI Group
	Paved Shoulder	Multi-use Path
		

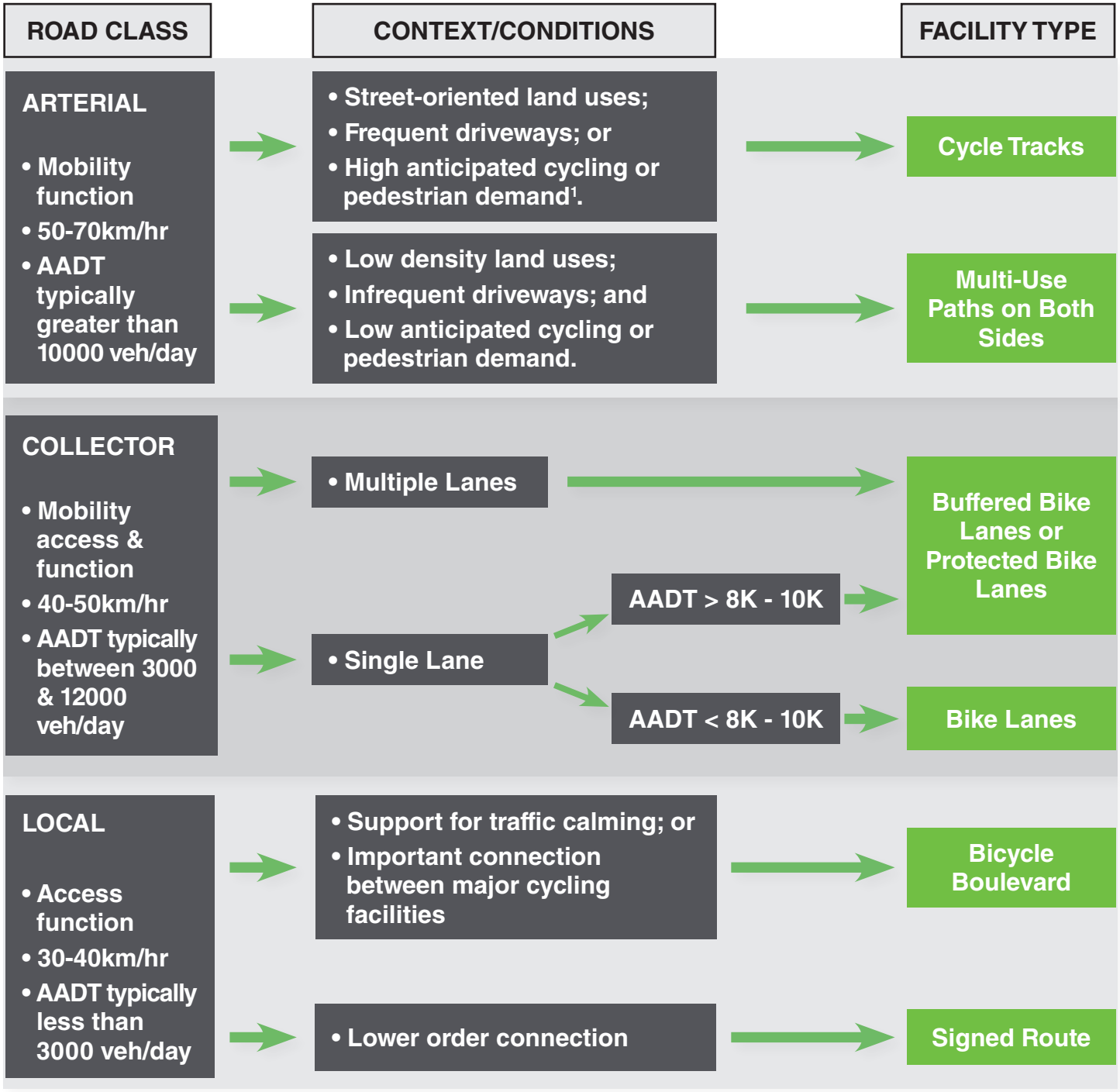
Recommendation:

Adopt the guidance provided by the **Ontario Traffic Manual Book 18: Bicycle Facilities** as the best practice for the planning, design and operation of cycling facilities in Ontario.

One of the critical factors to ensuring safe and comfortable cycling infrastructure is the selection of context-appropriate cycling facility types. As new roads are built, or existing roads are reconstructed, the City is implementing cycling facilities that reflect roadway volumes, speeds and land use conditions. Note the facility type recommendations contained within this ATMP will be further evaluated and validated at the corridor level on a case-by-case basis to ensure compliance with the facility type selection guidance provided in the Ontario Traffic Manual Book 18: Cycling Facilities

A generalized cycling facility selection tool for urban streets in the City of Brampton is presented in Exhibit 3.2. While the ATMP provides high-level recommendations for facility types for the proposed network, further review will be carried out before each project moves to implementation. The generalized facility selection tool can help inform this more detailed review.

Exhibit 3.2: Generalized Cycling Facility Selection Tool



[1]TAC suggests that pedestrians and cyclists be separated where there is:

- A high percentage of pedestrians (more than 20% of users) and total user volumes greater than 33 persons per hour per metre of path width, or
- A low percentage of pedestrians (less than 20% of users) and total volumes greater than 50 persons per hour per meter of path width.

Despite the guidance in Exhibit 3.2, other factors that may indicate a need for a separated cycling facility include:

- Vehicular Operating Speeds (85th percentile) in excess of 60 km/hr;
- 30 or more heavy trucks/buses per hour;
- Continuity with adjacent facilities;
- Collision involving bikes are relevantly frequent (mid-block locations);
- Presence of major intersections with multiple turn lanes; or
- High presence of young cyclists;

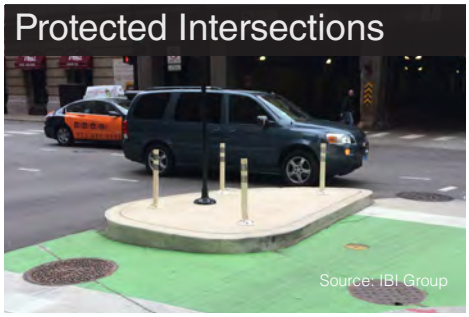
Design guidance for each class of cycling facility is presented in the **Design Compendium**.

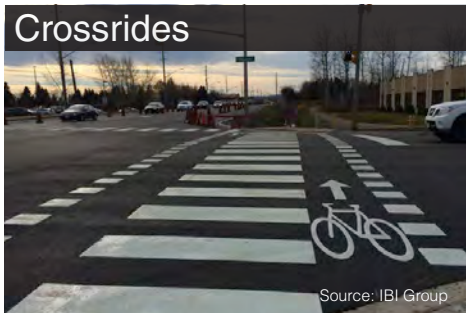
3.3 INTERSECTION & CROSSING TREATMENTS

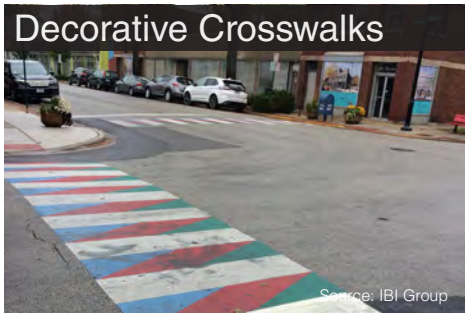
The design of intersections and crossings needs to reflect the mobility hierarchy laid out in Brampton 2040 Vision: first priority is walking, then cycling, transit, goods movement, and then shared vehicles and private vehicles. Intersections present the highest concentration of conflict points along a roadway.

A wide variety of intersection treatments are in use in the City of Brampton and planned for future applications to improve conditions for pedestrians and cyclists. A sampling of these interventions is shown in Exhibit 3.3.

Exhibit 3.3: Sampling of Intersection and Crossing Treatments







For further detail on these and other intersection treatments, please refer to the **Design Compendium**.

4

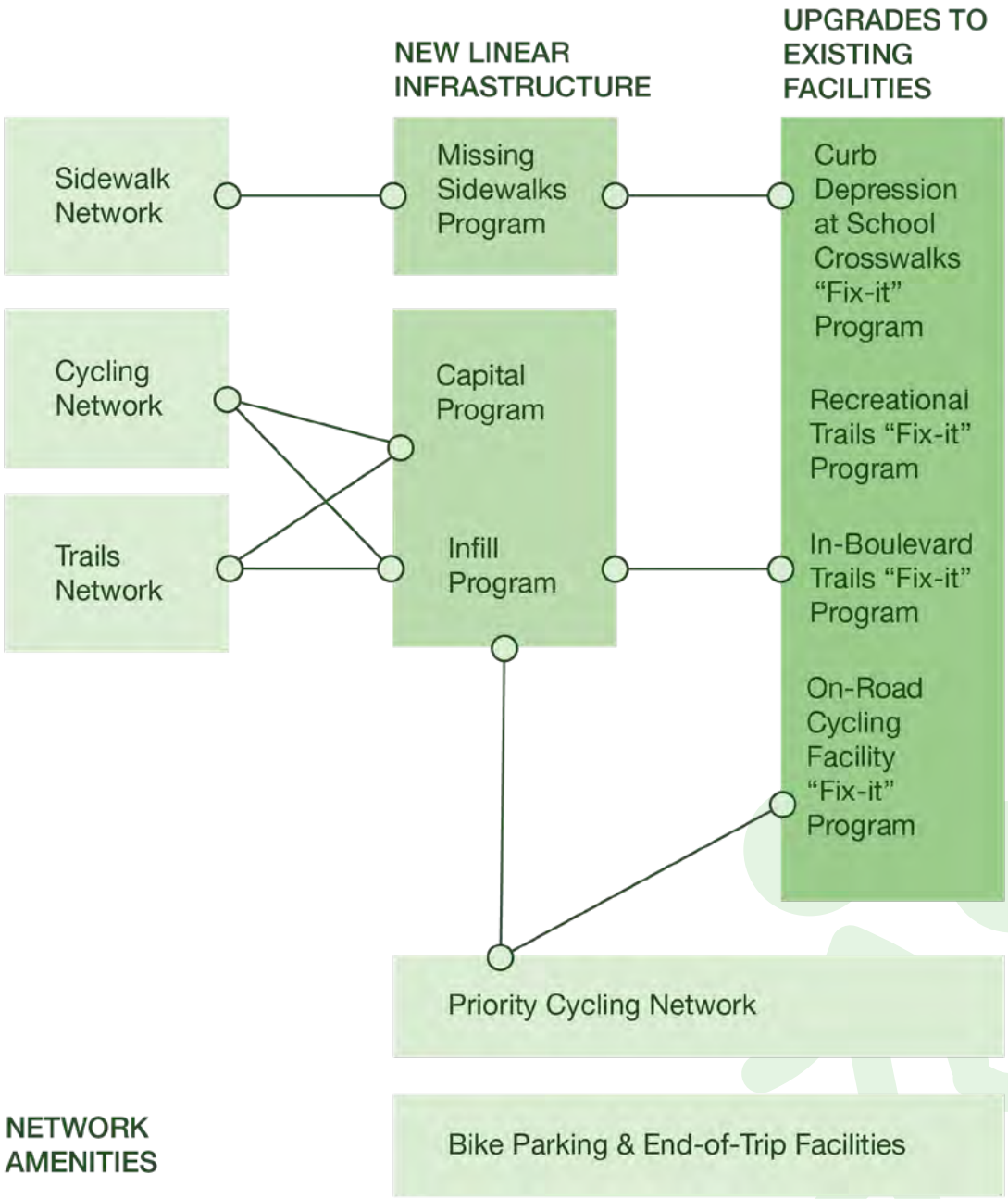
Connecting the Network

4.1 OVERVIEW

Enhancing and connecting the active transportation network in order to support an increase in walking and cycling is a critical focus for the Active Transportation Master Plan.

This chapter describes the improvement programs for the various active transportation networks.

Exhibit 4.1: Active Transportation Network Improvement and Implementation Programs



4.2 SIDEWALK NETWORK

Sidewalks are an essential part of the City's transportation network and offer a necessary service to those who travel on foot or use mobility devices. Almost all trips begin and end with walking, and sidewalks represent an important type of infrastructure that supports active mobility for users of all ages and abilities and that helps ensure safety for those most vulnerable. Certain demographics such as seniors and persons with disabilities, i.e., mobility, visual, hearing and/or cognitive, may find it difficult or even impossible to make walking trips if sidewalks are not provided. The provision of sidewalks should be understood as the removal of a barrier to access for vulnerable populations including children, seniors and persons with disabilities.

4.2.1 Existing Sidewalk Network

The City's pedestrian network is made up of sidewalks, multi-use paths and recreational trails. Multi-use paths and recreational trails provide a multi-modal function as they are intended to serve both pedestrians and people on bikes. Sidewalks, which is the focus of this section, are intended to primarily serve pedestrians, people with mobility devices, scooters, children on bikes, skateboards, etc. Paths and trails are key facility types that make up the cycling network that will be discussed later in this Chapter. The sidewalk network is fairly comprehensive, covering the majority of the City's arterial & collector roadways.

Exhibit 4.2 illustrates the existing sidewalk network (supplemented by the existing multi-use path and trails network).

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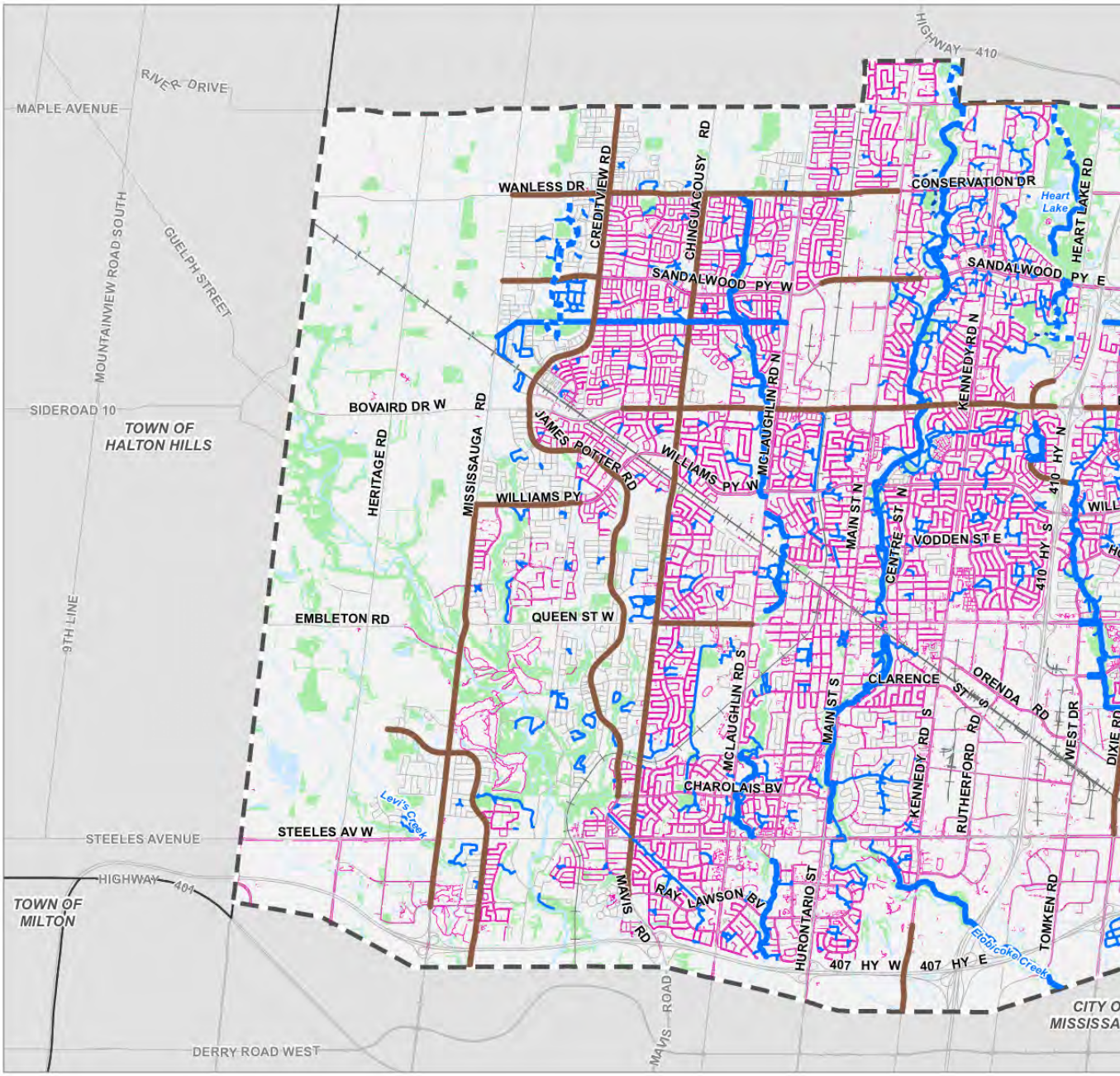
Exhibit 4.2: Existing Pedestrian Network



- Sidewalk
- Multi-Use Path
- Recreational Trail (Paved)
- Recreational Trail (Natural)
- Park Path (Paved)
- Park Path (Natural)
- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area
- Brampton Municipal Boundary

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N

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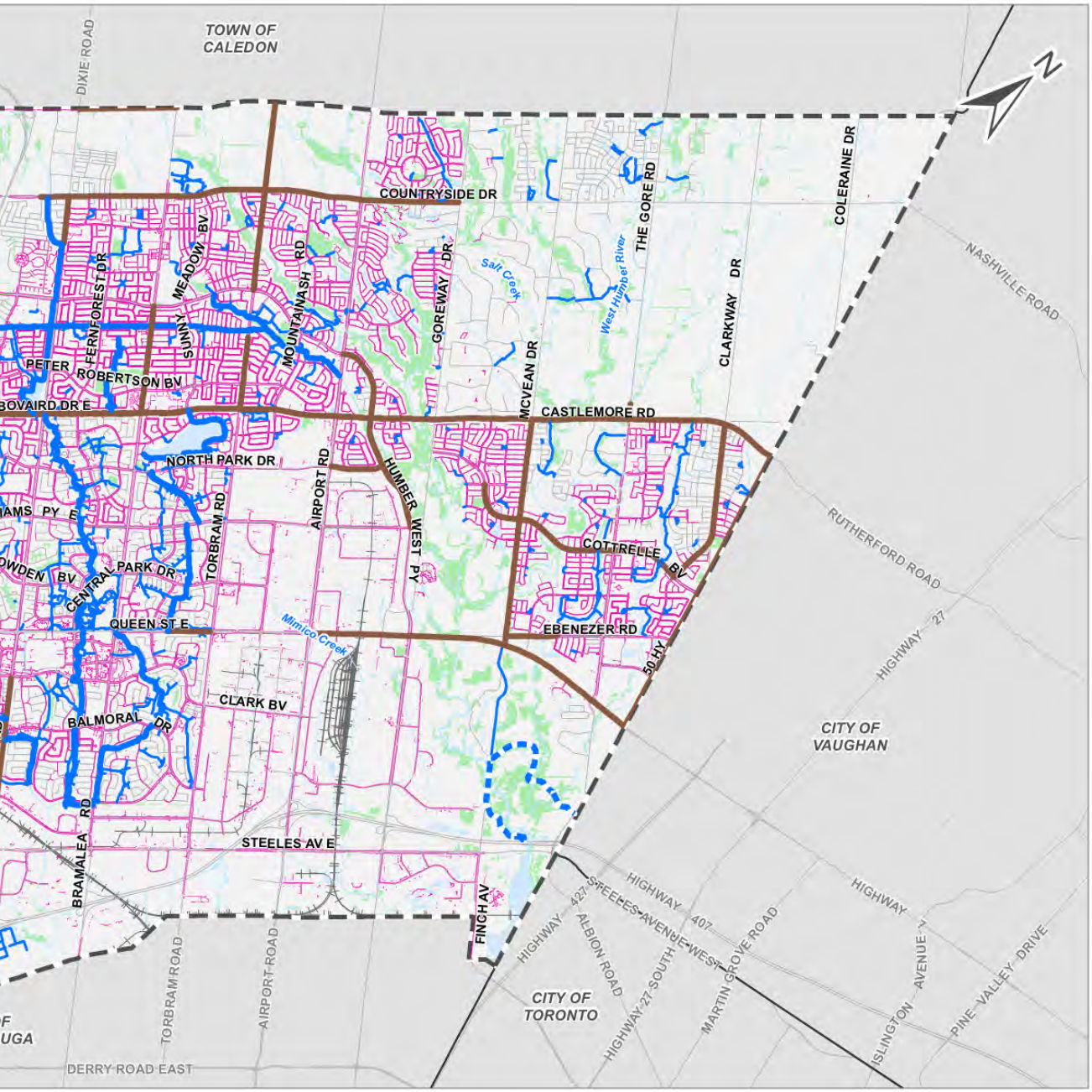

102159

Existing Sidewalks, Multi-Use Paths and Trails

Brampton ATMP
City of Brampton

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BRAMPTON Flower City

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Date: April, 2019

4.2.2 Missing Sidewalks Program

The City of Brampton's current "Missing Sidewalk Program" uses a warrant to prioritize the installation of sidewalks as stand-alone projects. The warrant takes into account road type, area, connection, and land use. Each criterion is assigned a value based on pre-defined factors. For example, the "area" criterion considers adjacent trip generators such as schools, transit routes, and recreation facilities, and assigns a value based on the frequency of these key destinations. A summary table of the existing scoring system is shown in Exhibit 4.3.

Exhibit 4.3: Existing Missing Sidewalk Prioritization Tool

ROAD TYPE	
Value	Description
5	MAJOR ARTERIAL
4	MINOR ARTERIAL
3	COLLECTOR
2	LOCAL LINK (LOCAL ROAD CONNECTING TO AN ARTERIAL ROAD, OR MORE THAN 2 COLLECTOR ROADS)
1	LOCAL

AREA	
	Description
-	SCHOOL ON ROAD
-	RECREATION CENTER ON ROAD
-	SHOPPING MALL ON ROAD
-	TRANSIT ROUTE ON ROAD
-	SCHOOL ON ADJACENT ROAD
-	RECREATION CENTER ON ADJACENT ROAD
-	SHOPPING MALL ON ADJACENT ROAD
-	TRANSIT ROUTE ON ADJACENT ROAD
Value	Criteria
5	THREE OR MORE OF THE ABOVE ON THE SAME STREET
4	TWO OF THE ABOVE ON THE SAME ROAD
3	ONE OF THE ABOVE ON THE ROAD
2	TWO OR MORE ABOVE ON AN ADJACENT ROAD
1	ONE OF THE ABOVE ON AN ADJACENT ROAD
CONNECTION	
	Description
-	A PATH FROM A SCHOOL TO THE STREET
-	PARK PATHWAY TO THE STREET
-	STREET TO STREET PATHWAY CONNECTING TO A ROAD
-	PARTIAL SIDEWALK ON THE STREET
Value	Criteria
3	THREE OR MORE OF THE ABOVE CONNECT TO THE SAME STREET
2	TWO OF THE ABOVE CONNECT TO THE SAME STREET
1	ONE OF THE ABOVE CONNECT TO THE STREET
LAND USE	
Value	Description
3	COMMERCIAL
3	VERY HIGH DENSITY (HIGH RISE APARTMENTS)
2	RESIDENTIAL (SINGLE, SEMI, AND TOWNHOUSES)
1	INDUSTRIAL
BLANK	RURAL RESIDENTIAL/ESTATE LOTS

As the identification and prioritization of missing sidewalk locations continues, it is recommended that the following indicators also be considered:

- The presence of seniors homes or healthcare centres
- Locations where major barriers, such as highways or railways, may impact pedestrian safety

Brampton Transit plays a large role in expanding the reach and mobility of both walking and cycling trips. When prioritizing projects it is important that projects that serve transit be given the highest priority.

While sidewalks should be provided on roadways of every class, their absence on particular roadways may pose a greater safety risk for vulnerable road users. Road classifications typically reflect the average daily traffic volumes and posted speeds of the roadway. Higher numbers of pedestrian fatalities or serious injury collisions typically occur on higher speed arterials. From the standpoint of addressing fatalities, it is therefore important that installing pedestrian infrastructure on arterial roads be prioritized. Missing sections of sidewalks on arterial roadways were identified and mapped on Exhibit 4.5. These are considered critical links to be provided in order to improve pedestrian access and safety.

Many of the sidewalk gaps exist due to construction constraints such as corridors with extensive utility infrastructure which is both costly and time-consuming to relocate. In other cases, the sidewalk gaps occur along major structures or crossings which are often not replaced for several decades. Under these scenarios, the relative cost of retrofitting the sidewalk without a corresponding capital road project may be substantially higher and therefore not deemed cost effective. Going forward, in evaluating and addressing the sidewalk gaps, it is recommended that a portion of the overall funding for the program be increased and allocated specifically to a reserve type fund to address these more challenging links.

In addition, it is recommended that the location of these sidewalk gaps be provided as an input to the Capital Road Reconstruction prioritization process.

Recommendation:

Update the Missing Sidewalk Program priority warrant to include metrics relating to the presence of seniors homes/healthcare centers and locations where major barriers, such as highways or railways may impact pedestrian safety.

Update the Missing Sidewalk Program priority warrant to recognize that projects where a transit route has been identified, be elevated to the highest priority

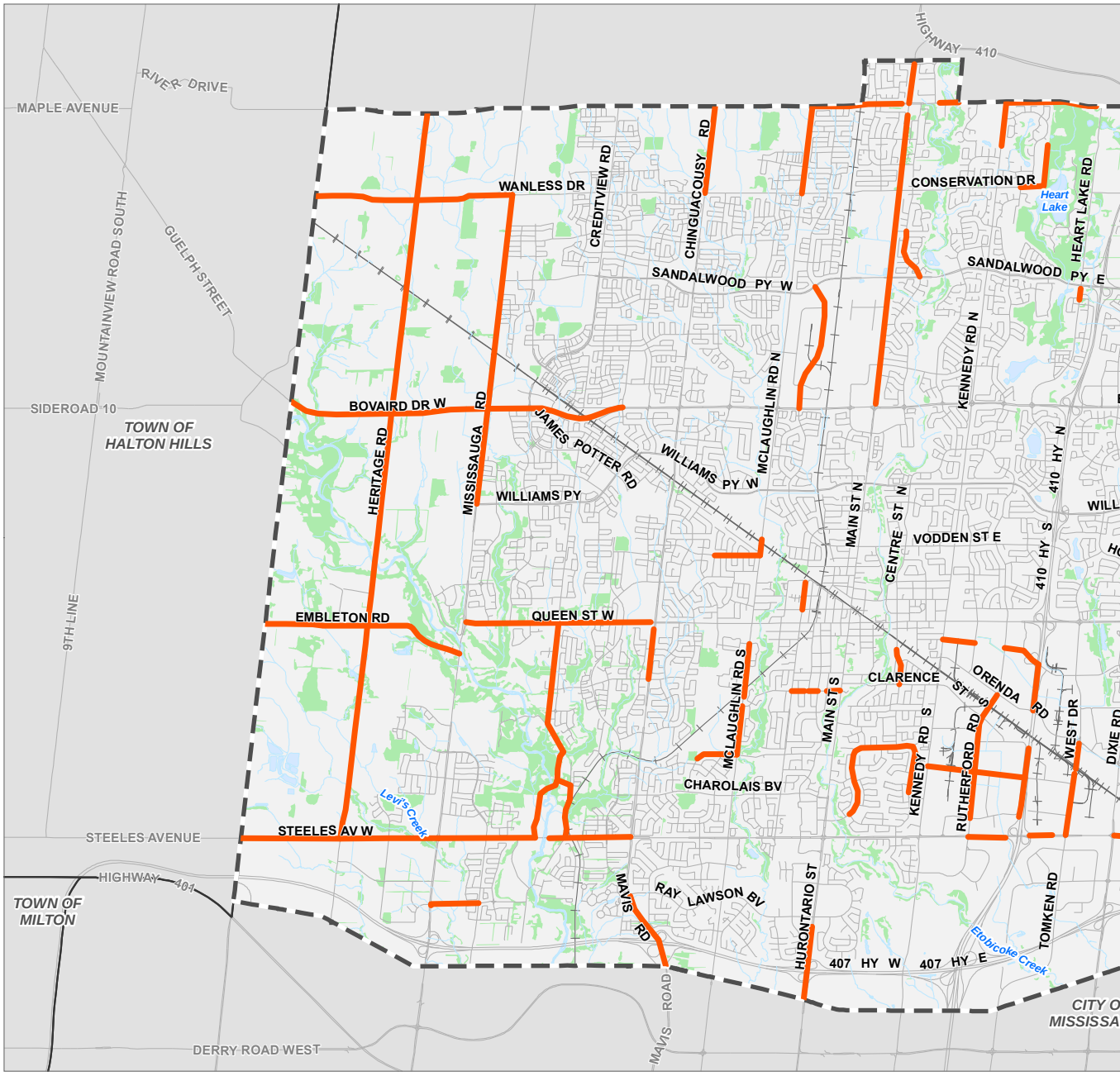
Public Consultation & Input

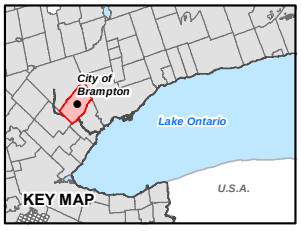
Various comments received through the public engagement process are related to site access challenges for cyclists and pedestrians, particularly for locations with an abundance of parking, like transit terminals and major retailers. Although primarily related to the site planning process, site access has implications on the efficacy of the active transportation network. Specific locations with site access issues are identified below in Exhibit 4.4.

Exhibit 4.4 Locations for Consideration in the Missing Sidewalks Program

Location	Adjacent To	Key Issue
Thomas Street, L6X 1N1	Transit, School, Key Destination	Missing Sidewalk
John Street, L6W 1Z9	Transit, School, Key Destination	Barrier Crossing
October Place, L6Y 5R4	Transit, School, Key Destination	Missing Sidewalk
Nelson St W, L6X 1B8	Transit, School, Key Destination	Missing Sidewalk
Nelson St W, L6X 1R4	Transit, School, Key Destination	Address Accessibility Issue
Theatre Lane, L6V 1R1	Transit, School, Key Destination	Missing Sidewalk
Nelson St W, L6X 1B8	Transit, School, Key Destination	Address Accessibility Issue
Kennedy Rd S, L6W 4V2	Transit, School, Key Destination	Site Access
Dixie Rd, L6T 4W6	Transit, School, Key Destination	Site Access
Steeles Ave E, L6W 4S2	Transit, School, Key Destination	Site Access
Orenda Road, L6T 1G8	Transit, School, Key Destination	Site Access

Exhibit 4.5: Map of Missing Sidewalk (Arterial)





- Missing Sidewalk (Arterial)
- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area
- Brampton Municipal Boundary

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N

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102159

Missing Sidewalks on Arterial Roads

Brampton ATMP
City of Brampton

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Date: April, 2019

Resourcing Sidewalk Construction

It is expected that all new roadways constructed in the City will be designed to include sidewalks or multi-use paths. It is also an emerging North American best practice that sidewalks or multi-use paths be programmed at any location where a road reconstruction is being undertaken. Road reconstruction is a cost-effective and efficient approach to construct missing sidewalks, and also offers design and construction flexibility to address local concerns.

However, leveraging capital works coordination opportunities will not be sufficient to ensure that facilities are being installed where they are needed. Beyond the cost-savings resultant from capital work coordination, it is necessary for the City of Brampton to adequately resource the scoping, design and construction of stand-alone missing sidewalk projects.

Recommendation:

Provide dedicated annual capital funding of $1.25 million to accelerate the installation of missing sidewalks on arterial roadways and address challenging corridors.

4.3 CYCLING NETWORK

The cycling network was refined from the network presented in the 2015 Transportation Master Plan Update and includes a variety of facility types such as signed routes, bike lanes, buffered bike lanes, protected bike lanes, cycle tracks and multi-use paths (located within road allowance) and multi-use trails (located within parks and valley lands).

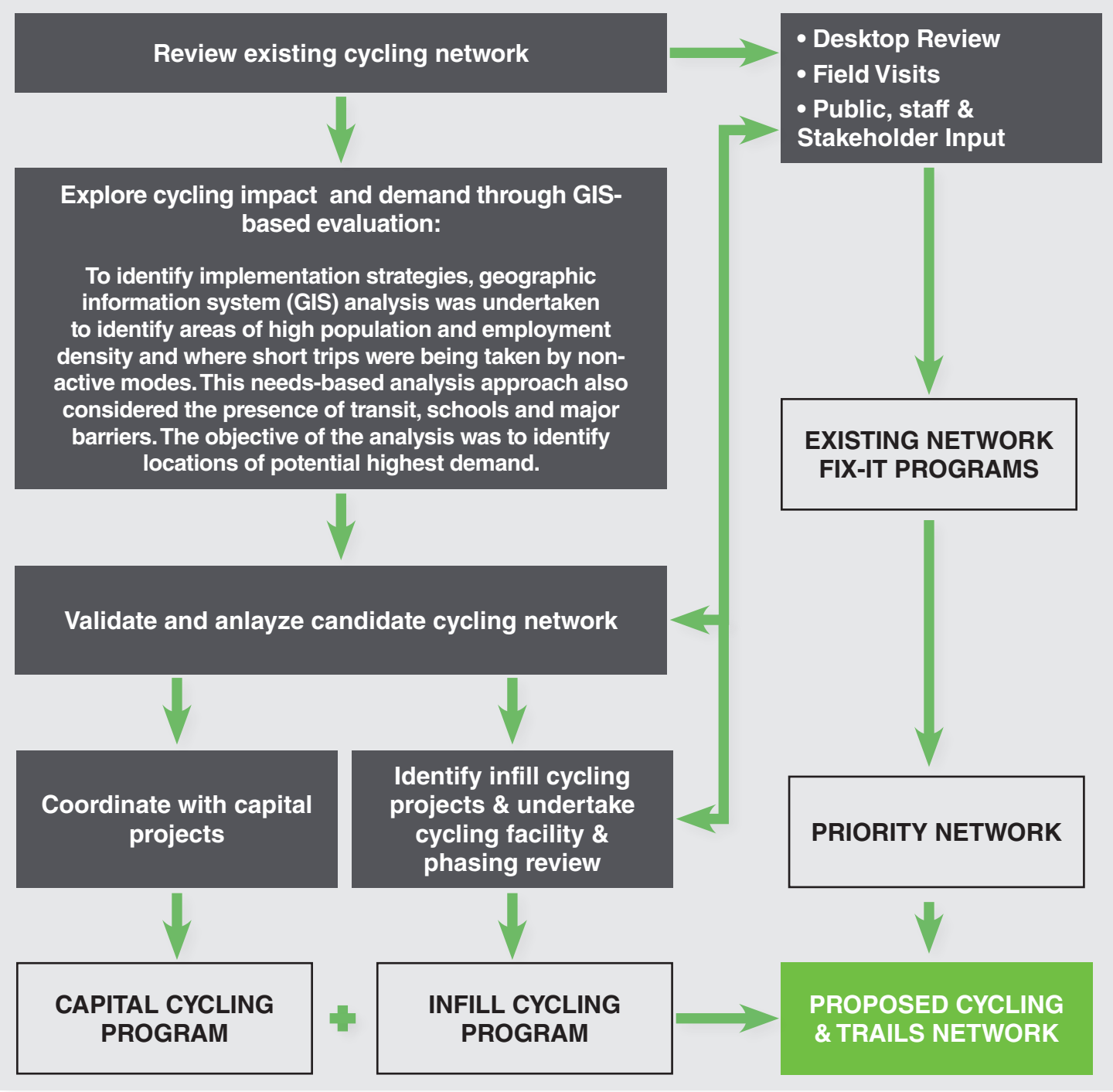
The final cycling network will be implemented by applying the following strategies:

- Improvements/enhancements to the existing facilities
- Planned infrastructure identified through planned construction opportunities
- Infill projects to supplement and connect existing and planned networks

In order to prioritize its implementation, a priority cycling network centred around a central "signature" loop and a number of key east-west routes have been identified and presented as short-term priorities (presented later in this section).

It is important to note that elements of the cycling network includes pedestrian infrastructure (recreation trails and multi-use paths) so improvements and expansion of these also support improved infrastructure for pedestrians. The process followed to identify the full cycling network program is shown in Exhibit 4.6.

Exhibit 4.6: Cycling Network Development



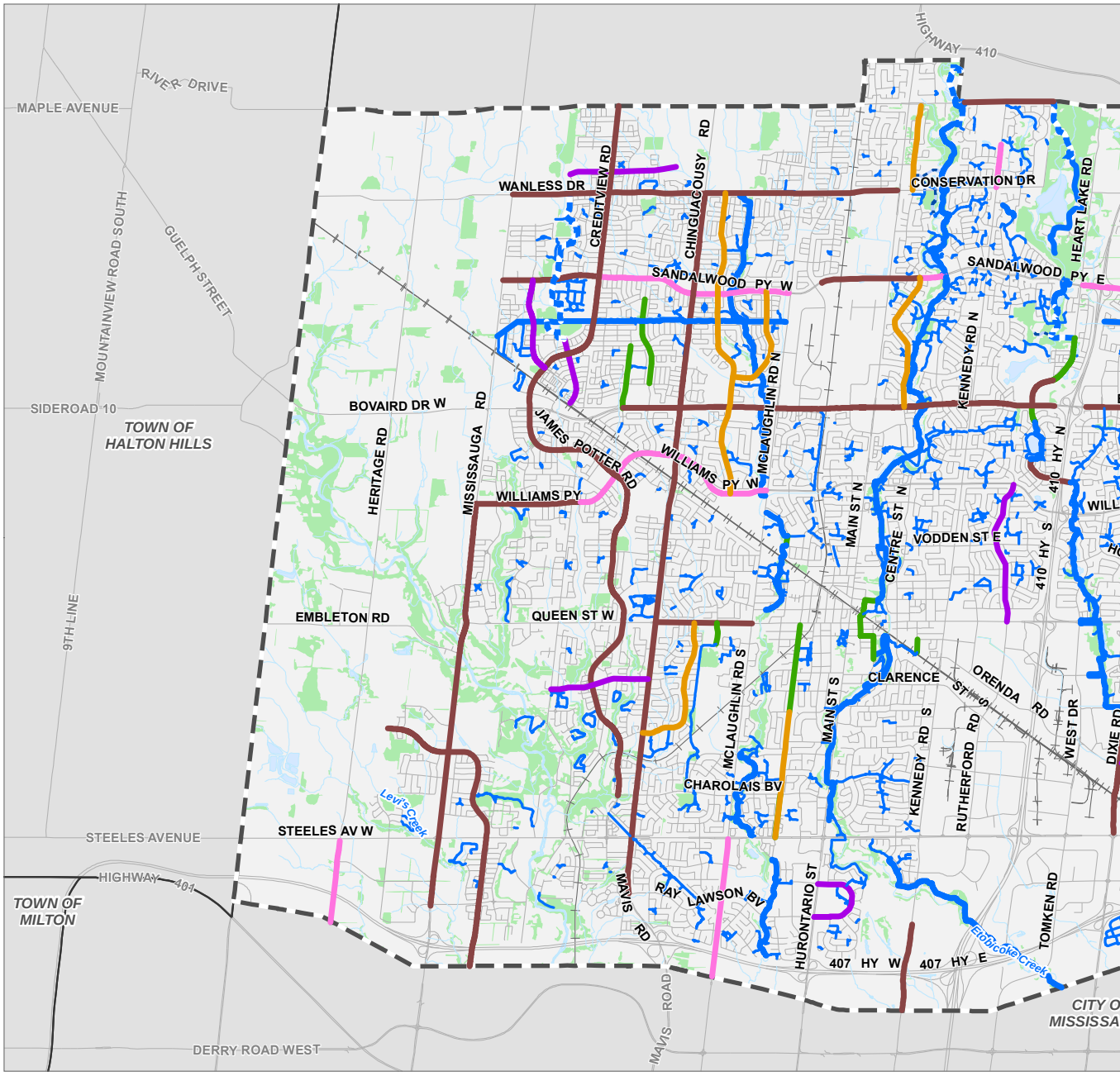
4.3.1 Existing Cycling Network

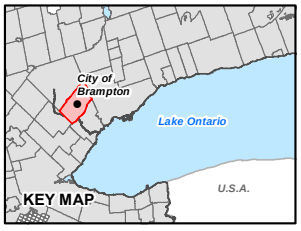
The City of Brampton's existing cycling network includes approximately 466 km of bike lanes, signed or marked routes, boulevard bike paths, multi-use paths, recreational trails and park paths. The majority of the existing cycling facilities (approximately 278 km) are paved off-road multi-use paths constructed either in the boulevard adjacent to a roadway or within open space along a watershed. The extent of Brampton's existing cycling facilities is summarized in Exhibit 4.7. A map of these bikeways is provided in Exhibit 4.8.

Exhibit 4.7: Summary of Existing Cycling Facilities

CYCLING NETWORK FACILITY TYPE	CENTERLINE KM
Bike Lanes	11.3
Shared Roadways (includes signed routes, and routes marked with sharrow or urban shoulder pavement markings)	8.5
Boulevard Bike Paths	20.1
Boulevard Multi-use Paths	107.1
Recreational Trails	66.8 (paved) + 5.2 (natural) = 72
Park Paths	218.8 (paved) + 4.8 (natural) = 223.6
Total	466.4

Exhibit 4.8: Map of Existing Cycling Facilities





Existing Network

- Multi-Use Path
- Recreational Trail (Paved)
- Recreational Trail (Natural)
- Park Path (Paved)
- Park Path (Natural)
- Boulevard Bike Path
- Bike Lane
- Signed Route
- Urban Shoulder
- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N

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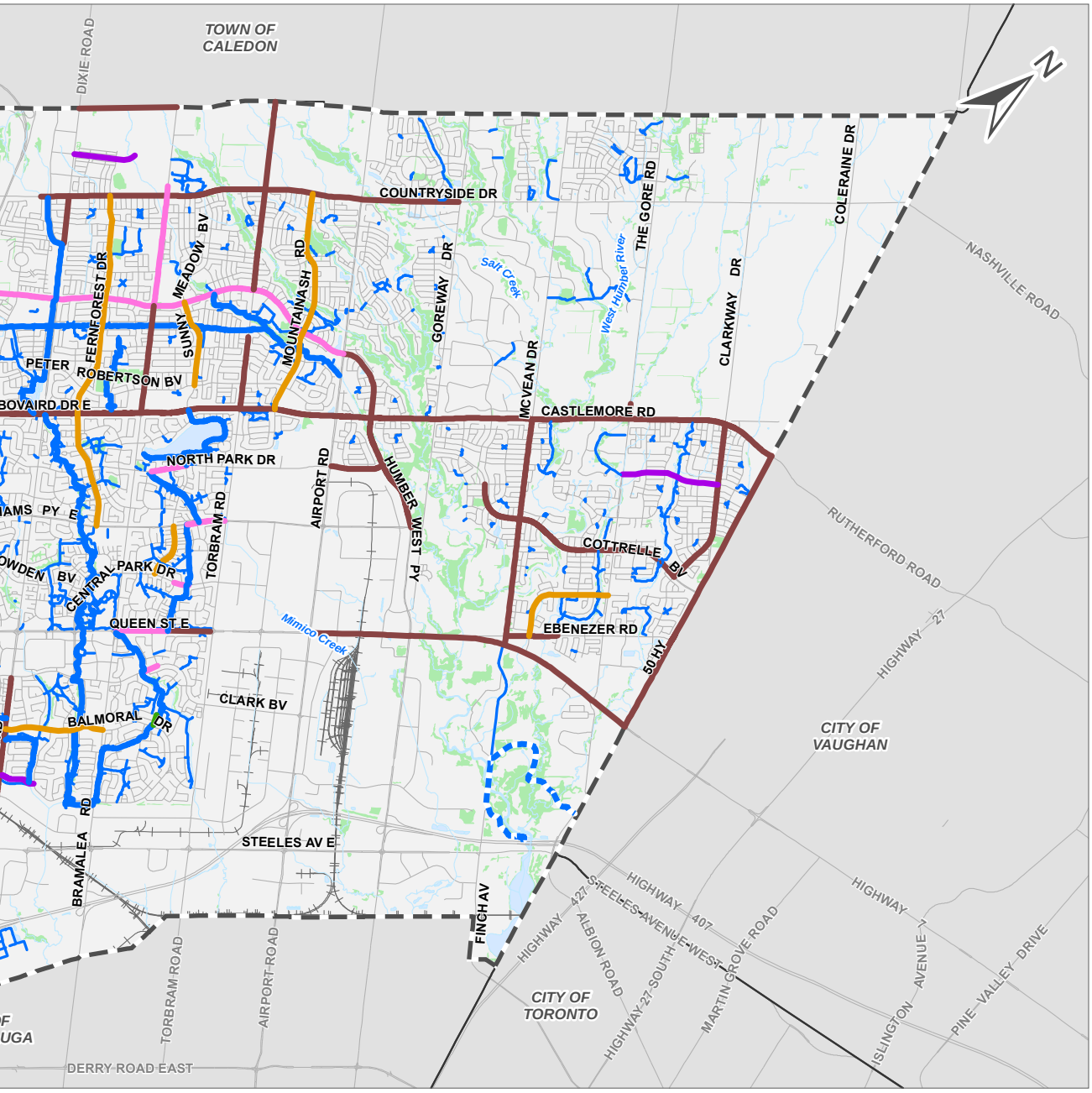

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Existing Network

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City of Brampton

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BRAMPTON Flower City

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Date: April, 2019

4.3.2 Cycling & Trails Capital Program

Coordination with road reconstruction and resurfacing projects provides a timely opportunity to install cycling facilities

At the time that a road is being reconstructed, significant changes may be made to the geometrics of the roadway, including changing the locations of catch basins and curbs. When roads are being reconstructed, it therefore may be possible to achieve cycling facilities that are physically separated such as cycle tracks or multi-use paths.

Similarly, installing painted bicycle lanes may be less expensive when undertaken in coordination with road resurfacing projects. Because laying new pavement requires the re-instatement of pavement markings, configurations that include bike lanes may be added without the cost of having to scrub existing markings to change lane widths or dimensions.

Opportunities to coordinate implementation of cycling facilities were identified by companying candidate cycling network routes against the City of Brampton's capital works program for road projects, as shown in Exhibit 4.9. Incorporating cycling projects into existing road reconstruction and resurfacing projects may be understood as a 'Complete Streets' approach to implementing enhancements for all road users. However, it should be noted that the capital works schedule can be reviewed and adjusted, which may shift installations from year to year. This means that the approximate timelines shown in this plan may be subject to change, as the road capital program evolves over time.

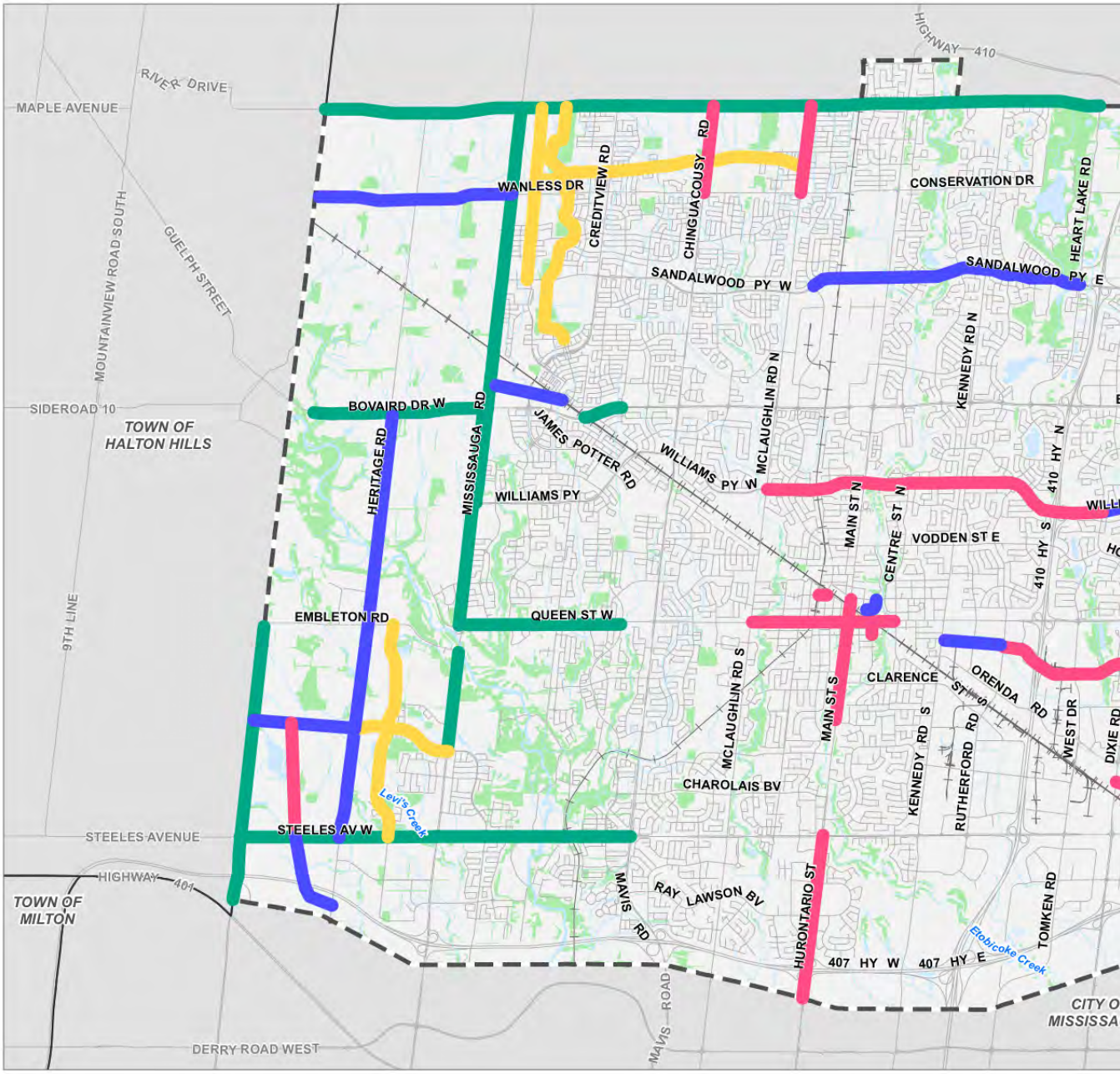
Other Studies that Include Cycling Facilities

Beyond road reconstruction and resurfacing projects, a number of studies and projects that may include cycling facilities were already underway at the time that the ATMP study was initiated. These include:

- Downtown Reimagined Streetscaping Study
- Downtown Etobicoke Creek Revitalization Studies (Riverwalk)
- Queen Street Transit Master Plan
- Function and Design Review of the Heart Lake Road Corridor Study
- Claireville Conservation Area Trail Design
- Various Environmental Assessment Studies

As with road reconstruction and resurfacing projects, these projects are not driven by cycling infrastructure, but have the potential to include cycling facilities within their scope. It is therefore worthwhile to consider the linkage opportunities these study areas represent from a network perspective.

Exhibit 4.9: Capital Plan Program & Cycling Network



Capital Plan Horizon

- Development Project
- 0-5 Year Capital Program; 2017 TO 2021
- 6-10 Year Capital Program
- Anticipated Regional Project

- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N

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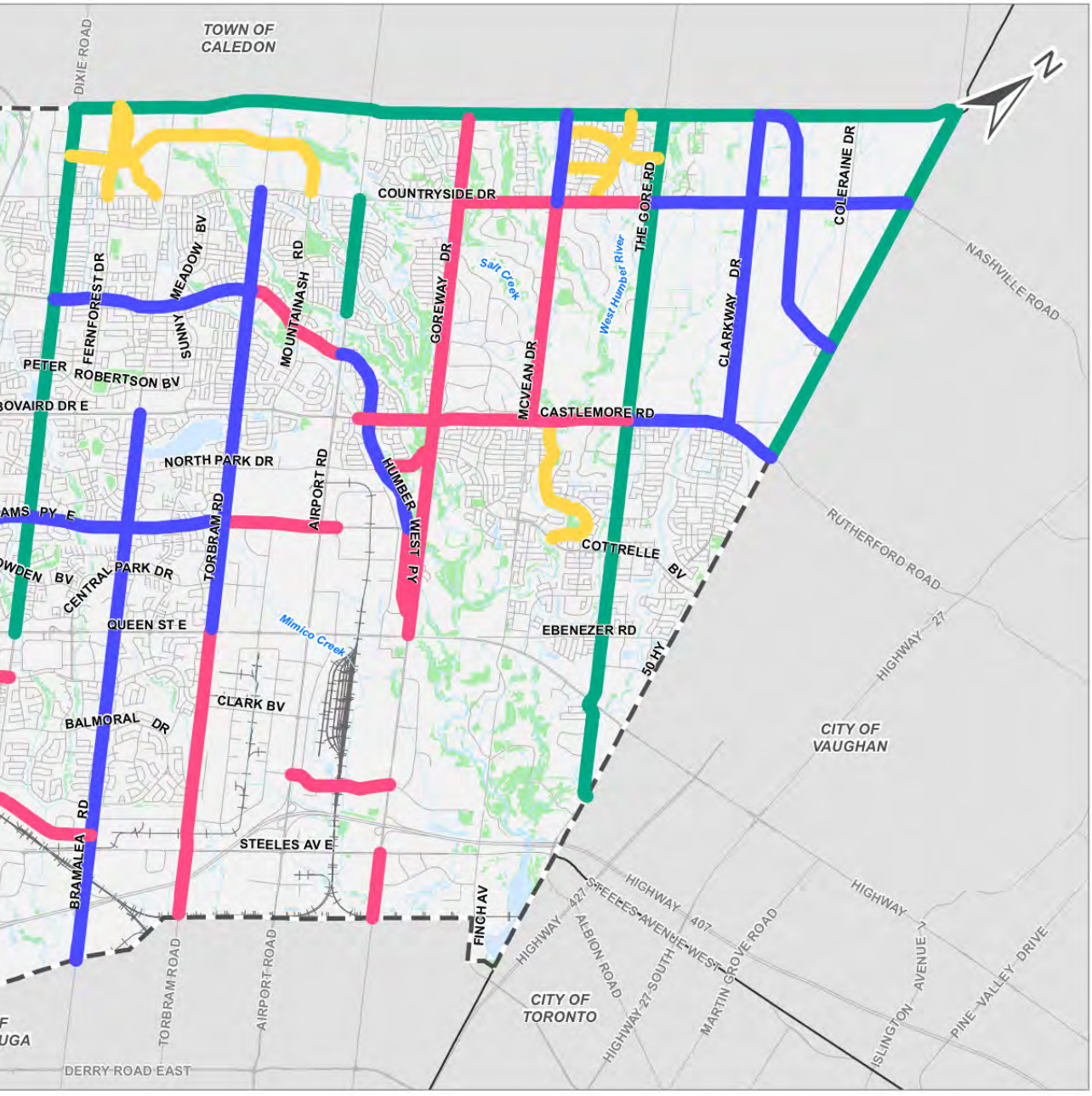

102159

Capital Plan Network and Cycling Network Overlay

Brampton ATMP
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Date: April, 2019

4.3.3 Cycling Infill Program

Although there is benefit in coordinating with existing studies and construction, leveraging these opportunities will not be sufficient to ensure that cycling infrastructure is programmed in all the places where it would **provide the most benefit.**

In addition to the cycling and trails projects that will be delivered through a coordinated capital program, infill projects will also be needed to achieve a connected network over time. To understand what parts of the City have the greatest cycling potential, and therefore the greatest need for infrastructure, a geospatial analysis of cycling indicators was completed.

The purpose of this geospatial analysis was to identify and prioritize candidate cycling projects to be recommended as near-term priorities. These network "infill" projects would help to fill gaps between existing cycling facilities. The analysis applied the following indicators to identify improvements with the most potential to increase ridership:

- **Connectivity:** Network cohesion has been identified as a significant factor affecting the likelihood of people who rarely cycle to do so more frequently.
  - If the proposed project connects to an existing cycling facility, then **15 points** were assigned;
  - If it connects to a funded capital project that includes a cycling facility, then **10 points** were applied; and,
  - If it connected to a planned facility, then **5 points** were applied.

Three ridership levels were recognized: low (>15/day), medium (16-50/day) and high (over 50/day). Assumptions about the potential cycling increases from these existing levels, were then calculated based on two factors - the population and employment density of the project area, and the extent to which the recommended facility would connect to other cycling facilities.

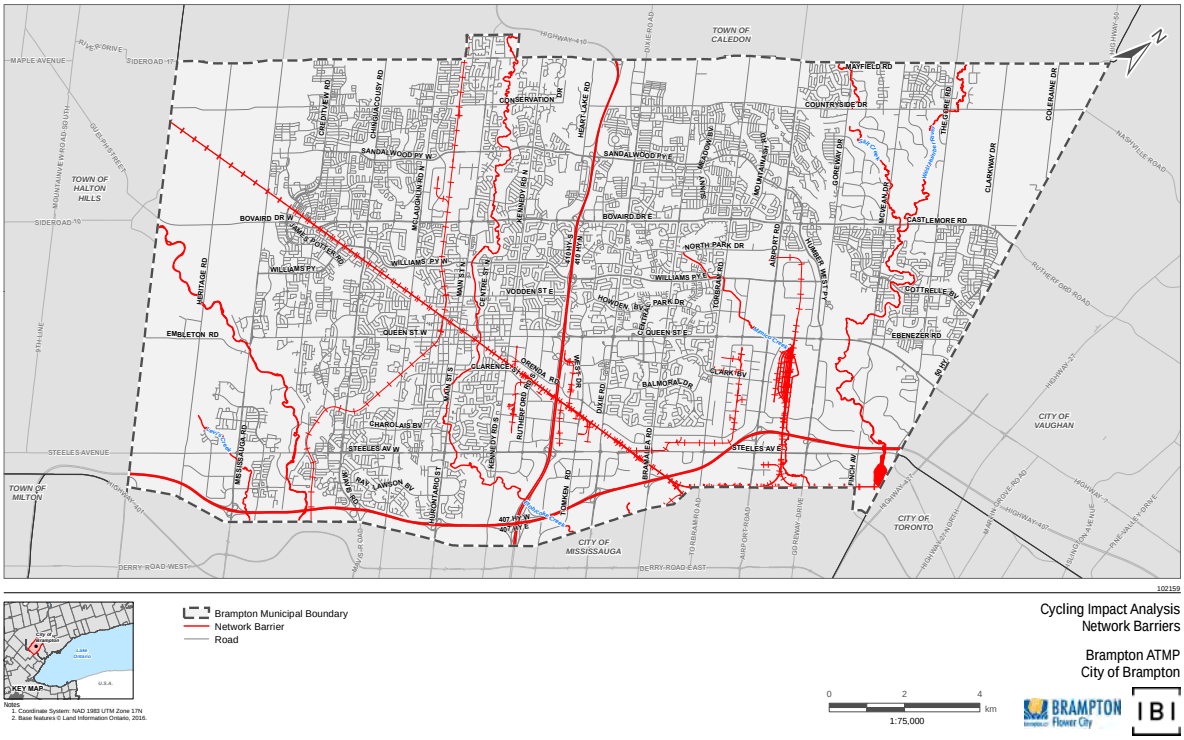
- **Existing Cycling Trips:** 2011 Transportation Tomorrow Survey (TTS) data was used to identify current cycling activity for each zone(s) where a cycling facility is recommended. The existing cycling activity recorded in the TTS Transportation Activity Zone (TAZ) for the corridor the facility passes through was identified as a base level of existing cycling activity. In cases where the proposed cycling facility would pass through multiple zones, the higher estimate was used.
- **Cost to Implement:** The analysis considered the anticipated high-level cost to deliver the project as an important feasibility consideration. The costs to install cycling facilities may range from as little as $15/linear meter for painted bike lanes to $1,000/m+ for multi-use facilities. The analysis therefore scored:

- **20 points** for on-street facilities that would be lower-cost to deliver;
- **13 points** for multi-use paths located within a public right-of-way; and,
- **7.5 points** for off-road trails, which may incur more grading and naturalization costs than boulevard facilities.

➤ **Barriers:** Cycling for transportation is often limited by physical barriers such as rivers, highways or railways. Providing cycling links that cross physical barriers reduces gaps in the network as a whole.

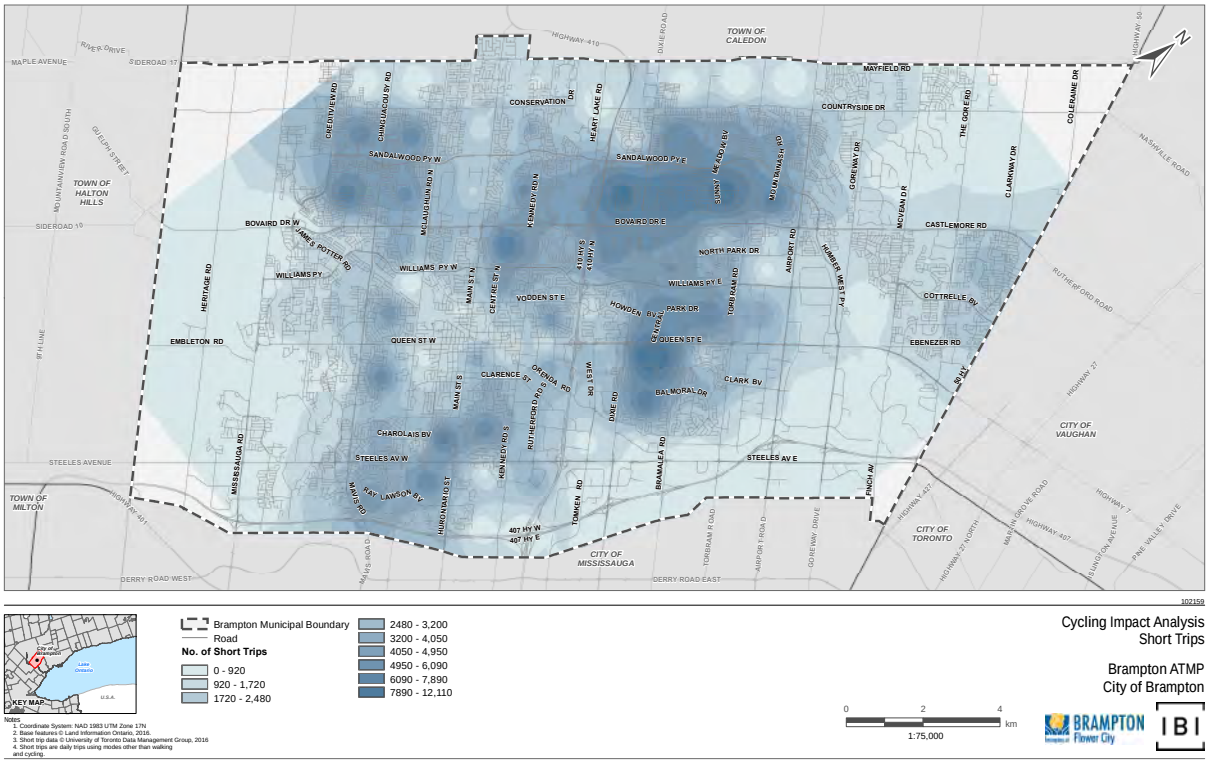
- The analysis recognized the value of candidate projects that crossed a barrier by assigning them **10 points**.

Exhibit 4.10: Barriers



- **Short Trips:** 2011 Transportation Tomorrow Survey (TTS) data was used to identify numbers of people who were traveling distances of 5km or less by motor vehicle. These short trips are an important indicator of the likelihood that a trip may be made by bicycle, as people are more likely to switch from driving to cycling for short trips. The analysis highlights areas where there is currently a high demand for short trips not currently being made by bicycle, but could potentially be completed by bicycle in future.

Exhibit 4.11: Short Trips Analysis



➤ **Existing Population and Employment Density:** Having origins and destinations that are close to each other is important for cycling, because it increases the likelihood that a short trip by bicycle is practical. Each corridor where a cycling facility is recommended was evaluated and scored based on a weighted total of each traffic zone it passed through. For instance, if a link passed through two different traffic zones with two different density numbers – a total density number would be assigned based on weighting the percent of each zone that link fell in. Based on total density, points were assigned as follows:

- **2 points** for locations where there are 15-60 people and jobs per hectare;
- **3 points** for locations where there are 60-100 people and jobs per hectare; and,
- **4 points** for locations where there are over 100 people and jobs per hectare.

Exhibit 4.12: Population and Employment Density

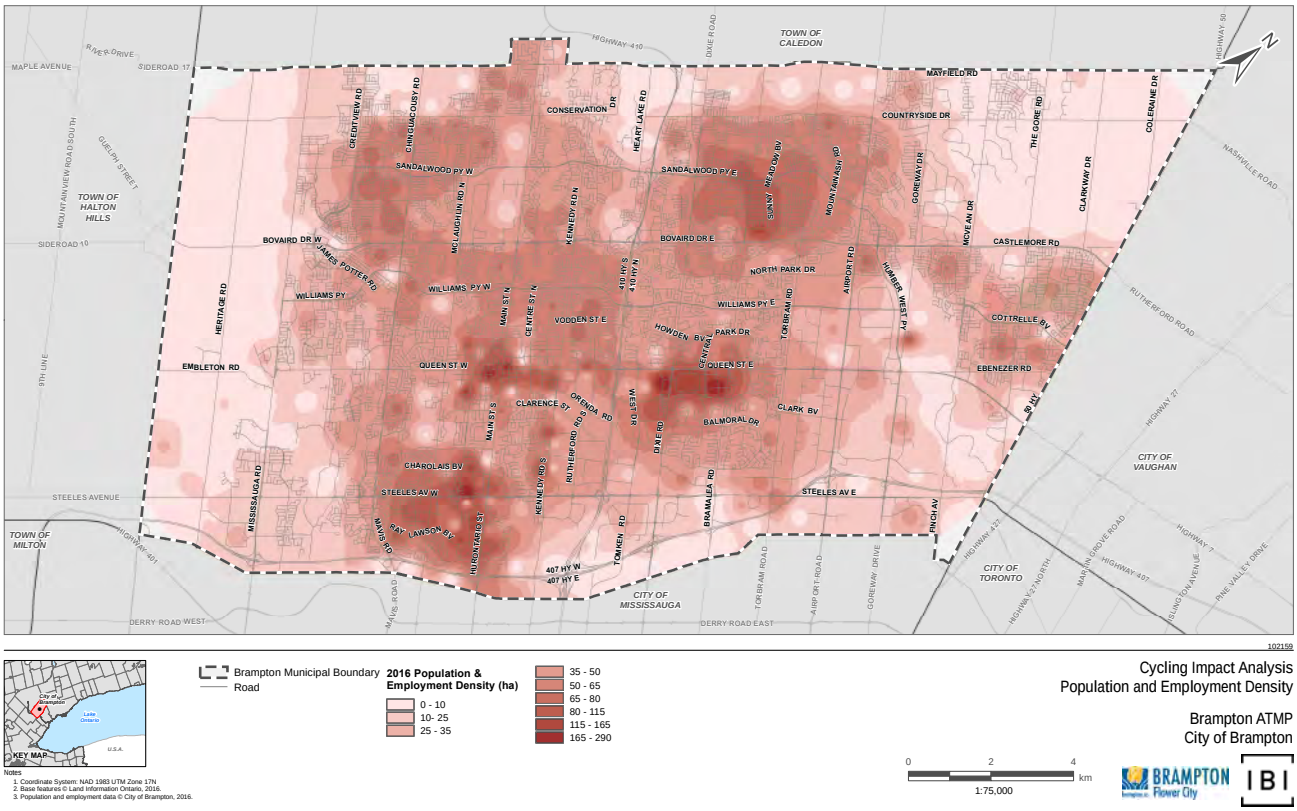


Exhibit 4.13: Summary of Analysis Scoring for Infill Cycling Projects

FACTOR	ASSIGNMENT OF SCORES			
Connectivity	Planned 5 points	Capital 10 points	Existing 15 points	
Existing Cycling Trips	<15 0 points	15 to 50 15 points	>50, 30 points	
Cost	Proposed Off-road Trail 7.5 points	Proposed Boulevard Path 13 points	Proposed On-Street 20 points	
Barriers	10 points if any barrier crossed			
Short Trips	<2,000 0 points	2,000-4,000 2 points	4,000-6,000 3 points	>6,000 5 points
Population and Employment Density	<15 0 points	15-60 2 points	60-100 3 points	>100 5 points

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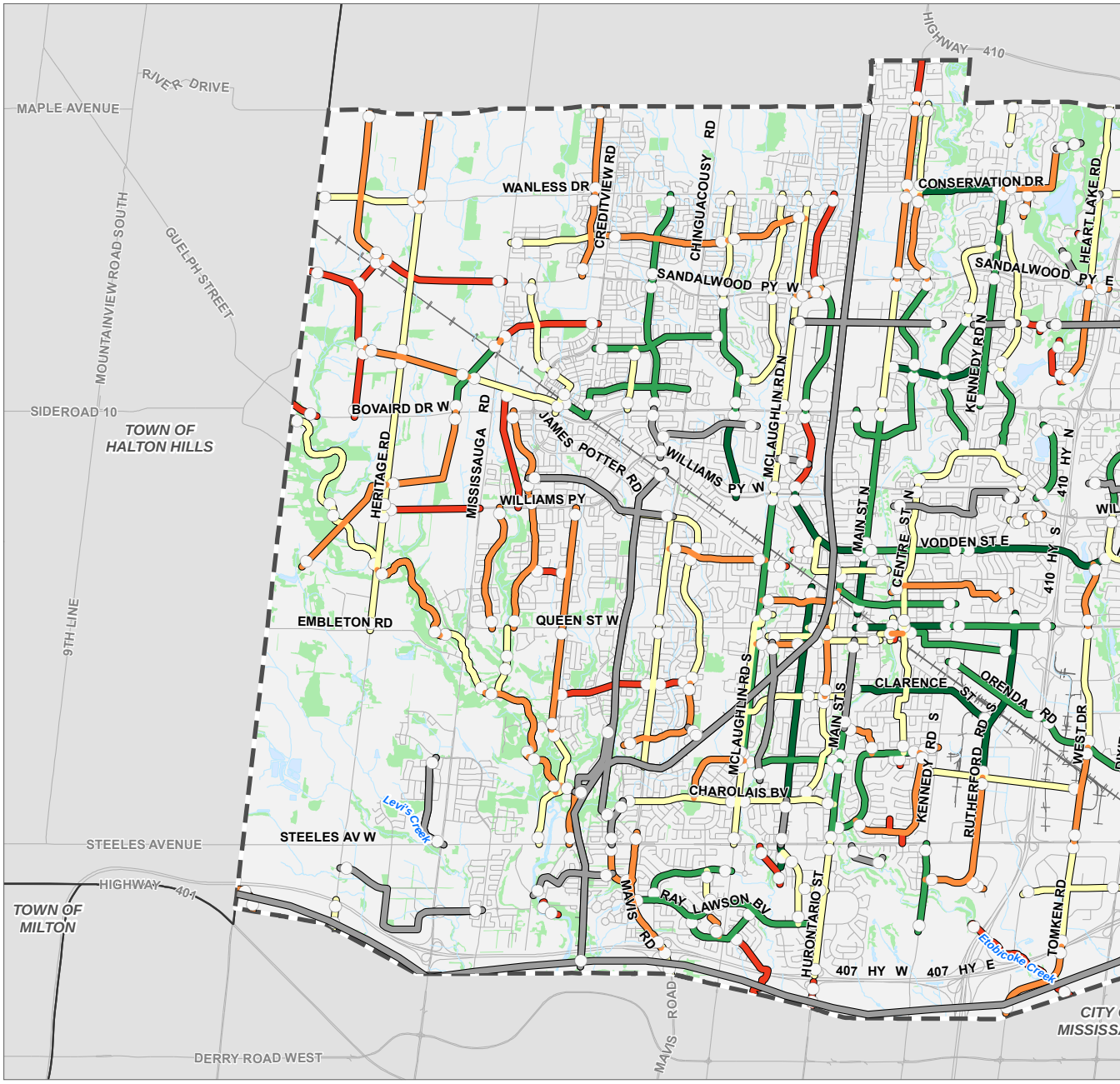
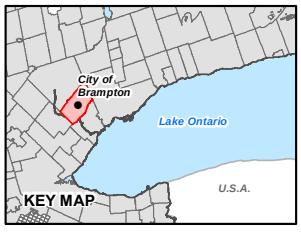
Exhibit 4.14: Cycling Network Analysis Scoring





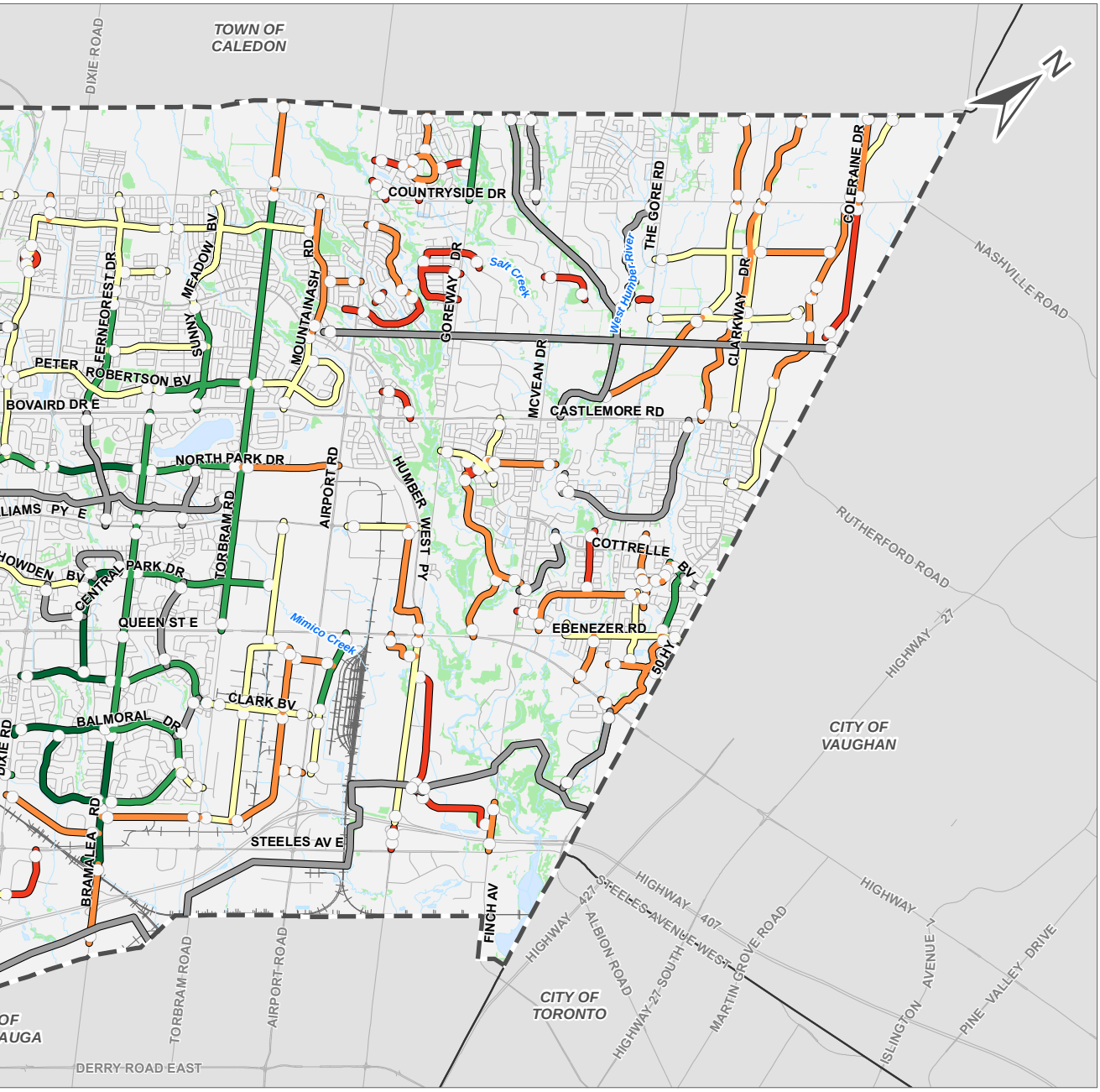
Unscored Segment

Analysis Scoring

- 0 - 34
- 35 - 47
- 48 - 60
- 61 - 73
- 74 - 85

Watercourse
Road
Rail Line
Waterbody
Wooded Area

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N



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Analysis Scoring

Brampton ATMP
City of Brampton

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Public Consultation & Input

The digital consultation process for the ATMP included an exercise for the public to map their cycling priorities. The emphasis was on identifying and prioritizing east-west opportunities. Appendix B includes a list of the public's bike lane priorities, along with the key issues identified, public priority ranking, and the link scores based on the metrics identified in Exhibit 4.13. A majority of the links recommended by the public were identified for the addition of cycling facilities through the City's capital program (refer to Exhibit 4.9).

4.3.4 Feasibility Review & Facility Selection

Building upon the cycling capital and infill programs, facility types for the cycling and trails network were identified, as shown in Exhibit 4.16.

For links identified as part of the Capital Program, the cycling facility types are already identified for most projects, but some are currently under study though environmental assessments, and will be subject to the findings of those studies.

For links identified as part of the Infill Program, a facility selection analysis was completed to identify recommended high-level facility types. In general, facilities along arterial roadways were identified for separated cycling facilities (multi-use trails or cycle tracks) depending on land use and roadway context. Facilities along local roadways will generally be signed routes or bicycle boulevards which incorporate traffic calming treatments. Along collector roadways, the facility selection is more challenging, and requires considering a wider variety of factors. The identification of facility types along Collectors is discussed in more detail in the following section.

For additional information on facility selection, refer to Section 3.2 or the **Design Compendium**.

Facility Identification for Collector Roadways

Brampton has a number of residential collector roads that were built to accommodate on-street parking while maintaining two-way traffic. As a result, these two-lane collectors typically have travel lanes of 4.5 m – 5 m in width. These wide travel lanes are undesirable from a road safety perspective, as wider lanes may encourage drivers to speed. The introduction of painted lane lines to define and narrow the motor vehicle travel lanes can help moderate speeds and compliance with the posted limit.

The application of new road markings to narrow/define travel lanes, presents an opportunity to introduce either urban shoulders or painted bike lanes (refer to Chapter 3.2 for further discussion of facility types). These retrofits would maintain two motor-vehicle travel lanes, and would not affect vehicular capacity. Geometric changes would not be necessary to the roadway to install urban shoulders or painted bicycle lanes at these locations. Allocating road space to serve a variety of users is a desirable strategy for traffic calming to improve road safety while achieving a network of cycling facilities.

Other roadways that carry moderate traffic volumes on 4-lane cross-sections, may represent similar opportunities to install bicycle lanes with minimal or no impact to motor vehicle travel times. Exhibit 4.15 lists the cycling facility feasibility on local four-lane collector roads. On roads such as Vodden Street where 4 travel lanes are provided, a reconfiguration may be undertaken to re-stripe the road with 2 travel lanes and 1 turn lane instead of 4 travel lanes (referred to as a road diet). This re-configuring of the general purpose travel lanes in turn allows space for the introduction of painted bicycle lanes.

Additional information on the review of 4-lane collectors is included in Appendix C.

Exhibit 4.15: Cycling Facility Implementation Feasibility on Four-lane Collector Roads

Street Name	Suggested Facility Type	Implementation Notes
McMurchy Ave. S	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Financial Dr.	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Can also address speeding concerns.
Peter Robertson Blvd.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Charolais Blvd.	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Can also address speeding concerns.
Vodden St. E	Protected bike lanes or cycle tracks	Investigate opportunities for road diet (volumes on threshold). If not feasible, provide cycle tracks when road is reconstructed. Consider providing interim bike lanes through lane narrowing for critical sections
North Park Dr. (West of Torbram Road)	Protected bike lanes	High speeds and heavy truck percentage indicates need for separation. Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Multi-use trail in boulevard could be considered if road diet not feasible (few driveways and back-lotted residential).
North Park Dr. (East of Torbram Road)	Multi-use Path	Industrial area – heavy truck percentage and volumes indicates need for separation. Multi-use path on north side would addresses sidewalk gap, however may be challenging due to utilities / grading impacts. Sidewalk on south side could be replaced by multi-use path.
Mackay St. N	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Rutherford Rd. S	Multi-use trail	Industrial area - heavy truck percentage and volumes indicates need for separation. Suggest multi-use trail on west side (also addresses sidewalk gap). Some challenging sections which will require access consolidation and further study.
Howden Blvd.	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes.

Street Name	Suggested Facility Type	Implementation Notes
Clark Blvd.	Protected bike lanes or multi-use trail	Investigate opportunities for road diet (volumes on threshold) to provide protected bike lanes. Limited frontage / driveways, so alternatively consider multi-use trail in boulevard.
Orenda Rd.	Cycle tracks	Industrial area - heavy truck percentage indicates need for separation. Existing two-way centre left turn lane in place (limits opportunities for road diet). Numerous driveways - consider cycle tracks when road is reconstructed.
Central Park Dr.	Protected Bike Lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes.
Clarence St.	Protected bike lanes	Industrial area. Investigate opportunities for road diet (volumes on threshold) to provide protected bike lanes.
Balmoral Dr.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Corporation Dr.	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Suggest protection to address higher truck volumes.
Cottrelle Blvd.	Multi-use trail	Multi-use trail on north side provides continuity with existing sections of trail between Prince Edward Blvd & Clarkway Drive. Limited driveways.
Dearbourne Blvd.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Ebenezer Rd.	Multi-use trail	Speeding indicates need for separation. Multi-use trail on north side provides continuity with existing section West of Alfonzo Crescent. Limited driveways.
Edgeware Rd.	Buffered bike lanes or multi-use trail	Low volumes suggest road is over-designed - consider lane removal to accommodate buffered bike lanes. Alternative would be to provide a multi-use trail on south side (will also address sidewalk gap). Heavy truck percentage and speeds indicate need for designated facility.
Hereford St.	Bike lanes or Buffered bike lanes	Heavy truck percentage and speeds indicates need for designated facility. Short section of four lane roadway. Aim to provide continuity with planned on-road facilities along two-lane section through lane narrowing and/or removal of right turn lanes.
Intermodal Dr.	Multi-use trail	Heavy truck percentage indicates need for separation. Suggest multi-use trail on south side (will also address sidewalk gap).

Street Name	Suggested Facility Type	Implementation Notes
Malta Ave.	Buffered bike lanes or multi-use trail	Consider lane removal to accommodate buffered bike lane. Depending on ROW availability, a multi-use trail on the east side may be feasible alternative by replacing existing sidewalk with MUP (need to minimize impacts to boulevard trees.
Ray Lawson Blvd.	Protected bike lanes or multi-use trail	Characteristics of an arterial roadway indicate need for separation. Investigate opportunities for road diet (volumes on threshold) to provide protected bike lanes. East of McLaughlin Road, multi-use trail in boulevard on north side could be considered if road diet not feasible (few driveways and back-lotted residential);
Sir Lou Dr.	Buffered bike lanes	Investigate opportunities for road diet (volumes on threshold). Multi-use trail in boulevard could be considered if road diet not feasible (few driveways and back-lotted residential); would need to consider transition to on-road facilities on Country Ct Blvd
Elgin Dr.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Jordan Blvd.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.
Hanover Rd.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.
Glenvale Blvd.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.
Finchgate Blvd.	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.
Hilldale Crescent	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.

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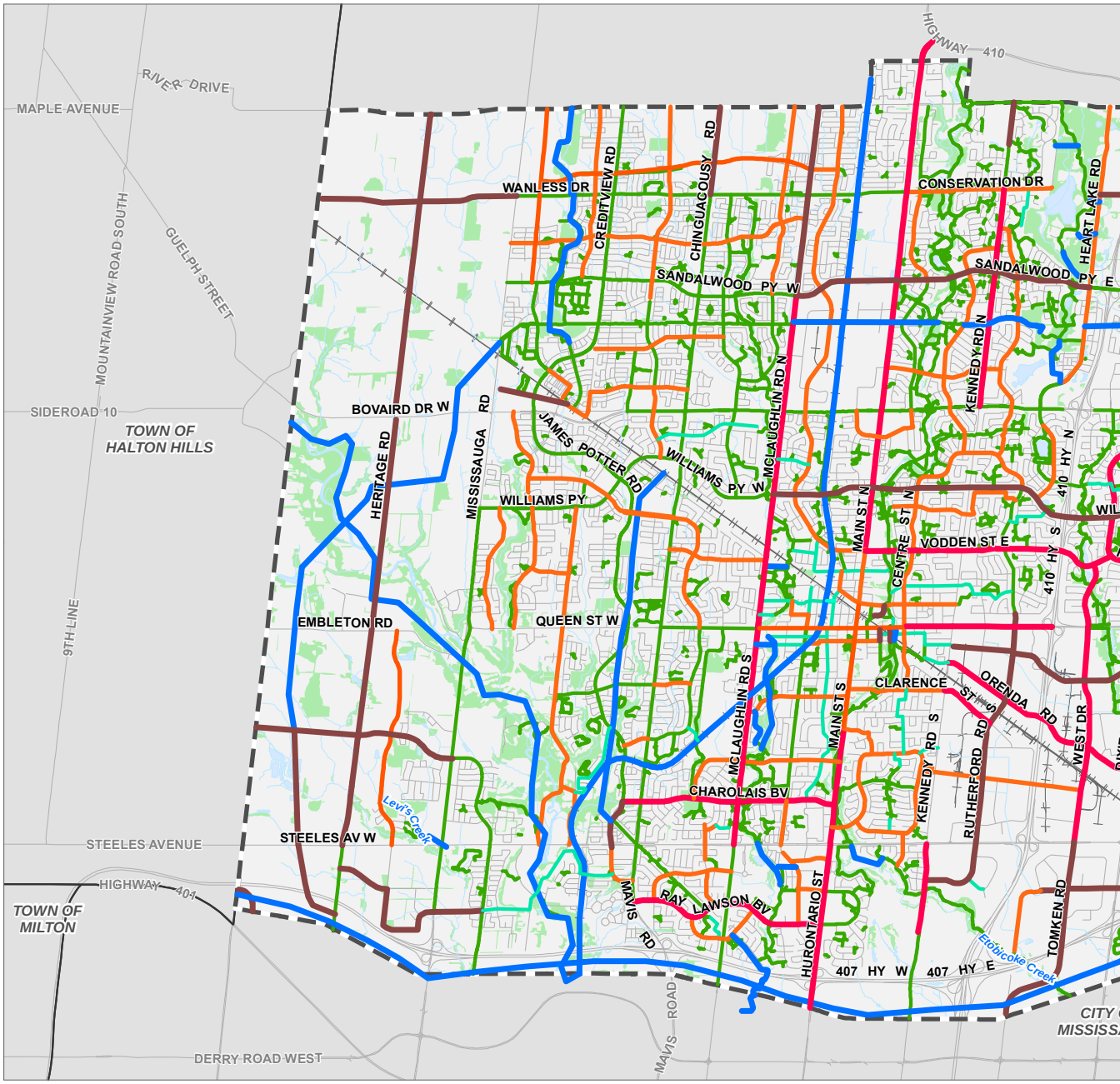
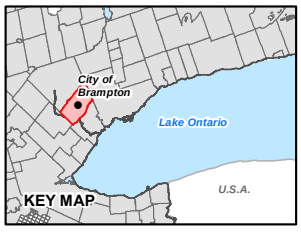
Exhibit 4.16: Proposed Network & Facility Type



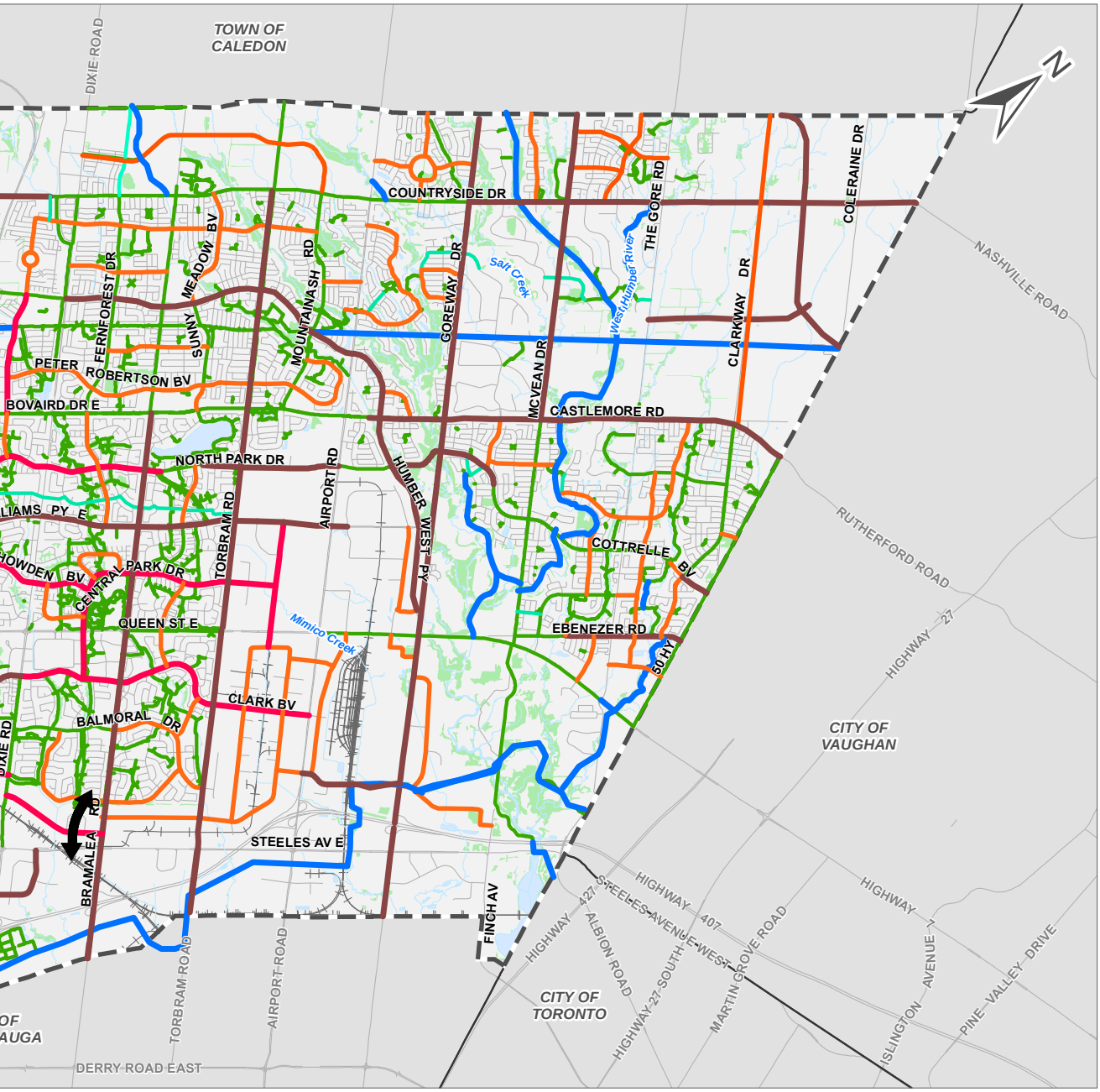


Notes
1. Coordinate System: NAD 1983 UTM Zone 17N

Facility Type

- Multi-Use Path / Boulevard Path
- Protected Bike Lane or Cycle Track (Separated)
- Bike Lane or Buffered Bike Lane (Designated)
- Shared Roadway
- Recreational Trail
- Regional Capital Plan Project
- Existing Network Link
- Desired GO Station Connection

- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area



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Proposed Cycling Network - Facility Types

Brampton ATMP
City of Brampton

0 2 4 km
1:75,000

4.3.5 Cycling Network Phasing

Building upon the cycling capital and infill programs, preliminary phasing for the cycling and trails network is shown in Exhibit 4.17.

For links identified as part of the Capital Program, the cycling facilities are programmed for the corresponding timeline of the road capital project. As noted in Section 4.3.2, the timing of the links may change as capital program priorities change, however this is more likely for projects identified in the medium and long term projects.

For links identified as part of the Infill Program, the analysis scores were used to identify which projects would provide the most benefit to cyclists, with a maximum possible score of 100 points. Projects with the highest scores are considered to be short-term priorities. It is desirable that infill projects identified as short-term priorities be initiated within a 5-year horizon. Infill projects that were not identified as short-term priorities may still be pursued by the City, but have been programmed within a longer term horizon of 5+ years. Another consideration for phasing the infill program is the need to provide sufficient time to complete public consultation. Often, in order to install cycling faciltiies, the road may have to be reconfigured through removal of parking or travel lanes. Since removing existing parking or travel lanes typically necessitates public consultation, the public and councillors must be engaged far enough in advance of planned construction to ensure that comments are received for consideration as part of the cycling facility design process.

Some highly desirable projects require extensive planning and have been identified as longer term projects despite their potential value (i.e. the Orangeville Brampton Railway Corridor Trail), and various hydro corridor trails.

Recommendation:

Allocate an annual budget towards implementing the short-term priorities identified in the ATMP “Infill” Program.

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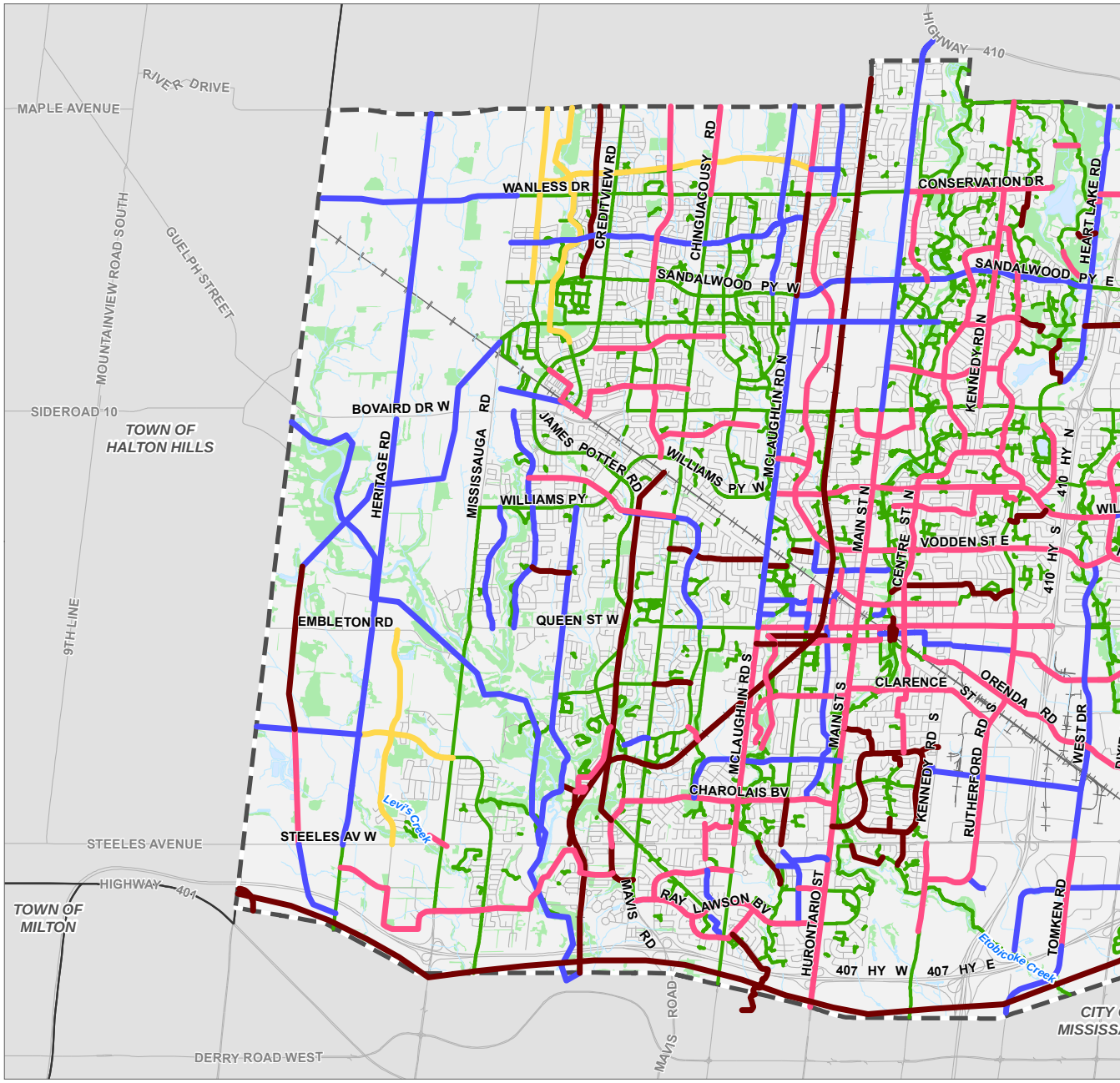
Exhibit 4.17: Cycling Network Phasing Map



Network Horizon

- Short Term
- Medium Term
- Long Term
- Development Project
- Existing Network Link
- Desired GO Station Connection

- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N

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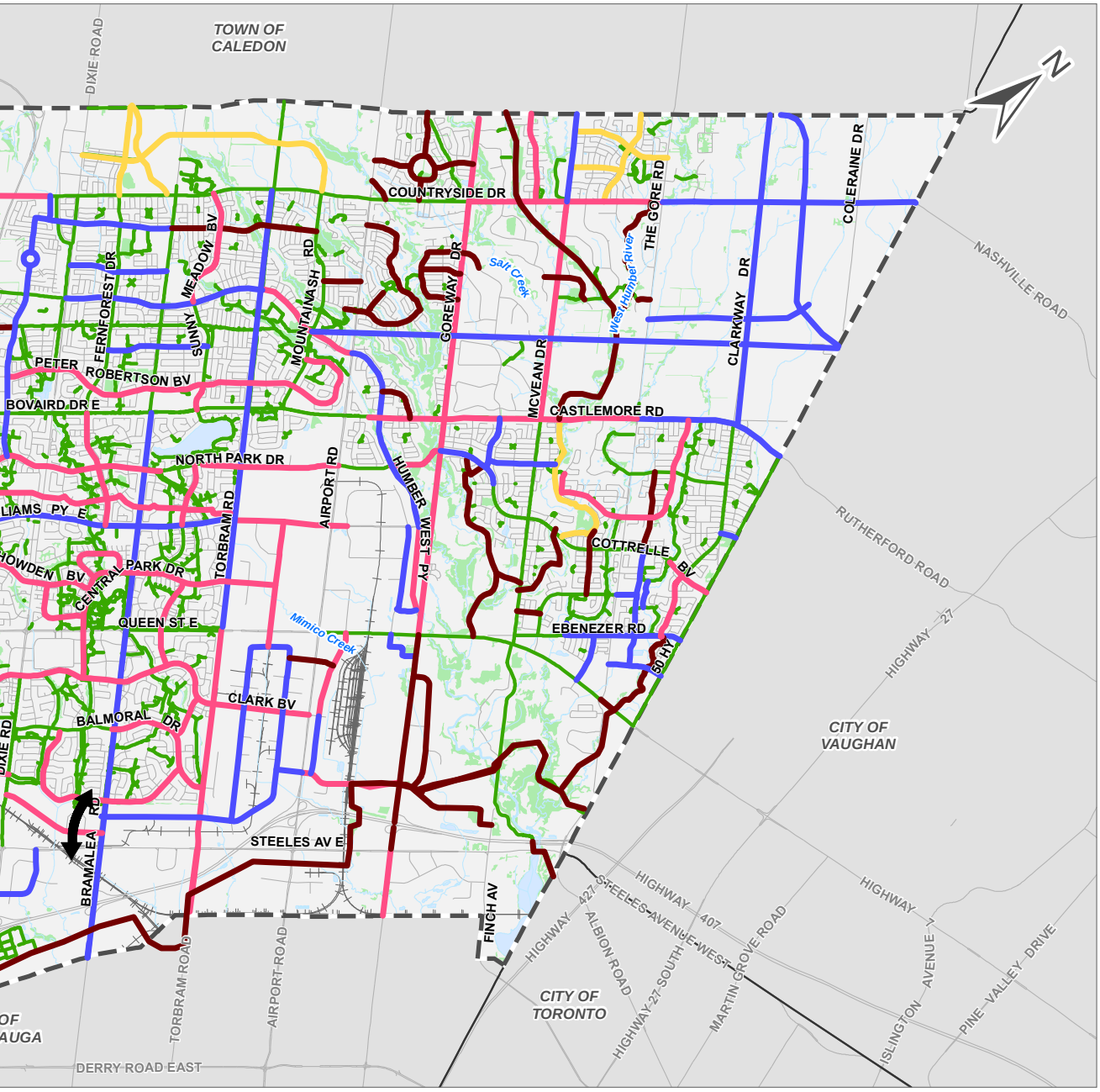


102159

Network Phasing

Brampton ATMP
City of Brampton

0 2 4 km

1:75,000

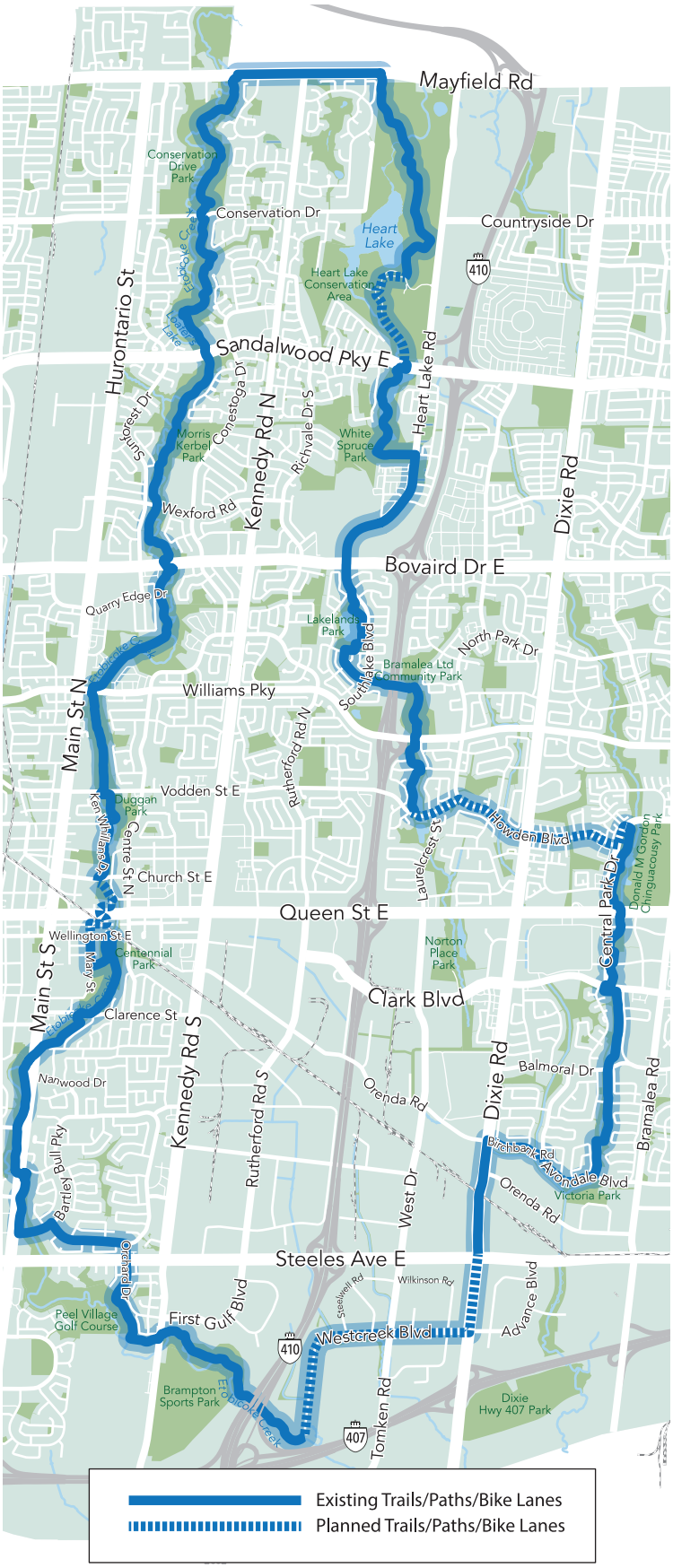
Date: August, 2019

4.3.6 Priority Cycling Network

In order to prioritize and direct the development of the cycling network, a core network of higher order cycling facilities was identified. This network consists of existing and proposed multi-use paths, buffered bike lanes and protected bike lanes that are intended to be completed over the shorter-term (5-year) horizon.

The central component of the priority network is the City's signature loop (see inset), with connecting east-west routes that provide access to the loop and connect a number of existing north-south corridors (recreational trails). The proposed priority network is illustrated in Exhibit 4.18.

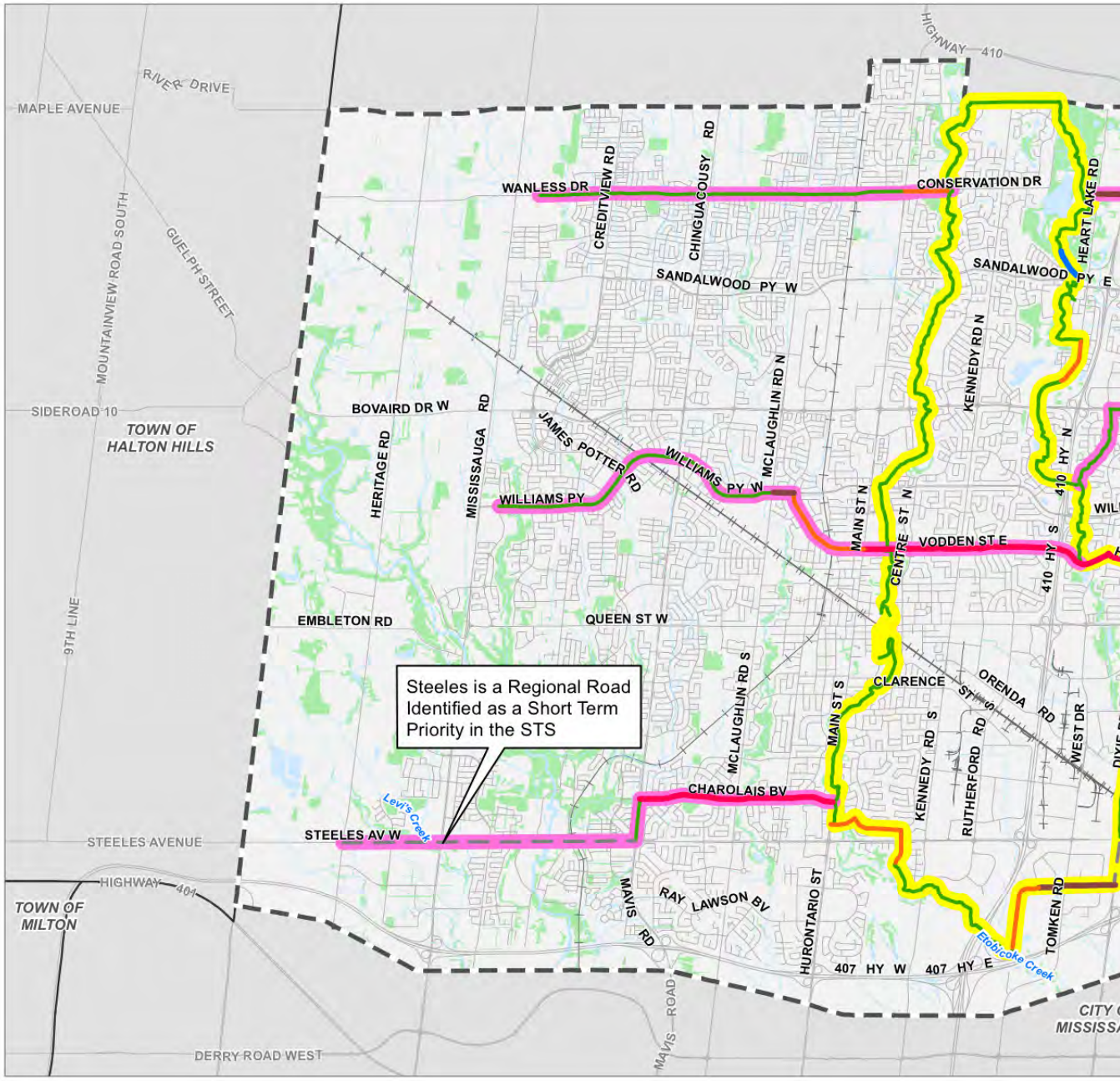
Funding for the priority cycling network is included under the "short-term priorities" recommendation in Section 4.3.5.



BRAMPTON TRAIL LOOP

A Brampton loop trail has been identified as a leading near-term priority. It includes trail connectivity and accessibility improvements between the Etobicoke Creek, Chinguacousy Recreational Trail and Esker Lake Recreational Trail. The objective is to connect the three trail systems to create a 38km loop. The loop would link to amenities such as Downtown Brampton, Heart Lake Conservation Area, Franceschini Bridge, Kennedy Valley/Brampton Sports Park, Bramalea Limited Community Park, Chinguacousy Park, Peel Village and a number of recreation centres and schools. The loop would be promoted and marketed by the City and Regional partners as a safe, user friendly route for riders of all ages and abilities.

Exhibit 4.18: Priority Network



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1. Coordinate System: NAD 1983 UTM Zone 17N

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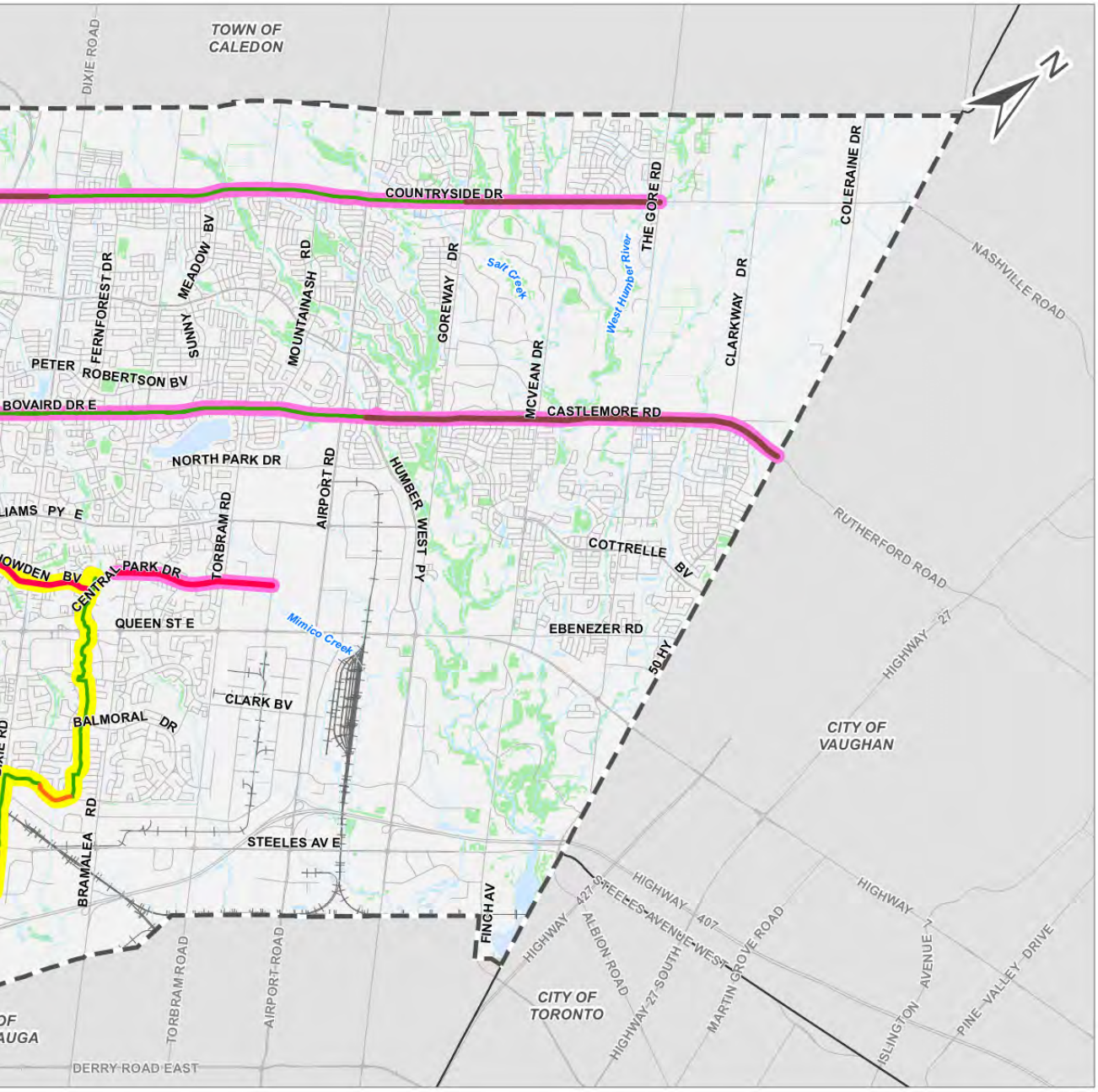

102159

Watercourse
Road
Rail Line
Waterbody
Wooded Area

Priority Cycling Network:
Loop Route and East-West Connections

Brampton ATMP
City of Brampton

0 2 4 km

1:75,000

BRAMPTON Flower City

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Date: April, 2019

4.4 FIX-IT PROGRAM

In order to ensure a uniform level of quality across Brampton's cycling and trails network it will be necessary to upgrade a number of existing facilities. Strategies to improve the existing network have been summarized in Exhibit 4.19. A Fix-it Program identifies specific locations along the existing bicycle network that should be priorities for adopting these strategies.

Exhibit 4.19: Summary of Fix-it Program Improvement Strategies

Fix-it Program Improvement Strategies
Signage and Parking
Add bicycle parking facilities at strategic destinations along the bicycle network
Add wayfinding signs along the trail system to improve access to other trails and major destinations
Add signed route signage (and markings) along local roadways that can be used to provide access to recreational trails or significant sections of park paths.
Multi-Use Paths and Recreational Trails
Introduce centerline pavement markings at strategic locations and signage
Improve surface quality
Widen or standardize width
Remove and replace sub-standard sidewalks/boulevard bike paths/multi-use paths along roadways used to detour recreational trails to controlled crossings away from the valley lands.
Intersections and Crossings
Introduce curb cuts
Introduce curb cuts and use signs or pavement markings to clarify right-of-way where a crossing is unsignalized
Introduce new signalized crossings
Introduce traffic control at mid-block crossings
Upgrade existing signalized crossings with the addition of a cross-ride
Initiate further study for feasibility of grade-separated crossings
Ensure that protected crossings are provided along all recreational trails by either introducing a midblock crossing or properly diverting trail users to an existing crossing

The Fix-it programs described in the following sections can help improve Brampton's active transportation network within 5-10 years. It provides low-cost solutions that will implement noticeable improvements for users, especially once coupled with the priority network discussed previously.

Recommendation:

Allocate an annual budget over the next 5 years to address the gaps identified in the ATMP "Fix-it" program.

4.4.1 Recreational Trail Fix-it Program

The City of Brampton is home to a number of significant "named" off-road trails, mostly running north-south, parallel to the major tributaries, creeks and rivers running through the City. General characteristics of these trails are described below:

- **Etobicoke Creek Recreational Trail –** provides significant network connectivity, as it serves the downtown core, and extends across the full north-south extent of Brampton's municipal jurisdiction. The Etobicoke Creek Recreational Trail is an off-road facility that follows the naturalized area adjacent to Etobicoke Creek. This trail may be upgraded with the installation of road crossing improvements where the trail meets both major and minor roadways. A protected crossing is needed at Kennedy Road, and is currently in design. The Downtown Etobicoke Creek Revitalization Study and long-term plan for the Riverwalk will complete a critical gap in the trail through the downtown. In the interim and as a part of the realignment of James/John Street, a signalized crossing (with a crossride) provided at Queen Street will provide trail users a more direct route through the downtown. As noted in Section 1.1.2 the Etobicoke Creek Trail includes two significant regional connections, as multi-use path projects have recently been completed across Brampton's municipal boundaries to the City of Mississauga in the south, and the Town of Caledon in the north.

- **Chinguacousy Recreational Trail –** includes a trail segment through naturalized parkland, and a segment adjacent to Dixie Road. The southern limit of the trail system is Victoria Park. The northern limit of the trail at Countryside Drive provides an important network connection to the existing and planned boulevard multi-use path following an east-west orientation along Countryside Drive. Where the trail meets major and minor roadways, there are opportunities for crossing improvements. These include a potential connection at the southern limit of the trail to the Bramalea GO Station leveraging some on-road connections and the existing signalized crossing at the GO station entrance on Steeles Avenue.

- **Esker Lake Recreational Trail –** is a trail with boulevard connections to link the trail to major intersections. The trail extends between the City's northern boundary, through the Heart Lake Conservation Area, to just north of Steeles Avenue, at Victoria Park. Opportunities exist to improve this trail as an active transportation corridor by providing more direct crossings where the trail meets minor and major roadways. The recently completed Franceschini Bridge rehabilitation project across Highway 410 represents a significant improvement to the network. Additional gaps to be addressed include the southern portion of Heart Lake Conservation Area, which is a provincially significant wetland, and through White Spruce Park. Alternate connections through these areas may be considered as an interim measure.

- **Fletcher's Creek Recreational Trail –** is an off-road recreational trail with four distinct existing sections. These need to be linked together between:

  - Wanless Drive & McLaughlin Road (just south of Williams Parkway);
  - McLaughlin Road (south of Brookview Road) and Dusty Lane;
  - Elgin Drive and Steeles Avenue; and
  - A point south of Steeles Avenue and the 407 ETR.

- **Don Doan Recreational Trail –** is predominantly a recreational trail but does include significant sections of boulevard multi-use path. The southern limit of the Don Doan Trail is Victoria Park. The northern limit of the trail at Bovaird Drive, provides an important network connection to the existing and planned boulevard multi-use path along Bovaird Drive/Castlemore Road. Upgrades may be undertaken to better connect the trails and paths into an easy-to-follow continuous north-south route. Upgrades may include curb cuts and crossings where the trail intersects local streets, such as Greenbriar Road, Doncaster Drive, and Jayfield Road.

In the area bounded by Highway 410, Sandalwood Parkway, Airport Road and Bovaird Drive, there are the following two connecting trails with a general east-west orientation:

- **Flower City Recreational Trail –** is aligned within the TransCanada pipeline easement with existing sections of the trial extending between Mississauga Road and McLaughlin Road; and Great Lakes Drive and Sandalwood Parkway east of Torbram Road. The City of Brampton will work with TransCanada to negotiate an easement with the objective of connecting the two sections of the Flower City Trail. There are opportunities along the existing sections of the Flower City Trail to provide more direct crossings where the trail meets minor and major roadways.

- **Stephen Llewelyn Recreational Trail –** extends between Sandalwood Parkway west of Torbram Road to Airport Road and connects with the Flower City Trail. The trail is already physically separated at major arterial roads, but can be improved by introducing curb cuts at local streets that may be used to access the trail, such as Eagleridge Dr. and Mint Leaf Blvd.

In order to realize the full network potential of these existing trail assets, an infrastructure renewal program is recommended and included in the Recreational Trail Fix-It program. This program would upgrade and renew existing infrastructure, in order to improve infrastructure quality and achieve a number of objectives:

- Ensure all Trails are compliant with the Accessibility for Ontarians with Disability Act Standards including, but not limited to
  - Curb cuts to ensure accessibility for people using mobility devices where multi-use paths meet sidewalks and roadways
  - Walking hazard indicator (tactile plates), where multi-use paths meet roadways, to communicate the point at which the trail ends for persons who are blind or visually impaired.
  - Accessibility accommodations as applicable to multi-use path surfaces, grading and other considerations described in Section 4 of this report.
- Apply best practices being observed by the City of Brampton for cycling facility and wayfinding signs, pavement markings, crossings and geometry described in the **ATMP Design Compendium**.

The recommended Recreational Trail Fix-it Program is mapped in Exhibit 4.20.

A full summary of the upgrades is included in Appendix E. The funding requirements for this program are identified in Section 7.

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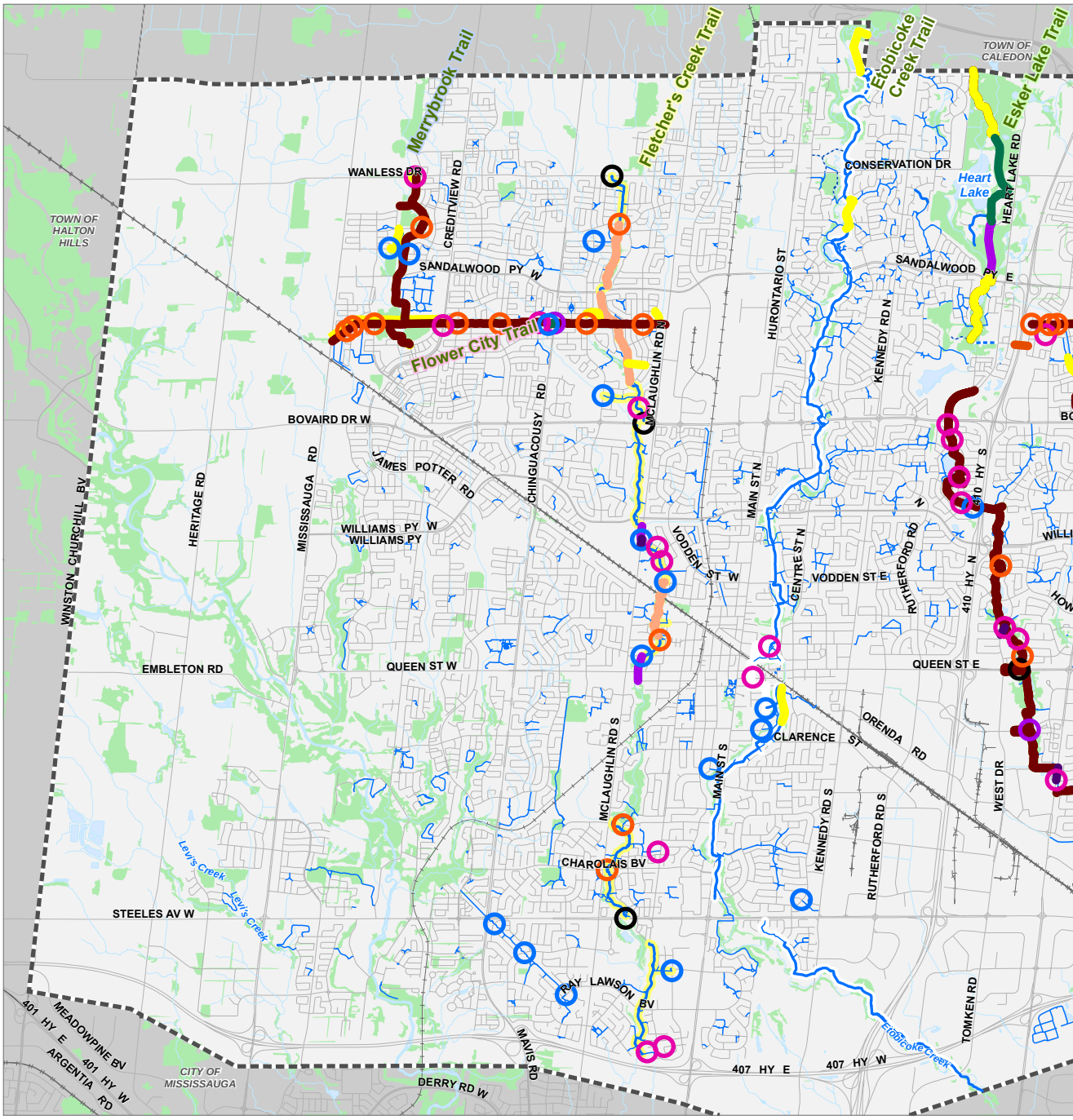
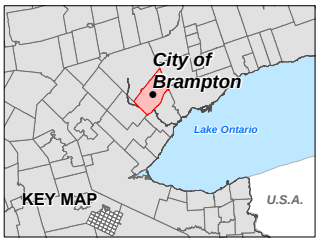
Exhibit 4.20: Recreational Trail Fix-it Program





Existing Network

- Recreational Trail (Paved)
- Recreational Trail (Natural)
- Park Path (Paved)
- Park Path (Natural)

Potential Crossing Improvements

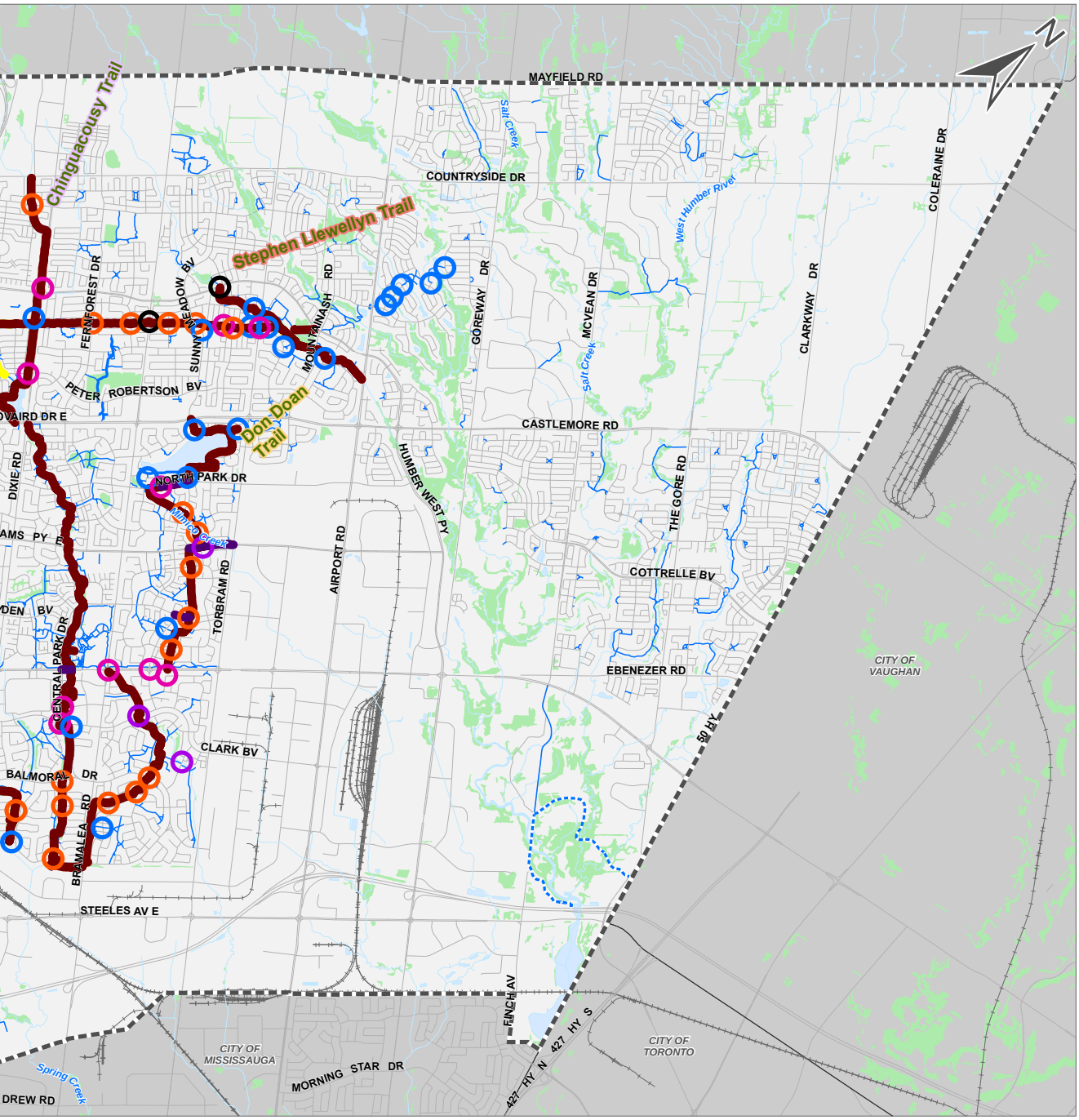
- Curb Cut
- Curb Cut & Unsignalized Crossing
- New Signalized Crossing
- Upgraded Crossing Needing Further Review
- Crossride Upgrade

Potential Su

- Multi-U
- Paveme
- Path W
- Remov

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N



Potential Trail Surface and Crossing Improvements

rface Upgrades

se Path/Cycle Track addition
ent Upgrade
idening
e Existing Sidewalk and Replace with MUP

Way-Finding
Grade Seperated Highway Crossing
New Recreational Trail

0 2 4 KM

1:30,000

Brampton ATMP
City of Brampton

BRAMPTON Flower City
brampton.ca

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4.4.2 In-Boulevard Facilities Fix-it Program

Many of the City of Brampton's in-boulevard facilities were constructed prior to the adoption of national and provincial design guidelines for such facilities (e.g. Transportation Association of Canada Bikeway Traffic Control Guidelines, Ontario Traffic Manual Book 18 - Cycling Facilities). As a result, there are some variations in design, and many do not meet current standards.

Many of the upgrades included within this program occur at signalized and unsignalized intersections. At crosswalks, a cyclist is required to dismount and cross as a pedestrian by walking their bicycle. Upgrading existing crossings with bike friendly 'cross-rides' allows a cyclist to continue to ride through without having to dismount off their bike. It should be noted that the introduction of cross-rides requires signal hardware upgrades and may require changes to the geometry of the intersection, where stop bars, medians or curb radii require modification to accommodate a wider cycling/pedestrian crossing area.

The upgrade opportunities for these boulevard facilities include the provision of a consistent and adequate width for cycling travel, and the application of signage and pavement markings. Pavement markings should be provided at all crossings along the alignment of in-boulevard crossing facilities where they are not present. The consistent application of pavement markings and both regulatory and wayfinding signage to boulevard trails is an important strategy to highlight that facilities are intended for a mixed-use function.

Existing boulevard facilities that run adjacent to sidewalks and are too narrow for a mixed-use function may be by-lawed as cycle tracks. However, as many of the uni-directional boulevard facilities were not originally constructed following the minimum design standards for cycle tracks, most locations will need upgrades to existing signs, markings and intersection designs. In locations where a multi-use facility requires the cyclist to cross from one side of the road to another, clear signage and pavement markings that provide advanced warning of the upcoming crossing should be provided.

Locations that should be prioritized for the In-boulevard fix-it program are mapped in Exhibit 4.21.

A table summarizing the improvements is provided in Appendix E. The funding requirements for this program are identified in Section 7.

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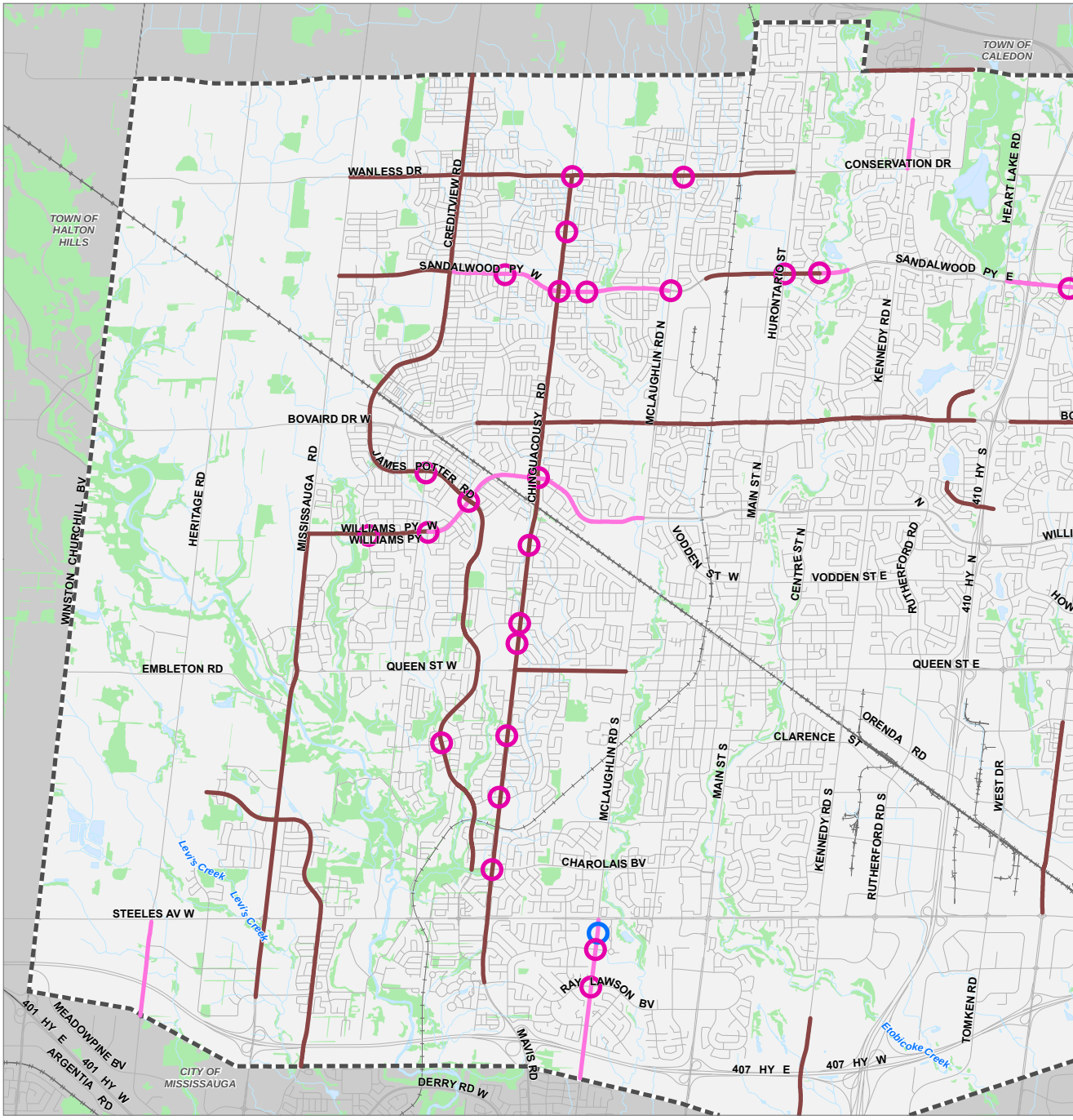
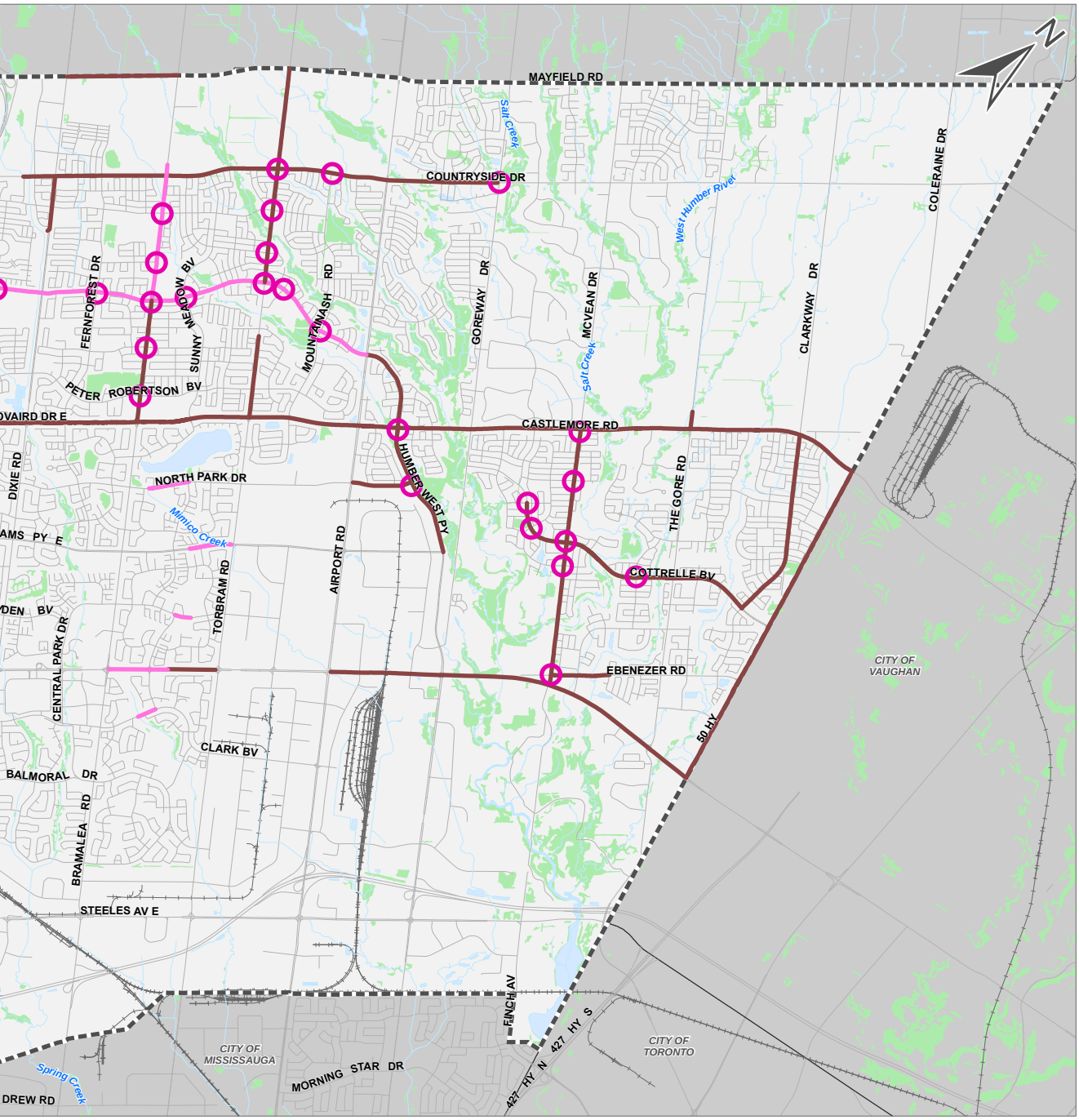
Exhibit 4.21: In-Boulevard Fix-it Program



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N



es

Track addition

Potential Boulevard Surface and Crossing Improvements

Brampton ATMP
City of Brampton

0 2 4 KM

1:30,000

4.4.3 On-Road Cycling Facilities Fix-it Program

The primary upgrades needed for the City's existing on-road facilities include:

- Formalizing existing urban shoulders / edge lines as designated bike lanes through the addition of pavement markings and signage.
- Modifications to lane configurations around signalized intersections to ensure that cycling facilities are continuous on the intersection approaches.

These upgrades are summarized in Exhibit 4.22.

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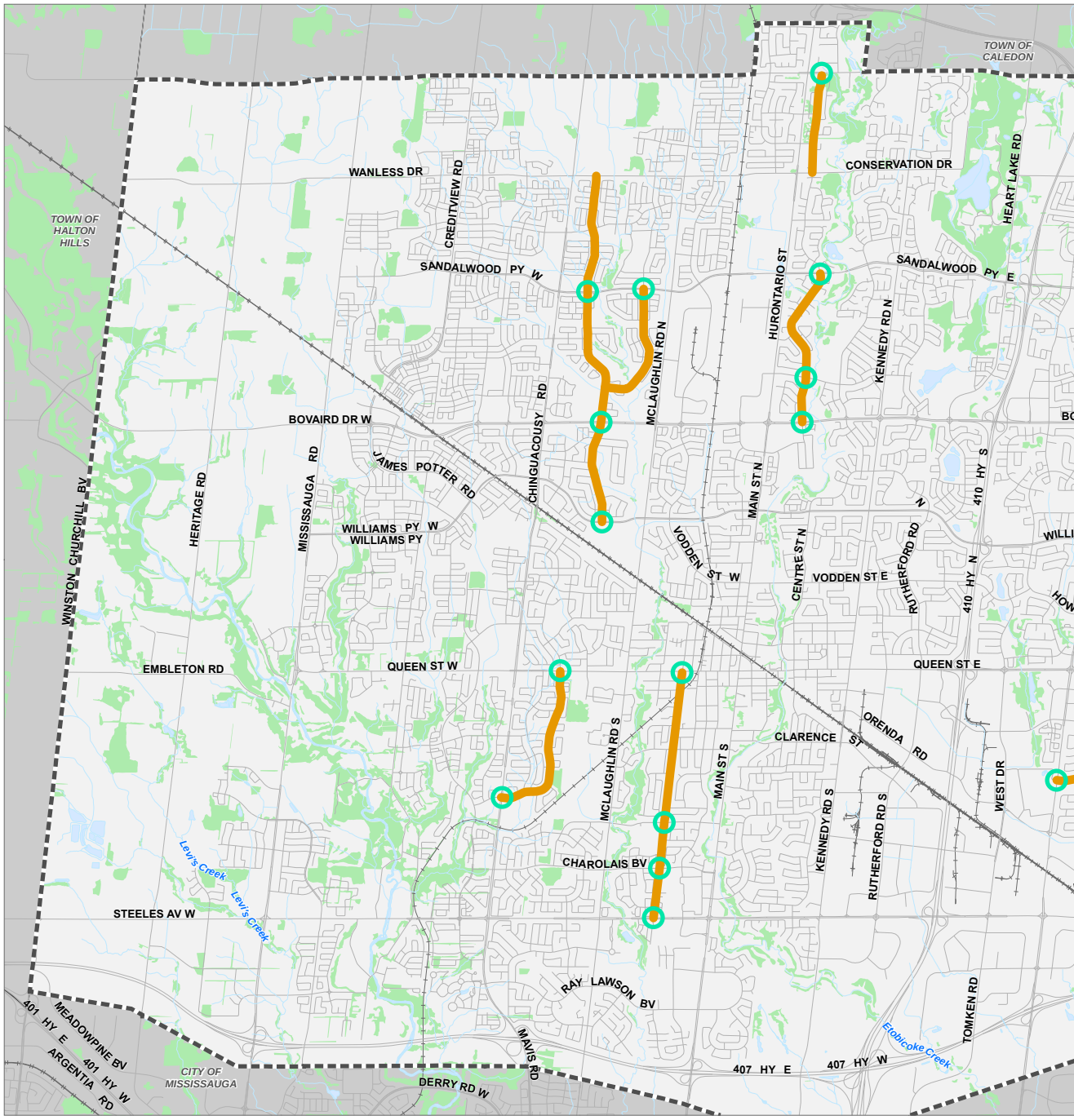
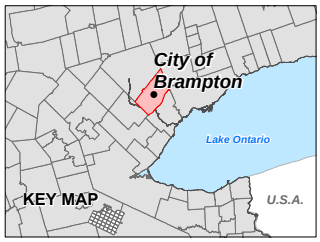
Exhibit 4.22: On Road Cycling Facility Improvements





Potential Crossing Improvements

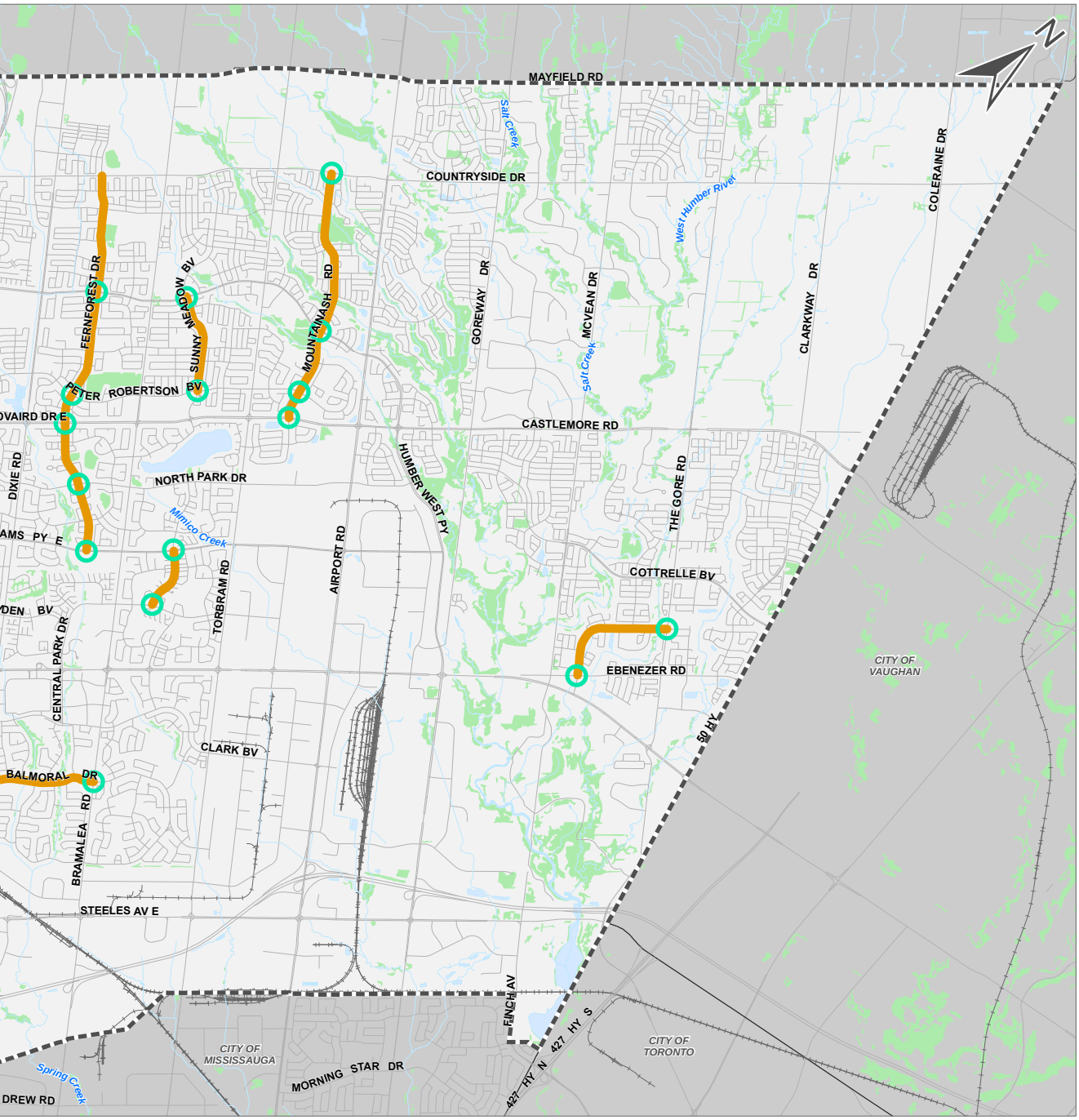
Signalized Crossing Improvement

Potential Surface Upgrades

Urban Shoulder Upgrade to Bike Lane

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N



Potential On-Road Surface and Crossing Improvements

Brampton ATMP
City of Brampton

0 2 4 KM

1:30,000

4.4.4 Curb Depressions at School Crosswalks Fix-it Program

In addition to ensuring that schools are served by connecting linear infrastructure, safe and accessible crossings are paramount. Through this program, routine upgrades of existing school crosswalks to fully accessible depressed curbs will be completed.

These locations are illustrated in Exhibit 4-23.

The funding requirements for this program are identified in Section 7.

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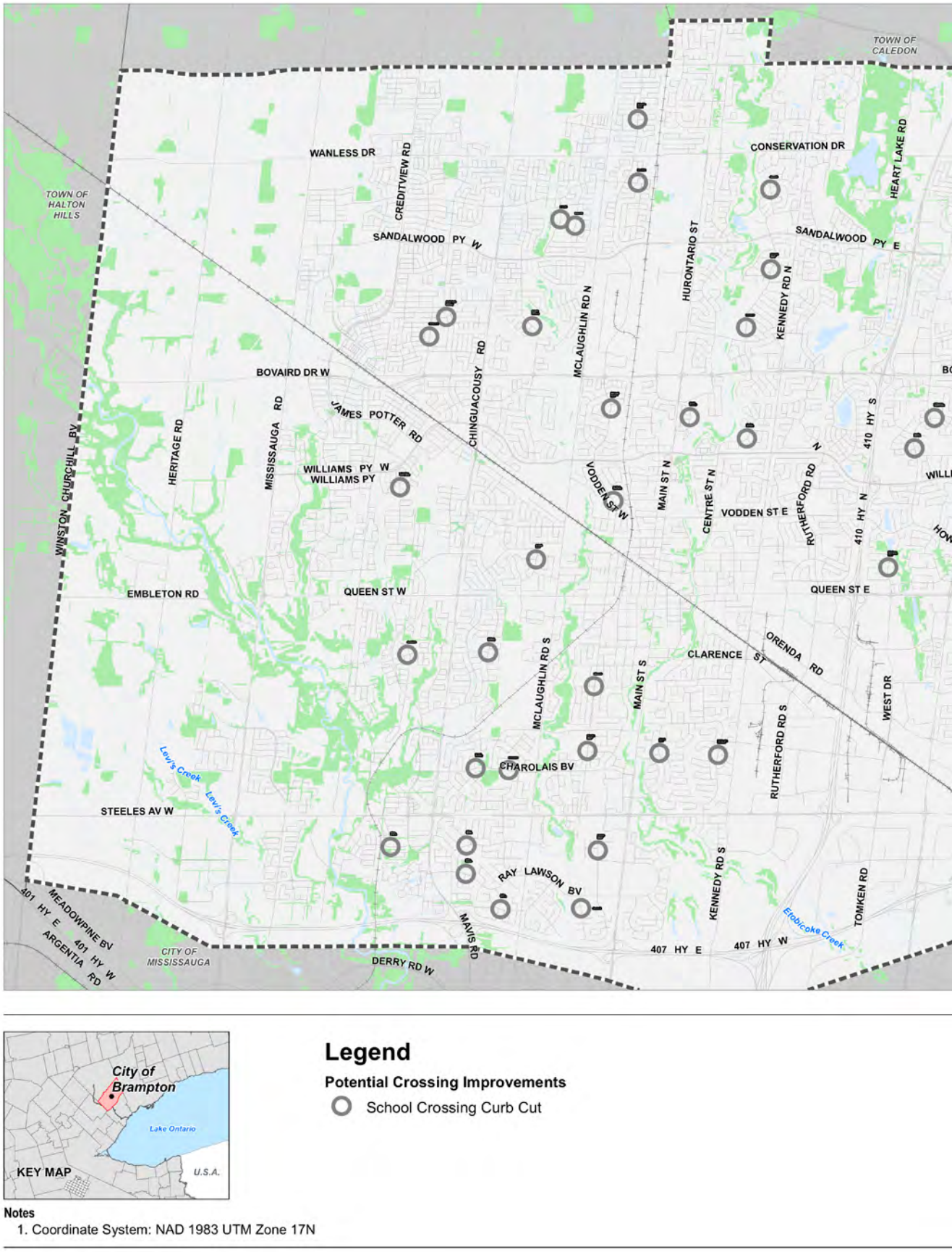
Exhibit 4.23: School Crosswalks Fix-it Program



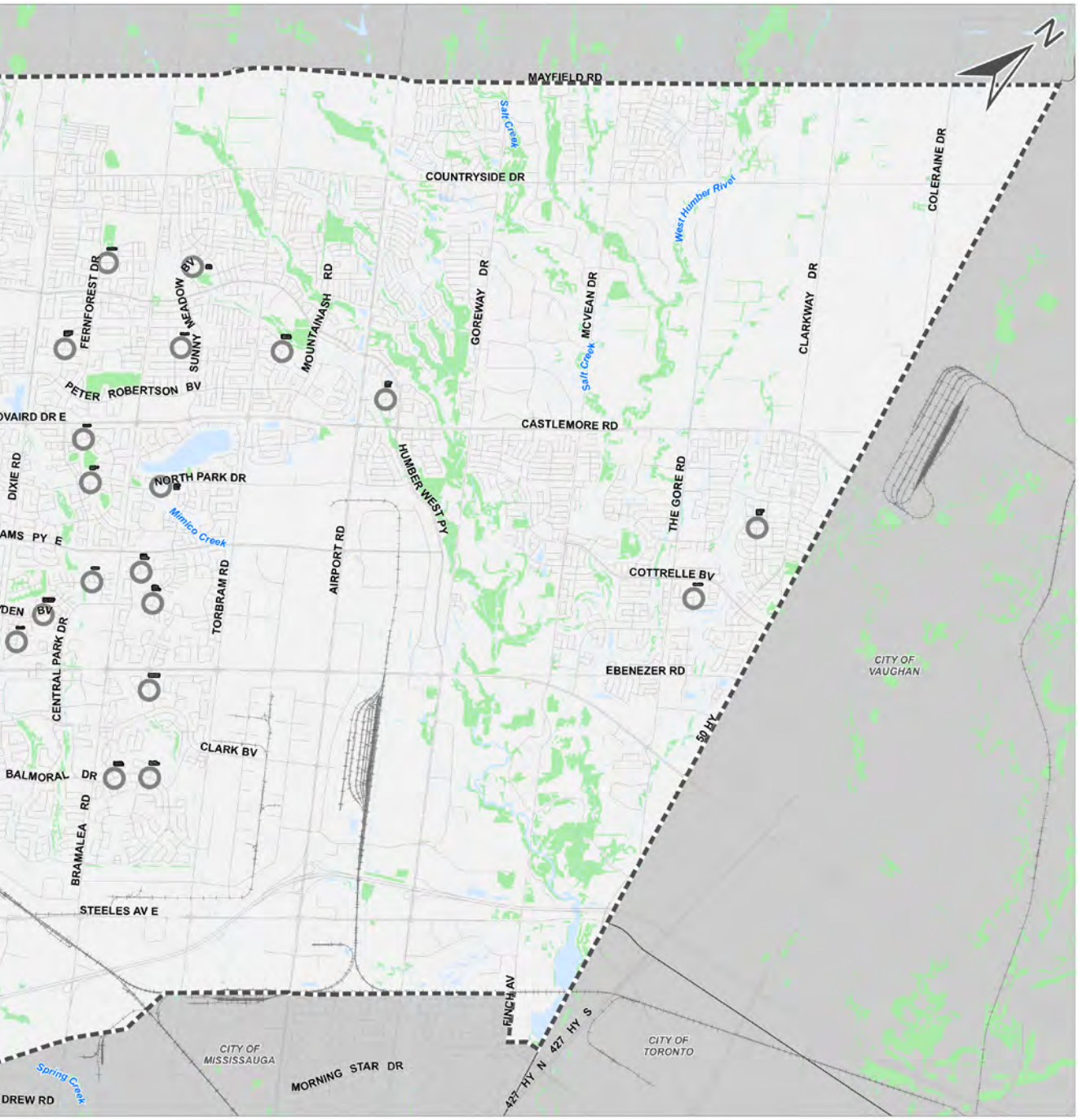
Legend

Potential Crossing Improvements

School Crossing Curb Cut

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N



Potential School Crossing Improvements

Brampton ATMP
City of Brampton

0 2 4 KM

1:30,000

4.5 BICYCLE PARKING

In order to foster greater use of a well-connected cycling network for more utilitarian trip purposes – as well as recreational ones - it is important that trip end destinations provide safe, comfortable, and convenient places to secure a bicycle. Bicycle parking is an essential component of a comprehensive active transportation network, and includes the following considerations:

- Identifying locations that are suitable for the installation of bicycle parking
- Selecting suitable types of bike parking racks depending on the parking need (long-term vs. short-term storage)
- Ensuring proper placement of the racks in the public right-of-way (including spacing between bike racks)
- Providing an appropriate number of spaces to provide for various types of development
- Considering other end-of-trip facilities such as bike repair stands, change and shower facilities, lockers, bench, etc.

This chapter focuses on the location and type of bike parking, as well as the mechanisms for delivering bike parking (on both public and private property). For guidance on suitable types of bike parking, quantity, and placement, refer to the **Design Compendium**.

The City of Brampton will primarily be installing bike parking in **public locations**. The City of Brampton's installation program will target locations near trip generators such as the key destinations shown in Exhibit 4.24.

4.5.1 Location Planning & Candidate Locations

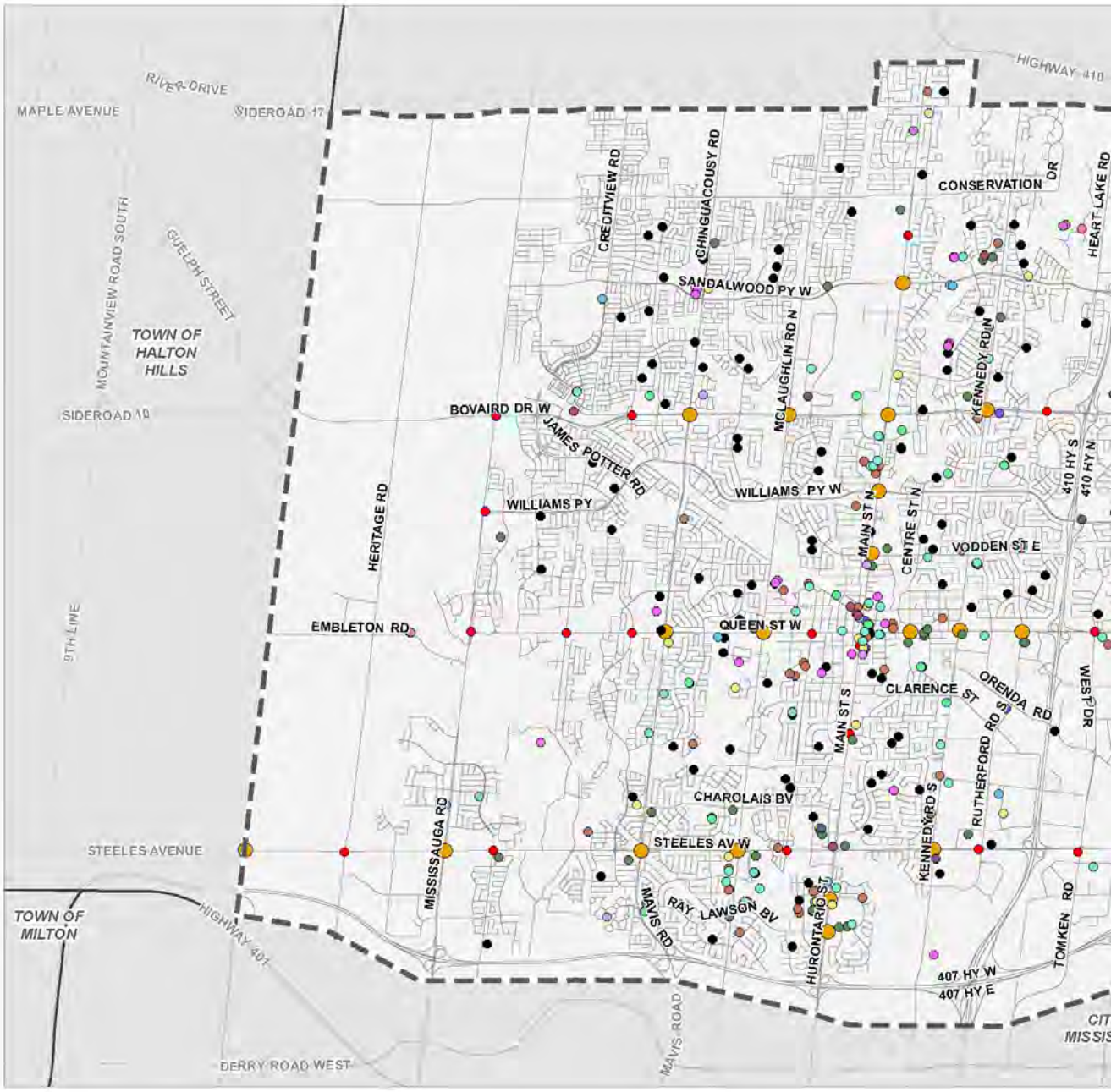
Bicycle parking will provide the most benefit when installed at trip destinations that have the potential to generate significant bicycle trips (particularly if theses destinations are well served by connectivity to a cycling network). Key destinations may include commercial areas and shopping centres, schools, health care providers, sports and recreation facilities, arts and culture amenities, and public services including government buildings and social services.

REGION OF PEEL BICYCLE PARKING PROGRAM

The Region of Peel's Sustainable Transportation Strategy (STS) secured funding to install 50 bike racks annually, and included a mandate to consider locations where covered bike parking would be suitable. It is anticipated that the Region's bike parking program will respond to the needs for bicycle parking at Brampton area schools and locations in the Regional road rights-of-way.

The STS provides a mandate to consider the suitability of installations in the City of Brampton, on both public and private property. In coordination with this approved program, the City of Brampton will therefore consider bicycle parking rack locations being installed by the Region when programming municipal installations. The City of Brampton will emphasize the installation of bicycle parking at locations under municipal jurisdiction. This may include civic squares, parks, and destinations located on municipal roadways that are maintained and operated by the City.

Exhibit 4.24: Key Destinations



ol
Transit Station
Transit Station

Key Destinations

Brampton ATMP
City of Brampton

0 2 4 km
1:75,000

BRAMPTON Flower City

IBI

Date: November, 2016

Exhibit 4.25: Wellington – Züm Main Station Stop Bike Parking with Canopy

It is particularly desirable to provide bike parking where it will support rapid transit. Presently, sheltered bike parking is provided at GO transit stations, as well as, at some Brampton Züm (bus rapid transit) stops.

Candidate Locations

Through public engagement for the Active Transportation Master Plan, various locations were identified as desirable candidates for bike parking and bike repair stands. The complete list of candidate locations and comments is available in Appendix F. Additional locations will be considered on an ongoing basis as requests from the public are received and evaluated.

A majority of the comments concerning bike parking emphasize the need where car parking is provided, so as to encourage cycling. Bicycle access and parking at major commercial developments and retailers is also frequently referenced. The more general comments recommend bylaws to include bicycle parking as a site planning requirement, and exploring partnership and sponsorship options to fund the installation of bike repair stands.

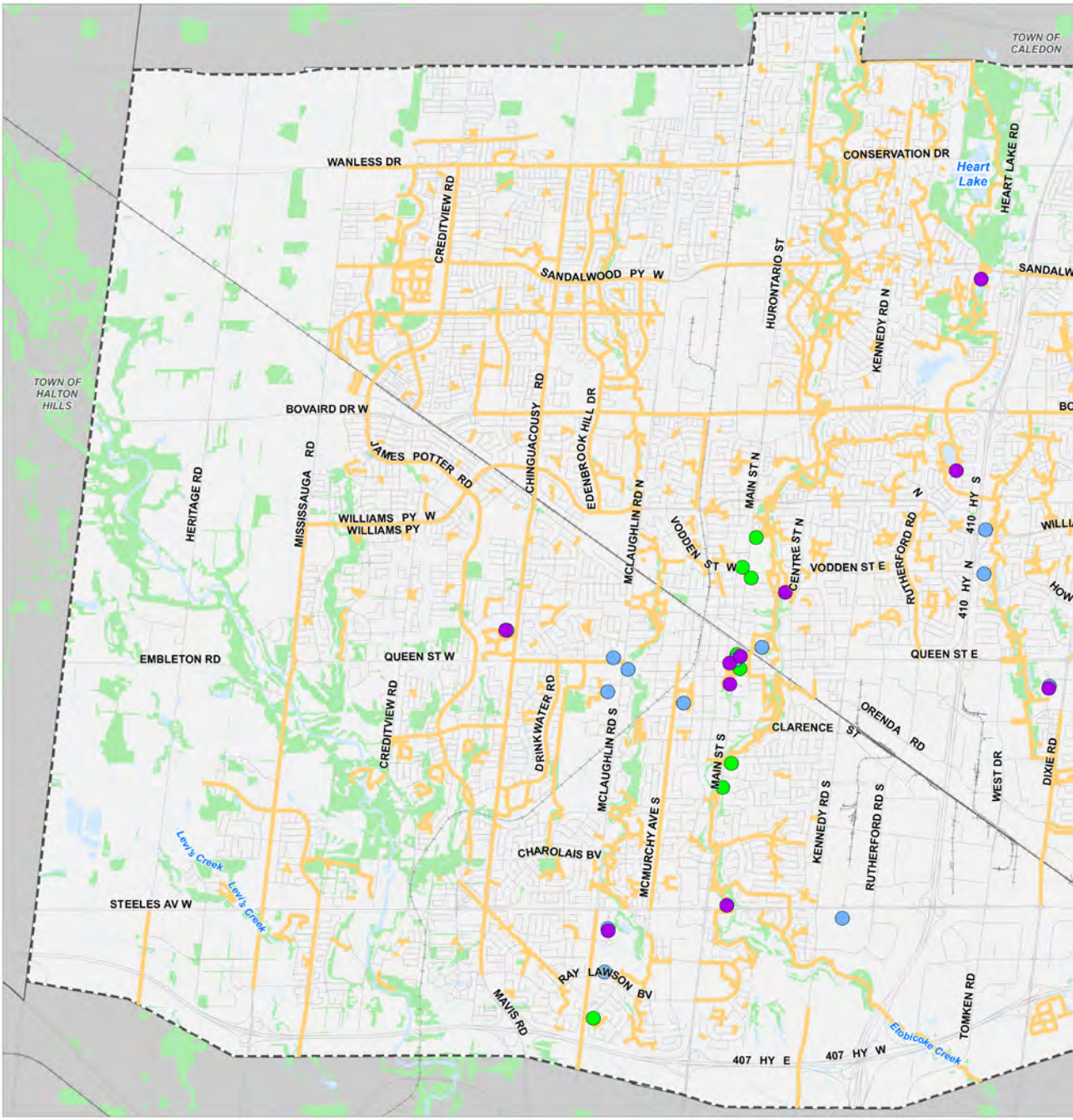
While various specific locations were identified, many comments recommend an approach that would provide consistent end-of-trip facilities across various land uses and major destinations, including downtown, commercial and institutional locations, and at recreational facilities and parks. Exhibit 3.27 shows the candidate bike parking and bike repair stand locations identified in the consultation. In order to assess the overall City-wide needs for bicycle parking, it is recommended that the City develop an inventory of existing bike parking on both public and private property, provided that it is available to the public.

As the bike parking inventory is developed, and candidate locations are reviewed for implementation opportunities, it is critical that the type of parking (i.e .short term versus long term) and the type/ placement of these racks follows best practices. Additional guidance on these considerations for bike parking is provided in the **ATMP Design Compendium**.

Recommendation:

Prepare an inventory of bicycle parking located within the City that is available to the public, to identify gaps and to inform a future bike parking program. The inventory should include (but not be limited to) public spaces (roads, parks) recreation centres, civic buildings, schools, commercial properties, office space, etc.

Exhibit 4.26: Candidate Bicycle Parking Locations (from Public Consultation)

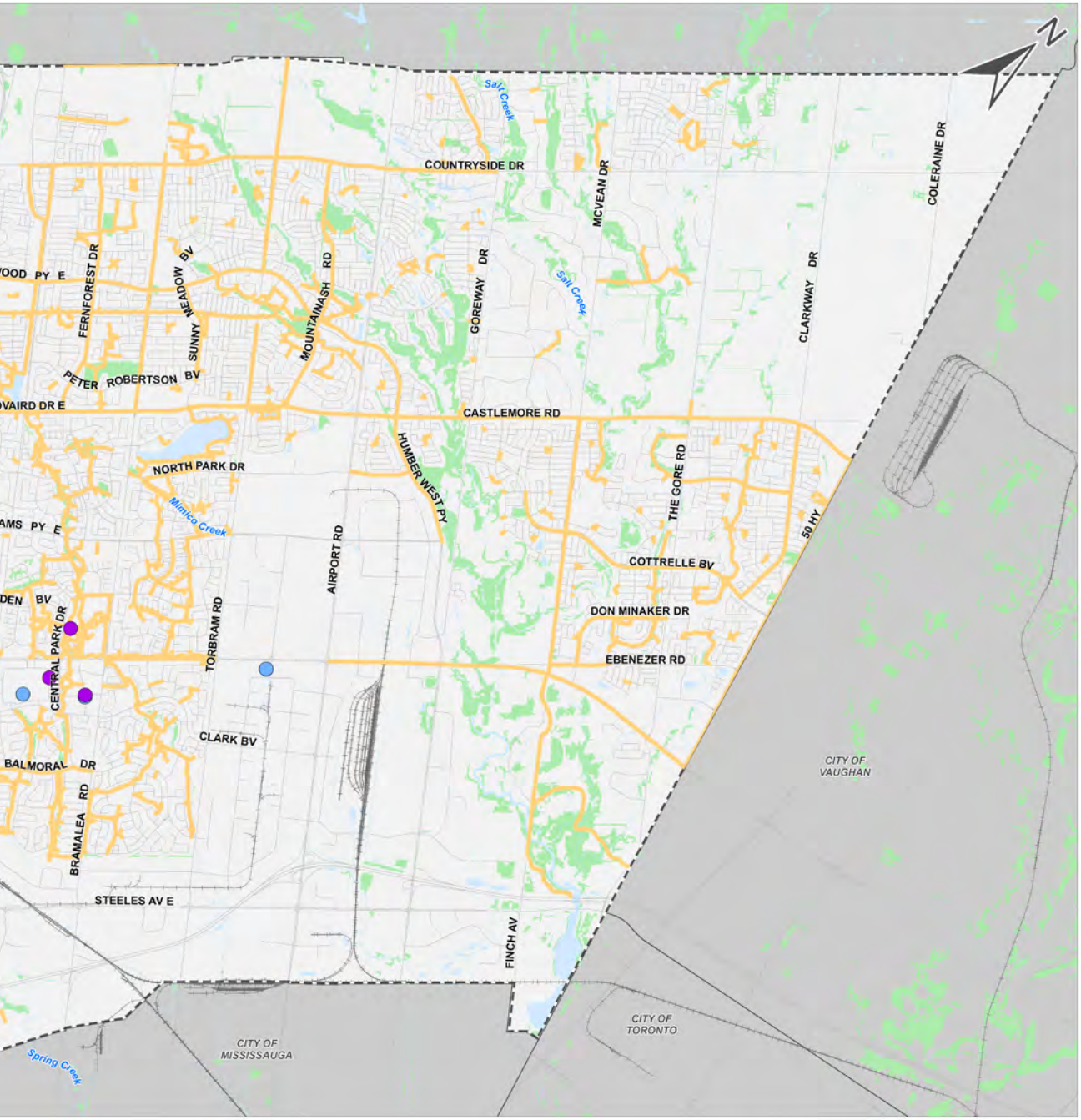


Legend

- Install Bike Rack
- Install Bike Shelter
- Install Repair Stand
- Existing Network

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N



Potential Bike Facility Additions

Brampton ATMP
City of Brampton

0 2 4 KM

1:30,000

BRAMPTON Flower City

IBI

4.5.2 Bike Parking Requirements for Developments

Among the methods for prescribing the inclusion of bicycle parking on private properties, one of the most effective is to incorporate it within the parking requirements of the municipal by-law (refer to Exhibit 4.28).

The City of Brampton's Sustainable Community Development Guidelines (SCDG) document includes guidance to provide for sheltered bike storage at the Draft Plan/Site Plan process. The guidelines recommend providing sheltered bike storage for 15% of total building occupants for a residential development, and accessible and secure bike racks at the front of non-residential developments. Although this guidance has provided a valuable first step, it essential that bicycle parking be a requirement for every development application.

Several of Brampton's peer municipalities have included these provisions within their by-laws. When legislated alongside motor vehicle parking requirements for new developments, the bicycle parking requirements can be framed as a way to mitigate the costs of providing more costly motor vehicle parking spaces.

Exhibit 4.27: Bike Parking in front of Peel Memorial Hospital

Exhibit 4.28: Sample Municipal Parking Supply By-laws

MUNICIPALITY	LEGISLATED BICYCLE PARKING REQUIREMENTS
Burlington	Bylaw applies to retail, industrial and educational facilities. Required quotas vary depending on GFA and number of students.
Hamilton	Bylaw requires where new units are being constructed, bicycle parking must amount to 5% of the total required motor vehicle parking spaces.
Oakville	Bylaw requires 1 bicycle parking spot per dwelling unit, plus 0.25 per dwelling unit for visitors.
Toronto (See Note 1)	Bylaw for bicycle parking space requirements for dwelling units in an apartment building or a mixed-use building are: ➤ In Bicycle Zone 1, a minimum of 1.0 bicycle parking spaces for each dwelling unit, allocated as 0.9 "long-term" bicycle parking space per dwelling unit and 0.1 "short-term" bicycle parking space per dwelling unit; and ➤ In Bicycle Zone 2, a minimum of 0.75 bicycle parking spaces for each dwelling unit, allocated as 0.68 "long-term" bicycle parking space per dwelling unit and 0.07 "short-term" bicycle parking space per dwelling unit.
City of Vaughan	Bylaw requires that for various commercial and office buildings a minimum of 6 bicycle parking spaces be provided for all buildings, and that 0.1 bicycle parking spaces per unit be provided thereafter.
Vancouver	Bylaw legislates according to building classes, between 0.1 and 2.25 bicycle parking spaces may be required per unit.

Note 1 - The Amalgamated City of Toronto identifies two bicycle zones. Zone 1 refers to the pre-amalgamation City of Toronto, East York, York and a portion of south Etobicoke. Zone 2 refers to North York, Scarborough, and the middle and northern portions of Etobicoke.

Recommendation:

Update the City of Brampton parking zoning bylaw to require all new developments to include an appropriate supply of bicycle parking, taking guidance from the best practices outline within the ATMP.

4.5.3 Bike Parking Supply

Targeted Bike Parking for Key Destinations

Many jurisdictions have guidelines, policies or by-laws governing bike parking quantity minimums. A variety of approaches are used to inform bicycle parking policy for public spaces requirements. Bicycle parking policies may be framed according to zoning, building type, building area, number of units or expected rates of use. Exhibit 8.6 describes a framework for bicycle parking requirement recommendations based on expected rates of use; the concepts in this exhibit have been adapted from North American and European guidance.

Local experience and counts can also provide a reference point. Bicycle parking usage should be monitored and if demand is reaching capacity, additional bicycle racks should be added. If necessary, on-site car parking stalls can be used to accommodate additional bicycle parking. One car-parking stall can accommodate 10 or more bicycles, depending on the type of rack used.

An insufficient supply of short-term bicycle parking may result in bicycles being locked in undesirable places, such as to fences, signposts, lampposts, furniture, and trees, which may be damaged as a result. Bicycles parked in undesirable places may also become an obstacle or a hazard for pedestrians and other cyclists, and can impact site accessibility.

Exhibit 4.29: Example of Bicycle Parking Policy Framework

Land Use or Facility	Metric	Target number of Bike Parking spaces	Comments
Shopping Centre (mall)	Per entrance	5-10	Serves both staff and visitors
Commercial street	Per block	2-5	Serves both staff and visitors
Office	Per 200 square metres of Net Floor Area	1	Serves workers, and customers if office has a counter function.
School – Primary or Secondary	Per classroom	1-2	Serves both students and teachers
School – Post-Secondary	Per classroom	4	Serves both students and teachers
High-density residential (i.e. apartments or condos)	Dwelling Unit	0.3-0.8	Serves residents and visitors
Retail, personal service shop, business service, or restaurant	Per 300 square metres of Net Floor Area	1	Serves employees and customers
Sports Complex	Per visitor capacity	0.2-0.3	Serves both staff and event attendees
Cultural Destination (theatre, concert hall, cinema, museum, church etc.)	Per visitor capacity	0.2-0.3	Serves staff, performers and attendees
Health Care Institution	Per bed	0.2	Serves facility staff and visitors.
Destination Park	Per visitor during seasonal peak	0.2-0.4	Serves facility staff and visitors.

Land Use or Facility	Metric	Target number of Bike Parking spaces	Comments
Transfer points (railway stations, bus terminals etc.)	Location dependent Reference metrics: ➤ Short term spaces for 1.5% of AM Peak Period Daily Ridership; and ➤ Long-term spaces for 5% of projected AM Peak Period Daily Ridership.	Location dependent	Site operators should provide racks where most convenient for staff and travellers, then observe demand to ensure sufficient supply.

Exhibit 4.30: University of Guelph Bicycle Repair Stand

4.5.4 Other End-of-Trip Facilities

There are several variables that influence the choice to use active transportation as a utilitarian mode. One of these variables is the presence of end-of-trip facilities, such as repair stands, showers and lockers in the work place in addition to safe, secure bike parking. Providing these facilities can provide more comfort for those that choose to commute on foot or by bicycle.

There are few regulatory tools that city builders can use to mandate the inclusion of end-of-trip facilities at places of employment. Some municipalities, such the City of Toronto include requirements for end-of-trip change and shower facilities within their zoning or parking bylaws.

One example of the promotion of end-of-trip facilities is through Leadership in Energy and Environmental Design (LEED) credits. Buildings that are attempting to achieve the LEED designation can earn one credit by providing adequate bicycle facilities on-site. To earn this credit, the proponent must provide both long-term and short-term bicycle parking and shower facilities on-site.

Recommendation:

Incorporate the policies outlined in the ATMP relating to end-of-trip facilities into the development of the parking zoning by-law.

5

Providing Year-Round Mobility

5.1 OVERVIEW

At this time the City of Brampton's Public Works Department oversees all maintenance activities related to active transportation infrastructure, including snow clearing, sweeping, repairs, etc.

The Road Operations Division maintains all sidewalks and multi-use trails (within road allowances), crosswalks and transit stops.

The Parks Maintenance and Operations Division maintains all walking and cycling facilities that are located in parks, valley lands, utility corridors and outside of the public road allowance. This includes all park paths, and certain pedestrian areas such as the Rose Theatre Garden Square and City Hall Ken Whillans Square.

Proper maintenance is critical to ensuring that walking and cycling infrastructure (including transit stops) is safe, comfortable, usable throughout the year. A good maintenance regimen can help to encourage walk or ride trips in all seasons, reduce the risk of injuries, and extend the service of life of infrastructure.

Maintenance for active transportation includes a variety of activities. A summary of key maintenance activities is shown in Exhibit 5.1 below.

Exhibit 5.1: Summary of Key Maintenance Activities for Active Transportation Facilities

Type	Maintenance Activity	Purpose
Non-Winter and Seasonal	Inspection and Patrol	Monitor facilities for any conditions requiring other actions
	Pothole Repair	Address potholes that impact rideability
	Surface Discontinuity Repair	Address other surface discontinuities that impact walking / riding
	Pavement Markings and Signage	Refresh and restore pavement marking to ensure visibility; Ensure signage is visible and retro-reflective
	Sweeping	Remove debris and dirt and can accumulate in facilities
	Vegetation	Trim and clear vegetation in the vicinity of active transportation facilities to reduce encroachments and ensure adequate sightlines
Winter	Snow Clearing & De-Icing Operations	Ensure access to walking and cycling facilities during the winter

This chapter covers the following:

- Provincial maintenance standards
- City of Brampton current practices and service levels
- Future service level thresholds and service improvements

5.2 MAINTENANCE STANDARDS

Ontario Regulation 239/02, a regulation under the Municipal Act, 2001, identifies maintenance standards for municipal highways. These standards are optional for municipalities (i.e. municipalities are not required to comply), however many municipalities choose to adopt them as policy. The standards focus on the maintenance outcome, without providing prescriptive details of how the maintenance is to be carried out. As a result, municipalities are free to implement a variety of techniques to achieve the desired results and to adapt maintenance practices based on local conditions.

Ontario Regulation 239/02 identifies numerous maintenance activities related to roadways, including assigning road classifications, patrolling, deficiency thresholds, time to repair a deficiency, etc.

As of May 3, 2018, Ontario updated the Regulation 239/02 Minimum Maintenance Standards for Municipal Highways. The update recognizes the importance of sidewalks and cycling facilities as part of the transportation network with the addition of the following standards:

- Winter maintenance standards for bicycle lanes
- Winter maintenance standards, including patrol obligations, for sidewalks
- Inspection and standards for encroachments on areas adjacent to sidewalks

In addition, the Regulation sets standards for dealing with icy roadways including bicycle lanes, and sidewalk repairs. The actual Regulation should be referenced for all standards and definitions. A summary is presented in this report for context only.

Ontario Regulation 239/02 standards for bicycle lanes are described in Exhibit 5.2. This exhibit describes the targeted maximum depth of snow and the timeframe following end of snow accumulation to achieve that depth; or after becoming aware that the depth of snow is greater than the target. The goal is to provide **a minimum bicycle lane width of the lesser of 1 metre** or the actual bicycle lane width.

Exhibit 5.2: Ontario Regulation 239/02 Level of Service for Snow Accumulation in Bicycle Lanes

Class of Highway or Adjacent Highway	Bicycle Lanes (see Note 1)	
	Snow Depth	Time
1	2.5 cm	8 hours
2	5 cm	12 hours
3	8 cm	24 hours
4	8 cm	24 hours
5	10 cm	24 hours

Note 1: “bicycle lane” means a portion of a roadway that has been designated by pavement markings or signage, or by signage and a physical or marked buffer for the preferential or exclusive use of cyclists.

The Regulation indicates that addressing snow accumulation on a bicycle lane includes performing one or a combination of the following methods:

- Plowing
- Salting
- Applying abrasive materials
- Applying other chemical or organic agents
- Sweeping

Exhibit 5.3: Ontario Regulation 239/02 Ice Formation Prevention including Bicycle Lanes

Class of Highway	Time for Treating for Ice Formation Prevention (once probability of ice forming is known)
1	6 hours
2	8 hours
3	16 hours
4	24 hours
5	24 hours

Exhibit 5.4: Ontario Regulation 239/02 Treatment of Icy Roadways including Bicycle Lanes

Class of Highway	Time Permitted for Treatment of Icy Roadways
1	3 hours
2	4 hours
3	8 hours
4	12 hours
5	16 hours

Ontario Regulation 239/02 also includes standards for ice accumulation on roadways including bicycle lanes. In the 24-hour period before possible formation of ice on roadways, the municipality must monitor the weather and patrol for ice. If there is probability that ice will form on the roadway, they must treat the roadway to prevent ice formation within the times shown in Exhibit 5.3. If ice forms on the roadway, then the municipality has the time set out in Exhibit 5.4 for treating the icy roadway.

Ontario Regulation 239/02 includes standards for snow accumulation on sidewalks after snow accumulation has ended: the depth of snow must be reduced to 8 cm or less within 48 hours for a minimum width of 1 m.

Two key challenges/limitations that are not addressed by the Minimum Maintenance Standards in Regulation 239/02 are as follows:

- For two-tier municipalities, in-boulevard multi-use trails or cycle tracks are not addressed

- Minimum standards for bicycle lanes are based on priority approach set by a roadway classification system using Average Daily Traffic (number of motor vehicles) and speed limit. The priority roadways for motor vehicles may not be the same priority roadways for bicycle lanes. If given a choice, cyclists may choose bicycle lanes on roadways with lower volumes and speeds, thus the higher priority for bicycle lanes is on lower class roadways.

5.3 CURRENT CONDITIONS

The City of Brampton meets the road maintenance standards set out in the regulations to the Municipal Act. The following sections review current maintenance practices for active transportation facilities.

5.3.1 Winter Maintenance

Winter maintenance operations refer to plowing, salting, sweeping and snow removal. In an average winter, the City of Brampton will use 25,000 tonnes of salt, 1,000 tonnes of sand and 1,000,000 litres of salt brine as part of its maintenance operations.

Existing On-Street Operations

The maintenance operations executed by the City includes a number of proactive and reactive responses. The types of operations being used depends on type, extent and time of each weather event. Whether plowing, sweeping, removal, salting or brine operations are used will depend on the forecast for the snow event. Different operation types are appropriate for wet snow, blowing snow, snow with freezing rain, snow that will melt and then freeze, and heavy accumulation.

Arterial and collector roads are cleared as the first priority, followed by local roads. The expectation is that the needs of on-street bike lanes are to be addressed as part of these road operations. Presently, there is no separate program to address snow accumulation in bike lanes. As the City's network of painted bicycle lanes grows, enhancing the available maintenance may be necessary to ensure bike lanes remain safely passable during the winter time. There may be an increased likelihood of windrows encroaching in a bicycle lane when they are located curbside, and snow removal operations may be needed in addition to regular plowing operations.

Presently, multi-use paths located within parks, valley land and/or utility corridors are designated as "recreational trails". This allows the courts to recognize a lower duty of care under the Occupiers Liability Act as opposed to the Municipal Act which governs the maintenance of a multi-use paths and sidewalks located within a road allowance.

Presently, roadways that are classified as arterial and collectors are the first to receive salt brine and salt. Active transportation users do not generate the heat needed to dissipate residual snow, so it may therefore be necessary to schedule additional sweeping operations along bike lanes to ensure that they remain safe and passable.

The objective of these operations on arterial and collector roads is to achieve a level of clearing that is close to bare pavement. Local roads are done afterwards. Salt is applied based on snow accumulation. On local roads, salt is applied when the snowfall is 7.5 cm (3") or less. When a single snowfall is greater than 7.5 cm (3"), then the local road may be plowed. It is not expected that bare pavement will be achieved on all local roads, but that the road will be safe and passable.

The City's service level targets for various facilities is provided in Exhibit 5.5.

Exhibit 5.5 Existing Service Level Targets

Amount of time after the end of a winter event	Road infrastructure	Parks infrastructure
➤ 12 hours		➤ Rose Theatre Garden Square ➤ City Hall ➤ Ken Whillans Square ➤ Fire Hall Parking Lots
➤ 24 hours	➤ Roads ➤ Sidewalks ➤ School crossings ➤ Transit stops ➤ *Bridge Decks are a priority	➤ City Facility Parking Lots
➤ 48 hours	➤ If events are pro-longed or severe	➤ Park Pathways

Existing Sidewalk Operations

Arterial sidewalks generally receive mechanical clearing, using CAT vehicles. However, not all sidewalks are maintained by the City, and at these locations it is the responsibility of the property owner. Property owners of non-City maintained sidewalks are expected to clear sidewalks by 11:00 AM the day after the end of a winter event, otherwise they may be subject to a fine or clearing costs by by-law enforcement.

5.3.2 Summer Maintenance

Maintenance operations in the summertime refers to trash pickup and street sweeping. Ensuring a cycling surface that is free of broken glass or debris is important to ensure proper traction and the removal of hazards. Summer maintenance is performed both manually by parks staff, and mechanically by sweepers.

To ensure adequate traction, operations undertaken in the spring are important from a cycling safety perspective. Presently, a trail sweeping operation is initiated in the spring, to remove the build-up of silt and debris that has accumulated over the winter. These springtime operations typically take place in April, when the forecast suggests that the season has turned and it will no longer snow. Both salt and sand may be applied during the winter months, and following a spring melt, the amount of sand buildup may pose a slip and fall hazard.

If high rates of walking and cycling are documented on a trail, it may be appropriate to begin springtime maintenance operations sooner, or to budget for multiple rounds of clearing. Locations where the build-up of debris may be significant are not currently documented. A review of historical routine inspection records or as a part of inspections going forward, these problematic areas can be identified and appropriate resources allocated.

Budgeting

The overall annual budget is approximately $13 million dollars, although this may vary from year to year depending on levels of snowfall, infrastructure expansion, and related cost increases.

Approximately 90% of the winter maintenance work that takes place in the City of Brampton is outsourced. Contracts for winter operations are typically awarded as 7-year terms. The current contract began after the 2016/2017 winter season.

5.4 IMPROVING MAINTENANCE FOR WALKING AND CYCLING

As many Cities in Ontario do not clear their recreational trails in the winter, Brampton's existing commitment to clearing its recreational trails and sidewalks positions it as a leader. In order to enhance existing service levels, consultations with road operations staff will be required to better understand existing practices and the need to either reallocate resources or provide greater resourcing.

When available, cycling and pedestrian counts may help to identify high-use facilities, which would support a mandate for enhanced maintenance levels.

Many walking and cycling trips will use both regional and municipal roadways. It is therefore desirable that enhancements to maintenance standards and priority networks be coordinated between the **Regional** and **municipal** levels of government.

Regional Coordination

The City of Brampton is located within the Region of Peel. On February 22, 2018, the Region of Peel's Council approved a Sustainable Transportation Strategy (STS), which includes the following Actions;

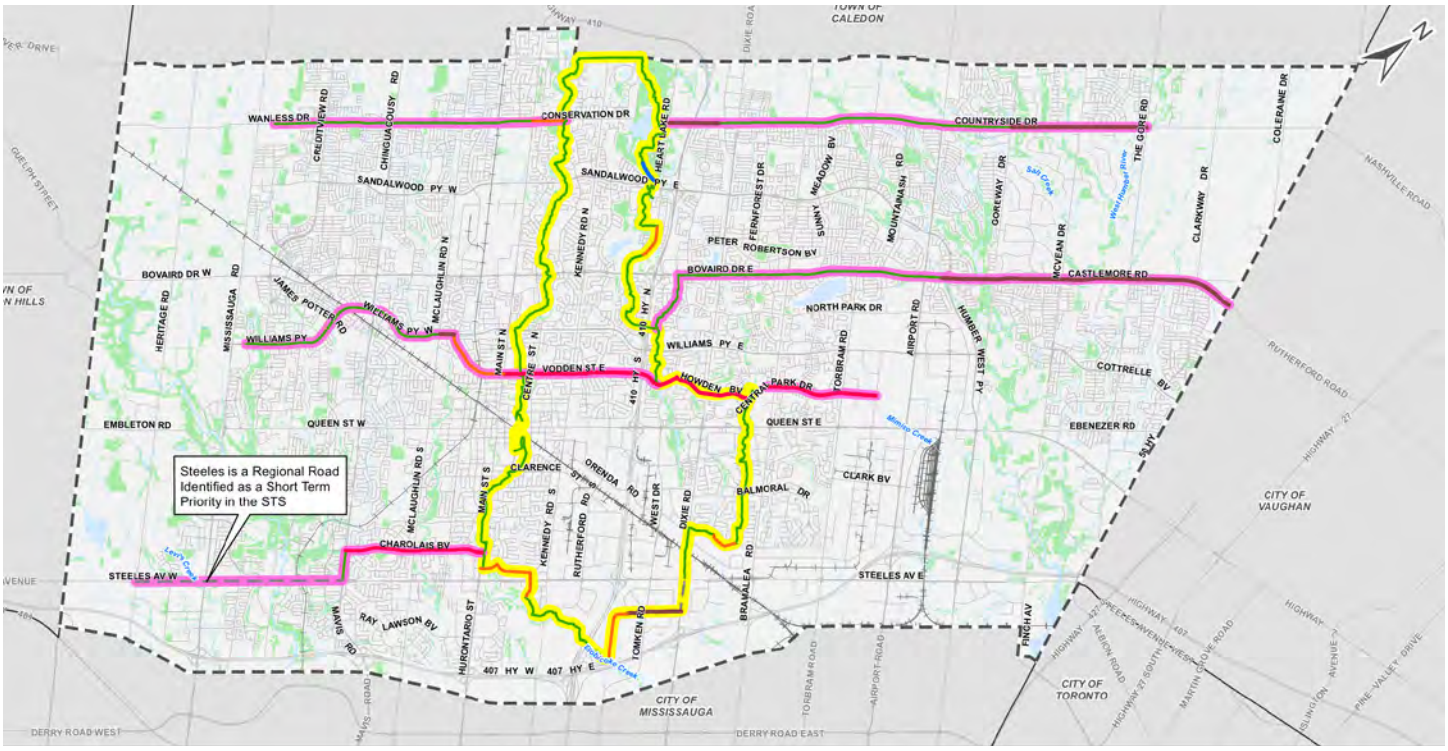
- **W4 –** Improve winter maintenance for walking facilities
- **W5 –** Develop priority winter maintenance network for Regional sidewalks
- **B7 –** Improve year-round maintenance standards for cycling facilities
- **B8 –** Develop priority winter maintenance network for Regional cycling facilities

These actions indicate the Region is also committed to enhanced maintenance for active transportation and will be a key partner.

Towards a Priority Maintenance Network

As a starting point, the Priority Cycling & Trails network identified through the ATMP (refer to Exhibit 5.6 below and Section 3.3.6 for additional information) could be considered for a pilot of enhanced priority maintenance.

Exhibit 5.6 Potential Priority Maintenance Network



The Service Levels identified in Exhibit 5.7 describe enhanced standards that may be considered for the priority network and reviewed with City of Brampton Road Operations staff. These service levels largely reflect assigning the standards of the Priority 1 Roadways to the priority cycling network and service levels. Consultations to develop a priority cycling network should be undertaken in coordination with the Region of Peel and other relevant stakeholders, such as Brampton Transit.

Exhibit 5.7: Priority Cycling Network – Draft Service Levels for Further Assessment

Type	Activity	Regular Network (open year-round)	Priority Network
Non-Winter	Patrolling	Per Ontario Reg 239/02	3 times every 7 days
	Pothole Repair	Per Ontario Reg 239/02	600 cm^2 x 8 cm depth within 4 days
	Surface Discontinuity Repair	Per Ontario Reg 239/02	Height of 5 cm within 2 days
	Pavement Markings	Refresh as needed	
	Sweeping	Per current City practice	For on-road facilities - twice monthly; March to May and September to November. Once monthly all other summer months. For Boulevard facilities – once monthly; March to November
	All other activities*	Per Ontario Reg 239/02	
Winter	Snow Clearing	Per Ontario Reg 239/02 See Exhibit 5.4	Maintain to bare pavement condition – 4 hours One-way facilities: width of 1 m or width of bike lane, whichever is less Two-way facilities: 2.4 m
	Ice Treatment	Per Ontario Reg 239/02 See Exhibits 5.5 and 5.6	Within 6 hours

* Includes weather monitoring, shoulder grading, crack repair, illumination, signage, traffic control, bridge deck spalls.

As the needs of people cycling differ from motor vehicles, the preferred approach used for winter maintenance differs for these two travel modes. The following points should be considered within the context of local experience and knowledge, when implementing a winter maintenance program for persons travelling by bicycle.

- Liquid salt (brine) is applied in anticipation of snowfall
- During and after a snow event, sweepers instead of plows are used to clear snow from sidewalks and cycling facilities
- The previously applied brine prevents the newly fallen snow from binding to the surface of the active transportation facilities
- The sweepers are able to clear snow right down to the bare surface
- Salt and abrasives are not necessary to dissipate residual snow and ice and prevent skidding
- Brine is immediately reapplied, by the sweeper vehicles, to avoid snow and ice bonding during the next snow event
- For heavy snowfalls: first pass with plow, then follow with sweeper

Recommendation:

Assess the maintenance best practices outlined within Chapter 5 to determine the impact to operating budgets, equipment need and resources.

Recommendation:

Assess the service level thresholds outlined within Chapter 5 (Exhibit 5.5) to determine the impact to operating budgets, equipment need and resources.

Recommendation:

Develop a pilot priority cycling network for enhanced year-round maintenance and assess its impact to operating budgets, equipment needs and resources.

6

Developing a Walking & Cycling Culture

6.1 PROGRAMS

The infrastructure improvements and design standards discussed in Sections 3 to 5 of this report address designing for the safety, comfort and connectivity of the physical active transportation network and infrastructure, for people of all ages and abilities. While building the active transportation network is itself a key ingredient in making walking and biking a viable transportation option, it also has to be coupled with supportive policies and programs that will foster a walking and cycling culture.

The 2016 Transportation Tomorrow Study indicates that in the City of Brampton, more than half (53%) of the trips to work and school that are less than 5km are made by car (either as a driver or passenger). Trips of this distance are realistically walkable or cycleable, provided the proper infrastructure and supports – including education and awareness – are in place.

Broadly speaking in the North American context, the data suggest that people on bikes can be categorised into the following four groups, shown in Exhibit 6.1:

Exhibit 6.1: Categories of Cyclists

Category	Description	Distribution (typical urban municipality)
Strong and Fearless	Typically ride for both recreational and utilitarian purposes, comfortable riding along side of motorized traffic.	1%
Enthused and Confident	Comfortable sharing the road with vehicular traffic but prefer to do so in a designated area	7%
Interested but Concerned	**Ride for recreational along park paths, trails and/or sidewalks (children), not comfortable riding on the roadway, could be attracted to cycling by the implementation of designated and separated facilities**	**60%**
No way, No How	Represents people who are not, and may never be interested	32%

Comprising 60% of the population, the target audience for practitioners promoting the expansion of cycling should be the 'Interested but Concerned' group.

Programs focused on encouragement, education and enforcement are important tactics for convincing people to consider cycling and walking as a favourable transportation option for everyday trips.

There are approximately 296km of recreational trails and park paths in Brampton today, and they are generally used by Brampton as recreation amenities and cycling is seen as a recreational activity. Few see a bicycle as a practical transportation option for work or other utilitarian, destination-based trips. Programs to **encourage** occasional recreational cyclists to leave their cars at home more often and replacing those trips (in whole or in part) with an active transportation mode are a necessary step to building the desired walking and cycling culture. Events, workplace and programs, activities for school children and effective communication campaigns (social media) should inspire people to walk and cycle by informing them of the many societal benefits of active transportation.

People may choose to drive a car instead of walking or riding a bike because they lack the knowledge or skillset. Whether it's an understanding of the rules of the road relating to cycling, how to repair a flat tire, knowing that a typical 5 km trip to the grocery store or library is realistically walkable or cycle-able; or that there is safe, comfortable and connected infrastructure in place to support their everyday trips, **education** provides those "interested and concerned" with a greater sense of comfort and safety. Informing and educating people in turn encourages them to choose alternate modes and can shift their transportation choices from motorized vehicles to more active forms of transportation. Formal training courses, community bike hubs, partnerships with schools are all effective methods to educate those interested in cycling.

Source: IBI Group

Understanding of road users' rights and responsibilities is a key aspect of the education initiatives discussed above.

However, **enforcement** is required to ensure that all user's meet their obligations to keep roads safe for all users. Regulations that protect vulnerable roads users, coupled with law enforcement partnerships are essential to making travellers feel safer on bikes and by foot. . Enforcement campaigns, safety blitzes, and effective partnerships are key tactics to creating a culture of safe roadways for all users.

Exhibit 6.1 provides direction on the continuation of existing initiatives and identifies new programs in the areas of education, encouragement, and enforcement. The focus of these programs will be to get more people to choose an alternate (active transportation) mode and reap the many benefits outlined in Chapter 1. Where possible, the City will partner with agencies and community groups to ensure a consistent message and maximize exposure.

Exhibit 6.2: Proposed Cycling Related Outreach Programing

	Proposed Outreach Program	Existing / New	Encouragement	Education	Enforcement
1	Develop an AT specific display and associated promotional material that can be used at public events.	E	+	+	+
2	Provide CAN-Bike training to city staff and members of the Brampton Cycling Advisory Committee to support the delivery of safety clinics, skills training, bike rodeos, etc.	E	+	+	
3	Offer active mobility camps (such as Bike Adventure, BMX and scooter/skateboard) aimed at youth, aged 10 to 13.	E	+	+	
4	Support community initiatives such as the Brampton Bike Hub (Bike Brampton) which provides the community with skilled mentors and resources (bicycle mechanics and cycling skills).	E	+	+	

	Proposed Outreach Program	Existing / New	Encouragement	Education	Enforcement
5	Support community initiatives such as the BikeWrx (Brampton Bike Hub) providing bike maintenance and repair education programs to the Brampton community.	E	+	+	
6	Participate in the School Travel Planning program (Peel Safe and Active Routes to School (PSARTS) Committee) to educate and encourage students to use active transportation to and from school.	E	+	+	
7	Support and promote the Peel Children's Safety Village living-lab for elementary School children to learn and practice road safety skills (Personal Safety and Pedestrian/Bike Safety programs).	E	+	+	
8	Promote the Bicycle Rodeo Kit (Peel Regional Police) which is available for the community to help children learn and practice bicycle techniques and mechanics, including proper helmet fitting, bike safety, and skills drills.	E	+	+	
9	Support the Sheridan Bike Hub (Sheridan College – Davis Campus) which provides students with a do-it-yourself repair space, a bike rental program and a mentorship program.	E	+	+	
10	Collaborate with local post-secondary education institutions to undertake research projects, data collection and to support AT on local campuses (connectivity to network, end-of-trip facilities).	N	+	+	

	Proposed Outreach Program	Existing / New	Encouragement	Education	Enforcement
11	Develop marketing material, and conduct education campaigns leading up to the construction of new types of pedestrian and cycling facilities.	N	+	+	
12	Develop a seasonal Bike Ambassador Engagement Team to help implement promotional and education activities.	N	+	+	
13	Reinstate “Bike Basic” and “Bicycling for Adults” City Recreation programs focused on educating registrants on the fundamentals of cycling, such as fitting the bike and helmet to the rider, street signs, signaling, stopping and riding techniques.	N	+	+	
14	Maintain the City’s Cycling Guide which includes a full size infrastructure map and information regarding cycling in the City of Brampton.	E	+	+	
15	Sponsor and support community rides (Brampton Cycling Advisory Committee) which are a series of non-competitive, family-friendly rides that take place in each of Brampton’s Ward from May to September.	E	+		
16	Participate in the planning and delivery of Bike the Creek, an annual event that features the Etobicoke Creek Recreational Trail and other routes, geared towards a range of abilities, and celebrates the exploration of the city by bicycle.	E	+		

	Proposed Outreach Program	Existing / New	Encouragement	Education	Enforcement
17	Host a Bike to Work Day celebration for the City. Bike to Work Day is observed nationally, regionally and locally to promote cycling as a viable, healthy, and fun option for commuting to work.	E	+		
18	Participate in Bike Month which takes place in June across the GTHA and is a campaign that brings together families, artists, commuters, and community groups to promote cycling at numerous local events all month long.	E	+		
19	Promote and support Bike to School Week (Region of Peel), a GTHA-wide campaign encouraging students to bike to school.	E	+		
20	Facilitate a cycling related employee trip reduction program and related cycling events (i.e. Bike Friday).	E	+		
21	Maintain a cycling website which provides a central resource for finding information upcoming events, safety and education, an interactive map and external resources.	E	+	+	
22	Support and promote the Walk + Roll Peel (Region of Peel) branding which encourages and supports walking and cycling across Peel Region.	E	+	+	
23	Plan and host a “Ciclovia” or an Open Streets event(s).	N	+		
24	Develop an Active Mobility Charter for the City, as proposed in Brampton’s Vision 2040.	N	+		

	Proposed Outreach Program	Existing / New	Encouragement	Education	Enforcement
25	Carry out the Brampton Vision 2040 action to assemble an Active Mobility Charter Stewardship Committee, a volunteer advisory committee to work with City staff to implement the vision of the Active Mobility Charter.	N	+		
26	Work with Regional partners and other GTHA municipalities to roll out a regional bike share system.	N	+		
27	Support and promote the Peel Regional Police's Positive Ticketing Program where youth are rewarded for good behaviours (such as wearing a bicycle helmet).	N	+	+	
28	Maintain a traffic by-law that supports vulnerable road users and is consistent across the Region.	N	+	+	+
29	Promote the Peel Regional Police Bike Registration Program, allows residents to register their bike in case of theft.	E	+	+	
30	Expand the City's current way-finding strategy to include directional signage along cycling corridors or routes of significant value and that include a number of different facility types.	N	+	+	
31	Develop and include pedestrian and cycling safety material in fleet/transit training program.	N	+	+	
32	Translate AT marketing collateral to maximize outreach to Brampton's diverse ethnic communities.	N	+	+	

Proposed Outreach Program		Existing / New	Encouragement	Education	Enforcement
33	Supply and offer bike valet at major public events in the City.	N	+		
34	Partner with Peel Regional Police to publicize pertinent information to residents related to vulnerable road users.	N	+	+	+
35	Partner with Peel Regional Police to establish a plan for ongoing enforcement of bicycle helmets laws, traffic infractions and encouragement of safe cycling and walking behaviours.	N			+
36	Collaborate with Brampton Transit to promote walking and cycling at the many promotional, outreach, and educational events they host and attend across the City every year.	N	+	+	

Recommendation:

Review the existing and proposed outreach programs contained within this chapter and develop an annual action plan to educate and encourage active transportation in the City and to provide assistance to agency partners to enforce pedestrian and cycling related laws, regulations, etc., as appropriate.

Identify key messages in support of this ATMP to be applied to the programs included within this chapter.

6.2 POLICY

Policy plays an integral role in ensuring that land use and transportation planning work together to create places more supportive of active transportation. Community design determines whether trip origins and destinations are sufficiently close to each other to support travel by active modes. The following Active Transportation supportive policies are recommended for consideration within future updates of the Transportation Master Plan and/or City of Brampton Official Plan:

1. Encourage and promote active transportation (walking and cycling) as a preferred mode of transportation for both recreational and short-trip everyday purposes through activities such as infrastructure improvements, educational programs, enforcement campaigns and promotional initiatives.

2. Ensure safe and secure pedestrian and cycling practices and behaviour, by all road and recreation path users through education, skills training and use of pedestrian and bicycle facility guidelines and best practices.

3. Incorporate considerations for active transportation in the land use planning, development and approval process to ensure that land use and transportation systems support and give priority to pedestrian and cycling needs such as sidewalks, bicycle routes, and trip end facilities (e.g. secure bike parking, showers, lockers).

4. Ensure that any roadway construction or reconstruction by the City includes provisions to meet the functional and safety needs of pedestrians and cyclists.

5. Recognize that all roads in Brampton excluding freeways are available to pedestrians and cyclists, and that in accordance with the City's 2040 Vision, "priorities in the civic transportation agenda will be: first walking, then cycling, transit, goods movement, and then shared vehicles and private vehicles."

6. Protect for and develop an Active Transportation network which includes sidewalks, off-road multi-use trails, in-boulevard and on-road cycling facilities, consistent with the City of Brampton's Active Transportation Master Plan (ATMP), and present the existing and proposed ATMP network as a Schedule in the City's Official Plan. Recognize the ATMP will evolve and improve and expand upon this network by adjusting the routes/facility types as

necessary and add missing links through opportunities offered by unopened road allowances, hydro rights-of-way, abandoned rail trails, open greenspace development and future roadway improvements. Amendments to the network plan are not required for route or facility type revisions, provided that continuity and functionality of the network are maintained in the same general location and/or is consistent with the route selection principles included in the ATMP.

7. Ensure that the performance of the active transportation network is monitored through service indicators and targets (performance measures) to assess and evaluate AT network and program implementation relative to the ATMP.

8. Adopt the City of Brampton ATMP that includes goals and objectives for creating a pedestrian and cycling friendly city, through an integrated active transportation (pedestrian and cycling) network plan and implementation strategy, policies, and supporting education, enforcement, promotion and a monitoring program. Complete a formal update of the ATMP at least every five years, with the next update to be scheduled no later than 2024.

9. Deliver education and pedestrian and cycle skills training initiatives that create an awareness of safe walking and cycling practices for all road, sidewalk and pathway use.

10. Continue to enhance the integration of transit with walking and cycling by the following measures:

    - Maximizing bicycle access to transit stations and platforms;
    - Providing where feasible, separate routes or multi-use pathways in, adjacent to and across transit corridors;
    - Continue to equip all new buses with bicycle racks;
    - Promoting park-and-ride by ensuring secure bicycle parking at transit stations; and
    - Improve pedestrian access and sidewalk connections to all transit stations and bus stops.

11. Ensure that walking and cycling are important components of a multimodal transportation network by incorporating considerations for pedestrians and cyclists within an integrated land use and transportation planning and decision-making process.

12. Require the continued expansion of bicycle trip end facilities (parking, lockers, showers) at all cycling destinations, whenever possible or practical through the following measures:

    - Development of a comprehensive bicycle parking program that establishes public and private sector responsibilities and opportunities;
    - Require the land use planning approval process and zoning by-laws to set standards for bicycle parking that is adequate to meet demands, and produce secure, illuminated, highly visible, sheltered and convenient bicycle parking;
    - Provide leadership by example through focusing bicycle trip end facilities on City-owned properties and rapid transit (GO) stations;
    - Identify as a Transportation Demand Management measure, methods to help developers reduce costs and land requirements by avoiding or reducing the need for large surface land area parking lots;
    - Ensure that the location and design of bicycle parking minimizes any impediments with other systems such as pedestrians and emergency vehicles; and
    - Develop effective strategies to prevent bicycle theft.

13. Ensure that the design of active transportation facilities follows recognized and generally accepted guidelines to maximize pedestrian and cycling safety, security, accessibility, convenience and attractiveness.

14. Ensure that transportation operational measures undertaken as part of system management work are identified and implemented to support safe and convenient cycling. These measures may include, but not limited to:

    - Exemptions (for bicycles) from turn prohibitions;
    - Contra-flow cycling lanes on one-way streets;
    - Vehicle/Bicycle detection equipment at intersections;
    - Management of loading zones to minimize disruption of cyclists; and
    - Set speed limits on roadways that are consistent with

adjacent land use and reflective of “complete streets” thinking and prioritization of vulnerable road users.

15. Provide for safe and comfortable year-round operation of the primary active transportation network (Exhibit 4.18) through the adoption, implementation and monitoring of pedestrian and cycling maintenance practices and standards for both on and off-road routes.

16. Work with Peel Regional Police to increase the effective enforcement of cycling behaviour for both on-road and multi-use pathways, to comply with regulations of the Highway Traffic Act and Municipal By-Laws.

17. Recognize the bicycle as an important element towards maximizing efficient operations of the transportation and land use system, by helping to reduce the space needed for mobility requirements such as parking, and being supportive of more intensive land use practices.

18. Ensure public safety and the integrity of the transportation system by incorporating bicycle facilities in a compatible, complementary and non-conflicting manner. For example, the City will continue to minimize interference with pedestrians by prohibiting cycling on sidewalks by adults.

19. Adopt a “leadership by example role” and showcase to other municipalities and employers, by implementing infrastructure and innovative programs that support, encourage, educate and enforce safe cycling.

20. Recognize and promote the many benefits of cycling which underline why this mode of transportation must be supported and given a preferential implementation status. Bicycling provides benefits that include community health from exercise, economic returns from retails sales and tourism, positive environmental impacts from a reduction in air pollution, energy consumption and mobility space requirements, and increased social interactions.

21. Improve and enhance access to bicycle facilities and destinations by supporting a broad range of cycling initiatives that improve route network infrastructure, encouragement and promotion to get more people cycling, and education and enforcement programs for safer and more knowledgeable cyclists.

22. Recognize and support active transportation as an important means to help produce a more sustainable transportation system that uses resources in a manner that is efficient and considerate of the needs of future generations.

Recommendation:

Incorporate the suggested Active Transportation supportive policies outlined in the ATMP in the City's Official Plan and Transportation Master Plan.

7

Implementation

7.1 IMPLEMENTATION

The implementation strategy outlined in this section provides a roadmap for achieving an integrated, attractive, and accessible active transportation network. It recommends key steps and actions to achieve the goals and objectives of the ATMP. It is recommended that the ATMP, along with the implementation strategy, be adopted by City Council. The implementation strategy is also assumed to be the long term strategy towards improving active transportation in the City of Brampton.

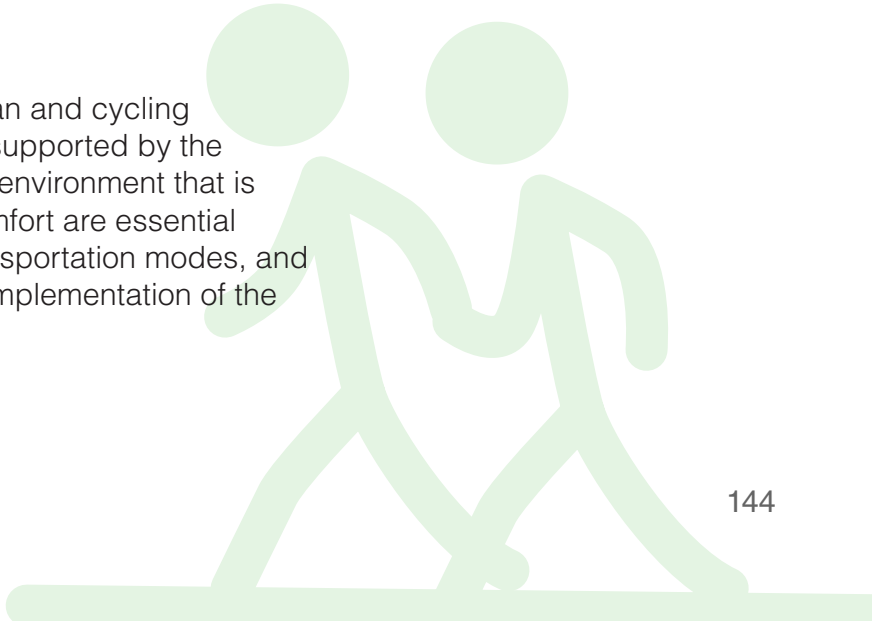
The various recommendations in this report have been grouped into two categories for implementation: short term (0-5 years) and longer term (5+ years). The City's Transportation Master Plan is updated on a regular basis (every 5 years) which provides an opportunity to revise and/or confirm proposed network links and other infrastructure recommendations. As such, the City's ATMP should also be reviewed on a regular basis as a part of the TMP update. The focus of implementation for this ATMP is the short term (0-5 years) with projects identified in the longer term (5+years) to be confirmed through future updates to the plan.

Exhibit 7.1: Implementation Recommendations

Recommendation:		**Financial Implications:**
The City's Active Transportation Master Plan and the Implementation Strategy to build a comprehensive active transportation network to 2041 be adopted by City Council."	Short Term	N/A
The City's Active Transportation Master Plan be updated through a public process every five years.	Short Term	N/A

7.1.1 Design for Safety & Comfort

The implementation of high quality pedestrian and cycling infrastructure as defined in Chapter 3 (and supported by the Design Compendium) will help to create an environment that is safe and attractive for users. Safety and comfort are essential factors in encouraging the use of active transportation modes, and are therefore integral considerations in the implementation of the ATMP.



The Ontario Traffic Manual Book 18 - Cycling Facilities also provides direction, reflecting up-to-date standards on best practices for cycling infrastructure that can be applied uniformly across the province.

Exhibit 7.2: Design for Safety & Comfort Recommendations

Recommendation:	Timeline	Financial Implications
Use the ATMP Design Compendium to inform the design of complete streets and the active transportation network presented in the Active Transportation Master Plan.	Short-Term	N/A
Adopt the guidance provided by the Ontario Traffic Manual Book 18: Bicycle Facilities as the best practice for the planning, design and operation of cycling facilities in Ontario.	Short Term	N/A

7.1.2 Connecting the Network

As outlined in Chapter 4, the cycling network will be delivered through the following programs:

- **Capital Plans:** Major road reconstruction projects are identified in the City's 10-year Roads Capital Program. Coordination of large scale capital projects with active transportation is a cost effective way to implement infrastructure without additional active transportation specific budget. Another cost effective current practice at the City that does not require additional budget allocation, involves identifying active transportation infrastructure through the secondary planning and block planning process.
- **Infill Program:** This program prioritizes a number of active transportation links (for walking and cycling) using the defined processes and metrics as outlined in Chapter 4.

Exhibit 7.3: Connecting the Network Recommendations

Recommendation:	Timeline	Financial Implications
Update the Missing Sidewalk Program priority warrant to include metrics relating to the presence of seniors homes/healthcare centers and locations where major barriers, such as highways or railways may impact pedestrian safety.	Short-Term	N/A
Update the Missing Sidewalk Program priority warrant to recognize that projects where a transit route has been identified, be elevated to the highest priority.	Short-Term	N/A
Provide dedicated annual capital funding of $1.25 million to accelerate the installation of missing sidewalks on arterial roadways and address challenging corridors.	Short-Term	$1.25M annually
Allocate an annual budget towards implementing the short-term priorities identified in the ATMP "Infill" Program.	Short-Term	$4M annually
Allocate an annual budget over the next 5 years to address the gaps identified in the ATMP "Fix-it" program.	Short-Term	$1.25M annually
Prepare an inventory of bicycle parking located within the City that is available to the public, to identify gaps and to inform a future bike parking program. The inventory should include (but not be limited to) public spaces (roads, parks) recreation centres, civic buildings, schools, commercial properties, office space, etc.	Short-Term	N/A
Update the City of Brampton parking zoning by-law to require all new developments to include an appropriate supply of bicycle parking, taking guidance from the best practices outline within the ATMP.	Short-Term	N/A
Incorporate the policies outlined in the ATMP relating to end-of-trip facilities into the development of the parking zoning by-law.	Short-Term	N/A

The “Fix-it” plan includes the following sub-programs that will be needed to improve the existing network and will need to be funded over the next 5-10 years:

- **Recreational Trail Program:** encapsulates strategies aimed at ensuring a uniform level of quality across Brampton’s off-road trails. Strategies are discussed in Section 4.4 and includes:
  - Introduce centerline pavement markings at strategic locations;
  - Improve surface quality; and,
  - Widen or standardize width.
- **In-Boulevard Program:** is similar to the Recreational Trail Program, this program aims to normalize the quality of in-boulevard facilities. Strategies are discussed in Section 4.4 and includes:
  - Introduce curb cuts;
  - Introduce curb cuts and use signs or pavement markings to clarify right-of-way when a crossing is unsignalized; and,
  - Remove and replace sub-standard paths/trails along roadways used to detour recreational trails to controlled crossings.
- **On-Road Program:** covers upgrades needed for the City’s existing on-road facilities include:
  - Formalize existing urban shoulders/edge lines as designated bike lanes through the addition of pavement markings and signage; and,
  - Modifications to lane configurations around signalized intersections to ensure that cycling facilities are continuous on the intersection approaches.
- **Curb Depression at School Crosswalks Program:** aims to provide routine upgrades of existing schools crosswalks to construct fully accessible depressed curbs.

7.1.3 Providing Year Round Mobility

Proper maintenance is critical to ensuring that walking and cycling infrastructure is safe, comfortable, and usable throughout the year. A good maintenance regimen can help to encourage walking or cycling trips in all seasons, reduce the risk of injuries, and extend the service of life of infrastructure.

Exhibit 7.4: Providing Year Round Mobility Recommendations

Recommendation:	Timeline	Financial Implications
Assess the maintenance best practices outlined within Chapter 5 to determine the impact to operating budgets, equipment need and resources.	Short-Term	N/A
Assess the service level thresholds outlined within Chapter 5 (Exhibit 5.5) to determine the impact to operating budgets, equipment need and resources.	Short-Term	N/A
Develop a pilot priority cycling network for enhanced year-round maintenance and assess its impact to operating budgets, equipment needs and resources.	Short-Term	TBD

7.1.4 Developing a Walking & Cycling Culture

As outlined in Chapter 6, ensuring a positive community outlook on walking and cycling is essential in increasing the number of active transportation trips. This will require tactics such as developing proper policies and guidelines, installing appropriate infrastructure, and providing education through community awareness and various outreach programs.

Exhibit 7.6: Developing a Walking & Cycling Culture Recommendations

Recommendation:	Timeline	Financial Implications
Review the existing and proposed outreach programs contained within Chapter 6 and develop an annual action plan to educate and encourage active transportation in the City and to provide assistance to agency partners to enforce pedestrian and cycling related laws, regulations, etc., as appropriate.	Short-Term	TBD
Identify key messages in support of this ATMP to be applied to the programs included within this chapter.	Short-Term	N/A
Incorporate the suggested Active Transportation supportive policies outlined in the ATMP in the City's Official Plan and Transportation Master Plan.	Short-Term	N/A

7.2 MONITORING AND EVALUATION

Implementation of the Brampton ATMP is expected to begin in 2019. It is recommended that the City of Brampton implement the ATMP network infrastructure programs on an annual basis in accordance with proposed phasing and available capital funds and as authorized by Council. Collecting data to monitor and evaluate pedestrian and cyclist behavior will help the city to evaluate the effectiveness of various activities recommended in the ATMP towards achieving the stated vision/goals of their plan.

To evaluate progress made toward achieving the goals of the ATMP, the measures in Exhibit 7.7 may be monitored.

Exhibit 7.7: Measures to be Monitored for Evaluating the ATMP Objectives

Objective of the ATMP (Section 1.3)	Measure	Target	Evaluation Type
Invest efficiently in an expanding network	Length of network (km) completed within the 5-year short-term timeline	150 km of new infill cycling and trails infrastructure (in addition to co-ordinated road capital projects). 20 km of new sidewalks to address gaps along arterial roads.	Program output
Provide options to all residents, including enhancing accessibility	Number of projects delivered that enhance accessibility (e.g. curb cuts to make trail access points AODA compliant)	25 projects per year, beyond Capital Plan.	Program output
Maximize the value (usage) of existing infrastructure	Number of fix-it program improvements completed to improve quality and connectivity of existing trails and cycling infrastructure Year over year walking and cycling count data	30 improvements per year, beyond Capital Plan 10% of City-wide trips by 2041, as per Transportation Master Plan.	Program outcome
Improve the safety of walking and cycling	Year over year walking and cycling collision data	Decline in year-over-year collision rate, calculated relative to walking and cycling activity.	Program outcome
Improve access to transit and provide viable active transportation options for the first / last mile	Percentage of rapid transit stops and stations with direct cycling connection Percentage of rapid transit stops and stations with bicycle parking Percentage of transit stops and stations with sidewalks	80-100% of stations. 80-100% of stations. 100% of stations.	Program output

There are several best practice monitoring techniques to consider. For example, a comprehensive monitoring program may go beyond comparing counts and introduce more qualitative measures to document comfort levels. Surveys may be used to gauge public response, and traffic camera footage to assess cyclist and pedestrian behavior. The observations from these types of evaluation programs may help identify design issues and helped establish recommendations for updates to facility design.

7.2.1 Measuring Pedestrian and Cycling Demand

There are a number of methods for measuring demand, that is how many people are walking and cycling. Common methods include:

- Region-wide travel survey, Transportation for Tomorrow that provides statistics for one time period every 5 years;
- Individual trip-making data recorded in smartphone applications such as Strava; and,
- Manual or automatic counters at specific locations.

Strava Data

The City of Brampton has been promoting a partnership initiative with the Region of Peel to purchase the GPS enabled smartphone app “Strava”. From a demographic perspective, the marketing of this app tends to attract cyclists who wish to share their recreational ride routes. While the data gathered by self-selecting users may over-emphasize athletic accomplishments (and under-emphasize routine cycling trips to utilitarian destinations), it nonetheless represents a valuable record of locations with existing cycling demand.

Cycling and Pedestrian Counts

Bicycle and pedestrian counts can be conducted manually or with automatic count technologies; however automatic counters have certain advantages. Automatic count technologies are useful in conducting longer-term counts, establishing daily, weekly, or monthly variations and almost always require fewer person-hours. The most common technologies used for bicycle and pedestrian counts as identified by the US National Pedestrian and Bicycle Counting Project are:

- Passive infrared (detects a change in thermal contrast);
- Active infrared (detects an obstruction in the beam);
- Ultrasonic (emits ultrasonic wave and listens for an echo);
- Doppler radar (emits radio wave and listens for a change in frequency);
- Video imaging (either analyzes pixel changes or data are played back in high speed and analyzed by a person);
- Piezometric (senses pressure on a material either tube or underground sensor); and,
- In-pavement induction loop (senses change in induction field as metal passes over it).

Most automated technologies work well for counting users that pass a specific point. Emergent video technologies may be used to capture additional demographic or behavioral information. A combination of technologies such as Eco-Counter's Eco-Multi can also distinguish between types of users.

The choice of an automatic count technology primarily depends on the type of data that is required to be collected, the project budget, and the number of people who can work on the project. All automatic count technologies require calibration. When choosing sensor types, the roles and responsibilities for data warehousing and management should also be considered.

Region of Peel Cordon Count Program

The Cordon Count Program collects data on how vehicles and people travel in the Greater Toronto Area (GTA).

Together with other GTA Regional municipalities and the Ontario Ministry of Transportation, Peel Region carries out full counts every 5 years and partial counts in between. The latest full counts and partial counts were completed in 2006 and 2009.

The Region of Peel relies on this data to estimate future trends for passenger, vehicle, truck, active transportation and transit trends, and to plan Peel's transportation system.

Cordon Count data:

- Provides the auto occupancy information we need to support High Occupancy Vehicle (HOV) and carpooling initiatives.
- Tells us how many people are using different modes of transportation.
- Helps us monitor growth and impacts on road and transit facilities of various new developments.
- Tells us how many and which types of commercial vehicles use Peel's roads.
- Validates the forecast of the Travel Demand Forecasting Model
- Is used as input for the Capital Roads Program and phasing of development in the Region.

The cordon count locations have been selected in the past to provide an understanding of vehicular movement in / out and through the Region and City, with the counting of pedestrians and bicycles added to the data collection. Thus, cycling and pedestrian facilities away from the major streets, and off-road trails are typically not included in the Cordon Count Program. Deploying counters at strategic locations along Brampton's recreational trails is important for benchmarking existing rates of use. Count data can be used to document levels of walking and cycling to help build momentum for future initiatives. Anecdotal evidence is not enough to convince stakeholders, and so counting equipment should be thoughtfully deployed on Brampton's walking and cycling corridors.

Peel Region and City of Brampton undertake cordon traffic counts on a continual basis. The Cordon Count Program involves counting vehicles crossing selected stations over a 15-hour period from 5:30 a.m. to 8:30 p.m. There are 110 cordon count locations in Brampton as shown on Exhibit 7-8.

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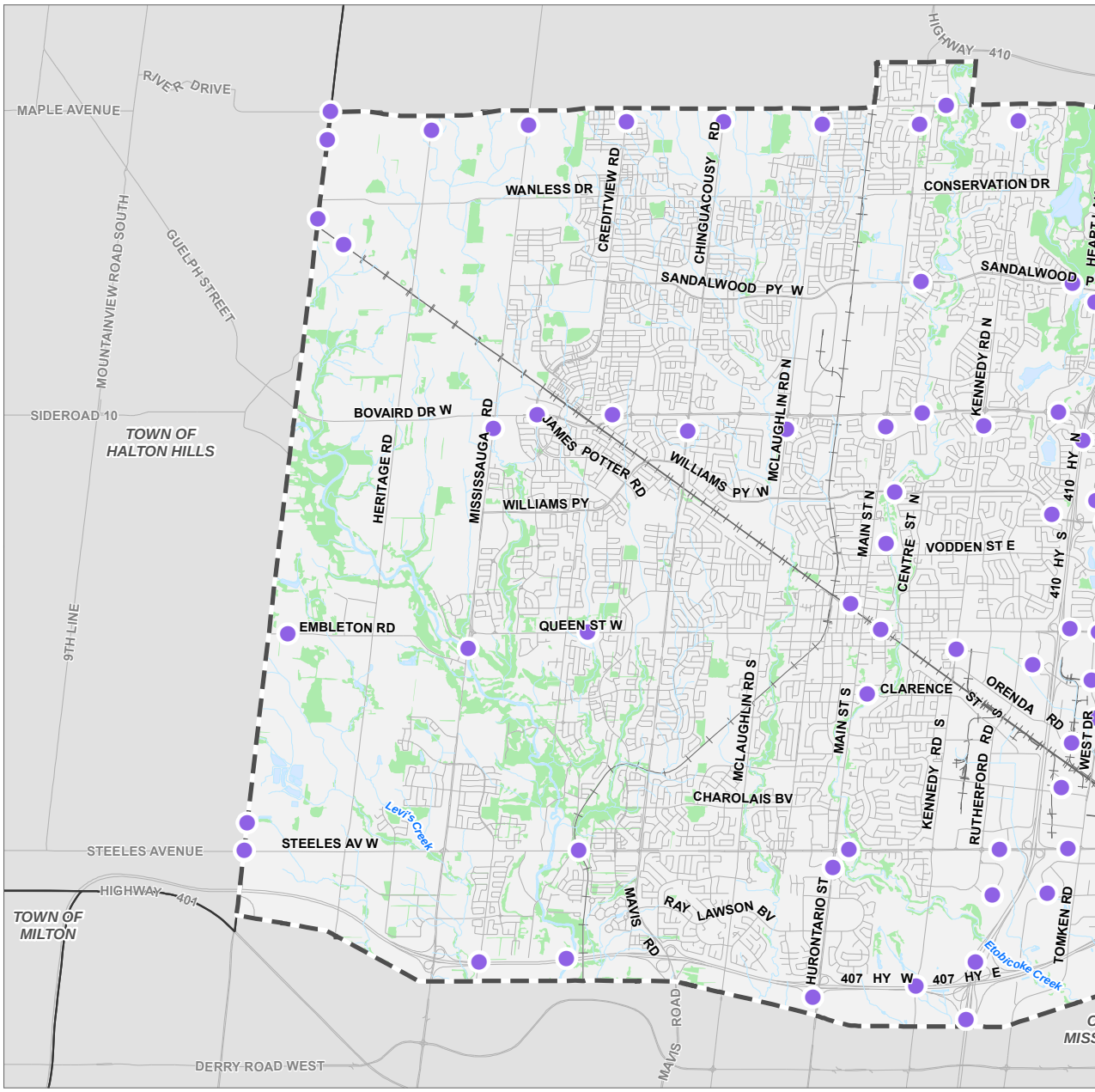
Exhibit 7.8 Cordon Count Program



- Cordon Count Location
- Watercourse
- Road
- Rail Line
- Waterbody
- Wooded Area

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N

Path: J:\102159_BramptonATMP\5.0 Design (Work) Phase\z-GIS\MXD\ATMP\Analysis_Mapping\REVISIONS_2019-03-18\TMM_102159-Fig-10-cordon-count-locations-v1_2019-07-11.mx

102159

Cordon Count Locations

Brampton ATMP
City of Brampton

0 2 4 km

1:75,000

Date: July, 2019

7.2.2 Counters Deployed within Capital Projects

Permanent counting hardware can be deployed on a routine basis as a component of major capital projects. At the time that new facilities are being constructed, there is more flexibility to install sensors for both in-ground and above ground permanent counting hardware. The cost of adding a permanent counter to a project is relatively small compared to the overall capital cost of a new active transportation facility. Since active transportation trips are typically short, counters are recommended to be located every one to five kilometers along a new facility.

The coordinated installation of counting hardware installation during the construction of multi-use trails or cycle tracks may yield cost savings in a number of respects. Where it is desirable to lay ground sensors, embedding these without cuts to the asphalt or concrete surface can help to prevent surface degradation. Similarly, above-ground sensors may require an in-ground mount or a connection to utilities as their power source.

The installation of permanent counting sensors on active transportation facilities over longer periods is better able to account for the weather or seasonal uptake. These counters provide valuable data by the hour over a much longer period of time, providing insight into short and long-term trends. For example, counts may help to better understand whether infrastructure is being used for recreational or commuter purposes. Facilities being used for commuting will see spikes of users during the AM and PM weekday peak periods in a similar pattern to those observed for other modes of transportation. Conversely, where a facility is being used for recreational purposes, counts will be more pronounced during “off-peak” travel times, such as weekends and holidays.

Recommendation:

Explore the potential for the installation of active transportation counters as part of capital project construction contracts.

7.2.3 Infill Counter Program

Pedestrian and bicycle count data are commonly used to:

- Track changes in pedestrian and bicycle activity over time;
- Evaluate the effects of new infrastructure on pedestrian and bicycle activity;
- Prioritize pedestrian and bicycle projects;
- Model transportation networks and estimate annual volumes; and,
- Conduct risk or exposure analyses in combination with crash data.

NCHRP REPORT 797 Guidebook on Pedestrian and Bicycle Volume Data Collection (TRB, Washington, D.C., 2014) provides detailed guidance on non-motorized count data applications, data collection programs, adjusting count data, and count technology. Locations for permanent pedestrian and cyclist counter locations in the City of Brampton to complement the Cordon Count Program are recommended below. NCHRP REPORT 797 is the recommended resource for additional details required to implement and analyze short-duration counts and continuous counts from permanent counters. Specific counting technologies require particular site characteristics. Although permanent counter locations are being recommended, site-specific factors will need to be investigated further during implementation, and locations adjusted accordingly.

Count locations are typically selected as follows:

- **Random locations:** simple random sampling is typically not appropriate for automated counting. However, consideration of stratified random sampling considering categories such as commuting versus recreational routes, land-use types, income levels, proximity to various generators such as schools, parks, transit stations, etc. can be useful for developing predictive pedestrian and bicycle volume models and safety performance functions.

- **Representative locations:** counting at representative sites can be used to measure how pedestrian and bicycle activity changes over time in a community as a whole. Count sites should not be limited to locations that are convenient, have the highest pedestrian or bicycle volumes, or are expected to have the greatest increases in walking and bicycling. Sites are typically selected to represent:
  - Located in different geographic parts of the community
  - Surrounded by different types of land uses
  - Found on different types of facilities (e.g., multi-use trails, bicycle lanes, sidewalks)
  - Reflective of the range of socioeconomic characteristics in the community as a whole
- **Targeted locations:** sites are selected on the basis of being associated with particular projects, facility types, barriers, or locations with particular characteristics (e.g., safety concerns). These are more likely to be implemented on an as-needed basis for specific projects or analyses.
- **Control locations:** this approach compares sites affected by a project with unaltered sites (control locations) to determine how much of the observed change in demand can be attributed to the project. Control sites account for broader influences on walking and bicycling (e.g., an increase in gas prices or a community-wide promotion program), making it possible to quantify the change in walking and bicycling activity or safety actually due to the project of interest.

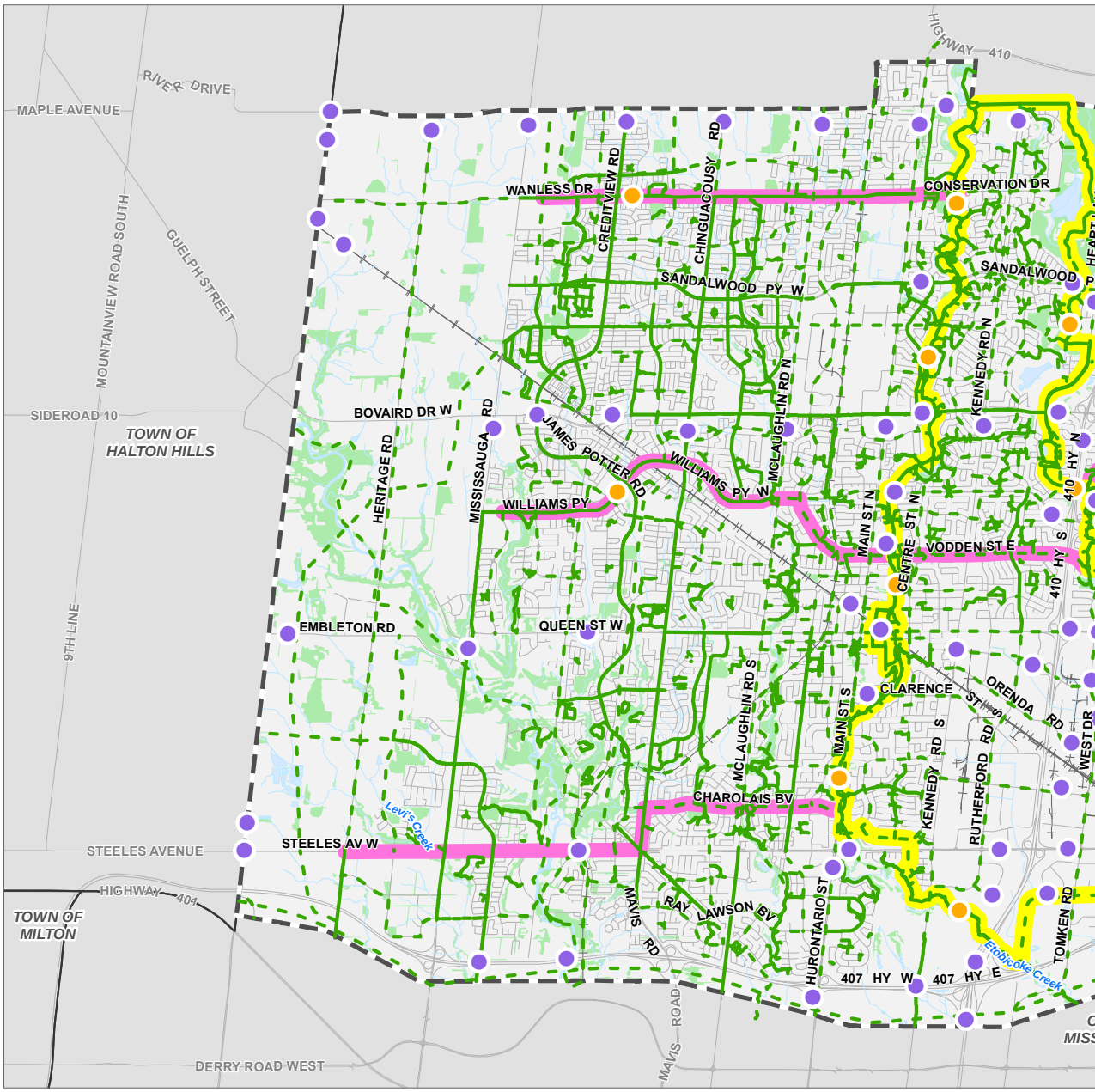
The recommended permanent pedestrian and cyclist counter locations focus on off-road facilities and representative locations on the Brampton Trail Loop and East-West Connections and within the major planning areas based on the City of Brampton's Secondary Planning Areas. These locations are shown on Exhibit 7-9.

7.2.4 Data Management and Sharing

Walking and cycling are transportation modes and the collection of data for these modes should ideally be integrated with counting programs being undertaken for motor vehicles. Instituting a data management protocol whereby walking and cycling counts are seen alongside motor vehicle counts for a given corridor, will help traffic operations staff to better understand how all modes travelling on the street interact.

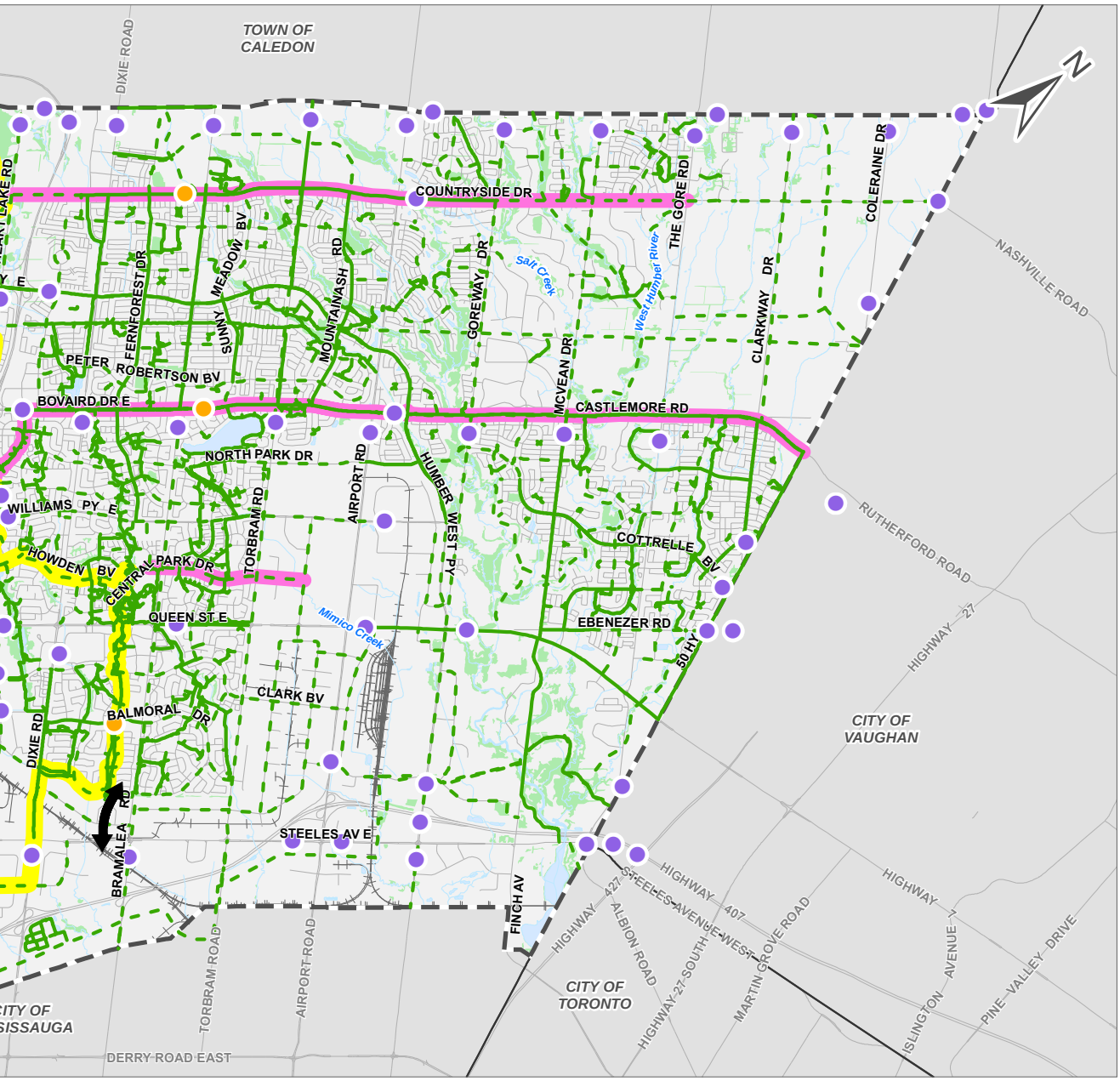
The transparency of an open data policy, which allows for planning and traffic management staff from neighboring jurisdictions to access Brampton information, may be desirable, as this will help to inform the development of more cohesive networks across jurisdictional boundaries.

Exhibit 7.9 Cordon and AT Count Program



Notes
1. Coordinate System: NAD 1983 UTM Zone 17N

Path: J:\102159_BramptonATMP\5.0 Design (Work) Phase\z-GIS\MXD\ATMP\Analysis_Mapping\REVISIONS_2019-03-18\TMM_102159-Fig-10-cordon-count-locations-v2_2019-07-11.mx



102159

Proposed Infill AT Counter Locations

Brampton ATMP
City of Brampton

0 2 4 km

1:75,000

BRAMPTON Flower City

IBI

Date: August, 2019

The various recommendations for monitoring and evaluation presented in this report are summarized in Exhibit 7-10.

Exhibit 7.10: Monitoring & Evaluation Recommendations

Recommendation:	Timeline	Financial Implications
Incorporate temporary automated bike counters into the City's inventory of automated traffic recorders and add the collection of daily bike volumes to the data collection program.	Short Term	$10K annually
Implement permanent pedestrian and cyclist counters at the strategic locations identified in Exhibit 7.3, to collect data year-round in all-weather. These counters should be implemented through existing construction opportunities and as a part of the annual "fix-it" program.	Short Term	$10K annually
Consider purchasing Strava Metro data as a tool to illustrate areas of cycling demand.	Short Term	$15K annually
Incorporate the ATMP performance metrics identified in this chapter into the "City Dashboard 1.0", the City's performance dashboard.	Short Term	N/A

7.3 INFRASTRUCTURE COSTS

There are several network improvements recommended in this plan through the various programs identified in Section 4. Estimated capital costs for each program are summarized in this chapter, with a more detailed list of specific projects provided in Appendices D and E.

7.3.1 Cycling Infill Projects

In Chapter 4, a list of cycling infill projects was identified based on the prioritization framework, leading to recommendations for improvements over short and longer term time periods. The cost of this program is identified in Exhibit 7.3. A full list of specific projects for each time period is provided in Appendix D.

Exhibit 7.11: Cycling Infill Projects Program Costs

Infill Program	
Horizon	**Cost Estimate**
Short Term	$19,100,000
Medium Term	$26,900,000
Long Term	$40,500,000
Total	**$86,500,000**

7.3.2 Fix-it Program

In Chapter 3, a list of priorities to improve the existing off-road and in boulevard network were identified. The cost of this program is identified in Exhibit 7.11. A full list of specific projects is provided in Appendix E.

Exhibit 7.12: Fix-it Program Capital Costs

Fix-it Program	
Program	**Cost Estimate**
Recreational Trail Program	$7,500,000
In-Boulevard Facilities Program	$3,500,000
On-Road Cycling Facilities Program	$1,400,000
School Curb Depressions at Crosswalks	$150,000
Total	**$12,550,000**

Appendix A

Existing Policies

Appendix A – ATMP 'Existing Policies and Initiatives'

FEDERAL POLICIES		
Section	Planning for a Sustainable Future: A Federal Sustainable Development Strategy for Canada	Policy Type
Implementation Strategies for Clean Transportation – Enabling Capacity – 1.1.20	Provide tax relief to Canadians who use public transit regularly and encourage individuals to make a sustained commitment to using public transit regularly to help reduce traffic congestion, air pollution and GHG emissions, through the Public Transit Tax Credit (FIN).	Transit
Climate Change – What Others are Doing – Theme I – Pg. 26	In addition to federal and provincial/territorial governments, some Canadian municipalities are promoting lower- or zero-emission modes of transportation such as cycling and public transportation.	Alternative Modes

FEDERAL POLICIES		
Section	Strategies for Sustainable Transportation Planning The concept of sustainable transportation promotes a balance between transportation's economic and social benefits and the need to protect the environment.	Policy Type
Principle 4: Support Economic Development	Flexible transportation systems would ensure that as many residents as possible have options for getting around (e.g. public transit, cycling and walking) rather than requiring them to rely on automobiles.	Alternative Modes
Principle 6: Consider All Modes	At the heart of an urban transportation plan is typically a set of policies, programs and projects for various transportation modes that support the plan's overall goals. Modes like walking, cycling and public transit (and substitutes like telework) are fundamentally more sustainable than automobile travel.	Alternative Modes/ Transit

FEDERAL POLICIES		
Section	Bill 51 – Planning and Conservation Land Statue Law Is a reform to the Planning Act, which outlines a legislative framework for land use planning in Ontario. Bill 51 provides changes to the planning process. The changes to the planning process include sustainable development, protection of green space and provides municipality with more power and flexibility.	Policy Type
3. (q)	The promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians.	
(4) Paragraph 2 of subsection 41 (4) of the Act is amended by striking out "and" at the end of subparagraph (b) and by adding the following subparagraphs:	The sustainable design elements on any adjoining highway under a municipality's jurisdiction, including without limitation trees, shrubs, hedges, plantings or other ground cover, permeable paving materials, street furniture, curb ramps, waste and recycling containers and bicycle parking facilities, if an official plan and a by-law passed under subsection (2) are in effect in the municipality.	

FEDERAL POLICIES		
Section	Bill 31 – Making Ontario Roads Safer Act	Policy Type
	Making Ontario's Roads Safer Act, 2015 and its supporting regulations aim to make conditions safer for everyone travelling on the roads: drivers, cyclists and pedestrians. With an objective to reduce fatalities and injuries on Ontario's roads, the following information highlights why Ontario's laws are changing and the increased fines and penalties.	
Section 62	Section 62 of the Act is amended to permit bicycles to carry a flashing red lamp on their rear, this maybe in addition to or instead of the red light or reflection on their rear that is currently required. Subsection 62 (18) of the Act, which imposes a $20 fine for contravening the requirements for lights and reflectors on bicycle, is repealed.	

FEDERAL POLICIES		
Section	Bill 31 – Making Ontario Roads Safer Act	Policy Type
Section 144	Section 144 of the Act is amended to allow for traffic control signals that are specific to bicyclists. In locations where there are both bicycle traffic control signals and regular traffic control signals, bicyclists will be required to obey the bicycle traffic control signals. Subsection 144 (29) of the Act is amended to remove the prohibition against riding or operating a bicycle along a crosswalk.	
Section 148	Section 148 of the Act is amended to require the driver of a motor vehicle overtaking a bicycle to maintain a distance of at least one metre, as nearly as practicable, between the vehicle and bicycle.	
Section 156	Section 156 of the Act is amended to permit bicycles to be ridden or operated on their paved shoulder of a highway that is divided into two separate roadways.	
Section 140 and 176	Sections 140 and 176 of the Act are amended to require drivers to remain stopped at a pedestrian crossover or school crossing until the person crossing the street and the school crossing guard are off the roadway. The current Act allows drivers to proceed once the person crossing and the school crossing guard are no longer on the driver's half of the roadway. Other amendments to section 140 of the Act consolidate the duties of drivers and pedestrians at pedestrian crossovers: ➤ Drivers must stop before entering the crossover and not overtake another vehicle already stopped at the crossover; and, ➤ Pedestrians (which includes persons in wheelchairs) must not enter a crossover and into the path of a vehicle or street car that is so close that the driver cannot stop, In the new subsection 140 (8), the Minister of Transportation is authorized to make regulations respecting pedestrian crossovers, including prescribing signs and markings.	

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
Section 1.2 Coordination	Where planning is conducted by an upper-tier municipality, the upper-tier municipality in consultation with lower-tier municipalities shall: ➤ Where transit corridors exist or are to be developed, identify density targets for areas adjacent or in proximity to these corridors, including minimum targets that should be met before expansion of the boundaries of settlement areas is permitted in accordance with policy 1.1.3.8.	Coordination Policies
Section 1.4, Housing, 1.4.3 pg. 19	Planning authorities shall provide for an appropriate range of housing types and densities to meet projected requirements of current and future residents of the regional market area by: Promoting densities for new housing which efficiently use land, resources, and infrastructure and public services facilities and support the use of active transportation and transit in areas where it exists or is to be developed.	Land Use
Section 1.5 Public Spaces Parks and Open Space, 1.5.1, pg. 10	Healthy, active communities should be promoted by: ➤ Planning public streets, spaces and facilities to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity; and, ➤ Planning and providing for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and, where practical, water-based resources.	Land Use
Section 1.6.7 Transportation Systems, 1.6.7.1	Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.	Land Use
1.6.7.2	Efficient use shall be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.	Land Use/ TDM
1.6.7.3	As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be maintained and, where possible, improved including connections which cross jurisdictional boundaries.	Land Use/ Development Policies

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
1.6.7.4	A land use pattern, density and mix of uses should be promoted that minimize the length and number of vehicle trips and support current and future use of transit and active transportation.	Land Use/ Development Policies
1.6.7.5	Transportation and land use considerations shall be integrated at all stages of the planning process.	Land Use
Section 1.7, Long Term Economic Prosperity, 1.7.1 pg.	Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and climate change adaptation through land use and development patterns which: ➤ Promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas; and, ➤ Focus major employment, commercial and other travel-intensive land uses on sites which are well served by transit where this exists or is to be developed, or designing these to facilitate the establishment of transit in the future.	Land Use/ Alternative Modes
Section 2.1 Where and How to Grow	**Growth Plan for Greater Golden Horseshoe 2017** Complete communities support quality of life and human health by encouraging the use of active transportation and providing high quality public open space, adequate parkland, opportunities for recreation, and access to local and healthy food. They provide for a balance of jobs and housing in communities across the GGH to reduce the need for long distance commuting. They also support climate change mitigation by increasing the modal share for transit and active transportation and by minimizing land consumption through compact built form. Compact built form and intensification efforts go together with more effective transit and active transportation networks and are fundamental to where and how we grow. They are necessary to ensure the viability of transit; connect people to homes, jobs and other aspects of daily living for people of all ages; and meet climate change mitigation and adaptation objectives. Moreover, an increased modal share for active transportation and transit, including convenient, multimodal options for intra- and inter-municipal travel, supports reduced air pollution and improved public health outcomes.	Transportation Demand Management / Alternative Mode Policies

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
2.2.1 Managing Growth	Applying the policies of this Plan will support the achievement of complete communities that: ➤ Expand convenient access to: ● A range of transportation options, including options for the safe, comfortable and convenient use of active transportation; ● Public service facilities, co-located and integrated in community hubs; and, ● An appropriate supply of safe, publicly-accessible open spaces, parks, trails, and other recreational facilities.	Land Use/ Development Policies
2.2.2 Delineated Built-up Areas	4. All municipalities will develop a strategy to achieve the minimum intensification target and intensification throughout delineated built-up areas, which will: ➤ Ensure lands are zoned and development is designed in a manner that supports the achievement of complete communities; ➤ Prioritize planning and investment in infrastructure and public service facilities that will support intensification; and, ➤ Be implemented through official plan policies and designations, updated zoning and other supporting documents.	Land Use
2.2.3 Urban Growth Centres	Urban growth centres will be planned: ➤ To accommodate and support the transit network at the regional scale and provide connection points for inter- and intra-regional transit.	Land Use/ Transit
2.2.4 Transit Corridors and Station Areas	8. All major transit station areas will be planned and designed to be transit supportive and to achieve multimodal access to stations and connections to nearby major trip generators by providing, where appropriate: ➤ Connections to local and regional transit services to support transit service integration; and, ➤ Infrastructure to support active transportation, including sidewalks, bicycle lanes, and secure bicycle parking.	Transit
2.2.5 Employment	4. In planning for employment, surface parking will be minimized and the development of active transportation networks and transit-supportive built form will be facilitated.	Land Use/ Development/ Transit

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
2.2.5 Employment	9. Within all major transit station areas, development will be supported, where appropriate, by: ➤ Prohibiting land uses and built form that would adversely affect the achievement of transit-supportive densities. 10. Lands adjacent to or near to existing and planned frequent transit should be planned to be transit-supportive and supportive of active transportation and a range and mix of uses and activities.	Land Use
2.2.7 Designated Greenfield Areas	1. New development taking place in designated greenfield areas will be planned, designated, zoned and designed in a manner that: ➤ Supports the achievement of complete communities; ➤ Supports active transportation; and, ➤ Encourages the integration and sustained viability of transit services.	Land Use/ Development
3.1 Infrastructure to Support Growth	3.1 A comprehensive and continuous active transportation network will offer a viable alternative to the private automobile for personal travel.	TDM/Alternative Modes
3.2.2 Transportation – General	2. The transportation system within the GGH will be planned and managed to: ➤ Offer a balance of transportation choices that reduces reliance upon the automobile and promotes transit and active transportation. 4. Municipalities will develop and implement transportation demand management policies in official plans or other planning documents or programs to: a) reduce trip distance and time; b) increase the modal share of alternatives to the automobile, which may include setting modal share targets; c) prioritize active transportation, transit, and goods movement over single-occupant automobiles; d) expand infrastructure to support active transportation; and e) consider the needs of major trip generators.	TDM/Alternative Modes

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
3.2.3 Moving People	1. Public transit will be the first priority for transportation infrastructure planning and major transportation investments. 2. All decisions on transit planning and investment will be made according to the following criteria: ➤ Infrastructure to Support Growth ➤ Growth Plan for the Greater Golden Horseshoe | 34 ● Aligning with, and supporting, the priorities identified in Schedule 5; ● Prioritizing areas with existing or planned higher residential or employment densities to optimize return on investment and the efficiency and viability of existing and planned transit service levels; ● Increasing the capacity of existing transit systems to support strategic growth areas; ● Expanding transit service to areas that have achieved, or will be planned to achieve, transit-supportive densities and provide a mix of residential, office, institutional, and commercial development, wherever possible; ● Facilitating improved linkages between and within municipalities from nearby neighbourhoods to urban growth centres, major transit station areas, and other strategic growth areas; ● Increasing the modal share of transit; and, ● Contributing towards the provincial greenhouse gas emissions reduction targets. 4. Municipalities will ensure that active transportation networks are comprehensive and integrated into transportation planning to provide: ➤ Safe, comfortable travel for pedestrians, bicyclists, and other users of active transportation; and, ➤ Continuous linkages between strategic growth areas, adjacent neighbourhoods, major trip generators, and transit stations, including dedicated lane space for bicyclists on the major street network, or other safe and convenient alternatives.	Transit

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
3.2.8 Public Service Facilities	4. Existing public service facilities that are located in or near strategic growth areas and are easily accessible by active transportation and transit, where that service is available, should be the preferred location for community hubs. 6. New public service facilities, including hospitals and schools, should be located in settlement areas and preference should be given to sites that are easily accessible by active transportation and transit, where that service is available.	Land Use/ Development
4.2.10 Climate Change	1. Upper- and single-tier municipalities will develop policies in their official plans to identify actions that will reduce greenhouse gas emissions and address climate change adaptation goals, aligned with the Ontario Climate Change Strategy, 2015 and the Climate Change Action Plan, 2016 that will include: ➤ Reducing dependence on the automobile and supporting existing and planned transit and active transportation.	Land Use/ Transit/ AT Modes
Section	Greenbelt Plan 2017	Policy Type
3.3.2 Parkland and Open Space and Trail Policies	1. Encourage the development of a system of publicly accessible parkland, open space and trails where people can pursue the types of recreational activities envisaged by this Plan, and to support the connectivity of the Natural Heritage System and the achievement of complete communities in settlement areas across the Greenbelt. 2. Encourage the development of a trail plan and a co-ordinated approach to trail planning and development in the Greenbelt to enhance key existing trail networks and to strategically direct more intensive activities away from sensitive landscapes. 3. Promote good stewardship practices for public and private lands within the Greenbelt, including clear demarcation of where public access is permitted.	Bicycle and Trail Network
3.3.3 Municipal Parkland, Open Space and Trail Strategies	For all lands falling within the Protected Countryside, municipalities should: ➤ Provide for a full range of publicly accessible, built and natural settings for recreation, including facilities, parklands, open space areas, trails and water-based activities; and, ➤ Providing facilities, parklands, open space areas and trails that particularly support an active, healthy community lifestyle.	Trail Network

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
3. Settlement Areas	Serving as centres for the development of community hubs where compatible services are co-located to address local needs in convenient locations that are accessible by active transportation and, where available, transit.	Bicycles and Trail Network
3.4.2 General Settlement Area Policies	2. Municipalities shall incorporate policies in their official plans to facilitate the development of community hubs that: ➤ Enable the co-location of public services to promote cost effectiveness and service integration; and, ➤ Facilitate access through locations served by a range of transportation options, including active transportation and, where available, transit.	Transit/ Alternative Modes

PROVINCIAL POLICIES		
Section	Provincial Policy Statement 2014	Policy Type
3.3.3 Municipal Parkland, Open Space and Trail Strategies	For all lands falling within the Protected Countryside, municipalities should: ➤ Provide for a full range of publicly accessible, built and natural settings for recreation, including facilities, parklands, open space areas, trails and water-based activities. ➤ Develop and incorporate strategies (such as community-specific levels of provision) into official plans to guide the adequate provision of municipal recreation facilities, parklands, open space areas and trails. ➤ Include the following considerations in municipal parks plans and open space strategies: Geographic-Specific Policies in the Protected Countryside Greenbelt Plan (2017) | 32: ● Providing for open space areas for current and future populations and promoting stewardship of open space areas; ● Providing facilities, parklands, open space areas and trails that particularly support an active, healthy community lifestyle; ● Identifying key areas or sites for the future development of major facilities that avoid sensitive landscapes; ● Identifying and targeting under-serviced areas for improved levels of protection; ● Protecting the recreation and tourism values of waterfront areas as a high priority; and, ● Supporting urban agriculture and other local food initiatives. ➤ Include the following considerations in municipal trail strategies: ● Preserving the continuous integrity of corridors (e.g. abandoned railway rights-of-way and utility corridors); ● Planning trails on a cross-boundary basis to enhance interconnectivity where practical; ● Incorporating the existing system of parklands and trails where practical; ● Restricting trail uses that are inappropriate to the reasonable capacity of the site (notwithstanding the ability to continue existing trails/uses); and, ● Providing for multi-use trail systems which establish a safe system for both motorized and non-motorized uses.	Trail Network/ Alternative Modes

Highway Traffic Act	
Highway Traffic Act, R.S.1990,c.H.8, s. 140 (6).	Riding in pedestrian crossover prohibited: No person shall ride a bicycle across a roadway within a pedestrian crossover.
Highway Traffic Act, R.S.O. 1990, c. H.8, s. 148 (4).	Vehicles meeting bicycles: Every person in charge of a vehicle on a highway meeting a person traveling on a bicycle shall allow the cyclist sufficient room on the roadway to pass.
Highway Traffic Act, R.S.O. 1990, c. H.8, s. 144 (29).	Riding in crosswalks prohibited: No person shall ride a bicycle across a roadway within or along a crosswalk at an intersection or at a location other than an intersection which location is controlled by a traffic control signal system.
HTA, R.S.O. 1990, c. H.8, s. 154 (1).	Where highway divided into lanes: ➤ Any lane may be designated for slowly moving traffic, traffic moving in a particular direction or classes or types of vehicles and, despite section 141, where a lane is so designated and official signs indicating the designation are erected, every driver shall obey the instructions on the official signs.
HTA, R.S.O. 1990, c. H.8, s. 152.	For the purposes of sections 141, 153 and 154, “designated” means designated by the Minister or by any person authorized by him or her to make the designation or designated by by-law of a municipality.
HTA, R.S.O. 1990, c. H.8, s. 153	Highway designated for one-way traffic: Where a highway has been designated for the use of one-way traffic only and official signs have been erected accordingly, vehicles and street cars shall be driven only in the direction so designated.
HTA, R.S.O. 1990, c. H.8, s. 185 (2).	Regulating or prohibiting assisted bicycles, etc., on municipal highways: Prohibiting motor assisted bicycles, etc., on municipal highways. 2. The council of a municipality may by by-law prohibit pedestrians or the use of motor assisted bicycles, bicycles, wheelchairs or animals on any highway or portion of a highway under its jurisdiction.
HTA, R.S.O. 1990, c.H.8., s. 147 (1)	Slow vehicles to travel on right side: Any vehicle traveling upon a roadway at less than the normal speed of traffic at that time and place shall, where practicable, be driven in the right-hand lane then available for traffic or as close as practicable to the right hand curb or edge of the roadway.
HTA, R.S.O. 1990, c.H.8., s. 148 (4)	Vehicles meeting bicycles: Every person in charge of a vehicle on a highway meeting a person traveling on a bicycle shall allow the cyclist sufficient room on the roadway to pass.
HTA, R.S.O. 1990, c.H.8, s. 148 (6)	Bicycles overtaken: Every person on a bicycle or motor assisted bicycle who is overtaken by a vehicle or equestrian traveling at a greater speed shall turn out to the right and allow the vehicle or equestrian to pass and the vehicle or equestrian overtaking shall turn out to the left so far as necessary to avoid a collision.

Municipal Act	
Municipal Act, 2001, c. 25, s. 27 (1).	Except as otherwise provided in this Act, a municipality may pass by-laws in respect of a highway only if it has jurisdiction over the highway.
Municipal Act, 2001, c. 25, s. 28 (1).	Except as otherwise provided in this Act or under section 8 of the Public Transportation and Highway Improvement Act or in a by-law passed under this Act, a municipality has jurisdiction or joint jurisdiction, as the case may be, over the following highways: ➤ All highways over which it had jurisdiction or joint jurisdiction on December 31, 2002; ➤ All highways established by by-law of the municipality on or after January 1, 2003; and, ➤ All highways transferred to the municipality under this Act, the Public Transportation and Highway Improvement Act or any other Act.
Municipal Act, 2001, c. 25, s. 44 (4).	4. The Minister of Transportation may make regulations establishing minimum standards of repair for highways and bridges or any class of them.
Municipal Act, 2001, c. 25, s. 44 (1).	The municipality that has jurisdiction over a highway or bridge shall keep it in a state of repair that is reasonable in the circumstances, including the character and location of the highway or bridge.

Metrolinx 2041 Regional Transportation Plan	
Pg. v	The 2041 RTP builds on The Big Move by putting traveller needs at the core of planning and operations. This will be done by: ➤ Designing communities, transit stations and Mobility Hubs to support transit use and active transportation; ➤ Anticipating and preparing for integrated mobility systems that use emerging transportation technologies and business models; ➤ Using parking demand strategies to encourage car sharing and other modes besides the car; and, ➤ Addressing the beginning and end of a traveller's journey—the first- and last-mile.
What is the 2041 Regional Transportation Plan?, Pg. 4	It aims to build a truly integrated transportation system for the GTHA—one that is comprehensive, connected, accessible, sustainable and focused on people—and one that supports safe streets, active transportation and healthy communities.
How was Developed, Pg. 6	It also incorporates the forecasts and policy directions of the Growth Plan, and extensive research into a wide range of strategies to improve the traveller experience in the region, including active transportation, climate change resiliency, transportation demand management (TDM), intelligent transportation systems (ITS), and goods movement.
What will it achieve?	It will offer health benefits from a reduction in air pollution and an increase in active transportation, and will improve economic competitiveness and productivity in the GTHA.
Stronger integration of transportation and land use	However, many new roads and developments are designed to give preference to the movement of cars and trucks rather than transit users, pedestrians and cyclists. Without significant changes to community design practices, new transit services will not grow ridership, and active transportation will remain inconvenient, unsafe and uncomfortable.
Vision and Goals	The Strategies and Priority Actions also reflect the passenger transportation hierarchy in Ontario's Transit-Supportive Guidelines (2012), and promote a shift in travel behaviour across all modes, while recognizing the diverse needs of travellers.44 In declining order, that hierarchy assigns priority to: trip avoidance or shortening; active transportation, such as walking and cycling; public transit; ridesharing (carpooling, vanpooling); car-sharing, ride-sourcing and taxis; and single-occupant vehicles.
Reinvent transportation demand management	The Metrolinx Smart Commute program has expanded to engage more than 300 employers with TDM initiatives such as carpool ride matching, discounted transit passes, active transportation promotion, and telework arrangements. TDM strategies are also being incorporated into municipal policies and plans.

Metrolinx 2041 Regional Transportation Plan	
Integrate transportation and land use	As the GTHA and its transportation system expand, there is a great opportunity to create more complete, connected, healthy and sustainable communities by reducing automobile dependence, improving access to services and amenities, and supporting transit and active transportation.
Encourage walking and cycling through better design	The 2041 RTP includes a number of actions to significantly increase walking and cycling trips. Investments to support active transportation are relatively small compared to those for rapid transit and highways, but their congestion, health and safety impacts can be significant.
Priority Actions for Strategy 5	Develop a regional framework for on demand and shared mobility: ➤ Proactively test and evaluate new services and technologies (e.g., micro-transit, on-demand and shared mobility) in emerging markets where conventional transit and active transportation are not meeting demand.
How will the 2041 Regional Transportation Plan make a difference?	Implementation of the 2041 RTP will also support an increase in active travel, with walking and cycling trips doubling from 2011. As shown in Figure 34, the percentage of travel mode share for active transportation will increase across all travel markets.
Definitions	Active transportation: As defined in the Provincial Policy Statement (2014) 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. Mobility Hubs: Mobility Hubs are Major Transit Station Areas at the intersection of two or more Frequent Rapid Transit Network routes, designed to support a high number of transit boarding's and alightings, and facilitate seamless, efficient transfers between modes. They have and/or are planned to have a high density mix of jobs, residences, public services, and other land uses that encourage and support transit use and active transportation, or the potential to develop into areas with a high-density mix of land uses. See Major Transit Station Area.

Region of Peel Section 2.2.3 on the ROP Sustainable Transportation Strategy **Region of Peel Official Plan**	
5.4.3 Rural Services	Active Transportation is greatly impacted by the following interconnected elements of the built environment: Density, Service Proximity, Land Use Mix, Street Connectivity, Streetscape Characteristics and Parking.
5.9.2.7 – The Transportation System	In planning for the development, optimization and/or expansion of new or existing Regional transportation corridors: ➤ Prioritize transit, carpooling, active transportation and goods movement needs over those of single occupant vehicles.
5.9.5 The Inter and Intra Regional Transit Network	The increased use of transit contributes to the increased sustainability of the transportation system and helps maximize the use of existing transportation infrastructure. Transit is strongly linked with both transportation demand management (TDM) and active transportation (the promotion of sustainable modes of transportation such as transit is a common TDM measure as most transit trips start and end with walking.
5.9.8 Environmental Impact	Encourage efficient fuel use and conservation by promoting TDM programs, linked trips, the use of Intelligent Transportation Systems and the use of public transit and active transportation.
5.9.10 Active Transportation	Active Transportation offers an alternative to trips made by automobile, especially for trips covering short distances. Active Transportation, in the form of walking is a component of most trips made by transit. Increased resilience on active transportation, by itself or in combination with other sustainable modes, would therefore help reduce the strain on the transportation system. In addition, increasing the share of trips made by active transportation would help increase the sustainability of the transportation system, reduce transportation-related pollutant emissions, provide health benefits and increase people's connection to their communities.
5.9.10.1.1 Objectives	To increase the share of trips made using active transportation
5.9.10.1.2 Objectives	To encourage and support the development of a safe, attractive, accessible and integrated network of bicycle and pedestrian facilities that enhances the quality of life, and promotes the improved health, of Peel residents.
5.9.10.2.1	Work with the Province, Metrolinx, the area municipalities and adjacent municipalities to integrate pedestrian and bicycle networking into transportation planning to: ➤ Provide safe, attractive and accessible travel for pedestrians, and bicyclist with unities and new development; and, ➤ Provide linkages between intensification areas, adjacent neighbourhoods and transit stations.

Region of Peel Section 2.2.3 on the ROP Sustainable Transportation Strategy **Region of Peel Official Plan**	
5.9.10.2.2	Work with the Province, Metrolinx, the area municipalities, adjacent municipalities, and the private sector to develop and implement an Active Transportation Plan for Peel that builds on area municipal pedestrian and cycling plans. (Adopted ROPA 26).
5.9.10.2.3	Support the use of Regional roads and other Regional land as part of a safe attractive and accessible active transportation network.
5.9.10.2.4	Encourage the area municipalities to promote land uses which foster and support the use of active transportation.
5.9.10.2.5	Work with the area municipalities to develop performance indicators for the implementation and usage of active transportation and use these indicators to monitor the impact and effectiveness of the active transportation plan.
5.9.10.2.6	Work with school boards and the private sector to promote the use of active transportation by students and to support the Peel Safe and Active Routes to School Program.
5.9.10.2.7	Encourage school boards to select school site locations, define the catchment areas and design school campuses to maximize walking and bicycling as the primary means of travel to school.
5.9.10.2.8	Work with all levels of government, non governmental community groups and the private sector to increase the active transportation model share through educational programs that target the needs of residents and employees in the Region of Peel.
Regional Road Widening 7.7.2.5	Require the gratuitous dedication to the Region of additional land, if needed where an existing at grade railway crossing of a Regional road or an active transportation facility to be grade separated in the future.

Appendix B

Public Input on Network Priorities

Appendix B – Priorities Identified in Digital Consultation

Location	Key Issue	Public Rank	Analysis Score
Bramalea Road, L6T 4J9	Site Access	top priority	71-85
Vodden St W, L6X 2W4	Missing Link	top priority	71-85
Vodden St, L6S 5V5	Missing Link	top priority	71-85
Vodden St E, L6V 2N2	Missing Link	top priority	71-85
Central Park Dr, L6S 1E1	Missing Link	top priority	71-85
Rutherford Rd S, L6W 3J1	Missing Link	top priority	71-85
Bramalea Rd, L6T 2W8	Missing Link	top priority	71-85
Fairhill Ave, L7A 2P9	Missing Link	top priority	71-85
Clark Boulevard, L6T 2C9	Missing Link	top priority	71-85
Mcmurchy Avenue South, L6Y 1Z2	Missing Link	top priority	71-85
Sheridan College Drive, L6Y 5H9	Site Access	top priority	71-85
Queen Street East, L6W 4K6*	Missing Link	top priority	71-85
Vodden Street East, L6V 1N5	Missing Link	top priority	71-85
Ray Lawson Blvd, L6Y 5J7	Missing Link	medium priority	71-85
Conservation Drive, L6Z 4N8	Missing Link	medium priority	71-85
Highway 410, L6V 4R8	Barrier Crossing	medium priority	71-85
Claireville Conservation Road, L6T 0B3	Facility Upgrade	medium priority	71-85
Royal Orchard Dr, L6X 4M4	Missing Link	medium priority	71-85
Quarry Edge Dr, L6V 4L5	Missing Link	top priority	61-70
Orenda Rd, L6W 1V8	Missing Link	top priority	61-70
Main St S, L6W 2C7	Missing Link	top priority	61-70
North Park Dr, L6S 2S2	Missing Link	top priority	61-70
Queen St E, L6T 2G7*	Missing Link	top priority	61-70
Torrance Woods, L6Y 4R1	Missing Link	top priority	61-70
Queen St W, L6X 0B1*	Missing Link	top priority	61-70
Orenda Road, L6T 5N9	Missing Link	top priority	61-70
Van Kirk Drive, L7A 1A4	Site Access	medium priority	61-70
Van Kirk Drive, L7A 0J3	Safety	medium priority	61-70

Location	Key Issue	Public Rank	Analysis Score
West Drive, L6T 5C3	Site Access	medium priority	61-70
Steeles Avenue East, L6T 4H8*	Missing Link	top priority	46-60
Howden Blvd, L6S 1N9	Missing Link	top priority	46-60
Charolais Blvd, L6Y 3K6	Missing Link	top priority	46-60
Pine Ridge Lane, L6W 1G6	Missing Link	top priority	46-60
Steeles Ave W, L6Y 5R4*	Missing Link	top priority	46-60
Steeles Ave W, L6Y 5H4*	Site Access	top priority	46-60
Embleton Rd, L6X 0C9*	Missing Link	medium priority	46-60
Mill St S, L6Y 1T9	Missing Link	medium priority	46-60
Heritage Rd, L6Y 0C9	Missing Link	medium priority	46-60
Glidden Rd, L6W 1V9	Missing Link	medium priority	46-60
Howden Boulevard, L6S 3V3	Missing Link	medium priority	46-60
Kennedy Rd N, L6V 3V7*	Missing Link	top priority	36-45
Creditview Rd, L7A 3A8	Missing Link	top priority	36-45
Finch Ave, L4T 3P7*	Missing Link	top priority	36-45
Botavia Downs Drive, L7A 2Z7	Missing Link	top priority	36-45
Sandalwood Pky W, L7A 1E8	Facility Upgrade	top priority	Capital Plan
Sandalwood Pky W, L7A 1E8	Facility Upgrade	top priority	Capital Plan
Williams Pky E, L6V 3N3	Facility Upgrade	top priority	Capital Plan

Location	Key Issue	Public Rank	Analysis Score
Williams Pky W, L6X 5C8	Facility Upgrade	top priority	Capital Plan
Torbram Rd, L6T 3P8	Missing Link	top priority	Capital Plan
Torbram Rd, L6S 1Z1	Safety	top priority	Capital Plan
Chinguacousy Rd, L7A 0G7	Missing Link	medium priority	Capital Plan
Hwy. 407, L6W 4S6*	Barrier Crossing	top priority	Provincial Link
Bovaird Drive East, L6S 5T1*	Barrier Crossing	medium priority	Regional Link
McCrimmon Dr, L7A 2Z4	Missing Link	medium priority	N/A
Joshua Court, L6S 3W4	Facility Upgrade	medium priority	N/A

* Roads under Regional or Provincial jurisdiction

Appendix C

Collector Roadway Implementation Strategy

Appendix C – Four-lane Collector Roads and their Speed Limits

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
McMurchy Ave. S	6,310 veh/ day (2017)	40 km/ hour	51 km/ hour	2%	Designated	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Financial Dr.	9,610 (2015)	50 km/ hour	69 km/ hour	2%	Designated or Separated (Preferred)	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Can also address speeding concerns.
Peter Robertson Blvd.	6,840 (2016)	50 km/ hour	52 km/ hour	1%	Designated	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Charolais Blvd.	13,710 (2015)	50 km/ hour	64 km/ hour	2%	Designated or Separated (Preferred)	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Can also address speeding concerns.

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
Vodden St. E	17,130 (2015)	50 km/ hour	65 km/ hour	3%	Separated	Protected bike lanes or cycle tracks	Investigate opportunities for road diet (volumes on threshold). If not feasible, provide cycle tracks when road is reconstructed. Consider providing interim bike lanes through lane narrowing for critical sections
North Park Dr. (West of Torbram Road)	11,550 (2016)	50 km/ hour	68 km/ hour	12%	Separated	Protected bike lanes	High speeds and heavy truck percentage indicates need for separation. Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Multi-use trail in boulevard could be considered if road diet not feasible (few driveways and back-lotted residential).

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
North Park Dr. (East of Torbram Road)	10,750 (2014)	50 km/ hour	68 km/ hour	12%	Separated	Multi-use Path	Industrial area – heavy truck percentage and volumes indicates need for separation. Multi-use path on north side would addresses sidewalk gap, however may be challenging due to utilities / grading impacts. Sidewalk on south side could be replaced by multi-use path.
Mackay St. N	8590 (2014)	50 km/ hour	54 km/ hour	2%	Designated	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Rutherford Rd. S	21,650 (2015)	60 km/ hour	59 km/ hour	12%	Separated	Multi-use trail	Industrial area - heavy truck percentage and volumes indicates need for separation. Suggest multi-use trail on west side (also addresses sidewalk gap). Some challenging sections which will require access consolidation and further study.
Howden Blvd.	10,630 (2014)	50 km/ hour	67 km/ hour	2%	Designated or Separated (Preferred)	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes.

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
Clark Blvd.	15,725 (2016)	40 km/ hour	59 km/ hour	4%	Separated	Protected bike lanes or multi-use trail	Investigate opportunities for road diet (volumes on threshold) to provide protected bike lanes. Limited frontage / driveways, so alternatively consider multi-use trail in boulevard.
Orenda Rd.	14,430 (2014)	60 km/ hour	85 km/ hour	13%	Separated	Cycle tracks	Industrial area - heavy truck percentage indicates need for separation. Existing two-way centre left turn lane in place (limits opportunities for road diet). Numerous driveways - consider cycle tracks when road is reconstructed.
Central Park Dr.	9,230 (2016)	50 km/ hour	65 km/ hour	2%	Separated	Protected Bike Lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes.
Clarence St.	13,100 (2015)	50 km/ hour	59 km/ hour	3%	Separated	Protected bike lanes	Industrial area. Investigate opportunities for road diet (volumes on threshold) to provide protected bike lanes.
Balmoral Dr.	6,440 (2014)	40 km/ hour	50 km/ hour	2%	Designated	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
Corporation Dr.	7390 (2017)	50 km/ hour	60 km/ hour	12%	Designated	Protected bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate protected bike lanes. Suggest protection to address higher truck volumes.
Cottrelle Blvd.	7,240 (2016)	50 km/ hour	74 km/ hour	3%	Separated	Multi-use trail	Multi-use trail on north side provides continuity with existing sections of trail between Prince Edward Blvd & Clarkway Drive. Limited driveways.
Dearbourne Blvd.	3,090 (2014)	50 km/ hour	54 km/ hour	2%	Shared or Designated (Preferred)	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Ebenezer Rd.	10,490 (2016)	50 km/ hour	58 km/ hour	2%	Designated or Separated	Multi-use trail	Speeding indicates need for separation. Multi-use trail on north side provides continuity with existing section West of Alfonzo Crescent. Limited driveways.

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
Edgeware Rd.	3,363 (2017)	50 km/ hour	65 km/ hour	11%	Designated	Buffered bike lanes or multi-use trail	Low volumes suggest road is over-designed - consider lane removal to accommodate buffered bike lanes. Alternative would be to provide a multi-use trail on south side (will also address sidewalk gap). Heavy truck percentage and speeds indicate need for designated facility.
Hereford St.	1,550 (2015)	50 km/ hour	70 km/ hour	11%	Designated	Bike lanes or Buffered bike lanes	Heavy truck percentage and speeds indicates need for designated facility. Short section of four lane roadway. Aim to provide continuity with planned on-road facilities along two-lane section through lane narrowing and/or removal of right turn lanes.
Intermodal Dr.	13,520 (2014)	50 km/ hour	64 km/ hour	14%	Separated	Multi-use trail	Heavy truck percentage indicates need for separation. Suggest multi-use trail on south side (will also address sidewalk gap).
Malta Ave.	3330 (2016)	50 km/ hour	65 km/ hour	0%	Designated	Buffered bike lanes or multi-use trail	Consider lane removal to accommodate buffered bike lane. Depending on ROW availability, a multi-use trail on the east side may be feasible alternative by replacing existing sidewalk with MUP (need to minimize impacts to boulevard trees.

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
Ray Lawson Blvd.	18,630 (2015)	50 km/ hour	59 km/ hour	3%	Separated	Protected bike lanes or multi-use trail	Characteristics of an arterial roadway indicate need for separation. Investigate opportunities for road diet (volumes on threshold) to provide protected bike lanes. East of McLaughlin Road, multi-use trail in boulevard on north side could be considered if road diet not feasible (few driveways and back-lotted residential);
Sir Lou Dr.	2,800 (2015)	50 km/ hour	65 km/ hour	2%	Designated	Buffered bike lanes	Investigate opportunities for road diet (volumes on threshold). Multi-use trail in boulevard could be considered if road diet not feasible (few driveways and back-lotted residential); would need to consider transition to on-road facilities on Country Ct Blvd
Elgin Dr.	7,590 (2015)	50 km/ hour	59 km/ hour	2%	Designated	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate buffered bike lanes. Could add separators to upgrade to protected bike lanes if desired.
Jordan Blvd.	2,902 (2016)	40 km/ hour	54 km/ hour	3%	Shared or Designated (Preferred)	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.

Street Name	Volume	Speed Limit	85th % speed	Truck %age	Facility Class Pre-Selection	Suggested Facility Type	Implementation Notes
Hanover Rd.	3,970 (2015)	40 km/ hour	57 km/ hour	3%	Shared or Designated (Preferred)	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.
Glenvale Blvd.	3,000	50 km/ hour	55 km/ hour	2%	Shared or Designated (Preferred)	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.
Finchgate Blvd.	3,000	50 km/ hour	64 km/ hour	2%	Shared or Designated (Preferred)	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.
Hilldale Crescent	3,000	50 km/ hour	55 km/ hour	2%	Shared or Designated (Preferred)	Buffered bike lanes	Volumes indicate opportunity for road diet (4 lanes to 2 lanes + centre two-way left turn lane) to accommodate conventional or buffered bike lanes.

Appendix D

Infill Program Summary Table

Appendix D – Infill Project Program Summary

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
26A	Alfonso Crescent	Alfonso Crescent	Ebenezer Road	Bike Lane	Medium Term	No	0.17	$9,000
42	Auction Lane	Queen Street East	Goreway Drive	Bike Lane	Medium Term	No	0.65	$30,000
203B	Balmoral Drive	Bramalea Road	Torbram Road	Bike Lane or Buffered Bike Lane	Short Term	No	1.90	$110,000
830	Banting Crescent	Moffatt Avenue	McLaughlin Road South	Shared Roadway	Short Term	No	0.20	$3,000
823	Bartley Bull Parkway, Orchard Drive, Hartford Trail	Main Street South	200m South of Appleton Trail	Buffered Bike Lane	Long Term	Yes	1.57	$90,000
29A	Bartley Bull Parkway	Bartley Bull Parkway	Orchard Drive	Bike Lane	Long Term	No	3.07	$150,000
53	Bellchase Trail	Clarkway Drive	Hwy 50	Bike Lane	Medium Term	No	0.22	$10,000
83	Biscayne Crescent	First Gulf Boulevard	Clipper Court	Shared Roadway	Medium Term	No	0.27	$4,000
71	Blackforest Drive, Larkspur Road	Fernforest Drive	Sunny Meadow Blvd	Bike Lane	Medium Term	No	1.42	$70,000
45B	Braidwood Lake Road	Sandalwood Parkway East	Burwash Court	Bike Lane	Short Term	No	1.31	$70,000
825	Bramtrail Gate	McLaughlin Road North	Van Kirk Drive	Buffered Bike Lane	Medium Term	No	0.38	$20,000
12	Braydon Boulevard, Treeline Boulevard	West of Sparkling Place	Airport Road	Bike Lane	Long Term	No	2.84	$140,000
177	Brisdale Drive	Sandalwood Parkway West	Mayfield Road	Bike Lane	Short Term	No	2.52	$130,000
3A	Brisdale Drive	Bovaird Drive West	Grovewood Drive	Bike Lane	Short Term	No	0.31	$20,000
3B	Brisdale Drive	Sandalwood Parkway West	50m North of Wetmeadow Drive/McCrimmon Drive	Bike Lane	Short Term	No	0.23	$10,000
174	Buick Boulevard, Botavia Downs Drive, Earlsbridge Boulevard	Mississauga Road	McLaughlin Road North	Bike Lane	Medium Term	No	4.27	$210,000
29C	Cathedral Road	Bartley Bull Parkway	Nanwood Drive	Bike Lane	Long Term	No	0.32	$5,000
114	Central Park Drive, Corporation Drive	Clark Boulevard	Chrysler Drive	Protected Bike Lane	Short Term	Yes	4.04	$240,000
192A	Centre Street South, Centre Street North, Rutherford Street North	Williams Parkway East	Clarence Street	Bike Lane	Short Term	No	4.96	$250,000
30	Chamney Court, Glidden Road	Chamney Court (end)	West Drive	Bike Lane	Medium Term	No	2.34	$120,000
95	Charolais Boulevard	James Potter Road	Main Street South	Protected Bike Lane	Short Term	Yes	3.02	$180,000
118	Chrysler Drive, Gateway Boulevard	Walker Drive	Williams Parkway	Buffered Bike Lane or Cycle Track	Short Term	No	1.77	$110,000
46	Churchville Road	Steeles Avenue West	Creditview Road	Bike Lane or Paved Shoulder	Long Term	No	0.98	$50,000
819	Churchville Road, Stephanie Avenue, Pantomine Boulevard	Financial Drive	Clementine Drive	Shared Roadway	Short Term	No	2.61	$40,000
16A	Clarence Street	Main Street South	Kennedy Road	Bike Lane	Short Term	No	1.35	$70,000
16B	Clarence Street	Kennedy Road	Rutherford Road South	Protected Bike Lane or Cycle Track	Short Term	No	0.80	$50,000
57	Clark Boulevard	Dixie Road	Airport Road	Buffered Bike Lane or Cycle Track	Short Term	No	4.49	$270,000
103	Clementine Drive	Steeles Avenue West	Mavis Road	Bike Lane	Long Term	No	0.75	$40,000

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
645	Commuter Drive, Ganton Heights	Creditview Road	Commuter Drive	Bike Lane	Short Term	No	0.58	$30,000
73	Conservation Drive	Hurontario Street	Conservation Drive	Bike Lane	Short Term	No	2.07	$100,000
102	Cottrelle Boulevard	Goreway Drive	Prince Edward Boulevard	MUP	Medium Term	No	0.96	$730,000
804	Cottrelle Boulevard	Clarkway Drive	Highway 50	MUP	Short Term	No	0.41	$310,000
116	Countryside Drive	Heart Lake Road	Ross Drive	MUP	Short Term	Yes	0.99	$750,000
109	Coventry Road, Nevets Road	Walker Drive	Delta Park Boulevard	Bike Lane	Long Term	No	0.63	$30,000
171	Credit River	North of Derry Road West	North of Winston Winston Churchill Boulevard	Recreational Trail	Medium Term	No	10.99	$5,500,000
48	Creditview Road	Steeles Avenue West	Williams Parkway West	Bike Lane or Paved Shoulder	Medium Term	No	5.02	$250,000
89	Crystalhill Drive	Humber West Parkway	Castlemore Road	Bike Lane	Long Term	No	0.63	$30,000
831	Curtis Drive	Norbert Road	Harold Street	Recreational Trail (Recreational Trail)	Short Term	No	0.51	$260,000
23	Da Vinci Avenue, Ryckman Lane	Michelangelo Boulevard	End of Ryckman Lane	Shared Roadway	Long Term	No	0.81	$10,000
203A	Dearbourne Boulevard, Avondale Boulevard	Balmoral Drive	Balmoral Drive	Bike Lane or Buffered Bike Lane	Short Term	Yes	3.03	$180,000
61	Deerhurst Drive	Intermodal Drive	Goreway Drive	Bike Lane	Long Term	No	1.79	$90,000
803A	Degrey Drive	Chrysanthemum Recreational Trail	Panahill Drive	Shared Roadway	Short Term	No	0.28	$4,000
59	Delta Park Boulevard	Clark Boulevard	Queen Street East	Bike Lane	Short Term	No	1.25	$60,000
21	Denison Avenue, Mill Street North	McLaughlin Road North	Church Street West	Shared Roadway	Medium Term	No	1.21	$20,000
208	Devon Road	Intermodal Drive	Clark Boulevard	Bike Lane	Medium Term	No	0.82	$40,000
67	Dewside Drive, Octillo Boulevard	Dixie Road	Bramalea Road	Bike Lane	Medium Term	No	1.37	$70,000
65A	Dusk Drive	James Potter Road	Chinguacousy Road	Bike Lane	Medium Term	No	0.36	$20,000
161B	Dusty Lane	McLaughlin Road South	Fletchers Creek Trail	Shared Roadway	Medium Term	No	0.19	$3,000
52	Eagle Plains Drive	Mountainash Road	Airport Road	Bike Lane	Long Term	No	0.52	$30,000
76	East Drive, Walker Drive, Summerlea Road	Bramalea Road	Van Der Graaf Court	Bike Lane	Medium Term	No	7.63	$380,000
810	Eastbourne Drive	Balmoral Drive	Clark Boulevard	Bike Lane	Short Term	No	0.63	$30,000
169	East-West Arterial Road (SP47)	The Gore Road	West of Coleraine Drive	MUP	Medium Term	No	2.32	$1,760,000
26B	Ebenezer Road	Alfonso Crescent/Attmar Drive	Hwy 50	MUP	Medium Term	No	1.63	$1,240,000
10	Edgeforest Drive	Park Path	The Gore Road	Shared Roadway	Long Term	No	0.16	$3,000
818	Edgeware Road, Hereford Street, Hallstone Road	Heritage Road	Financial Drive	Buffered Bike Lane or MUP	Short Term	No	2.87	$2,180,000
88E	Eiffel Boulevard	Goreway Drive	Mount Royal Circle	Bike Lane	Long Term	No	0.55	$30,000
86	Elbern Markell Drive	Queen Street West	Bovaird Drive West	Bike Lane	Medium Term	No	3.12	$160,000
18	Elmgrove Avenue	Fairglen Avenue	Pleasantview Avenue	Shared Roadway	Long Term	No	0.31	$5,000
154	Entrance to Heart Lake Conservation Area	Heart Lake Conservation Area	Heart Lake Road	Recreational Trail	Long Term	No	0.28	$140,000
29B	Erindale Crescent	Bartley Bull Parkway	Peel Village Park Path	Shared Roadway	Long Term	No	0.17	$3,000

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
704	Esker Lake Recreational Trail	135m North of Sandalwood Parkway East	Heart Lake Conservation Area	Recreational Trail	Short Term	Yes	0.41	$210,000
162	Etobicoke Creek Recreational Trail (Diversion Channel)	South of Rail Corridor	South of Queen Street East	Recreational Trail	Long Term	No	0.17	$90,000
820	Etobicoke Creek Trail Connection (South of Steeles)	Steeles Avenue	Etobicoke Creek Rec. Trail at Peel Village Golf	Recreational Trail	Long Term	No	0.61	$310,000
209	Exchange Drive, Sun Pac Boulevard	Humberwest Parkway	Williams Parkway East	Bike Lane	Medium Term	No	1.46	$70,000
117	Fairhill Avenue, Duffield Road	East of Creditview Road	Edenbrook Hill Drive	Bike Lane	Short Term	No	1.86	$90,000
29D	Farmington Drive, Norval Cresent	Peel Village Park Path	Bartley Bull Parkway	Shared Roadway	Long Term	No	0.25	$4,000
44	Father Tobin Road	Bramalea Road	Mountainash Road	Bike Lane	Long Term	No	2.06	$100,000
119	First Gulf Boulevard, Rutherford Road South	Kennedy Road South	Archdekin Drive	MUP	Short Term	No	4.50	$3,420,000
77	Fleming Avenue, Elliott Street, Wellington Street West, Wellington Street East	Fleming Avenue (End)	Mary Street	Bike Lane	Short Term	No	1.01	$50,000
655	Fletchers Creek Recreational Trail	200m North of Elgin Drive	Jessie Street	Recreational Trail	Short Term	No	1.71	$860,000
160	Fletchers Creek Recreational Trail (Sheridan College)	Fletchers Creek Trail (North of Steeles Avenue West)	260m West of New London Court	Recreational Trail	Long Term	No	0.68	$340,000
661	Flower City Recreational Trail	Conestoga Drive	Richvale Drive South	Recreational Trail	Short Term	No	0.78	$390,000
707	Flower City Recreational Trail	McLaughlin Road North	Etobicoke Creek Trail (375m West of Conestoga Drive)	Recreational Trail	Medium Term	No	2.05	$1,030,000
708	Flower City Recreational Trail	Heart Lake Road	Great Lakes Drive	Recreational Trail (Bridge Over 410)	Long Term	No	0.71	$350,000
712	Flower City Recreational Trail	Mountainash Road	Hwy 50	Recreational Trail	Medium Term	No	7.40	$3,700,000
130	Flowertown Avenue	Chinguacousy Road	McLaughlin Road North	Bike Lane	Long Term	No	1.40	$70,000
98	Fogal Road	The Gore Road	Hwy 50	Bike Lane	Medium Term	No	0.77	$40,000
45A	Gillingham Drive, Quarry Edge Drive, Yellow Brick Road	Bovaird Drive West	Bovaird Drive East	Bike Lane	Short Term	No	1.36	$70,000
809	Glenvale Boulevard, Finchgate Boulevard	Clark Boulevard	Central Park Drive	Bike Lane or Buffered Bike Lane	Short Term	No	1.27	$80,000
802	Gordon Randle Drive	Mayfield Road	Countryside Drive	Bike Lane	Short Term	No	1.25	$60,000
92	Goreway Drive	Steeles Avenue East	Queen Street East	MUP	Long Term	No	2.95	$2,240,000
43B	Great Lakes Drive	Sandalwood Parkway	Bovaird Drive	Protected Bike Lane or Cycle Track	Medium Term	No	1.71	$100,000
219	Hallstone Road	Mississauga Road	Financial Drive	Bike Lane	Short Term	No	0.69	$30,000
808	Hanover Road	Central Park Drive	Howden Boulevard	Bike Lane or Buffered Bike Lane	Short Term	No	0.99	$60,000
125	Harold Street	McLaughlin Road South	Main Street South	Bike Lane	Short Term	No	1.46	$70,000
192B	Harper Road, Cornwall Road, Marsden Crescent, Sterne Avenue	Clarence Street	Bartley Bull Parkway	Shared Roadway	Short Term	No	1.07	$20,000
50	Heart Lake Road	New Pines Trail	Mayfield Road	Bike Lane	Medium Term	Yes	4.02	$200,000

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
134	Heritage Road	Bovaird Drive West	Mayfield Road	MUP	Medium Term	No	4.17	$3,170,000
807	Hilldale Crescent	Central Park Drive	Central Park Drive	Bike Lane or Buffered Bike Lane	Short Term	No	1.18	$70,000
58	Hinchley Wood Grove, Conestoga Drive	Centre Street North/Rutherford Road North	Kennedy Road North	Bike Lane	Short Term	No	3.50	$170,000
816	Honour Oak Crescent, Fairmont Close, Leadership Drive	Churchville Road	James Potter Road	Shared Roadway	Short Term	No	1.38	$20,000
110A	Howden Boulevard, North Park Drive	Don Doan Trail (East of Jefferson Road)	Central Park Drive	Protected Bike Lane or Cycle Track	Short Term	Yes	5.33	$320,000
186	Hurontario Street	Bovaird Drive West	Hwy. 410	Protected Bike Lane or Cycle Track	Medium Term	No	5.30	$320,000
123	Ingleborough Drive	Elbern Markell Drive	Creditview Road	Bike Lane	Long Term	No	0.54	$30,000
28	Intermodal Drive	Goreway Drive	Gorewood Drive	Bike Lane	Long Term	No	1.63	$80,000
710	James Potter Road	Steeles Avenue West	Charolais Boulevard	MUP	Short Term	No	0.71	$540,000
33	Jessie Street	Jessie Street (End)	East of Elliott Street	Shared Roadway	Long Term	No	0.80	$10,000
158A	John Street, James Street, Queen Street East	Wellington Street East	Scott Street	MUP	Long Term	No	0.23	$170,000
17	John Street, Trueman Street, Eastern Avenue	Mary Street	Kennedy Road South	Shared Roadway	Medium Term	No	1.12	$20,000
806	Jordan Boulevard	Williams Parkway	North Park Drive	Bike Lane or Buffered Bike Lane	Short Term	No	0.88	$50,000
128	Kennedy Road North	Ken Park Path (South of Fernbrook Crescent)	Mayfield Road	MUP	Short Term	No	0.60	$450,000
188	Kennedy Road North	Bovaird Drive East	Conservation Drive	Protected Bike Lane or Cycle Track	Short Term	No	3.09	$190,000
191	Kennedy Road South	680m North of Hwy 407	Steeles Avenue East	Protected Bike Lane or Cycle Track	Short Term	No	1.26	$80,000
63	Kingknoll Drive	Ray Lawson Boulevard	McLaughlin Road	Bike Lane	Short Term	No	1.38	$70,000
88A	Lacoste Boulevard	Airport Road	Mount Royal Circle	Bike Lane	Long Term	No	0.52	$30,000
827	Lancashire Lane	Malta Avenue	Hurontario Street	Buffered Bike Lane	Medium Term	No	0.53	$30,000
88B	Landscape Drive	Countryside Drive	Mount Royal Circle	Bike Lane	Long Term	No	0.29	$10,000
64	Langston Drive, Richvale Drive South, Richvale Drive North, Winterfold Drive	Rutherford Road North	Kennedy Road North	Bike Lane	Short Term	No	3.53	$180,000
37	Latania Boulevard, Jacksonville Drive, Rosegarden Drive	Richgrove Drive	Gladtone Shaw Park (260m East of Goreway Drive)	Shared Roadway	Long Term	No	1.07	$10,000
91	Latania Boulevard, Richgrove Drive	Goreway Drive (at Latania Boulevard)	Goreway Drive (at Richvale Drive)	Bike Lane	Long Term	No	1.40	$70,000
25	Lexington Road, Tappet Drive	Redwillow Road	Tappet Drive (at Recreational Trail)	Bike Lane	Medium Term	No	0.95	$50,000
811	Linkdale Road, Townsend Gate, Hansen Road North, Bruce Beer Drive	Etobicoke Creek Recreation Trail and Dantek Court	Rutherford Road	Bike Lane	Short Term	No	2.14	$110,000
822	Mackay Street North	Bovaird Drive	Williams Parkway	Buffered Bike Lane	Short Term	No	1.63	$100,000

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
187	Main Street North	Nelson Street West	Vodden Street West	Bike Lane	Short Term	No	0.92	$50,000
85	Main Street North	Vodden Street West	Bovaird Drive West	Protected Bike Lane or Cycle Track	Short Term	No	1.99	$120,000
105	Main Street South	Steeles Avenue East	Nanwood Drive	Protected Bike Lane or Cycle Track	Short Term	Yes	1.64	$100,000
801	Main Street South	Nanwood Drive	Wellington Street	Bike Lane	Short Term	No	1.25	$60,000
88D	Maisonneuve Boulevard	Mayfield Road	Mount Royal Circle	Bike Lane	Long Term	No	0.61	$30,000
32	Major Oaks Drive, Archdekin Drive	Rutherford Road North	Williams Parkway	Shared Roadway	Long Term	No	0.63	$9,000
65B	Major William Sharpe Drive, Valleyway Drive	Queen Street West	West of James Potter Road	Bike Lane	Medium Term	No	2.59	$130,000
66	Malta Avenue, Extension of Malta Drive	Ray Lawson Boulevard	Axelrod Avenue	Bike Lane	Medium Term	No	1.08	$50,000
813	Marotta Avenue, Olde Town Road, Vintage Gate	Pertosa Drive	Fletchers Creek Recreation Trail	Shared Roadway	Short Term	No	1.48	$20,000
185	McLaughlin Road North	Queen Street West	Sandalwood Parkway West	Protected Bike Lane or Cycle Track	Medium Term	No	4.73	$280,000
221	McLaughlin Road North	Sandalwood Parkway West	Wanless Drive	MUP	Long Term	No	1.44	$1,100,000
161A	McLaughlin Road South	Queen Street West	Dusty Lane	MUP	Medium Term	No	0.20	$150,000
184	McLaughlin Road South	Steeles Avenue West	Queen Street West	Protected Bike Lane or Cycle Track	Short Term	No	3.09	$190,000
821	McMurchy Avenue	Charolais Boulevard	Steeles Avenue	Buffered Bike Lane	Long Term	No	0.63	$40,000
106	McMurchy Avenue North	Nelson Street	Railroad Street	Shared Roadway	Short Term	No	0.39	$6,000
832	McMurchy Avenue North, Nelson Street West, Haggert Avenue North	Queen Street West	Denison Avenue	Buffered Bike Lane	Medium Term	No	0.63	$40,000
108	Meadowpine Boulevard	Winston Churchill Boulevard	Municipal Boundary (Mid-Block)	MUP	Long Term	No	0.41	$310,000
222	Mill Street North	Queen Street West	North of Nelson Street West	Shared Roadway	Short Term	No	0.37	$6,000
56	Mill Street North, Church Street West, Church Street East	Rosedale Avenue West	Kennedy Road North	Bike Lane	Short Term	No	1.98	$100,000
15	Mill Street South	Charolais Boulevard	Queen Street West	Shared Roadway	Medium Term	No	2.56	$40,000
829	Moffatt Avenue	Tait Boulevard/Talon Gate	Banting Crescent	Buffered Bike Lane	Short Term	No	0.17	$10,000
88C	Mount Royal Circle	Mount Royal Circle	Mount Royal Circle	Bike Lane	Long Term	No	1.10	$60,000
29F	Nanwood Drive	Cathedral Road	Main Street South	Bike Lane	Long Term	No	0.36	$20,000
43C	Nasmith Street	Bovaird Drive	North Park Drive	Bike Lane	Medium Term	No	0.61	$30,000
100A	New Recreational Trail	McLaughlin Road South	Royce Avenue	Recreational Trail	Long Term	No	0.26	$130,000
99	Nexus Avenue, Thorndale Road	Fogal Road	Cottrelle Boulevard	Bike Lane	Medium Term	No	1.66	$80,000
110B	North Park Drive	Jameson Crescent	Airport Road	MUP	Short Term	No	1.91	$1,450,000
805	Nuttall Street, North Park Drive, Northampton Street, Mansion Street, Maitland Street,	Esker Lake Recreation Trail	Torbram Road	Shared Roadway	Short Term	No	3.96	$60,000

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
112	Markham Street, Jefferson Road, Jayfield Road, Jill Crescent Oaklea Boulevard, Timberlane Drive	Ray Lawson Boulevard	Ray Lawson Boulevard	Bike Lane	Short Term	No	1.26	$60,000
229	Off-Road Trail	Intermodal Drive	Claireville Conservation Road	Recreational Trail	Long Term	No	1.31	$660,000
226	Orangeville/Brampton Rail Corridor	South Limit	North Limit	Recreational Trail	Long Term	No	14.82	$7,410,000
82B	Orenda Court	Trueman Street	Kennedy Road	Shared Roadway	Short Term	No	0.36	$6,000
82A	Orenda Road	Kennedy Road	Dixie Road	Protected Bike Lane or Cycle Track	Short Term	No	3.06	$180,000
97	Palleschi Drive	Queen Street East	Ebenezer Road	Bike Lane	Medium Term	No	0.69	$30,000
803B	Panahill Drive, Gardenbrooke Trail	Degrey Drive	Castlemore Road	Bike Lane	Short Term	No	2.92	$150,000
111	Pearson Road, Elgin Drive	Charolais Boulevard	Main Street South	Bike Lane or Buffered Bike Lane	Medium Term	No	2.47	$150,000
812	Pertosa Drive	Bovaird Drive	Williams Parkway	Bike Lane	Short Term	No	0.71	$40,000
107	Peter Robertson Boulevard, Mountainberry Road	Great Lakes Drive	Mountainash Road	Bike Lane or Buffered Bike Lane	Short Term	No	5.78	$350,000
20	Pleasantview Avenue, Rosedale Avenue, Sproule Drive	Vodden Street West	Ken Whillans Drive	Shared Roadway	Medium Term	No	1.48	$20,000
74	Queen Mary Drive	Sandalwood Parkway West	Mayfield Road	Bike Lane	Medium Term	No	2.70	$130,000
193	Queen Street East	Centre Street North	Kennedy Road South	Protected Bike Lane or Cycle Track	Short Term	No	0.66	$40,000
194	Queen Street East	Kennedy Road South	Hwy 410	Protected Bike Lane or Cycle Track	Short Term	No	1.40	$80,000
55	Queen Street East, North-South Recreational Trail	The Gore Road	Ebenezer Road	Recreational Trail & MUP (North side of Queen St. E.)	Long Term	No	1.73	$870,000
70A	Ray Lawson Boulevard	Mavis Road	Hurontario Street	Protected Bike Lane or Cycle Track	Short Term	No	2.86	$170,000
155	Recreational Trail	Richvale Drive South	White Spruce Park	Recreational Trail	Long Term	No	0.45	$230,000
163	Recreational Trail	Heart Lake Road	White Spruce Park	Recreational Trail	Long Term	No	0.73	$360,000
666	Recreational Trail	1.6km North of Steeles Avenue West	1km North of Embleton Road	Recreational Trail	Long Term	No	2.33	$1,160,000
701	Recreational Trail	Claireville Recreational Trail	Queen Street East	Recreational Trail	Long Term	No	1.39	$700,000
702	Recreational Trail	McVean Drive	Cottrelle Boulevard	Recreational Trail	Long Term	No	1.31	$660,000
703	Recreational Trail	Castlemore Road	Mayfield Road	Recreational Trail	Long Term	No	5.45	$2,730,000
705	Recreational Trail	Conservation Drive	Heart Lake Conservation Area	Recreational Trail	Short Term	No	0.32	$160,000
706	Recreational Trail	Heart Lake Road	Heart Lake Conservation Area	Recreational Trail	Short Term	No	0.13	$70,000
709	Recreational Trail	Steeles Avenue West	100m North of Steeles Avenue	Recreational Trail	Short Term	No	0.29	$140,000
826	Recreational Trail	Axelrod Avenue	Malta Avenue	Recreational Trail	Medium Term	No	0.25	$130,000

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
833	Recreational Trail	Winston Churchill Boulevard	Highway 50	Recreational Trail	Long Term	No	24.66	$12,330,000
834	Recreational Trail	Highway 50	Highway 407	Recreational Trail	Long Term	No	0.67	$330,000
835	Recreational Trail	300m West of Edgeforest Drive	Countryside Drive	Recreational Trail	Long Term	No	1.99	$990,000
157	Recreational Trail (Ebenezer Resource Management Tract)	Queen Street East	South of Upper Ridge Crescent	Recreational Trail	Long Term	No	3.01	$1,510,000
711	Recreational Trail (Hydro Corridor)	James Potter Road	Spicebush Terrace	Recreational Trail	Long Term	No	5.17	$2,580,000
152	Recreational Trail (Hydro Corridor, Fletchers Creek)	Saint Barbara Boulevard	Timberlane Drive	Recreational Trail	Long Term	No	1.64	$820,000
150	Recreational Trail (Kidd Valley Rec. Trail Connection)	North of Martineau Road	South of Eastbrook Way	Recreational Trail	Medium Term	No	0.38	$190,000
151	Recreational Trail (Lauderhill Valley)	Airport Road	Countryside Drive	Recreational Trail	Long Term	No	0.33	$170,000
170	Recreational Trail (TransCanada Pipeline)	East of Winston Churchill Boulevard	Mississauga Road	Recreational Trail	Medium Term	No	4.71	$2,360,000
814	Red Maple Drive	McLaughlin Road	Royal Orchard Drive	Shared Roadway	Short Term	No	0.45	$7,000
90	Redwillow Road	Cottrelle Boulevard	Castlemore Road	Bike Lane	Medium Term	No	0.74	$40,000
13	Regentview Drive	Regentview Drive (End)	Conservation Drive	Shared Roadway	Long Term	No	0.55	$8,000
96	Riverstone Drive	McVean Drive	Don Minaker Drive	Shared Roadway	Long Term	No	0.33	$5,000
39	Robert Parkinson Drive	Sandalwood Parkway West	Mayfield Road	Bike Lane	Long Term	No	2.44	$120,000
120	Ross Drive	Templehill Road	Countryside Drive	Shared Roadway	Medium Term	No	0.33	$5,000
84	Royal West Drive	Queen Street West	Williams Parkway	Bike Lane	Medium Term	No	1.75	$90,000
100B	Royce Avenue	Royce Avenue (End)	McMurchy Avenue	Shared Roadway	Long Term	No	0.42	$6,000
1	Salvation Road, Springhurst Avenue, Grovewood Drive	Commuter Drive	Chinguacousy Road	Bike Lane	Short Term	No	2.20	$110,000
129	Sandalwood Parkway West	McLaughlin Road	Van Kirk Drive	MUP	Medium Term	No	0.38	$290,000
158B	Scott Street	Queen Street East	Roselea Park Trail	Shared Roadway	Long Term	No	0.12	$2,000
70B	Sir Lou Drive	Malta Avenue	Hurontario Street	Bike Lane	Short Term	No	0.37	$20,000
14	Skranda Hill	North of Oaklea Boulevard	South of Ray Lawson Boulevard	Shared Roadway	Medium Term	No	0.34	$5,000
94	Southlake Boulevard	Williams Parkway East	Stoneylake Avenue/Harbourtown Crescent	Bike Lane	Short Term	Yes	1.18	$60,000
215	Sterritt Drive	Chinguacousy Road	Drinkwater Road	Bike Lane	Long Term	No	0.52	$30,000
68A	Sunny Meadow Boulevard	Bovaird Drive East	Peter Robertson Boulevard	Bike Lane	Short Term	No	0.38	$20,000
68B	Sunny Meadow Boulevard	Sandalwood Parkway East	Countryside Drive	Bike Lane	Short Term	No	1.71	$90,000
54	Thorndale Road	Castle Oaks Crossing	Cottrelle Boulevard	Bike Lane	Long Term	No	1.12	$60,000
196	Tomken Road	Hwy 407	Steeles Avenue East	MUP	Short Term	No	1.50	$1,140,000
197	Tomken Road	200m North of Cardiff Boulevard	Hwy 407	MUP	Medium Term	No	1.37	$1,040,000
22	Trail in Chris Gibson Park	McLaughlin Road North	Chris Gibson Park	Recreational Trail	Long Term	No	0.28	$140,000

ID	Street Name	From	To	Facility Type	Proposed Phasing	Priority Network	Length (km)	Cost Estimate
29E	Tullamore Road	Bartley Bull Parkway	Kennedy Road South	Shared Roadway	Long Term	No	0.28	$4,000
60	Tyler Avenue	The Gore Road	Thorndale Road	Bike Lane	Medium Term	No	0.28	$10,000
24	Valleycreek Drive, Valleystream Circle	Cottrelle Boulevard	Cottrelle Boulevard	Shared Roadway	Long Term	No	0.50	$7,000
815	Valleyway Drive, Valleyway Drive Extension	Elbern Markell Drive	Chinguacousy Road	Bike Lane	Short Term	No	2.22	$110,000
824	Van Kirk Drive	Wanless Drive	Mayfield Road	Buffered Bike Lane	Medium Term	No	1.26	$80,000
213	Via Romano Way, Cottrelle Avenue	Ebenezer Road	Trail East of Thorndale Road	Bike Lane	Short Term	No	1.19	$60,000
43A	Via Rosedale, Templehill Road, Father Tobin Road, Golf Links Drive	Sandalwood Parkway	Bramalea Road	Bike Lane	Medium Term	No	3.43	$170,000
817	Vivians Crescent	Drinkwater Road	Recreational Trail	Shared Roadway	Short Term	No	0.25	$4,000
72B	Vodden Street East	Main Street North	Howden Boulevard	Protected Bike Lane or Cycle Track	Short Term	Yes	3.59	$220,000
72A	Vodden Street West, Royal Orchard Drive, Van Kirk Drive	Main Street North	Mayfield Road	Bike Lane	Short Term	Yes	5.99	$300,000
62	West Drive, Laurelcrest Street	Steeles Avenue	Vodden Street East	Protected Bike Lane or Cycle Track	Medium Term	No	4.01	$240,000
78	Westbrook Avenue, Skyvalley Drive	Don Minaker Drive	Lynngrove Way	Bike Lane	Long Term	No	0.91	$50,000
183A	Westcreek Boulevard	Westcreek Boulevard (End)	Steelwell Road	Bike Lane	Medium Term	Yes	1.08	$50,000
183B	Westcreek Boulevard, Advance Boulevard	Steelwell Road	Steeles Avenue	MUP	Medium Term	Yes	2.15	$1,630,000
79	Wexford Road, Notre Dame Avenue	Hurontario Street	Richvale Drive South	Bike Lane	Short Term	No	1.65	$80,000
81	Windmill Boulevard	Ray Lawson Boulevard	Kingknoll Drive	Bike Lane	Medium Term	No	0.53	$30,000
828	Windmill Boulevard	Diane Court	Morton Way	Buffered Bike Lane	Short Term	No	0.50	$30,000
75	Woodslea Road	Walker Drive	Airport Road	Bike Lane	Medium Term	No	0.36	$20,000
19	Woodward Avenue, Ronald Gardens, Lauderdale Road, Madoc Drive	Scott Street	Rutherford Road North	Shared Roadway	Long Term	No	1.88	$30,000
11	Yukon Lane, Cupid Drive	Braydon Boulevard	Maldives Crescent	Shared Roadway	Long Term	No	0.37	$6,000

Appendix E

Fix-it Program Summary Tables

Fix-it Program Summary – Recreational Trail Program

Trail Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Esker Lake Trail	N/A	Heart Lake Conservation Park	Sandalwood Parkway	construct new multi-use path	0.71	N/A	$760,000	$540,000
Fletcher's Creek Trail	N/A	South of Williams Parkway	South of Brookview Road	construct new multi-use path	0.24	N/A	$760,000	$180,000
Fletcher's Creek Trail	N/A	Dusty Lane	South of Queen Street	construct new multi-use path	0.31	N/A	$760,000	$230,000
Flower City Trail	N/A	Flower City Trail	Leopard Gate	construct new multi-use path	0.01	N/A	$760,000	$7,000
Flower City Trail	N/A	Flower City Trail	Wildhorse Lane	construct new multi-use path	0.01	N/A	$760,000	$7,000
Flower City Trail	N/A	Flower City Trail	Grasshopper Way	construct new multi-use path	0.01	N/A	$760,000	$6,000
Esker Lake Trail	N/A	Heart Lake Conservation Entrance Road	820m South of Mayfield Road	construct new rec trail	1.23	N/A	$500,000	$620,000
Flower City Trail	N/A	Corvette Court	Chinguacousy Road	construct new rec trail	0.08	N/A	$500,000	$40,000
Chinguacousy Trail	Sandalwood Parkway	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Trail	Clark Boulevard	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Chinguacousy Trail	Knightsbridge Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Trail	Peter Robertson Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Don Doan Trail	North Park Drive (John Bosco School)	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Don Doan Trail	Queen Street and Bramalea Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Don Doan Trail	Queen Street and Glenvale Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Don Doan Trail	Forsythia Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Esker Lake Trail	Bovaird Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Esker Lake Trail	Dixie Road and Balmoral Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Esker Lake Trail	Loraine Crescent	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Esker Lake Trail	South Lake Boulevard and Stoney Lake Avenue	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Esker Lake Trail	South Lake Boulevard and Streamline Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Esker Lake Trail	Hillside Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Esker Lake Trail	Lakelands Park Path	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Etobicoke Creek Trail	Church Street and Ken Whillans Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Etobicoke Creek Trail	John Street	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Fletchers Creek Trail	Brookview Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Fletchers Creek Trail	Bishop Francis Allen School	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Fletchers Creek Trail	Clydesdale Crescent	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Fletchers Creek Trail	Fred Kline Park	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Fletchers Creek Trail	McLaughlin Corners West Parking Lot	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Fletchers Creek Trail	Sparrow Park	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Flower City Trail	Creditview Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Flower City Trail	Lonestar Crescent	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000

Trail Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Flower City Trail	St. Isaac Jogues Catholic Elementary School	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Flower City Trail	Torbram Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Flower City Trail	Wild Indigo Crescent	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Merrybrook Recreational Trail	Wanless Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Trail	Cloverdale Road (south side only)	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Chinguacousy Trail	Brampton Soccer Centre Parking Lot Entrance	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Don Doan Trail	Dorset Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Don Doan Trail	Glenvale Boulevard	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Don Doan Trail	Pennington Place	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Don Doan Trail	Philosophers Trail	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Don Doan Trail	Pleasant Valley Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Don Doan Trail	Professors Lake Parkway	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Esker Lake Trail	Rocky Point Crescent	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Esker Lake Trail	Birchbank Road	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Etobicoke Creek Trail	Mary Street	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Etobicoke Creek Trail	Elizabeth Street	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Etobicoke Creek Trail	Mary Street	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Fletchers Creek Trail	Edenbrook Hill Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Fletchers Creek Trail	Fairglen Avenue	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Fletchers Creek Trail	Dusty Lane	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Fletchers Creek Trail	Edenbrook Hill Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Fletchers Creek Trail	Malta Avenue	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Fletchers Creek Trail	McLaughlin Road	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Flower City Trail	Corvette Court	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Flower City Trail	Silktop Trail	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Flower City Trail	Sunny Meadow Boulevard	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Hydro Corridor Trail	Kingknoll Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Hydro Corridor Trail	Millstone Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Hydro Corridor Trail	Ray Lawson Boulevard	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Merrybrook Recreational Trail	Kempsford Crescent	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Merrybrook Recreational Trail	Miracle Trail	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Neighbourhood Path	Bartley Bull Parkway	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Neighbourhood Path	Latania Boulevard	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Neighbourhood Path	Quincy Place	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Neighbourhood Path	Vision Way	N/A	N/A	curb cut	N/A	1	$3,000	$3,000

Trail Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Neighbourhood Path	Whitwell Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Stephen Llewellyn Trail	Andes Court	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Stephen Llewellyn Trail	Cobblestone Court	N/A	N/A	curb cut	N/A	2	$3,000	$6,000
Stephen Llewellyn Trail	Cougar Court	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Stephen Llewellyn Trail	Eagleridge Drive	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Treeline Park Path	Maldives Crescent	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Chinguacousy Trail	Algonquin Boulevard	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Chinguacousy Trail	Avondale Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Chinguacousy Trail	Balmoral Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Chinguacousy Trail	Templehill Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Balmoral Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Doncaster Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Central Park Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Dorchester Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Greenbriar Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Greenmount Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Jayfield Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Don Doan Trail	Jordan Boulevard	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Esker Lake Trail	La France Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Esker Lake Trail	Brentwood Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Esker Lake Trail	Lambeth Street	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Fletchers Creek Trail	Charolais Boulevard	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Fletchers Creek Trail	Elgin Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Fletchers Creek Trail	Denison Avenue	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Fletchers Creek Trail	Earlsbridge Boulevard	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Barleyfield Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Checkerberry Crescent	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Geddes Lane	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Brisdale Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Edenbrook Hill Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Fernforest Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Great Lakes Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Leagate Street	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Maidengrass Road	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Queen Mary Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Sprucelands Avenue	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Flower City Trail	Sunny Meadow Boulevard	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Merrybrook Recreational Trail	Aldersgate Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Merrybrook Recreational Trail	Buick Boulevard	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Merrybrook Recreational Trail	Tysonville Circle	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000
Merrybrook Recreational Trail	Veterans Drive	N/A	N/A	curb cut and PXO	N/A	1	$4,000	$4,000

Trail Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Flower City Trail	N/A	Brussels Avenue	Checkerberry Crescent	grade separated highway crossing	0.16	N/A	$5,500,000	$890,000
Don Doan Trail (Central Park Drive)	N/A	Glenvale Boulevard	Don Doan Rec. Trail	remove existing sidewalk and replace with MUP	0.18	N/A	$760,000	$140,000
Don Doan Trail (North Park Drive)	N/A	Pennington Place	Crosswalk at John Bosco School	remove existing sidewalk and replace with MUP	0.33	N/A	$760,000	$250,000
Don Doan Trail (Queen Street West)	N/A	Central Park Drive	Don Doan Rec. Trail	remove existing sidewalk and replace with MUP	0.12	N/A	$760,000	$90,000
Don Doan Trail (Williams Parkway)	N/A	Torbram Road	Don Doan Rec. Trail	remove existing sidewalk and replace with MUP	0.55	N/A	$760,000	$420,000
Esker Lake Trail (Dixie Road - east side)	N/A	Esker Lake Rec. Trail	Balmoral Drive	remove existing sidewalk and replace with MUP	0.16	N/A	$760,000	$120,000
Esker Lake Trail (Laurelcrest Street - west side)	N/A	Esker Lake Rec. Trail	Loraine Crescent	remove existing sidewalk and replace with MUP	0.10	N/A	$760,000	$80,000
Fletchers Creek (McLaughlin Road - east side)	N/A	Brookview Road	Fletechers Creek Trail	remove existing sidewalk and replace with MUP	0.07	N/A	$760,000	$50,000
Don Doan Trail	Clark Boulevard	N/A	N/A	signalized crossing	N/A	1	$160,000	$160,000
Don Doan Trail	Eastbourne Drive	N/A	N/A	signalized crossing	N/A	1	$160,000	$160,000
Don Doan Trail	Williams Parkway	N/A	N/A	signalized crossing	N/A	1	$160,000	$160,000
Esker Lake Trail	Clark Boulevard	N/A	N/A	signalized crossing	N/A	1	$160,000	$160,000
Flower City Trail	Chinguacousy Road	N/A	N/A	signalized crossing	N/A	1	$160,000	$160,000
Esker Lake Trail	N/A	Mayfield Road	Heart Lake Conservation Area - Internal Road	trail surface upgrade	0.94	N/A	$120,000	$110,000
Esker Lake Trail	N/A	White Spruce Park	Heart Lake Road	trail surface upgrade	1.04	N/A	$120,000	$130,000
Etobicoke Creek Trail	N/A	North City limit	Mayfield Road	trail surface upgrade	0.65	N/A	$120,000	$80,000
Etobicoke Creek Trail	N/A	North End of Centennial Park	South End of Centennial Park	trail surface upgrade	0.44	N/A	$120,000	$50,000
Etobicoke Creek Trail	N/A	Loafer's Lake	Somerset Drive Public School	trail surface upgrade	0.45	N/A	$120,000	$50,000
Fletcher's Creek Trail	N/A	Fletcher's Creek Trail spine	Queen Mary Drive	trail surface upgrade	0.22	N/A	$120,000	$30,000
Flower City Trail	N/A	Mississauga Road	Tysonville Circle	trail surface upgrade	0.30	N/A	$120,000	$40,000
Flower City Trail	N/A	Tysonville Circle	Creditview Road	trail surface upgrade	1.13	N/A	$120,000	$140,000
Flower City Trail	N/A	Edenbrook Hill Drive	Flower City Trail spine	trail surface upgrade	0.28	N/A	$120,000	$30,000
Flower City Trail	N/A	Woodhaven Drive	Flower City Trail spine	trail surface upgrade	0.17	N/A	$120,000	$20,000
Flower City Trail	N/A	Aylesbury Drive	Flower City Trail spine	trail surface upgrade	0.44	N/A	$120,000	$50,000
Flower City Trail	N/A	Peter Robertson Boulevard	Flower City Trail spine	trail surface upgrade	0.25	N/A	$120,000	$30,000
Flower City Trail	N/A	Loons Call Crescent	Dixie Road	trail surface upgrade	0.48	N/A	$120,000	$60,000
Merrybrook Trail	N/A	Buick Boulevard	Merrybrook Trail spine	trail surface upgrade	0.24	N/A	$120,000	$30,000
Merrybrook Trail	N/A	Wanless Drive	Flower City Trail	trail surface upgrade	2.25	N/A	$120,000	$270,000

Trail Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Merrybrook Trail	N/A	Kempsford Crescent	Killick Road	trail surface upgrade	0.18	N/A	$120,000	$20,000
Merrybrook Trail	N/A	Pellegrino Road	Merrybrook Trail spine	trail surface upgrade	0.18	N/A	$120,000	$20,000
Stephen Llewellyn Trail	N/A	East of Torbram Road	Cliff Swallow Court	trail surface upgrade	0.21	N/A	$120,000	$20,000
Esker Lake Trail	Queen Street	N/A	N/A	trail underpass	N/A	1	$100,000	$100,000
Fletchers Creek Trail	Bovaird Drive	N/A	N/A	trail underpass	N/A	1	$100,000	$100,000
Fletchers Creek Trail	Steeles Avenue	N/A	N/A	trail underpass	N/A	1	$100,000	$100,000
Fletchers Creek Trail	Wanless Drive	N/A	N/A	trail underpass	N/A	1	$100,000	$100,000
Flower City Trail	Bramalea Road	N/A	N/A	trail underpass	N/A	1	$100,000	$100,000
Stephen Llewellyn Trail	Sandalwood Parkway	N/A	N/A	trail underpass	N/A	1	$100,000	$100,000
Chinguacousy Trail	N/A	South of Naperton Drive	Brampton Soccer Centre driveway	trail widening	1.02	N/A	$70,000	$70,000
Chinguacousy Trail	N/A	Flower City Trail	Bovaird Drive	trail widening	1.70	N/A	$70,000	$120,000
Fletcher's Creek Trail	N/A	South of Sandalwood Parkway	North of Queen Mary Drive	trail widening	1.22	N/A	$70,000	$90,000
Fletcher's Creek Trail	N/A	Earlsbridge Boulevard	North of Sandalwood Parkway	trail widening	0.86	N/A	$70,000	$60,000
Fletcher's Creek Trail	N/A	Fairglen Avenue	Denison Avenue	trail widening	0.79	N/A	$70,000	$60,000
Flower City Trail	N/A	Brisdale Drive	McLaughlin Road North	trail widening	2.07	N/A	$70,000	$140,000
Flower City Trail	N/A	Mississauga Road	Brisdale Drive	trail widening	2.13	N/A	$70,000	$150,000
Chinguacousy Trail	N/A	South of Queen Street East	North of Queen Street East	way-finding	0.08	N/A	$4,000	$400
Chinguacousy Trail	N/A	South of Peter Robertson Boulevard	North of Peter Robertson Boulevard	way-finding	0.04	N/A	$4,000	$200
Chinguacousy Trail	N/A	South of Avondale Boulevard	Queen Street East	way-finding	2.99	N/A	$4,000	$10,000
Chinguacousy Trail	N/A	Queen Street East	Bovaird Drive East	way-finding	3.81	N/A	$4,000	$20,000
Chinguacousy Trail	N/A	60m North of Hanover Road	Chinguacousy Park Entrance Driveway	way-finding	0.05	N/A	$4,000	$200
Chinguacousy Trail	N/A	100m North of Knightsbridge Road	Knightsbridge Park	way-finding	0.18	N/A	$4,000	$800
Chinguacousy Trail	N/A	Chinguacousy Park Entrance Driveway	Chinguacousy Park Driveway (150m East of Central Park Drive)	way-finding	0.05	N/A	$4,000	$300
Chinguacousy Trail	N/A	80m South of Hilldale Crescent	Hilldale Crescent	way-finding	0.07	N/A	$4,000	$300
Chinguacousy Trail	N/A	20m South of Williams Parkway	Williams Parkway	way-finding	0.01	N/A	$4,000	$100
Chinguacousy Trail	N/A	Bovaird Drive East	Peter Robertson Boulevard	way-finding	0.95	N/A	$4,000	$4,000
Chinguacousy Trail	N/A	Peter Robertson Boulevard	Countryside Drive	way-finding	2.53	N/A	$4,000	$10,000
Don Doan Trail	N/A	South of Avondale Boulevard	Balmoral Drive	way-finding	2.09	N/A	$4,000	$9,000
Don Doan Trail	N/A	Epsom Downs Drive	Bramalea Road	way-finding	1.62	N/A	$4,000	$7,000
Don Doan Trail	N/A	Balmoral Drive	Epsom Downs Drive	way-finding	0.15	N/A	$4,000	$600
Don Doan Trail	N/A	Queen Street East	Central Park Drive	way-finding	0.77	N/A	$4,000	$4,000
Don Doan Trail	N/A	Central Park Drive	Williams Parkway	way-finding	0.91	N/A	$4,000	$4,000
Don Doan Trail	N/A	200m East of Grenoble Boulevard	Torbram Road	way-finding	0.53	N/A	$4,000	$3,000
Don Doan Trail	N/A	Williams Parkway	North Park Drive	way-finding	1.04	N/A	$4,000	$5,000
Don Doan Trail	N/A	Jefferson Road	Jordan Boulevard	way-finding	0.50	N/A	$4,000	$3,000

Trail Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Don Doan Trail	N/A	North Park Drive	Bovaird Drive East	way-finding	1.89	N/A	$4,000	$8,000
Don Doan Trail	N/A	100m West of Philosophers Trail	Philosophers Trail	way-finding	0.10	N/A	$4,000	$500
Esker Lake Trail	N/A	Mayfield Road	Birchbank Road	way-finding	10.73	N/A	$4,000	$40,000
Esker Lake Trail	N/A	Tailfin Road	East of Highway 410	way-finding	0.62	N/A	$4,000	$3,000
Esker Lake Trail	N/A	Harbourtown Crescent	Bovaird Drive East	way-finding	0.24	N/A	$4,000	$1,000
Esker Lake Trail	N/A	Dixie Road	Path to Brentwood Drive	way-finding	0.05	N/A	$4,000	$200
Esker Lake Trail	N/A	Path to Brentwood Drive	Birchbank Road	way-finding	0.98	N/A	$4,000	$4,000
Esker Lake Trail	N/A	Dixie Road	East of Nuttall Street	way-finding	4.91	N/A	$4,000	$20,000
Esker Lake Trail	N/A	Tailfin Road	Deep Sea Drive	way-finding	0.13	N/A	$4,000	$600
Esker Lake Trail	N/A	Deep Sea Drive	Harbourtown Crescent	way-finding	0.73	N/A	$4,000	$3,000
Esker Lake Trail	N/A	Bovaird Drive	New Pines Trail	way-finding	0.54	N/A	$4,000	$3,000
Esker Lake Trail	N/A	Heart Lake Conservation Park	Mayfield Road	way-finding	0.94	N/A	$4,000	$4,000
Esker Lake Trail	N/A	400m South of Sandalwood Parkway	North of Sandalwood Parkway	way-finding	0.57	N/A	$4,000	$3,000
Esker Lake Trail	N/A	White Spruce Park Entrance	400m South of Sandalwood Parkway	way-finding	0.47	N/A	$4,000	$2,000
Esker Lake Trail	N/A	80m West of Nuttall Street	Nuttall Street	way-finding	0.07	N/A	$4,000	$300
Flower City Trail	N/A	Mississauga Road	McLaughlin Road North	way-finding	4.24	N/A	$4,000	$20,000
Flower City Trail	N/A	Sandalwood Heights Secondary School	Sandalwood Parkway East	way-finding	0.26	N/A	$4,000	$2,000
Flower City Trail	N/A	Checkerberry Crescent	Stephen Llewellyn Trail (East of Torbram Road)	way-finding	4.06	N/A	$4,000	$20,000
Merrybrook Recreational Trail	N/A	Flower City Trail	Wanless Drive	way-finding	2.16	N/A	$4,000	$9,000
Merrybrook Recreational Trail	N/A	Aylesbury Drive	Flower City Trail	way-finding	0.43	N/A	$4,000	$2,000
Merrybrook Recreational Trail	N/A	Pellegrino Road	Leadenhall Road	way-finding	0.17	N/A	$4,000	$700
Stephen Llewellyn Trail	N/A	West of Mountainash Road	East of Mountainash Road	way-finding	0.09	N/A	$4,000	$400
Stephen Llewellyn Trail	N/A	Mountainash Road	Airport Road	way-finding	0.73	N/A	$4,000	$3,000
Stephen Llewellyn Trail	N/A	Sandalwood Parkway	Mountainash Road	way-finding	1.54	N/A	$4,000	$7,000

Fix-it Program Summary – In-Boulevard Cycling Facilities Program

Street Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
James Potter Rd	N/A	Steeles Avenue	Charolais Boulevard	construct new multi-use path	0.62	N/A	$760,000	$470,000
Sandalwood Pkwy	N/A	Brisdale Drive	St. Edmund Driveway	construct new multi-use path	0.17	N/A	$760,000	$130,000
Sandalwood Pkwy	N/A	McLaughlin Road	East of Van Kirk Drive	construct new multi-use path	0.47	N/A	$760,000	$360,000
Bramalea Road	Dewside Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Bramalea Road	Father Tobin Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Bramalea Road	Larkspur Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Bramalea Road	Peter Robertson Boulevard	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Chinguacousy Road	Bovaird Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Fandor Way/Nelson Mandela Public School	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Queen Street West	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Steeles Avenue	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Bonnie Braes Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Charolais Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Daviselm Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Duffield Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Dusk Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Earlsbridge Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Major William Sharpe Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Sandalwood Parkway	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Chinguacousy Road	Teramoto Park driveway	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Chinguacousy Road	Williams Parkway	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Cottrelle Boulevard	Clarkway Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Cottrelle Boulevard	Huntspoint Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Cottrelle Boulevard	Prince Edward Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Cottrelle Boulevard	The Gore Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Cottrelle Boulevard	Thorndale Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Cottrelle Boulevard	Westbrook Avenue	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Bramalea Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Countryside Drive	Frobisher Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Goreway Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Landscape Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Mountainash Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Ross Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Sesquicentennial Park Entrance	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Torbram Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Countryside Drive	Yellow Avens Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000

Street Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Creditview Road	Aylesbury Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Bleasdale Avenue	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Buick Boulevard/Botavia Downs Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Clockwork Drive/Killkarrin Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Crown Victoria Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	El Camino Way	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Fairhill Avenue	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	McCrimmon Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Remembrance Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Veterans Drive/Ganton Heights	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Creditview Road	Wanless Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Financial Drive	Casablanca Close	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Financial Drive	Cooperage Street/Coastline Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Financial Drive	Hallstone Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Financial Drive	Olivia Marie Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Financial Drive	Seapines Street/Miner Street	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Financial Drive	Wardsville Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Humberwest Parkway	Fairlawn Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Humberwest Parkway	Ricardo Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Humberwest Parkway	Castlemore Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Humberwest Parkway	Cottrelle Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Arrowpoint Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Ashby Field Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Beaconcrest Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Daviselm Drive/Teal Crest Circle	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Fahey Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Hepburn Gate	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Leadership Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Queen Street West	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Semley Street/Antibes Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Bonnie Braes Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Creditview Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
James Potter Road	Williams Parkway	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
McLaughlin Road	Ray Lawson Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
McLaughlin Road	Sheridan College Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
McLaughlin Road South	Gurdwara Gate/Oaklea Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
McVean Drive	Castlemore Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
McVean Drive	Cottrelle Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
McVean Drive	Ebenezer Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
McVean Drive	Huntspoint Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000

Street Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
McVean Drive	Lexington Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Airport Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Brisdale Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Dixie Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Dufay Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Fidelity Avenue	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Robert Parkinson Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Sheepberry Terrace	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Springtown Trail	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Sunforest Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Van Kirk Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Veterans Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Virtues Avenue	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Bramalea Road	N/A	N/A	cross-ride upgrade	N/A	3	$2,000	$6,000
Sandalwood Parkway	Brisdale Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Cedarcliff Trail	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Edenbrook Hill Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Fernforest Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Great Lakes Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Hurontario Street	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	McLaughlin Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Mountainash Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Queen Mary Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Sandalwood Parkway	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Sunforest Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Sandalwood Parkway	Sunny Meadow Boulevard	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Sandalwood Parkway	Torbram Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Torbram Road	Peter Robertson Boulevard	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Torbram Road	Steeplebush Avenue	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Torbram Road	Australia Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Torbram Road	Father Tobin Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Wanless Drive	Chinguacousy Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Wanless Drive	Leadenhall Road	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Wanless Drive	McLaughlin Road	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000

Street Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Wanless Drive	Queen Mary Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Wanless Drive	Robert Parkinson Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Wanless Drive	Van Kirk Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Wanless Drive	Veterans Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Williams Parkway	Abbotsbury Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Williams Parkway	Fletchers Creek Boulevard	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Williams Parkway	Pertosa Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Williams Parkway	Royal West Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
Williams Parkway	Valleyway Drive	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Williams Parkway	Whitewash Way/Withers Way	N/A	N/A	cross-ride upgrade	N/A	2	$2,000	$4,000
Williams Parkway	Elbern Markell Drive	N/A	N/A	cross-ride upgrade	N/A	1	$2,000	$2,000
McLaughlin Road	Sheridan College Entrance	N/A	N/A	curb cut	N/A	1	$3,000	$3,000
Bramalea Rd	N/A	Hocken Court	Sandalwood Parkway	trail surface upgrade	0.66	N/A	$120,000	$80,000
Bramalea Rd	N/A	Dewside Drive	Cedarbrook Road	trail surface upgrade	0.18	N/A	$120,000	$20,000
Castlemore Rd	N/A	West of Julian Drive	East of Julian Drive	trail surface upgrade	0.12	N/A	$120,000	$10,000
Heart Lake Rd	N/A	New Pines Trail	Sandalwood Parkway	trail surface upgrade	1.41	N/A	$120,000	$170,000
Heart Lake Rd	N/A	230m South of New Pines Trail	New Pines Trail	trail surface upgrade	0.25	N/A	$120,000	$30,000
Sandalwood Pkwy	N/A	Brisdale Drive	Chinguacousy Road	trail surface upgrade	0.72	N/A	$120,000	$90,000
Sandalwood Pkwy	N/A	Chinguacousy Road	McLaughlin Road	trail surface upgrade	1.45	N/A	$120,000	$170,000
Sandalwood Pkwy	N/A	East of Van Kirk Dr	Alectra Utilities Driveway	trail surface upgrade	0.44	N/A	$120,000	$50,000
Sandalwood Pkwy	N/A	West of Great Lakes	Fernforest Drive	trail surface upgrade	1.36	N/A	$120,000	$160,000
Sandalwood Pkwy	N/A	Cobblestone Court	Lakespring Gate	trail surface upgrade	0.37	N/A	$120,000	$40,000
Sandalwood Pkwy	N/A	Mountainash Road	Airport Road	trail surface upgrade	0.63	N/A	$120,000	$80,000
Williams Pkwy	N/A	Chinguacousy Drive	McLaughlin Road	trail surface upgrade	1.52	N/A	$120,000	$180,000
Williams Pkwy	N/A	Abbotsbury Drive	Chinguacousy Drive	trail surface upgrade	1.74	N/A	$120,000	$210,000
Bramalea Rd	N/A	South of Dewside Drive	Dewside Drive	trail widening	0.16	N/A	$70,000	$10,000
Bramalea Rd	N/A	Father Tobin Road	Countryside Drive	trail widening	0.42	N/A	$70,000	$30,000
Castlemore Rd	N/A	West of Goreway Drive	Goreway Drive	trail widening	0.09	N/A	$70,000	$7,000
Chinguacousy Rd	N/A	Bovaird Drive	South of Olde Town Road	trail widening	0.37	N/A	$70,000	$30,000
Cottrelle Blvd	N/A	The Gore Road	Via Romano Way	trail widening	1.03	N/A	$70,000	$70,000
Cottrelle Blvd	N/A	Prince Edward Boulevard	The Gore Road	trail widening	2.22	N/A	$70,000	$160,000
Cottrelle Blvd	N/A	Airport Road	Humberwest Parkway	trail widening	0.73	N/A	$70,000	$50,000
Heart Lake Rd	N/A	New Pines Trail	Sandalwood Parkway	trail widening	1.42	N/A	$70,000	$100,000
Sandalwood Pkwy	N/A	Alectra Utilities Driveway	Hurontario Street	trail widening	0.48	N/A	$70,000	$30,000
Sandalwood Pkwy	N/A	Alectra Utilities driveway	Hurontario Street	trail widening	0.51	N/A	$70,000	$40,000
Sandalwood Pkwy	N/A	Sunforest Drive	Etobicoke Creek Trail	trail widening	0.36	N/A	$70,000	$30,000

Street Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Sandalwood Pkwy	N/A	Fernforest Drive	East of Bramalea Road	trail widening	0.79	N/A	$70,000	$60,000
Sandalwood Pkwy	N/A	Trailhead Crescent	Mountainash Road	trail widening	0.22	N/A	$70,000	$20,000
Sandalwood Pkwy	N/A	Heart Lake Road	Great Lakes Drive	trail widening	0.65	N/A	$70,000	$50,000
Wanless Dr	N/A	McLaughlin Road	Hurontario Street	trail widening	1.38	N/A	$70,000	$100,000
Williams Pkwy	N/A	Chinguacousy Drive	McLaughlin Road	trail widening	1.54	N/A	$70,000	$110,000

Fix-it Program Summary – On-Road Cycling Facilities Program

Street Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Balmoral Drive	Bramalea Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Balmoral Drive	Dixie Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Colonel Bertram Road	Mayfield Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Don Minaker Drive	Ebenezer Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Don Minaker Drive	The Gore Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Drinkwater Road	Chinguacousy Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Drinkwater Road	Queen Street	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Fernforest Drive	Bovaird Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Fernforest Drive	Peter Robertson Boulevard	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Fernforest Drive	Sandalwood Parkway	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Fletchers Creek Boulevard	Bovaird Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Fletchers Creek Boulevard	Williams Parkway	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Grenoble Boulevard	Central Park Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Grenoble Boulevard	Williams Parkway	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Mackay Street	North Park Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Mackay Street	Williams Parkway	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
McMurchy Avenue	Charolais Boulevard	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
McMurchy Avenue	Elgin Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
McMurchy Avenue	Queen Street	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
McMurchy Avenue	Steeles Avenue	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Mountainash Road	Bovaird Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Mountainash Road	Countryside Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Mountainash Road	Peter Robertson Boulevard	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Mountainash Road	Sandalwood Parkway	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Sandalwood Parkway	Edenbrook Hill Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Sandalwood Parkway	Queen Mary Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Sunforest Drive	Bovaird Drive	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Sunforest Drive	Sandalwood Parkway	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Sunforest Drive	Wexford Road	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Sunny Meadow Boulevard	Peter Robertson Boulevard	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000
Sunny Meadow Boulevard	Sandalwood Parkway	N/A	N/A	Signalized Crossing Improvement	N/A	1	$20,000	$20,000

Street Name	Location	From	To	Improvement Type	Length (km)	Unit	Unit Cost	Cost Estimate
Balmoral Drive	N/A	Dixie Road	Avondale Boulevard	Urban Shoulder Upgrade to Bike Lane	0.65	N/A	$30,000	$20,000
Balmoral Drive	N/A	Avondale Boulevard	Bramalea Road	Urban Shoulder Upgrade to Bike Lane	0.75	N/A	$30,000	$20,000
Colonel Bertram Road	N/A	Conservation Drive	Mayfield Road	Urban Shoulder Upgrade to Bike Lane	1.21	N/A	$30,000	$40,000
Don Minaker Drive	N/A	Ebenezer Road	The Gore Road	Urban Shoulder Upgrade to Bike Lane	1.54	N/A	$30,000	$50,000
Drinkwater Road	N/A	Chinguacousy Road	Queen Street West	Urban Shoulder Upgrade to Bike Lane	2.06	N/A	$30,000	$60,000
Fernforest Drive	N/A	Bovaird Drive East	Countryside Drive	Urban Shoulder Upgrade to Bike Lane	3.16	N/A	$30,000	$90,000
Fletcher Creek Boulevard, Edenbrook Hill Drive	N/A	Williams Parkway	Wanless Drive	Urban Shoulder Upgrade to Bike Lane	4.44	N/A	$30,000	$130,000
Grenoble Boulevard	N/A	Central Park Drive	Williams Parkway	Urban Shoulder Upgrade to Bike Lane	0.77	N/A	$30,000	$20,000
Mackay Street	N/A	Williams Parkway East	Bovaird Drive East	Urban Shoulder Upgrade to Bike Lane	1.63	N/A	$30,000	$50,000
McMurchy Avenue South	N/A	Steeles Avenue West	Queen Street West	Urban Shoulder Upgrade to Bike Lane	3.06	N/A	$30,000	$90,000
Mountainash Road	N/A	Bovaird Drive East	Countryside Drive	Urban Shoulder Upgrade to Bike Lane	3.19	N/A	$30,000	$100,000
Queen Mary Drive	N/A	Edenbrook Hill Drive	Sandalwood Parkway West	Urban Shoulder Upgrade to Bike Lane	1.62	N/A	$30,000	$50,000
Sunforest Drive	N/A	Bovaird Drive West	Sandalwood Parkway East	Urban Shoulder Upgrade to Bike Lane	2.02	N/A	$30,000	$60,000
Sunny Meadow Boulevard	N/A	Peter Robertson Boulevard	Sandalwood Parkway East	Urban Shoulder Upgrade to Bike Lane	1.23	N/A	$30,000	$40,000

Fix-it Program Summary – School Curb Depressions at Crosswalks

Location	Improvement Type	Unit	Unit Cost	Cost Estimate
Beryl Ford Public School	curb cut	1	$3,000	$3,000
Bishop Allen Separate School	curb cut	1	$3,000	$3,000
Burnt Elm Public School	curb cut	1	$3,000	$3,000
Cherrytree Public School	curb cut	1	$3,000	$3,000
Churchville Public School	curb cut	1	$3,000	$3,000
Conestoga Public School	curb cut	1	$3,000	$3,000
Dorset Drive Public School	curb cut	1	$3,000	$3,000
Earnscliffe Senior School	curb cut	1	$3,000	$3,000
Ecole Elementaire Carrefour Des Jeunes	curb cut	1	$3,000	$3,000
Ecole Elementaire Catholique Sainte-Jeanne d'Arc	curb cut	1	$3,000	$3,000
Fairlawn Public School	curb cut	1	$3,000	$3,000
Georges Vanier Catholic School	curb cut	1	$3,000	$3,000
Guardian Angels Catholic Elementary School	curb cut	1	$3,000	$3,000
Hanover Public School	curb cut	1	$3,000	$3,000
Hickory Wood Public School	curb cut	1	$3,000	$3,000
Hickory Woods Public School	curb cut	1	$3,000	$3,000
Hilldale Public School	curb cut	1	$3,000	$3,000
Larkspur Public School	curb cut	1	$3,000	$3,000
Lester B Pearson Catholic School	curb cut	1	$3,000	$3,000
Maria Goretti Elementary School	curb cut	1	$3,000	$3,000
Massey Street Public School	curb cut	1	$3,000	$3,000
Morton Way Public School	curb cut	1	$3,000	$3,000
Our Lady of Fatima School	curb cut	1	$3,000	$3,000
Our Lady of Providence School	curb cut	1	$3,000	$3,000
Pauline Vanier Catholic Elementary School	curb cut	1	$3,000	$3,000
Peel Alternative School North	curb cut	1	$3,000	$3,000
Ridgeview Public School	curb cut	1	$3,000	$3,000
Robert J Lee Public School	curb cut	1	$3,000	$3,000
Roberta Bondar Public School	curb cut	1	$3,000	$3,000
Rowntree Public School	curb cut	1	$3,000	$3,000
Russell D Barber Public School	curb cut	1	$3,000	$3,000
Saint Kevin Separate School	curb cut	1	$3,000	$3,000
Somerset Public School	curb cut	1	$3,000	$3,000
Springdale Public School	curb cut	1	$3,000	$3,000
St Cecilia Elementary School	curb cut	1	$3,000	$3,000
St Francis Xavier Elementary School	curb cut	1	$3,000	$3,000
St. Angela Merici Catholic Elementary School	curb cut	1	$3,000	$3,000
St. Anthony Catholic Elementary School	curb cut	1	$3,000	$3,000
St. Brigid Elementary School	curb cut	1	$3,000	$3,000
St. Jean Brebeuf Elementary School	curb cut	1	$3,000	$3,000
St. Jean Brebuef Elementary School	curb cut	1	$3,000	$3,000
St. Jean-Marie Vianney Catholic Elementary School	curb cut	1	$3,000	$3,000
St. John Bosco School	curb cut	1	$3,000	$3,000
St. Joseph School	curb cut	1	$3,000	$3,000
St. Josephine Bakhita Catholic Elementary School	curb cut	1	$3,000	$3,000
St. Leonard Separate School	curb cut	1	$3,000	$3,000
St. Lucy Catholic Elementary School	curb cut	1	$3,000	$3,000
St. Marguerite Bourgeoys Separate School	curb cut	1	$3,000	$3,000
St. Monica Elementary School	curb cut	1	$3,000	$3,000
Stanley Mills Public School	curb cut	1	$3,000	$3,000
Thorndale Public School	curb cut	1	$3,000	$3,000
Worthington Public School	curb cut	1	$3,000	$3,000

Appendix F

Bike Parking Candidate Locations

Appendix F – Bike Parking Candidate Locations

Candidate Location	Rack Type	Destination Served	Comments
Timberlane Park, L6Y 4B4	Short Term – Rack	Recreational Facility	Bike rack. Large population of senior cyclists and children access and use park.
Main St S, L6W 2E2	Short Term – Rack	Commercial	No bike racks exist around here.
Main St S, L6W 2E1	Short Term – Rack	Commercial	Ideally, a bike rack should be located here. Easily accessible and visible from the Metro store.
46 ON-10, L6V 1N6	Short Term – Rack	CBD	There are so few bike racks in downtown Brampton, it's sad.
Main Street North, L6X 1R1	Short Term – Rack	CBD	All plaza's and grocery stores should have bicycle parking available.
Main Street North, L6V 4H6	Short Term – Rack	CBD	All plaza's and grocery stores should have bicycle parking available.
Main Street North, L6V 3E4	Short Term – Rack	Commercial	Fast Food restaurants should provide their own bicycle parking to provide active options for customers to get to these restaurants.
John Street, L6W 1Z1	Short Term – Rack	Residential, Institutional	Ensure bicycle parking is located near affordable housing sites, and places of worship.
9 ON-10, L6W 2A7	Short Term – Rack	CBD	Bike shelter is required in garden square.
McLaughlin Rd S, L6Y 2C8	Long Term - Rack and Shelter	Institutional	There should be proper, secured bike parking shelter areas at all City facilities. Promoting healthy commuting without providing support facilities is counter-productive. Please consider adding to all City-run facilities so people can get around without having to worry about bike security.

Candidate Location	Rack Type	Destination Served	Comments
Nelson Street East, L6V 2L8,	Long Term – Rack and Shelter	Recreational Facility	Shared Shelter for cluster of users in area.
Mcmurchy Avenue South, L6Y 1Y6	Long Term – Rack and Shelter	Recreational Facility	Shelter Standard: located near 4-season facilities.
Mclaughlin Road South, L6Y 3A9	Long Term – Rack and Shelter	Institutional	Shelter Standard: Locate near all government offices and Service Ontario sites.
Queen St W, L6X 1Y5	Long Term – Rack and Shelter	Commercial	Locate Shelters near all grocery stores and meeting places like coffee shops.
Chinguacousy Road, L6X 3H1	Long Term – Rack and Shelter	Recreational Facility	Locate Shelters in all major sporting facilities and multi-use parks. Extended stays may require protection from the elements.
Williams Pky, L6S 3W6	Long Term – Rack and Shelter	Transit	Most Carpooling Stops and Transit Stations should contain bicycle parking shelters.
Vodden St E, L6S 5Y7	Long Term – Rack and Shelter	Commercial	Major retail plazas need bicycle parking, and bike lanes and/or signage.
Lisa Street, L6T 4N4	Long Term – Rack and Shelter	Residential	Dense, Mixed-Income areas require extra amenities that wealthy areas may not.
Kings Cross Road, L6T 3X9	Long Term – Rack and Shelter	Residential	Dense, Mixed/Low-Income areas require extra amenities that wealthy areas may not. Secure parking helps avoid thefts and provides stability to works and students.
City Centre Drive, L6T 5K2	Long Term – Rack and Shelter	Commercial	Maintain a healthy ratio of car: bicycle parking.
Steeles Avenue East, L6W 4S2	Long Term – Rack and Shelter	Commercial	Major Retail = options for cyclists, and consistent parking.

Candidate Location	Rack Type	Destination Served	Comments
Sheridan College Drive, L6Y 5H9	Long Term – Rack and Shelter	Institutional	Bicycle Shelters provide stable and secure bike parking for students who are away from their bikes for hours and into the night. Students shouldn't have to worry about being able to bike home.
Ray Lawson Boulevard, L6Y 5B3	Long Term – Rack and Shelter	Recreational Facility	All Recreation Centres should have consistent cycling infrastructure.
Gateway Blvd, L6T 4X2	Long Term – Rack and Shelter	Industrial	Car dependent areas still require cycling considerations.
Bike Repair Location			
Queen St W, L6Y 1L9	Install Repair Stand	CBD	Repair stand at City Hall just makes good sense for anyone coming to City Hall, residents, and people who work there
Vodden Street East, L6V 1T4	Install Repair Stand	Recreational Facility	Repair/air compressor station
Main Street North, L6V 1C6	Install Repair Stand	CBD	Repair stations should go in gathering locations and junctions.
Main St S, L6W 2C5	Install Repair Stand	Recreational Facility	Repair Stations/air filling stations should be automatically included in major parks
Chinguacousy Road, L6X 3H1	Install Repair Stand	Recreational Facility	Locate Repair Stations/Air Compressor Stations in all major sporting facilities and multi-use parks. Extended stays may require protection from the elements.
Sandalwood Parkway East, L6Z 4T3	Install Repair Stand	Recreational Facility	Repair stations should be located in areas difficult to access, so riders don't get stranded by simple repairs.
Esker Lakes Trail, L6V 4N8	Install Repair Stand	Recreational Facility	Community Parks should contain repair stations.

Bike Repair Location			
Lisa St, L6T 4S6	Install Repair Stand	Residential	Dense, Mixed-Income areas require extra amenities that wealthy areas may not.
Team Canada Drive, L6T 1B4	Install Repair Stand	Transit	Major Transit Stations require extra resources for riders/cyclists.
Kings Cross Road, L6T 3X9	Install Repair Stand	Residential	Dense, Mixed/Low-Income areas require extra amenities that wealthy areas may not.
Central Park Drive, L6S 2C8	Install Repair Stand	Recreational Facility	Major Parks need consistent amenities.
15, L6W 4J6,	Install Repair Stand	Recreational Facility	Repair stations provide support to riders in remote sections of trails.
Sheridan College Drive, L6Y 5H9	Install Repair Stand	Institutional	Free resources for students are important to providing transportation options and reducing vehicle parking needs.
Etobicoke Creek Trail, L7C 1E1	Install Repair Stand	Recreational Facility	Even communities outside of busy corridors need resources, since some people are doing long rides and need repairs and tire-pumps.