THE CITY OF Waterloo

TRANSPORTATION MASTER PLAN 2020 UPDATE

VOLUME 2 – ACTIVE TRANSPORTATION STRATEGY

TRANSPORTATION MASTER PLAN UPDATE
LOOKING AHEAD

paradigm alta PLANNING + DESIGN LURA LISTEN · UNDERSTAND · RELATE · ADVANCE

8 ACTIVE TRANSPORTATION STRATEGY

8.1 Overview

The way that communities in North America plan and design for active transportation has evolved considerably since the completion of the previous TMP. This shift is due in large part to an expansion in research in the field and the evaluated success of cities that are creating high quality networks and infrastructure. Several different aspects have influenced the changing approach to active transportation infrastructure that also contributes to addressing the vision and goals of the WTMP presented in **Volume 1**.

- **Traffic Congestion** – people using active transportation require less physical space than automobiles and can accommodate higher volumes in smaller spaces.[1] This relates to the WTMP goal to optimize the transportation system.
- **Air and Noise Pollution** – people using active transportation do not contribute to air and noise pollution. This also lowers greenhouse gas emissions which contribute to climate change.[2] This relates to the WTMP goal to support sustainable development.
- **Public Health and Safety** – people using active transportation are getting exercise and lowering their risk of cardiovascular disease, cancer, and have improved mental health.[3] In addition, people using active transportation are not a high risk to other road users and designing networks and roads for people to use active transportation commonly improves their safety.[4]This relates to the WTMP goal to create a sense of belonging.
- **Economic** – people using active transportation are regular shoppers, and the addition of facilities such as bike parking, supports local businesses.[5,6] This relates to the WTMP goal to support economic development.
- **Equity** – where and how active transportation facilities are planned and designed can have impacts on who uses them. Equity should be part of the conversation to ensure that equity-seeking and vulnerable populations benefit from active transportation improvements. This relates to the WTMP goal to create a sense of belonging and to promote travel choice.

When planning and designing active transportation networks and facilities, there is now more importance placed on thinking about the users for which the facilities are being designed. Research has identified that most people are not comfortable cycling on roads with high traffic volumes and speeds, yet most destinations in a community are on roads with these

1 https://www.canada.ca/en/public-health/services/being-active/active-transportation.html
2 https://equiterre.org/sites/fichiers/fmm_transportation_recs.pdf
3 https://www.bmj.com/content/357/bmj.j1456
4 *Marshall, W., and N. Garrick, 2011* - Evidence on why bike-friendly cities are safer for all road users, Environmental Practice, 13, 1.
5 https://trec.pdx.edu/news/study-finds-bike-lanes-can-provide-positive-economic-impact-cities
6 https://injuryprevention.bmj.com/content/23/4/239

characteristics. Physically separated facilities are intended to provide a low-stress experience to better accommodate all people cycling on these busier, faster roads.[7][8]

The WTMP is addressing these barriers to building successful active transportation facilities and networks by examining the existing conditions and proposing a connected network of facilities intended to be used by a majority of the population through prioritizing low-stress facilities. This relates to the WTMP goal to promote travel choice. The development of the active transportation network also considered the existing and future demand, as well as the ability for the network to provide access to schools, community facilities, and transit. Barriers and network gaps were considered to define where new facilities are needed to complete the network. The following sections describe this analysis in more detail.

8.1.1 Plan Process

The Active Transportation Strategy chapter was developed throughout the WTMP planning process. The strategy builds on existing conditions identified in Chapter 5, and through input from the planning process proposes updated active transportation recommendations including new cycling facilities, and clarity on how pedestrian facilities are planned and prioritized for.

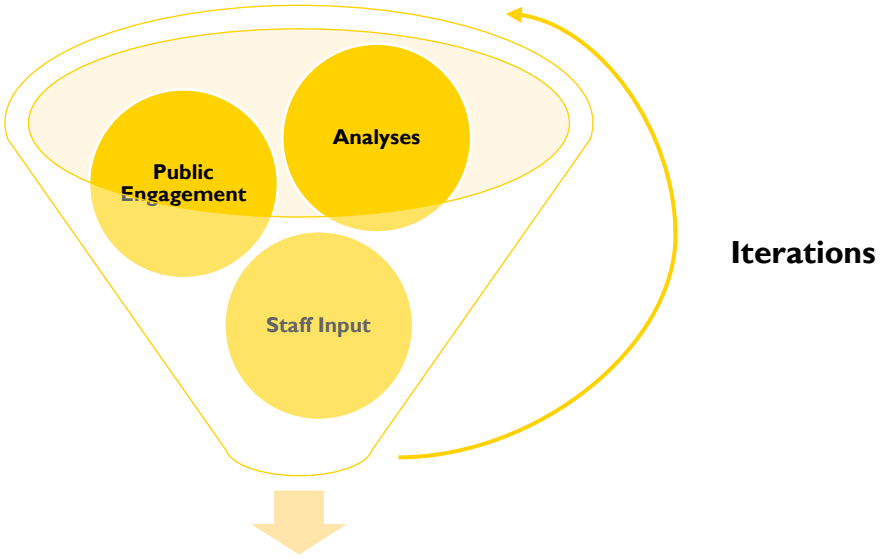
As **Figure 8.1** illustrates, inputs into the planning process that supported the development of the recommendations included:

- **Analyses –** The Live, Work, Play Relative Demand analysis, Active Transportation Access analysis (**Section 8.2**), and Active Transportation Barriers analysis (**Section 8.3**), including the Network Gaps analysis (**Subsection 8.3.3**) all contributed to the development of plan recommendations.
- **Public Engagement –** Feedback from the public engagement phases helped identify and support the development of plan recommendations.
- **Staff Input –** Feedback from City and Region staff was sought throughout the planning process to guide and support plan development.

The planning process was iterative, which means that these inputs where reviewed and sought after at different stages of the project to support and further develop decision-making and the development of plan recommendations.

[7] https://nacto.org/2016/07/20/high-quality-bike-facilities-increase-ridership-make-biking-safer/
[8] *Teschke, K. et al., 2012* - Route Infrastructure and the Risk of Injuries to Bicyclists, American Journal of Public Health, Volume 102

FIGURE 8.1: INPUTS INTO THE PLANNING PROCESS



8.1.2 Active Transportation Guidance

The following documents provide facility design guidance for active transportation facilities in Ontario:

- **Ministry of Transportation Ontario Traffic Manual Book 18: Cycling Facilities (2013, currently being updated) –** The *Ontario Traffic Manual Book 18* provides provincial guidance for cycling facilities in Ontario. The manual includes facility planning, selection, and design guidance, as well as intersection and crossing treatments, such as "crossrides". The guide is currently being updated with completion expected in 2020.
- **Ministry of Transportation Ontario Traffic Manual Book 15: Pedestrian Crossing Facilities (2016) –** The *Ontario Traffic Manual Book 15* provides guidance for the planning and design of pedestrian crossing facilities, including pedestrian crossovers in Ontario. The guidance covers a wide range of considerations and includes criteria for facility selection based on the roadway context.
- **Transportation Association of Canada Geometric Design Guide for Canadian Roads (2017) –** The *Geometric Design Guide* provides federal guidance for roadway and active transportation facility design. The updated facility selection guidance includes lowered thresholds for implementing physically-separated facilities, as well as guidance for new facility types such as advisory bike lanes. The guide also provides direction on intersection and crossing treatments, including protected intersections.

- **Ministry of Transportation Ontario Traffic Manual Book 12A: Bicycle Traffic Signals (2018) –** The *Ontario Traffic Manual Book 12A* provides guidance for the implementation of bicycle traffic signal design for intersections and "crossrides" in Ontario, including considerations for signage and implementation.
- **National Association of City Transportation Officials (NACTO), Various Documents –** NACTO is a coalition of Transportation Departments from cities across North America. The organization has released many influential documents with guidance for active transportation, including the *Urban Street Design Guide* (2013), *Urban Bikeway Design Guide* (2014), *Designing for All Ages & Abilities* (2017), and *Don't Give Up at the Intersection* (2019).

8.2 Active Transportation Access

Facilities that provide direct connectivity to daily needs can influence residents' mode choice. By connecting people to transit locations, schools, and other community resources through low-stress bikeways that are designed for people of all ages and abilities, the City can help ensure that investments in cycling can provide meaningful changes to Waterloo residents' lives. This section is divided into three analyses:

- Access to Transit;
- Access to Schools; and
- Access to Community Resources.

For each analysis, the percent of Waterloo's population living within 250 m of a low-stress bikeway that connects to a given destination was calculated. The analyses show that a high percentage of Waterloo residents has access to destinations using low-stress bikeways, but that some areas without connectivity remain. In addition, many of the existing trails do not meet current design guidance for a bikeway facility, and thus in practice do not provide a connection.

8.2.1 Access to Transit

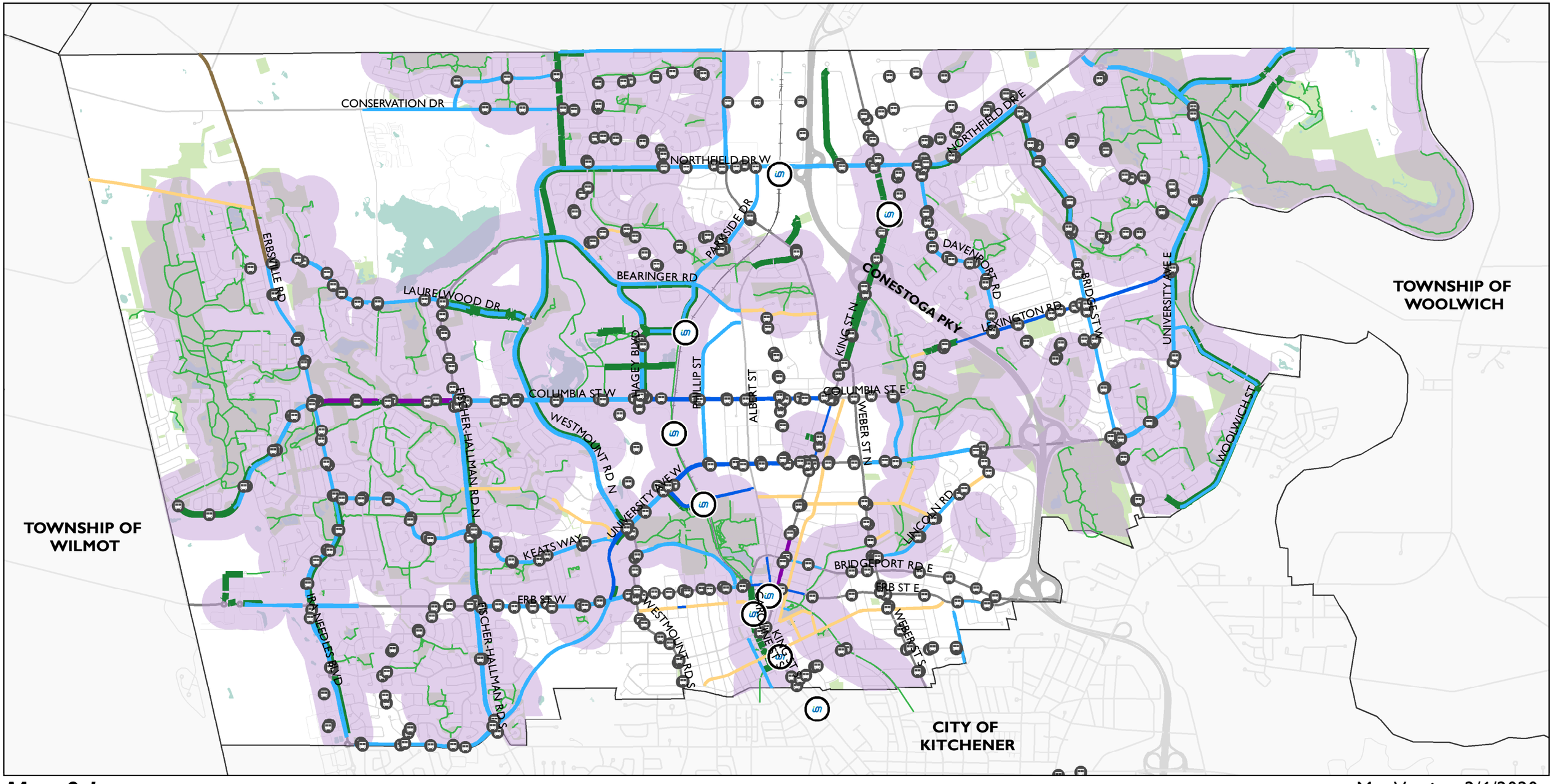
Map 8.1 shows low-stress bikeways that connect an existing transit stop or station. Currently 85% of residents live within 250 m of a low-stress bikeway (e.g., trail, path, or separated bicycle lane) that connects to a transit stop or station. The largest gaps in connectivity include:

- Westmount neighbourhood;
- Westside neighbourhood (west side sub-divisions);
- Near Wilfrid Laurier University;
- Green Acres Park (north of Laurel Creek Reservoir);
- Around the intersection of Lexington Road and Bridge Street;
- West of the BlackBerry Technology Park; and
- Northfield ION Station.

8.2.2 Access to Schools

Map 8.2 shows low-stress bikeways that connect an existing primary, secondary, or post-secondary school. The ability for students to travel to school without the need of a motor vehicle helps encourage freedom through personal mobility. Currently 79% of residents live within 250 m of a low-stress bikeway (e.g., trail, path, or separated bicycle lane) that connects to a school. The largest gaps in connectivity include:

- Westmount neighbourhood;
- Westside neighbourhood (west side sub-divisions);
- Lakeshore Village neighbourhood, near the Northfield ION Station;
- West of the BlackBerry Technology Park;
- Maple Hills neighbourhood;
- Near St. Agnes Catholic Elementary School and Elementary School L'harmonie;
- North of Laurel Creek Reservoir;
- Near Wilfrid Laurier University; and
- East of Conestoga Mall near Anndale Park.



Map 8.1

CYCLIST ACCESS TO TRANSIT

Map Version: 2/6/2020

Cycling Facilities
- Raised Bike Lane
- Segregated/Buffered Bike Lane
- Painted Bike Lane
- Paved Shoulder
- Signed Route

Trails
- Community Trail
- Multi Use

Transit
- ION Station
- GRT Bus Stop
- Low-Stress Corridor with Access to Transit

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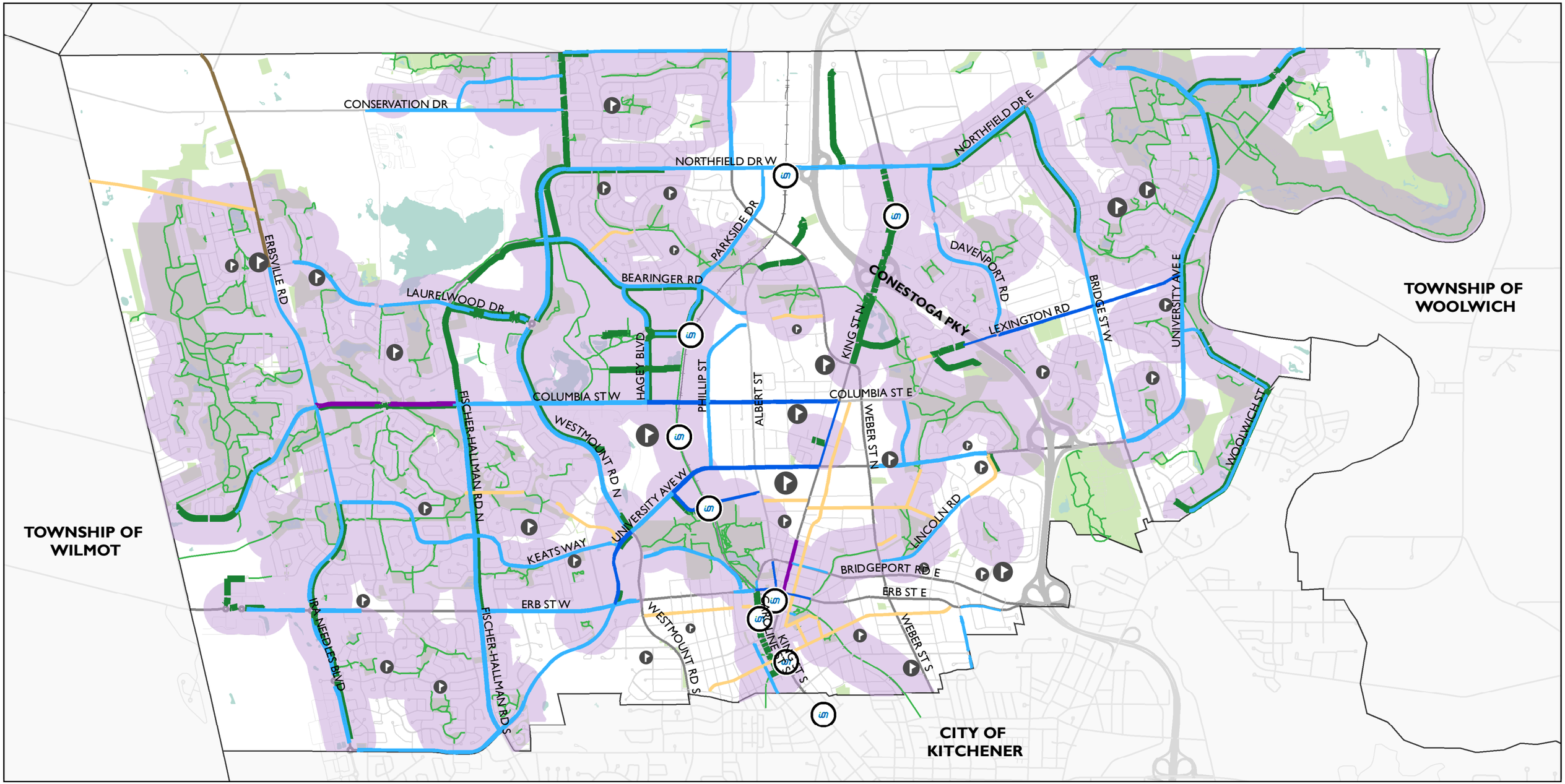

Map 8.2

CYCLIST ACCESS TO SCHOOLS

Map Version: 4/29/2020

Cycling Facilities
- Raised Bike Lane
- Segregated/Buffered Bike Lane
- Painted Bike Lane
- Paved Shoulder
- Signed Route

Trails
- Community Trail
- Multi Use

Schools (scaled by known enrollment)
- <250
- 250-500
- 500-1000
- 1000-5000
- >5000

Low-Stress Corridor with Access to Schools

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8.2.3 Access to Community Resources

Map 8.3 shows low-stress bikeways that connect an existing community resource, defined in this analysis as a grocery store, hospital, library, recreation centre, community centre, parks, and local administration building. The ability for residents to access community resources through multiple means of transportation helps ensure that everyone has low-cost options for meeting their daily needs. Currently 68% of residents live within 250 m of a low-stress bikeway (e.g., trail, path, or separated bicycle lane) that connects to a community resource. The largest gaps in connectivity include:

- Westvale neighbourhood;
- Westside subdivision (west side sub-divisions);
- Westmount neighbourhood;
- Beechwood neighbourhood;
- North of Laurel Creek Reservoir;
- Near Pinebrook Park;
- Near Wilfrid Laurier University;
- West of the BlackBerry Technology Park;
- East of Conestoga Mall near Anndale Park;
- Near St. Agnes Catholic Elementary School and Elementary School L'harmonie; and
- Near St. Matthew Catholic Elementary School, Sandowne Public School, Sandowne Park, and Wintermeyer Park.

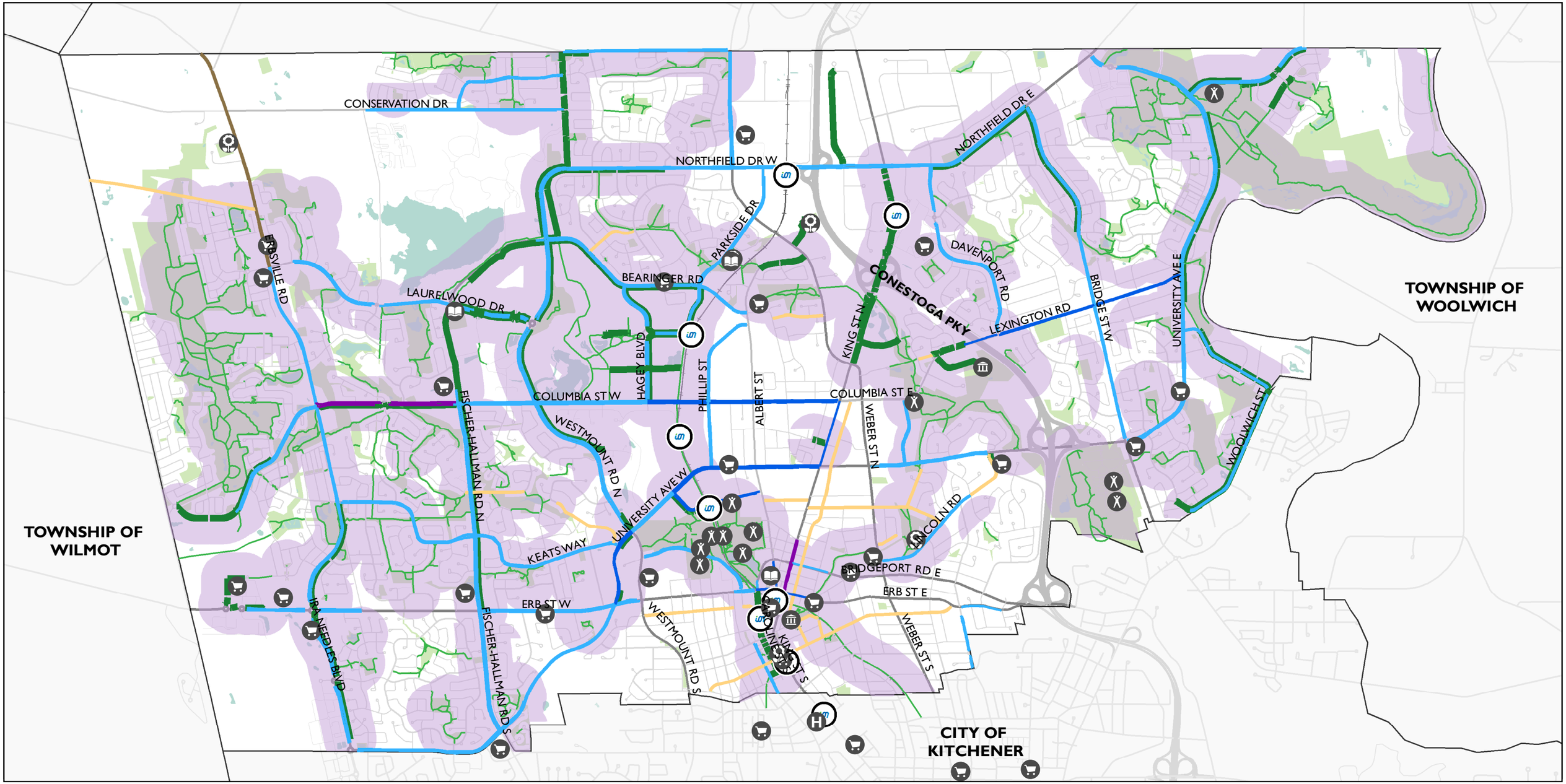

Figure 8.3

CYCLIST ACCESS TO COMMUNITY RESOURCES

Map Version: 4/29/2020

Cycling Facilities
- Raised Bike Lane
- Segregated/Buffered Bike Lane
- Painted Bike Lane
- Paved Shoulder
- Signed Route

Trails
- Community Trail
- Multi Use

Community Resources
- City Administration
- Community Centre
- Grocery
- Hospital
- Library
- Sports or Recreation

Low-Stress Corridor with Access to Community Resources

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8.3 Active Transportation Barriers

Perceived and physical barriers to cycling and walking can also greatly influence a person's mode choice. The frequency and severity of barriers can range from being a simple inconvenience and increasing travel time to preventing a user from being able to physically access a destination by cycling or walking. Barriers include conditions that negatively impact the user experience of people using active transportation, such as stressful routes if facilities are not suitable based on the roadway characteristics, or design issues such as missing curb cuts, or not suitable design treatments.

8.3.1 Influencing Factors

Through the WTMP public survey, respondents indicated that the following issues were most likely to prevent them from cycling (respondents were able to select multiple factors). The respondents overwhelmingly identified safety as an issue preventing them from cycling. Safety is being considered and addressed throughout the plan as it is one of the goals of the WTMP.

- **Safety –** 75% of respondents.
- **Parking –** 51% of respondents.
- **Theft –** 50% of respondents.
- **Weather –** 33% of respondents.

Respondents also indicated that the following factors were most likely to prevent them from walking (respondents were able to select multiple factors).

- **Distance to destination –** 59% of respondents.
- **Safety –** 49% of respondents.
- **Faster travel options available –** 42% of respondents.
- **Weather –** 33% of respondents.

8.3.2 Safety Issues

For both cycling and walking, survey respondents indicated that concerns about safety were either the most or second most influential factor preventing them from traveling by bicycle or by foot.

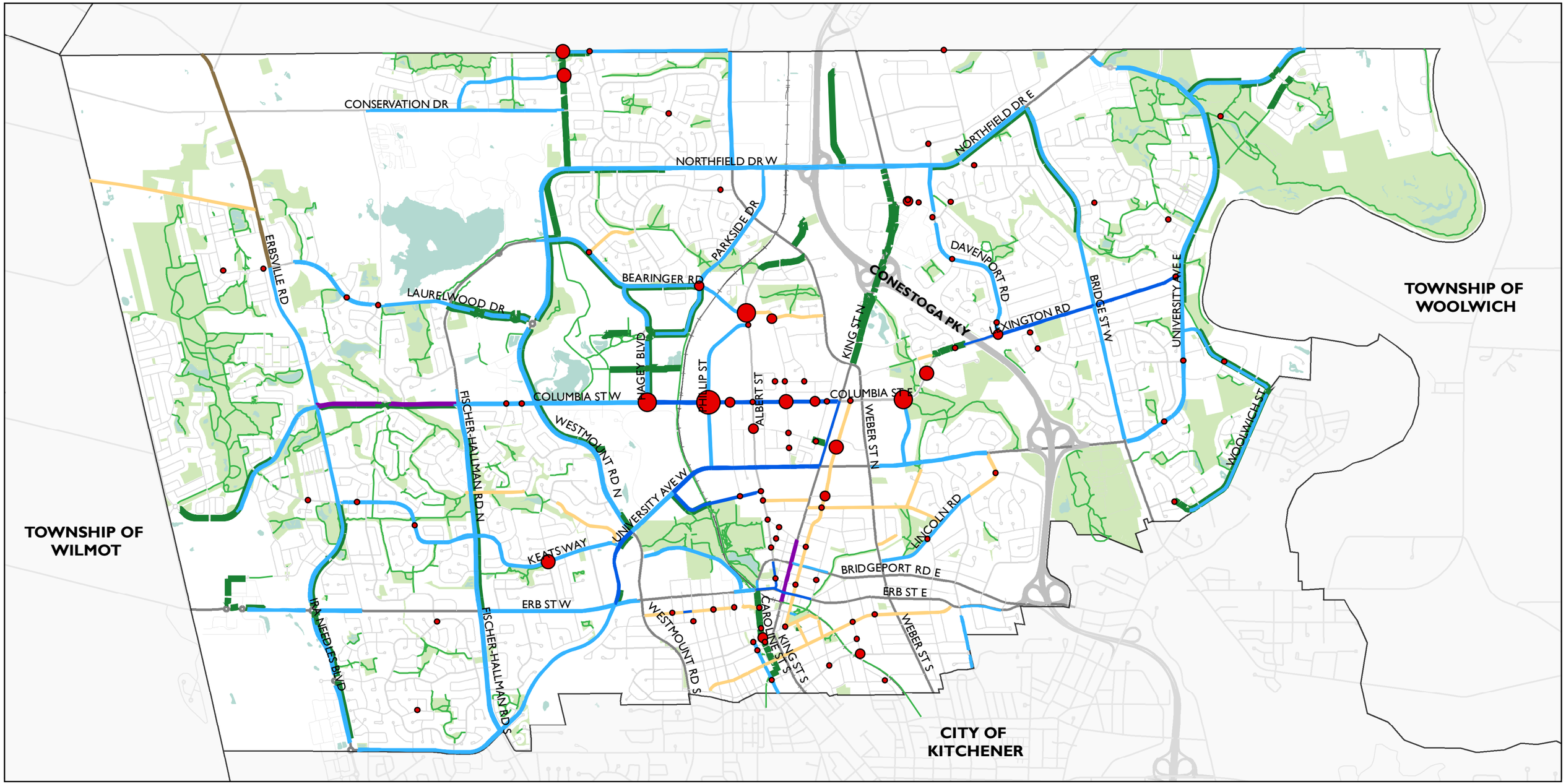
Map 8.4 shows the number of reported cyclist- or pedestrian-involved collisions between December 2012 and June 2018. The intersections with the greatest number of reported cyclist- and pedestrian-involved collisions were:

- **Columbia Street West and Phillip Street –** 13 collisions;

- **Columbia Street West and Hagey Boulevard –** 9 collisions;
- **Columbia Street East and Marsland Drive –** 6 collisions;
- **Albert Street and Hazel Street –** 6 collisions; and
- **Columbia Street West and Hazel Street –** 4 collisions.

Corridors with the most frequent instances of cyclist- or pedestrian-involved collisions between December 2012 and June 2018 included:

- Columbia Street;
- Regina Street North;
- Caroline Street;
- Albert Street;
- Keats Way;
- Dawson Street;
- Moore Avenue;
- Hickory Street; and
- Westmount Road.



Map 8.4

PEDESTRIAN- AND CYCLIST-INVOLVED COLLISIONS

Map Version: 2/6/2020

Cycling Facilities
- Raised Bike Lane
- Segregated/Buffered Bike Lane
- Painted Bike Lane
- Paved Shoulder
- Signed Route

Trails
- Community Trail
- Multi Use

Collisions (2012-2018)
- 1
- 2
- 3 - 4
- 5 - 9
- 10 - 13

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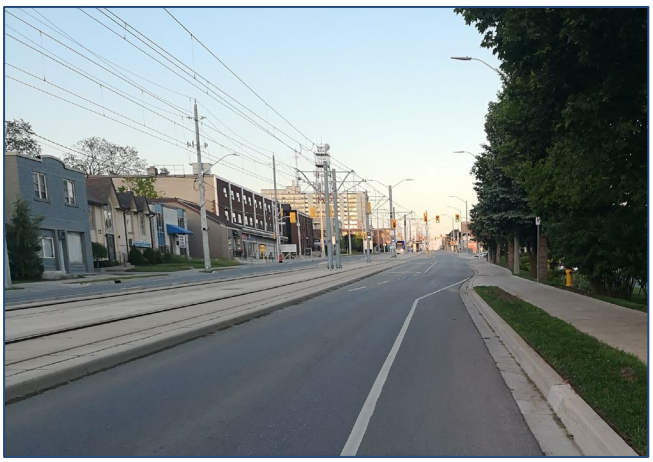
8.3.3 Network Gaps

Network gaps are missing links in the active transportation network that are barriers to people walking and cycling. Three categories of gaps can be identified, these are spot gaps, connection gaps, and system gaps, which are shown on **Map 8.5**. The gaps were organized based on their characteristics, which are described in the following section. The gaps were identified through comments from City staff, comments from the public, and by the consulting team. The Network Gap analysis provides a framework for the City to use as part of tracking, monitoring, and resolving issues in the cycling and pedestrian networks.

Spot Gaps

Spot gaps are localized obstacles or barriers to using a facility. Many separate spot gaps can exist throughout the length of a facility. Examples of spot gaps include:

- Missing curb ramp at a crossing;
- An unmarked crossing; and
- An obstacle in the facility, such as a utility pole in the middle of the sidewalk.

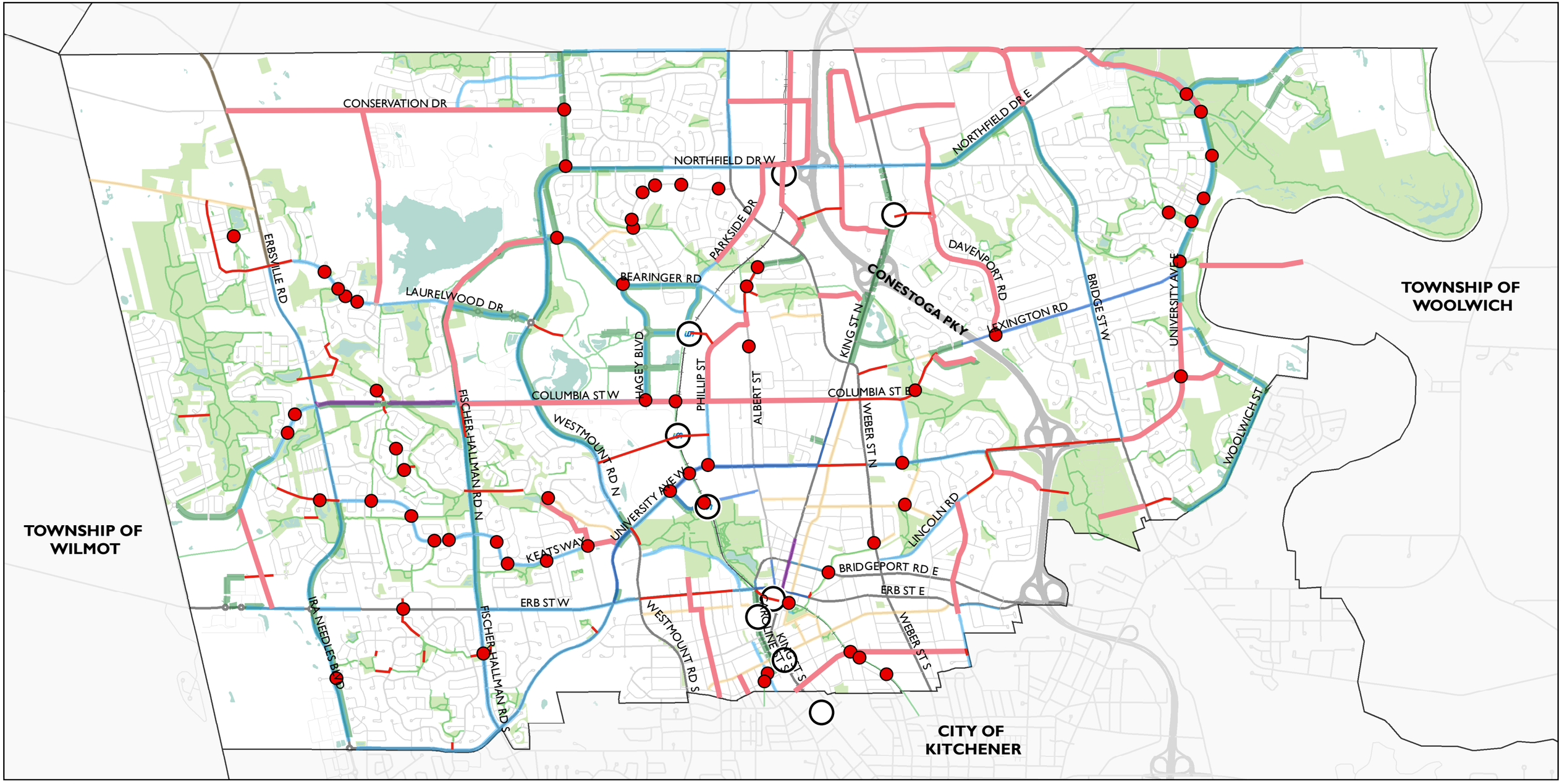


Most of the spot gaps that were identified were at intersections or crossings where no treatment is present to facilitate a safe crossing for pedestrians or cyclists. Additional spot gaps likely exist and could be identified over time, for example a spot gap could occur due to poor maintenance. It is recommended that the City have a process to collect complaints through 311 or another means, and then appropriately flag and send these reports to address them.

Connection Gaps

Connection gaps are areas between existing facilities where no facilities exist. This creates a barrier for people using active transportation modes. An example could be a sidewalk that ends a block before there is a crossing to another sidewalk. This situation might deter someone from walking to a destination. Otherwise, the situation may create an unpleasant or even hazardous travel experience.

Many of the identified connection gaps are where sidewalks currently only exist on one or neither side of the road. Another common situation for connection gaps was a connection to or from an existing trail to an on-road facility.



Map 8.5

ACTIVE TRANSPORTATION NETWORK GAPS

Map Version: 8/31/2020

Cycling Facilities
- Raised Bike Lane
- Segregated/Buffered Bike Lane
- Painted Bike Lane
- Paved Shoulder
- Signed Route

Trails
- Community Trail
- Multi Use

Gap Types
- Spot Gap
- Connection Gap
- System Gap

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System Gaps

System gaps are areas where no facilities exist at all, and therefore act as a barrier to people traveling by active transportation modes to, from, within or through that area. Most system gaps are in the northern part of the city and include significant east-west and north-south corridors where there are no existing active transportation facilities.

8.4 Proposed Active Transportation Facilities

As part of the process to propose appropriate facilities for roads, suitable facilities selection criteria were developed from the draft update to *OTM Book 18* and the NACTO *All Ages & Abilities* guide in **Table 8.1**. **Table 8.2** and **Table 8.3** summarize and reconcile the terminology for bikeways and pedestrian facilities, respectively, amending the existing terminology. This reorganization better aligns with provincial and national guidance. Based on the established suitability and terminology the proposed networks are described later in this section.

8.4.1 Ultimate Cycling Network

The ultimate cycling network consists of both existing and proposed facilities. The ultimate network resolves many of the barriers and gaps identified in the Network Gap Analysis. The network was developed on the following principles which all enhance the user experience:

- **Access to destinations –** routes that get people to destinations;
- **Density –** there are multiple available route options;
- **Quality –** routes that are low-stress;
- **Directness –** routes limit out of the way travel; and
- **Completeness –** routes are connected and provide access to all parts of the city.

The ultimate network is classified into five classifications to simplify and better organize the types of cycling facilities and are shown on **Map 8.6**. The categories are summarized as follows:

- **Physically Separated Bikeway –** This classification includes Raised Cycle Track, Separated Bike Lane, and Multi-Use Paths. These are intended for major network connections on streets with high volumes and speeds (>40km/h), and generally includes arterials and major collectors. Overall, there are 82 centreline km of physically separated bikeways, which includes 38 km of existing multi-use paths, as well as 35 km of new or upgraded facilities. When implementing a physically separated bikeway, the City should consider which facility type will be most feasible and appropriate based on factors including available right-of-way, roadway characteristics, land use, and connectivity with adjacent facilities.

TABLE 8.1: CYCLING FACILITY AND TREATMENT SELECTION TABLE

Roadway Context				All Ages & Abilities Bicycle Facility
Target Speed	**Target Max. Volume (AADT*)**	**Motor Vehicle Lanes**	**Key Operational Considerations**	
Any	Any	Any	High curbside activity, frequent buses, motor vehicle congestion, or turning conflicts	Physically Separated Bikeway
<15km/h	Not relevant	No centreline, or single-lane one-way	Pedestrians share the roadway	Shared Street
<30km/h	<2000		<50 vehicles /hr in the peak direction at peak hour	Neighbourhood Bikeway
<40km/h	<500			
	1500-3000	Single lane each direction	Low curbside activity, or low congestion pressure	Visually Separated Bikeway or Physically Separated Bikeway
	3000-6000			Visually Separated Bikeway or Physically Separated Bikeway
	>6000			Physically Separated Bikeway
	Any	Multiple lanes per direction		
>40km/h	<6000	Single lane each direction	Low curbside activity, or low congestion pressure	Physically Separated Bikeway or reduce speed
		Multiple lanes per direction		Physically Separated Bikeway or reduce to single lane and reduce speed
	>6000	Any	Any	Physically Separated Bikeway
High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts		Any	High pedestrian volume	Physically Separated Bikeway with delineated cycling and walking spaces
			Low pedestrian volume	Physically Separated Bikeway

Adapted from "Designing for All Ages & Abilities" NACTO (2017)
* Annual Average Daily Traffic is a common measure for expressing traffic volumes

TABLE 8.2: EXISTING AND PROPOSED BIKEWAY CLASSIFICATION TERMINOLOGY

Current City Classification	Regional Classification *, **	Provincial Classification ***	Proposed Terminology Moving Forward	Description
Physically Separated Bikeways				
Community Trail	N/A	Multi-use Trail	Multi-use Trail	An off-street pathway that is paved and generally with 3.0 m width or greater that runs through and between parks and other off-road corridors. These trails provide direct connections for people walking and cycling, as well as other modes of active transportation. They also include the Laurel Trail where the uses are separated.
Multi-Use Trail	Boulevard Multi-use Trail	Multi-use Path	Multi-use Path	A wide, paved, off-street pathway that is separated from motor vehicle traffic by a strip of grass (often referred to as a "boulevard" or "verge") or by a paved "splash strip". It is a combined single path shared by cyclists and pedestrians.
Raised Bike Lane	N/A	Raised Cycle Track	Raised Cycle Track	A type of Conventional Bicycle Lane that is adjacent to a motor vehicle travel lane but vertically isolated from motor vehicle traffic by movable or fixed curbs. A Raised Cycle Track is designated for exclusive use by cyclists and is distinct from the sidewalk.
Segregated Bike Lane *and* Buffered Bike Lane	Physically Separated Bike Lane *and*	Separated Bicycle Lane	Separated Bike Lane	A type of Conventional Bicycle Lane that is isolated from motor vehicle traffic by a vertical barrier, such as

TABLE 8.2: EXISTING AND PROPOSED BIKEWAY CLASSIFICATION TERMINOLOGY

Current City Classification	Regional Classification *, **	Provincial Classification ***	Proposed Terminology Moving Forward	Description
	Buffered Bike Lane			bollards, planters, on-street parking, or a median or by a horizontal buffer, such as hatched pavement markings to restrict motor vehicle encroachment.
Visually Separated Bikeways				
Painted Bike Lane	Bike Lane	Conventional Bicycle Lane	Conventional Bike Lane	Typically, an at-grade portion of an urban arterial or collector roadway which has been designated by pavement markings and signage for the preferential or exclusive use of cyclists. On one-way streets, conventional bicycle lanes can be placed on the left and right sides.
Segregated Bike Lane *and* Buffered Bike Lane	Physically Separated Bike Lane *and* Buffered Bike Lane	Buffered Bike Lane	Buffered Bike Lane	A type of Conventional Bicycle Lane that has additional horizontal separation through the use of a buffer space that is marked by offset lines with hatched markings.
Paved Shoulder	Rural Bike Lane	Signed Bicycle Route with Paved Shoulder	Paved Shoulder	Typically, a Signed Bicycle Route along the paved shoulder of a rural secondary highway, arterial, or collector roadway that may include a buffer zone in the form of two edge lines with diagonal hatching or bicycle-friendly rumble strips to provide greater separation between motorists and cyclists traveling in the same direction.

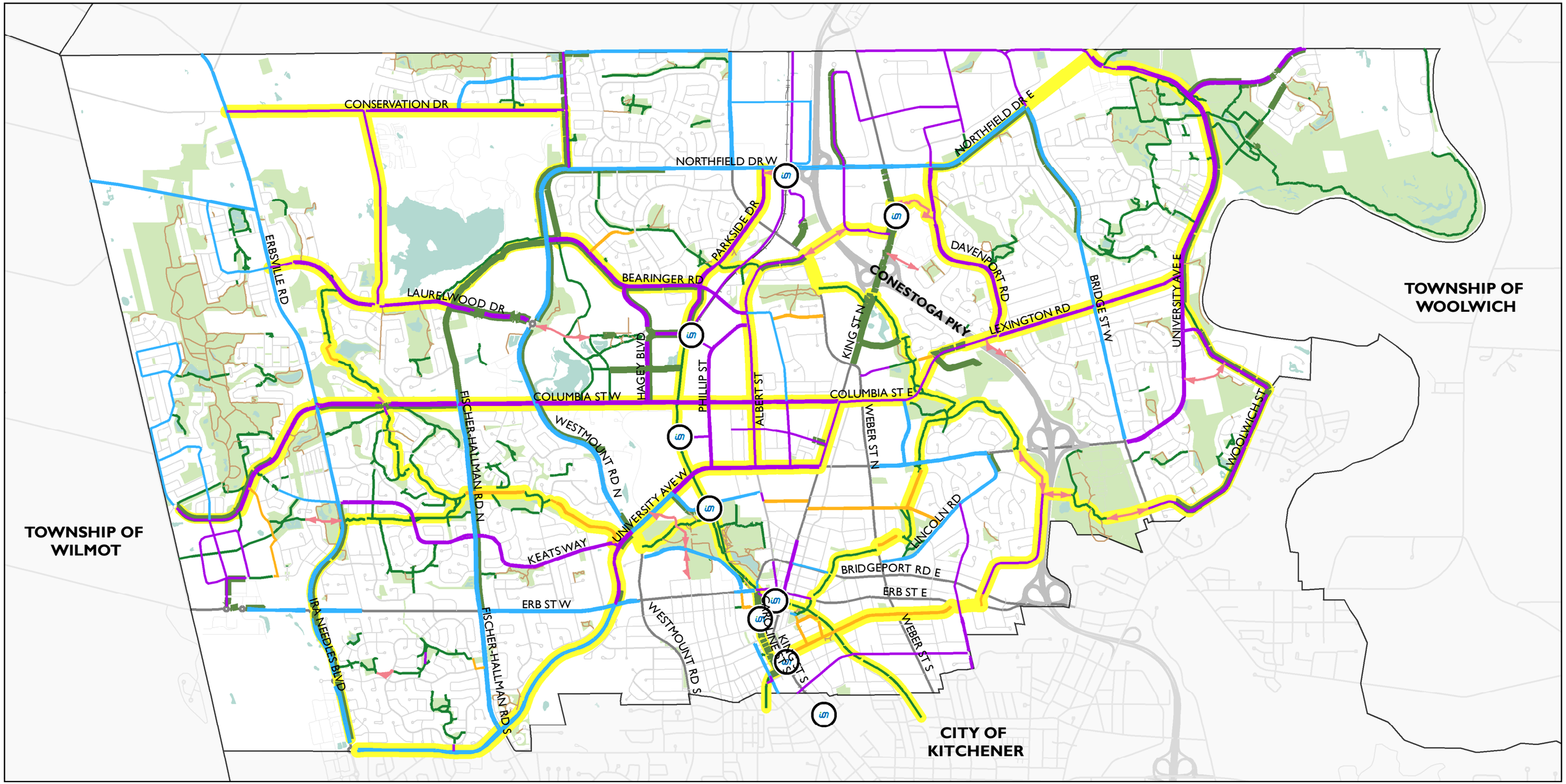
TABLE 8.2: EXISTING AND PROPOSED BIKEWAY CLASSIFICATION TERMINOLOGY

Current City Classification	Regional Classification *, **	Provincial Classification ***	Proposed Terminology Moving Forward	Description
Neighbourhood Bikeways				
N/A	N/A	Bicycle Priority Street	Neighbourhood Bikeway	Typically, a low-volume, low-speed, residential roadway that is optimized for bicycle travel through traffic calming, traffic reduction, and intersection crossing treatments.
N/A	N/A	Advisory Bike Lane	Advisory Bike Lane	Advisory bike lanes are a type of mixed traffic facility typically on low-volume, low-speed constrained roadways. Dashed white lines delineate space for people cycling, while a two-way general purpose lane requires motor vehicles to negotiate that space and enter the advisory bike lane.
Signed Route	Shared Lane *and* Enhanced Shared Lane	Mixed Traffic Operations	Signed Route with Mixed Traffic Operations	A shared roadway with green marker signs for the purposes of awareness, consistency, and wayfinding. Usually only located on local urban and suburban roads where traffic volumes and speeds are low. Additional shared-use lane markings ("sharrows"), "Share the Road" signs, or "Shared Use Lane Single File" signs may also be installed.

* Cycling Facility Nomenclature, Region of Waterloo, DOC#: 2543286 V4
** Walk Cycle Waterloo Region, Region of Waterloo, 2014
*** Ontario Traffic Manual, Book 18: Cycling Facilities, 2013

TABLE 8.3: PROPOSED PEDESTRIAN FACILITIES CLASSIFICATION TERMINOLOGY

Current City Classification	Proposed Terminology Moving Forward	Description
Sidewalk	Sidewalk	Generally, a raised concrete path for pedestrian travel either directly adjacent to the roadway or separated by a boulevard.
Walkway	Walkway	A pathway connection between blocks, generally for pedestrian use only.
Community Trail	Recreation Trail	Trails that do not provide direct connections to destinations. They provide a recreational function and are not the focus of the WTMP.
Community Trail	Multi-use Trail	Facility described in the bikeway classification terminology table that are destination oriented. A wide, paved, off-street pathway that is separated from motor vehicle traffic by a strip of grass (often referred to as a "boulevard" or "verge") or by a paved "splash strip". Can include distinct cycling and walking facilities or a combined single path shared by cyclists and pedestrians.
Multi-use Trail	Multi-use Path	A wide, paved, off-street pathway that is separated from motor vehicle traffic by a strip of grass (often referred to as a "boulevard" or "verge") or by a paved "splash strip". It is a combined single path shared by cyclists and pedestrians.



Map 8.6

Map Version: 3/15/2021

PROPOSED ULTIMATE CYCLING NETWORK

Cycling Facilities
- Physically Separated Bikeway
- Visually Separated Bikeway
- Neighbourhood Bikeway
- Conceptual Connection

Trails
- Multi-Use Path
- Multi-Use Trail
- Recreation Trail
- Primary Network

Other
- ION Station
- Park
- Waterbody

The Proposed Ultimate Network includes existing and proposed facilities on regional roads. The proposed facilities are from the Regional Transportation Master Plan. New recommendations may be developed through further discussions with the Region.

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- **Visually Separated Bikeway** – This classification includes Buffered Bike Lane, Conventional Bike Lane, and Paved Shoulder facilities. These are intended for major network connections on streets with medium volumes and medium speeds (<50km/h), and generally includes minor collectors. Overall, there are 15 centreline km of visually separated bikeways in the network, including 4 km of new visually separated bikeways. This number does not include existing or proposed facilities on Region of Waterloo rights-of-way.
- **Neighbourhood Bikeway –** These are intended for low-volume, low-speed routes that provide a network connection. They will incorporate measures to reduce traffic speeds and volumes and facilitate cycling through movement. Neighbourhood bikeway routes can also include advisory bike lane facilities as they are appropriate in similar contexts. Overall, there are 9 centreline km of neighbourhood bikeways in the network. All these facilities should be reviewed and monitored to ensure that vehicle operating speeds and volumes are maintained within the suitable ranges as outlined in **Table 8.1**. Vehicle speed and volume management countermeasures should be implemented to create suitable conditions for neighbourhood bikeways.
- **Conceptual Connection –** These are desired connections that would need additional study to determine facility type depending on property opportunities, alignment, etc. These may be recommended to recognize obvious desire lines, or to avoid uncomfortable routes or obstacles (e.g., Highway 85 interchanges). Note that there are two conceptual grade separated Highway 85 crossings included in this category (one between University Avenue and Bridgeport Road and one between King Street and Northfield Drive), as described in more detail in **Subsection 8.4.6**.

  Overall, there are 5 centreline km of conceptual connections in the network. As these connections are studied for feasibility, appropriate facility types should be selected based on **Table 8.1**.

- **Trails –** The network also shows the existing trail network, which has been reclassified to identify which trails provide a transportation purpose based on alignment and connection in the network and takes into consideration existing surface material. Recreation trails are shown but do not have a direct, transportation purpose.

  Overall, 68 km of trails were identified as multi-use trails, with the remaining 45 km of former community trails identified as recreation trails. Of the 68 km of multi-use trails, 12 km should be evaluated for upgrade as the current trail surface is mulch or stonedust. Additional multi-use trails may need to be upgraded to provide additional width or other improved conditions. Trail facility characteristics were not considered as part of the WTMP.

Intersection and crossing treatments should be included in the design and implementation of proposed projects. Additional upgraded intersection and crossing treatments should be studied and implemented on an on-going basis to ensure that the City is working towards addressing the barriers that arise at these locations.

Table 8.4 summarizes all proposed projects. The proposed projects include new facilities where no existing facilities are present as well as locations where there are proposed upgrades to existing facilities. For example, a location where there is currently a painted bike lane is proposed to be upgraded to a physically separated bikeway. These projects will be prioritized for implementation to become part of the ultimate network.

Existing and planned facilities on regional roads are not included in **Table 8.4** but are shown on **Map 8.6** for context based on existing conditions and the Regional Transportation Master Plan. At this point no changes to the facilities on regional roads have been proposed. For the Primary Network, regional roads are used in isolated cases where they provide an important linkage in the overall network. It has been identified that there may be an opportunity for the City to work with the Region on proposing new facility classifications for regional roads. Discussion on the opportunity for working with the Region for developing new facilities on regional roads is included in **Subsection 8.7.1**.

Recommendation 6: Incorporate the proposed ultimate cycling network summarized in **Table 8.4** and **Map 8.6** into the City of Waterloo Official Plan.

Recommendation 7: Implement the facilities included in the Ultimate Cycling Network using design guidance from *OTM Book 18*, the TAC *Transportation Design Guide for Canadian Roads*, NACTO *Urban Bikeway Design Guide*, and any future relevant guidance.

8.4.2 The Pedestrian Environment

Walking is the most ancient and universal form of travel. It is also an important form of exercise and recreation as well as for commuting purposes. Pedestrians include residents and visitors of all ages and abilities. To travel safely, conveniently, directly, and comfortably, they require an urban environment and infrastructure designed to meet their travel needs.

The urban landscape of Waterloo has grown and changed dramatically over the past two decades. Intensification along nodes and corridors and the planning of compact urban form has helped support residential and employment growth in key areas of the city, specifically along and around the ION light rail transit system. This transit system has changed how people can move around the city and region, providing greater options for multi-modal trips and less reliance on the auto. A well connected, well designed active transportation network for pedestrians and cyclists is a critical element to the future success of this service, particularly for the first and last mile of their trip.

TABLE 8.4: PROPOSED ACTIVE TRANSPORTATION PROJECTS

ID	Street Name	Project Extents	Primary Network	Proposed Facility	Project Type	Estimated Length (centreline metres)
1	Albert-Conestogo Highway Crossing	Weber Street North to Conestogo Road	Yes	Conceptual Connection	New	480
2	Albert Street	Seagram Drive to Bricker Avenue	No	Physically Separated Bikeway	New	90
3	Albert Street	Waterloop Trail to Columbia Street East	Yes	Physically Separated Bikeway	New	1,300
4	Allen Street	King Street South to Erb Street East	Yes	Neighbourhood Bikeway	Upgrade	1,690
5	Baffin Place	Davenport Road to Mcmurrary Road	No	Physically Separated Bikeway	New	360
6	Bearinger Road	Parkside Drive to Albert Street	No	Physically Separated Bikeway	Upgrade	1,060
7	Bechtel Park	Existing Trail to Bridge Street West	Yes	Conceptual Connection	New	400
8	Bechtel Park Highway Crossing	Bluevale Street North to Bechtel Park	Yes	Conceptual Connection	New	270
9	Bennington Gate	Columbia Street to West Connector Trail	Yes	Physically Separated Bikeway	New	80
10	Bluevale Street North	Bechtel Hwy Crossing to Bridgeport Road East	Yes	Physically Separated Bikeway	New	1,320
11	Bluevale Street North	Bridgeport Road East to Erb Street East	Yes	Neighbourhood Bikeway	New	120
12	Blythwood Road	Hazel Street to Weber Street North	No	Neighbourhood Bikeway	Upgrade	970
13	Bricker Avenue	Albert Street to King Street North	No	Neighbourhood Bikeway	Upgrade	830

TABLE 8.4: PROPOSED ACTIVE TRANSPORTATION PROJECTS

ID	Street Name	Project Extents	Primary Network	Proposed Facility	Project Type	Estimated Length (centreline metres)
14	Bridge Street West	King Street to Bridge Street West	No	Physically Separated Bikeway	New	1960
15	Bridle Trail	Bridge Street to Auburn Drive	Yes	Physically Separated Bikeway	New	420
16	Carter Avenue	University Avenue East to Marshall Street	Yes	Neighbourhood Bikeway	Upgrade	760
17	Columbia Street West	Fischer-Hallman Road North to King Street North	Yes	Physically Separated Bikeway	Upgrade	3,580
18	Columbia Street West	Rhine Fall Drive to Erbsville Road	Yes	Physically Separated Bikeway	Upgrade	1,760
19	Columbia Street West to West Connector Trail	West Connector Trail to Columbia Street	Yes	Conceptual Connection	New	80
20	Conestogo Road - Conestoga Mall	King Street North to Davenport Road	Yes	Conceptual Connection	New	530
21	Craigleith Drive	Roxton Drive to Craigleith Drive	Yes	Neighbourhood Bikeway	Upgrade	980
22	Davenport Road	Frobisher Drive to Northfield Drive East	No	Physically Separated Bikeway	New	210
23	Davenport Road	Northfield Drive East to Lexington Road	Yes	Physically Separated Bikeway	Upgrade	3,700
24	Father David Bauer Drive	Erb Street West to Caroline Street South	No	Neighbourhood Bikeway	New	440
25	Harvard Park - University to Bluevale	University Avenue East to Bechtel Park Highway Crossing	Yes	Conceptual Connection	New	490
26	Herbert Street	William Street East to Allen Street West	No	Neighbourhood Bikeway	Upgrade	460

TABLE 8.4: PROPOSED ACTIVE TRANSPORTATION PROJECTS

ID	Street Name	Project Extents	Primary Network	Proposed Facility	Project Type	Estimated Length (centreline metres)
27	Holbeach Crescent	Dearborn Boulevard to Holbeach Green	No	Neighbourhood Bikeway	Upgrade	270
28	Honeywood Place West Connector Gap	West Connector to West Connector	Yes	Neighbourhood Bikeway	New	230
29	Keats Way	Erbsville Road to University Avenue West	No	Physically Separated Bikeway	Upgrade	6,100
30	Kingscourt Drive to King Street North	King Street North to Kingscourt Drive	No	Conceptual Connection	New	340
31	Laurelwood Drive	Erbsville Road to Bearinger Road	Yes	Physically Separated Bikeway	Upgrade	3,310
32	Laurelwood Extension to University of Waterloo	Laurelwood Drive to Wes Graham Way	No	Conceptual Connection	New	530
33	Lexington Road	Davenport Road to University Avenue East	Yes	Physically Separated Bikeway	Upgrade	3,590
34	Lincoln Road	Weber Street North to Mayfield Avenue	No	Visually Separated Bikeway	Upgrade	2,170
35	Margaret Avenue	Lincoln Road to Erb Street East	No	Physically Separated Bikeway	New	1,100
36	Margaret Avenue South	Erb Street East to City Boundary	No	Physically Separated Bikeway	Upgrade	900
37	Marshall Street	King Street North to Lincoln Road	No	Neighbourhood Bikeway	Upgrade	2,600
38	McMurray Road	Northland Drive to Bridge Street	No	Physically Separated Bikeway	New	800
39	Montpellier Drive	Columbia Street to Paris Boulevard	No	Neighbourhood Bikeway	New	980

TABLE 8.4: PROPOSED ACTIVE TRANSPORTATION PROJECTS

ID	Street Name	Project Extents	Primary Network	Proposed Facility	Project Type	Estimated Length (centreline metres)
40	Northfield Drive West	Parkside Drive to Northfield Station	Yes	Conceptual Connection	New	220
41	Phillip Street	University Avenue West to Columbia Street	No	Physically Separated Bikeway	Upgrade	620
42	Roxton Drive	Roxton Drive to Craigleith Drive	Yes	Neighbourhood Bikeway	Upgrade	70
43	Shakespeare Drive	Shakespeare Drive to Keats Way	Yes	Neighbourhood Bikeway	Upgrade	1,540
44	Thorndale Drive and Westvale Drive	Westvale Park to Fischer-Hallman Road	No	Neighbourhood Bikeway	New	190
45	Toll Gate Blvd	Bearinger Road to Glen Forrest Blvd	No	Neighbourhood Bikeway	Upgrade	990
46	University Avenue	Bridge Street West to Northfield Drive East	No	Physically Separated Bikeway	New	850
47	University Avenue East	Bridge Street to Woolwich Street	No	Physically Separated Bikeway	New	2,690
48	University Avenue East	Northfield Drive East to Millennium Blvd	Yes	Physically Separated Bikeway	New	1,920
49	Waterloo Park - Father David Bauer to University	University Avenue West to Father David Bauer Drive	No	Conceptual Connection	New	600
50	Waterloo Recreation Complex	Father David Bauer Drive to Roslin Avenue	No	Conceptual Connection	New	280
51	Westvale Gate	Westvale Drive to University Avenue West	No	Physically Separated Bikeway	New	70

TABLE 8.4: PROPOSED ACTIVE TRANSPORTATION PROJECTS

ID	Street Name	Project Extents	Primary Network	Proposed Facility	Project Type	Estimated Length (centreline metres)
52	Westvale Park	Westvale Park to Westvale Park	No	Physically Separated Bikeway	New	110
53	Westvale Public School	Westwind Park to Westvale Park	No	Conceptual Connection	New	190
54	Wideman Road	City Boundary to Erbsville Road	No	Visually Separated Bikeway	New	3,210
55	William Street	City Hall to William Street East	No	Neighbourhood Bikeway	New	60
56	William Street East	Herbert Street to Spurline Trail	No	Neighbourhood Bikeway	Upgrade	450
57	Willow Street	William Street East to Allen Street West	No	Neighbourhood Bikeway	Upgrade	320
58	Wismer Street	University Avenue East to Woolwich Street	No	Conceptual Connection	New	460
59	John and Park Street	Iron Horse Trail Upgrades	Yes	Physically Separated Bikeway	New	100
60	Randall Drive	Northfield to Weber	No	Visually Separated Bikeway	New	1,540
61	OMSF Trail	Dutton Drive to Northfield Station	No	Physically Separated Bikeway	New	540
62	Wyman Road and Northland Road	Colby Drive to McMurray Road	No	Physically Separated Bikeway	New	950
63	Forwell Creek Road	Forwell Trail to Weber	No	Physically Separated Bikeway	New	290
64	Westfield Links - Clair Fields	Brandenburg Blvd to Erbsville Road	No	Conceptual Connection	New	350
65	Albert St	Columbia St W to University St W	Yes	Physically Separated Bikeway	New	600
66	Union St	Moore Ave S to Margaret Ave S	No	Physically Separated Bikeway	New	1,100
67	Trail Connection	Lexington Rd to Existing Trail	No	Conceptual Connection	New	250

Pedestrian Supportive Policies

Numerous pedestrian related policies and initiatives have been developed over the years to support the advocacy for and planning of the pedestrian environment in the City.

Sidewalk Policy

The City of Waterloo Sidewalk Policy (2005) requires that sidewalks be provided on both sides of all roads, except:

- Local roads in business/industrial parks without transit service, where a sidewalk is required on only one side of the road;
- Local roads with projected traffic volumes less than 500 Annual Average Daily Traffic (AADT), where a sidewalk is required on only one side of the road; and
- Cul-de sacs, which require no sidewalks, except where there is a park, walkway, community or multi use trail, in which case one sidewalk is to be provided.

Given the policy is 15 years old, an update is recommended to better reflect Waterloo's commitment to active transportation and align with todays context, current policies, and strategic direction. A draft updated Sidewalk Policy is shown in **Appendix B**. Prioritization of implementing sidewalk facilities is discussed in **Subsection 8.4.8**.

The City should review block lengths and provide walkways to improve pedestrian network density and directness where possible.

Pedestrian Charter

At the September 8, 2008 City Council meeting, the Pedestrian Charter was supported by Council. The fundamental principles of the Pedestrian Charter are:

- To advocate for walking as a safe, comfortable, and convenient mode of urban travel respecting the following:
  - Accessibility
  - Equity
  - Health and Well-Being
  - Environmental Sustainability
  - Personal and Community Safety
  - Community Cohesion and Vitality

- To create an urban environment in all parts of the City that encourages and supports walking aiming for the following goals:
  - Ensure that residents' access to basic community amenities and services does not depend on car ownership or public transit use
  - Set policies that reduce conflict between pedestrians and other users of the public right-of-way
  - Promote laws and regulations that respect pedestrians' particular needs

Official Plan

The City's transportation system is designed to facilitate the safe and convenient movement of people and goods between land uses within the City and to external destinations. Achieving a healthy and livable City and a transportation system that is sustainable into the future will require placing increased emphasis on moving people – this means managing our travel to reduce reliance on the automobile in favour of transit and more active forms of movement such as walking and cycling.

Objectives of the Transportation System

The following provides examples of the objectives of the transportation system. Plan for a transportation system that:

- (a) Provides for the safe and convenient movement of goods and people with varying degrees of mobility within and to/from Waterloo;
- (b) Increases the opportunities for, and removing the disincentives to, walking, cycling and transit;
- (c) Is multi-modal, meaning that users have choice in the type of transportation within the City;
- (d) Provides connectivity between various modes of transportation, enabling users to choose multiple modes for a single trip; and
- (e) Includes a local neighbourhood transportation system that is safely and adequately connected to the higher-order network throughout the City.

Accessibility Standards

The Accessibility Standards were prepared to assist staff and developers in implementing the accessibility requirements of Part IV.1 Design of Public Spaces Standards of Ontario Regulation 191/11 (Integrated Accessibility Standards), under the Accessibility for Ontarians with Disabilities Act 2005 (AODA). Developers and organizations are obligated to follow these

standards to identify, remove and prevent barriers so that persons with disabilities can access and participate in activities within the community.

2019 – 2022 Strategic Plan

One of the Strategic Pillars of the 2019-2022 Strategic Plan is Safe, Sustainable Transportation with the objective to Improve all modes of transportation to make Waterloo more mobile, accessible, and connected. Key goals of the plan are to:

- Adopt Vision Zero practices and tactics to enable safe travel by all modes of transportation
- Facilitate a modal shift, enable increased use of active transportation and public transit

Recommendation 8: Adopt the Updated Sidewalk Policy in Appendix B to provide clear standards on where sidewalks are built.

8.4.3 Primary Network

This is the backbone of the network and consists of a grid of important cross-town routes providing access from each section of the City to major destinations (such as Uptown, the universities, and ION stations). The Primary Network is an update to the High Priority Network, and the new terminology helps to clarify the role of the network at the top of the hierarchy. Routes within the Primary Network should be prioritized for maintenance, snow clearing, road crossing upgrades such as PXOs, among other elements. The Primary Network is shown on **Map 8.6**. **Table 8.5** summarizes the priority network facility composition.

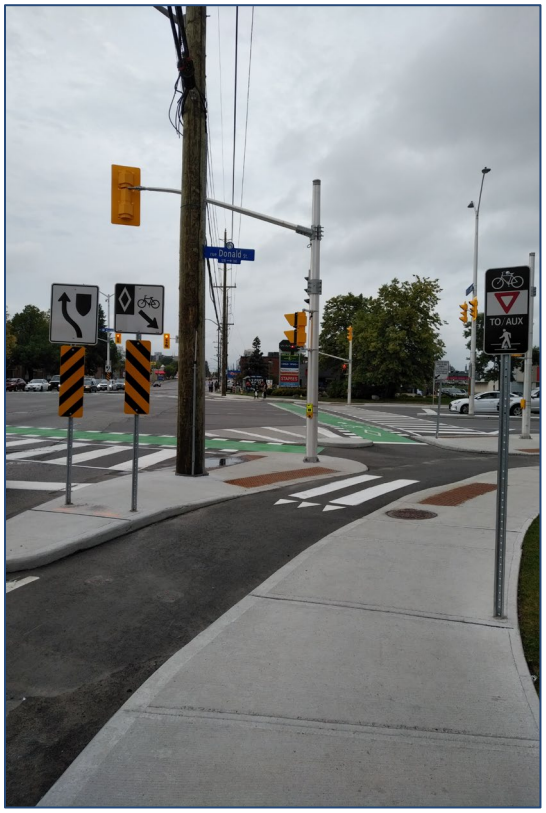
TABLE 8.5: PROPOSED PRIORITY NETWORK FACILITY COMPOSITION

Primary Network Proposed Facilities	Length (centerline kilometres)
Physically Separated Bikeway (excluding Multi-Use Trail)	35
Multi-Use Trail	17
Visually Separated Bikeway	4
Neighbourhood Bikeway	4
Conceptual Connection	2.5
Total	**62.5**

8.4.4 Intersections and Road Crossing Design

Road intersections and crossing locations are a location where there are more conflict points between people walking and cycling with motor vehicle traffic. As part of building active transportation facilities along corridors, appropriate design treatments should be implemented at intersections and crossings, including roundabouts to enhance user experience. As the Region owns all signalized intersections in Waterloo, the City should work with the Region on intersection improvements, especially at intersections with the cycling network and regional roads.

The design guidance documents in **Subsection 8.4.1** include specific details on geometric design and treatment considerations for intersection and crossing countermeasures and designs such as protected intersections. The intention of these countermeasures and designs are to:



- More clearly direct how people walking and cycling should cross roads;
- Increase the conspicuity of where people walking and cycling are crossing roads;
- Manage motor vehicle traffic at intersections and crossings where conflicts exist;
- Limit and manage conflict points at intersections and crossings;
- Shorten the crossing distance for people walking and cycling across intersections and crossings;
- Better tie-in to facilities along corridors and improve access to destinations; and
- Improve the accessibility of crossings.

Recommendation 9: Implement road crossing and intersection treatments along all route corridors, including mid-block crossings where desired.

8.4.5 Highway 85 Crossings

Highways are a common linear barrier to active transportation networks, with limited crossing opportunities and constraints at those crossing locations including on- and off-ramps with high motor vehicle speeds and volumes as well as jurisdictional challenges as highways are commonly owned by the province. The limited number of available locations to cross the highway reduces the network's density and directness. This impact is even greater when considering which highway crossings are designed to be used by people of all ages and abilities, given the constraints of many crossing locations.

In Waterloo there are five roads that currently cross Highway 85. Each crossing has different conditions that impact the experience for someone walking or cycling. The conditions are summarized below.

- **Northfield Drive –** Painted bike lanes and sidewalks on both sides with free-flow on/off-ramp crossings. It is a Regional road crossing over the highway.
- **King Street –** Multi-use paths on both sides that include crossride pavement markings at on/off-ramps. It is a Regional road crossing under the highway.
- **Lexington Road –** Sidewalks on both sides and bidirectional buffered bike lane. No/off-ramps from Highway 85. It is a City-owned Major Collector road crossing over the highway.
- **University Avenue –** Sidewalk on north side of road with free-flow on/off-ramp crossings. There are currently no cycling facilities. It is a Regional road that crosses over the highway. The Region is studying this street for the addition of multi-use paths on both sides between Bridge Street and Lincoln Road. Past discussions considered utilizing an existing culvert under the highway, south of the ramps, however - this option is not practical as it would not be useable certain times of the year because of the creek and would be challenging to construct.
- **Bridgeport Road –** Sidewalk on north side of road with free-flow on/off-ramp crossings. There are currently no cycling facilities. It is a Regional road that crosses under the highway. There are no new or improved active transportation facilities planned for this road.

Given the limitations of the available existing roads crossing Highway 85, alternative opportunities were considered. As part of the network development process, potential locations for new active transportation crossings of Highway 85 were reviewed, with the goal of facilitating safer and more direct active transportation access. The following criteria were used to determine the suitability of the crossings:

- No existing low-stress cycling crossing including free-flow ramp conflicts within 1 km;
- Provide a direct route between major destinations and neighbourhoods; and
- Contributes to network density and directness.

Two locations have been selected for inclusion in the WTMP based on the above criteria and are shown as Conceptual Connections on **Map 8.6**.

- North Crossing (between Northfield Drive West and King Street North). The only way to cross Highway 85 at this location is to use either Northfield Drive West or King Street North, neither of which has low-stress cycling facilities and have free-flow on/off-ramps. A crossing at this location would provide more direct access to destinations, including the Albert Street Business Park, University of Waterloo, Conestoga Mall, and Conestoga ION Station. This location was also included in the 2011 TMP.
- South Crossing (between University Avenue East and Bridgeport Road East). The only way to cross Highway 85 at this location is to use either University Avenue East or Bridgeport Road East, neither of which has low-stress cycling facilities and have free-flow on/off-ramps. A crossing at this location would provide more direct access to destinations, including Bechtel Park, Uptown Waterloo, Bridgeport (village) and surrounding neighbourhoods.

The grade separated crossings should be designed with a focus on user experience, such as direct access, ample width for passing others, limited slope, geometry that allows for people to comfortably ride and make turns, as well as lighting.

Recommendation 10: Continue to study the feasibility and design of the grade separated highway crossings at the recommended locations.

Recommendation 11: Identify opportunities to support the funding and construction of the grade separated highway crossings working with the City's planning group.

8.4.6 Planning Level Cost Estimates

To better plan for and prioritize the proposed recommendations in this plan, planning level cost estimates have been developed for these projects. The cost estimates are intended for high-level planning purposes. Unit costs are based on sources in southern Ontario. Costing assumes typical grading and environment conditions. The following items have either been excluded from the facility costs or included as a blanket contingency (e.g., pole relocations). They should ultimately be evaluated on a case-by-case basis.

- Pole relocations;
- Street furniture;
- Bus stop/transit stops;
- Property acquisition;
- Major roadside drainage works;
- Bridges / overpasses (not including grade separated crossings);

- Railway crossings;
- Retaining walls;
- Stairways / ramps;
- Landscaping and tree removal;
- Major intersections; and
- Taxes and permit fees.

The project costs are presented in **Table 8.6**, which includes a low cost and a high cost to represent the cost range depending on the facility type that is implemented. For example, for physically separated bikeways, the low cost represents reconfiguration of existing roadway space, while the high cost represents unidirectional raised cycle tracks. Some projects do not have different facility type options, so there is only one cost provided with the project. Neighbourhood bikeways have a calculated high cost that includes speed and volume management countermeasures. The low cost identifies that the low cost is to be determined based on the assumption that some elements of a neighbourhood bikeway, including speed and volume management countermeasures and signage are already met.

TABLE 8.6: PROPOSED PROJECT PLANNING LEVEL COSTS

ID	Street Name	Project Extent	Proposed Facility	Length (centreline metres)	Low Cost ($)	High Cost ($)
1	Albert-Conestogo Highway Crossing	Weber Street North to Conestogo Road	Conceptual Connection	480	7,431,000	N/A
2	Albert Street	Seagram Drive to Bricker Avenue	Physically Separated Bikeway	90	23,000	117,000
3	Albert Street	Waterloop Trail to Columbia Street East	Physically Separated Bikeway	1,300	339,000	1,760,000
4	Allen Street	King Street to Erb Street East	Neighbourhood Bikeway	1,690	TBD*	153,000
5	Baffin Place	Davenport Road to McMurrary Road	Physically Separated Bikeway	360	94,000	488,000
6	Bearinger Road	Parkside Drive to Albert Street	Physically Separated Bikeway	1,060	138,000	717,000
7	Bechtel Park	Existing Trail to Bridge Street West	Conceptual Connection	400	263,000	N/A
8	Bechtel Park Highway Crossing	Bluevale Street North to Bechtel Park	Conceptual Connection	270	6,130,000	N/A
9	Bennington Gate	Columbia Street to West Connector Trail	Physically Separated Bikeway	80	22,000	113,000
10	Bluevale Street North	Bechtel Highway Crossing to Bridgeport Road East	Physically Separated Bikeway	1,320	343,000	1,780,000
11	Bluevale Street North	Bridgeport Road East to Erb Street East	Neighbourhood Bikeway	120	TBD*	11,000
12	Blythwood Road	Hazel Street to Weber Street North	Neighbourhood Bikeway	970	TBD*	44,000

TABLE 8.6: PROPOSED PROJECT PLANNING LEVEL COSTS

ID	Street Name	Project Extent	Proposed Facility	Length (centreline metres)	Low Cost ($)	High Cost ($)
13	Bricker Avenue	Albert Street to King Street North	Neighbourhood Bikeway	830	TBD*	38,000
14	Bridge Street West	King Street to Bridge Street West	Physically Separated Bikeway	1,960	510,000	2,644,000
15	Bridle Trail	Bridge Street to Auburn Drive	Physically Separated Bikeway	420	110,000	572,000
16	Carter Avenue	University Avenue East to Marshall Street	Neighbourhood Bikeway	760	TBD*	35,000
17	Columbia Street West	Fischer-Hallman Road North to King Street North	Physically Separated Bikeway	3,580	931,000	4,833,000
18	Columbia Street West	Rhine Fall Drive to Erbsville Road	Physically Separated Bikeway	1,760	230,000	1,191,000
19	Columbia Street West to West Connector Trail	West Connector Trail to Columbia Street	Conceptual Connection	80	55,000	N/A
20	Conestogo Road - Conestoga Mall	King Street North to Davenport Road	Conceptual Connection	530	343,000	N/A
21	Craigleith Drive	Roxton Drive to Craigleith Drive	Neighbourhood Bikeway	980	TBD*	45,000
22	Davenport Road	Frobisher Drive to Northfield Drive East	Physically Separated Bikeway	210	54,000	279,000
23	Davenport Road	Northfield Drive East to Lexington Road	Physically Separated Bikeway	3,700	482,000	2,501,000
24	Father David Bauer Drive	Erb Street West to Caroline Street South	Neighbourhood Bikeway	440	TBD*	20,000

TABLE 8.6: PROPOSED PROJECT PLANNING LEVEL COSTS

ID	Street Name	Project Extent	Proposed Facility	Length (centreline metres)	Low Cost ($)	High Cost ($)
25	Harvard Park - University to Bluevale	University Avenue East to Bechtel Park Highway Crossing	Conceptual Connection	490	320,000	N/A
26	Herbert Street	William Street East to Allen Street West	Neighbourhood Bikeway	460	TBD*	21,000
27	Holbeach Crescent	Dearborn Boulevard to Holbeach Green	Neighbourhood Bikeway	270	TBD*	13,000
28	Honeywood Place West Connector Gap	West Connector to West Connector	Neighbourhood Bikeway	230	TBD*	21,000
29	Keats Way	Erbsville Road to University Avenue West	Physically Separated Bikeway	6,100	793,000	4,117,000
30	Kingscourt Drive to King Street North	King Street North to Kingscourt Drive	Conceptual Connection	340	221,000	N/A
31	Laurelwood Drive	Erbsville Road to Bearinger Road	Physically Separated Bikeway	3,310	431,000	2,236,000
32	Laurelwood Extension to University of Waterloo	Laurelwood Drive to Wes Graham Way	Conceptual Connection	530	348,000	N/A
33	Lexington Road	Davenport Road to University Avenue East	Physically Separated Bikeway	3,590	468,000	2,426,000
34	Lincoln Road	Weber Street North to Mayfield Avenue	Visually Separated Bikeway	2,170	27,000	291,000
35	Margaret Avenue	Lincoln Road to Erb Street East	Physically Separated Bikeway	1,100	287,000	1,490,000

TABLE 8.6: PROPOSED PROJECT PLANNING LEVEL COSTS

ID	Street Name	Project Extent	Proposed Facility	Length (centreline metres)	Low Cost ($)	High Cost ($)
36	Margaret Avenue South	Erb Street East to City Boundary	Physically Separated Bikeway	900	117,000	608,000
37	Marshall Street	King Street North to Lincoln Road	Neighbourhood Bikeway	2,600	TBD*	117,000
38	McMurray Road	Northland Drive to Bridge Street	Physically Separated Bikeway	800	65,000	335,000
39	St. Moritz Avenue and Montpellier Drive	Columbia Street to Paris Boulevard	Neighbourhood Bikeway	980	TBD*	89,000
40	Northfield Drive West	Parkside Drive to Northfield Station	Conceptual Connection	220	142,000	N/A
41	Phillip Street	University Avenue West to Columbia Street	Physically Separated Bikeway	620	158,000	817,000
42	Roxton Drive	Roxton Drive to Craigleith Drive	Neighbourhood Bikeway	70	TBD*	4,000
43	Shakespeare Drive	Shakespeare Drive to Keats Way	Neighbourhood Bikeway	1,540	TBD*	70,000
44	Thorndale Drive and Westvale Drive	Westvale Park to Fischer-Hallman Road	Neighbourhood Bikeway	190	TBD*	18,000
45	Toll Gate Blvd	Bearinger Road to Glen Forrest Boulevard	Neighbourhood Bikeway	990	TBD*	45,000
46	University Avenue	Bridge Street West to Northfield Drive East	Physically Separated Bikeway	850	221,000	1,480,000
47	University Avenue East	Bridge Street to Woolwich Street	Physically Separated Bikeway	2,690	350,000	1,816,000

TABLE 8.6: PROPOSED PROJECT PLANNING LEVEL COSTS

ID	Street Name	Project Extent	Proposed Facility	Length (centreline metres)	Low Cost ($)	High Cost ($)
48	University Avenue East	Northfield Drive East to Millennium Boulevard	Physically Separated Bikeway	1,920	250,000	1,296,000
49	Waterloo Park - Father David Bauer to University	University Avenue West to Father David Bauer Drive	Conceptual Connection	600	390,000	N/A
50	Waterloo Recreation Complex	Father David Bauer Drive to Roslin Avenue	Conceptual Connection	280	182,000	N/A
51	Westvale Gate	Westvale Drive to University Avenue West	Physically Separated Bikeway	70	19,000	95,000
52	Westvale Park	Westvale Park to Westvale Park	Physically Separated Bikeway	110	29,000	149,000
53	Westvale Public School	Westwind Park to Westvale Park	Conceptual Connection	190	124,000	N/A
54	Wideman Road	City Boundary to Erbsville Road	Visually Separated Bikeway	3,210	81,000	803,000
55	William Street	City Hall to William Street East	Neighbourhood Bikeway	60	TBD*	6,000
56	William Street East	Herbert Street to Spurline Trail	Neighbourhood Bikeway	450	TBD*	21,000
57	Willow Street	William Street East to Allen Street West	Neighbourhood Bikeway	320	TBD*	15,000
58	Wismer Street	University Avenue East to Woolwich Street	Conceptual Connection	460	299,000	N/A
59	John Street and Park Street	Iron Horse Trail Upgrades	Physically Separated Bikeway	100	26,000	135,000

TABLE 8.6: PROPOSED PROJECT PLANNING LEVEL COSTS

ID	Street Name	Project Extent	Proposed Facility	Length (centreline metres)	Low Cost ($)	High Cost ($)
60	Randall Drive	Northfield Road to Weber Street	Visually Separated Bikeway	1,540	77,000	770,000
61	OMSF Trail	Dutton Drive to Northfield Station	Physically Separated Bikeway	540	141,000	729,000
62	Wyman Road and Northland Road	Colby Drive to McMurray Road	Physically Separated Bikeway	950	247,000	1,283,000
63	Forwell Creek Road	Forwell Trail to Weber	Physically Separated Bikeway	290	76,000	392,000
64	Westfield Links - Clair Fields	Brandenburg Blvd to Erbsville Road	Conceptual Connection	350	228,000	N/A
65	Albert St	Columbia St W to University St W	Physically Separated Bikeway	600	156,000	810,000
66	Union St	Moore Ave S to Margaret Ave S	Physically Separated Bikeway	1,100	285,000	1,485,000
67	Trail Connection	Lexington Rd to Existing Trail	Conceptual Connection	250	200,000	N/A

* TBD identifies that the low cost is to be determined based on the assumption that some elements of a neighbourhood bikeway, including speed and volume management countermeasures and signage are already met.

8.5 Active Transportation Priorities

The proposed projects from the ultimate cycling network will be implemented over time, either as standalone capital projects, or as part of road renewal and reconstruction projects. To support the City with identifying which proposed projects are priorities, the WTMP completed a prioritization process that is described in more detail below. The process identifies which projects should be priorities based on measurable criteria related to goals of the project (quantitative approach), and then assesses if there are any opportunities to implement the project (qualitative approach).

Prioritization should be an iterative and fluid process, that recognizes priorities may change as new information emerges or other opportunities arise. It is important that there is flexibility to allow for new projects or to respond to changing circumstances. The recommended priorities in the WTMP are based on the information available through the planning process, including current and forecasted budgets and council direction. The priorities may change in the future. Projects may be implemented with low-cost options in the short-term, then updated as part of future capital works projects.

8.5.1 Active Transportation Prioritization Criteria

Quantitative Approach

- **Safety –** Addresses a documented safety issue/ high number of cyclist-involved collisions. Projects with 1-4 collisions along the corridor are prioritized. Projects with 5+ collisions receive higher priority.
- **Connectivity –** Expands connectivity to ION, schools, and community resources. Projects that have destinations within 500 m are prioritized. Projects that have destinations within 250m receive higher priority.
- **High-use Corridor –** Proposed project is along the Primary Network.

Qualitative Approach

Based on staff and consultant knowledge, proposed routes will be selected and refined through an iterative selection process.

- **Opportunity –** Planned capital works along a corridor presents opportunity to align and implement proposed facility as part of planned capital works project.
- **Cost-effectiveness –** Represents a low-cost or more easily implementable project within already available road right of way.
- **Budget –** Prioritize projects that fit into budget envelopes (cost could be $, km's, # of projects).

Representing Prioritization

Based on the results of the prioritization process, the proposed projects are bundled into short-, medium-, and long-term categories. These categories summarize how the project addresses the WTMP vision and goals, as well as the role of the project in the ultimate network. The priority categories are intended to support staff with planning for and implementing these projects. If a capital project is planned on only part of the route, staff should consider the feasibility of partial implementation or reconsider the project timing. The projects are presented in these categories in **Table 8.7** and **Map 8.7**.

8.5.2 Active Transportation Priorities

The **Table 8.7** summarizes the prioritization for each of the projects identified through the WTMP. Proposed projects that are already planned and budgeted for in the City's Capital Plan are not included in the priorities. Criteria were considered fully met, almost met, partially met, somewhat met, or not met based on the criteria presented in **Subsection 8.5.1**.

Recommendation 12: Program the cycling projects into the capital works plan based on the recommended prioritization and using the planning-level cost estimates

8.5.3 Sidewalk Prioritization Methodology

The City formalized a sidewalk prioritization methodology in 2015.[9] The methodology is specific to implementing new infill sidewalks in urbanized areas of the City where sidewalks do not exist and does not change the City's 2005 sidewalk policy. The methodology prioritizes sidewalks based on the following criteria:

- Streets with no sidewalk and Arterial/Major Collector class road with one sidewalk located in high pedestrian use areas;
- 800 m walking distance from an LRT (ION) station;
- 800 m walking distance from a school, college, university;
- 800 m from a City facility/service;
- High employment areas;
- Key node areas;
- Road classification daily traffic volume (classification as defined in the Official Plan); and
- GRT route or a street connecting to a GRT route.

[9] City of Waterloo. (December 7, 2015). *Methodology for Prioritizing Construction of New Sidewalks* (Report No. IPPW2015-038). Committee of the Whole Meeting.

The approach considers engineering judgement as well as degree of difficulty in construction in a retrofit scenario. If the challenges are too great (i.e., tree impacts, grade challenges and or cost), the sidewalk could be deferred to such time when the street is re-constructed.

Based on the existing and planned active transportation network, a Multi-use Pathway may be constructed in lieu of a sidewalk.

The methodology process includes consultation with residents, and collaboration with Advisory Committees of Council.

TABLE 8.7: CYCLING PRIORITY PROJECTS

ID	Street Name	Safety	Connectivity	High Use	Quantitative Score	Qualitative
Short-Term						
3	Albert Street	◑	●	●	●	
4	Allen Street	◑	●	●	●	
6	Bearinger Road	●	●	○	●	
17	Columbia Street West	◑	●	●	●	
20	Conestogo Road – Conestoga Mall	◑	●	●	●	
22	Davenport Road	◑	●	○	◕	Small project
23	Davenport Road	◑	●	●	●	
31	Laurelwood Drive	◑	●	●	●	
33	Lexington Road	◑	●	●	●	
41	Phillip Street	●	●	○	●	
59	John Street and Park Street (Iron Horse Trail)	●	●	●	●	
60	Randall Drive	◑	●	○	◕	Small project
63	Forwell Creek Drive	●	●	○	◕	Small project
65	Albert St	◑	●	○	◕	Part of Northdale Streetscape Master Plan
Medium-Term						
1	Albert-Conestogo Highway Crossing	○	●	●	◕	
2	Albert Street	◑	●	○	◕	
7	Bechtel Park	○	●	●	◕	

TABLE 8.7: CYCLING PRIORITY PROJECTS

ID	Street Name	Safety	Connectivity	High Use	Quantitative Score	Qualitative
8	Bechtel Park Highway Crossing	○	●	●	◕	
9	Bennington Gate	○	◑	●	◑	
10	Bluevale Street North	○	●	●	◕	
11	Bluevale Street North	○	●	●	◕	
12	Blythwood Road	◑	●	○	◕	
13	Bricker Avenue	◑	●	○	◕	
15	Bridle Trail	◑	◑	●	◕	
16	Carter Avenue	○	◑	●	◑	
19	Columbia Street West to West Connector Trail	○	◑	●	◑	
21	Craigleith Drive	○	◑	●	◑	
24	Father David Bauer Drive	○	●	○	◑	
25	Harvard Park - University to Bluevale	○	●	●	◕	
26	Herbert Street	○	●	○	◑	
29	Keats Way	◑	●	○	◕	
30	Kingscourt Drive to King Street North	○	●	○	◑	
32	Laurelwood Extension to University of Waterloo	○	○	○	○	Identified in 2011 TMP
34	Lincoln Road	◑	●	○	◕	
35	Margaret Avenue	○	●	○	◑	

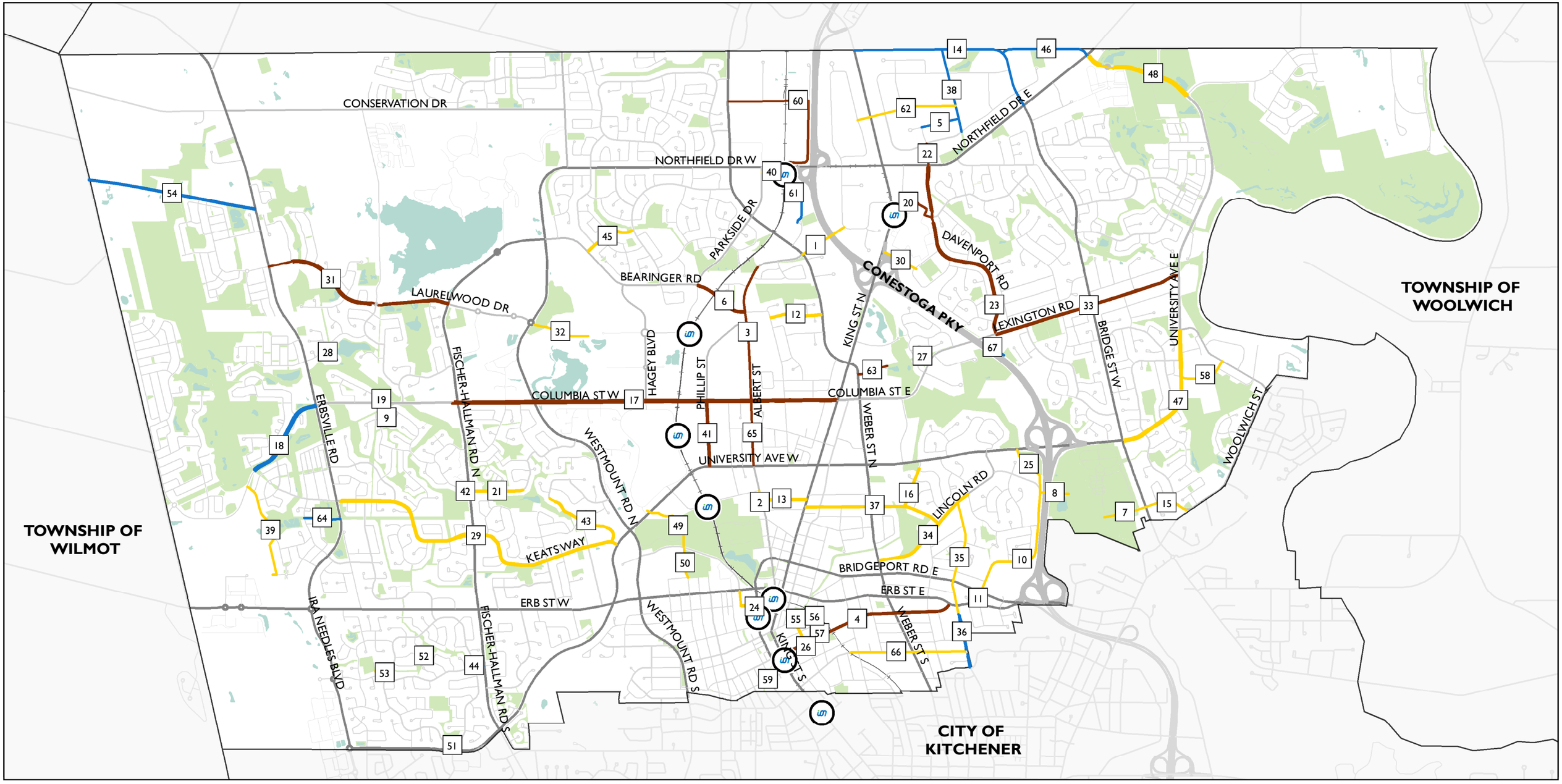
TABLE 8.7: CYCLING PRIORITY PROJECTS

ID	Street Name	Safety	Connectivity	High Use	Quantitative Score	Qualitative
37	Marshall Street	◑	●	○	◕	CP Planned 2028 - King to Carter
39	Montpellier Drive	○	●	○	◑	
40	Northfield Drive West	○	●	●	◕	
42	Roxton Drive	○	◑	●	◑	
43	Shakespeare Drive	○	◑	●	◑	
45	Toll Gate Boulevard	◑	●	○	◕	
47	University Avenue East	◑	●	○	◕	
48	University Avenue East	○	●	●	◕	
49	Waterloo Park - Father David Bauer to University	○	●	○	◑	
50	Waterloo Recreation Complex	○	●	○	◑	
53	Westvale Public School	○	●	○	◑	
55	William Street	○	●	○	◑	
56	William Street East	○	●	○	◑	
57	Willow Street	○	●	○	◑	
58	Wismer Street	◑	◑	○	◑	
62	Wyman Road/ Northland	◑	◑	○	◑	
66	Union St	◑	◑	○	◑	
Long-Term						
5	Baffin Place	○	◑	○	◔	

TABLE 8.7: CYCLING PRIORITY PROJECTS

ID	Street Name	Safety	Connectivity	High Use	Quantitative Score	Qualitative
14	Bridge Street West	◑	○	○	◔	
18	Columbia Street West	○	○	●	◔	
27	Holbeach Crescent	○	◑	○	◔	
28	Honeywood Place West Connector Gap	○	○	●	◔	
36	Margaret Avenue South	○	◑	○	◔	
38	McMurray Road	○	◑	○	◔	
45	Thorndale Drive and Westvale Drive	○	◑	○	◔	
46	University Avenue	○	○	○	○	
51	Westvale Gate	○	○	○	○	
52	Westvale Park	○	◑	○	◔	
54	Wideman Road	○	◑	○	◔	
61	OMSF Trail to Northfield	○	◑	○	◔	
64	Westfield Links – Clairfields Trail	○	◑	○	◔	Feasibility assessment needed
67	Trail Connection	○	○	○	○	Feasibility assessment needed

○ Criteria not met
◔ Criteria somewhat met
◑ Criteria partially met
◕ Criteria almost met
● Criteria fully met



Map 8.7

Map Version: 3/8/2021

PROPOSED CYCLING PRIORITY PROJECTS

Project Priority
- Short-term
- Medium-term
- Long-term

Other
- ION Station
- Park
- Waterbody

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THE CITY OF Waterloo

TRANSPORTATION MASTER PLAN

8.6 Active Transportation Operations and Maintenance

A key part of the WTMP's goal to build a successful active transportation network is reviewing operation and maintenance practices. Ongoing maintenance in all seasons is equally important to building new infrastructure in ensuring the functionality and longevity of the active transportation network.

Sidewalks, bikeways, and trails require regular upkeep, particularly in the winter and shoulder seasons. People of all ages and abilities walk and bike to transit and various destinations year-round, making the same kinds of trips in winter as they make during the rest of the year, and the same kinds of trips as people in motor vehicles. A well planned and executed operations and maintenance strategy ensures that the facilities used for these trips continue to be safe and accessible.

8.6.1 Existing Practice for Maintenance of Active Transportation Facilities

The City has existing procedures for maintenance of active transportation infrastructure which are a joint effort between several departments including Transportation, Environment and Parks (incl. Forestry), as well as other agencies such as the Region and Grand River Transit. Established procedures for maintaining a state of good repair and for general maintenance include regular refresh of paint on trails and at signed crossings, routine mowing of fringe areas and sweeping of trails and pathways, removal of debris and encroaching vegetation, topping up of stone-dust, litter removal, inspections, and limb trimming. Some activities are context-specific and scheduled as-needed, including asphalt maintenance, pothole repair, repair of traffic control devices, and replacing thermoplastic paint for bikeways.

In the winter, the City maintains sidewalks and on-road cycling facilities in response to snow and ice accumulation with plowing, salting, sweeping and snow removal. The City adheres to Ontario Regulation 239/02, a regulation under the *Municipal Act, 2001*, for maintenance standards. The regulation should be referenced for further details and definitions.

Snow removal for bicycle lanes, defined as a portion of a roadway that has been designated by pavement markings, signage, or a physical/marked buffer for cyclists, is dependent on the class of roadway. For instance, snow removal (defined as a minimum of 1.0 m width clear to bare pavement) occurs at 2.5 cm accumulation within 8 hours for a Class 1 highway at the highest standard and at 10 cm within 24 hours for a Class 5 highway at the lowest standard. Higher speeds and larger average annual daily vehicle traffic result in a higher class of highway. Minimum standards are not provided for in-boulevard multi-use trails and raised cycle tracks.

Based on the existing practice, sidewalks are cleared by the City within 48 hours of the end of accumulation, or by property owners within 24 hours if connected to a residence or business. Trail clearance begins on commuter trails at 5 cm accumulation of snow. Spurline, Iron Horse, and Laurel trails are prioritized. Typically, service is completed within 48 hours after the snow has stopped falling. Where trails are not maintained a sign is posted.

8.6.2 Recommended Practices

Stakeholder engagement (**Sections 2.4 and 2.5**) has shown strong and consistent support for expanded and more responsive maintenance of sidewalk and bikeway facilities during all seasons. Feedback emphasized that lack of maintenance is a significant impediment to walking and cycling in the winter, particularly to accessing transit. Stakeholders noted concerns regarding safety, difficult terrain, and snow dumping into bike lanes. Phase 2 engagement received feedback requesting improved alignment between the City of Waterloo and the City of Kitchener for winter maintenance of active transportation and trail networks that crossed city boundaries. Concerns were also expressed regarding overuse of salt, as well as improvements to non-winter maintenance activities with concerns for trail flooding and debris and garbage creating hazards for cyclists in the roadway.

A successful maintenance strategy addresses key goals of accessibility, safety, and connectivity to transit, schools, community resources, shopping, in a way that is efficient and cost-effective. The City completed a Winter Control Modernization Review in 2019 to explore cost-effective improvements, which provided targeted recommendations. This review has informed WTMP recommendations listed below.

- **Review of design standards, equipment, and methods -** as active transportation facility design evolves at the City, a review should be undertaken to align design standards and maintenance requirements with existing equipment and methods. Clearing snow from

bicycle lanes, trails, and sidewalks can require special considerations for equipment type and methods.

- Review methods to ensure they are context-specific to facilities, for example, salt may not dissipate in bikeways due to lack of generated heat from users which may warrant a switch to brine and additional sweeping operations;
- Identify required equipment and methods to meet maintenance and operations practices per facility type;
- Identify strategic investments into new equipment to clear trails and bikeways, and/or equipment rotation procedures to meet identified operational needs (per Winter Control Modernization Review);
- Review design standards to identify opportunities for improvements to snow storage and drainage, as well as design for context-specific maintenance vehicles; and
- Review methods to identify alternatives to or methods to decrease use of de-icing salts where possible to mitigate environmental impacts.
- The City needs to build capacity to implement new methods and equipment to better deal with AT infrastructure during winter months and extreme weather events arising from climate change. This would include the necessary budget adjustments to add such capacity in the near to mid-term time frame.

- **Cross-organizational collaboration -** the active transportation network spans and interfaces across jurisdictional boundaries (internal and external) such as at transit stops. Cross-organizational collaboration is necessary to ensure connectivity and effective maintenance.
  - Review and update snow storage policies to ensure that there is synergy between roadway clearing, transit clearing, and bikeway/trail/sidewalk clearing so that one does not interfere with the other or unnecessarily duplicate work; and
  - Review and define practices and partnerships with external jurisdictions (Grand River Transit, Region of Waterloo, University of Waterloo, etc.).
- **Prioritization of resources for winter control through tiered levels of service –** prioritization and tiered service was a key recommendation in the Winter Control Modernization Review (2019). O. Reg. 239/02 tiers are based on volume and speeds of roadways for motor vehicles which may not align with the highest benefit to active mode users. A specific approach for active transportation facilities is needed with strategic approaches recognizing different users (pedestrians, cyclists, etc.) and different facilities.
  - Develop a winter priority network for cycling facilities based on the Primary Network. A map will introduce a level of reliability and predictability for the users;
  - Develop standards for clearing cycling facilities outside of the Primary Network which may accept lower maintenance, while a commitment should be made to exceed

O.Reg. 239/02 so that all routes remain open and maintained, including cycle tracks and in-boulevard multi-use paths;

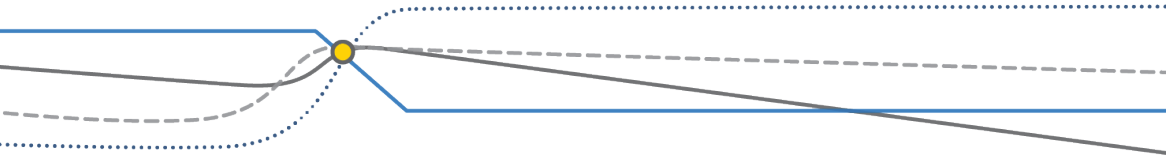
- Review and update sidewalk clearing policies by identifying characteristics for prioritization. This may feed into a tiered level of service, which may differentiate response times into two categories, and which may vary response based on time or accumulation. Prioritization could be based on road classification, transit connections, usage volumes, destinations served, key connections, and crossings. All sidewalks, pathways, and trails intended for winter use should be cleared; and
- Pilot an approach to mapping of the sidewalk clearing prioritization policies above to identify connectivity gaps that may exist.

The City needs to build capacity to implement new methods and equipment to better deal with AT infrastructure during winter months and extreme weather events arising from climate change. This would include the necessary budget adjustments to add such capacity in the near to mid-term time frame.

Recommendation 13: Align design standards and maintenance requirements with existing equipment and methods.

Recommendation 14: Facilitate cross-organizational collaboration as part of facility operations and maintenance.

Recommendation 15: Develop prioritization of resources for winter control through tiered levels of service by considering factors such as the Primary Network, access to transit, usage volumes, access to destinations, and key connections.



8.7 Active Transportation Opportunities

Beyond the proposed projects planned in **Section 8.4**, there are other opportunities to improve and promote the development of the active transportation network. This chapter identifies a range of different initiatives that the City can undertake, from strategic opportunities to expand the network, future projects with additional considerations beyond the proposed network, as well as improvements that can be made to the network, such as trail lighting and wayfinding. The timeline for implementation of these opportunities varies, with some being short-term opportunities, while others are identified as much longer-term opportunities that are beyond the timeline of this WTMP.

8.7.1 Bicycle Friendly Community

In Spring 2018, the City's Bicycle Friendly Community designation was upgraded to a **Gold Level**. The program assesses a community's commitment and investment to building a cycling friendly community based around "the 5 E's": Engineering, Education, Encouragement, Enforcement, and Evaluation & Planning.[10] The City is only the third community in Ontario to achieve Gold. The City achieved Gold in part due to the following factors:

- Increases in the number of residents riding their bikes every day;
- Investment in new cycling infrastructure, including physically separated facilities;
- Strong Complete Streets policy;
- Strong educational and encouragement efforts run by the City and their partners;
- Good Bike Month promotion encouraging residents to ride their bikes; and
- Excellent data collection efforts to track the impact of the City's investments.

The next goal for the City is to be the first community to achieve Platinum or Diamond level community in Ontario. For the City to achieve this goal, there are some key actions for the City to take. The following points are feedback that the City received as part of the evaluation in 2018. Many of these points are being addressed as part of the WTMP.

- Expand All Ages and Abilities cycling infrastructure, especially physically separated facilities on major roadways;
- Improve quantity and quality of bike parking, including more parking at multi-family homes;
- Expand the City's Priority Winter Maintenance routes;
- Strengthen the City's Complete Streets Policy to provide fewer exceptions to building active transportation infrastructure;

[10] https://www.sharetheroad.ca/bicycle-friendly-communities-p138264

- Undertake a network connectivity study to identify network gaps, especially where small improvements could be made, such as implementing crossrides and new bicycle signals;
- Invest in a community-wide bike share system; and
- Adopt Vision Zero policies.

Additional recommendations were also made to support the City's Education, Encouragement, Enforcement, and Evaluation and Planning initiatives.

Recommendation 16: Implement the WTMP recommendations, which will help the City achieve the Platinum level Bicycle-Friendly Community ranking.

8.7.2 Facilities in Regional Right-of-Ways

The City has worked on developing a relationship between roles and responsibilities for active transportation facilities within road rights-of-way owned by the other jurisdiction. Most recently, it has been confirmed that the City owns in-boulevard facilities within the right-of-way, such as sidewalks and multi-use paths. As a result, there is an opportunity for the City to address gaps in the cycling network by converting sidewalks on regional roads to multi-use paths. Some possible examples of locations where this could be supportive to enhancing network quality and connectivity in the short-term are:

- Fischer-Hallman Road North from Columbia Street West to Beechlawn Road; and
- Westmount Road from Waterloo Park Access to University Avenue

Recommendation 17: Address gaps in the cycling network by converting sidewalks in key locations in Region-owned rights-of-way to multi-use paths.

8.7.3 Sidewalk Widening at Key Locations

There are many locations throughout the City where it is desirable to widen sidewalks given high pedestrian traffic at certain times of day. Wider sidewalks will provide a more comfortable pedestrian experience and allow for better pedestrian movement, enhancing the user experience. Examples of locations that should be considered for sidewalk widening include at ION stations, at university campus frontages and in areas with high pedestrian traffic such as Uptown Waterloo. As opportunities arise through reconstruction, site development or other construction projects the City should consider whether sidewalk widening should be included as part of the project.

Recommendation 18: Use opportunities such as road reconstruction or site development to widen sidewalks at key locations.

8.7.4 Re-routing of The Great Trail

In 2016, the Region of Waterloo in conjunction with the City of Waterloo undertook a study to realign The Great Trail (formerly Trans Canada Trail) to the existing rail corridor (Waterloo Spur Line) between Waterloo and the Township of Woolwich. This alignment was identified in the 2011 Transportation Master Plan.

The realigned trail will connect people to the new ION system, Waterloo Central Railway and the St. Jacob's Market area and benefit nearby residents, commuters and tourists using active modes of travel. The realignment would provide a more direct route than the current circuitous one, thereby reducing the length from 7.3km to 4.0km.

The study was broken out in to 2 phases:

- Phase 1 – Northfield Drive to Farmers Market Road in Township of Woolwich; and
- Phase 2 – Research & Technology Park to Northfield Drive.

The study recommended the following:

- Phase 1 will be located within the Waterloo Spur Line corridor adjacent to the rail tracks;
- Following a review of existing constraints as well as operational challenges due to ION services (including twinning of the tracks and high operating speeds), Phase 2 considered alternate options for the realignment of the trail;
- Options were reviewed and evaluated, concluding that Phase 2 will be located to the east side of Parkside Drive between Bearinger Road and Northfield Drive; and
- The 2 phases would be connected via an existing hydro easement located behind the Firehall located on Northfield Drive.

The study identified that while the preferred route was not feasible at that time, that ultimately the long-term goal would be to locate the trail as close to the rail corridor as possible. Given this, as land develops adjacent the rail corridor the city should look to secure easements to facilitate the creation of a future trail corridor.

Although not specified at the time given the high-level review/evaluation, the **west** side of the tracks would be the most logical route for the ultimate trail alignment. This is supported by the following:

- The Great Trail is currently located on the west side of the tracks from the R&T Park to Bearinger Road, therefore making a connection to a future re-aligned trail easier on the west side;

- The OMSF (ION operations yard) is located on the east side of the tracks with multiple track alignment and operations in/out of the yard. This would make it extremely challenging to locate a trail through this area;
- The mid-block pedestrian crossing over Northfield Drive is located on the west side of the tracks; and
- Potential future developable properties along the route are primarily on the west side of the tracks, thereby making the potential collection of easements over time easier.

Recommendation 19: Continue to pursue the re-routing of the Great Trail.

8.7.5 Improved Active Transportation Crossing at Columbia Street West and the Laurel Trail

The Laurel Trail forms the southern section of The Great Trail through Waterloo Park, connecting to the Iron Horse Trail before continuing south to Kitchener and beyond. This trail sees some of the highest active transportation users in the entire city, connecting commuters between the two cities, Uptown Waterloo, and the universities. It also provides a connection to the Waterloo Spur Line trail.

The Laurel Trail crosses Columbia Street West via an existing uncontrolled crossing on the west side of the LRT (ION) tracks. Although there are traffic signals less than 90m east of the trail, the city should explore opportunities to install a controlled crossing facility to assist in safer road crossings.

Recommendation 20: Explore opportunities to install a controlled crossing facility at Columbia Street West and the Laurel Trail.

8.7.6 Coordinating with Adjacent Jurisdictions

During the development of the WTMP, the active transportation network plans for the Region of Waterloo, City of Kitchener, and the Townships of Wilmot and Woolwich were reviewed to ensure that the proposed network in the WTMP connected to these other jurisdictions' plans. The City's staff should continue to coordinate with staff in these adjacent jurisdictions on the implementation of projects at and near the municipal boundary to support implementation of projects that support connections across the municipal boundaries. The coordination of projects may impact the planned prioritization of projects in the WTMP.

Recommendation 21: Continue to work with the City of Kitchener, the Region of Waterloo, and the Townships of Wilmot and Woolwich to coordinate and implement connected active transportation improvements.

8.7.7 Active Transportation Connection to Woolwich

A future opportunity is the development of an active transportation bridge over the Grand River to the Township of Woolwich that would connect to the Walter Bean Trail along University Avenue at Kaufman Flats. The connection was identified as a desired connection during the public engagement process and shown on **Map 8.5** Active Transportation Network Gaps as a 'System Gap'. The connection would provide access to the Snyder's Flats Conservation Area and the community of Bloomingdale. This would enable more loop options for recreational trips as the next nearest crossings of the Grand River are at Conestogo to the north and Bridgeport to the south.

At this stage, the bridge has not been evaluated for feasibility from a technical and cost perspective. The bridge would require significant environmental assessment work to minimize impacts to the natural environment. The project would also require the cooperation of the Township of Woolwich, which has indicated initial support for an active transportation crossing in the general area. The Region of Waterloo's TMP identifies potential AT connections across the Grand River which should be reviewed when considering options.

8.7.8 Incorporating Counters in Projects

Tracking user numbers along the active transportation network provides important data for staff in understanding how the network is being used, assists in prioritizing locations for enhancements and helps build justification for budgeting purposes and grant applications. Given this, the city should consider incorporating the cost for purchasing and installing permanent counters into capital and development projects, specifically locations along the Primary Network. Projects outside of the Primary Network also provide opportunities and should be reviewed for applicability with the City's Active Transportation team.

Recommendation 22: Consider installing counters as part of all new cycling facility construction, with priority for the Primary Network.

8.7.9 Trail Lighting

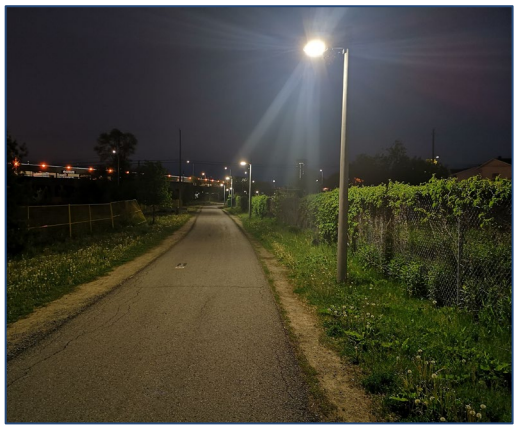
This topic specifically considers trail lighting as an opportunity, as active transportation facilities within road rights-of-way are commonly lit through lighting within the right-of-way.

Why is Trail Lighting Important?

Lighting is an important element for both actual and perceived sense of safety and security. Lighting can help to see other users and increase visibility to prevent collisions with other users or objects such as bollards, enhancing user experience. Being able to see your surroundings also allows people to feel safer. Lighting is especially important on trails that are used primarily for transportation purposes as these trails often provide direct connections to destinations. It

must be recognized that people regularly must travel outside of daylight hours to these destinations when walking or cycling as a transportation option.

Trail lighting policies help to support investment and decision-making around which trails get lighting, at the appropriate scale and type of lighting and the associated operations and maintenance plan. The adoption of policies can also help to communicate to the public around expectations for the provision of lighting for new trails as well as to help reduce the need to retrofit trails in the future. Requests for lit trails was common feedback received during public engagement events.



Lighting Considerations

Lighting for built trails should be analyzed per segment context with full consideration for safety needs, wildlife habitat, trail function, cost benefit, and maintenance commitments. In general, lighting is not appropriate for trails in remote areas, trails with low use, or where there is little to no development. Lighting may also be necessary for daytime use in trail tunnels and underpasses. Street lighting can improve visibility of roadways at crossings and trails.

Guidelines for Lighting Trails

The following list includes essential guidelines when planning and designing trail lighting:

- Lighting should be at pedestrian scale. Placement, spacing, and other finish specifications depends on the fixture and optics;
- Good lighting improves natural surveillance and visibility;
- Place lighting at decision points and areas of interest, such as street crossings, intersections with other trails, trail spurs, and near commercial and mixed-use developments;
- Illuminate only the intended targeted areas and use cut-off fixtures that aim lights down instead of above or behind the fixture, which causes light pollution and trespass;
- Consider how lighting impacts colour rendering, areas of concealment, and abstracted illumination;
- Use energy efficient lamps that comply with new environmental guidelines, and that provide supreme colour rendering, such as white lights;
- Consider timers, sensors, and remote-control technology which can enhance the sense of security and conserve energy;
- Lighting should avoid trees and be placed outside of canopy edge;

- Solar powered lighting is available where utility connection is not feasible or when alternative energy sources are desired. Daylight hours should be analyzed per season prior to specifying solar lighting; and
- Avoid light fixtures at eye level that could cause glare and impair visibility.

Lighting Typologies

The type of lighting is another important consideration when considering lighting trails. Solar powered and conventional electric lighting are both commonly used for trail lighting, but there are benefits and constraints associated with both lighting types that should be considered.

Solar Lighting

- Benefits:
  - **No Electrical Grid Connection Cost** – Solar fixtures are ideal for projects where it would be expensive to build a connection to the electrical grid. These costs can vary depending on distance or other local engineering challenges.
  - **Avoid Trenching Costs** – Trenching and installing electrical connections for a pathway can quickly become expensive. Solar lighting avoids the need to trench for wires.
  - **Reduce Site Disruption and Restoration** – With trenching for wires also comes the disruption of the site, closing of the trail during construction and the cost of site restoration afterwards. Solar products only require the footing for the poles to be installed, greatly reducing the overall disruption and restoration of surface grade.
  - **Faster Installation** – With less work required for site preparation and with self-contained fixtures, installation time of most solar fixtures is reduced.
  - **No Power Outages** – Solar fixtures are designed with the capacity to stay on regardless of variations in weather or power outages.
  - **Sustainable Light** – Solar lights generate all the power they need, eliminating the need for power from the grid.
  - **Remove Risk of Theft and Corrosion** – Electrical wires can be vulnerable to theft and corrosion, especially in more acidic soil conditions. Solar lights eliminate the risk and have features to make them vandal resistant. Many solar fixtures have been designed to match the aesthetic of wired lights but with the advantages of solar power.
- Constraints:
  - **Upfront Investment** – The upfront investment for solar LED lighting is higher than for conventional wired lighting. However, long term servicing and maintenance is very low. A financial analysis is recommended to determine the cost benefit of using solar

lighting for Waterloo. Also, it is very important when working with the solar lighting manufacturer to understand what parts of the fixture and product are guaranteed as well as product lifecycle and durability.

- **Solar Battery Lifespan** – Solar lights include batteries that need periodic replacement.
- **Indirect or Variable Sunlight Conditions** – Solar lighting fixtures typically require 2–5 hours of direct sunlight per day. However, some lighting companies have developed controllers that adapt to surroundings and save power. Additionally, companies are developing software for remote management to help optimize the lighting system or predict lower energy periods.
- **Limited Aesthetic** – Most solar lighting fixtures serve a very practical purpose. The primary design program is to house or host the photovoltaic panel and prevent theft and vandalism. As a result, their finishes can be limited and tend toward the more modern simple aesthetic. Selection is improving as the industry expands.

Conventional Electrical Lighting

- Benefits:
  - **Market Availability/Competitiveness** – Conventional electrical lighting is typically more affordable than solar lighting due to the basic technology of the fixtures, wide availability, and competitive pricing across North America.
  - **Wider Range of Fixture Styles and Finishes** – The current market for electrical lighting styles spans a wide range from traditional to modern. The colour, finish, and form of both pole and bollard lights have many options which can be matched to current lighting in and around Waterloo.
  - **Flexibility in Colour Temperature** – Colour temperature of lighting refers to the light appearance of a light bulb and is measured in degrees Kelvin. Electrical lighting offers more flexibility with colour temperature.
- Constraints:
  - **Trenching Requirement** – Electrical wiring for lighting requires trenching by machine, which is disruptive to the site and existing improvements. Trails may need to be closed during the installation of electrical wiring to accommodate the equipment and labour.
  - **Availability of Power Source** – Conventional electrical lighting requires connection to the electrical grid, and available sources for the connections can be limited or require additional trenching outside the trail corridor. Specific power connections were not assessed during the physical assessment and should be completed by an electrical engineer if a wired lighting system is selected.

- **Operating Cost** – Conventional electrical lighting requires connection to the electricity grid. The operational cost to provide daily lighting on trails will be added to the City's operation costs.

Prioritizing Trail Lighting

The City should develop a lighting policy to invest in trails through a transparent and equitable process. The policy should focus on which types of trails have lighting. It could also include scenarios where lighting may be appropriate. As part of the WTMP process, transportation focused trails have been identified, and include multi-use paths and walkways. These trails should be priority for trail lighting. Other trails have a more recreational focus and lighting could impact the experience of the trail and/or the surrounding environment. As many trails go through City park lands, the Transportation, Planning and Parks departments should work together to coordinate and implement lighting.

When thinking about how to prioritize lighting of existing trails, there are different criteria to support how lighting is prioritized. Trails should be prioritized in sizeable sections so that projects can provide a more significant benefit instead of just a spot improvement. Criteria that could be considered to support prioritization include:

- Trail Volumes (number of users).
- Part of Primary Network or Regional Minimum Grid.
- Destinations (trail provides access to transit, schools, shopping).
- Public Feedback (comments about where lighting is desired).
- Trail Type (transportation focus versus recreational focus).

Recommendation 23: Develop a methodology and policy to prioritize the implementation of trail lighting for multi-use paths, coordinating with Transportation, Planning, and Parks departments.

8.7.10 Wayfinding

Why is Wayfinding Important?

Wayfinding is a system of signs, markings, maps, and other signifiers by which people follow a route from one place to another. It is intended to help people navigate their surroundings intuitively and efficiently, enhancing user experience. A robust wayfinding system can have many positive outcomes for the active transportation system. Some of the benefits of wayfinding are described below.

- **Orientation –** Wayfinding can help people orient themselves quickly. It allows users to better understand where they are going and how it relates to other locations either on a map or through signage with destinations included. Wayfinding can assist users in understanding how the active transportation network fits together as a whole.
- **Route Planning –** Wayfinding provides people information to enable them to plan their routes effectively and it allows people to make more accurate judgements on travel time, which can otherwise be a barrier.
- **Promotion of Active Transportation –** Wayfinding can make cycling more comfortable for new or casual cyclists by helping them feel more confident in knowing where they are going. It also increases awareness of active transportation by communicating to other road users, such as motor vehicles, the presence of active transportation infrastructure.
- **Placemaking –** Wayfinding encourages people to discover new destinations by allowing them to confidently explore the network and learn about destinations listed on signage. Wayfinding can be used as a placemaking tool by giving places an identity and by integrating with the cultural environment.

Guidelines for Wayfinding

Draft OTM Book 18 (2020) includes a list of seven principles to guide a wayfinding system, as follows:

- **Simplicity –** Keeping the information straightforward yet with enough detail to be helpful;
- **Consistency –** Signage that has a uniform design and is located consistently;
- **Conspicuity –** Signage that is directed at cyclists;
- **Relevance –** Ensuring that destinations and facilities included on signs are relevant to users;
- **Continuity –** Signage that allows users to interpret them while they keep moving;
- **Integrative –** A system that connects routes as part of whole network and is not isolated; and
- **Universality –** Designed to be accessible for all ages and abilities.

The following list includes essential guidelines when planning and designing wayfinding:

- **Signage Type –** There are three main types of signs that are recommended for use in wayfinding for cycling routes:
  - **Decision Signs –** These signs advise of an upcoming junction and provide information about the possible routes, such as distance to destinations. They are usually placed 40 to 50 m before a decision point and include destinations, travel distance/time, and directional arrows;
  - **Turn Signs –** These signs notify users of an immediate turn, and are placed 5 to 10 m before a turning point; and
  - **Confirmation Signs –** These signs are used to reassure users that they are on the correct route. They are usually placed 20 to 30 m after a decision point and repeated at least every kilometre.

  In addition to the main signs above, other signs may be useful in certain circumstances. These include:

  - **Fingerboard Signs –** These provide detailed information about possible routes at major junctions;
  - **Trailhead/information Kiosks –** These may include maps, interpretation panels, and other detailed information about the trail network;
  - **Street Name Signs –** These may include symbols to highlight active transportation infrastructure or route;
  - **Distance Markers –** These are used to show distance from a single point;
  - **Bike Route Map Signs –** These show a map of the entire route or the network; and

  - **Gateway Signs –** These may be used at the entry to a neighbourhood or park.
- **Sign Design –** The NACTO guide suggests the use of "Clearview Hwy" typeface as it is consistent with other US guide signs, while Draft OTM Book 18 recommends a typeface that is consistent with the local context. The latter document also recommends sign size, colours, and amount of text should be designed to be read by cyclists travelling at average speed.
- **Destination Hierarchy –** Destinations should be used on wayfinding signage to give context to the users' location and so they know where each route leads to. Destinations included on the signs differ depending on where the destination is in relation to the users' location and the importance of that destination. There are three levels of destinations:

- **Primary –** These are city-wide destinations and as such are the largest and most important destinations in the city. Primary destinations may include locations such as downtowns, universities, and major parks. Generally, they would be listed on signs up to 8 km away;
- **Secondary –** These are destinations that are significant for a sector of the city, and may include neighbourhoods, light rail transit stations, hospitals, or shopping centres. They would usually be listed on signs up to 2 km away; and
- **Tertiary –** These are destinations that are relevant for the local area, and may include community centres, schools, or on-street bikeways. They are generally listed on signs up to 1 km away.

- **Pavement Markings –** Pavement markings can be used in conjunction with wayfinding signage to guide users along routes. They are especially helpful in areas where signage might be obscured or in particularly complex junctions. This might include directional "sharrows" or route branding.
- **Maintenance –** Like all signs, wayfinding signs eventually need replacement due to weathering, new information, or accidental or willful destruction. Municipalities should keep track of wayfinding signage characteristics to ensure replacement occurs at the end of its lifecycle or when in need of updating.
- **Temporary Conditions –** Ontario Traffic Manual Book 7 Temporary Conditions (2014) sets out guidelines for construction detours, which can also be applied to pedestrian and cyclist facilities. Of particular significance to wayfinding is Figure TL-42(i), which describes detour and alternative route signage.

Wayfinding Practices

The following summarizes recommended wayfinding practices for Waterloo:

- **Overall Approach –** The existing Waterloo wayfinding system is consistent with the recommendations of NACTO and Draft OTM Book 18, specifically with respect to destination hierarchy. It uses decision signs and confirmation signs, but turn signs as described above, are not commonly used in the City. Use of such signs would provide a valuable tool for users to navigate the active transportation network.

  It is recommended that the existing system be continued with the additional inclusion of turn signs at junctions. This system should be extended to the remainder of the active transportation network in line with the priority locations set out in the prioritization section below. Other optional types of signs, such as trail head signs, should also be added at major junctions or congregation points.

- **Accessibility –** For new or rebuilt recreational trails that must be designed to be AODA compliant, signage must also meet the standards set out by the AODA. The additional

accessibility information on the signage is required on signs at the start of the recreational trail includes trail length, width, slope, surface, and amenities, and must be done in legible text. It is recommended that a standard sign template be developed for use at the start of all recreational trails and adapted accordingly.

- **Ongoing Maintenance and Temporary Conditions –** The existing GIS database and inventory that the City uses should be maintained and expanded to include all new signage added to the system to ensure ongoing maintenance. Temporary conditions, such as construction projects, can be a potential detriment to cyclists and pedestrians if they are not able to easily follow their route through the affected area. There should be a process for all construction projects to consider impacts on active transportation infrastructure and ensure an appropriate detour is in place, and that that detour is signed accordingly.
- **Coordination with Other Jurisdictions –** As the City is integrated into the Region of Waterloo and with surrounding municipalities more than most cities, it is important to ensure that it is not acting on its own. An ideal wayfinding system integrates with those in other local jurisdictions, including the Region of Waterloo and the City of Kitchener, and Grand River Transit. This includes the use of consistent sign type and design, and use of corresponding destinations (e.g., using ION stations at the same level of the hierarchy).
- **Signage Clutter –** Implementing a wayfinding system means placement of additional signs throughout the city, which could contribute to over-signage or signage "clutter" in the public realm. There are several ways that over-signage can be mitigated. One strategy is to use pavement markings as supplementary to signage, which can also help to eliminate the need for redundant signage. It should be noted that additional pavement markings require regular maintenance and can be obscured by leaves and snow during certain times of the year and therefore should be not be used on its own.

  The issue of signage clutter can also be addressed by using a coordinated and integrated approach between internal departments and other jurisdictions (e.g., Region of Waterloo, Grant River Transit, Grand River Conservation Authority). It is possible to rely on existing wayfinding signage for motor vehicles if it is appropriate for bicycles and pedestrians. For example, a street name blade sign is used by car drivers, bikes, and pedestrians alike to understand the street network, and thus additional street name signage at these locations is not necessary. Coordination with other signage by sharing posts is another way of reducing clutter.

Prioritizing Wayfinding

The existing wayfinding system should be expanded to include additional parts of the active transportation network. The following criteria should be used to determine prioritization:

- **Primary Network –** The Primary Network should be a priority for wayfinding as it forms the backbone to the overall active transportation network.

- **Routes accessing major destinations –** Routes leading to and from major destinations, such as the universities or ION stations, should be a priority.
- **Unintuitive routes –** Routes that have multiple turns or jogs that may not be easy to follow for users should be a priority as these are routes that may confuse casual users.
- **Routes through barriers –** Routes that provide a safe crossing of a major barrier, such as across Highway 85 or Laurel Creek, should be a priority as they are critical to expanding the access to areas on either side of the barrier.
- **Connections to Primary Network –** Routes that are directly connected to the Primary Network should be a priority to provide continuity with the wayfinding system already used on the Primary Network.

Recommendation 24: Continue to implement the signage family that is currently being used in the City.

Recommendation 25: Develop signage for recreational trails that includes information such as trail length, width, slope, surface, and amenities in legible text.

Recommendation 26: Develop a methodology to prioritize the implementation of wayfinding signage across the City's cycling network.

Recommendation 27: Develop a plan for the implementation of signage on existing and planned facilities.

Recommendation 28: Coordinate implementation of signage with other departments and jurisdictions.

Recommendation 29: Continue to maintain an inventory of signage information, including wayfinding signage in a GIS database.

8.7.11 Funding Opportunities

As noted in **Subsection 7.3.3**, there are various funding opportunities that could support the City's capital planning for these projects. The following is not an exhaustive list but includes common and available sources of funding for active transportation projects at the time of writing:

- **Development Charges –** The City of Waterloo Development Charges By-law includes charges for Roads and Related Works, which includes active transportation infrastructure. The by-law should be updated to reflect the additional active transportation projects that are included in this plan.

- **Municipal Levy –** The City of Waterloo council could pass a by-law pending permission from the province to enact a municipal levy to help pay for active transportation facilities and their maintenance as per section 312 of the *Municipal Act*.
- **Ontario Builds –** The Ontario Builds program is a provincial infrastructure funding program which has funded active transportation infrastructure such as sidewalks, trails, and bike lanes in urban and rural communities across the province.
- **Federal Gas Tax Fund –** Gas tax is collected annually by the federal government. Jurisdictions receive a proportion of the federal dollars based on their populations. The Gas Tax Fund supports environmentally sustainable municipal infrastructure by funding a range of projects including transportation projects.
- **Green Municipal Funds –** The Federation of Canadian Municipalities (FCM) manages the Green Municipal Fund (GMF). Eligible capital projects include transportation that must demonstrate the potential to reduce vehicle kilometres travelled in a single occupancy vehicle by encouraging active transportation. Matched funds are required.
- **Infrastructure Canada –** The programs of Infrastructure Canada are the Active Transportation Fund, New Building Canada Fund (NBCF) and the aforementioned Gas Tax Fund. Typically, the federal government contributes one-third of the cost of municipal infrastructure projects. Provincial and municipal governments contribute the remaining funds and, in some instances, there may be private sector investment as well. The NBCF supports projects of national, regional, and local significance that promote economic growth, job creation and productivity. Numerous active transportation projects and roadway and transit projects with active transportation elements have been funded through this program.
- **Volunteer and Private Sector –** The City could seek out partnerships for funding plan recommendations. Funding for improvements and ongoing maintenance could be funded partially through volunteers and donations, either from individuals or service clubs and trail groups. Advertising on trail elements or development of a program for sponsorship could also be used to fund new infrastructure and improvements.

Recommendation 30: Continue to identify and pursue funding opportunities for active transportation projects to enable the implementation of recommendations in the WTMP.

8.7.12 20-Minute City

Cities as diverse as Ottawa, Paris, and Melbourne are moving forward with the concept of planning, designing, and building 15 or 20-minute city or neighbourhoods. The concept of a 20-Minute City is where residents have convenient access to everyday services and places including grocery stores, restaurants, schools, health services, parks, and some jobs within a 20-minute walk of their home. These communities are often characterized as vibrant, with a mix of

residential and commercial land uses. They have access to infrastructure for walking and cycling that connect to these local destinations, as well as public transit.

A 20-Minute City is intended to reduce the need to travel long distances, which in turn will reduce vehicular traffic and therefore can make an impact on greenhouse gas emissions. It can also improve access to services and opportunity for all people, regardless of the transportation mode they use. The 20-Minute City concept is also about investing in and strengthening neighbourhoods through community-level planning that addresses community needs and supports social interaction and connection.

The active transportation recommendations in this WTMP are in-line with the 20-Minute City concept, with recommendations to build a connected, high-quality network for people walking and cycling to community destinations. The graphic shown in **Figure 8.2** was developed to help illustrate what the 20-Minute City would look like in Waterloo based on the proposed ultimate network recommendations from the WTMP, including a dense, direct, and connected network of high-quality cycling and pedestrian facilities. The Uptown Waterloo and University area is a good example of an existing area that satisfies many of the elements of a 20-Minute City, such as having services like grocery stores, schools, and other community destinations within a 20-minute walk. In addition, the rapid transit line provides fast and convenient access to additional services and destinations beyond the extents of a 20-minute walk, without the need to rely on personal motor vehicles.

Land use planning policy is critical to the success of the 20-Minute City concept, as a mix of different land uses are needed in an area to ensure a variety of services are available to nearby residents. The overarching principles and objectives of the City of Waterloo Official Plan include some direction that is consistent with the concept of a 20-Minute City. The City's Official Plan also uses the Complete Community framework to plan for a community that is consistent with the 20-Minute City goals.

Moving Towards a 20-Minute City

The following summarizes actions to move Waterloo towards a 20-Minute City:

- The proposed ultimate cycling network and pedestrian network recommendations in the WTMP need to be implemented to fulfill the transportation directions of building a 20-Minute City;
- The City should evaluate an existing area of the city against the objectives of the 20-Minute City concept to determine what gaps exist in services and land uses, and to determine opportunities for change to existing policy. The area of the City studied should have a 20-minute walking radius and be one that does not have as many existing services and community destinations as the Uptown Waterloo and University area. This evaluation will inform changes to City-wide policy for land use and services, which are included in the recommendations below;

FIGURE 8.2: 20-MINUTE CITY CONCEPT IN WATERLOO

- The City should review and update land use planning policy documents, such as the Official Plan, to encourage a mix of land uses and services so that people can access their everyday services within a 20-minute walk;
- The City should perform a comprehensive review and update of other City policy documents to implement the 20-Minute City concept. This may include plans and policies for provision of social services, emergency services, and housing. It should also build on the efforts of the City's Diversity, Equity, and Inclusion Strategy responding to, and with consideration of, topics that the working group has developed through the course of their work; and
- The City should engage with community ambassadors and other community members and groups to help guide the vision for, and implementation of, the 20-Minute City. This includes ensuring that policy changes address the needs and desires of the community, and the community can have some ownership over the results.

Additional tools to assist with implementation of the 20-Minute City concept include:

- Adopting and committing to 'community ambassadorship' approach as described in the Town and Country Planning Association webinar; and
- Using the Federal Highway Administration (FWHA) *Guidebook for Measuring Multimodal Network Connectivity* to support future network development. Tools in this document, such as those illustrated in **Figure 8.3**, have already been incorporated into the work of the WTMP and will serve as a useful reference point for future study of a specific neighbourhood.

Recommendation 31: Continue to pursue and implement policies and projects based on the 20-Minute City concept.

FIGURE 8.3: CONNECTIVITY ANALYSIS METHODS

(Source: FWHA Guidebook for Measuring Multimodal Network Connectivity, 2018)