City of Brantford

Active Transportation Master Plan

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Final Report

September 2023

City of Brantford
Active Transportation Master Plan

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1. Introduction

The City of Brantford included a review of active transportation as part of the 2020 Transportation Master Plan Update (TMP), which included an assessment of pedestrian and planned cycling infrastructure. The development of the Active Transportation Master Plan (ATMP) supports the TMP recommendations by addressing pedestrian and cycling mobility in more detail. The pedestrian content focuses on gaps in the linear network, standards to maintain the network, and crossing of streets. The cycling content provides direction for the upgrade of the existing network and details of planned new facilities, including priority ranking and estimated costs. An overview of supporting actions to further encourage walking and cycling as modes of transportation (more than solely recreational) is also included.

Brantford has a population of 104,413 (2021). The following set of data provides an overview of the community.

Land area (urbanized)	62.13 km^2
Population density	1680.6 people/km^2
Median age	40.8 years of age
Number of households	41,675
Percent of single family homes	60.6 % (other types include apartments, etc.)
Average persons per household	2.5 people/household
AM peak period trips total	49,890 trips

Mode of transportation:

The majority of transportation is by motor vehicle, with 84% of all AM peak period trips by motor vehicle (including both driver and passenger).

1.1 Objective and Vision

The objective of the ATMP is to create a plan for the City of Brantford that will result in the implementation of Active Transportation Infrastructure that provides our citizens with access to various active transportation modes and options that encourage healthy living through physical activity, address social and economic transportation needs and help the City reach net-zero carbon emissions by 2050.

The following Vision Statement serves as an outline to provide direction for the ATMP.

> Active Transportation is an increasingly important component of urban transportation systems that assists in addressing environmental and climate concerns, equity issues and overall health of citizens. The ATMP will provide a guide to building a fully integrated active transportation network within the City of Brantford that is well

connected with purpose, safer and accessible for all users including pedestrians and cyclists.

There are critical benefits for the advancement of active transportation infrastructure throughout municipalities. These include addressing environmental concerns related to air quality and climate change. The addition of active transportation infrastructure can assist in reducing carbon emissions from vehicles that contribute to climate change as well as protect green space, reduce urban sprawl and promote the use of green technologies. Equality can be addressed by providing access to mobility for all citizens regardless of economic status through the design of the pedestrian realm and providing mobility for a person using a mobility device or a pedestrian with vision loss. A well-connected cycling network also addresses equity issues by providing mobility for children and adults that do not own a vehicle. Public Health professionals continue to raise concern with obesity rates of children due to a decline in active lifestyles. Providing a connected, safe and operational active transportation network that encourages a more active lifestyle for residents of all ages, can assist in addressing this issue. This is further supported by the Stats Canada Health Report on Cycling in Canada, which states;

> "The health benefits of physical activity, including cycling, are widely recognized. In an era when nearly a third of children and youth and just under two-thirds of adults are overweight or obese, cycling for leisure or transport is a valuable form of exercise. Cycling is also good for the environment—commuting by bicycle helps to alleviate road congestion and noise pollution and reduces emissions."

General urban design goals recognize the economic and lifestyle benefits of more compact cities that are supported by the implementation of active transportation infrastructure. These municipalities benefit from reduced maintenance and infrastructure costs (narrower streets), reduced use of land for parking lots, improved safety related to Safe Streets principles and a reduction in urban sprawl.

1.2 Cycling and Pedestrian Collision Statistics

The Ontario Traffic Manual Book 15 – Pedestrian Crossing Facilities, defines a pedestrian as "any person who is not in or upon a vehicle, motorized or otherwise propelled; or a person in a non-motorized wheelchair; or person in a motorized wheelchair that cannot travel at over 10 km/h; or a person pushing a bicycle or motorized wheelchair or non-motorized wheelchair".

The Ontario Traffic Manual Book 18 – Cycling Facilities, defines a cyclist as "a person who operates a human-powered or power-assisted bicycle, tricycle, or unicycle". Currently e-bikes or e-scooters are not permitted on city trails, multi-use paths or designated bike lanes. A bicycle is recognized as a vehicle in the Province of Ontario.

Cycling facilities as discussed in the ATMP are designed to accommodate both human-powered and potential future inclusion of power-assisted bicycles, tricycles, unicycles; segways; and electric skateboards.

Collisions involving cyclists were analyzed for a three-year period from January 2017 to December 2019. The majority of collisions involving cyclists occurred at intersections (79%). There were a total of 109 collisions involving cyclists, resulting in a yearly average of 36.3 collisions. Of these collisions, 17% are classified as property damage only, 72% are non-fatal injuries and 11% non-classified. One fatal cycling collision was documented during the 3 year period.

Collisions involving pedestrians were analyzed for a three-year period from January 2017 through December 2019. The majority of collisions involving pedestrians occurred at intersections (88%). There were a total of 155 collisions involving pedestrians, resulting in a yearly average of 51.7 collisions. Of these collisions, 80.6% resulted in non-fatal injuries. One fatal pedestrian collision was documented during the 3 year period.

Overall, data indicates driver behaviour is a significant contributing factor in the majority of collisions (56%) and 16% of collisions are classified as undetermined. Drivers were assessed as 'driving properly' in 27% of collisions reported.

The City of Brantford, through the Vision Zero Road Safety Action Plan, developed a data driven collision analysis program that focuses on priority collision locations that staff will provide recommendations to implement collision countermeasures to improve conditions. In addition, it is recommended that increased educational programs be implemented to target drivers, cyclists and pedestrians by reminding them of their responsibilities.

1.2.1 Cycling Highlights

The cycling network in the City of Brantford is a combination of off-street trails and facilities within the road right-of-way that includes bike lanes, signed routes, and multi-use paths. The planned expansion of the cycling network as outlined in this report is significant; and will provide connectivity to the 64.1 km of streets with existing cycling infrastructure (bike lanes, signed routes, and multi-use paths), plus 40 km of trails in greenspaces.

Plans for the network include an additional 135.2 km of on-street cycling facilities plus an additional 10.7 km of off-street trails to be added. Thus, a total cycling network of about 250 km (centerline value) of active transportation facilities will exist once fully implemented.

Appendix “A” is a map of projects to be undertaken, and Appendix “G” includes a general cross-sectional design for each project and cost estimate. The projects are listed in order of priority for implementation, with the ranking based on collision statistics, priority gaps in the existing cycling network, and land use characteristics (indicating potential cycling demand). Implementation of the 111 cycling projects (Appendix “G”) , will be led by Traffic Services and consideration will be given to accommodate cycling infrastructure through other Department/Division capital projects where appropriate. Active Transportation facilities will further be identified through the Development application process and will be identified by Transportation Planning in consultation with Traffic Services.

The cost of cycling projects to be completed within the road right-of-way is estimated at $12.7 million. This does not include the 11.7 km of planned new trails through greenspaces. The on-street cycling projects are divided into two groups:

1) Projects funded through the Capital Budget program – Reconstruction and Active Transportation ($355,000 annually) projects, estimated at $3.3 million total. These projects are estimated to be completed over the next 10 to 15 years.

2) Projects related to development (both “greenfield” and in existing urban areas identified as “strategic growth areas”) total an estimated $9.4 million. This funding requires identification through the development charge study and those projects would then assume to be fully or partially funded from development charges.

Funding of new trails through greenspaces is recommended to be funded through the City’s Capital Budget process by Parks & Recreation. The two active transportation potential crossing locations over the Grand River that have been identified, will require extensive Environmental Assessments, stakeholder consultation and additional funding. These crossings should be taken into consideration as opportunities through development or extensive construction projects and as funding opportunities present themselves.

The maintenance of cycling infrastructure conducted by Operational Services during the summer season consists of road patrol inspections, pothole and catch basin repairs and regularly scheduled sweeping of on-street bike lanes. During the winter months, the City is required to clear designated bike lanes and multi-use paths of snow as defined by Maintenance Standards and Legislation.

It is recommended that the costs associated with maintenance be tracked on a location by location basis so that as the cycling network expands and new forms of infrastructure are added, the maintenance costs can be more accurately estimated.

The Parks and Recreation Division maintains the trail network system (shared pedestrian-cycling facilities in greenspaces). These maintenance works are primarily completed during the summer season which includes pavement repairs and foliage removal. Parks and Recreation is also in the process of developing a maintenance work program as was identified in the Trail Safety Audit Study

The City of Brantford partnered with Strava Metro, a company that developed the largest dataset collection of human-powered transportation through a user app. The program collects data from registered users' cellphones to track cycling and pedestrian trips in the City. The data shows modes have increased substantially between the years 2018 and 2022. In 2018, there were 23,257 Active Transportation trips tracked by 3,057 registered users. In 2022, this number increased to 63,278 trips tracked (a 172% increase) and 6,053 registered users. The average number of trips per Strava user increased 38% during this same period. These numbers show that interest in active transportation modes has increased immensely during this time period. Even higher trip volumes were recorded in 2021 during the height of the pandemic. Continued City investment to enhance the active transportation network would continue this trend of increased walking and cycling.

1.2.2 Pedestrian Highlights

Pedestrian facilities (eg. sidewalks and crossings) in the City of Brantford are in good condition and staff continue to take action to enhance the pedestrian facilities. The network of sidewalks city-wide is expansive (approximately 610 km of concrete sidewalks), although there are a few neighbourhoods that lack some sidewalks and connectivity, specifically the neighbourhoods of Greenbrier, Centennial, Grand Woodlands, Farringdon Park area, and East Ward/Echo Place in the vicinity of Woodman Park (both north and south of Colborne Street). The lack of sidewalks in two industrial areas of the city were identified and included Oak Park Road, Lynden Road, Henry Street and Elgin Street. As identified by Planning and Development Services, sidewalks are to be installed on both sides of all streets as per municipal standards.

Pedestrian connectivity is also enhanced with the network of trails and multi-use paths across the city.

Pedestrian crosswalks are provided using five different types of facilities. Curb-cuts exist at nearly every existing crossing, and they are upgraded with tactile plates to assist those with visual disabilities. The City is also actively upgrading the full network of signalized intersections across the city to include audible pedestrian push buttons for people with visual disability and to meet Accessibility for Ontarians with Disabilities Act (AODA) requirements by 2026. The network of pedestrian crossings is being expanded with the recently introduced Pedestrian Crossovers (PXO) and the introduction of raised crosswalks, which further improves safety and mobility for pedestrians.

Through the community engagement process, the feedback indicated concerns with residents not clearing snow and ice during winter weather events. While property owners are responsible for clearing sidewalks adjacent to their property, with an aging population it can become more difficult for residents to complete snow clearing. City services have increased their monitoring of winter sidewalk clearing over the last several years to ensure accessibility for all residents. The City of Brantford offers a community volunteer service called “Snow Buddys” that could be promoted to enhance the level of winter sidewalk clearing.

2. Background Documentation and Public Engagement

The City of Brantford has a number of Council-approved documents that clearly state efforts to enhance active transportation facilities across the city. These documents provide support for the development of the ATMP and implantation of cycling, pedestrian infrastructure.

Staff undertook an extensive public engagement process as part of the development of the ATMP and the input from residents has helped to form the content of this report.

2.1 City of Brantford Documents

2.1.1 Council Priorities (2023-2026)

Council identifies a list of priorities at the outset of each term, and five of these priorities support efforts to invest in active transportation infrastructure:

Priority #3 Move people more effectively.

Priority #4 Create a vision and strategy for managing development and affordable housing.

Priority #5 Develop a planning and implementation schedule for various projects related to City assets.

Priority #9 Commit to and implement the downtown revitalization plan and vision.

Priority #10 Build a greener Brantford.

2.1.2 Brantford Official Plan

The City of Brantford Official Plan states 10 principles upon which the policies of the document were developed. Three of these principles support active transportation initiatives. They are:

Principle 5 New development achieved through intensification initiatives will focus on Strategic Growth Areas and will support the ongoing revitalization of the Downtown, mixed-use centres and mixed-use corridors. Intensification will be compatible with existing development patterns, while supporting an evolution to a more compact and transit-supportive urban structure.

Principle 7 The City will endeavor to achieve healthy communities that are accessible and inclusive with a diversity of housing and transportation options. Amenities and services will be close to where people live. The City will strive to provide all communities

with equal access to recreation and leisure amenities, including for sports, arts and cultural related activities.

Principle 9 Active transportation modes, including walking and cycling, will be recognized as safe, convenient and appealing options for travelling around the City. Pedestrian-friendly community design and a connected multi-use pathway and trail network will provide enhanced mobility options across the City for people of all ages and abilities.

The Official Plan also includes policies to support active transportation through 1) addressing the needs, safety, and convenience of pedestrians and cyclists when constructing or reconstructing transportation infrastructure, 2) following the principles of Complete Streets in the design of roads, 3) accommodating active transportation on new roadways, and 4) planning and developing a continuous and linked network of multi-use pathways, trails and bikeways throughout the City. The Official Plan also includes a map showing the ultimate plan for the off-street trail network, and it is included in the ATMP as Appendix B.

2.1.3 2020 Brantford Transportation Master Plan Update

The City of Brantford's TMP Update was approved by Council in 2020 and included a comprehensive review of the city's transportation network (all modes of transportation). A brief addendum was added in 2021 which did not modify any of the active transportation content. The City of Brantford benefits from an existing urban form that includes a compact street network in much of the city and some existing on-street bicycle lanes and multi-use paths. Efforts to increase active transportation mode share are modestly successful as the active transportation mode share (walking and cycling combined) has steadily increased from 6.6% (2006) to 6.9% (2011) to 7.8% (2016). These values are for trips that both start and end within the City of Brantford. (Transportation Tomorrow Survey, Joint Project in Transportation at the University of Toronto, 2017)

Section 3.0 of the TMP describes a framework for complete streets. Sidewalks are justified on all streets and where the speed limit is posted at 50 km/h or greater, the ideal design includes a 2.0 m buffer between the roadway and a sidewalk. Sidewalks should be provided on both sides of all local and collector streets, and arterial streets could replace one of the sidewalks with a multi-use path to accommodate cyclists. Table 3-3 in the TMP provides specific details and dimensions. Signalized intersections that are the jurisdiction of the City are required to include pedestrian crosswalks. Midblock crossings are to be positioned as per provincial guidelines, municipal policies and standards which consider design elements including sight distances, posted speed limits, roadway geometrics, and existing volumes of both pedestrians and motor vehicles. Tactile plates and curb-cuts are to be integrated into all pedestrian crossings.

Cycling facilities are to be designed based on street characteristics including motor vehicle volumes, the number of vehicle lanes, and sensitive to any on-street parking.

The document provides descriptions and images of many active transportation facilities including sidewalks, multi-use paths, trails, pedestrian crossing types, signed bike routes, Bicycle Priority Streets, paved shoulders, bike lanes, buffered bike lanes, cycle tracks, and crossrides.

The City conducted an addendum of the Transportation Master Plan (2020) in 2021. This 2051 Addendum states "The Active Transportation Plan remains as documented in the 2020 Transportation Master Plan Update". This addendum does state some initial categorizing of cycling projects into three stages of implementation – Short, Medium, and Long Term; and includes costing of all cycling/ trail projects to total $31.7 million (2020 dollars). A map entitled Proposed 2051 Active Mode Network describes the planned cycling network, and is included in the ATMP as Appendix C.

2.1.4 Parks and Recreation Master Plan (2018)

The Parks and Recreation Master Plan addresses the broad spectrum of community recreation, including off-road trails. Off-road trails serve both recreational and utilitarian needs for pedestrians and cyclists. Three critical objectives related to the trail network are stated in the Plan:

1. To support the development of new sports and new user groups as may occur with the diversification of the population (age, ability, ethnicity, and income) and recreational interests (related to the delivery of recreational services).
2. To promote physical activity as a way of life and quality of life through programming as well as through ensuring passive and active recreational opportunities are accessible through a range of activities e.g. trails (related to health, wellness, and active living), and
3. To enhance the urban trails system through effective on- and off -road linkages which provide a connected trail navigation system (self-guided or otherwise) and integrating all quadrants of the City.

Recommendations are identified specifically for the trail network, including elements such as the continued expansion of the bikeways and trails network described in the Official Plan and other linkages described in the Parks and Recreation Master Plan; a standard/ policy for winter maintenance of trails; a comprehensive inventory and mapping of trails; a unified trails signage, identification, and wayfinding network; and promotional materials for citizens and tourism marketing.

2.1.5 Vision Zero – Brantford's Road Safety Plan

The Strategic Vision, as stated in the Vision Zero: The City of Brantford's Road Safety Plan, identifies the need to educate all road users to improve road safety in the City and

aims to reduce collisions that involve cyclists and pedestrians by 25%. Vulnerable road users (pedestrians and cyclists) are identified as a critical area of focus. In 2019, the number of cyclist and pedestrian collisions totaled 94, of which 2/3^{rds} were pedestrian related. The Road Safety Plan under Engineering Action and Evaluation, Action C, states,

> Continue expansion of the cycling network, specifically as multi-use paths, trails through greenspaces, and segregated bike lanes to improve safety.

Reviews of the Vision Zero Plan are identified as an on-going task, so this Safety Plan will continue to evolve based on City and community input. The six 'E's – engineering, enforcement, engagement, education, equity and evaluation – are a fundamental element of the Safety Plan.

2.1.6 Brantford Age Friendly Strategy (2022)

Transportation is identified as one of eight focus areas for healthy aging. Within the document, Strategies 1.1 and 1.2 identify walking enhancements on sidewalks, trails, and in parks to ensure the needs of older residents are addressed. Pedestrian infrastructure elements include street crossings, illumination, expanding the network of facilities, signage, and amenities. Strategies 2.2 and 2.3 identify infrastructure improvements for vulnerable road users, expanding the cycling network, and enhancements of additional transportation options. Metrics that are identified for on-going monitoring of progress include:

- Total km of sidewalks
- Total km of paved paths
- Total km of bike lanes

2.1.7 Age Friendly Community Summit (2015)/ Community Impact Report (2017)

A summit held in 2015 in the City of Brantford that included community participants representing 19 organizations is described in a final report entitled the Community Impact Report (2017). Transportation was one subject area discussed during the day-long 2015 Summit. Highlights from the discussion, focusing on active transportation items that, at the time, were not yet initiated or complete include:

- Enhance amenities at bus stops – including shelters and benches
- Ensure parking lots accommodate wheelchairs
- Provide charging stations for electric wheelchairs across the city
- Review sidewalk specification – minimal ridges and minimal slopes
- Aim for wider sidewalks
- Add bike lanes where possible
- Ensure a high standard of winter maintenance – e.g. snow buddies program
- Ensure an accessible/ seniors lens in city planning

- Ensure sensitivity training includes mobility and aging issues
- Enact legislation for wheelchair design (lights, reflectors, etc.)
- Develop a safety campaign to promote wheelchair safety (directed at users AND others)

2.1.8 Bicycle Friendly Community Workshop (2018)

In 2018, the Share the Road Cycling Coalition facilitated a Bicycle Friendly Communities Workshop for the City of Brantford. The purpose of this Workshop was to help identify a path forward for the area to become more bicycle friendly through the development of new programs, projects, and partnerships, and to make cycling more comfortable and accessible for all residents and visitors to the area. The Workshop focused the efforts of over 80 attendees on developing strategies to advance new programs to support cycling in addition to creating innovative strategies for creating a stronger network of cycling infrastructure throughout the City. A work plan was created that follows the five E's of the Bicycle Friendly Communities program including Engineering initiatives, Education initiatives, Encouragement, Enforcement, and Evaluation & Planning.

2.1.9 Downtown Streetscaping Study

Approved in 2022 by Council, this study details plans to enhance the downtown core, focusing on street design. Included in the study are plans to enhance the pedestrian realm and to create well-defined east/west bicycle lanes through the downtown. On Dalhousie Street the cycling facility is planned to be westbound only along the north side of the street; terminating at Queen Street, and on Colborne Street the facility is planned to be eastbound only along the south side of the street. West of Queen Street the Colborne Street facility is planned to be a two-way facility to continue the downtown cycling connection across the Icomm Drive intersection to Brant's Crossing. An intersecting two-way link on Queen Street from Colborne Street to Dalhousie Street and continuing to Wellington Street is planned to connect these east/west facilities and to connect cyclists to the residential neighbourhood north of downtown.

These links are incorporated into this city-wide active transportation study, ensuring the downtown facilities are well-connected to the adjacent neighbourhoods and the broader network.

2.1.10 Trails Safety Audit

The Trail Safety Audit was conducted in 2022. The study identified actions regarding the general condition and maintenance of the trail network and site specific tasks – including slope stabilization, surface repairs, vegetation maintenance, street crossing enhancements, etc. A schedule of 10 years of actions (to 2032) was developed, and a total estimated cost of these works is $1.9 million. A plan for community education of trail usage was also described.

2.1.11 Walk 21: Walkability Roadshow Brantford (2007)/ Brantford Community Strategic Plan

This Community Strategic Plan focused on pedestrian infrastructure and the 'culture of walking' in the city. Many ideas were brainstormed in this community event. Discussions included identifying existing strengths and future objectives to improve the pedestrian realm. The City of Brantford was envisioned with an enviable 'livability' that includes walking and cycling as typical modes of transportation. Existing documentation describing the links between more active lifestyles and the general health of citizens was presented. 'Walkability' as a metric to measure a community's pedestrian amenities was described. The benefits of strong communication between various City Departments were recognized, and examples of existing cooperation between Public Health and Public Works staff were cited.

Objectives identified by participants included:

- Integrate pedestrian strategies into City planning and specifically in new developments,
- Ensure the Downtown Master Plan prioritizes pedestrian activity,
- Ensure all City policies support active lifestyles (and not hamper active transportation),
- Have city-wide policies to incubate active transportation,
- Ensure 'tools' exist to create pedestrian infrastructure (e.g. various types of street crossings),
- Complete an inventory of drop curbs city-wide,
- Review pedestrian connectivity to critical activity centres including the downtown, the train and bus stations, and major trails,
- Complete an inventory of audible signals city-wide,
- Investigate modifications to speed limits in various areas of the city,
- Check on the status of a City program of Public Art to enhance the pedestrian realm,
- Continue to create a pedestrian promenade along the river,
- Install a wayfinding network-of-signage in the downtown,
- Build a skateboard park,
- Create pleasant pedestrian spaces that encourage walking - both downtown and suburban,
- Confirm that the Mayor has signed the International Charter for Walking,
- Explore the idea of a World Record Walk – with Parks & Recreation leading this initiative, and
- Ensure information is on the City website encouraging and promoting walking/ active transportation.

The above list shows the vision that the community had in 2007, and that the City has made progress on various ideas that were brought forward at that time. In 2010, the City was recognized with the Ontario Walkability Award of Excellence which was presented in recognition of the City's work to improve community walkability and foster a culture of walking within the city.

2.1.12 Provincial Documents

Note that there are Provincial documents that provide justification and specific direction for investment in pedestrian and cycling infrastructure, and links to critical documents are provided below:

- AODA – Accessibility for Ontarians with Disabilities Act
  - www.aoda.ca
- Ontario Traffic Manual Book 15 – Pedestrians
  - www.library.mto.gov.on.ca
- Ontario Traffic Manual Book 18 – Cycling
  - www.otc.org/research-and-resources/otm-book-18
- CycleON – Action Plan 2.0
  - www.ontario.ca/page/cycleon-action-plan-20

2.1.13 Academic

Analysis of collision data reveals that cyclists and pedestrians involved in collisions are 80 to 90 percent are more likely to sustain injury. Research by People for Bikes (USA, 2018) indicates that 70% of respondents from polling in eight USA cities stated that conventional bicycle lanes are not 'safe' enough – and 63% of these would utilize a bicycle (more) if cycling facilities felt safer. The same expectations for cycling comfort exist for all types of cyclists. The average cost of expanding the cycling network during the past three years (2019 – 2021) in five American cities (Austin, Denver, New Orleans, Pittsburgh, and Providence R.I.), three of which are winter cities, averages $174,000/km. (www.Bloomberg.com How to Make a City Safer for E-Bikes? Think Infrastructure).

2.1.14 Community Climate Change Action Plan

In July 2022, City Council approved the Community Climate Change Action Plan (CCCAP) which provides a guide for all members of the City of Brantford community on how they can adjust their own behaviours to reduce greenhouse gas (GHG) emissions. Total community GHG emissions in 2019 were 743,515 tonnes of carbon dioxide equivalent (T of CO_2) with 31% of emissions coming from on-road transportation. The City of Brantford has emission reduction targets of 30% by 2030, 80% by 2040, and net-zero by 2050. Transportation is a key aspect of the City's climate change efforts to reach these targets. The CCCAP outlines City actions to increase active transportation in the community including completing the ATMP and continuous improvements to on-

road bike facilities and off-road trail networks. Community members are encouraged to increase their active transportation by taking advantage of the trail and bike lanes in and around the City of Brantford, learn more about bike safety, and participate in Bike Month in June every year to improve their knowledge of the cycling network.

Active transportation produces almost no GHG emissions so with the City's goal to shift away from motor vehicle use toward active transportation will have a dramatic impact on reducing GHG emissions and improving air quality in the City as per the City's CCCAP. The ATMP includes new dedicated cycling and walking facilities in the City which will reduce annual GHG emissions and energy consumption from passenger transportation. With every vehicle taken off the road, approximately 3.1 tonnes of CO_2 is eliminated annually.

2.2 Community Engagement

Development of the ATMP was initiated in April 2022 and the community engagement portion of the project focused on two general opportunities for residents to provide comments through the Plan development period.

The first opportunity was the development of an online survey through the City's Let's Talk Brantford platform, where residents had opportunity to provide feedback on both pedestrian and cycling facilities in the city. Residents were asked several questions to describe their level of usage and ideas to improve the active transportation facilities in the City of Brantford. A total of 303 residents completed the online survey during the months of June and July, 2022.

The second opportunity came from two Public Open houses that were hosted in late July 2022, one at City Hall and a second at the Wayne Gretzky Sports Centre. Valuable comments were received. The information was also posted online with an online response form. Overall, most public comments received support City investment in both pedestrian and cycling infrastructure.

2.2.1 On-line Survey

The online survey was posted June 23, 2022. A copy of the survey is included as Appendix E. In addition to the online survey, three additional efforts were made to increase the community awareness of the Plan; they included:

- Staff hosted a Pop-up Information Table for Bike Month with electronic access to the survey using tablets: June 24, 2022 at the Brantford Farmers' Market & June 25, 2022 at Brant's Crossing.
- The survey was promoted through an online social media link.

- The Grand River Council on Aging promoted the link in their newsletter which is distributed to approximately 425 contacts, plus posted on their Facebook page which has approximately 950 followers.

A total of 303 responses to the online survey were received. The results provide a basis of support for active transportation initiatives and a community perspective for decision making to adopt active transportation infrastructure.

A total of 73% of respondents identified that they walk daily or weekly for the purpose of recreation or exercise. A total of 32% of respondents identified that they walk as their primary mode of transportation to complete tasks.

The state of sidewalk infrastructure in the City of Brantford is considered to be acceptable based on survey results. The continuity of sidewalks is rated as good, including 'no gaps' and 'a few missing gaps', by 74% of respondents. 'Gaps' in sidewalks refers to both short and long segments of missing sidewalks, regardless of whether constructed in concrete or asphalt. Figure 1 below depicts the rating of sidewalk continuity, with the two-tones of green indicting the 'good' ratings.

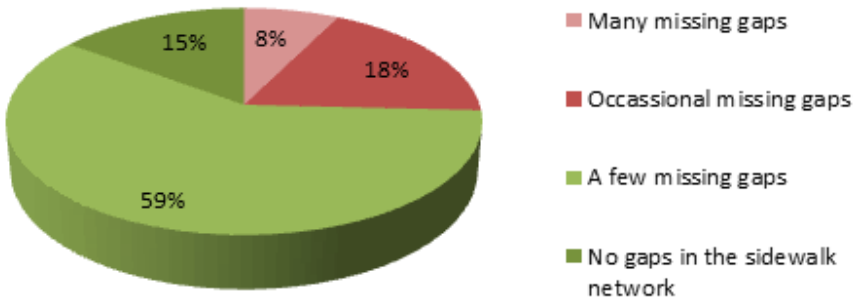


Figure 1: Sidewalk Continuity – Community Feedback

The condition of sidewalks is rated as good, including ‘always good’ and ‘usually good’, by 62% of respondents (e.g. concrete in good condition, reasonably level, etc.). Figure 2 depicts the rating of sidewalk condition, with the two-tones of green indicting the ‘good’ ratings.

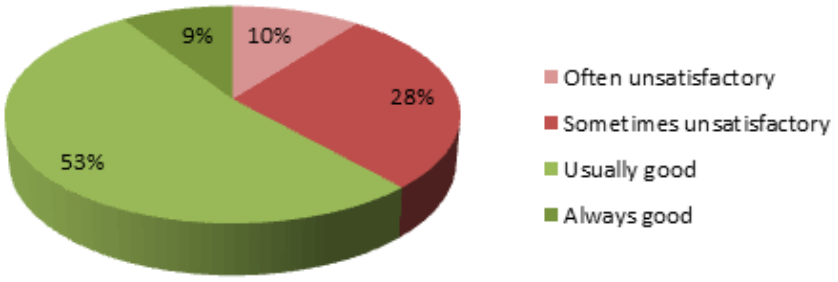


Figure 2: Sidewalk Condition – Community Feedback

The winter maintenance levels are rated as ‘good’ by 30% of respondents, including ‘always good’ (3%) and ‘usually good’ (27%) categories – the green shaded areas in Figure 3 below. However, 40% of respondents stated that winter maintenance is ‘sometimes unsatisfactory‘, so a minor increase in winter maintenance efforts may see a significant increase in community satisfaction.

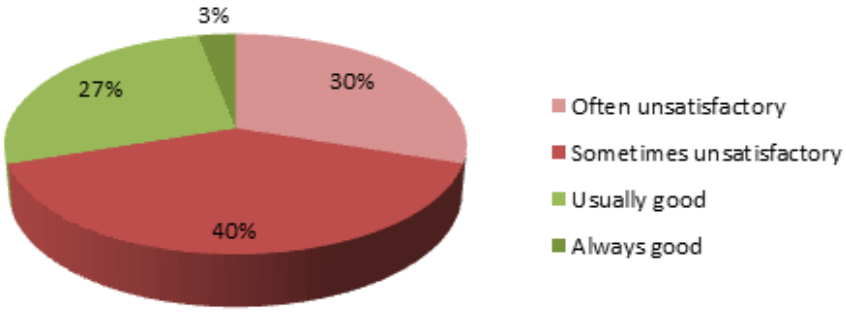


Figure 3: Sidewalk Maintenance – Community Feedback

The survey found 80% of respondents are satisfied with the accommodation for pedestrians at existing traffic signals.

The City should continue efforts to educate residents about PXO’s as less than half of respondents (44%) are clearly aware of these new traffic control devices.

Locations suggested for improved pedestrian crossing accommodations included 85 intersections. A few were identified multiple times including:

- Brant Avenue/Paris Road,
- Clarence Street/Icomm Drive,

- Dunsdon Street/Blackfriar Lane,
- Dunsdon Street mid-block west of Park Road North,
- Erie Avenue/Ninth Avenue.

An additional 18 intersections were identified twice. A few comments regarding the need for traffic calming were also received. Three comments (1% of respondents) suggested that additional pedestrian crossings are unnecessary, and that money could be spent on more important items.

Respondents describe their cycling activity as follows (multiple answers were permitted):

- Recreational cycling is very typical: 60% - 80% of respondents
- Commuter or task-oriented cycling is well represented: 30% - 50% of respondents
- 20% of respondents indicated that they do not cycle.

Residents were asked their 'top 4' critical issues to improving cycling. Three issues rank as a top priority:

- Filling in gaps in the cycling network,
- The need for improved driver etiquette, and
- Include more buffers/barriers in bike lane design.

A question was asked to identify the most-common destinations across the city to help prioritize cycling projects (links). They are:

- Commercial areas
- Trail network.
- Downtown
- Lynden Park Mall commercial area
- Brantford Commons/King George Road
- Powerline Road
- Mohawk Park

The on-line survey asked residents to identify trail crossings that would benefit from traffic control. Approximately 40 locations were identified demonstrating that residents are familiar with the trails network. Nearly 50% of the total 303 surveys completed include information for this question. There were two locations that were clearly identified as priority locations based on the frequency of responses. They are:

- Erie Avenue @ Hamilton/Brantford Rail Trail
- Veterans Memorial Parkway/Colborne Street @ TH&B Rail Trail

- Hardy Road (SC Johnson Trail/on-street)
- TH&B Rail Trail crossings at Locks Road, Mohawk Street, Birkett Lane, and Shellard Lane
- Colborne Street @ Icomm Drive
- Wayne Gretzky Parkway @ Highway 403.

The community 'review' of existing bicycle lane infrastructure indicates that some residents want to see more elaborate designs for cycling infrastructure. Of respondents, 70% submitted comments for this question. Approximately 20% of respondents are satisfied with the current design of bike lanes, while 80% desire more buffers or barriers to separate cyclists from vehicles. Of the four possible enhancements suggested (multi-use path, concrete curbs, flex posts, and painted buffer), all four appear to solicit comparable levels of support – regardless of the traffic characteristics. Five streets had a modestly higher level of support for enhancements including: Hardy Road, Dunsdon Street, North Park St, Erie Avenue, and Garden Avenue.

54% of respondents support the idea that the City should finance a cycling safety education program. Two suggestions on how to possibly implement a cycling education program were listed:

1) A program structured within schools (Grade 5 suggested), and

2) A program offered at City recreation facilities.

Six times more respondents favour the program offered within schools. 10% of the respondents omitted this question, and 5% of respondents indicated that cycling education is not necessary for youth in the City of Brantford.

Some general demographics on who completed the survey are provided below:

- 1% of respondents are teenagers
- 27% of respondents are in their 20s and 30s
- 41% of respondents are in their 40s and 50s
- 30% of respondents are in their 60s or older.

The average age of respondents was 50 years old (49.9). 55% of respondents identify as female.

2.2.2 Public Open House

The Open House portion was hosted at the following two locations:

- Monday July 25, 2022 6 p.m. to 8 p.m.
    - Council Chambers, City Hall, 58 Dalhousie Street

- Wednesday July 27, 2022 12 p.m. to 2 p.m.
    - Foyer, Wayne Gretzky Sports Centre, 254 Park Street North

Feedback received from approximately 25 people attending the 2 venues. Comment was also received from 1 person online. The information presented at the two venues and online is included in the ATMP as Appendix F.

Comments received through this Open House are summarized as follows:

- The trail network is well-appreciated by many residents.
- The recently installed new pedestrian crossing devices called PXOs work well.
- Community education of active transportation infrastructure would be excellent e.g. for the new PXOs and for new design features that are a part of bike lanes.
- AODA features such as audible signals and tactile plates at curb-cuts are very much appreciated.
- Promote recreational cycling on our great trail network to get more residents on bicycles, and then some will develop commuter cycling habits.
- Cycling education in schools is very important.
- Some streets are missing sidewalks – they are needed.
- More cycling infrastructure is needed.
- Create a program to encourage more existing businesses to install bike racks – and ensure all new development includes bike parking.
- Do all City facilities have bike parking?
- Review the size of text on existing wayfinding signage.
- Continue concrete sidewalks through all driveways.

2.2.3 Notice of Study Completion

A draft version of the ATMP study, complete with appendices, was posted on the City's website as community notification of the document and to solicit residents' comments,. The ATMP was posted for two weeks in August 2023 and a total of 15 responses were received.

The Study was also circulated internally to City Departments and the Active Transportation Working Group for final comments.

3. Active Transportation Infrastructure

Pedestrian and cycling infrastructure is addressed as two separate considerations of infrastructure as the needs of both differ. It is noted that there are locations where the two modes of transportation do share facilities with multi-use paths along street rights-of-way, trails, and paved shoulders in rural areas. Transportation design does otherwise aim to separate these two modes due primarily to speed and characteristic differences.

3.1 Collision Analysis

In order to assess safety of the network for vulnerable road users, an analysis of collisions involving cyclists and/or pedestrians was completed between 2017 and 2019.

3.1.1 Collision Analysis - Cycling

Cycling collision data across the city was analyzed for a five year period, January 2017 to December 2021. On March 17, 2020, the Government of Ontario declared a state of emergency due to the COVID-19 pandemic and ordered gradual closure of businesses and stay at home orders. Similar to other jurisdictions in Ontario, the City of Brantford experienced a reduction in vehicular traffic volumes, resulting in a reduction in the number of collisions. Based on this information it was determined to be more appropriate to utilize three years of data 2017 – 2019 because they were typical years prior to the pandemic.

The data is a record of all collisions, both police attended collisions and self-reported. Figure 4 shows how collisions declined significantly during the pandemic, with the annual average number of collisions involving cyclists dropping to 21.5 collisions/year, with the previous three years of collisions averaging 36.3 collisions/ year. Figure 4 also shows how the majority of collisions that involve cyclists are at intersections, indicated by blue (79%); and a much smaller portion of collisions being midblock (between intersections), indicated by orange (21%).

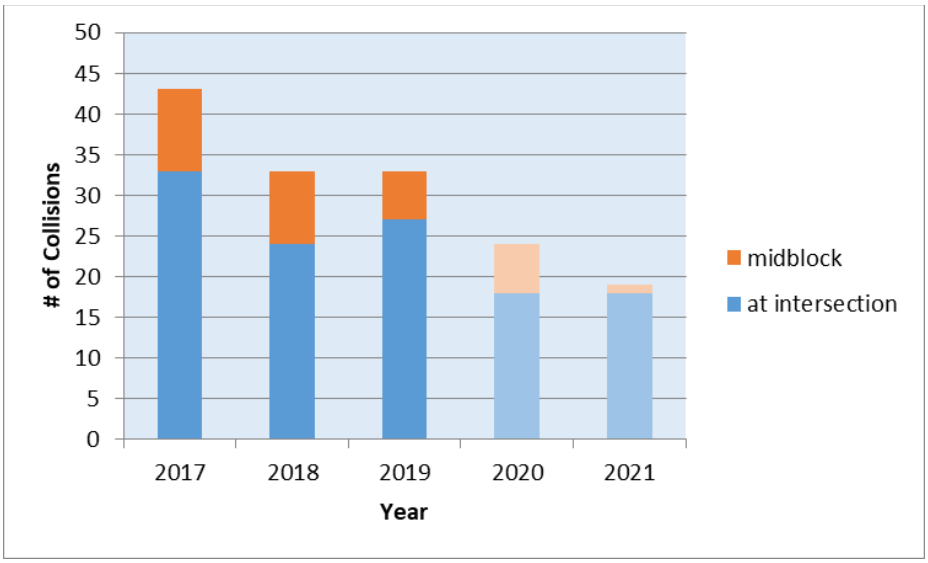


Figure 4: The Frequency of Collisions Involving Cyclists (2017 – 2021)

Analysis of the three years of data 2017 – 2019 provides an understanding of collision characteristics, including severity. The total number of collisions involving cyclists in this three year period totals 109 collisions. Of these collisions, 19 collisions (17%) are classified as 'property damage only'; and 79 collisions (72%) classified as 'non-fatal injuries' (involving some degree of injury). Three of the 109 collisions (3%) are collisions between a cyclist and a pedestrian. One fatal cycling collision occurred in September 2019. The following graph, Figure 5, shows the 109 collisions classified by collision type. Since the majority of collisions occur at intersections, the most frequently occurring collisions types are 'turning collisions' (47%) and 'angle collisions' (31%).

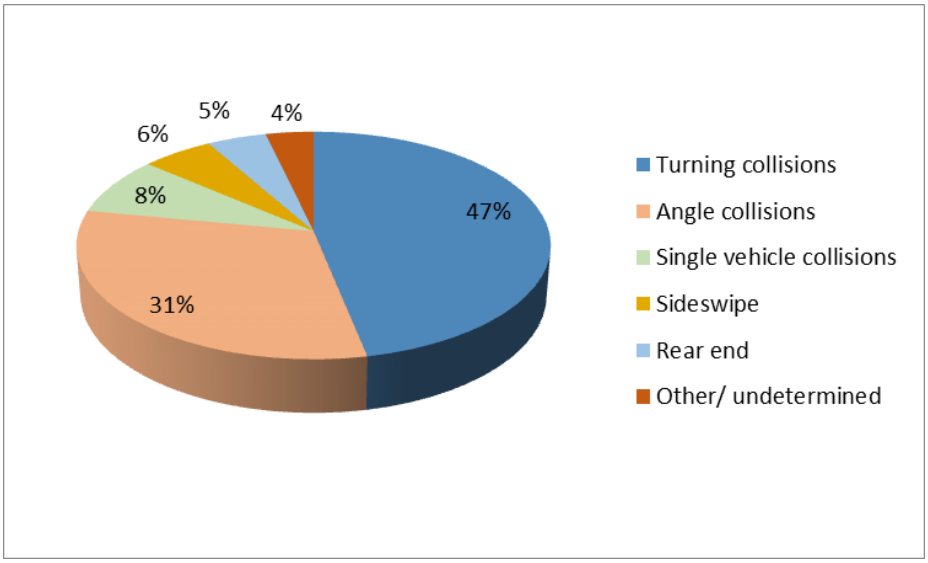


Figure 5: Collisions Involving Cyclists Classified by Collision Type (2017 – 2019)

3.1.2 Collision Analysis - Pedestrians

Pedestrian collision data across the city was analyzed for a five year period, January 2017 to December 2021. On March 17, 2020, the Government of Ontario declared a state of emergency due to the COVID-19 pandemic and ordered gradual closure of businesses and stay at home orders. Similar to other jurisdictions in Ontario, the City of Brantford experienced a reduction in vehicular traffic volumes, resulting in a reduction in the number of collisions. Based on this information it was determined to be more appropriate to utilize three years of data 2017 – 2019 because they were typical years prior to the pandemic.

The data is a record of all collisions – both police attended collisions and self-reported. Figure 6 shows how collisions declined significantly during the pandemic, with the annual average number of collisions involving pedestrians dropping to 31.0 collisions/year, with the previous three years of collisions averaging 51.7 collisions/year. Figure 6 also shows how the vast majority of collisions that involve pedestrians are at intersections, indicated by blue (78%); and a much smaller portion of collisions being midblock (between intersections), indicated by orange (22%).

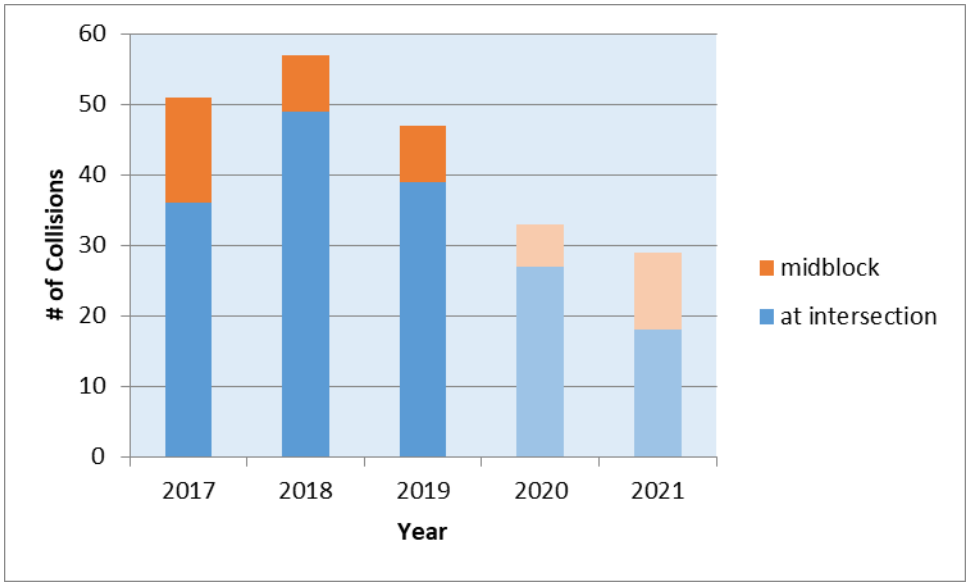


Figure 6: The Frequency of Collisions Involving Pedestrians (2017 – 2021)

Analysis of the three years of data 2017 – 2019 provides an understanding of collision characteristics, including severity. The total number of collisions involving pedestrians in this three year period totals 155 collisions. 21 collisions (14%) are classified as property damage only and 125 collisions (81%) classified as non-fatal injuries (involving some degree of injury). Three of the 155 collisions (2%) are collisions between a cyclist and a pedestrian. One fatal pedestrian collision occurred in March 2018. The following graph, Figure 7, shows the 155 collisions classified by the assessed

operations of the driver of the vehicle. The data indicates that drivers are at fault in 56% of all collisions: failing to yield, making improper turns, and disobeying traffic controls; and that drivers are driving properly in 27% of reported collisions. Note that in 16% of the recorded collisions, fault is undetermined.

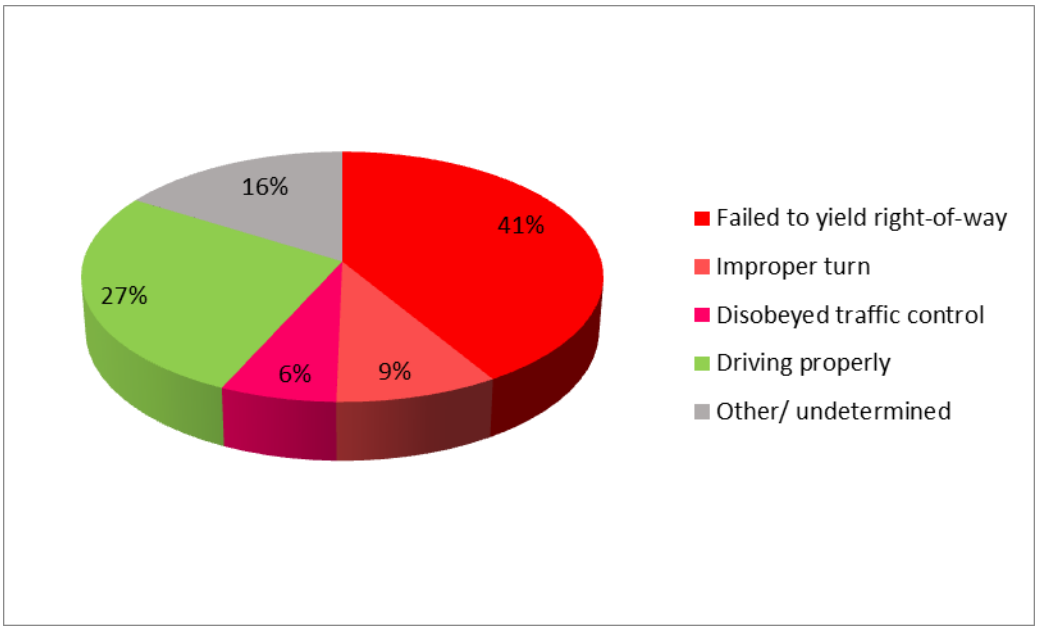


Figure 7: The Assessed Action of the Driver in Collisions Involving Pedestrians (2017 – 2019)

Weather conditions appear to have a minimal impact on pedestrian collisions. There is no disproportionate increase in collisions during winter, and the vast majority of collisions (88%) occur during clear weather (no precipitation). Regarding locations, one street does appear to have a higher frequency of collisions, however this could be partially due to higher pedestrian traffic. Even with possible higher pedestrian traffic, Clarence Street in the downtown should be further investigated. The plan for a multi-use path along this street could benefit both pedestrians and cyclists.

3.2 Cycling Infrastructure

3.2.1 Walking & Cycling Current Statistics

Usage rates are typically a good indicator for many programs. The City of Brantford's efforts to increase active transportation mode share is showing success. The 2020 TMP update identified a steady increase from 6.6% (2006) to 7.8% (2016) in active transportation users.

Furthermore, Strava Metro collects data from personal cellphones to track cycling and pedestrian trips in the City, and has shown that these modes have increased substantially between the years of 2018 to 2021. In 2018, there were 23,257 active transportation trips tracked in the City of Brantford from 3,057 cellphones, with this number increasing to 83,310 trips tracked in 2021 (a 360% increase) from 6,590 cellphones. These numbers show that interest in active transportation modes has increased immensely in this time period. Continued City investment to enhance the active transportation network would continue this trend of increased walking and cycling.

3.2.2 Existing Facilities

The City of Brantford currently has 19.8 km of streets with bike lanes, 30.1 km of streets with signed on-street cycling routes, 0.9 km of paved shoulders, and 14.5 km of multi-use paths. Thus a total length of 65.3 km of City streets have existing cycling infrastructure. Since these street facilities provide two-way operations, this represents 130.6 lane-km of cycling facilities (2 times 65.3 km). The City also has 40 km of trails in greenspaces. The first bike lane was installed along Hardy Road in 2007, and since then there has been a modest increase in cycling infrastructure annually, including improvements to the trail network. Figure 8 is a map of existing cycling infrastructure in the City of Brantford.

In 2021 the Ontario Ministry of Transportation in conjunction with the Ontario Traffic Council released an updated version of Ontario Traffic Manual Book 18 – Cycling Facilities which provides updated design guidelines for cycling infrastructure. The ATMP includes a review of the City of Brantford's existing facilities to identify any possible design modifications to better conform to current Book 18 guidelines. These modifications are described in the list of all planned cycling projects – Appendix G.

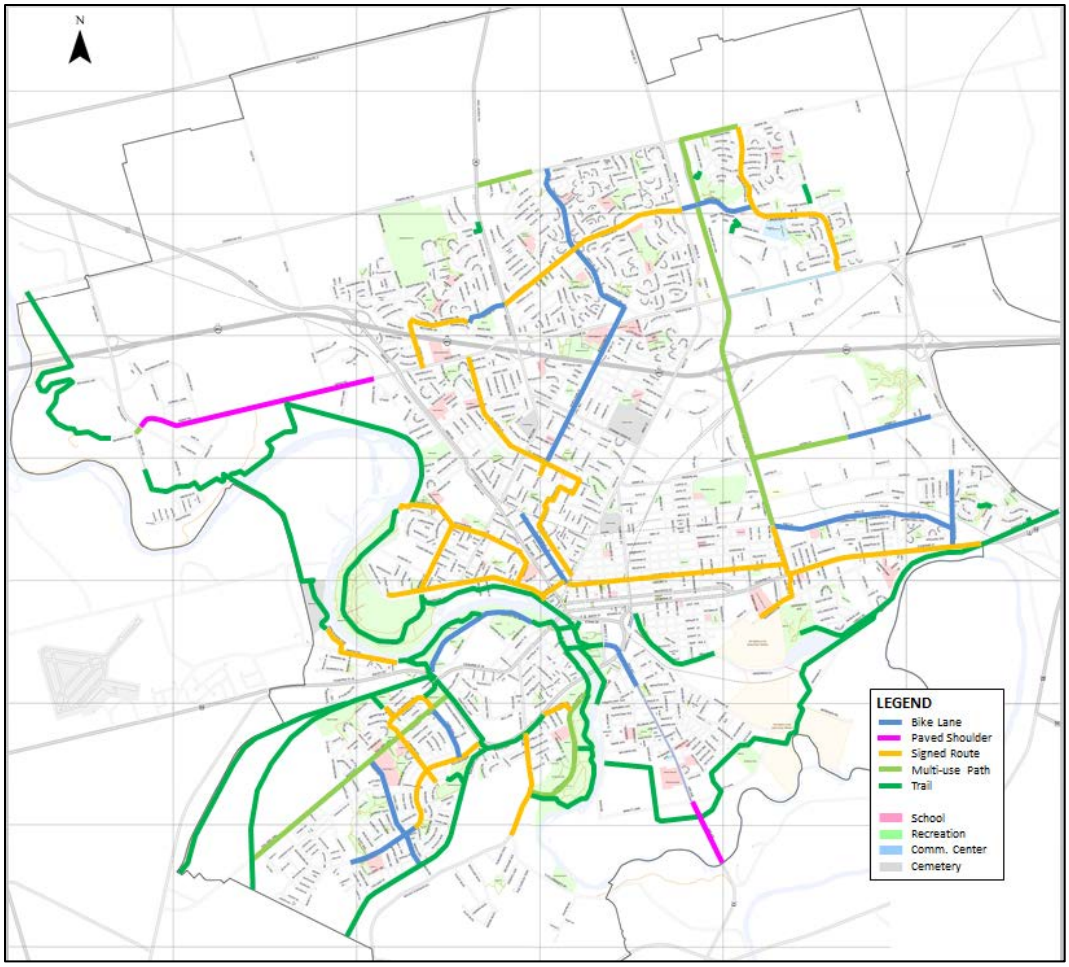


Figure 8: Map of Existing Cycling Infrastructure in Brantford

The following descriptions of linear and non-linear facilities serve as a 'toolbox' of resources that describe the City of Brantford's existing cycling facilities and additional forms of infrastructure that will be considered as staff continue to expand the cycling network.

3.2.3 Linear Facilities

Linear cycling facilities in the City of Brantford exist or are planned to be implemented in the follow forms:

Bike Lane – a portion of the roadway dedicated for use by cyclists, with separation between cyclists and motor traffic in various ways, from a line painted on the asphalt for lower-volume streets, to painted buffers (and the occasional use of flex posts), and enhancing the separation between cyclists and motor traffic. There are currently 39.5 lane-km of bike lanes (2 times 19.8 km). Bike lanes can be designed and installed by either the Planning/Development process, Engineering Services or Operational Services. Facilities installed through the Planning/Development process

will be maintained by the Developer until the road is assumed by the City of Brantford at which time, the Operational Services Division will assume maintenance responsibilities.

Bicycle Path – a one-way or two-way cycling facility typically in a greenspace. A pedestrian facility is typically provided separately (parallel) to ensure pedestrians avoid using the dedicated cycling facility. No such facilities currently exist in the City of Brantford.

Cycle Track – a one-way or two-way cycling facility that physically separates cyclists from motor vehicles through the use of curbs, bollards, planters, or other separation devices. See Figure 9. No such facilities currently exist in the City of Brantford.

Figure 9: Sample Images of a Cycle Track

Paved Shoulder – part of the contiguous paved surface of a roadway (asphalt or concrete) that is separated from the portion of the roadway used for moving motor traffic by an edge line. They can be utilized by pedestrians and cyclists (shared-use) where parking of vehicles is strictly limited or restricted. Separation may also include painted hatching, rumble strip, etc. Signage may be added to further clarify usage (and restrict parking). If a paved shoulder is intended for shared-use by pedestrians and cyclists (typical), bicycle stencils should not be installed as they convey exclusive use for cyclists. There are currently 1.7 lane-kilometers of paved shoulders in the City of Brantford.

Bicycle Boulevard – a low-volume, low-speed street that prioritizes bicycle traffic through treatments such as traffic calming (chicanes, speed cushions, etc.), traffic reduction (diverters, etc.), signage, pavement markings, and intersection crossing treatments. These streets provide a comfortable cycling environment as well as directness and connectivity in the cycling network. They may also be referred to as a “Bicycle Greenway” or “Neighbourhood Bikeway”. No such facilities currently exist in the City of Brantford.

Signed Route – typically a low-volume, low-speed street operating as a shared-use facility for both motor traffic and bicycles. Signage indicating bicycle usage is primarily provided as wayfinding for cyclists to direct them to connected cycling infrastructure. There are currently 60.2 lane-km of signed routes in the City of Brantford.

Multi-use Path – a shared-use facility with pedestrians along a street right-of-way, typically beside a street for vehicle traffic. A multi-use path (MUP) typically replaces the need for a sidewalk and a separate cycling facility along a street with a low volume of pedestrian traffic. Other forms of cycling facilities are recommended when pedestrian volumes are more significant. A multi-use path is typically recommended to be a 3.5 m wide asphalt platform to minimize conflict between cyclists and pedestrians, however this width can be adjusted to accommodate constraints. In each case, either municipal design standards or the recommended guidelines identified in the Ontario Traffic Manual should be followed. There are currently 29.1 lane-km of multi-use paths in the City of Brantford.

Trail – a second form of shared-use facility, with pedestrians, along or through a greenspace such as a park or wilderness area. The suitable width of a trail is determined based on the expected level of usage by both pedestrians and cyclists, with typical widths ranging from 2.0 m to 6.0m, In each case, either municipal design standards or the recommended guidelines identified in the Ontario Traffic Manual should be followed. An asphalt surface is desirable if the facility is planned to have winter maintenance, which facilitates year-round commuter cycling. Trails are designed and installed through various groups, the Planning/Development process or the Parks and Recreation Division. Parks and Recreation maintains maintenance of these facilities. In cases where trails have been installed through the development process, these facilities will be maintained by the developer until the locations have been assumed by the City of Brantford. There are currently 80.0 lane-km of trails in the City of Brantford. A list of trails, both existing and planned, is included as Appendix I.

Centerline – Consideration for the installation of a painted centerline on multi-use paths and trails should be given to improve safety and to provide guidance to users. Since trails can have irregular levels of use, a strict expectation for a larger group of users to cluster in a narrower swath at all times especially when there is no opposing flow of users is unreasonable. Separation of cyclists and pedestrians into separate facilities is perhaps the most suitable way to minimize conflicts; however consideration of a centerline is more appropriate on wider shared-use facilities (>4.0 m) and when the flow of users is more consistent in both directions. Promotion of trail etiquette is considered to be a more suitable method of managing the two-way

flow of users travelling at different speeds, with messages such as “Stay to the right except to pass” and “Ring bell when passing”.

A centerline is recommended on a two-way facility that is dedicated to only cycling – whether a cycle track or a bike path.

Illumination – as all segments of the cycling network, including trails, are potentially used for commuter cycling, illumination should be considered. Illumination is however not required on all cycling facilities, but can improve safety, enhance comfort for users and deter unwanted behavior and activity.

3.2.4 Non-linear Facilities

Signalized Intersection – an intersection where traffic approaching from all directions is regulated by a traffic control signal. Signal heads, specifically for the purpose of bicycle traffic, are an approved traffic control device in Ontario; and typical uses are to control bicycle traffic if operating in a contra-flow scenario or to provide separate phasing for bicycle traffic at a typical intersection. See Figure 10.

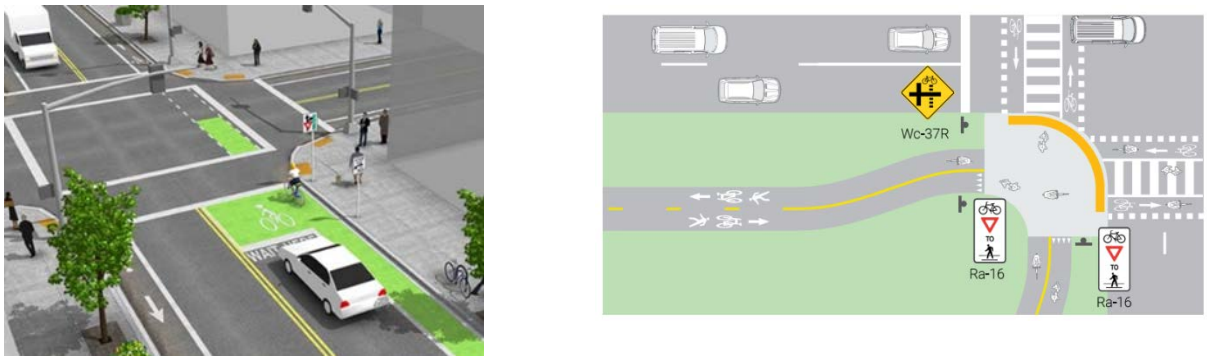
Figure 10: Image of a Bicycle Traffic Signal Head

Protected Intersection – also known as setback or offset intersection, this design keeps bicycles physically separated from motor vehicles up until the intersection, providing a high degree of comfort and safety for people of all ages and abilities. They have been implemented across North America as cities have expanded their protected bikeway networks. See Figure 11. This design can reduce the likelihood of high-speed vehicle turns, improve sightlines, and dramatically reduce the distance and time during which people on bicycles are exposed to conflicts. This type of design can have significant benefits of drivers yielding to cyclists, pedestrians and as a result reducing conflicts This form of intersection design will be considered at suitable locations by Operational Services as the City of Brantford continues to expand its cycling network.

Figure 11: Image of a Protected Intersection

Bike Box – rectangular pavement markings behind a stop bar typically used on streets with bike lanes, allowing left-turning cyclists to queue at a traffic signal ahead of motor vehicles. The rectangular area is typically coloured green. See Figure 12.

Crossride – part of the roadway through an intersection designated as a crossing for cyclists, where they are permitted to ride within the crossing. This crossing is indicated by signs, pavement markings, and a traffic signal if the crossing is signalized. These crossings can be found as part of on-road bike lanes that cross through signalized intersections but are often more commonly found as part of multi-use paths or trail crossings at signalized intersections. The crossing may be coloured green to add emphasis. See Figure 12.



Figures 12: Sample Images Include Bike Box, Crossride for on-road bike lane and a multi-use path.

Green Markings – cycling facilities may include some green markings to add visual attention to the facilities and conflict zones thus increasing awareness and safety. See Figure 12. Markings can vary from a single green line parallel to other markings

that define a bike lane, to green bike boxes or green crossrides, to fully green bike lanes in segments with unique design conditions.

Sharrow – a pavement marking consisting of two white chevron markings and a bicycle stencil. They are intended to inform motorists and guide cyclists as to where cyclists should ride at critical decision points within a travel lane shared by both motorists and cyclists (e.g. where a bicycle lane ends, at a narrow bridge, etc.). Depending on the width of the travel lane, the sharrow is positioned for either single file operations with motor traffic or in a side-by-side configuration.

Wayfinding Signage – information that is typically posted along multi-use facilities throughout the City of Brantford to provide guidance for both pedestrians and cyclists. These signs provide distances to multiple destinations at critical intersections. See Figure 13. Distances are approximated in kilometers, to one decimal (i.e. 0.1 km). Destinations include nearby schools, parks, attractions, and cycling infrastructure. Some feedback was received regarding the font size, thus future signage is proposed to increase the font and use abbreviations including “Sch.”, “Tr”, “Pk”, etc.

Figure 13: Sample Image of Brantford Wayfinding Signage

The **Pedestrian Crossover (PXO)** is described in the Pedestrian Toolbox section of the ATMP. Currently it is a traffic device solely to serve as a pedestrian crossing device. Thus, in some municipalities where a PXO is used on a trail or multi-use path to cross a street, signage has been posted requiring cyclists to dismount. Efforts are underway in Ontario to modify the PXO to permit cyclists to use them.

3.3 Pedestrian Infrastructure

3.3.1 Toolkit of Pedestrian Devices

Infrastructure to accommodate pedestrians is listed herein to serve as an overview of elements that the City uses to facilitate and encourage walking as a mode of transportation. The items can be sub-categorized into three groups – 1) linear facilities, 2) intersection elements, and 3) pedestrian amenities.

3.3.2 Linear Facilities

Sidewalk – a concrete platform typically along a street right-of-way intended for pedestrian use only. The width of the facility may vary for different types of streets and geometric constraints (stated in Section 5.1 of the ATMP). Concrete sidewalks should be contiguous through all driveways to highlight the possible presence of pedestrians. Driveway design should minimize the driveway sideslope across a sidewalk in order to maintain as much of a flat platform as possible to reduce the risk of people falling in slippery conditions. The City has an annual program to assess the condition of sidewalks. This program serves as an excellent inventory of the network, including mapping of sidewalks.

Multi-use Path – a shared-use facility for pedestrians and cyclists along a street right-of-way, typically beside a street for motor traffic. A multi-use path typically replaces the need for a sidewalk and a separate cycling facility along a street with a low volume of pedestrian traffic. Other forms of cycling facilities are recommended when pedestrian volumes are more significant. A multi-use path is typically recommended to be a 3.0 - 3.5 m wide asphalt platform to minimize conflict between cyclists and pedestrians with the hard surface facilitating easier winter maintenance.

Trail – a second form of shared-use facility, with pedestrians, along or through a greenspace such as a park or wilderness area. The suitable width of a trail is determined based on the expected level of usage by both pedestrians and cyclists, with typical widths ranging from 2.0 m to 6.0m. An asphalt surface is desirable if the facility is planned to have winter maintenance, which facilitates year-round commuter cycling.

Paved Shoulder – part of the contiguous paved surface of a roadway (asphalt or concrete) that is separated from the portion of the roadway used for moving motor traffic by an edge line. They can be utilized by pedestrians and cyclists (shared-use) where parking of vehicles is strictly limited or restricted. Separation may also include painted hatching, rumble strip, etc. Signage may be added to further clarify usage (and restrict parking). If a paved shoulder is intended for shared-use by pedestrians and cyclists (typical), bicycle stencils should not be installed as they convey exclusive use for cyclists.

3.3.3 Intersection Elements

There are currently five types of pedestrian crossings (crosswalks) used by the City of Brantford where pedestrian facilities intersect streets. These types are listed below and include a description of their use. These crossings provide various means to control traffic and pedestrians, and whichever is employed, it is recommended that a minimum distance of 250m should be maintained between such devices to ensure a suitable balance of pedestrian mobility and traffic flow. However, unique situations may justify closer crossings. Where crossings include signals, crossing times for pedestrians signals are calculated with a walking speed of 1.0 m/s. The City provides curb-cuts at pedestrian crossing locations and are in place at the majority of locations throughout the municipality. The City will address missing locations based on requests from residents and stakeholders.

Signalized Intersection – Standard practice in the City of Brantford is to include pedestrian crossing facilities at all signalized intersections. The City is implementing a program to retrofit all traffic signals with audible signals. Typical markings include stop bars and two parallel lines to define the pedestrian crossing; however ladder crossings are installed at arterial streets to increase the visibility of the pedestrian crossings, and are otherwise considered in unique circumstances. Pushbutton activation for a pedestrian signal is used in unique conditions as they hamper pedestrian mobility.

Unsignalized Intersection – Traffic control is only provided for pedestrians at unsignalized intersections where a stop sign or yield sign exists. Although no markings are technically required at unsignalized intersections, The standard practice is to mark these intersections with stop bars and two parallel lines across the street to define the pedestrian crossing. A ladder crossing is not typical at an unsignalized intersection, and is only considered in unique circumstances (e.g. some all-way stop-controlled intersections with unique characteristics such as near schools).

Intersection Pedestrian Signal (IPS) – a pedestrian crossing that provides signalized control of traffic. This type of crossing can be installed at either an existing intersection or mid-block (between intersections). Traffic signals are a very familiar device to control traffic therefore traffic complies well. A pedestrian crossing phase for the traffic signals is activated by a pushbutton. Typical markings include stop bars and a ladder crossing to highlight the pedestrian crossing area. When installed at an existing intersection, there is typically only one marked ladder crossing to accentuate that crossing.

Pedestrian Crossover (PXO) – a relatively new device approved for use in Ontario (2018). There are four variations of PXOs: types A, B, C, and D; each suitable for

streets with different motor vehicle volumes. A PXO can be installed at either an existing intersection or mid-block (between intersections). Typical markings include yield lines and one ladder crossing. See Figure 14. A flex post may be considered, typically at the street centerline, to further highlight the crossing. The design also includes AODA compliant push buttons so pedestrians can activate the crossing and audible signals so people with a sight impairment know the signal is activated to stop motor vehicles.

Figure 14: Sample Image of a Pedestrian Crossover (PXO)

School Crossing – a well-established pedestrian crossing device in Ontario intended for use only during times when children are walking to or from school (AM, noon, and PM). This device includes pavement markings (including a ladder crossing) and school crossing guard signage as described in the Ontario Traffic Manual. Each of these locations is staffed with a crossing guard using stop control signage during student commute times. Confusion does exist with the use of this type of crossing; with people assuming it is a formal crossing location at all times, even when a crossing guard is not present. This confusion can lead to dangerous scenarios, thus consideration to convert all such locations to PXO crossings is being considered.

The City continues to add new pedestrian crossing facilities, both with new development and where crossings are determined to be needed on existing streets. Details describing the implementation of new facilities are documented in Section 5 – Implementation.

3.3.4 Pedestrian Amenities

Providing linear facilities and crossings are critical for pedestrian mobility. Making the pedestrian realm more comfortable and interesting further encourages and promotes walking. The following are additional features that the city can utilize to enhance the public realm and increase comfort for vulnerable road users (Figure 15).

Clear Zone – Ensuring that all sidewalks have a defined width with no obstacles makes walking easier and is a critical element of sidewalks for people with reduced mobility. A minimum clear width of 1.2m is recommended and this width could be increased to 2.0m on busier sidewalks such as in the downtown.

Urban Braille – Adding additional visual and tactile elements to sidewalks make them easier for people with disabilities to navigate. The most common element that is already being added broadly across the City of Brantford is a tactile plate at all street crossings. Additional elements for consideration, perhaps most suitable in busier commercial areas, include tactile and colour contrasting edges to define the clear zone of sidewalks, tactile street names stamped in the concrete, and textured diamond shapes to identify access points to adjacent buildings along the sidewalk.

Illumination – Proper illumination of sidewalks is critical for personal safety (both a crime deterrent and visibility for pedestrians to see where they are going) and perceived comfort of pedestrians.

Street Furniture – Providing well-sited seating areas enhances a sidewalk or multi-use path significantly. They are not only a comfort for users (of all ages and mobility), but add interest to the pedestrian environment – making walking a much more pleasant experience.

Trees – A canopy of green makes any urban space more inviting, but trees provide additional benefits including shade from the sun, air filtering, and moderating of the summer heat-island effect in urban areas. In winter, trees can help moderate colder conditions by helping to calm winter winds. Well-positioned trees can also create a buffer of comfort from adjacent motor vehicles. Technology has been developed to plant trees in the complicated network of buried utilities in denser urban areas.

Planters – Similar to trees, planters and flower beds beautify the pedestrian realm, adding interest and creating a calmer environment.

Waste Receptacles – a critical piece of infrastructure in denser urban areas – especially where there are commercial land uses and areas of employment, where shoppers and workers need to discard waste and recycling.

Figure 15: Image of a Vibrant Urban Streetscape

4.0 Brantford's Planned Cycling Network

The City of Brantford's Transportation Master Plan identified the network of cycling infrastructure that includes existing facilities and planned facilities (see map, Appendix B). This ATMP builds on the recommendations of the TMP by:

1) Addressing geographic areas that were identified in the TMP for further investigation,

2) Addressing gaps that have been identified in the ATMP,

3) Reviewing the types of facilities proposed and modifying some of the planned facilities to better conform to the guidelines stated in Ontario Traffic Manual, Book 18 (2021 ed.),

4) Developing more detailed design concepts (i.e. cross-sections) for the individual projects throughout the network including cost estimates, and

5) Developing a priority ranking of the projects to assist in the order of implementation.

4.1 Transportation Master Plan Review Task #1: Gaps identified in the Transportation Master Plan for further analysis

Six notable cycling gaps were identified in the Transportation Master Plan for which solutions were not resolved. As the ATMP is developing more detailed designs for the entire planned cycling network, solutions to these gaps are best addressed herein, creating integrated solutions with adjacent planned facilities. Recommended solutions to these cycling gaps are described below. The gaps are listed according to the order as they are presented in the Transportation Master Plan map, Appendix C (top-left to bottom-right).

Oak Park Road Bridge over Highway 403 – special treatment required

A two-way multi-use path is proposed along the west side of the Ministry Transportation Ontario bridge over Highway 403. This should be reviewed and discussed with the Ministry of Transportation for consideration as part of future Ministry Transportation Ontario works on the bridge. Currently the bridge has narrow paved shoulders and no sidewalks. The schedule of the Ministry Transportation Ontario bridge works is unknown. There is no plan for the City to undertake any modifications to this Ministry Transportation Ontario bridge; however the City can proceed with the construction of the multi-use path north and south of the bridge with other roadworks in advance of any Ministry Transportation Ontario bridgeworks. It is standard practice, that the Province

requires municipalities to fund the installation of sidewalks and other features requested to be included as part of bridge work.

Tollgate Road Bridge over Highway 403 – special treatment required

A road diet, the reduction in number of travel lanes and/or lane widths in order to reduce speeds, improve safety and enhance active transportation, is proposed for Tollgate Road to create width on the existing roadway for bike lanes. The existing bridge has a sidewalk on both sides and an asphalt roadway width of 7.2m. Therefore, until the bike lanes are implemented on the street, sharrows and appropriate signage are proposed on the bridge until any future roadworks can include widening the bridge platform to accommodate bike lanes. This should be reviewed and discussed with the Ministry of Transportation for consideration as part of future Ministry Transportation Ontario works on the bridge. It is standard practice, that the Province requires municipalities to fund the installation of sidewalks and other features requested to be included as part of bridge work.

North side of Highway 403 at Wayne Gretzky Parkway – this location is identified for consideration of a future transit station within the Lynden Park Mall area

A multi-use path is planned for Lynden Road on the north side of the Mall, and a multi-use path is planned to connect Roy Blvd (on the south side of the Mall) across Wayne Gretzky Parkway to Edmondson Street. These two east-west facilities should provide ample opportunity for the designers of the planned transit station to include a cycling connection.

Dalhousie Street/ Colborne Street/ Icomm Drive connection to Brant's Crossing – connection required

The Downtown Streetscaping EA, completed after the Transportation Master Plan, proposes one-way bike lanes in the same direction as motor traffic on both Dalhousie Street and Colborne Street through the downtown (blue dashed lines in Figure 16). West of Queen Street, the Colborne Street facility would be a two-way cycle track along the south side of the street – replacing the existing parking along the south curb (yellow dashed line). Queen Street is also planned to be a critical connection in the design to provide a two-way north-south cycling connection between Wellington Street bike lanes and Dalhousie/ Colborne Street (yellow dashed line). The Dalhousie Street bike lane is therefore planned to end at Queen Street to avoid stranding cyclists at 'busy' Brant Avenue. Westbound cyclists through the downtown can continue northwesterly via Queen Street/ Wellington Street/ Albion Street facilities OR southwesterly via Queen Street/ Colborne Street facilities westerly to Icomm Drive.

To complete a connection to Brant's Crossing, this ATMP recommends a two-way crossride at the Brant Avenue/ Colborne Street/ Icomm Drive intersection to connect to the southwest corner of the intersection, and from the intersection southerly, a 4.0 m asphalt multi-use path is planned (yellow dashed line) to replace the existing concrete sidewalk for about 100 m to the start of the Brant's Crossing trail network (solid green line).

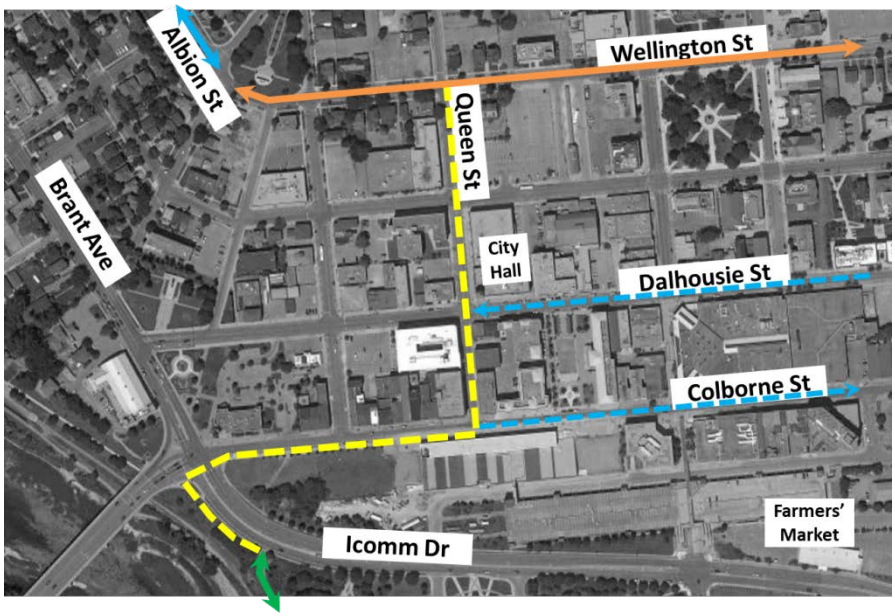


Figure 16: Design Concept at Brant Avenue/ Colborne Street/ Icomm Drive

Trail Crossings of the Grand River by Brant's Crossing

The City has completed the Three Bridges EA which recommends 1) the rehabilitation of the Brant's Crossing trail bridge with a wider wooden platform, 2) the short term rehabilitation of the TH&B trail bridge decking, and 3) stated 'no plans' for defined cycling infrastructure on the Lorne Bridge.

This ATMP further addresses river crossings in this general area by recommending that further detailed evaluation be completed to identify a preferred River crossing location south of Veterans Memorial Parkway to service existing and future proposed developments that would provide connectivity between the TH&B trail near Baldwin Avenue westerly to the Gilkison Trail (southeast of the Gilkison Street/ Eagle Street intersection).

Cycling Plans in the Conklin and Shellard neighbourhoods

These plans require no further investigation as they are being addressed through new development plans. The critical link planned is the extension of the Blackburn Drive bike lanes westerly to Shellard Lane.

4.2 Transportation Master Plan Review Task #2: Gaps in the Network Identified Post-Transportation Master Plan

Through the public engagement process of the ATMP, additional gaps in the cycling network were identified. These gaps were addressed as part of the complete review of all links across the network with all other links. These additional gaps are listed below to highlight where the network has been developed further, beyond what was described in the cycling network described in the Transportation Master Plan. Figure 17 shows the location of these gaps on a map.

- Royal Oak Park Trail
- King George Road cycling facilities
- Sandra Street bike lanes
- Paris Road cycling connectivity (south of Tollgate Road)
- Cycling connectivity across Brant Avenue
- Repairs to the Drummond Street Trail Bridge
- A trail connection from Shallow Creek Trail/ Drummond Trail Bridge easterly to Mohawk Park along the water channel
- Locks Road and Mohawk Street (an on-street link)
- Erie Avenue cycling connections
- Active Transportation opportunities for crossing the Grand River, south of Veterans Memorial Parkway do not exist and opportunites need to be explored to provide a safe and functional crossing point.
- Connectivity at municipal borders to Brant County – a connection northerly to the Village of St. George and a connection easterly at Johnson Road. The other five primary connection areas to Brant County were determined to be suitably identified in the Transportation Master Plan (the Town of Paris, Colborne Street West, trail connections southerly, Phelps Road, Tutela Heights Road, and Erie Avenue to the southeast, Colborne Street East, and Lynden Road easterly).

This review of the cycling network included an assessment of connectivity to Brant County to ensure cyclists are well-served when crossing the municipal border. The orange dots in Figure 17 indicates the connectivity to Brant County (13 links) and includes connections to the nearby communities of Paris, St. George, and Mount Pleasant.

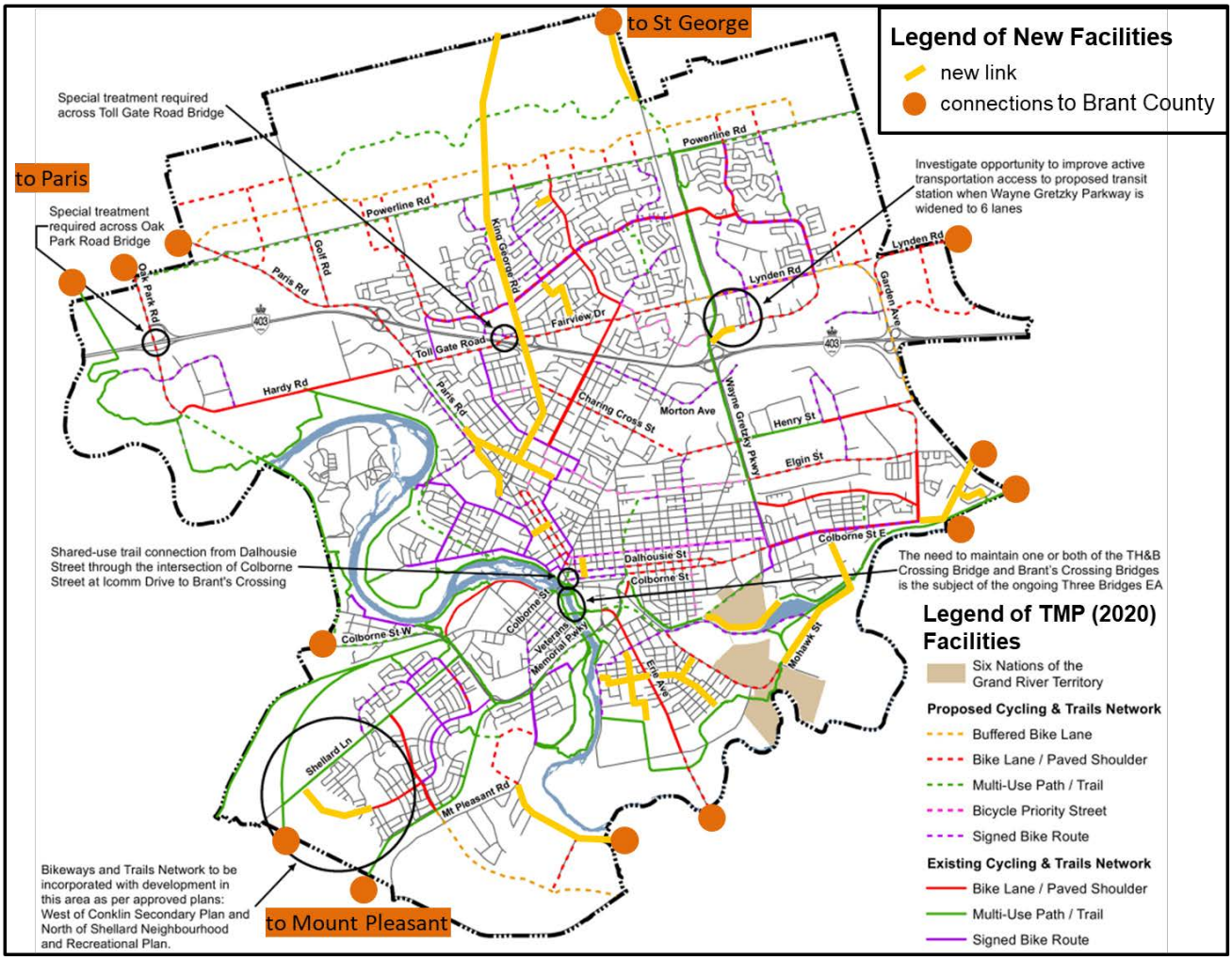


Figure 17: Map of Additional Links Identified in this ATMP

4.3 Transportation Master Plan Review Tasks #3, #4, & #5

Tasks 3, 4, & 5 are closely related as they all involve a detailed review of the full network of planned cycling facilities across the city, describing each link individually. To accomplish these three tasks, the network was subdivided into short segments, each segment with similar characteristics, in order to describe each of these shorter segments. The cycling network was subdivided into 141 on-street links – including both existing and planned links. An additional 44 links were identified off-street as trails, and 11 links describing bridge connections were also identified.

Each of the links was described using the following characteristics:

Length – the length of each link was measured using on-line web-mapping software. Lengths are typically measured to the center of intersections. This

dimension serves to provide a suitable comparison of each link for purpose of unit costing and collision analysis.

Transportation Master Plan Status – describes each link as ‘existing’, ‘planned’, ‘upgrade’, or ‘enhancement’. ‘Existing’ and ‘planned’ describe the status of links as of the summer of 2022, and ‘upgrade’ describes links with existing cycling infrastructure but are planned to be replaced with a higher-order facility (e.g. a signed route planned to be upgraded to bicycle lanes). The fourth category of status termed ‘enhancement’ describes some additional links that not identified in the City’s current Transportation Master Plan.

Volume of Motor Vehicle Traffic – described as average annual daily traffic (AADT), this data serves to indicate what form of cycling facility is suitable. Ontario Traffic Manual, Book 18 provides guidance regarding the type of cycling facility dependent on adjacent traffic volumes. Critical volumes are 1000 AADT, which is a ‘trigger’ for modest cycling infrastructure such as Bicycle Boulevards, and 3000 AADT, which is a ‘trigger’ for defined space for cyclists (i.e. bike lanes); thus the City’s GIS staff mapped AADT data based on these volumes. See Figure 18. The streets that are not coloured (i.e. black or grey) are typically suitable for cyclists to ride on without special cycling infrastructure. The intent of creating cycling infrastructure is to provide some direct cycling routes along some major streets and to provide connectivity between the areas of calmer, low-volume streets (i.e. less than 1000 AADT).

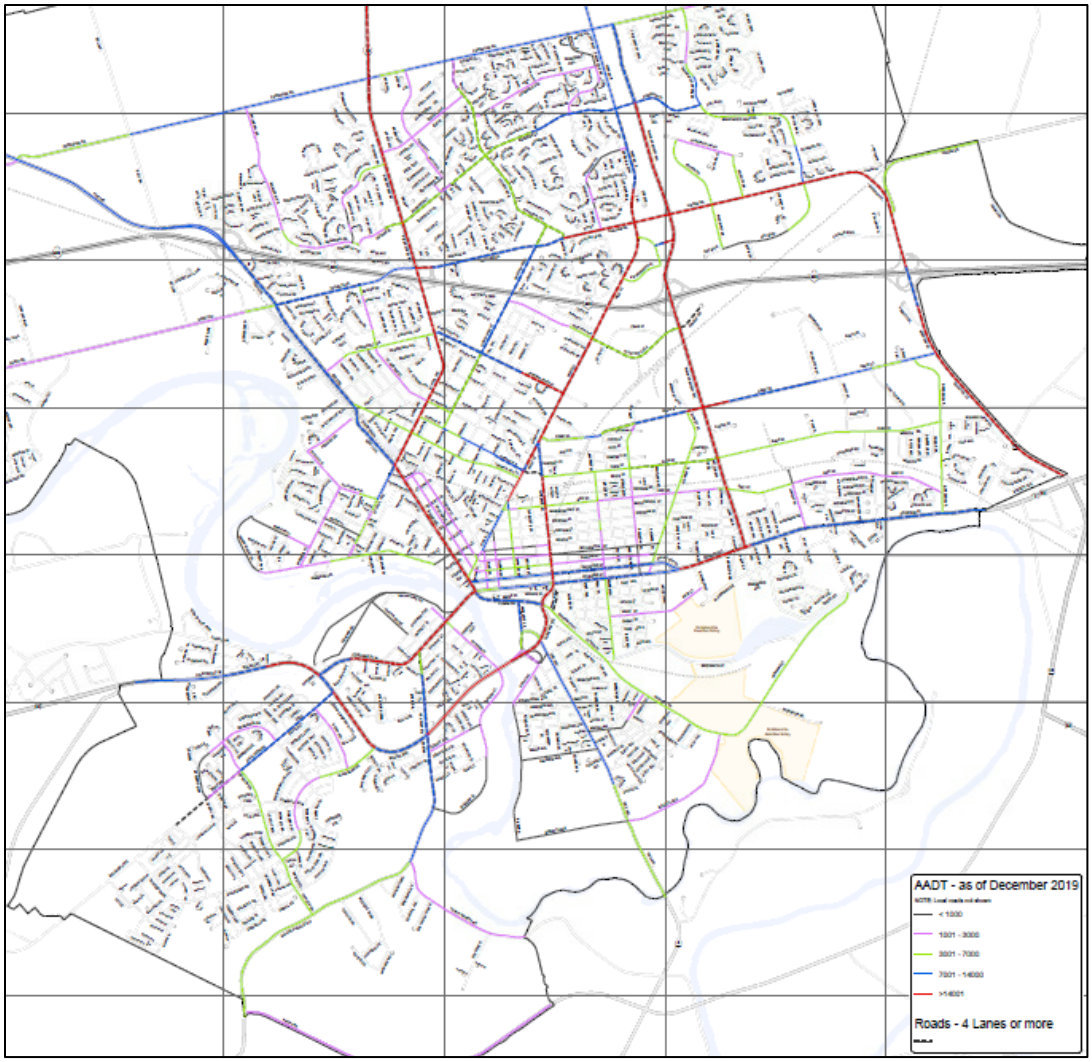


Figure 18: Map of Street Traffic Volumes (AADT)

Posted Speed Limit – City data from the Traffic Bylaw which describes exceptions to the standard 50 km/hr speed limit was used as this data source. This data served to determine the design features of cycling facilities.

Truck Route Network – City data from the Traffic Bylaw which describes truck routes was used as this data source. See Figure 19. This data served to determine the design features of cycling facilities. If a planned cycling facility is on a truck route, then the design of the facility would typically be planned to be more robust to create additional comfort for cyclists. An example would be where motor vehicle volumes suggest only a modest separation between motor vehicles and bicycles; but if the link is also a truck route, then the buffer would be considered to have additional separation – such as a wider buffer or physical separation in the form of flex posts or curbing.

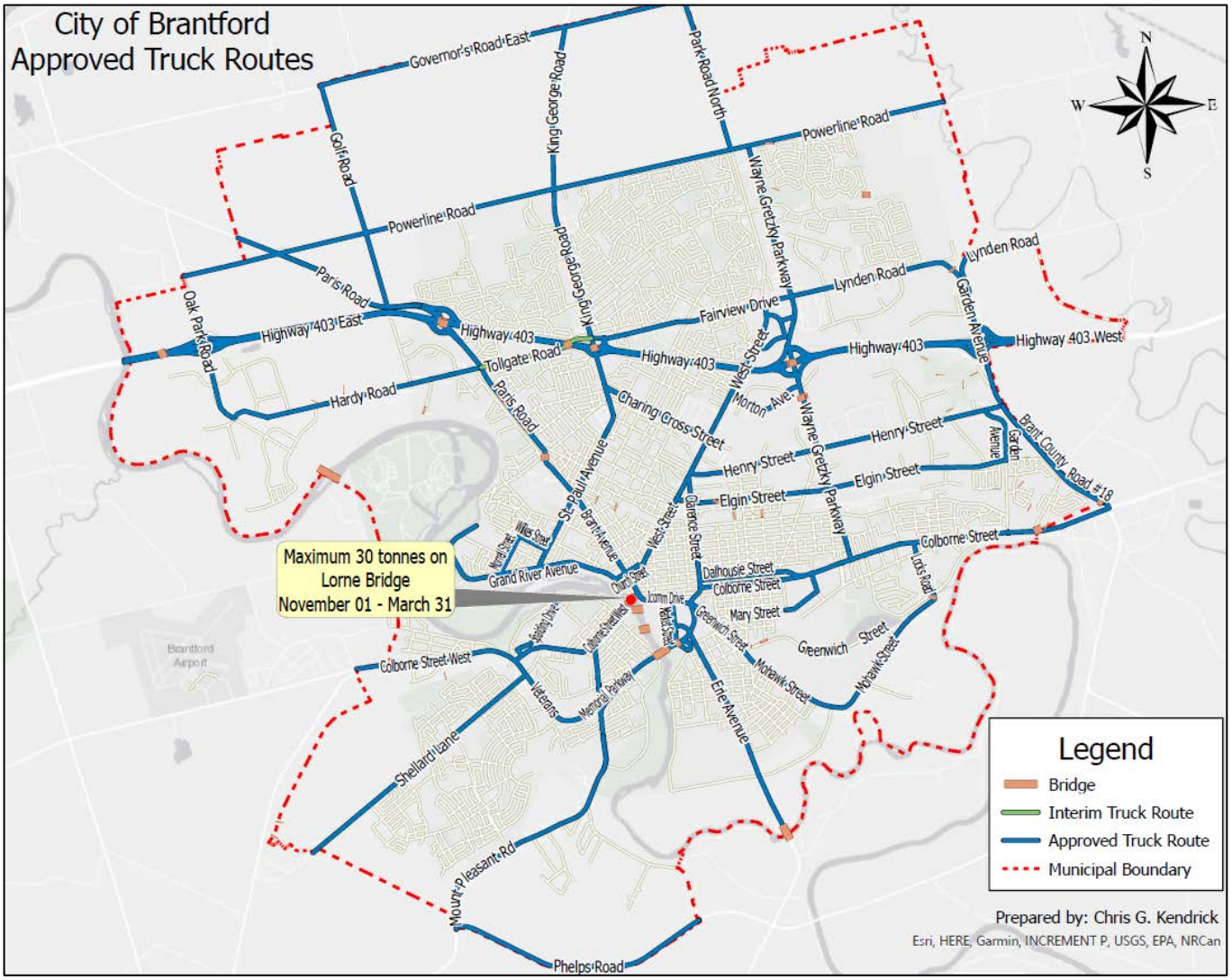


Figure 19: Map of Brantford Truck Routes

Strategic Growth Areas – Planned cycling infrastructure within or adjacent to the City of Brantford's "Strategic Growth Areas" were identified. See Figure 20. This

characteristic was only noted to identify which links in the cycling network would be suitable for funding through development charges.

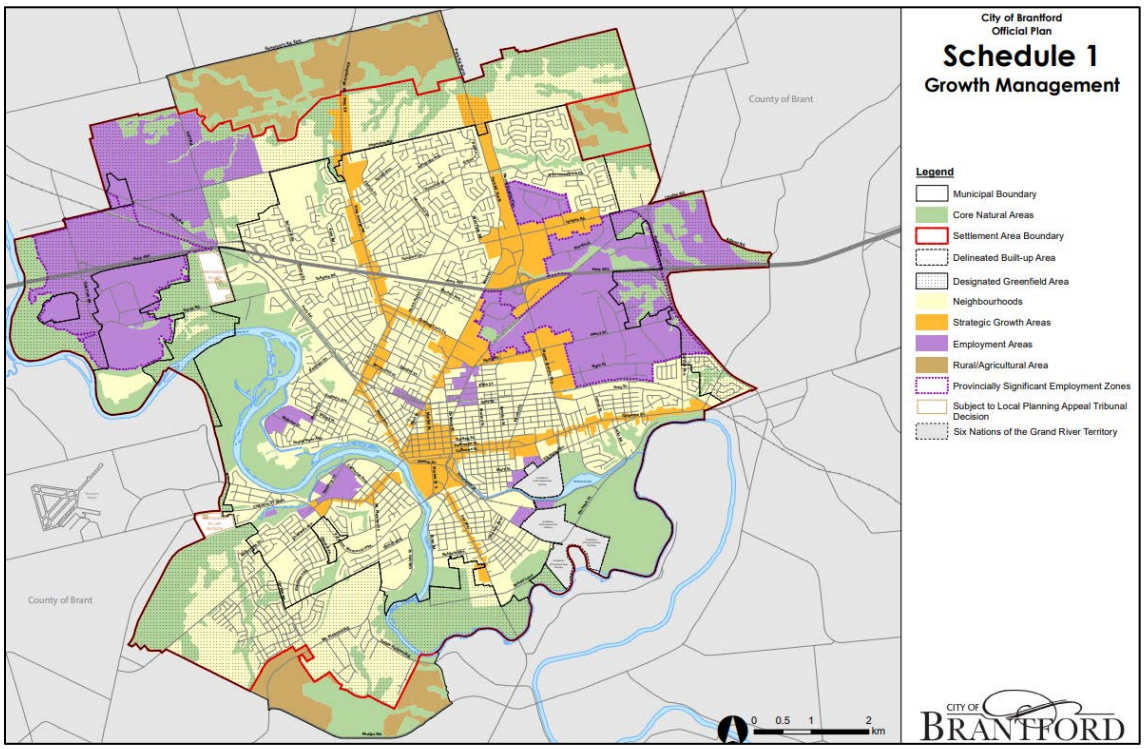


Figure 20: Map of Planned Strategic Growth Areas

4.4 Transportation Master Plan Review Task #3: Review existing & planned links to Ontario Traffic Manual, Book 18 Information

A review of existing planned links as described in the Transportation Master Plan was required given the updated guidelines published in Ontario Traffic Manual, Book 18 in 2021 (released after the completion of the Transportation Master Plan). The characteristics of each link were compared with the nomograph in Ontario Traffic Manual, Book 18 (Figure 21) to assess the best type of cycling facility for each link. Some of the links were updated to recommend a cycling facility different than what was proposed in the Transportation Master Plan.

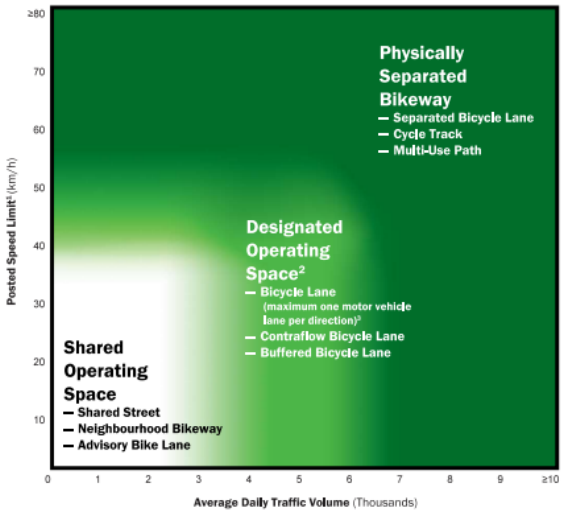


Figure 21: Ontario Traffic Manual, Book 18 Cycling Facility Nomograph (Urban/ Suburban)

This review was also conducted for links added to the cycling network as part of this ATMP, to determine a best cycling facility type for these newly proposed links as well. For each link in the cycling network, Appendix G describes both the facility type that was proposed in the Transportation Master Plan and the updated facility type proposed in the ATMP. The total length of existing cycling facilities (including on-street and off-street) is 104.1 km with an additional 145.9 km planned to be added. The full length of cycling facilities will total approximately 250 km. Figure 22 provides a summary of existing and planned cycling facility types in the full network, and Figure 23 shows this same updated plan of Cycling Infrastructure (2023) as a map.

	Existing Facilities (km)	Planned Facilities (km)	TOTAL LENGTH (km)
Bike Lanes	19.8	49.5	69.3
Cycle Tracks	0	7.4	7.4
Paved Shoulders	0.9	3.0	3.9
Bicycle Boulevards	0	21.7	21.7
Signed Routes	28.9	6.9	35.8
Multi-use Paths	14.5	46.7	61.2
Trails	40.0	10.7	50.7
TOTAL	**104.1 km**	**145.9 km**	**250.0 km**

Values in the above table are street centerline lengths. (multiply each value x2 for lane*km length)

Figure 22: Updated Lengths (km) of Cycling Infrastructure (2023)

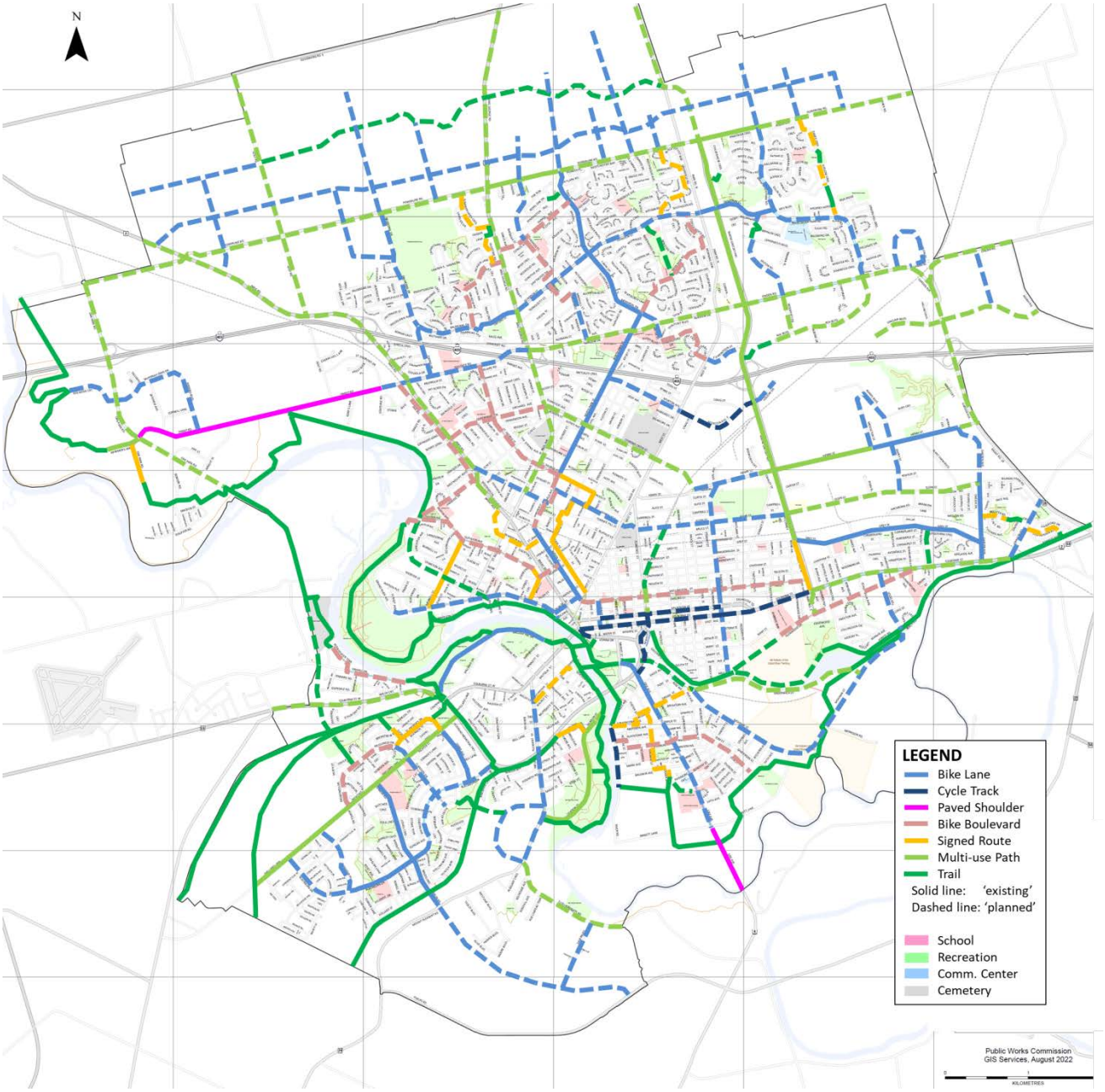


Figure 23: Updated Map of Planned Cycling Infrastructure (2023)

4.5 Transportation Master Plan Review Tasks #4: Development of a Typical Cross-section for Each Link & Cost Estimate

The detailed development of a typical cross-section for each of the 111 links in the network was undertaken in order to provide approximate widths (meters) of lane configurations to ideally fit within existing curbs (or identify if curbs need to be modified to achieve cycling infrastructure plans). Thus approximate roadway widths were measured (typically 3 locations for each link) to determine the available asphalt width to

accommodate motor traffic, bicycle traffic, and possible on-street parking. On-line mapping software was used to complete this task, and the software suggests accuracy to +/- 10 cm. Proposed cross-section widths for these various roadway uses (including buffers/ barriers) were then developed for each link. For some links, multiple cross-section width details were developed because some links include segments with varying characteristics (e.g. on-street parking existing for 2 of 5 blocks along one link). Existing on-street parking may be impacted in various projects; however Operational Services will work to implement infrastructure with as minimal impact as possible.

The following is an example of typical dimensions for a general road cross-section, Figure 24. These widths may vary depending on geometric constraints and would follow the general design guidelines of the Ontario Traffic Manual and the City of Brantford Linear Design Standards.

- 1.5m bike lane
- 0.5m buffer
- 3.2m lane for motor traffic
- 3.0m centre-turning lane
- 3.2m lane for motor traffic
- 0.5m buffer
- 1.5m bike lane
- 0.6m buffer adjacent to parked cars, and
- 2.4m on-street parking lane

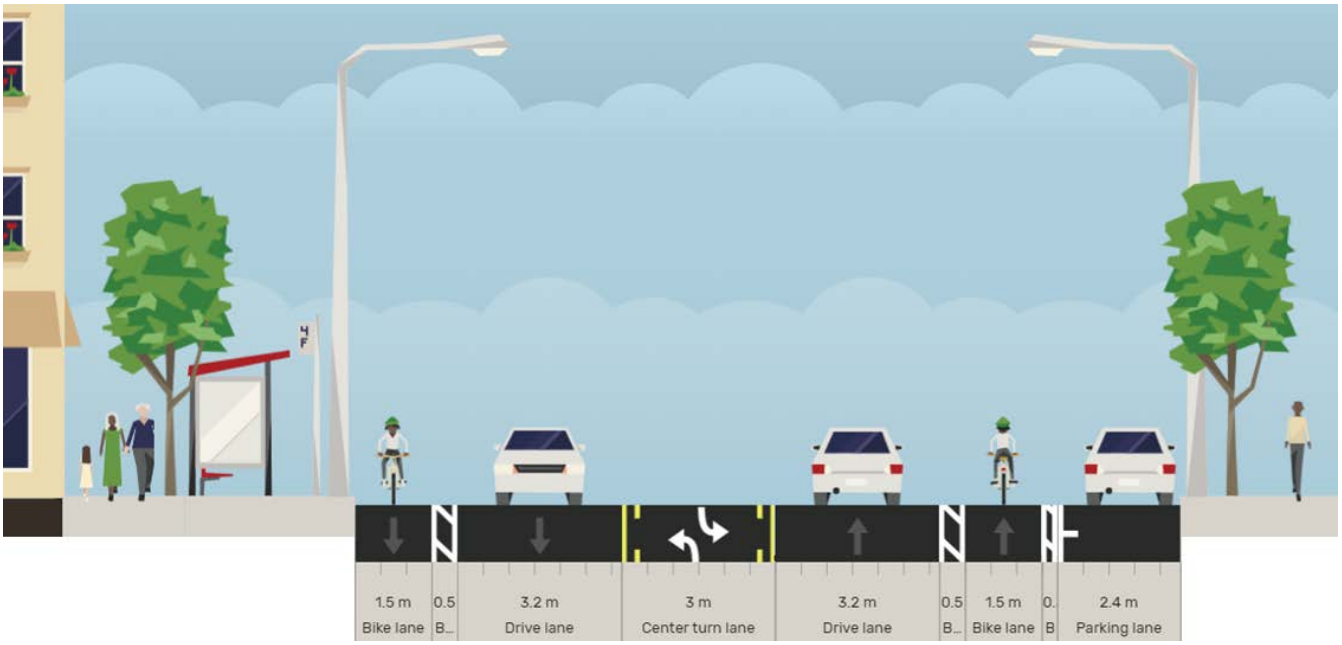


Figure 24: A Graphic Representation of the Sample Cross-section Described Above and in Appendix G

The cross-section details of each project made it possible to calculate a more detailed cost estimate for each project, also included in Appendix G. The cost estimates of the 111 cycling projects were calculated based on values that are stated in Appendix H.

The individual projects vary in cost significantly from $5,000 to $500,000 as some only require less expensive pavement marking modifications of the existing asphalt, and other projects involve significant roadworks. The total cost of the 111 cycling projects to be completed within the street right-of-way is estimated at $12.7 million. This does not include the 11.7 km of planned new trails through greenspaces and consideration for two proposed trail bridges over the Grand River. The street right-of-way cycling projects are divided into two groups:

1) Projects funded through the Capital Budget program – Reconstruction and Active Transportation ($355,000 annually) projects, estimated at $3.3 million total. These projects are estimated to be completed over the next 10 to 15 years.

2) Projects related to development (both “greenfield” and in existing urban areas identified as “strategic growth areas”) total an estimated $9.4 million. This funding requires identification through the development charge study. Through this study, the amount of funding would be determined from development charges and additional funding from the municipality.

Funding of new trails through greenspaces is recommended to be funded through the City’s Capital Budget process through the Parks & Recreation budget. The two recommended active transportation bridges over the Grand River are proposed to be funded as special projects through the Capital Budget process and external grant funding opportunities.

4.6 Transportation Master Plan Review Tasks #5: Develop a Priority Ranking of All Projects for Implementation

Listed below are additional characteristics that were described for the 111 links to assess a priority-ranking of planned facility implementation. Based on the aggregated numerical value of these characteristics for each individual link, a priority ranking was developed. The characteristics below were structured such that higher values indicate a higher importance to complete any specific link in the network. A unique value was then calculated for each link based on an equation combining the various characteristics stated as a value. ‘Collision’ and ‘critical gap’ values were multiplied by a factor of 10 as they are deemed to be the most important characteristics, and land use was multiplied by a factor of 5 as that data was deemed to be influential, but less critical than the other two sets of data. The result of this analysis generated a value for each of the 111 link ranging in value between 125 (the highest priority project) and 5 (the lowest priority projects). Appendix G includes the full list of 111 links in order of implementation

priority. It is recognized that this list is not proposed to be strictly followed, but the listed order instead provides guidance for staff to advance projects.

Collision Data – The City's collision database describes location, severity, and unique conditions for all collisions involving pedestrians, bicycles, and/or motor vehicles. The data was extracted for the five-year period of January 2017 – December 2021. A standard three-year period (2017 – 2019) was used in the analysis, however the two years of Covid-19 pandemic data was reviewed as well; and the data was confirmed to be notably different, with reduced collision incidents during the pandemic. The collision data was then divided by the length of the link to create a standard value in order to compare links. This data served to determine the priority ranking of the timing of cycling facilities implementation, with higher values indicating a higher priority. Since safety is a critical assessment across the network, collision values were increased in value by a factor of 10 to ensure they contributed significantly to the timing of cycling projects.

Adjacent Residential Land Use – A population density map (Figure 25) was used to assign a value to each link to indicate the density of residential land uses. A higher value describes higher density, thus a higher potential to generate trips by all modes – including cycling trips. If the adjacent lands are high density (>60 people/ha) – the value assigned was a '3'. If the adjacent lands are medium density (25 to 60 people/ha), a value of '2' was assigned; and if low density (<25 people/ha), the value assigned was '1'. If adjacent land uses were a mix of various densities, the value would reflect that mixture. For example, combinations of medium and low density residential areas were assigned a value of '1.5'. Land use values were weighted as a less critical value in determining the ranking of projects, thus only a factor of '5' was applied.

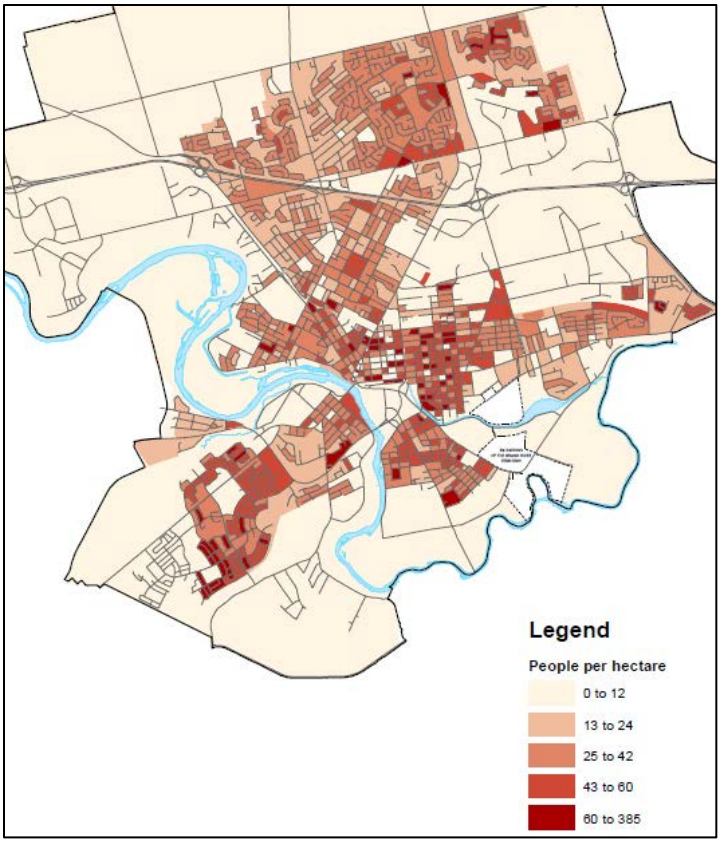


Figure 25: Brantford Population Density Map (Statistics Canada 2021 census)

Adjacent Commercial & Industrial Land Uses – A zoning map of general land uses was used to assign a value to links to indicate the type of land uses. These land uses indicate the potential of adjacent lands to generate trips by all modes – including cycling trips. If the adjacent lands are commercial, a value of '2' was assigned; and if industrial, the value assigned was '1'. Commercial land uses were assigned the larger value because they potentially not only generate bicycle trips by employees, but also by shoppers. If adjacent lands were a combination of both land uses, the value would reflect that mixture. For example, combinations of both land uses were assigned a value of '1.5'. Land use values were weighted as a less critical value in determining the ranking of projects, thus only increased in value by a factor of '5'.

Critical Gaps – The entire network of both planned and existing links was reviewed to identify which planned links are higher priorities for implementation to connect existing facilities in the network. Based on the importance of these gaps, a value between 1 and 3 was assigned, with a higher value indicating a higher priority gap to be completed. Since connectivity is a critical assessment across the network, links identified as gaps were increased in value by a factor of 10 to ensure they contributed significantly to the timing of cycling projects.

5. Implementation

5.1 Pedestrian Infrastructure

The enhancement of pedestrian infrastructure is addressed in different ways with different budgets.

Sidewalks are reconstructed as part of street reconstruction projects as routine accommodation, or smaller segments of sidewalks are repaired or replaced through standard City Maintenance/ Operations. New developments also include new pedestrian facilities. The following guidelines provide direction for the design of sidewalks as the design varies with different types of streets:

Arterial Street: Sidewalk on both sides of the street
Width: 2.0m, 1.8m min where constrained or > 2.0m for amenities

Collector Street: Sidewalk on both sides of the street
Width: 1.8m + 1.0m setback from the curb (1.7m to accommodate trees)

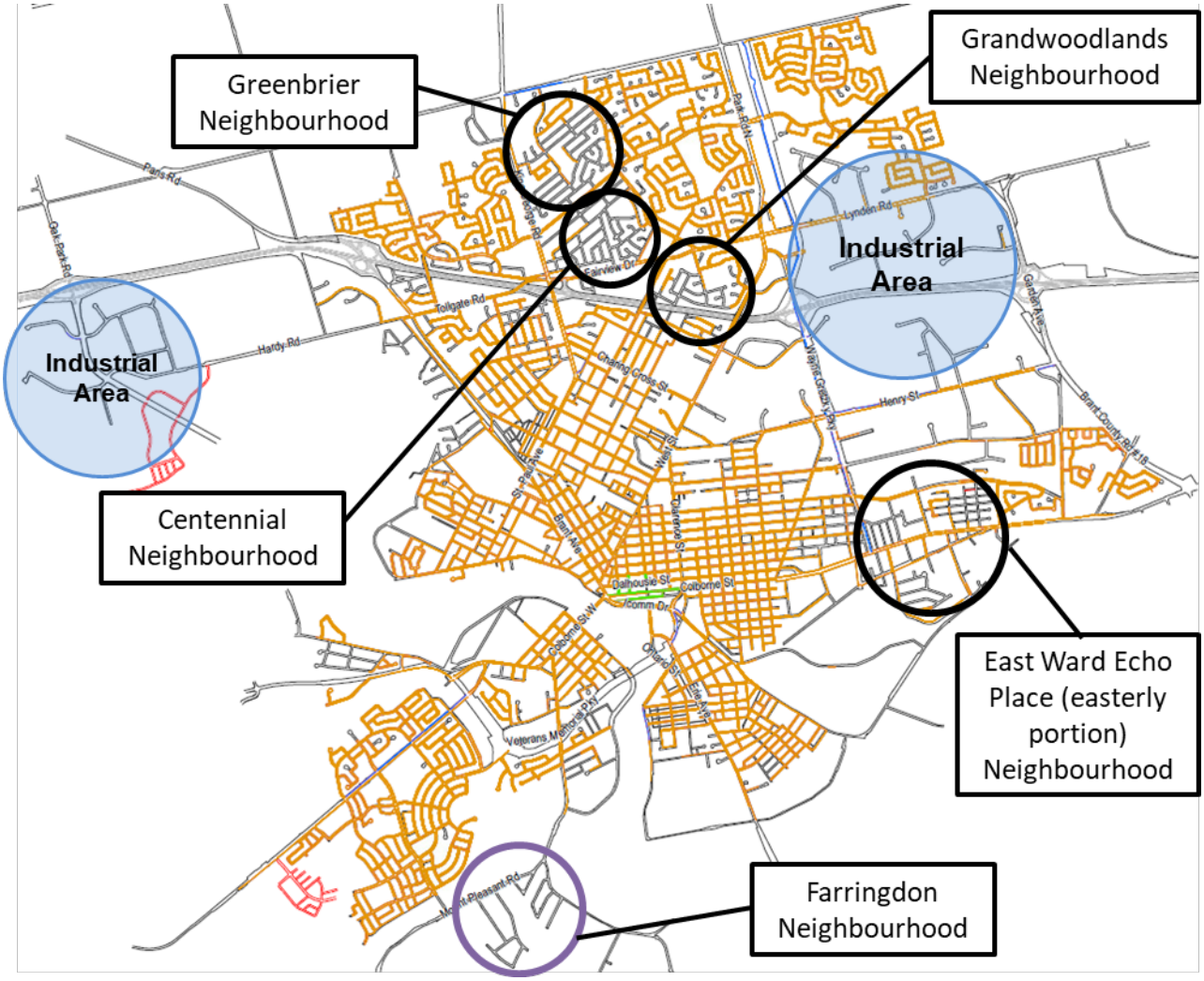
Local Street: Sidewalk on both sides of the street
Width: 1.5m + 1.0m setback from the curb (1.7m to accommodate trees)

The existing network of sidewalks city-wide is extensive; figure 26 below provides a visual representation of the existing sidewalk network, with orange lines indicating existing sidewalks. There are some neighbourhoods and roadways that were identified for improvements;

- Greenbrier Neighbourhood
- Centennial Neighbourhood
- Grand Woodlands Neighbourhood
- East Ward/Echo Place in the vicinity of Woodman Park (both north and south of Colborne Street)
- Neighbourhood surrounding Farringdon Park
- Oak Park Road (south of Highway 403)
- Lynden Road
- Henry Street
- Elgin Street

The City Budget is recommended to allocate an annual “Sidewalk Enhancement” expenditure of $60,000 to construct larger segments of sidewalk to address gaps in the network. This expenditure would be in addition to current budget allocations for minor

sidewalk repairs across the city. The missing sidewalks in the Farringdon area are proposed to be constructed and financed in conjunction with development in that area.



* Existing Sidewalks are indicated with orange lines.

Figure 26: The Existing Sidewalk Network with Missing Areas Highlighted

Multi-use Paths are recommended to be categorized as a cycling expenditure, thus the implementation and repair of these facilities are addressed as Cycling Infrastructure in the ATMP.

Trails are the jurisdiction of Parks & Recreation Division, thus the implementation and repair of these facilities are addressed through that budget.

Intersection Elements/ Crosswalks are the jurisdiction of the Traffic Services Department. These projects are financed by various budget items managed by Traffic Services staff. The City continues to receive requests for new crossings, including

locations that were submitted as a part of the community consultation. In July 2022 Council approved a Report (2022-206) which described the process that Traffic Services staff follow to determine priority pedestrian-crossing projects. The report is included in the ATMP as Appendix J.

The City has been proactive in managing Accessibility for Ontarians with Disabilities Act (AODA) compliance, and the financing of these projects are embedded in the annual City Budget.

- **Curb-cuts** at pedestrian crossings – The vast majority of locations are completed with curb-cuts; however there may be some missing locations in older neighbourhoods which are addressed through pubic requests.
- **Tactile plates** at curb-cuts – Routine accommodation, with existing ramps modified to include this tactile feature when works at any intersection or pedestrian crossing are 'substantial'.
- **Audible signals** – This feature includes the addition of unique sounds being activated at pedestrian signals for people with sight impairments, in order to convey the permitted direction of pedestrian crossings at different times. Pushbuttons are added at signals to activate this feature (the permanent operation of this feature has generated noise complaints from nearby homes). Traffic staff estimate that this feature will be added at all traffic signals in the city by 2025. Initial installations were deemed priorities near medical facilities, major activity centres, and along main traffic corridors.
- **Concrete pads at pushbuttons** are installed as routine accommodation to ensure all pedestrians can access pushbuttons.
- **Countdown timers** are not a strict requirement for AODA compliance, but they are recognized as a convenience for less agile pedestrians. Traffic Services staff include this technology at all new pedestrian crossings and they are included in audible signal projects as well.

Traffic Services staff are investigating signal phasing design called a "leading pedestrian interval" where the 'walk' phase for pedestrians is permitted before the parallel movement for motor traffic. There are pros and cons to this phasing design. This review is planned to be complete in 2023.

5.2 Cycling Infrastructure

The installation of cycling infrastructure is completed by various Departments and Divisions and Traffic Services is involved in all project implementation through consultation and scoping,

The ATMP is intended to serve as Council direction to proceed with these identified cycling projects. When a project is identified to proceed following the approval of this Plan, Traffic Services will prepare a notice to be distributed to properties immediately adjacent to the identified project location to notify residents and businesses of plans to modify the roadway to achieve the cycling infrastructure. The standard form of the notice to adjacent properties is included in the ATMP as Appendix K.

Stand-alone Cycling Projects

The lead for these projects is typically Traffic Services staff. These projects typically take place within the road right of way and result in minor concrete or asphalt works. The majority of the projects involve the modification of the existing pavement markings to add bicycle lanes. The construction of a multi-use path could be a project delivered as a stand-alone project if deemed a high priority. Appendix G in this report provides direction on the timing of these projects, with the projects listed in a suggested order for implementation. Costs associated with these projects are typically lower because they do not include significant construction and drainage elements.

Street Rehabilitation Projects

The lead for these projects is typically the Engineering Division. Cycling facilities are identified to street rehabilitation projects through project scoping supported by the TMP, the Parks & Recreation Master Plan, ATMP or studies. Traffic Services provides scope at the outset of these projects and review the design at various stages through the design process. The cycling component is typically a small portion of the full project, but associated costs may be significant if widening of a roadway is required, etc. Although these projects are listed in Appendix G in a suggested order of implementation, the timing of these projects is dependent on other factors such as the condition of the roadway surface and the state of underground utilities. Asset Management staff provide significant direction as to when these projects are initiated, and these rehabilitation projects are typically funded individually in the City Capital Budget (including the cycling component).

New Development projects

Construction of new streets in new neighbourhoods is a coordinated effort of City staff and developers. The primary lead on these initiatives is Transportation Planning who will consult with Traffic Services on a as needed basis. Traditionally Master Plan documents do not describe new development cycling plans. The details of these plans are developed with City Planning staff, and with the assistance of Traffic Services for any associated cycling facilities and identifying connection link to existing or proposed future infrastructure. These projects also include redevelopment of lands within the city, which may involve small additions to the cycling network (e.g. redevelopment of a

property along a street planned to include a multi-use path beside a busy street). Cycling projects associated with new developments are typically implemented during the development construction phase. In Appendix G, these projects are indicated with the notation “Development Charges”.

Trail Projects

Trail projects are typically led by staff in Parks & Recreation, with Traffic Services providing comment to ensure the design achieves connectivity to the on-road network where appropriate. Trail projects are provided in the ATMP as Appendix I. They are not listed in any priority order of installation, rather geographically to describe the connectivity of these facilities across the city. The financing of these projects is typically from the Parks & Recreation Division of the City budget.

6. Active Transportation – Supporting Actions

6.1 Education & Promotion

Conveying information to the public is critical in two forms – 1) education to ensure the public is familiar with new types of traffic devices that are being installed, and 2) promotion to explain and encourage active transportation as a viable form of transportation for some people in the community.

Active Transportation infrastructure has developed significantly in Ontario in the past decade. Pedestrian Crossovers (PXO's) were introduced less than 10 years ago through provincial legislation. The City of Brantford has been installing PXO's since 2021 and are well received and support by residents. The promotional materials that have been produced should be promoted on an annual basis to inform the public on how to use these new crossings.

New traffic devices for cycling have been introduced as well; including cross rides, bike boxes, and cycle tracks; and a plan to publish this information to educate citizens would be beneficial.

Suggested materials to provide information to the public include printed pamphlets, community newsletters and newspapers; along with online content such as websites, social media publications, and email distribution. Developing programs of active transportation education can also serve as promotion. Such programs already exist in the City of Brantford including events that have been developed for 'Bike Month" (recognized province-wide as June), and active transportation commuting programs at elementary schools. The City has also arranged bike parking at special events, and this service offers an opportunity to distribute pamphlets in addition to making active transportation a viable form of transportation to events. The City has trail etiquette 'rules' posted on the web, another great resource.

One unique opportunity that could exist is to develop a program with school boards to teach traffic safety at the Safety Village incorporating cycling and pedestrian safety in such a program. A community organization or a business that focuses on safety, such as an insurance agency, could possibly be a sponsor of such a program.

6.2 Enforcement/Bylaws

Enforcing laws related to active transportation legitimizes these modes of transportation. These laws exist to provide balance between the various users of community infrastructure, and do not simply prioritize one mode over another mode of transportation. In the Province of Ontario, the definition of a 'vehicle' includes a bicycle (with or without power-assist). Examples of existing City bylaws include:

- No parking a motor vehicle on a sidewalk.
- No parking a vehicle (including a bicycle) in a bike lane.
- No driving on trails or on multi-use paths.
- No cycling on sidewalks.
- No walking in bike lanes.
- ATV's, motorcycles, e-bikes, motorized bikes, or snowmobiles are not permitted on trails.
- Keep your pet on a leash when using trails and multi-use paths.

The City should add bylaws such as the following:

- Define where new types of active transportation vehicles are permitted, and some 'less active' transportation devices (e.g. segways, electric scooters, etc.), so residents have a source of information to know where such devices are permitted before purchasing costly devices. Appendix L provides a sample table for consideration. Nearby communities are investigating and should have experience to share (e.g. electric scooters).
- Control the speed of transportation devices on trails and multi-use paths.

6.3 Maintenance

In southern Ontario, maintenance is typically divided into two periods: summer and winter. Maintenance is a critical element in the provision of active transportation infrastructure as users are more vulnerable to poor conditions. Gravel on an asphalt bicycle lane can cause a cyclist to lose control. Mud or water on a sidewalk is a significant barrier for a pedestrian when wearing anything other than rubber boots. Ice or snow is a dangerous obstacle on sidewalks, multi-use paths, or bicycle lanes. Winter cycling is becoming more common, and experienced winter cyclists confirm that the biggest obstacle to cycling in winter in southern Ontario is icy conditions. Cold weather is only a significant challenge when temperatures are very cold, such as -10 C or lower.

Summer maintenance of the pedestrian network includes repairs to concrete sidewalks and the repainting (and other general repairs) of pedestrian crossings. Construction of sidewalks and pedestrian crossings are classified as capital works. Engineering Services Division conduct an annual inventory of sidewalk infrastructure which tracks the condition of sidewalks well.

Winter maintenance of the pedestrian network is primarily snow and ice removal on sidewalks. The vast majority of the sidewalk network is cleared of snow by adjacent property owners, with the City managing the winter maintenance in the downtown core and in areas where there are no adjacent property owners to attend to snow and ice. Feedback from the public consultation survey suggests that sidewalk maintenance

could be improved. City services have increased their monitoring of winter sidewalk clearing over the last several years with enhancements to the Operational Services, Road Patrol program. Three conditions are suggested to monitor closely:

- Problems with snow piled at intersections – blocking sidewalk crossings
- Icy conditions – separate from snow clearing
- Inconsistent clearing of residential sidewalks – whether it be sidewalks cleared later than the 24 hour deadline (after a snowfall), or delinquent owners that consistently fail to clear sidewalks.

Summer maintenance of the cycling network includes road patrol inspections, pothole patching, catch basin repairs, and regular scheduled sweeping of on-street bike lanes. The multi-use path network also requires monitoring and maintenance including local repairs, sweeping, etc. Additional sweeping of bike lanes and multi-use paths is arranged when community complaints and follow-up inspections identify problem areas. The introduction of barriers will require Road Operations to find new vehicle resources to operate within narrower widths. This may result in additional cost impacts if existing vehicles in the fleet are not suitable for this maintenance.

Currently, winter maintenance of the cycling network is primarily snow and ice removal of the multi-use paths and the clearing of the existing bike lanes as part of the typical winter maintenance of the adjacent travel lanes for motor vehicles. As the cycling infrastructure increases, and new facilities are added with barriers, the cost of winter maintenance is projected to increase due to extra routes required to clear the separated cycling facilities and to possibly add additional service vehicles to operate in these separate routes.

It is recommended City staff track pedestrian and cycling related maintenance costs as two separate items. As maintenance expectations for these facilities increase, staff will be able to provide cost estimates to Council. Tracking the maintenance costs of multi-use paths as a separate item is also recommended. The responsibility for multi-use paths is currently shared between Operational Services and Parks & Recreation Divisions. By definition, multi-use paths are within the street right-of-way, adjacent to roadways, and have frequent street crossings; thus they have many street-like elements and fit with other Operational Services activities. Trails through greenspaces are maintained separately by Parks & Recreation Division and a select network of these trails should be identified for winter maintenance to accommodate both recreational and commuter needs. Since these facilities have fewer interfaces with the street network, they could justifiably continue to be maintained as a separate facility type by Parks & Recreation.

Operational Services are currently conducting a review of winter maintenance practices, including active transportation; and will be following up with recommendations regarding future service levels.

6.4 Temporary Conditions

A formal table of closure procedures should be developed so all City Services are clearly informed of their responsibilities during both emergencies and scheduled closures of pedestrian and cycling infrastructure. For example, a sidewalk could be closed for a few weeks adjacent to a construction site if there is suitable notification for pedestrians at nearby crosswalks for pedestrians to cross to the other side of the street to a parallel sidewalk. A bike lane could also be closed with cyclists directed to a parallel low-volume street to avoid conflicts with construction equipment or a trench dug across a bike lane. A bike lane or sidewalk could also be temporarily converted into a shared-use facility for both pedestrians and cyclists if conditions are suitable (e.g. width and usage levels). A very short-term closure of a bike lane for 15 minutes of maintenance to a catch basin could simply be signed with signage such as “short-term closure of bike lane – dismount and use sidewalk”.

6.5 Evaluation

An annual or biannual review of data that describes active transportation infrastructure and activity is very beneficial. Tracking the rate of facility installations and identifying safety-concern areas in the network assist City staff in setting budgets, designing projects, ordering special equipment, and addressing community expectations.

The City has installed several bike and pedestrian counters on trails to begin to understand the level of usage on the trail network. Ridership data could also be collected at a few critical locations in the on-street bike lane network to better understand cycling activity. Since active transportation is typically a bit more irregular than motor vehicle traffic, data is recommended to be collected at all locations for 7 consecutive days (a full week of data). Figure 27 provides suggested locations to coordinate data collection of both the trail and on-street networks. Four screenlines are identified to better describe active transportation data: Highway 403, the Grand River, Wayne Gretzky Parkway, and West Avenue.

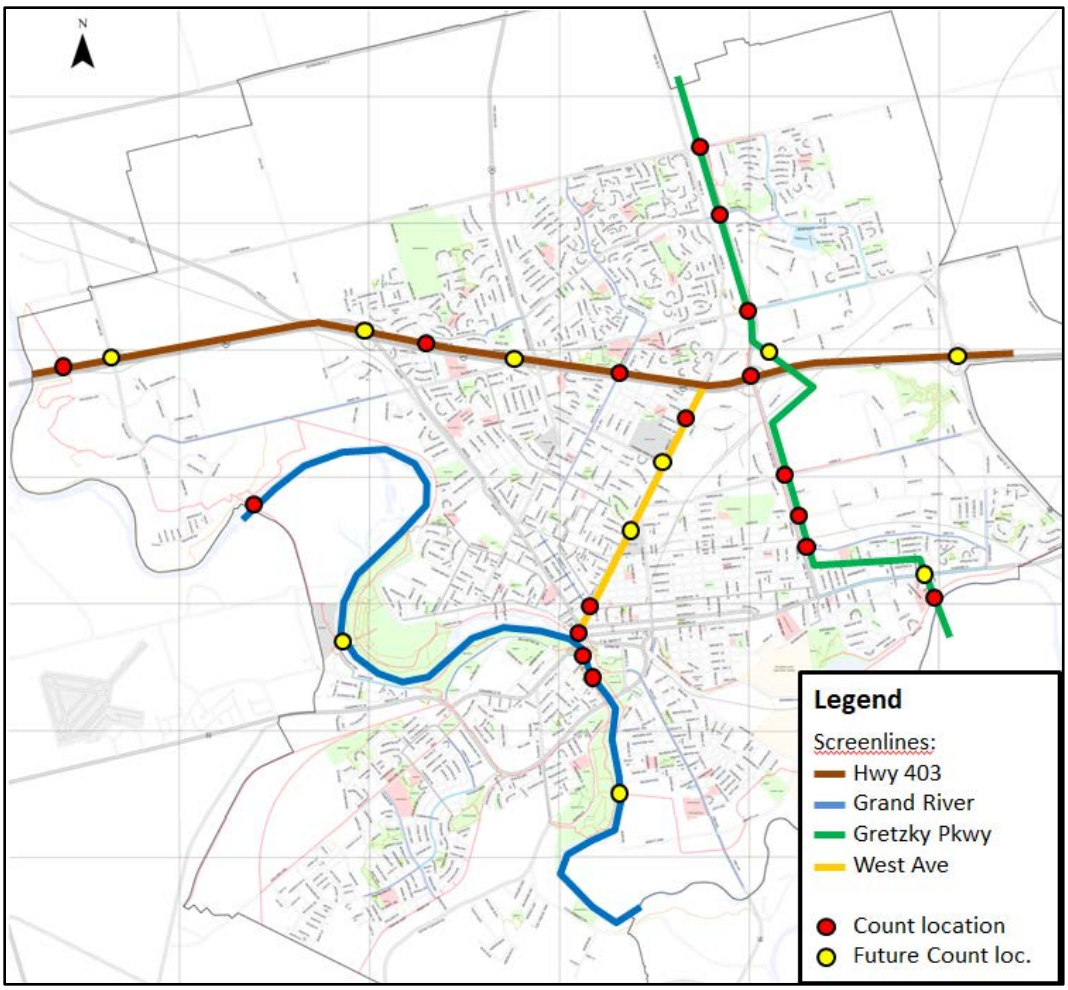


Figure 27: Suggested Screenlines for Active Transportation Data

Another great resource for ridership data and cycling activity demographics is the Transportation Tomorrow Survey (TTS) managed by the University of Toronto JPINT team. This data is collected on a five-year schedule and provides a great overview of all transportation data for the City of Brantford, including traffic and transit ridership.

Collision data is important to monitor as well, and the City of Brantford has an on-going program in tracking all collisions. This data can help identify locations that may require special attention and trends in collision data can help identify what safety messages might be most beneficial to convey to the community.

6.6 Wayfinding

Wayfinding signage at critical decision points provides a sense of orientation for both pedestrians and cyclists. The signage also encourages students to use active transportation to get to and from school, and gives parents 'peace-of-mind'. The City of Brantford has developed a network of signage along its multi-use path facilities, and the

continued expansion of this network of signage will be appreciated. The cost of this signage is modest, and is financed by the On-road Active Transportation Initiatives identified in the annual capital budget, and is typically installed when the new infrastructure is being constructed.

6.7 Bicycle Parking

At the end of every utilitarian cycling trip is the need to park a bicycle, thus parking facilities are essential. Parking facilities can vary depending on the duration of parking required. For short-term parking, a lower level of security may suffice such as a metal rack well-anchored to the ground. This form of bike rack is typical in the downtown core of most cities, and more such racks are needed in commercial areas. See Figure 28. The City should also conduct an inventory of all City facilities to ensure they too have short-term bicycle parking (e.g. libraries and recreation centres). Higher-security bike parking should also be provided for staff, typically an enclosed area. A storage area that can be accessed year-round could suffice, and as demand increases a larger enclosed area could be provided.

In addition to bike racks provided by the City of Brantford, it is important to ensure private businesses are installing bike parking. The City of Brantford is ensuring new developments include bike parking facilities, both short-term racks for customers and longer-term facilities for staff, as required. Existing properties are more of a challenge. It is recommended that the City create a program to encourage existing properties, including both commercial enterprises and schools, to provide short-term bike parking. Many non-City property managers would simply appreciate City expertise to assist with sourcing suitable bike racks and to provide advice determining a best location to install racks. Financial incentives may not be required.

Figure 28: Typical Street Bike Racks in Downtown Brantford

6.8 Micro-mobility/Bike Share

Bike Share programs and other forms of micro-mobility (e-bikes, e-scooters, etc.) are becoming more common. Currently there are approximately 75 North American cities with a bike share program and more than 200 cities with some form of e-scooter program (*Wikipedia, Bicycle-sharing system*). Locally, several municipalities have begun implementing these services in partnership with educational institutions.

The City of Brantford should pursue opportunities for such a program to be implemented and contact possible suppliers as such service providers are looking to expand into small cities. The programs are developing efficiencies that make them more viable in smaller markets.

Critical elements of a successful bike share program include a well-connected cycling-route network in conjunction with available locations for 'stations' along streets to park the bicycles. Identifying potential community partners would also help to make the City of Brantford more viable for such an initiative. Ideally a bike share program is primarily self-financed thus a minimal or zero-cost program for the municipality. Electric bicycles (e-bikes) could be included in a program, making cycling more appealing to a larger segment of the community. City bylaws should be reviewed, as described in Section 6.2, to ensure these newer forms of transportation are addressed legally.

The Province of Ontario is currently operating a pilot program to test electric kick-style scooters, and this program is ongoing through to January 1, 2025. City staff are monitoring this pilot.

6.9 Transit Connections

Connections to pedestrian facilities are an integral part of transit services – both local and for inter-city services.

All Transit busses are equipped with a bike rack to provide additional mobility for people using a bicycle in the city. Whether cyclists encounter a mechanical problem, bad weather, or simply want to take a break from cycling, Transit adds convenience for cycling. All GO Transit busses are equipped with a bike rack as well, providing multi-modal connectivity for cyclists travelling to other cities in the GO Transit service area. The VIA Rail station is located close to existing and planned cycling facilities – only a few blocks south and west of the station.

6.10 Legislative/Policies

An Active Transportation Working group has been created. Ongoing consultation with a working group is very valuable at this time. The City is potentially introducing new cycling elements in the next few years, and a working group will provide valuable

community perspective on these planned designs and insight into any planned community education materials. Continued community feedback on existing promotional materials for pedestrian infrastructure will also be valuable.

6.11 Climate Impact

Transportation emissions contribute to nearly 35% of Ontario's GHG emissions, and on-road passenger vehicles make up a significant portion of that contribution. In the City of Brantford, 31% of community emissions are attributed to on-road transportation. Our travel choices can have a significant impact on the livability of our communities, and choosing active modes can reduce air pollution, GHG emissions, and noise pollution.

Active transportation provides tangible benefits to communities, not only by promoting healthier lifestyles and contributing to economic growth, but also by helping Canada to reach its targets of reducing GHG emissions by 40% to 45% by 2030 compared to 2005 levels and net-zero emissions by 2050.

The City of Brantford's investment in active transportation infrastructure will result in environmental and climate benefits including:

- Climate change mitigation and improved air quality resilience by increased modal share for active transportation;
- Less space required for roads and parking, which helps to preserve open space and reduce water pollution due to runoff from paved surfaces; and
- Improved potential for nature-based solutions.

Active transportation produces almost no GHG emissions so with the City's goal to shift away from motor vehicle use toward active transportation will have a dramatic impact on reducing GHG emissions and improving air quality in the City as per the City's Community Climate Change Action Plan The ATMP includes new dedicated cycling and walking facilities in the City which will reduce annual GHG emissions and energy consumption from passenger transportation. With every vehicle taken off the road, approximately 3.1 tonnes of CO2e is eliminated annually.

The City of Brantford's ATMP will help the City to be a healthy, accessible, environmentally sustainable community that will reach its net-zero emissions target by 2050.

7. Conclusions

The City of Brantford has made good progress in providing and planning active transportation facilities in the past 15 years, as demonstrated by the well-respected trail network, the pedestrian infrastructure award the City received in 2010, and the on-going works to construct cycling facilities to provide connectivity.

The ATMP provides a comprehensive review of the City of Brantford's existing facilities, existing practices, and provides guidance in the expansion of new active transportation infrastructure.

An engagement strategy was undertaken to include feedback on the development of this plan, which included consultation with City Councillors, special interest stakeholder and online/in-person public input.

An implementation strategy for the cycling component within the street right-of-way has been provided and recommendations have been developed based on extensive evaluation metrics. Overall, one hundred eleven (111) locations have been identified for a total approximate cost of $12.7 million. An annual capital budget of $355,000 has been set aside for the installation of facilities between 2022-2031; however additional projects can be completed through annual construction and development projects.

The following is a list highlighting the status of existing conditions and recommended actions to continue to enhance active transportation facilities.

#	Item	Statement	Action	By Whom
1	The City of Brantford included a review of active transportation in the City's Transportation Master Plan	✔		Traffic Services
2	It is the decision of Council through City Bylaws to define which vehicle types are permitted on bike lanes, multi-use paths, or trails.		✔	Council
3	Efforts to increase active transportation (AT) mode share are showing success as the AT mode share (walking and cycling combined) has steadily increased from 6.6% (2006) to 6.9% (2011) to 7.8% (2016).	✔		Traffic Services
4	The City has a number of Council-approved	✔		Council

	documents that clearly state efforts to enhance active transportation facilities across the city.			
5	The current Council may choose to sign the International Charter for Walking		✔	Council
6	The continuity of sidewalks is graded by residents to be 'good' however Council may choose to allocate approximately $60,000/year to the completion of missing segments across the city.		✔	Budget Committee
7	The condition of sidewalks is graded by residents to be 'good' and an annual inventory of sidewalks documents this data well.	✔		Operational Services
8	The maintenance of sidewalks is graded by residents to be less than 'good', and a minor increase in winter maintenance efforts and monitoring may see significant increase in community satisfaction.		✔	Operational Services
9	An investigation of the 'snow angels' program may support a decision by Council to actively promote this program.		✔	AODA
10	24 locations were identified for improved pedestrian crossing accommodations		✔	Traffic Services
11	9 trail crossings of streets were identified for enhancement		✔	Traffic Services
12	Ensure the City standard requires concrete sidewalks to be contiguous across driveways with minimal slope for the safety of pedestrians (winter conditions).		✔	Engineering Services
13	Staff is considering the conversion of all school crossings to PXO crossings.		✔	Traffic Services
14	Street design is recommended to add more amenities to sidewalk design across the city.		✔	Engineering Services
15	Extensive Urban Braille design could be considered at specific areas of the sidewalk network.		✔	AODA
16	Clarence St in the downtown area is a priority to address safety concerns – in conjunction with the planned multi-use path.		✔	Traffic & Engineering Services
17	Illumination is to be considered for all trail projects, but not necessarily required.		✔	Parks & Recreation
18	New types of cycling infrastructure will be considered in future projects, including, cycle tracks, green markings, dedicated bike signals, and protected intersections.		✔	Traffic Services

19	Future MUP wayfinding signage is planned to use a modest increase in the size of the font		✔	Traffic Services
20	Monitor efforts in Ontario to modify the PXO design to permit cyclists to use them without having to dismount.		✔	Traffic Services
21	City staff to discuss the planned MUP on Oak Park Rd at an MTO Liaison Committee meeting.		✔	Traffic Services
22	City staff to discuss the planned bike lanes on Tollgate Rd at an MTO Liaison Committee meeting.		✔	Traffic Services
23	Approximately 12 links were added to enhance the cycling network that was described in the Transportation Master Plan (2020/21).	✔		Traffic Services
24	Approximately 20 existing links were modified to enhance the cycling network that was described in the Transportation Master Plan (2020/21).	✔		Traffic Services
25	Cycling links in proximity to strategic growth areas are identified to assist in identifying links to finance through development charges.	✔		Traffic Services
26	Consider increasing the annual budget allocation for on-street cycling projects to $1 million.		✔	Budget Committee
27	Multi-use Paths are recommended to be categorized as a cycling expenditure in future budgets – both capital and operational expenditures.		✔	Budget Committee
28	The City has been proactive in managing Accessibility for Ontarians with Disabilities Act (AODA) compliance, and the financing of these projects are embedded in the annual City Budget.	✔		AODA
29	Traffic Services investigating and implementing signal phasing design called a “leading pedestrian interval”.		✔	Traffic Services
30	Traffic Services cycling staff shall typically be involved in all project implementation, but the lead for projects vary.		✔	Traffic Services
31	Traffic Services cycling staff shall typically prepare a notice to be distributed to property addresses immediately adjacent to planned project to notify them of plans to modify their street to achieve the cycling infrastructure.		✔	Traffic Services

32	Promotional materials produced to inform the public how to use PXOs should continue annually.		✔	Community Engagement & Customer Services
33	Educating citizens about new cycling elements such as bike boxes, etc. will be beneficial.		✔	Traffic Services
34	Continued promotion of Bike Month is beneficial.		✔	Traffic Services
35	Staff arranging bike parking at special events should continue as a service and an opportunity to promote cycling.		✔	Traffic Services
36	Trail etiquette information should continue, possibly with expanded messaging.		✔	Parks & Recreation
37	The City should develop a program with school boards to teach traffic safety at the Safety Village incorporating cycling and pedestrian safety.		✔	Traffic Services
38	Continue the enforcement of laws in the city to legitimize active modes of transport.		✔	Police & Bylaw
39	Consider adding new bylaws that address operational issues.		✔	Traffic Services, Parks & Recreation
40	Track operational expenditures (maintenance) to better predict future maintenance as the cycling network expands.		✔	Operational Services
41	Review the jurisdiction of MUPs as they may be most suited to be exclusively a Road Operations responsibility.		✔	Operational Services & Parks and Recreation
42	A formal table of closure procedures should be developed so all City Services are clearly informed of their responsibilities during both emergencies and scheduled closures of pedestrian and cycling infrastructure.		✔	Traffic Services
43	An annual or biannual review of data that describes active transportation infrastructure and activity should be prepared.		✔	Traffic Services
44	Ridership data should be collected at a few critical locations – both on-street and on the trail network.		✔	Traffic Services, Parks & Recreation
45	More on-street bike parking is required, primarily in commercial areas.		✔	Traffic Services
46	The City should conduct an inventory of all		✔	Traffic

	City facilities to ensure they have short-term bicycle parking, and long-term parking where required.			Services
47	The City should create a program to encourage existing properties to provide bike parking, including both commercial enterprises and schools.		✔	Traffic Services
48	Create an Active Transportation Citizen Committee.		✔	Traffic Services

Appendices