



CITY OF BRAMPTON TRANSPORTATION MASTER PLAN UPDATE

TECHNICAL REPORT #5 - ACTIVE TRANSPORTATION

AUGUST 2015



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1. INTRODUCTION

As the City of Brampton undertakes its Transportation Master Plan Update (TMPU), the time is right to thoroughly assess the direction that the City's active transportation (AT) infrastructure and services are headed. Many municipalities in Canada and internationally are preparing AT strategies, policies and initiatives. These approaches can be planned for and enacted separately, but in many cases, the greatest benefits are realized when the programs, policies and initiatives are instituted in a synergistic fashion. This is reflected in this technical report, which is intended to serve as an AT strategy to develop the City's AT network while also considering the facilities and plans of other municipalities in the area.

This report identifies additional candidate routes for cycling facilities beyond those routes already proposed by the City. It recommends an AT network concept that should be further evaluated in a future update to Brampton's PathWays Master Plan and identifies next steps as well as best practices consistent with Book 18 of the Ontario Traffic Manual.

1.1 Scope of the Technical Report

Over the years, the City of Brampton has established a number of major linear trail systems which facilitate City-wide and localized AT for recreational and utilitarian purposes. Consultation as part of the TMPU has shown that recreational trails and AT are high priorities for Brampton's residents. One of the primary objectives of Brampton's 2002 PathWays Master Plan was to suggest how to connect these linear systems while identifying a network of on-road facilities. The PathWays Master Plan also identified a strategic policy and design framework to support both the on and off-road elements of the overall system.

Building on the work completed for the 2002 study, City staff developed a revised network concept in 2010, the PathWays Routing Plan. The intent of the update was to develop a continuous and connected system of AT routes by identifying missing links. In 2011, the Region of Peel developed its Active Transportation Study, which recommends additional opportunities to increase connectivity throughout the Region, including Brampton, along Regional roads. Through partnerships with the Federal government, Province, Region and its local municipalities, an inter-connected and continuous system of on and off-road AT routes can be realized.

This technical report forms the AT component of the TMPU and responds to the growing demand for sustainable transportation alternatives for recreational as well as utilitarian purposes in Brampton. It builds on what has already been done by the City and the Region of Peel in terms of implementing AT facilities and planning for the future. It also takes into account consultation feedback received to date from those members of the public that have first-hand experience or an opinion of cycling, walking and trails in Brampton.

The following steps were undertaken to develop this AT strategy:

- **Review of the AT Context** – Background information on AT provided by the City and Region has been reviewed. This includes the existing network, proposed and candidate routes, as well as previous studies and relevant guidance documentation.



- **Identification of Barriers and Opportunities in the AT Network** – Barriers include physically constrained crossings over freeways, railways and waterways. However, each barrier presents opportunities to improve the AT network. Responses from our online consultation tool were reviewed to find opportunities to improve the AT system for the benefit of its users.
- **Integration of the AT Network in Brampton** – A review was undertaken of the existing, previously proposed and candidate routes already being considered. Based on the opportunities previously listed and a set of selection criteria, additional candidate routes have been recommended to fill gaps in the network. The result is an expanded candidate route network, which feeds into the recommended AT network concept.
- **Policies and Initiatives** – A set of AT related policies and recommendations have been formulated to provide strategic direction for the City regarding future AT development, design and implementation. This section also highlights the initiatives that the City of Brampton and others are already taking to achieve those goals.
- **AT Performance Indicators** – In order to assess the current and future state of AT in Brampton, a set of performance indicators has been developed. These indicators are based on experience gained from similar Master Plans but tailored specifically for Brampton's unique AT conditions. They can be used to inform the development of future routes and network links.
- **Moving Forward** – This final section discusses how other aspects of the TMPU interact with the AT component, and how they will be integrated into the final TMPU report. It also outlines the next steps to be undertaken with regard to the selection of facilities and the recommended update to the City of Brampton PathWays Master Plan and Routing Plan. Relevant design guidelines and considerations from 'Ontario Traffic Manual Book 18 – Cycling Facilities' are presented here for reference.

The candidate route network was developed using Geographic Information Systems (GIS) data that included existing and proposed City and Regional AT facilities, the current arterial and collector road network, as well as new road links recommended in the TMPU. These datasets have been combined to form the basis of the figures that accompany this technical report.

Three maps that had been prepared by City staff in 2013 were also considered. These maps show existing, proposed and candidate routes for City roads, Regional roads and open spaces respectively:

- **Map 1:** Bicycle Facilities Implementation Program – Municipal Collector & Arterial Roads;
- **Map 2:** Active Transportation Plan – Regional Roads; and
- **Map 3:** Active Transportation Plan – Parks/ Open Space Paths.

With regard to 'Map 2: Active Transportation Plan – Regional Roads', the study team referred to the facilities recommended in the Region of Peel's Active Transportation Study.



2. ACTIVE TRANSPORTATION (AT) CONTEXT

Significant progress has been made by both the City of Brampton and the Region of Peel in implementing and planning a network of AT facilities. Existing routes are outlined below, along with descriptions of previous and planned studies, as well as relevant provincial-level guidance. Existing and proposed facilities in neighbouring municipalities have also been reviewed to ensure connectivity. **Figure 1** shows the Existing Cycling Network.

2.1 City of Brampton

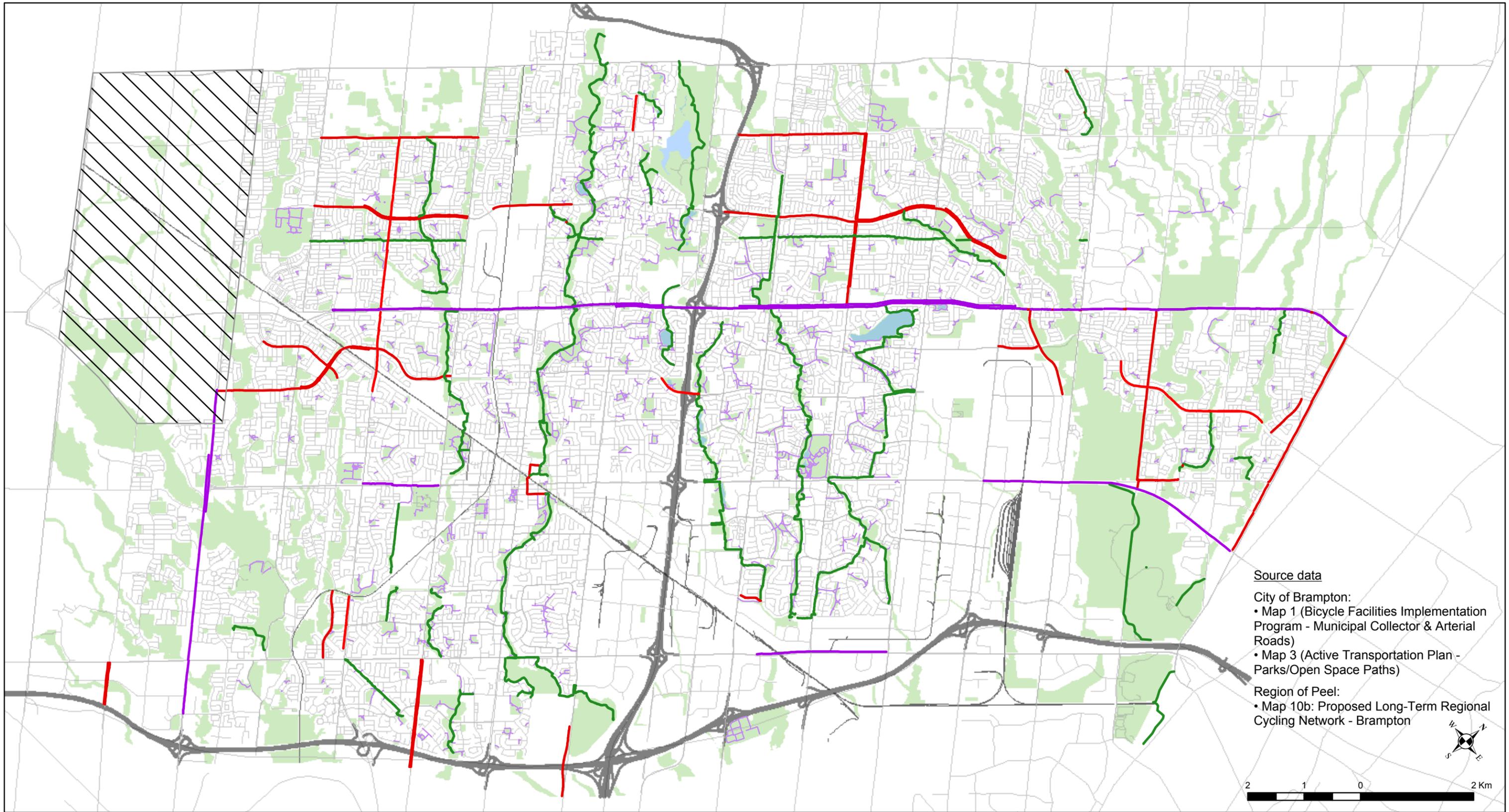
The City of Brampton has been responsible for significant progress in implementing a variety of AT facilities. These include on-road facilities for cyclists and sidewalks for pedestrians, as well as trails and pathways for shared use.

2.1.1 Existing Trails and Pathways

Brampton benefits from an extensive network of existing trails and pathways. Key pathways are noted below which follow the Natural Heritage System (NHS) and have a general north-south orientation:

- **Fletcher’s Creek Trail** – almost entirely off-road (as it is located primarily in the valley / NHS) from Wanless Drive to just north of Queen Street, between Elgin Drive and Steeles Avenue, and again from just south of Steeles Avenue to just north of Highway 407.
- **Etobicoke Creek Trail** – from the City’s northern boundary to the interchange of Highways 407 and 410. Aside from the downtown area, this is exclusively off-road and located primarily in the valley / NHS, as shown in the top right photo.
- **Esker Lake Trail** – from the City’s northern boundary at Heart Lake Conservation Area to Victoria Park, just north of Steeles Avenue. This is predominantly off-road. Some of the on-road sections are in-boulevard to reach crossing points.
- **Chinguacousy Trail** – from Countryside Drive also to Victoria Park. This is almost entirely off-road, although the northern section follows the alignment of Dixie Road.
- **Don Doan Trail** – from Bovaird Drive to Victoria Park with a mix of off-road and in-boulevard facilities. Pictured in the bottom right photo.





Source data

City of Brampton:

- Map 1 (Bicycle Facilities Implementation Program - Municipal Collector & Arterial Roads)
- Map 3 (Active Transportation Plan - Parks/Open Space Paths)

Region of Peel:

- Map 10b: Proposed Long-Term Regional Cycling Network - Brampton



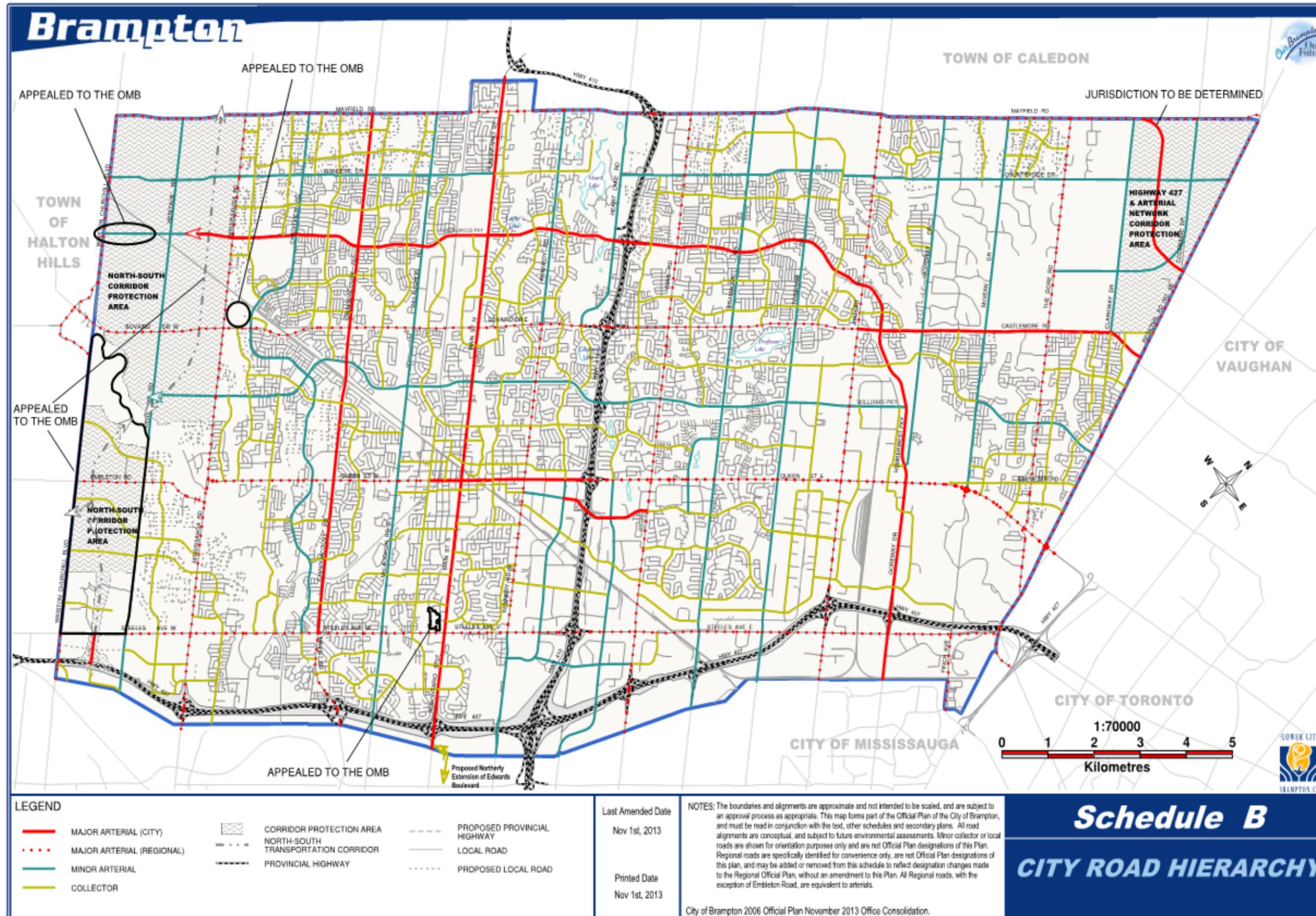
Legend

- | | | |
|----------|--|---|
| Existing | — On Street (City) | Conceptual Road Network for use in the Development Charges Background Study |
| | — Boulevard Paths (City) | |
| | — Off-road Trails (City) | |
| | — Boulevard Paths (Region) | |
| | — Access Paths (City) | |

Figure 1
 Existing Cycling Facilities in Brampton



Figure 2 – City Road Hierarchy (Schedule B of the City of Brampton’s Official Plan)





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

- **Flower City Trail** – in three off-road sections, between Creditview Road and McLaughlin Road, between Hurontario Street and Conestoga Drive, and between Great Lakes Drive and Sandalwood Parkway; and
 - The trail is also being expanded to Mississauga Road as part of Mount Pleasant (currently under construction)
- **Stephen Llewellyn Trail** – this runs off-road from Sandalwood Parkway to Airport Road and connects with the Flower City Trail.

There are also short trails and multi-use paths throughout the City utilized by residents within individual neighbourhoods, totaling 365 km.

2.1.2 Existing On-Road Bicycle Facilities

Figure 2, as it appears in Schedule B of the City of Brampton's Official Plan, identifies arterial roads (major and minor) and collector roads that fall under the jurisdiction of the City of Brampton. The following City roads currently have bicycle lanes:

- Rutherford Road between Williams Parkway and Queen Street;
- Birchbank Road between Dixie Road and Avondale Boulevard; and
- Bleasdale Avenue between Commuter Drive (opposite the Mount Pleasant GO station) and Creditview Road.

2.1.3 Existing In-Boulevard Facilities

Given that the City's creeks are generally oriented in a north-south direction, the east-west trail connections consist predominantly of in-boulevard multi-use AT facilities within the rights-of-way of major and minor arterials. West of McLaughlin Road, there are existing in-boulevard facilities on at least one side of the following City arterials:

- Wanless Drive, east of Creditview Road;
- Sandalwood Parkway, east of Creditview Road; and
- Williams Parkway, east of Mississauga Road.

There is also a short trail section along Sandalwood Parkway between Van Kirk Drive and the Etobicoke Creek Trail.

On the east side of Highway 410, there are existing east-west in-boulevard facilities on at least one side on the following roads:

- Countryside Drive between Highway 410 and Bramalea Road;
- Sandalwood Parkway between Highway 410 and Airport Road; and
- Humberwest Parkway between Castlemore Road and Williams Parkway.



Sections of Cottrelle Boulevard, Ebenezer Road and Clarkway Drive also feature in-boulevard facilities.

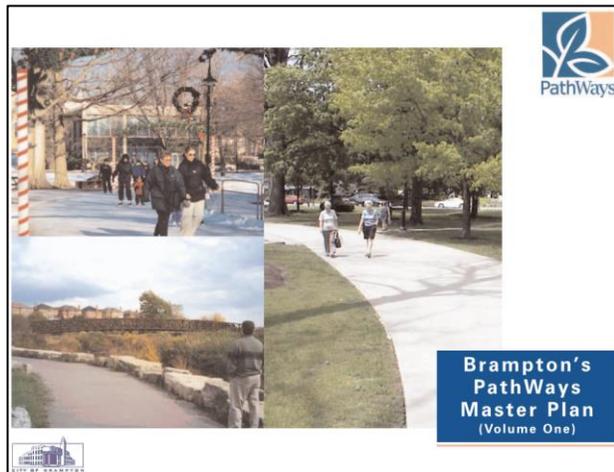
The following north-south City arterials have in-boulevard facilities on at least one side.

- James Potter Road between Ashby Field Road and Roundstone Drive on either side of Williams Parkway, and between the Orangeville-Brampton Railway and Steeles Avenue;
- Chinguacousy Drive between Wanless Drive and Steeles Avenue;
- McLaughlin Road between Steeles Avenue and the Mississauga boundary;
- Kennedy Road just north of Conservation Drive, and between the entrance to Brampton Sports Park and the Mississauga boundary;
- Bramalea Road between Countryside Drive and Bovaird Drive;
- Torbram Road between Countryside Drive and Sandalwood Parkway, and between the Flower City Trail and Bovaird Drive; and
- McVean Drive between Castlemore Road and Highway 407.

2.1.4 Existing Pedestrian Network

In residential areas that are urbanized, sidewalk and pedestrian access provision is generally very good. Sidewalks are present on both sides of almost all arterials, and there are frequent access paths or sidewalk extensions connecting them to the adjacent local roads. Please refer to **Section 4.6** and **Figure 5** for recommendations regarding improvements to the City sidewalk network.

2.1.5 City of Brampton PathWays Master Plan (2002)



The PathWays Master Plan outlines Brampton's strategy to create a unique community that builds on the City's natural, cultural and heritage features. Central to the plan is the ability to create and capture a unique identity, while connecting destinations that will leave pathway users with lasting impressions of the experience. In this regard, the PathWays Master Plan, founded on consultation and collaboration, is crucial in Brampton's attempts to attain a safe, seamless system that best reflects the needs of the community and is sympathetic to the natural environment.

Brampton's PathWays Master Plan is comprised of three volumes: a Master Plan providing strategic direction; Planning and Design Guidelines covering technical issues; and appendices outlining the Public Consultation undertaken.



2.1.6 City of Brampton PathWays Routing Plan (2010)

Based on the recommended pathways network from the PathWays Master Plan, the City of Brampton developed a PathWays Routing Plan. In addition to existing and proposed pathways, this identifies potential connecting routes, divided into proposed off-street facilities, bicycle lanes and other on-street routes. The routing plan has been included for reference in **Appendix D**.

2.1.7 Bicycle Facilities Implementation Program (BFIP)

At its meeting of April 13, 2011, City Council directed staff to proceed with the development of a strategy for implementing bicycle facilities within the existing road allowance. This led to the initiation of the Bicycle Facility Implementation Program (BFIP). A report entitled “Strategy for Implementing Bicycle Facilities within City of Brampton Road Rights-of-Way” was presented to Council on May 15, 2013.

The main objectives of this program are as follows:

- **Bicycle Facility Design Initiatives**, covering facility types, treatments, crossings and signals;
- **Design Standards** for each roadway classification and facility type;
- **Location Justification and Feasibility** so as to provide a network that meets the needs of recreational and utilitarian users, who use cycling as part of their trip to work, school or to run errands;
- **Laws and Regulations** on the use of designated cycling facilities; and
- **Consultation** with the Cycling Community.

It also establishes a series of guiding principles intended to direct staff when considering bicycle infrastructure and key implementation opportunities, such as major road reconstruction and the annual road resurfacing program. An extract from this report is included in **Appendix C**.

2.1.8 Pedestrian Safety Plan

The City’s Pedestrian Safety Plan is intended to serve as the overall planning framework to improve safety conditions for pedestrians. City staff use the plan when considering solutions to pedestrian problems on existing roadways or in new development areas. The plan also serves to raise public awareness about existing conditions, current practices and new initiatives aimed at improving pedestrian safety.

The objectives related to the development of this plan include the following:

- Examine existing pedestrian traffic control devices;
- Review pedestrian collision history to identify areas for improvement;
- Identify initiatives to improve safety for pedestrians within the existing transportation network;
- Identify design alternatives to provide a proactive approach to pedestrian safety in new development areas; and
- Propose an achievable implementation plan.



The Pedestrian Safety Plan concludes with an implementation plan for 10 initiatives identified in the plan, including:

- School walking route program;
- School crossing ahead signage;
- Two school crossing guards on four lane roads;
- Audible pedestrian signal placement guidelines;
- Enhanced crosswalk markings;
- Traffic calming measures;
- Revised geometric design;
- Maintenance of pedestrian facilities;
- School travel planning (Stepping Up program); and
- Public awareness, communications and education.

2.2 Region of Peel

Roads identified by a red dotted line in **Figure 2** are under the jurisdiction of the Region of Peel.

2.2.1 Existing Regional Active Transportation (AT) Network

Active transportation paths, otherwise known as “multi-use trails”, may be off-road (primarily in the valley / Natural Heritage System) or, if located within the roadway right-of-way, they are known as “in-boulevard facilities” or “boulevard paths”. These facilities are commonly designated for the shared use of pedestrians, cyclists and other active modes.

For the latest information on the state of the existing AT network, the Peel Trails Map on the Walk and Roll Peel website was consulted. Regional AT in-boulevard facilities have been implemented on the following arterials:

- Bovaird Drive between Worthington Avenue and Airport Road;
- Castlemore Road between Airport Road and Highway 50;
- Highway 50 between Queen Street and Castlemore Road
- Queen Street between Chinguacousy Road and McLaughlin Road;
- Queen Street, east of Airport Road;
- Queen Street between Bramalea Road and Torbram Road, part of which is a connecting link of the Don Doan Trail;
- Steeles Avenue between Advance Boulevard and Torbram Road; and
- Mississauga Road between Williams Parkway and the Hallstone Road / Hereford Street intersection.



Please refer to **Figure 1** for more details.

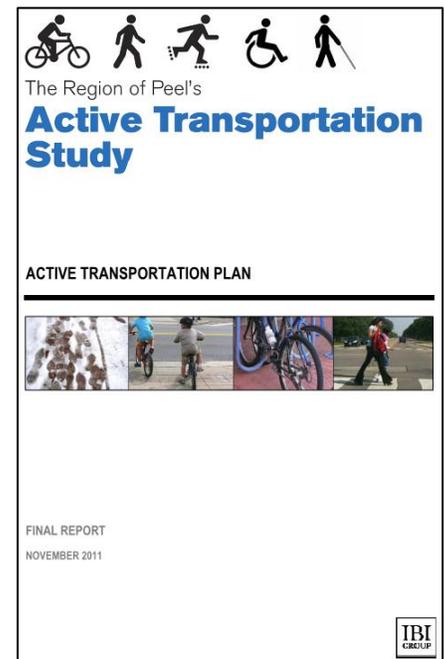


2.2.2 Region of Peel Active Transportation Study (2011)

The purpose of this regional AT plan is to increase the proportion of trips made by active modes, to encourage the integration of active transportation with transit, and to enhance the built environment in a way that is attractive, safe, accessible and integrated for cyclists and pedestrians. It identifies the role of the Region in terms of policy and network development, as well as promotion and marketing.

The recommended regional pedestrian and cycling strategy for Brampton is laid out and includes:

- A 20-year Capital Improvement Program to provide a sidewalk on one side and a multi-use trail on the other side of all Regional roads;
- Filling in of gaps in existing sidewalks and multi-use trails along fully built out Regional roads;
- Targeted pedestrian enhancements on sections of Queen Street, Kennedy Road, Steeles Avenue, Dixie Road and Bovaird Drive;
- Future policy discussions on design strategies regarding the potential for installing segregated bike lanes on sections of Queen Street and Mississauga Road, implementing multi-use trails on both sides of Regional roads and replacing sidewalks in need of reconstruction with multi-use trails;
- Assisting the City of Brampton in collaborating with MTO in improving freeway crossings; and
- Implementing an off-road multi-use path along the east-west hydro corridor to the south of Highway 407.



2.3 Province of Ontario

The province has produced several policy documents to provide direction to municipalities in the promotion of AT and the expansion of infrastructure provision.

2.3.1 #CycleON: Ontario's Cycling Strategy

This 2013 strategy supports the vision of the Ministry of Transportation (MTO) for the next 20 years: that cycling in Ontario will be recognized, respected and valued as a core mode of transportation, which provides individuals and communities with health, economic, environmental, social and other benefits.





Through the guiding principles of safety, accessibility, connectivity and partnership, the Ministry has set five aspirational goals for 2033:

- Ontario will be recognized as the best Canadian province for cycling and ranked among the top 10 jurisdictions worldwide for cycling. At least one Ontario city will be ranked among the 10 most bike-friendly cities in the world;
- The built environment in most Ontario communities will support and promote cycling for all trips under 5 km;
- Ontario's cycling environment will be safe for people of all ages, striving to achieve a record of zero fatalities and few serious injuries;
- Ontario's cities and towns will have interconnected networks of safe cycling routes enabling people to cycle to work, school, home and key destinations; and
- Ontario will have an integrated province-wide network of cycling routes.

The following strategic directions will help to achieve these goals:

- Design healthy, active and prosperous communities;
- Improve cycling infrastructure;
- Make highways and streets safer;
- Promote cycling awareness and behavioural shifts; and
- Increase cycling tourism in Ontario.

Provincial documents including Ontario Traffic Manual Book 18 (available for free download from MTO) and the Ministry's own Bikeways Design Manual are key elements in supporting this modal shift.



2.3.2 Ontario Traffic Manual (OTM) Book 18: Cycling Facilities



OTM Book 18 covers the full range of bike facilities within the road right-of-way, and features a selection tool to identify the most appropriate facility for each case. It employs the concept of the 'Design Domain' to identify the desired dimensions for each facility while providing flexibility to accommodate site conditions. Guidance is given on signage and pavement markings, and cross-sectional figures illustrate each facility. To provide context, there is a section addressing the common myths surrounding cycling. Parking and end-of-trip facilities are also discussed, as are good maintenance procedures to maximize the effectiveness of bike networks.

This Book includes emerging treatments such as 'crossrides' that allow cyclists to cross the roadway without dismounting. Conflict management at transit stops, grade separations and railway crossings are discussed in detail. Diagrams of typical intersection layouts demonstrate the application of innovative

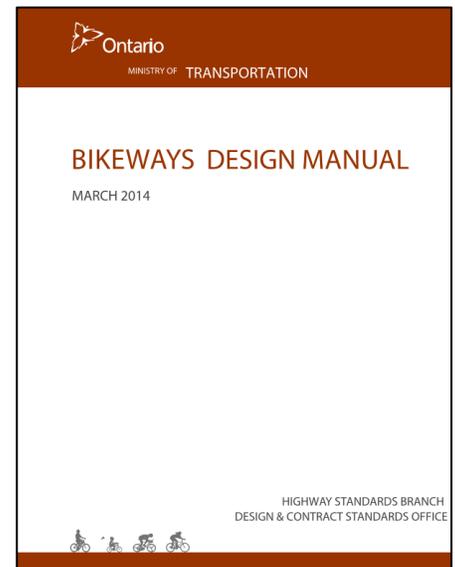
bicycle-friendly features. Best practices and key considerations are highlighted throughout.

Previous work undertaken by the City of Brampton appears to be broadly consistent with OTM Book 18. The City was a key member of the Book 18 Steering Committee and made an invaluable contribution toward the production of this manual. The facility selection methodology will be of particular relevance to the City as the proposed network is refined and implemented. For guidance on this process and the application of the manual to the City's AT strategy, as well as further details on crossrides, please refer to **Appendix C**.

2.3.3 MTO Bikeways Design Manual

This Bikeways Design Manual is an update to the Ministry of Transportation's Ontario Bikeways Planning and Design Guidelines which was published in 1996. The guidelines are to be applied to the design of on- and off-road bicycle facilities located within provincial highway rights-of-way.

The guidelines have been developed to inform and provide guidance regarding the design of cycling facilities within or crossing provincial highway rights-of-way. The manual covers bikeway design controls and cycling facility type selection, as well as the design of on- and off-road cycling facilities. The guidance is based on best practices in Canada and the United States, as well as relevant international research. This manual was approved and published in October 2014.





2.4 Neighbouring Municipalities

This section summarizes cycling facilities that have been implemented by neighbouring municipalities and connections with Brampton routes. Please refer to **Section 4.5** for recommendations on improving connectivity with the AT facilities of adjacent municipalities.

2.4.1 City of Mississauga

There are two points at which existing facilities in Mississauga connect to those in Brampton. The signed bike route on Meadowvale Boulevard connects to the multi-use trail on Heritage Road south of Steeles Avenue and the bicycle lanes on the Mississauga section of McLaughlin Road connect to the boulevard path on the Brampton side. There is also an existing in-boulevard facility on the Brampton side of Kennedy Road which terminates at the boundary with Mississauga.

At the following locations, existing Mississauga facilities terminate at the municipal boundary and there are no existing connecting routes into Brampton:

- Financial Drive, which has a signed bike route (a proposed connecting route is planned and is described in Section 4.1.1);
- Mavis Road has a signed bike route and boulevard path on the Mississauga side. On-street facilities are proposed on the Brampton side but only as far as the Highway 407 ramps, not across the freeway;
- A multi-use trail passes through the Meadowvale Conservation Area in Mississauga and connects to the signed bike route on Second Line West. This aligns with Mavis Road (Regional road) south of Steeles Avenue, and the route crosses Derry Road, continuing north into Brampton; however, there is currently no connection to facilities on the north side of Highway 407. The same is true of facilities on and around Samuelson Circle and Glamorgan Way. The Etobicoke Creek Trail currently terminates at Highway 410 in Brampton and at the municipal boundary on the Mississauga side. A new section of trail is proposed to connect the two ends, passing under Highways 410 and 407; and
- The short section of Finch Avenue that lies within Mississauga has a boulevard path that leads to the Humber West trail in Toronto.

2.4.2 Town of Caledon

The Town of Caledon features multi-use trails which form part of the Trans Canada Trail, the Elora Cataract Trailway and Caledon Trailway. Hiking trails include the Great Pine Ridges Trail, Grand Valley Trail, Oak Ridges Trail and Humber Valley Heritage Trail. A signed bike route runs along Old School Road, parallel to and approximately 3km from Brampton's boundary. The perpendicular signed bike routes on Creditview Road, Torbram Road and Humber Station Road currently terminate at Old School Road, parallel to and 3km from the municipal boundary. The Etobicoke Creek Trail is the only existing cycling facility to connect Caledon and Brampton.



2.4.3 City of Vaughan / York Region

The City of Vaughan Pedestrian and Bicycle Network shows facilities on some roadways in Vaughan that connect with City of Brampton or Regional of Peel roads that feature existing cycling facilities: York Regional Road 7, which connects with Queen Street; and Rutherford Road, which becomes Castlemore Road in Brampton. In both cases, there is an existing in-boulevard facility on the Brampton side.

2.4.4 Town of Halton Hills / Halton Region

Halton Hills enjoys an extensive trail system; however, the closest path to Brampton is approximately 1.4 km to the west of the municipal boundary. Only one facility shown on the Halton Region Cycling Map extends to the boundary with Brampton. A short stretch of multi-use trail in Norval connects Old Pine Crest Road on the boundary to Regional Road 7.

2.4.5 City of Toronto

The West Humber Trail extends to the Finch Avenue intersection of Highway 427. From there, a multi-use path connects to Albion Road on the municipal boundary. The West Humber Trail also links to a multi-use path on Finch Avenue that crosses through Mississauga to the Brampton boundary.



3. BARRIERS AND OPPORTUNITIES

This section identifies barriers that may restrict the operation of active transportation (AT) facilities, as well as the opportunities that each element presents to develop the network. The general public was invited to submit their comments, experiences and suggestions via an online mapping tool used in the public consultation. Please refer to **Appendix A** for a summary of the locations for which public feedback was received on how to improve AT in Brampton.

3.1 Freeways

Highway 410 bisects Brampton from north to south. Highway 407 crosses the city east-west near the city's southern boundary. This section describes the barriers that freeways present to the connectivity of the AT network and identifies opportunities for overcoming these barriers.

Highway 410 runs between the Mississauga and Caledon boundaries between Kennedy Road and Dixie Road. Every road crossing the 410 has an existing or candidate cycling facility; however, there are currently no complete existing facilities at any of those locations. Although there are in-boulevard facilities on Bovaird Drive either side of Highway 410, they are discontinued through the interchange. On all such overpasses, as well as the Orenda Road and Glidden Road underpasses, it is recommended that the feasibility of converting at least one of the sidewalks to a multi-use trail be investigated. This could be achieved by the reallocation of roadway and sidewalk space, as long as acceptable lane widths can be maintained.

Highway 407 runs close to Brampton's southern boundary. With the exception of Financial Drive, all overpasses are arterial roads. Peel Region is proposing multi-use trails where regional roads pass over the highway, as described in **Section 4.1.2**. There are also opportunities to increase the number of trails passing under Highway 407 and connecting to routes in Mississauga.

According to the 2041 Road Network proposed by this TMPU, the following roadways are proposed to be widened where they cross either Highway 407 or Highway 410:

- Winston Churchill Boulevard;
- Mississauga Road;
- Chinguacousy Road / Mavis Road;
- Williams Parkway; and
- Clark Boulevard.

Bicycle and pedestrian facilities should be incorporated into the associated bridge reconstruction for the above noted road network improvements. The barrier and the width constraints of the existing bridge structures means that a significant opportunity exists for continuous bicycle facilities along these roads.

There is an existing structure crossing Highway 410 between Bovaird Drive and Williams Parkway. The City of Brampton is currently undertaking a condition assessment to evaluate costs associated with the bridge. This will inform a decision on whether to expropriate it from the Ministry of Transportation of Ontario (MTO) for conversion to an AT facility that prohibits the use of all motor



vehicles except for municipal maintenance vehicles. Given the lack of existing AT facilities on other freeway crossings, it is strongly recommended that the suitability of this bridge as a dedicated AT crossing continue to be investigated.

3.2 Railways

The Canadian National (CN) mainline runs in an east-west orientation through Brampton. It meets the boundary with Mississauga at Torbram Road and the Halton Hills boundary just south of Wanless Drive, crossing Brampton in a straight line. There is also a spur that connects the CN Intermodal terminal and joins the mainline where it passes under Highway 407.

North of the CN mainline, the Orangeville Brampton Railway is a privately owned and operated short line that runs north-south between McLaughlin Road and the Hurontario Street / Main Street corridor. South of that point, it has a north-south orientation, crossing the boundary with the City of Mississauga just west of Mavis Road. Although the line remains in use, service is limited and primarily consists of industrial cargo trains. Outside of the central area bounded by McLaughlin Road, Kennedy Road, Vodden Street and Harold Street / Clarence Street, the only existing crossings are on arterial roads.

Railway lines and the right-of-way on either side of them form a corridor clear of obstructions. With the proper natural or artificial protection for AT users, it may be possible to provide trails alongside sections of low-speed railway lines where space permits. An example of this approach in Brampton is the multi-use trail along the Orangeville-Brampton Railway between Bovaird Drive and Williams Parkway. If that railway is ever brought fully out of service, its full conversion to multi-use trail should be considered, particularly through the downtown area.

3.3 Waterways

The Fletcher's Creek Trail, Etobicoke Creek Trail, Don Doan Trail, the Esker Lake Trail and the Chinguacousy Trail all take advantage of Brampton's natural waterways. The challenge lies in ensuring that road and trail crossings are conveniently located such that cyclists and pedestrians do not have to make significant detours to reach them. Trails should also be accessible from on-road and in-boulevard facilities.

Western and eastern areas of Brampton feature creeks, rivers and open spaces that could be converted into scenic and continuous routes similar to the existing off-road trails through the valley and Natural Heritage System. The Credit River provides a natural corridor for a potential creek trail through Bramwest. Similar river systems are present on the eastern side of Brampton. These present the opportunity for routes connecting Bolton and the Coleraine Business Park to the north via Gore Meadows Park and the Claireville Conservation Area to the Humber Trail in the City of Toronto.

3.4 Utility Corridors

In partnership with utility providers, utility corridors can provide an opportunity for active transportation connections. These corridors are very limited in uses but have proven to be



successful for active transportation trails in other jurisdictions, especially when they connect to other active transportation facilities outside of the utility corridor.

3.5 Land Uses

Sometimes off-road trails are prevented from following their optimal route by land already dedicated to other uses. For example, avoiding the Peel Village Golf Course requires the Etobicoke Creek Trail, and therefore the connection to Kennedy Road, to be north of the river. As a result, cyclists wishing to reach the in-boulevard facilities to the south on Kennedy Road must use that road bridge over the creek, whose physical constraints influence the quality of the cycling facility that can be provided. Likewise, the Lionhead Golf and Country Club may prevent the construction of a continuous multi-use trail along the Credit River.

Where the preferred alignment of off-road trails passes through private land, the opportunity may exist for easements allowing a public right-of-way through the property. This may be relatively easy to arrange where the land is municipally owned. However, other landowners may also look favourably on the opportunity to increase their accessibility. This is particularly true of those dedicated to sport and other activities where patrons may be inclined to arrive on foot or by bicycle. For example, with the proposed extension of the Etobicoke Creek Trail linking to the City of Mississauga network, the Brampton Sports Park may facilitate a connection through the land linking the trail to the existing in-boulevard facilities on Kennedy Road.

3.6 Goods Movement Corridors

Goods movement corridors are typically on arterial roads. Some cyclists also prefer to include these roads as part of their route due to the directness facilitated by the road grid configuration and the presence of land uses that may attract cyclists.

Due to their configuration, all-round visibility for drivers of goods vehicles is generally not as good as in a regular car, and blind spots are less easily mitigated. As a result, there may be a greater risk of on-road cyclists colliding with trucks than other vehicles. In instances where this may occur, the size and weight of trucks also means that the likelihood of serious or fatal injury to the cyclist is higher. In order to minimize safety concerns and enable the coexistence of these modes on such arterial roads, dedicated AT facilities should be provided and separated on or from the roadway.

Where separated facilities are implemented, conflict points that would otherwise be on-road are sometimes transferred to accesses with local streets and driveways. Such conflicts should be identified and mitigated where possible. On the positive side, visibility on these arterials is generally good, and corridors within industrial areas often have wide boulevards and fewer driveway accesses than in residential areas. As a result, many of these roads are ideal for the provision of in-boulevard facilities as the space is available and conflicts are reduced. Please refer to **Section 7.1.2** for recommendations regarding roads through such areas in Brampton.



3.7 Physical Constraints

Roads that experience sufficiently high traffic volumes and speeds may require designated or separated cycling facilities. However, there may be insufficient right of way width to achieve this either as bike lanes or in-boulevard facilities.

For example, further evaluation in a later, more detailed study may identify constraints in the available width along the City-owned section of Queen Street through the downtown area. Localized constraints may occur due to hydro poles, lighting standards or transit laybys and shelters. The vertical profile of a boulevard may be such that to achieve the necessary multi-use path width, retaining walls may be required.

In such cases, parallel routes may be available along streets that, although close to the main thoroughfare, experience lower traffic volumes and speeds. Please refer to **Section 4.4.1** for alternative routes through Downtown Brampton.

3.8 High Traffic Volumes

Roads where traffic volumes are high are also often congested during peak hours. Where conditions warrant and allow the provision of designated cycling operating space (e.g. bike lanes) or separated facilities (such as AT paths), these are often a more attractive alternative to auto use. Cycling speeds may be faster and more reliable than those of motor vehicles, and this can be observed by drivers queuing along the congested corridor.

For example, the strategic modelling for the preferred road network in 2041 indicates that despite road improvements, congestion is still anticipated on Bovaird Drive between Mississauga Road and Fernforest Drive. By that time, the corridor is planned to have continuous in-boulevard paths (including the Highway 410 overpass) and many of the connecting candidate routes will likely have been implemented. Consequently, the modal share for cycling on that section of Bovaird Drive can be expected to be higher than the City average.

3.9 Promotion and Education

Cultural or social concerns also impede the expansion of AT as a mode. Due to the predominance of the motor vehicle, walking and cycling are perceived to be less safe than other modes. This affects the participation rate and therefore the profile of walking and cycling at a street level. Consequently, the demand for AT infrastructure is less than that for other modes, which take precedence when a municipality makes investment decisions. Due to the lack of widespread provisions for AT, safety is compromised. This again reduces the participation rate and the 'cycle' continues.

Although the cultural barriers associated with an auto-focused society still exist, there has been a distinct shift in attitudes towards AT in recent years. Surveys have indicated that the majority of the public would like to walk or cycle more if suitable facilities were provided. This has led to an increase in the use of recreational trails, of which Brampton has many. By providing good connections to safe on-road cycling facilities, this surge in participation can spread more widely into the road network and increase utilitarian travel by bike or on foot.



4. AN INTEGRATED ACTIVE TRANSPORTATION (AT) NETWORK FOR BRAMPTON

This section reviews the networks previously proposed by the City and the Region, establishes the criteria for the selection of additional candidate routes and identifies missing links based on these criteria.

4.1 Assessing the Existing and Previously Proposed Network

The City of Brampton's Geographic Information Systems (GIS) data show existing and previously proposed on-road cycling facilities, boulevard paths along City roads, and off-road trails, which are primarily located in the valley and Natural Heritage System. GIS data for Regional roads were also incorporated. In the case of proposed facilities this was supplemented by information from the Region of Peel's Active Transportation Study for cycling and pedestrian facilities. Data for existing access paths through parks and green space was also received and incorporated into **Figure 3** and the inset figures.

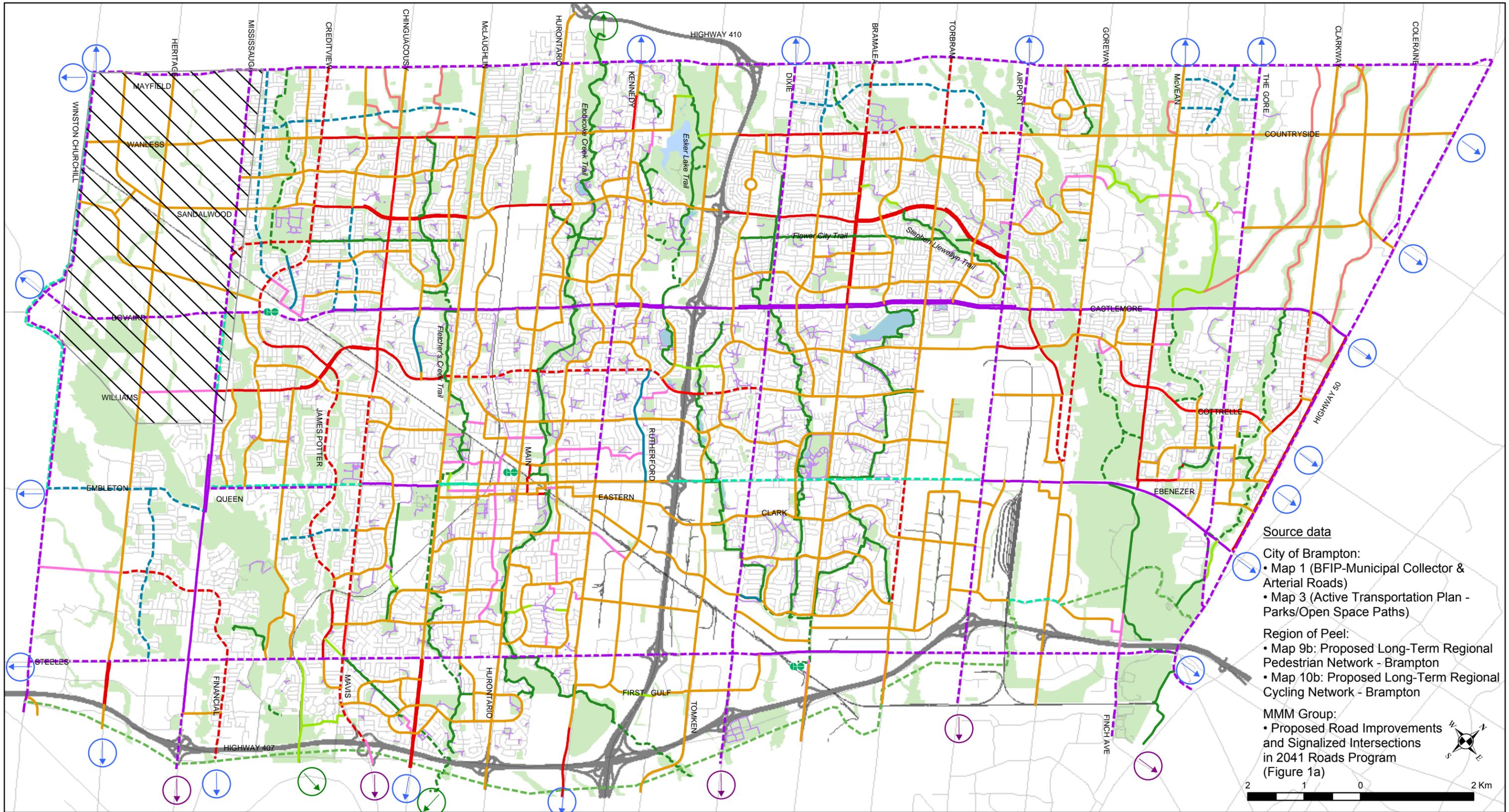
4.1.1 City of Brampton

The City of Brampton has previously proposed new on-road bicycle facilities on:

- Brisdale Drive between Sandalwood Parkway and Bovaird Drive;
- Worthington Avenue between Fairhill Avenue and Bovaird Drive;
- Veterans Drive from Creditview Road up to the boundary with Caledon;
- Fletcher's Creek Boulevard between Bovaird Drive and Williams Parkway; and
- Bonnie Braes Drive between Creditview Road and Chinguacousy Road.

Routes have been proposed in some parts of Bram West, the northeast section of the City and areas to the north of Wanless Drive. These include in-boulevard facilities on Financial Drive, which connect to the City of Mississauga network. Secondary Plans for these areas are currently under development; the local AT network will be determined by the ultimate road network and opportunities for off-road links.

A review of secondary and block plans has identified additional routes that have been considered. In **Figure 3**, these are shown as previous candidate routes for further evaluation as part of the proposed update to the 2002 PathWays Master Plan.



BRAMPTON
Flower City

Transportation
Master Plan

Legend

Existing

- On Street (City)
- Boulevard Paths (City)
- Off-road Trails (City)
- Boulevard Paths (Region)
- Access Paths (City)

Previously Proposed

- On Street (City)
- Boulevard Paths (City)
- Off-road Trails (City)
- On Street (Region)
- Boulevard Paths (Region)
- Off-road Trails (Region)

Previous Candidate

- On Street (City)
- Off Road (City)

Additional Candidate

- On Street / Boulevard Path (City)
- Off-Road Route (City)
- Regional Route

Inter-Municipal

- ↑ On Street
- ↑ Boulevard Path
- ↑ Off-Road
- + GO Transit Terminal

Conceptual Road Network for use in the Development Charges Background Study

Figure 3
Existing,
Proposed &
Candidate
Cycling Facilities
in Brampton



4.1.2 Region of Peel

According to the Region of Peel Active Transportation Study described in **Section 2.2.2**, multi-use trails are proposed the following Regional roads:

- Mayfield Road;
- Bovaird Drive from the Halton boundary to the end of the existing facility at Worthington Avenue;
- Queen Street from Mississauga Road to Chinguacousy Road;
- Steeles Avenue connecting up the short stretches already implemented;
- Winston Churchill Boulevard from the Town of Caledon boundary to Embleton Road;
- Mississauga Road;
- Mavis Road from Steeles Avenue to the City of Mississauga boundary;
- Kennedy Road from Bovaird Drive to Queen Street;
- Dixie Road;
- Airport Road;
- The Gore Road; and
- Highway 50.

Different types of cycling facility are proposed on other Regional roads as follows:

- Embleton Road - bike lanes;
- Queen Street from McLaughlin Road to McMurchy Road - bike lanes;
- Queen Street from Highway 410 to Airport Road - separated bike lanes; and
- Winston Churchill Boulevard from the Caledon boundary to Embleton Road - paved shoulders (in addition to the proposed multi-use trail).

For pedestrians, sidewalks are proposed on both sides of every Regional road where there is neither an existing sidewalk, nor an existing or proposed multi-use trail.

4.2 Route Selection Criteria

Route development and selection principles have been developed and applied based on an industry standard approach to route selection formulated over the course of many studies and shaped by feedback from the public and other stakeholders, and are consistent with OTM Book 18.

- **Safety:** Reducing risks to users and providing comfortable facilities will be key considerations when selecting routes for the network. The confidence and acceptance of the network can be instilled in users by reducing real and perceived risk.
- **Visible:** The AT routes should be a visible component of the transportation system.
- **Direct/Connected:** The City network should link communities and key destinations, and connect with on and off-road networks of neighbouring townships.
- **Destinations:** AT routes should provide access to major destinations in Brampton including cultural and service facilities, as well as routes to school, community and neighbourhood parks, shopping facilities and employment areas.



- **Integration with Other Modes:** The AT network should be integrated with other modes of transportation, particularly public transit. Routes should be selected to provide access to transit stops.
- **Attractive and Scenic:** AT routes should take advantage of attractive and scenic areas, views and vistas.
- **Diverse Experience:** The AT network should provide a diverse on and off-road walking and cycling experience throughout the City.
- **Easily Accessible:** AT routes should be easily accessible from local neighbourhoods within the City. Residents are more likely to use the pathways and trails if they find them rational, convenient and in line with their needs and expectations. Every effort should be made to integrate the existing and future routes of neighbouring townships.
- **Different routes for different users:** The system should appeal to a range of user abilities and interests. This requires the design of a variety of route types.
- **Cost Effective:** The cost to implement and maintain proposed AT network facilities and supporting programs should be phased over time and designed to be affordable and appropriate in scale for the City of Brampton. Opportunities for partnership funding from other non-local government sources (e.g. Provincial and Federal Governments, Peel Region and the private sector) should be pursued.
- **Supporting Services and Facilities:** Supportive services and facilities such as benches and bicycle parking should be available along routes and at destinations. Routes should be selected that provide opportunities to develop supporting facilities.

4.3 Previous Candidate Route Network

In a report to Committee of Council (April 2013), City staff produced a report entitled “Strategy for Implementing Bicycle Facilities within City of Brampton Road Rights-of-Way”. As shown in **Appendix C**, this included some guiding principles for facility selection which identified every City arterial or collector road without an existing or previously proposed cycling facility as a candidate cycling route for further evaluation.

The characteristics of these roads are generally consistent with the route selection criteria listed in **Section 4.2**. However, they should be evaluated through a more detailed Active Transportation and Trails Master Plan following the facility selection process outlined in **Appendix C**. This would form part of the proposed update to the PathWays Master Plan.

4.4 Identifying Missing Cycling Links

Based on the criteria outlined in **Section 4.2**, additional candidate routes have been identified as part of this study to be included in the AT network concept for further evaluation as part of the PathWays Master Plan update. These links, as well as those in **Section 4.5** providing improved connections between jurisdictions, are shown in **Figure 3**, along with the existing, previously proposed and previous candidate routes determined by the City. Selected excerpts from **Figure 3** are shown within the text below. The same legend applies, with additional candidate routes shown as solid pink lines.



4.4.1 Downtown Alternatives

Currently, the principal routes into downtown Brampton are Fletcher's Creek Trail, the Etobicoke Creek Trail and the bicycle lanes on Rutherford Road which, but for a short gap on Williams Parkway, would connect to Esker Lake Trail. All of these are oriented north-south.

Between Chinguacousy Road and McLaughlin Road, an existing in-boulevard facility is present on Queen Street, the arterial road which runs through the downtown in an east-west direction. However, between McLaughlin Road and Highway 410, most of which falls under the City's jurisdiction, the available right-of-way is constrained. Queen Street is being retained as a candidate route for further evaluation as to its suitability for the provision of cycling facilities, and opportunities also exist in conjunction with planned transit improvements. However, even if cycling facilities are implemented, some cyclists will be deterred by the volume of, and proximity to, motor vehicle traffic. This was reflected in the public comments received through online consultation tool, which are summarized in **Appendix A**.

Therefore, it is recommended that additional east-west candidate routes be considered through the downtown area. Benefits include:

- Lower traffic volumes and speeds;
- Improved connectivity with existing trails and bike lanes;
- Direct access to the Downtown GO station;
- Capitalization on the planned road connection on Denison Avenue at Haggert Avenue and the proposed AT bridge on John Street between James Street and Centre Street; and
- Better links to the planned bridge widenings over Highway 410 at Clark Boulevard and Williams Parkway, as well as the bridge north of Williams Parkway that it may be possible to use as an AT crossing.

The trails through Chris Gibson Park may be modified and used to connect to the candidate route on Flowerton Avenue via the existing Fletcher's Creek Trail crossing of the CN railway and Elmgrove Avenue. This would make Glendale Public School and Our Lady of Fatima School more accessible from the west. A strip of the Central Peel Secondary School playing fields may be required to complete the route east to Rutherford Road, which would also enhance the AT options for students of that school.

The remainder of this section discusses the rationale behind including the additional candidate routes in the subsequent evaluation. **Figures 3a-3h** are excerpts from **Figure 3** which illustrate the relevant areas and are based on the same legend, as shown on the previous page.

As with Queen Street, the principal north-south arterial through the downtown, Main Street is a constrained corridor. Similarly, the public expressed concerns regarding its safety for bikes. **Figures 3 and 3a** show an alternative north-south route that crosses the CN railway at Mill Street, allowing for good access to the Downtown GO station. To the north, it takes advantage of existing trails, parks and quieter street. Cyclists coming to and from the northeast may connect to the Etobicoke Creek Trail via Rosedale Avenue and Sproule Drive.



South of the CN railway line, the feasibility of formalizing the trail alongside the Orangeville-Brampton railway line north of Queen Street should be investigated. The worn tracks in the grass indicate that this is currently being used. Between Denison Avenue and Queen Street, alignments for consideration include:

- Entirely along the west side of the railway line;
- Along the west side of the railway line north of Nelson Street, switching to the east side of Park Street south of Nelson Street;
- Entirely on-road down Park Street; or
- Entirely on-road down Mill Street.

The route may connect with Queen Street on the west side of the railway line, on the east side aligned with Elliott Street, or on Park Street, where there would be a staggered transition either to Elliott Street or Mill Street. Even though the Orangeville-Brampton railway is lightly used by trains, an engineering assessment should be undertaken as to safety provisions to separate AT users and trains. Any proposed railway crossing and trail configurations at Park Street, Nelson Street and Queen Street should be reviewed for clarity to trail and roadway users and to ensure that barriers and stop bars are positioned so as to control and protect trail users.

South of Wellington Street, the candidate route continues along Mill Street to the retail park on the south side of Charolais Boulevard. Transfers between Mill Street and the Etobicoke Creek Trail may be made at Ambleside Drive to connect the route with the mobility hub at the Hurontario Street / Steeles Avenue intersection, and the municipal boundary with the City of Mississauga.

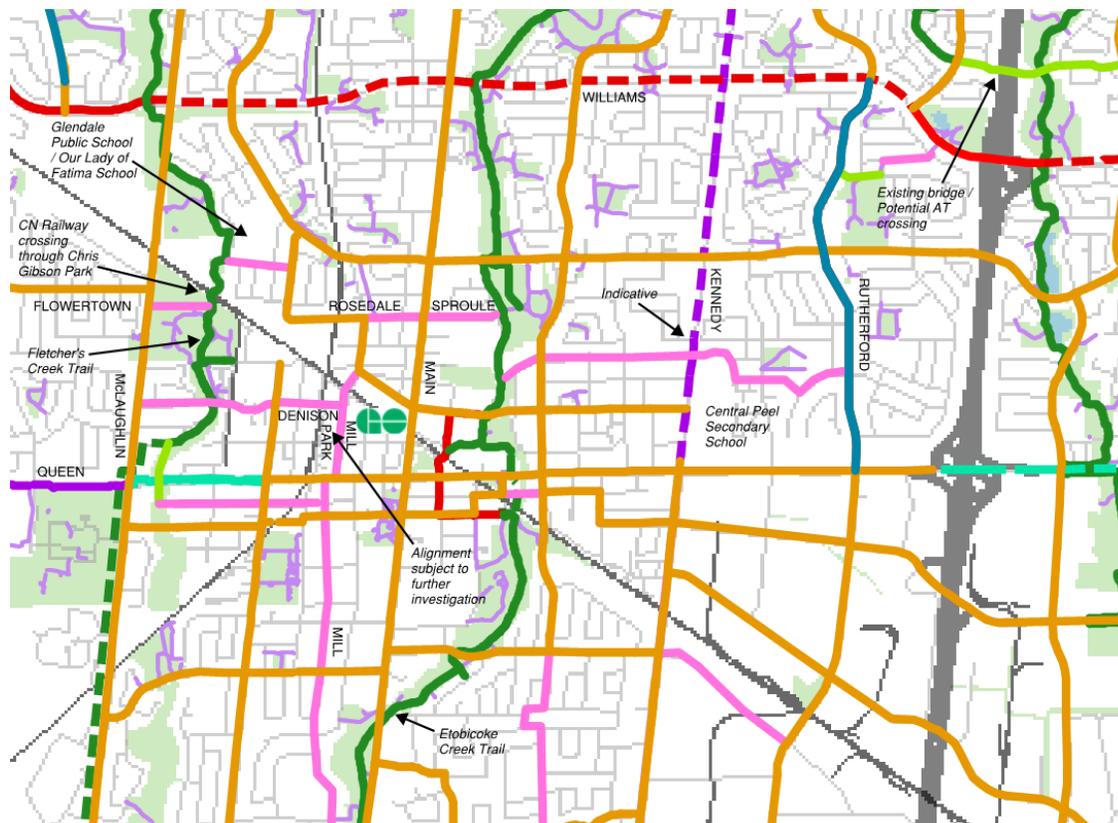


Figure 3a – Downtown Brampton Cycling Network



4.4.2 Existing Bridge over Highway 410 North of Williams Parkway

As described in **Section 3.1** and shown in the top right corner of **Figure 3a**, this existing bridge presents an excellent opportunity to provide an AT crossing over the freeway. The City of Brampton has been pursuing this with MTO and should continue to do so.

On the eastern side, the bridge could be connected with the existing multi-use path through Bramalea Limited Community Park and on to the Bovaird Trail. On the west side, there is an existing access path that ties into Streamline Drive, which in turn links into the Esker Lake Trail.

Unlike crossings at highway interchanges, this bridge would provide complete separation from motorized traffic. In particular, there is no need for pedestrians and cyclists to cross on-ramps leading to the highway where they need to negotiate fast-moving traffic. Such a crossing will be more appealing to recreational users, particularly those accompanied by children.

4.4.3 Heart Lake Conservation Area

The potential for connections through the Heart Lake Conservation Area between the candidate City routes Countryside Drive and Conservation Drive, ideally via the Esker Lake Trail, should be investigated. The existing path through Christie Park should also be reviewed for upgrade to multi-use pathway status. Designation of Regentview Drive as a cycling route, as illustrated in **Figure 3b**, would connect Conservation Drive to the existing multi-use pathways through Richvale Park and would complete the existing link with Sandalwood Parkway.

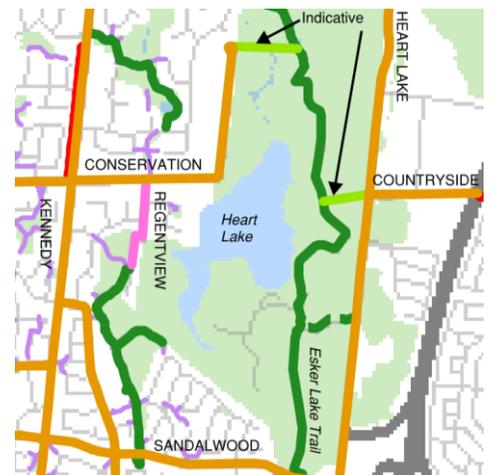


Figure 3b – Regentview Drive

4.4.4 Vivians Crescent / Elgin Drive Railway Crossing

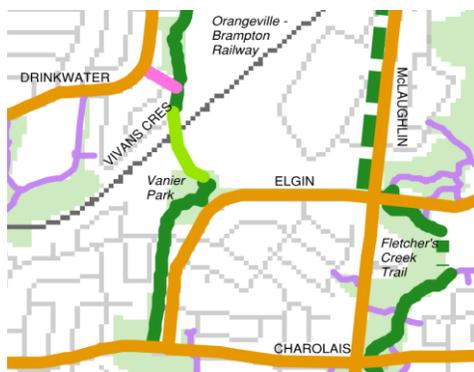


Figure 3c – Vivians Crescent

An informal pathway has been worn adjacent to and behind 95 Vivians Crescent, across the Orangeville Brampton Railway to the tennis courts in Vanier Park from where a pathway leads to Elgin Drive.

Adding a short section of Vivians Crescent to the candidate network (as shown in **Figure 3c**) connects Drinkwater Road and Elgin Drive, as well as the off-road trails either side of the tracks. Formalization of this link would therefore improve northwest-southeast connectivity across the railway barrier, particularly given that the Fletcher's Creek Trail is only 600 metres away along Elgin Drive. The section that would need to be added is on privately-held land. The City would need to identify funding to purchase this land before the connection could be made.



4.4.5 Sunny View Public School

This connection would be most effective as an off-road trail behind the school, as shown in **Figure 3d**, potentially using a strip of existing playing fields. Alternatively, Chapparral Drive could be made an on-road candidate route; however, this area is likely to be congested at school pick-up and drop-off times so designated cycling operating space may be required. This link would connect the existing in-boulevard facilities on Sandalwood Parkway and the existing Flower City Trail to Sunny View Public School. It would also improve connectivity with the City candidate route on Sunny Meadow Boulevard and a further trail extension would link to the existing in-boulevard facilities on Bramalea Road. A constraint to constructing this link is the very steep grade, which poses additional costs for engineering design and construction.

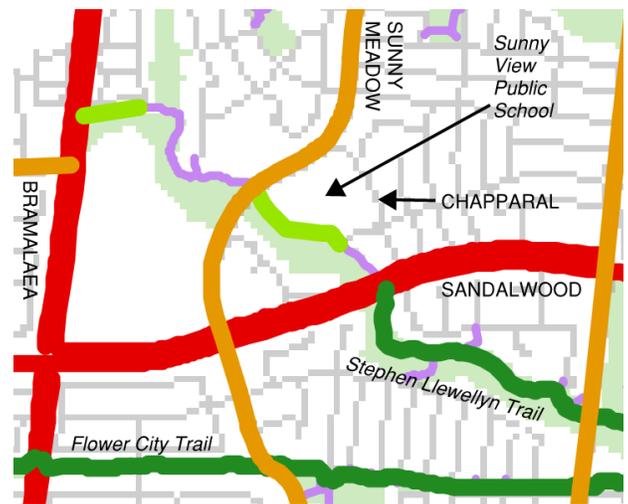


Figure 3d – Sunny View Public School

4.4.6 Peel Village

As highlighted in the public comments received to date, there is justification for adding Peel Village Parkway to the candidate routes. The sidewalk to the east of the St Francis Xavier School should be upgraded to a multi-use path. So too should the existing east-west paths through Peel Village Park be upgraded, as the north-south paths have been. With the potential loss of a strip of playground at St Francis Xavier School and the use of the parking access at Peel Alternative School North, this connection would improve access to both of these schools.

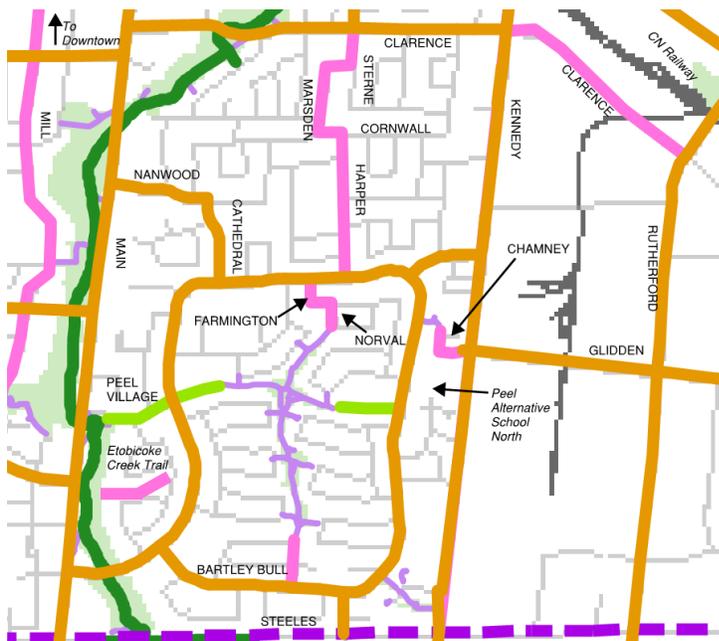


Figure 3e – Peel Village and Clarence Street

As identified in **Figure 3e**, new candidate route should also be designated via Sterne Avenue, Marsden Crescent, Cornwall Road and Harper Road to connect Centre Street to Bartley Bull Parkway. That road, as well as Cathedral Road and Nanwood Drive, are already candidate routes. The roads connecting the north-south trail to Bartley Bull Parkway, namely Farmington Drive, Norval Crescent and Erindale Crescent, will also be added to the candidate route network. Chamney Court has also been



designated as an additional candidate road due to its multi-use path connection with Bartley Bull Parkway and its direct alignment with Glidden Road at their intersection with Kennedy Road.

4.4.7 Clarence Street

There are relatively few roads in the area south of the CN railway and east of Kennedy Road, and opportunities to cross the railway are also limited. Given this, and the fact that Clarence Street is a candidate City road west of Kennedy Road, the continuation east to Rutherford Road should be added to the candidate route network as illustrated in **Figure 3e**. This is located in an industrial area, hence in-boulevard facilities should be considered, as described in **Section 7.1.2**.

4.4.8 Bram East / Secondary Plan Area 47 (Highway 427 Industrial)

This area benefits from several creek systems and short sections of multi-use trail exist between Castlemore Road and Castle Oaks Crossing, and between Cottrelle Boulevard and Ebenezer Road. Extension of this trail system should be investigated. This will benefit recreational users by connecting the Claireville Conservation Area with Gore Meadows Park and scenic areas further north. Also, for utilitarian users, the relative directness of the trails will provide more commuting options to those working in the Coleraine Business Park. Given the industrial land use and designation of Coleraine Drive as a primary truck route as part of the Peel Region Strategic Goods Movement Network, off-road trails in this area would provide separation between AT users and heavy good vehicles.

Extending the trails to Brampton’s northern boundary connects the community of Bolton with the City of Mississauga and the City of Toronto’s Humber Trail if the Gorewood Drive connection under Highway 407 is also added to the candidate route network. Through the Toronto Gore Rural Estate area, the trails can be extended west along the green space between McVean Drive and Goreway Drive, connecting to the existing trail between Countryside Drive and Mayfield Road in the Vales of Castlemore North.



Figure 3f – Bram East Connections

By adding a connection through Gladstone Shaw Park and along Rosegarden Drive, Jacksonville Drive and Latania Boulevard, this route can be linked to the candidate City roads in the Vales of Castlemore. An off-road connection already exists between Latania Boulevard and Quincy Place, there are paths through Treeline Park and there is a link between Whitwell Drive and Vision Way.



Taking advantage of these existing facilities, and upgrading them for the shared use of cyclists and pedestrians where necessary, on-road connections via Yukon Lane, Cupid Drive, Braydon Boulevard and Stonecrest Drive will integrate this route with the trails leading to the existing in-boulevard facilities on Sandalwood Parkway.

4.4.9 Esker Lake Trail / Rutherford Road Connection

Related to, but not dependent on, the bridge described in **Section 4.4.2** is the potential link between the Esker Lake Trail and the bicycle lanes on Rutherford Road. In the future, this connection will be made by the section of the proposed in-boulevard facilities on Williams Parkway between Southlake Boulevard and Rutherford Road. However, an interim solution is already available via the tunnel under Williams Parkway that links Major Oaks Park with Royal Salisbury Way. By designating Major Oaks Drive and Archdekin Drive candidate routes, and taking advantage of the existing multi-use trail through Century Parkette, that connection can be made, as shown in **Figure 3g**.

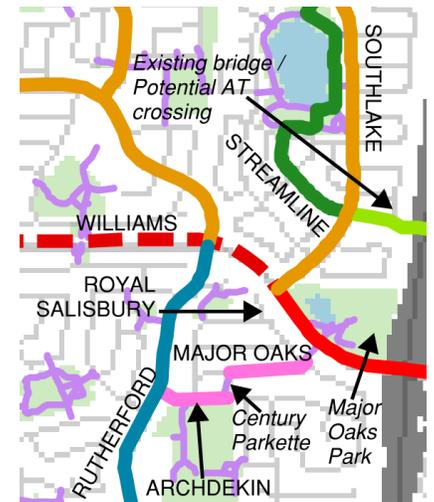


Figure 3g – Major Oaks Area

4.4.10 Trail Connections

To maximize multi-use trail connectivity, short additional candidate links should be considered at the following locations:

- Valleycreek Drive and Littlewood Gate, taking advantage of the access path connecting the latter to Cottrelle Boulevard;
- Alfonso Crescent; and
- Tappet Drive.

4.4.11 Mount Pleasant GO Station

To provide direct access to the Mount Pleasant GO station, the following links should be added to the candidate City roads, as shown in **Figure 3h**:

- Salvation Road, south of Springhurst Avenue;
- Commuter Drive; and
- Ganton Heights.

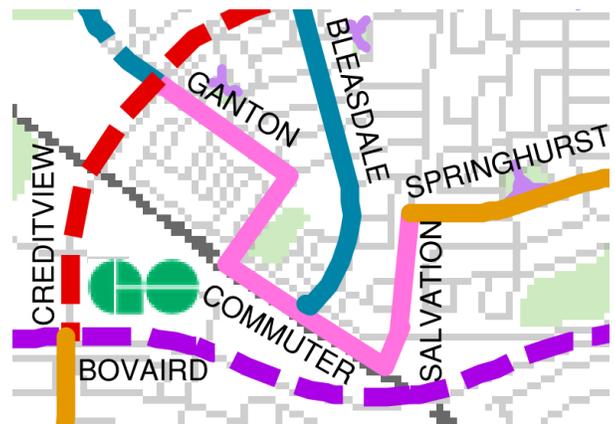


Figure 3h – Mount Pleasant GO Station

Station accesses and bike parking locations should be reviewed to ensure maximum accessibility for cyclists.



4.4.12 New Road Construction

New road links recommended in this TMPU have been automatically designated as additional City candidate routes. The only exception is Bram West Parkway, which is proposed to be a Regional road, and has therefore been identified as a candidate road for further evaluation when the Region updates its Active Transportation Study.

4.5 Improving Connections between Jurisdictions

Like all users of the AT network, cyclists (and to a lesser extent pedestrians) travel between municipalities, between home, school or work and other activities. Therefore it is vitally important that AT facilities are extended to boundaries and co-ordinated between municipalities. In all of the cases below, where a neighbouring jurisdiction has an existing or proposed facility and there is no current provision on the Brampton side of the municipal boundary, potential connections should be investigated and prioritized. Additional candidate routes identified are shown in **Figure 3**.

4.5.1 City of Mississauga

Section 2.4.1 identifies locations where the City of Mississauga has existing cycling facilities that extend to the boundary with Brampton but do not connect to a facility on the other side. In addition, there are other locations where the proposed Mississauga Cycling Route Network shows future connections that require short extensions to existing or proposed facilities on the Brampton side of the boundary for connectivity purposes:

- The City of Mississauga proposes a connection under Highway 407 alongside the Orangeville Brampton Railway. The safety and engineering feasibility of this option should be assessed. If viable, the trail may connect to Pantomime Boulevard, Steeles Avenue or Chinguacousy Road, potentially through the Meadowvale Cemetery.
- Mississauga also proposes a connection that will link to a trail that is proposed to run along a hydro corridor that meets Hurontario Street between Vicksburgh Drive and Kingsway Drive and passes under Highway 407. In Brampton, the part of this hydro corridor between the Steeles Avenue / Mavis Road intersection and Ray Lawson Boulevard features an existing multi-use path. This could be extended northeast to the existing in-boulevard facility along James Potter Road. Between McLaughlin Road and Timberlane Drive, the hydro corridor passes through the parking lot of the Gurdwara Nanaksar. By extending the multi-use path along the hydro corridor and connecting it to Skranda Hill, Oaklea Boulevard and Gurdwara Gate, a link can be made to the existing multi-use paths in Timberlane Park. This in turn can connect to the trail proposed along the continuation of the hydro corridor into Mississauga.
- A new trail is proposed along the Mississauga section of Fletcher's Creek Trail that will connect to the municipal boundary. The aforementioned proposed link under Highway 407 will link this to the Brampton section of Fletcher's Creek Trail.

Mississauga is proposing a primary in-boulevard route on Goreway Drive. Due to the absence of cycling facilities in the area occupied by Pearson Airport, it is 3.5km away from the nearest proposed connection across the Mississauga/Brampton boundary. Consequently, the Goreway



Drive candidate route between the municipal boundary and Steeles Avenue is of significance in terms of network connectivity. Also, Mississauga has identified Hurontario Street and Tomken Road as primary routes. The candidate City of Brampton routes that connect to them across the municipal boundary also carry greater importance as a result.

The Region of Peel Active Transportation Study is proposing multi-use trails on Mississauga Road, Dixie Road and Airport Road on both sides of the Brampton/Mississauga boundary.

4.5.2 Town of Caledon

The City of Brampton is proposing in-boulevard facilities on Creditview Road and Torbram Road that extend to the boundary with Caledon. This minimizes the length of road without any provision for cyclists. If Caledon should extend the routes on those roads to the boundary with Brampton, a direct, continuous route would result.

The Town of Caledon's trail network plan also identifies Kennedy Road and McVean Drive, both candidate City roads, as "possible cycling route linkages to adjacent municipalities". The Region of Peel Active Transportation Study proposes paved shoulders on Winston Churchill Boulevard, Airport Road, Dixie Road and the Gore Road to tie in with multi-use trails proposed on those same roads in Brampton.

Clarkway Drive is a candidate road and, although the area is designated for industrial use, in-boulevard facilities and off-road trails are available as alternative provisions. In any case, there is the potential for good connectivity should Caledon extend the existing Humber Station Road route. Bolton extends to the boundary with Brampton, hence there is the potential for a popular facility to be provided through Bram East to the Humber trail in Toronto.

4.5.3 City of Vaughan / York Region

There are locations where existing or proposed facilities on the City of Vaughan Pedestrian and Bicycle Network warrant the improvement of existing facilities or the prioritization of potential proposed facilities to ensure good connectivity. The in-boulevard facilities along Cottrelle Avenue should be completed in order to improve connectivity with the existing York Regional facility on Langstaff Road. Candidate facilities on Coleraine Drive and Countryside Drive link to Major Mackenzie Drive and Nashville Road respectively.

4.5.4 Town of Halton Hills / Halton Region

On road cycling routes are proposed on the following east-west road in Halton Hills, which connect to Regional arterial roads in Brampton:

- 17 Side Road, which becomes Mayfield Road;
- 5 Side Road, which links to Embleton Road; and
- Steeles Avenue.



As highlighted in **Section 2.4.4**, a short stretch of multi-use trail in Norval connects Old Pine Crest Road on the boundary to Regional Road 7. In Brampton, that Regional road is Bovaird Drive.

4.5.5 City of Toronto

In Brampton, both Finch Avenue and Albion Road are identified as candidate routes. Facilities on these roads would improve connectivity with Toronto's West Humber Trail. A cycling facility is proposed on Steeles Avenue West in Toronto. This would link the East Humber Trail to the Regional candidate routes on both Steeles Avenue and Highway 50.

4.5.6 City of Brampton / Region of Peel

Although roadways and their associated AT facilities are divided between City and Regional control, care should be taken to ensure seamless connectivity between the two. Also the implementation of cycling facilities on City and Regional roads should be spatially co-ordinated as much as possible. This will reduce the occurrence and duration of connectivity issues on routes that comprise facilities under both jurisdictions.

The report from the Region of Peel Arterial Roads Review Ad Hoc Steering Committee meeting held on June 21, 2012 identifies the section of Kennedy Road between Queen Street and Steeles Avenue, and Mavis Road south of Steeles Avenue for download from the Region to the City of Brampton. The characteristics of this road are generally consistent with the route selection criteria in **Section 4.2**. Consequently, this section has been identified as a candidate road for further evaluation (along with the Bram West Parkway proposed for construction) when the Region updates its plan. In the same report, Castlemore Road and Coleraine Drive were identified for upload from the City to the Region.

4.6 Identifying Missing Pedestrian Links

Figure 4 identifies the existing sidewalk network, along with opportunities for improvement on City roads within the built-up area have been identified. Please refer to **Figure 3** for details of multi-use paths, as well as existing and proposed in-boulevard facilities on Regional roads.

4.6.1 Provincial Highway Crossings

In built-up areas, AT facilities should be continuous on both sides of the road across provincial highway interchanges. Where width constraints impede multi-use paths, sidewalks should be provided at a minimum. At ramps, the ends of opposing multi-use paths or sidewalks should align so as to allow pedestrians and cyclists to cross at right angles to the direction of traffic flow. Active Transportation facilities should be reviewed and, where appropriate, improved on and approaching the Clark Boulevard overpass crossing Highway 410 since this is due to be widened. As discussed in **Sections 3.1 and 4.4.7**, the feasibility of converting the disused bridge over Highway 410 north of Williams Parkway to an AT facility should be investigated.

The City should consider providing sidewalks or boulevard paths on the Highway 407 overpasses at Mavis Road, Hurontario Street, Tomken Road, Bramalea Road, as well as the underpass at



Gorewood Drive. The need to provide AT facilities is particularly urgent where thin asphalt splash strips are currently present instead of sidewalks. Pedestrians may mistake them for sidewalks and endanger themselves due to the substandard width and uneven surface of the asphalt splash strips.

Please refer to **Section 4.1.2** and **Figure 3** for details of Region of Peel proposed improvements.

4.6.2 Transit Connections

The following potential improvements at intersections with existing or proposed ZÜM, LRT or Bus Rapid Transit stops would significantly shorten walking distances and do not appear to require the purchase of private residential land:

- Worthington Avenue at Bovaird Drive: the informal trail between Unsworth Street and Salvation Road should be paved;
- McLaughlin Road at Bovaird Drive: access should be provided from Goldenlight Circle through the fence on the southeast corner; and
- McLaughlin Road at Steeles Avenue: an access path should be implemented connecting Maple Leaf Circle to the northeast corner of the intersection.

The adequacy of pedestrian connections between the Bramalea GO station and Steeles Avenue should also be reviewed.

4.6.3 Interaction with Heavy Goods Vehicles

Given the importance of goods movement in Brampton, there will inevitably be significant overlap of the AT network with roads frequented by heavy goods vehicles. Consistent with 'Complete Streets' policies, roadways should be configured to accommodate cyclists, pedestrians, heavy goods vehicles and other modes in a way that maximizes safety for all users. To achieve this, in-boulevard facilities or sidewalks should be provided on both sides of links where heavy goods vehicles are expected, such as those in industrial areas or the Peel Region Strategic Goods Movement Network. This will reduce the risk of pedestrians sharing the roadway with trucks. Next steps and a summary of recommendations are provided in **Section 7**, with **Section 7.1.2** specifically addressing heavy goods vehicles.

Pedestrian facilities should be improved, either through the provision of a sidewalk or a multi-use trail, on Hurontario Street between Bovaird Drive and Wanless Drive. No pedestrian facility is currently present on the west side, which borders an industrial zone. The section between Petworth Road and Sandalwood Parkway is also lacking a sidewalk on the eastern side. Sidewalks should also be provided on Summerlea Road, Walker Drive and Gateway Boulevard south of Queen Street. Although they are located in an industrial zone, they serve Al-Iman School and provide access to the proposed Gateway rapid transit stop.



4.6.4 Schools and Institutional Land Uses

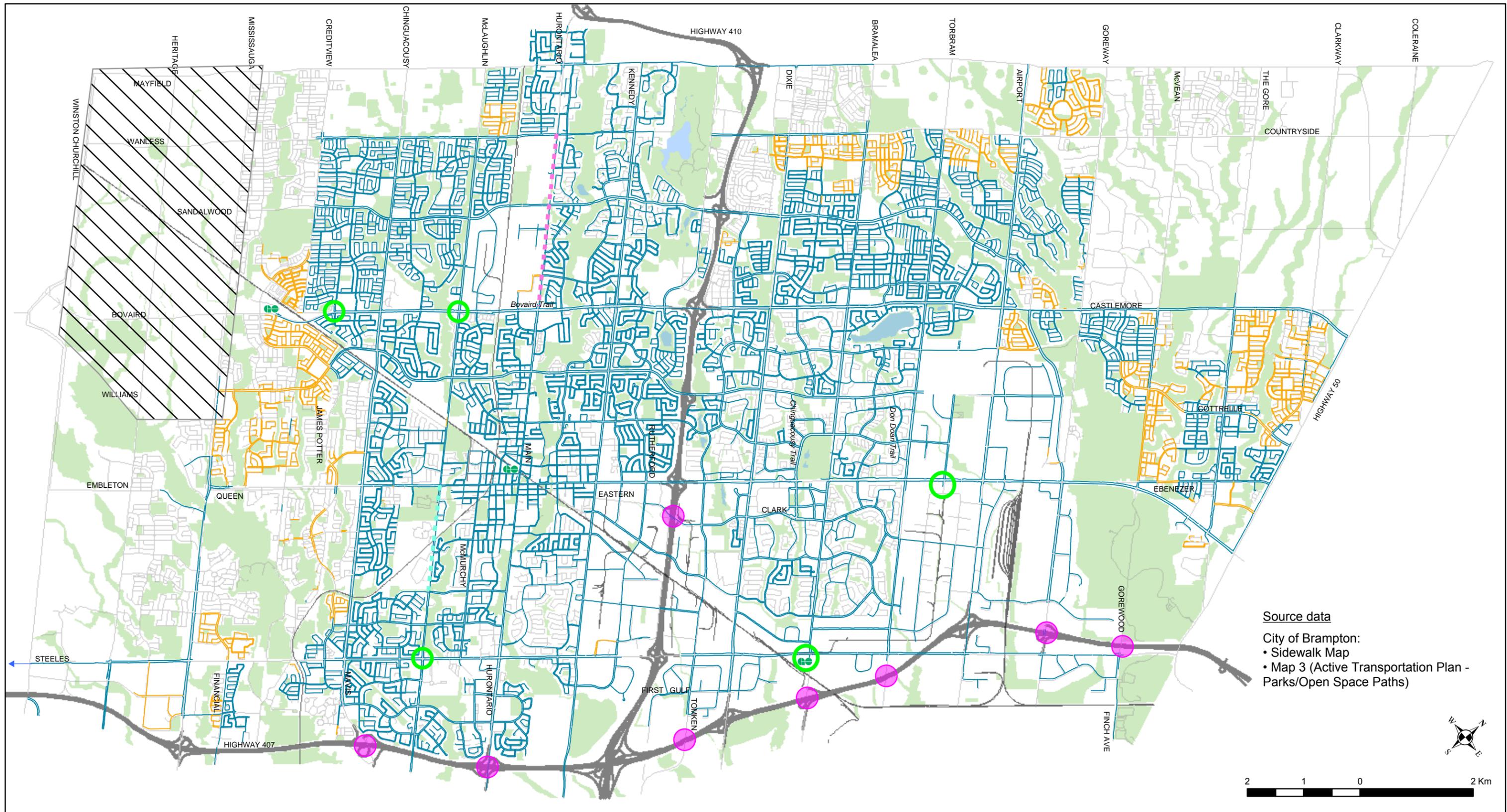
Good sidewalk and crossing provision near schools is essential for student safety as younger road users may be less attentive to road conditions. The proposed update to the PathWays Master Plan, which is included as a recommendation in **Section 7: Moving Forward**, should pay particular attention to accommodating AT facilities near schools. Where there are a number of schools in a given area, improvements to AT infrastructure will help to reduce congestion and pick-up and drop-off times. As risks to children walking and cycling to school are mitigated, parents' perception of safety will improve and they will be less likely to drive them to and from school.

The improvement of AT facilities in the vicinity of schools is also consistent with strategy #2 of Metrolinx' Big Move. In particular, supporting policy 2.11 states that: "school catchment areas shall be designed, to maximize walking and cycling as the primary means of school travel."

In the online comments received from the public, there was specific mention of the Peel Village area, where there is a concentration of schools. A sidewalk should be installed on the southern side of Bartley Bull Parkway between Harper Road and Duncan Bull Drive to assist the movement of pedestrians through Peel Village Park and along Farmington Drive to Harper Road. The sidewalk extension to Duncan Bull Drive will assist pedestrians from Farmington Drive, Norval Drive and Roberts Crescent heading west along Bartley Bull Parkway. Those streets should also be evaluated for sidewalk provision. Elsewhere, if an in-boulevard facility is not proposed along the west side of McLaughlin Road, the sidewalk should be completed between Queen Street and Elgin Drive to serve the institutional land uses there. In that case though, an off-road connection will be required to link up the currently disconnected Fletcher's Creek Trail. Sidewalks are present within the Sheridan Davis campus on the southeast corner of the McLaughlin Road / Steeles Avenue intersection.

4.7 A Recommended AT Network Concept

Figures 3 and 3a show the existing, previously proposed and previous candidate City roads determined by the City of Brampton. **Figure 4** shows the existing sidewalk network and recommended improvements. Incorporating the additional candidate City roads identified in this study, the existing and proposed Regional facilities and the potential pedestrian-related improvements results in the combined AT network concept. The links that constitute the network should be evaluated further for the provision of suitable cycling and pedestrian facilities as part of an Active Transportation and Trails Master Plan, as outlined in **Section 7.2** and **Appendix C**.



BRAMPTON
Flower City

Transportation
Master Plan

Legend

Existing		Existing Sidewalk		City Sidewalk / Boulevard Path		Suggested		City Sidewalk / Boulevard Path		City Highway Crossing		Transit
Previously Proposed		Development Sidewalk										

Review Pedestrian Access

Conceptual Road Network for use in the Development Charges Background Study

Figure 4
City of Brampton
Sidewalk Map



5. POLICIES AND INITIATIVES

The City of Brampton has the opportunity to create an environment that is supportive of all modes of transportation including walking and cycling. Infrastructure such as sidewalks, trails, bike lanes, benches and sign treatments all contribute to an improved active transportation (AT) system, but these alone will not produce a fully supportive system for the City.

A set of AT related policies and recommendations have been developed to provide strategic direction for the City regarding future AT development, design and implementation. They are grouped into the following components:

- Education;
- Encouragement;
- Engineering and Enforcement;
- Partnerships; and
- Design and Support Features.

The policies are described in more detail in **Table 1**.



Table 1: Recommendations for Supporting Active Transportation (AT) in Brampton

COMPONENT	OBJECTIVES
EDUCATION	Consider utilizing educational programming and promotional materials to encourage and inform people of the benefits of AT as it relates to community health and fitness, transportation, environment and sustainability, economy and tourism.
	Develop and distribute newsletters and educational materials to promote and educate the public on AT opportunities, recommendations for routes and destinations and updates on available routes.
	Consider the implementation of educational programs on walking and cycling such as the Active and Sustainable Routes to School Travel Program administered by the Metrolinx Smart Commute program. The City should also partner with Peel Region in offering programs like School Travel Planning, the Bicycle Parking Lot Program and the STEPS to School pilot program, as well as other interested agencies, not-for-profit organizations and school boards.
ENCOURAGEMENT	Explore community-based social marketing as a means of encouraging people to adopt more sustainable transportation habits, including walking and cycling.
	Develop, together with local organizations, a comprehensive approach to encouraging students and employees to walk or cycle to school or work and combine these modes with public transit for longer distance trips.
	Explore partnerships with local public and private organizations and integrate end-of-trip facilities into AT and trail promotional strategies and initiatives.
	Further promote multimodal trips through the integration of AT and transit maps. City staff should continue to work with local cycling and hiking groups and update the maps at least every two years to ensure new routes and connections are shown. The Bike & Ride program should be expanded along with the City's transit infrastructure.
ENGINEERING & ENFORCEMENT	Consider transportation operational measures in the future as part of the transportation system management to support safe and convenient AT movement and trail use. These measures may include: <ul style="list-style-type: none"> • Exempting cyclists from turn prohibitions at intersections, except where the restrictions are in place for safety reasons; • Expanding the installation of bicycle detection at intersections such that traffic signals recognize and react to cyclists on sideroads; and • Enforcing speed limits on roadways where observed speeds exceed acceptable levels.
	Focus enforcement activities from Peel Regional Police on issues related to the misuse of bicycle and pedestrian facilities, particularly sidewalk obstruction and the inappropriate use of trails.
	Work with Peel Regional Police in the development and delivery of cycling and walking-related safety programs.
PARTNERSHIPS	Continue to develop partnerships with Peel Region, outside agencies, volunteer groups, individuals as well as regional representatives to promote and educate residents on AT use throughout the City. This includes participation in coordination committees such as the AT Leadership Group and the Senior Management Steering Committee.
DESIGN & SUPPORT FEATURES	Support 'Complete Streets', which are accessible to all users, regardless of their chosen mode of transportation. The street network should be planned, designed, constructed and maintained to support transit, cyclists and pedestrians in addition to automobile traffic. The elderly, adults, young and disabled should all be able to safely use the streets in a municipality.
	Consider the application of the Greenroads™ sustainability rating system for roadway design and construction. This concept can be combined with that of Complete Streets, as it is focused on the physical make up and construction of the street.
	Work with partners to make the provision of support facilities such as rest areas, washrooms and waste receptacles a priority during the planning and implementation of AT facilities. New developments should be required to incorporate bicycle parking, showers and change rooms through the site plan application process. Bicycle and pedestrian-friendly principles should also be applied to the design and retrofit of roadways and transitions.



The City of Brampton, the Region of Peel, neighbouring municipalities and other partners have made good progress on these recommendations. Although others may be involved to a lesser degree, the key components of current initiatives are summarized in **Table 2** below.

Table 2: Current Active Transportation (AT) Initiatives

PROPONENT	INITIATIVE	KEY COMPONENTS				
		EDUCATION	ENCOURAGEMENT	ENFORCEMENT	SUPPORT / DESIGN FEATURES	PARTNERSHIPS
Region of Peel	Walk+Roll Peel	✓	✓		✓	
	Peel's School Travel Planning (STP) Pilot Program					
	STEPS to School Pilot Walking Program					
	Bicycle Parking Pilot Program					
	PSARTS Committee					
	Region of Peel Transportation Demand Management Study (2004)					
	Transportation Demand Management Five-year Plan for Supplemental Funding					
	Peel Health Communication Programs					
City of Brampton	Brampton Pedestrian Safety Plan					
	Bike & Ride					
City of Mississauga	Tour de Mississauga					
	Road Safety Mississauga / Mississauga Road Safety Handbook (2011)					
Other	Smart Commute Initiative (including 'Bike to Work Day' and the Active and Sustainable Routes to School Travel Program)	✓	✓			✓
	Road Watch					
	CAN-BIKE Cycling Skills Training	✓				✓
	Peel Children's Safety Village	✓				



6. PERFORMANCE INDICATORS

In order to assess the current and future state of active transportation (AT) in Brampton, a set of performance indicators have been developed. These indicators can be used to track demand for AT, utilization of facilities and the quality of infrastructure as the network evolves. Such practices will also inform the development of future routes and network links.

Factors include:

- Mode share of pedestrians and cyclists;
- Interaction with transit;
- Percentage of short trips taken by car, bike and on foot;
- Safety of pedestrians and cyclists;
- Bicycle and pedestrian level of service; and
- User satisfaction.

Please refer to **Appendix B** for more detail on each item, as well as considerations regarding network connectivity.



7. MOVING FORWARD – RECOMMENDATIONS

This final section discusses how other aspects of the TMPU interact with the active transportation (AT) component, and how it will be integrated into the final TMPU report. It also outlines the subsequent steps to be undertaken with regard to the selection of facilities and the associated update to the City of Brampton PathWays Master Plan and Routing Plan. The section concludes with a summary of key recommendations.

7.1 Integrating an AT Strategy into the TMPU

This section addresses integrating the active transportation strategy with transit and with goods movement. Integrating active transportation with transit can help extend the reach of both of these modes and can help to maximize the role that AT can play in improving mobility. It is necessary to recognize that the presence of heavy goods vehicles can pose a safety risk to the cyclists and pedestrians with whom they share the right-of-way. The selection of AT facilities should aim to mitigate that risk by considering alternative AT routes or off-road routes on main corridors used by heavy goods vehicles.

7.1.1 Transit Connections

Utilitarian cyclists travelling to work, to school or to run errands may combine AT with transit. Given the planned expansion of the ZÜM Bus Rapid Transit (BRT) network, Light Rail Transit (LRT) and GO bus and rail services, good intermodal connectivity will expand the range of travel choices available. This will lead to reduction in auto modal share and therefore less congestion, along with other benefits.

The City and Regional road network is planned to incorporate the following rapid transit services:

- **LRT** on the Main Street / Hurontario Street corridor south of the Downtown Brampton terminal near Queen Street; and
- **BRT** connecting north of the Downtown terminal along Main Street and east along Queen Street, as well as on Steeles Avenue from the Halton boundary to Finch Avenue, leading to Humber College;

ZÜM buses will operate on the following roads by 2021:

- Bovaird Drive / Castlemore Avenue corridor between the Mount Pleasant GO station and Humberwest Parkway;
- Queen Street west of the Downtown terminal to the Mount Pleasant GO station via Mississauga Road; and
- Steeles Avenue between the Gateway Terminal and Lisgar GO station.

The following additional ZÜM services are proposed for implementation by 2041:

- Sandalwood Parkway between Chinguacousy Road and Airport Road;
- Mississauga Road between Bovaird Drive and Steeles Avenue; and



- Chinguacousy Road, Kennedy Road, Bramalea Road and Airport Road between Sandalwood Parkway and Steeles Avenue.

In addition, a BRT service will operate along Highway 407, and the Mount Pleasant, Downtown and Bramalea terminals will be served by an expanded GO rail service. Please refer to TMPU Technical Report #4, Future Transit Provisions, for more details.

There are several proposed and candidate active transportation facilities around the Mount Pleasant GO station, with direct connections proposed for review as described in **Section 4.4.10**. Additional candidate routes to improve access to the Downtown GO station are identified in **Section 4.4.1**. Proposed trail connections along Avondale Boulevard and Bramalea Road will link the Etobicoke Creek, Chinguacousy and Don Doan Trails to the Bramalea GO Rail station. Bramalea Road south of the station is a candidate City road and there are existing in-boulevard facilities on part of Steeles Avenue.

The Metrolinx Mobility Hub Guidelines make several recommendations with regard to the integration of AT facilities. The layout of existing and proposed transit stations should be reviewed in closer detail to ensure that the following guidelines are being followed to the maximum extent possible:

- Provide secure and plentiful bicycle parking at station entrances with additional cycling amenities at high volume locations (1.4);
- Provide clearly marked and protected access for pedestrians and cyclists at station areas to minimize conflicts, particularly at passenger pick-up and drop-offs (PPUDO), bus facilities, and parking access points (1.6);
- Build or retrofit a network of complete streets to create a balance between the movement of pedestrians, cyclists, transit, and vehicles. Adopt road design standards that ensure safe movement of all road users (2.3);
- Provide an attractive pedestrian environment with a high level of priority, safety and amenities (2.4);
- Create cycling-supportive streets and communities (2.5);
- Adopt goods movement strategies within mobility hubs that support complete streets, while ensuring the efficient delivery of goods and services (2.6);
- Create understandable and accessible transit stations through consistency and clarity in station entrances and interfaces, spaces, layout, and visual cues connected by barrier-free movement spaces (3.4); and
- Develop wayfinding and signage to support the efficient navigation of the transit station and station area (3.5).

The GO Transit Rail Parking and Station Access Plan also provides opportunities for the City to work with Metrolinx to maximize the potential to attain the plan's objectives by improving the accessibility of transit stations by bicycle and on foot. The plan recommends the development of station-specific plans to direct the delivery of AT access improvements and promote AT, transit and carpooling. In particular, it highlights that stations with less extensive active travel facilities may have a high opportunity for improvements. The document also states that AT modes (walking and



cycling) and public transit will have priority access to stations and terminals, with dedicated access provided where appropriate, and that GO Transit will identify opportunities to separate parking charges from transit fares at selected locations to encourage walking, cycling, and taking transit to the station.

TMPU Technical Report #4 details the proposed 2041 transit network. With the exception of Mississauga Road between Queen Street and Steeles Avenue, and Hurontario Street north of the Sandalwood terminal, all of these routes are planned to have at least local bus services that support BRT in place by 2021. Where candidate routes on these corridors have been successfully evaluated for the provision of cycling facilities, these should be prioritized for implementation. Cyclists may then use any connecting AT facility and cycle along it to reach the major stations where connectivity is maximized and parking facilities should be most readily available.

7.1.2 Interaction with Heavy Goods Vehicles

Goods movement in Brampton is focused primarily on regional roads, as identified in the Peel Region Strategic Goods Movement Network. Some City roads are designated as connector truck routes, in most cases within designated industrial zones. Others are frequented by goods vehicles accessing particular industrial and office sites.

The Freight-Supportive Guidelines is a document aimed at helping municipalities, planners, engineers, developers and other practitioners create safe and efficient freight-supportive communities. Currently in draft form pending its formal release by MTO, it recommends that cyclists should have designated or separated facilities on routes that are also designated for trucks.

The guiding principles for facility selection in the Brampton City Council report quoted in **Appendix C** recommend that, in retrofit scenarios, in-boulevard facilities should be provided along industrial collector roads. In most cases, these roads have boulevards that are sufficiently wide for cycling facilities to be provided alongside existing sidewalks, or for such an AT path to be implemented. TMPU Technical Report #7 identifies industrial areas and the collector roads that run through them, as well as other roads where goods vehicles may be expected.

7.2 Facility Selection

Selecting an appropriate facility for each candidate route is outside the scope of the TMPU. However, **Appendix C** of this technical report gives a recommended approach for how this should be done as part of the Bicycle Facilities Implementation Program (BFIP) and the future update to the City of Brampton PathWays Master Plan and Routing Plan. This should be revised as part of an Active Transportation and Trails Master Plan Update using the AT network concept resulting from this study as the basis and applying the guidelines and network development approach in OTM Book 18.

In some cases, motor vehicle speeds and volumes will place a particular link in the red area of **Figure 7**, the Desirable Bicycle Facility Pre-Selection Nomograph in **Appendix C**. Where there is insufficient right-of-way to accommodate a separated facility, alternate routes should be considered. In **Section 4.3**, alternative candidate routes have been identified for the sections of the Queen



Street and Main Street corridors where available right-of-way is limited. Constraints on implementing facilities on the arterial corridors may also be time-related if their implementation phasing is tied to that of a transit improvement along the same corridor. For this reason, and the recommendation from OTM Book 18 that routing options be varied to cater for the needs of all types of cyclists, these candidate routes should be considered in their own right.

The update to the City of Brampton PathWays Master Plan and Routing Plan should include a review of the City of Brampton's Engineering and Design Standard Drawings, in particular drawings 200 to 219 inclusive which show cross sections for different classifications of road. The standard drawings should be reviewed and updated to make sure that City roadways are designed for all transportation users and all modes of transportation. Ontario Traffic Manual Books 15 and 18 should be used as a reference in this work.

7.3 Summary of Recommendations

The key recommendations to emerge from the AT component of this TMPU are as follows:

- The City should review and revise its roadway design standards to make sure that City roadways are designed for all transportation users and all modes of transportation. Ontario Traffic Manual Books 15 and 18 should be used as a reference in this work.
- The candidate route network, including the additional candidates identified by this study, should be evaluated through a more detailed Active Transportation and Trails Master Plan following the facility selection process outlined in **Appendix C**. This would form part of the proposed update to the PathWays Master Plan. An Active Transportation and Trails Master Plan will include more detailed information and recommendations on policies, programming, design standards and infrastructure, and will identify shorter term priorities and longer term goals.
- The policies and initiatives identified in **Section 5** should be implemented or continued.
- The performance indicators outlined in **Section 6** should be further developed and applied to the City's AT network.
- The suitability of the existing bridge over Highway 410 between Bovaird Drive and Williams Parkway for conversion to a dedicated AT crossing should continue to be investigated with MTO.
- Opportunities to implement off-road multi-use trails along railway lines and waterways, along with the appropriate natural or artificial protection, should be explored.
- The proposed update to the PathWays Master Plan should pay particular attention to accommodating AT facilities near schools. Where there are a number of schools in a given area, improvements to AT infrastructure will help to reduce congestion at pick-up and drop-off times.
- Where a neighbouring jurisdiction has an existing or proposed facility and there is no current provision on the Brampton side of the municipal boundary, potential connections should be investigated and prioritized.
- Consistent with 'Complete Streets' policies, roadways should be configured to accommodate cyclists, pedestrians, heavy goods vehicles and other modes in a way that maximizes safety for all users. To achieve this, in-boulevard facilities or sidewalks should be provided on both sides of links where heavy goods vehicles are expected, such as those in



industrial areas or the Peel Region Strategic Goods Movement Network. Where separated facilities are implemented, conflict points that would otherwise be on-road are sometimes transferred to accesses and side roads. Such conflicts should be identified and mitigated where possible.

- The integration of AT and transit facilities should be maximized, and the AT-related elements of the Big Move, Metrolinx Mobility Hub Guidelines and GO Transit Rail Parking and Station Access Plan should be followed.



APPENDIX A: ONLINE PUBLIC CONSULTATION



Public responses were generally complementary of the existing facilities. Trail provision, particularly the off-road sections of Etobicoke Creek Trail north of Church Street, was perceived very favourably, particularly for safety and the standard of maintenance.

There was particular support for the provision of facilities on roads that are proposed or candidate routes on Regional arterials:

- Queen Street east of Highway 410;
- Steeles Avenue;
- The Gore Road; and
- Winston Churchill Boulevard north of Bovaird Drive.

Comments were also in favour of upgrading the following City arterials for the benefit of cyclists:

- Chinguacousy Road;
- Creditview Road;
- Main Street;
- Rutherford Road, south of the existing bike lanes;
- Sandalwood Parkway; and
- Williams Parkway.

The public also highlighted many City collector roads that are proposed for improvement or are candidate roads subject to further evaluation:

- Brisdale Drive;
- Centre Street;
- Charolais Boulevard;
- Church Street;
- Clarence Street;
- Conestoga Drive;
- Earlsbridge Boulevard;
- Edenbrook Hill Drive;
- Elgin Drive;
- Father Tobin Road;
- Fernforest Drive;
- Fletcher's Creek Boulevard;
- Gardenbrook Trail;
- Howden Boulevard;
- Knightknoll Drive;
- McMurchy Avenue;
- Mountainash Road;
- North Park Drive;
- Peter Robertson Boulevard;
- Ray Lawson Boulevard;
- Royal Orchard Drive;



- Sunny Meadow Boulevard;
- Van Kirk Drive;
- Via Romano Way; and
- Vodden Street.

Additional facilities were requested in the following locations:

- The Peel Village area, where there is a concentration of schools;
- Along the Credit River north of Bovaird, east of Winston Churchill; Quieter, parallel alternatives to Main Street south of Queen Street; and
- More connectivity across the CN railway line in the downtown area.

Requests were also made for the feasibility of an off-road continuation of the Etobicoke Creek Trail under Queen Street to be investigated as an alternative to the current on-road detour.

Other comments were received related to support features, in particular the need for:

- More widely accessible bike parking. Access to the restaurant area on Main Street south of Queen Street was cited as an area for improvement;
- Incorporating rails into stairways where there is a vertical separation between trails and access roads. The Etobicoke Creek Trail connection to Wellington Street was highlighted; and
- More washroom facilities along off-road routes, particularly the Etobicoke Creek Trail, near Bovaird Drive.

The need for improved signage also featured, particularly with regard to:

- Wayfinding between disconnected trail sections, such as the Etobicoke Creek Trail on-road detour either side of Queen Street;
- Identification of trail exit points to reach a given street, such as Clarence Street and Main Street to and from the Etobicoke Creek Trail; and
- Signage to identify in-boulevard facilities as shared use, with pavement markings where appropriate.

Respondents identified several intersections and crossing points that they currently find dangerous or problematic. Although this study does not include detailed operational issues such as crossing provision, City staff will review the comments and formulate a plan to address these issues as they would if a resident had contacted them by phone, email or letter.

Please refer to **Appendix C** for details of bicycle-friendly crossing provisions and Book 18 of the Ontario Traffic Manual regarding intersection treatments for on-road cycling facilities. The manual also gives guidance on signing and information regarding bicycle parking facilities which may be relevant to comments that were received on those issues.



APPENDIX B: PERFORMANCE INDICATORS



In order to assess the current and future state of AT in Brampton, a set of performance indicators have been developed. They can be used to track demand for AT, utilization of facilities and the quality of provision as the network evolves. Such practices will also inform the development of future routes and network links.

Data Collection and Analysis

Data for the following factors can be collected on-site and tracked over time:

- **Pedestrian and Cyclist Counts:** Data on the number of people walking or cycling can be collected at strategically selected times and locations. Care should be taken to ensure that the potential for walking and cycling trips at a particular location is not under-represented by the data. For example, where the implementation of nearby AT facilities is being phased, volumes should be measured once full build out of the local network has been achieved and time has been allowed following the opening of new facilities for people to adjust their travel patterns.
- **Mode Share of Pedestrians and Cyclists:** The number of trips taken by walking or cycling divided by the total number of trips for all modes. Transit trips that involve a cycling component or significant walk may also be included. This may be focused on specific areas or across the network, may be broken down by trip purpose and may cover average daily travel or just the peak hour.
- **Interaction with Transit:** All transit-related trips involve some degree of walking. Passenger surveys may be undertaken at transit stops and stations to determine the distance walked, the route taken and the level of provision of pedestrian facilities on that route. The use of bike racks on buses and bicycle parking facilities at terminal may be similarly monitored. The scope and associated benefits of a potential data sharing arrangement with Metrolinx should be investigated.
- **Percentage of short trips taken by car:** A typical pedestrian is prepared to walk up to 2km for utilitarian purposes or to take transit. For most cyclists, the upper limit is around 8km. Surveys may be undertaken in parking lots at malls, transit stations or other locations particularly in the downtown area to assess what proportion of car users are driving a distance that they should be able to cover comfortably on foot or by bike. The origin and destination of their trip should be documented and the route identified. The quality of existing AT facilities and the potential demand for improved provision should be evaluated. The feasibility of making that trip by combining walking or cycling with transit should also be considered.
- **Safety of pedestrians and cyclists:** The number of collisions involving pedestrians or cyclists at individual intersections and network links may be assessed using data from Peel Regional Police. These values should be divided by the typical volumes of pedestrians and cyclists at that location so as not to over or underestimate the risk. Where similar collisions are found to occur frequently at a given location, possible site-specific causes should be investigated and appropriate mitigating measures should be proposed.
- **Bicycle and pedestrian level of service:** The 2010 Highway Capacity Manual provides a methodology for grading the level of service (LOS) of a facility from a cyclist or pedestrian's point of view. Factors are generally related to the perceived comfort or safety of the AT



user. These include sidewalk, roadway and bicycle facility widths, pavement surface conditions and the volume and speed of motor vehicles.

- **User satisfaction:** The perception of pedestrians and cyclists as to the quality of facility provision for them may be also be surveyed.

Network Connectivity

As with all modes that use the transportation network, pedestrian and cyclist trips have an origin and a destination. Whether people choose to make those journeys by walking or cycling is fundamentally dependent on whether the facilities are in place and can be joined to form a route that they can safely follow. The directness of that route is related to the time that the trip will take and is a key factor in comparing travel options across modes.

An AT network may be extensive with high quality, dedicated facilities. However, if the only way to access these facilities involves sharing a lane with high volume, fast moving traffic, or by having to walk across unpaved areas or cycle on sidewalks, the network will be poorly utilized. The fact that few AT users are observed on such a facility should not be taken as an indication that it was a poor use of resources and a reason not to invest further. On the contrary, targeted improvements should be identified to connect the network and ensure that it lives up to its potential in providing good value for money.

There are several measures of connectivity that can be applied:

- Intersection density, i.e. the number of intersections in a given area, can be determined. This relates to the number of available routing options, and the greater the intersection density, the more connected the network. Conversely, the average block length can be calculated, with a low value corresponding to a high intersection density. Also related is street density, which is the total length of all streets in a given area.
- The network can be represented as nodes (intersections or unconnected cul-de-sacs) and links between them. The average number of links per node can be determined, with a higher value indicating a more connected network.
- Statistical indices may also be applied. The 'gamma index' is the ratio of the number of links in the network to the maximum possible number of links between nodes. The 'alpha index' is similar but instead relates to the number of complete circuits available compared to the theoretical maximum.

Geographic Information Systems (GIS) software may be used to facilitate such analysis.

When determining the benefit of providing a facility, or prioritizing links for implementation, the impact on the aforementioned measures should be considered. Improvements should be targeted to where they can provide the greatest increase in the effectiveness of the network as a whole. The same techniques may be applied in determining winter maintenance priorities such that there remains an acceptable level of connectivity between facilities that are appropriately cleared for cyclist and pedestrian use.



APPENDIX C: FACILITY SELECTION AND IMPLEMENTATION



This study presents a candidate network concept, from which the AT network can be distilled. For each link in the candidate network, a suitable facility type must be identified.

Bicycle Facilities Implementation Program (BFIP)

In a report to Committee of Council in April 2013, staff included some guiding principles for facility selection. **Figure 5** below is an extract from Appendix B of that report:

Figure 5 – Bicycle Facilities Implementation Program Guiding Principles of Facility Selection

The following BFIP Guiding Principles for Facility Selection were established to identify the type of bicycle facilities (active transportation path, on-road bicycle lane, etc.) that could be appropriate for different classifications of candidate roadways:

- Where primary trails (through parkland) exist adjacent and running parallel to an arterial roadway, these trails can be considered as an alternate to accommodating infrastructure on an arterial/collector road (i.e. Etobicoke trail). Trail/road crossings and proper guide signs are essential to ensure that the trail provides an efficient alternate. The construction and lighting of trails identified within the City's Bicycle Facility Network must be consistent with facilities located within the City's road allowance to be considered as an efficient link within the network.
- Notwithstanding applications outlined above under item 1, cycling infrastructure for the majority of arterial roadways will consist of an active transportation path on one side of the roadway. Facilities along arterial roads with a rural cross-section will include a paved shoulder (shared route signage).
- Notwithstanding applications outlined above under item 1, every collector road will be included within the bicycle network:
 - a) New Roads
 - Collector roadways without residential frontage will include an active transportation path along one side of the roadway;
 - Collectors with residential frontage will include bicycle lanes.
 - b) Retrofit Applications
 - On-street bicycle lanes will be accommodated along collector roads (with residential frontage) where feasible (dependant on available pavement width and public support);
 - Where on-street bicycle lanes cannot be accommodated along collector roads (with residential frontage), a shared route will be marked and signed; and,
 - Bicycle facilities along industrial collector roads will be accommodated off the traveled portion of the road only (active transportation path).



Ontario Traffic Manual (OTM) Book 18: Cycling Facilities

The overview of the aforementioned Committee of Council report states that “OTM Book 18, when completed, will constitute a key input to the BFIP, in terms of guiding staff through the planning, design and implementation of bicycle infrastructure”. OTM Book 18 has since been completed and its formal publication by MTO is imminent.

The Manual incorporates an innovative three-step bicycle facility selection process, as summarized in **Figure 6**. This provides a consistent framework, is straightforward to apply and uses readily available data. Throughout OTM Book 18, practitioners are encouraged to design bicycle facilities within a design domain. This can be viewed as a range of values that a practitioner may choose for a particular design parameter. Since the process is not prescriptive, practitioners have the flexibility to consider site-specific physical and operational characteristics. This is especially important when there are constraints in retrofitting existing corridors and intersections.

The following considerations are critical to the selection process:

- **The choice to separate is not simple:** facilities that are separated between intersections may have greater conflict between cyclists and turning vehicles at driveways and the intersections themselves;
- **Design criteria need to recognize context:** the site-specific characteristics of each location must be considered; and
- **The final decision requires professional judgment:** practitioners should evaluate all factors and document their decisions since they may be called on to justify them.

The first step in the process is the ‘Desirable Bicycle Facility Pre-Selection Nomograph’; this is illustrated in **Figure 7**. The nomograph is divided into three types of operating environment categories:

- **Shared Roadway** (Blue);
- **Designated Cycling Operating Space** (White); and
- **Separated Facility or Alternate Routes** (Red).

‘**Shared Roadways**’ have relatively low traffic volumes and low to moderate speeds. Signed bike routes with standard or wide travelled lanes are examples. These may include ‘sharrows’ or ‘shared use lane markings’.

The ‘**Designated Cycling Operating Space**’ environment involves routes with moderate to high speeds combined with low traffic volumes, as well as scenarios where speeds are low and traffic volumes are moderate. Sample bicycle facilities include paved shoulders or buffered paved shoulders for rural cross-sections. Exclusive bicycle lanes, separated bicycle lanes or raised cycle tracks may be suitable for urban cross-sections.

At sites with high traffic volumes, and routes where moderate to high speeds coincide with moderate to high traffic volumes, ‘**Separated Facilities**’ should be considered. These include in-boulevard facilities, a buffered paved shoulder on a rural road, or a separated bicycle lane or raised cycle track on an urban road. Practitioners may also consider ‘**Alternate Routes**’, however they should take into account the implications in terms of cyclist access to popular destinations, network connectivity and the spacing of parallel routes.



Figure 6 – Model Worksheet for the OTM Book 18 Facility Type Selection Tool

Step One

Pre-select a desirable facility type

Roadway and Section:

Traffic Volume:

Date and source:

Motor vehicle operating speed:

Date and source:

Nomograph Result:

Step Two

A more detailed look

Describe Your Site:
Use the Tables in Chapter 3 to describe your site:

- Volume
- Speed
- Sightlines
- Cyclist demand
- Vehicle Mix
- Topographic barriers
- Collision history
- Directness/Accessibility
- Available space
- User skill/security/safety
- User delay
- Maintenance
- Intersection conditions
- By-laws/Regulations
- Costs/funding

Examine Context:
From the Tables in Chapter 3 document applicable principles and application heuristics.

Photo

Photo

This view shows the following relevant factors: _____

This view shows the following relevant factors: _____

Attach additional sheets if more documentary photos and data are required.

Step Three

Develop your rationale

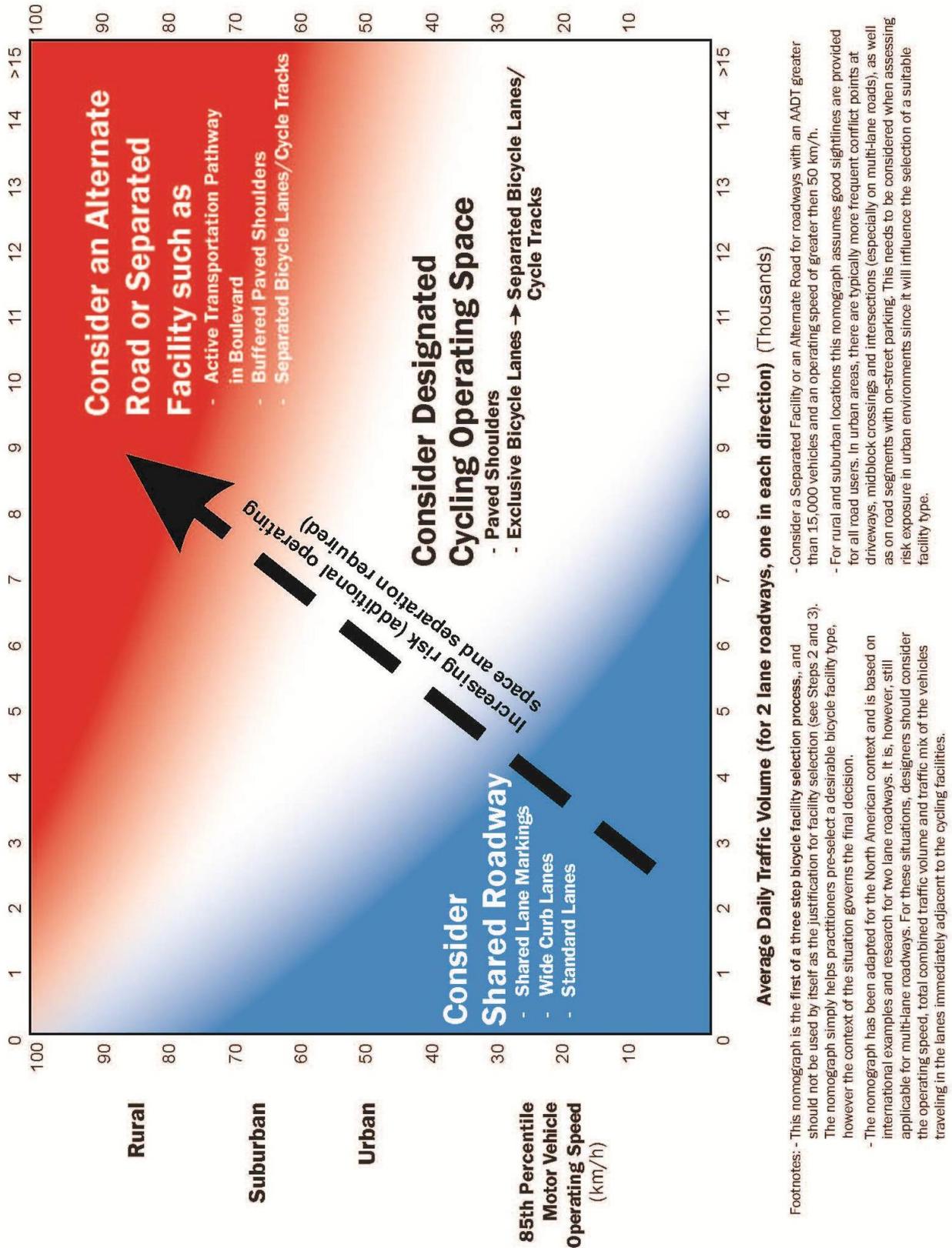
If Step 1 yields a result different than Step 2 or if Step 1 is inconclusive, prepare a rationale for selecting a preferred option.

List the relevant principles and heuristics:

Document your design considerations to support the rationale.



Figure 7 – ‘Desirable Bicycle Facility Pre-Selection Nomograph’ (OTM Book 18)





The nomograph does not contain precisely defined lines between the three operating environment categories since there are no absolute thresholds where one particular facility type is preferred over another. However, the gradual transition in colour on the nomograph from blue to white to red represents the relative increase in risk to cyclists as speeds and volumes on a roadway increase. As one progresses into higher levels of risk, there is a preference to provide the types of bicycle facilities that result in increasing degrees of separation. Once an operating environment and candidate facility type is identified, the practitioner should proceed to Step 2 to complete a more detailed assessment of site-specific conditions.

Although the nomograph provides a guide as to suitable facilities, the type that is identified may not always be the most appropriate solution for a given situation due to other design factors. A set of application ‘heuristics’, or knowledge-based rules, have been developed to aid practitioners in Step 2 of the bicycle facility type selection process. These heuristics link specific site conditions to appropriate facility types and supplementary design features.

Heuristics include:

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

OTM Book 18 also recognizes that cyclists vary in terms of their age, skill and comfort level. They also have differing purposes for their trips, with some cycling primarily for utilitarian reasons such as commuting and running errands, whereas others are riding for recreational or touring purposes. These factors will influence the route choices that individual cyclists make; some may prefer facilities within the roadway right-of-way as they are often more direct with greater connectivity, while others may elect to use trails for their greater separation from traffic and aesthetic qualities. Consequently, it is good practice to provide alternate on- and off-road facilities along parallel routes to allow cyclists to choose the facility type that is best suited to them.



Update to the City of Brampton PathWays Master Plan and Routing Plan

This study presents a candidate network concept, from which the proposed Active Transportation network can be distilled. Each link in the candidate network should be confirmed as being suitable for cyclists and an appropriate facility type should be identified.

Preferred Route Network and Facility Types

It is recommended that, as a first step, the City of Brampton PathWays Master Plan and Routing Plan be revised as part of an Active Transportation and Trails Master Plan Update. The AT network concept resulting from this study will form the basis for the update. For each given route, the facility type indicated by the Guiding Principles for Facility Selection outlined should be confirmed through the three-step process previously described.

There may be instances where design reviews identify other site constraints that would affect the feasibility of a particular candidate on-road facility. These may be localized constraints due to hydro poles, lighting standards, railway crossings or transit laybys and shelters. The vertical profile of a boulevard may be such that to achieve the necessary multi-use path width, retaining walls may be required.

Although such issues do not make the implementation of the facility entirely impractical, additional resources may be required to overcome them. In such cases, the decision may be taken to divert AT users onto adjacent primary trails through parkland. However, in determining what constitutes “adjacent”, careful consideration should be given to the additional distance being added to the AT trip. Additional access points may need to be added to the trail to ensure that the connectivity of the network and access to destinations is not compromised. In some cases, the costs associated with this may be greater than those associated with the measures required to overcome the original site constraints.

For the purposes of the gap analysis element of this study, it has been assumed that all roads identified as candidate routes are suitable for implementation. This should be further investigated using the process outlined. Where candidate routes are not included in the preferred AT network, the connectivity impact of omitting that facility should be investigated. Where appropriate, alternative routes may need to be considered.

In select locations where residents require on-street parking to accommodate their motor vehicles, an urban paved shoulder may be implemented as an interim solution. Pavement markings are similar to those for bicycle lanes, except that only the edge lines are painted with no bicycle stencils.

As cyclists may treat urban paved shoulders as if they were bicycle lanes, they should be of sufficient width to accommodate cyclists along the full length of the facility. Paved shoulders that meet the recommended width for bicycle lanes may be upgraded in the future by installing bicycle stencils on the roadway without the need for relocation of the edge lines.



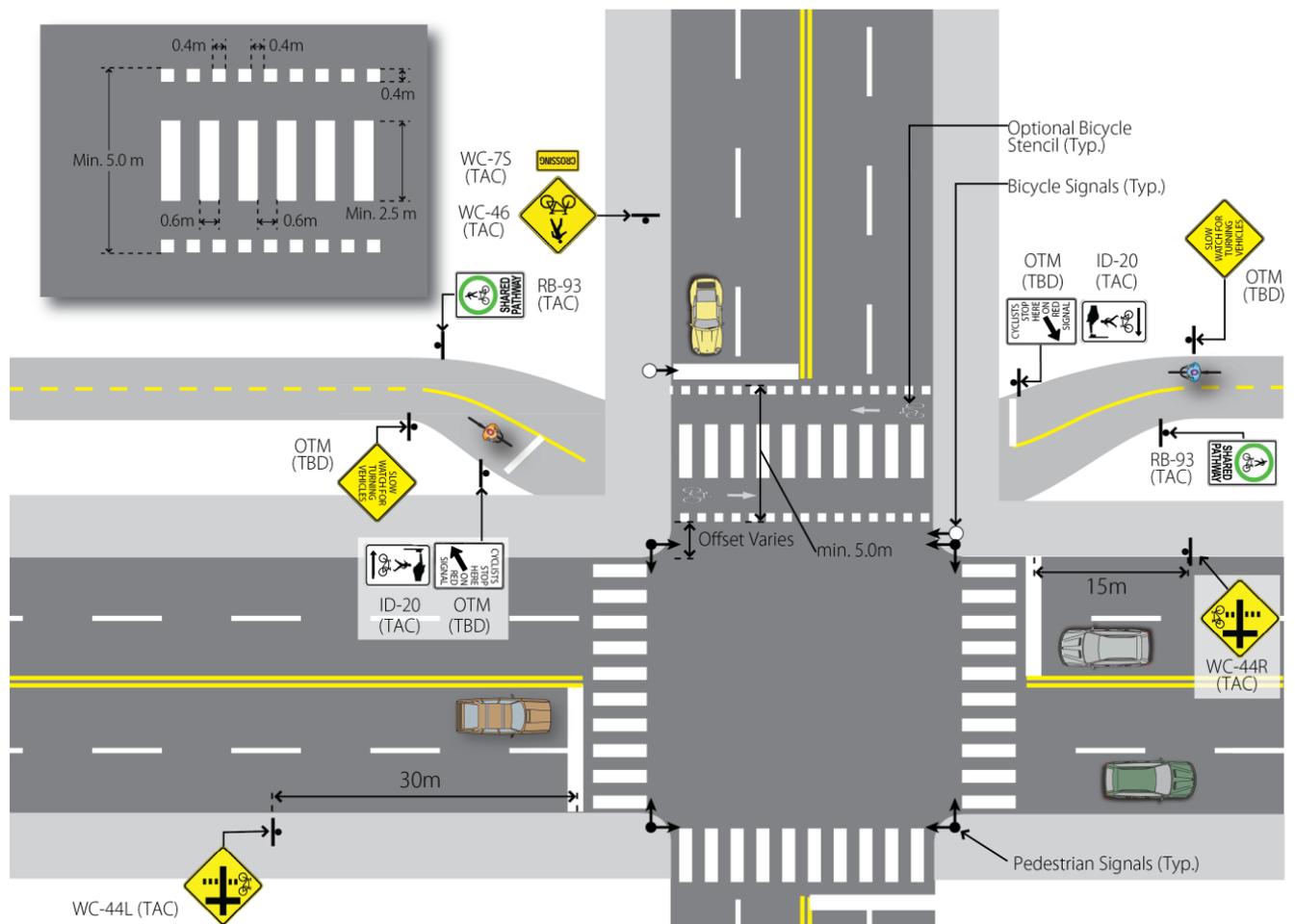
Streets that include urban paved shoulders should be signed as bicycle routes. Where insufficient road-of-way width is available to accommodate bicycle lanes or urban paved shoulders, roads may be signed as bicycle routes where roadway characteristics such as motor vehicle volumes and speeds are appropriate for shared use with cyclists. Shared use markings or ‘sharrows’ may be installed to guide cyclists and motorists on where to position themselves.

Please refer to OTM Book 18 on Cycling Facilities for guidance on bicycle facility dimensions, signage and other considerations.

Crossing Facilities

In addition to finalizing the route network, the AT and Trails Master Plan Update should also review the need for and location of underpasses, bridges, crossings and signals. Where existing crossing facilities link cycling routes, they should be upgraded to crossrides. Unlike crosswalks, where cyclists must dismount and cross as a pedestrian, crossrides allow cyclists to ride their bicycle within the crossing without dismounting. Practitioners may provide a crossing with separate space for cyclists and pedestrians, as shown in **Figure 8** below from OTM Book 18.

Figure 8 – Combined Pedestrian and Cyclist Crossride (Signalized Example)





Alternatively, the option exists to provide a combined crossing, with the cyclist crossing areas on each side of the pedestrian crossing. Where pedestrian and cyclist volumes are low, a reduced width mixed crossing may be proposed. This allows cyclists and pedestrians to mix, and for each to use the full width of the crossing, although cyclists must yield the right-of-way to pedestrians within the crossing. The need for mid-block crossings should also be investigated, particularly where AT paths switch from one side of the road to the other, or where cyclists may wish to cross over to access destinations on the other side of the road.

Implementation Phasing

Once the preferred route network has been finalized, the optimal phasing can be determined. In many cases, the most cost-effective approach will be to combine the works with roadway improvements, transit upgrades or other infrastructure investments. Maintenance cycles also offer frequent opportunities to implement new on-road facilities. In other cases, such as converting an in-boulevard sidewalk to an AT facility, timing is less dependent on external factors.

The significance of each link to the wider connectivity of the network should be evaluated considering the principles described in **Appendix B**. In particular, opportunities to incorporate AT improvements into major upgrades at critical points in the network, such as the freeway crossings identified in **Section 3.1**, should not be missed.



APPENDIX D: 2010 CITY OF BRAMPTON PATHWAYS ROUTING PLAN

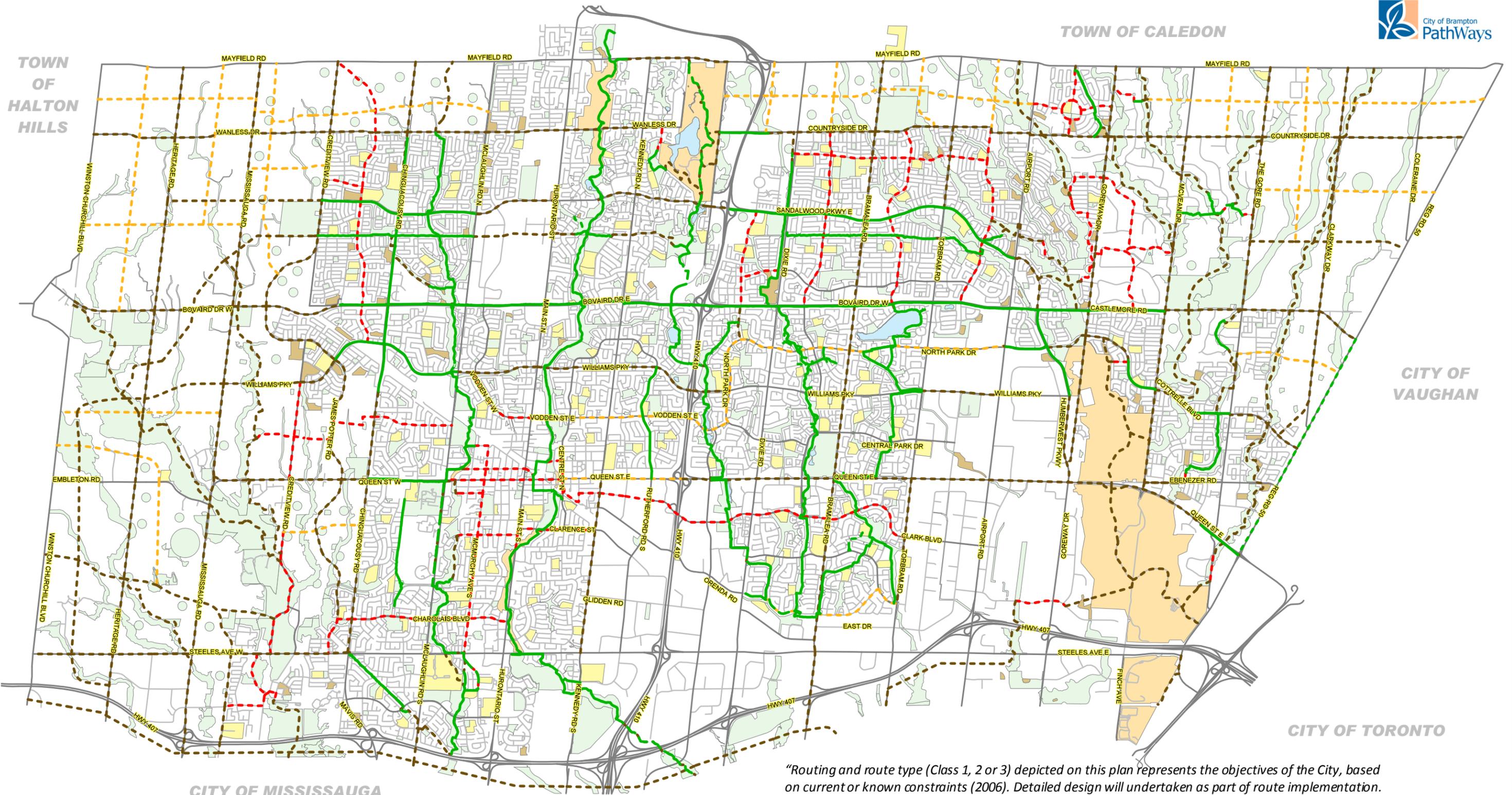
TOWN OF HALTON HILLS

TOWN OF CALEDON

CITY OF VAUGHAN

CITY OF TORONTO

CITY OF MISSISSAUGA



"Routing and route type (Class 1, 2 or 3) depicted on this plan represents the objectives of the City, based on current or known constraints (2006). Detailed design will undertaken as part of route implementation. This may result in amendments to the routing plan or changes to route type



Legend

- Existing Master Plan Pathways
- - - Proposed Master Plan Pathways
- - - Class I Proposed Pathways (Off Street)

- - - Class II Proposed Pathways (On Street Lane)
- - - Class III Proposed Pathways (On Street)

- Schools
- Parks

- Conservation Areas
- Stormwater Mgmt Ponds

Produced by : Parks Facility Planning

PATHWAYS ROUTING PLAN (2010)

Last Amended Date: April, 2008
Printed Date: May 31th, 2010