

TRANSPORTATION MASTER PLAN 2020 UPDATE EXECUTIVE SUMMARY



TRANSPORTATION MASTER PLAN UPDATE
LOOKING AHEAD





EXECUTIVE SUMMARY

Introduction

The **City of Waterloo Transportation Master Plan (WTMP)** is a strategic planning document that defines the policies, programs and, infrastructure required to meet the city's future transportation needs and fulfil Waterloo's transportation vision. Prepared following the master planning process (Approach #1) of the Municipal Engineers' Association *Municipal Class Environmental Assessment*, the WTMP considers all modes of transportation under the jurisdiction of the City, namely cycling facilities, pedestrian infrastructure, and roadways. It aligns with and complies with the City's Strategic Plan and Official Plan, integrating the transportation infrastructure requirements of existing and future land use with the community planning vision and objectives for growth management, public safety, affordability, economic vitality, and quality of life.

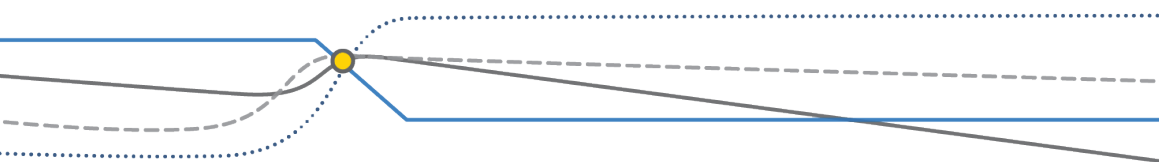
The first WTMP approved by City Council in 2011 outlined the recommended transportation strategy to support a "City that is truly accessible to all" to the year 2031. With a new 2041 horizon, the City is "Looking Ahead" with this update. The 2020 WTMP builds on the principles of the previous plan while providing new and updated policies and actions to address evolving transportation and land use issues facing the City of Waterloo.

Consultation and communication were essential components of the 2020 WTMP update. The engagement process included three formal rounds of public outreach comprising four pop-up events (Round 1), a Public Information Centre (Round 2), and an open comment period (Round 3). The City also held two stakeholder meetings with community groups, agencies, and neighbouring municipalities and made presentations to the Waterloo Advisory Committee on Active Transportation (WACAT), Grand River Accessibility Advisory Committee (GRAAC), and Sustainability Advisory Committee (SAC) during the study. City Council participated throughout the process, receiving two presentations, and participating in an interactive workshop. Digital engagement including a project portal on the City's EngageWaterloo platform, a project email address, social media posts, online surveys, and an interactive map complemented the in-person activities. Overall, the objectives, outcomes, and recommendations of the 2020 WTMP considers this input.

Foundations

Policy Context

The 2020 WTMP is based on the land use and transportation planning policy context defined by the City of Waterloo, Region of Waterloo, Province of Ontario, and other public agencies, much of which has changed since the 2011 WTMP was completed. Three documents provided the primary foundations for the updated plan:





City of Waterloo Strategic Plan

The 2019 City of Waterloo Strategic Plan identifies **safe, sustainable transportation** as one of its six strategic pillars or areas of focus. The plan explains this condition “exists when all users and all modes of transportation are able to share roadways and trail systems safely; when traffic speeds respect the safety of the community; when policy and planning supports the development and maintenance of sustainable infrastructure; and when more residents are able to rely on sustainable modes of transportation such as public transit or active transportation to get where they need to go”. Consistent with this pillar of the Strategic Plan, the 2020 TMP provides the framework to improve the safety and efficiency of all modes of transportation thereby making Waterloo more mobile, accessible, and connected.

City of Waterloo Official Plan

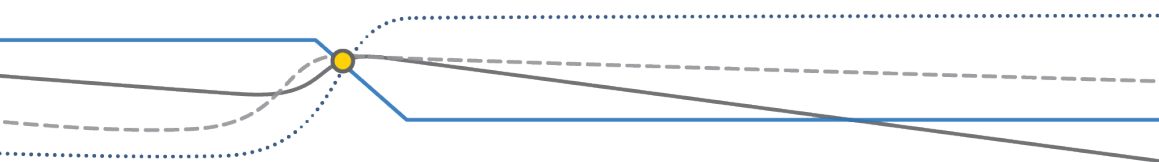
The 2012 City of Waterloo Official Plan (January 2020 consolidation) identifies the following transportation objectives considered to have a significant influence on the land use policies and designations of the Plan in Section 2.3:

- ▶ Encourage active transportation as an alternative to the automobile;
- ▶ Plan for and support a shift in focus from providing roads to move cars, to providing streets where people can interact and travel on, whether by foot, bicycle, transit, or another motorized vehicle;
- ▶ Support and contribute to the success of the public transit system;
- ▶ Continue to provide bicycle and vehicular parking that meets community needs while balancing needs of motorists and active transportation users; and
- ▶ Plan for trails and open space networks and supporting facilities that are interconnected and service transportation functions.

To achieve a healthy and livable City and a transportation system consistent with Official Plan objectives, the 2020 WTMP places increased emphasis on moving people – reducing reliance on the automobile in favour of transit and more active forms of travel such as walking and cycling.

Region of Waterloo Transportation Master Plan

The 2018 Regional Transportation Master Plan Update (2018 RTMP), the third version of the Region of Waterloo’s long-term transportation strategy, outlines the needs for active transportation (cycling and walking), public transit, and Regional roads to the year 2041. To realize the vision set out in the plan, transportation goals and actions of the lower-tier municipalities, including the City of Waterloo, must align with the directions set out in the Regional document. For the 2020 WTMP, this involves:





- ▶ Pursuing actions where the City is identified to take the lead role;
- ▶ Referencing and incorporating (where appropriate) the 2018 RTMP road, active transportation, and transit network plans;
- ▶ Providing connections (where possible) between City and Regional infrastructure to create a seamless and integrated transportation network; and
- ▶ Considering protected cycling facilities along City roadways to align with the broader Regional plan.

Changes in Demographics, Travel Behaviour and Traffic Conditions

Monitoring trends in demographics, travel behaviour, and traffic conditions enables the City to better understand change over time (and how that might affect the transportation system) and assess the effectiveness of the WTMP in meeting stated objectives.

Table ES.1 details the change in key socio-demographic characteristics observed in the City of Waterloo between 2011 and 2016 based on data from the Statistics Canada Census of Population and the Transportation Tomorrow Survey (TTS)¹. Of note, the population and number of households in the City grew (6 to 8%) as did labour force and the number of jobs albeit at a lower rate (3 to 5%). By contrast, average household size and vehicles per household both declined slightly over this period.

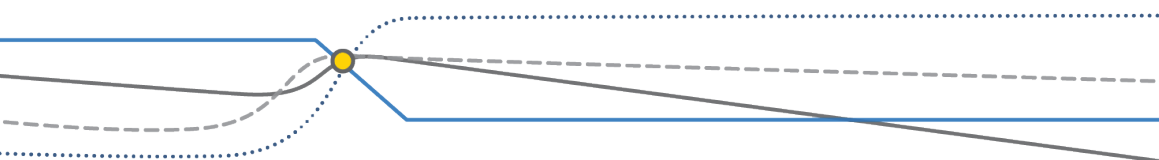
TABLE ES.1: CHANGE IN SOCIO-DEMOGRAPHIC CHARACTERISTICS, 2011-2016

Indicator	2011	2016	Change
Population and Households			
Population	98,780	104,985	+6.3%
Households	37,515	40,380	+7.6%
Average Household Size	2.63 persons	2.60 persons	-0.03 persons
Average Total Income	\$100,414	\$108,411	+\$7,997
Average Vehicles	1.63	1.58	-3.1%
Jobs and Labour Force			
Total Jobs	63,100	66,100	+4.8%
Total Labour Force	55,220	57,275	+3.7%
Labour Force-Employment Ratio	0.88	0.87	-1.0%

Source: 2011 and 2016 Census of Population and 2011 and 2016 Transportation Tomorrow Survey

Table ES.2 summarizes the change in trips made and mode share observed in the City of Waterloo between 2011 and 2016 based on the TTS data. Of note, the number of trips originating in Waterloo

¹ The Transportation Tomorrow Survey is a confidential and voluntary survey on how Ontarians in the Greater Golden Horseshoe (GGH) travel. The survey is typically conducted once every five years.





during the morning peak period and daily increased but at a slower rate than population growth (4.6% and 3.7%, respectively). Over this period, the auto passenger and driver mode shares decreased by approximately 3% each. This change is attributed to the growth in active transportation use, with walking and cycling mode shares increasing by about 3% and 2%, respectively. Transit share remained constant at around 7%.

TABLE ES.2: CHANGE IN TRIPS MADE AND MODE SHARE, 2011-2016

Period/ Mode	Year		Change
	2011	2016	
Trips Originating in Waterloo			
AM Peak (06:00-08:59)	50,800	51,030	4.6%
Daily (24 hours)	266,090	275,910	3.7%
Mode Share (of Daily Trips)			
Walk	4.0%	7.3%	3.3%
Cycle	1.2%	2.7%	1.5%
Transit	7.0%	6.5%	-0.4%
Auto Passenger	16.0%	13.3%	-2.6%
Auto Driver	69.7%	67.3%	-2.4%
Other	2.1%	2.8%	0.7%

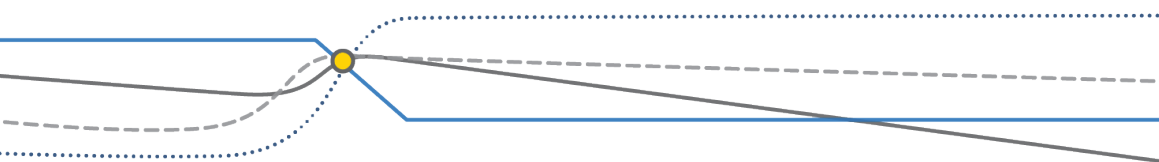
Source: 2011 and 2016 Transportation Tomorrow Survey

The active transportation mode share of trips less than or equal to 8 km increased in each of the seven wards in the City, except Ward 1. The more densely populated central wards still exhibited the highest active transportation mode share in 2016.

Residents of Waterloo travel most frequently to other locations within the City. The City of Kitchener is the next most common destination for City residents.

In 2016, approximately 40% of daily trips originating in the City were made to or from home (home-based) for discretionary purposes, with home-based work (29%), non home-based (18%), and home-based school (14%) comprising the remainder. Only the share of daily non home-based trips decreased between 2011 and 2016. As well, the average trip length increased for all trip purposes. As a result, the average length of trips originating in the City of Waterloo was 8.7 km in 2016 compared to 8.2 km in 2011.

Weekday AM and PM peak hour traffic operations at 40 signalized, five unsignalized and two roundabout intersections were analyzed to provide a snapshot of current traffic conditions on the road network serving the City. For the analyses, intersections and/or their individual movements





experiencing a level of service (LOS) E or F and/or volume to capacity (v/c) ratio of 0.9 or greater were considered critical. Of the 47 intersections examined:

- ▶ 12 operate or have individual movements (23) that operate at critical levels of service during the AM peak hour. By comparison, only seven movements at five intersections were considered critical based on the 2008 counts reported in the 2011 WTMP; and
- ▶ 23 operate or have individual movements (56) that operate at critical levels of service. By comparison, only nine movements at eight intersection were considered critical for the 2011 WTMP.

Overall, the afternoon peak hour experiences worse levels of service than the morning due to higher traffic volumes, owing to more discretionary trips being made (i.e. work to home with shopping, recreation, social, etc.).

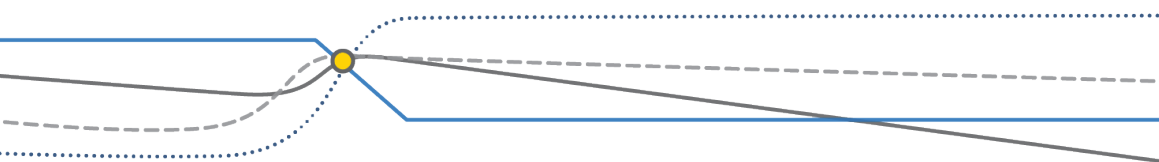
Potential Impact of Transportation Innovation

Travel behaviour in Waterloo can be expected to change over time due to infrastructure investments, transformative technologies, emerging government regulation and policies, and public network user preferences. Within the horizon of the 2020 WTMP (and beyond), the following initiatives were anticipated to have the greatest potential influence on future travel behaviour in the City:

- ▶ **ION Light Rail Transit** – The ION LRT service is expected to influence travel behaviour in Waterloo, leading to increased transit mode share and active transportation use. Initiatives by the City and Region to improve cycling facilities and provide pedestrian links to the ION LRT stations will help to spur further travel by these modes. Additionally, Grand River Transit has redesigned its bus network in the City to effectively extend the catchment area of the ION LRT service.
- ▶ **Car Sharing, Ride Sharing, Ride Hailing, and Ride Sourcing** – These shared mobility services can be successful in addressing the transportation challenges of communities like Waterloo, providing a viable solution to the “first and last mile dilemma” and offering mobility options for individuals without automobiles. These services can complement the transit system and offer efficient, cost-effective options to single-occupant vehicle travel, thereby reducing the volume of short distance auto trips.
- ▶ **Bike Sharing and E-Bikes** – Given the number of trips in the City under 8 km in length, and the high percentage of those trips currently being made by automobile, the potential exists to grow the share of travel by active modes. The greatest opportunity for a bikeshare system exists in the Uptown area and near the universities and colleges in the University Avenue corridor.

Implications of 2020 Coronavirus Pandemic

The 2020 Coronavirus pandemic was ongoing at the time of completing the WTMP update. During the pandemic, the City experienced considerable change in travel behaviour as governments implemented strict physical distancing measures to control the spread of the virus. Reduced travel demand,





especially in “shared” modes like transit and ridesharing and increased active travel (i.e. walking and cycling) were observed during this unprecedented time in history. While many previous travel trends are expected to resume as life returns to “normal”, this event has the potential to change behaviour and transportation services moving forward, most notably in home to work and work-based travel.

Although impossible to predict the impact at this point, the WTMP takes into consideration the potential implications to the extent possible in its strategies and action plans.

Growth and Development

The City of Waterloo is expected to continue to grow to the 2041 horizon year of the 2020 WTMP. **Table ES.3** summarizes the residential and non-residential development forecasts for the 2019 to 2041 planning period developed for the City’s 2019 Development Charges Background Study.

Both residential and non-residential development in the City will increase at a rate greater than the historical average over the immediate future. Waterloo will continue to transform from a low-rise suburban community to a more compact urban form, particularly within the Uptown Waterloo Urban Growth Centre, other designated nodes, corridors, and major transit station areas.

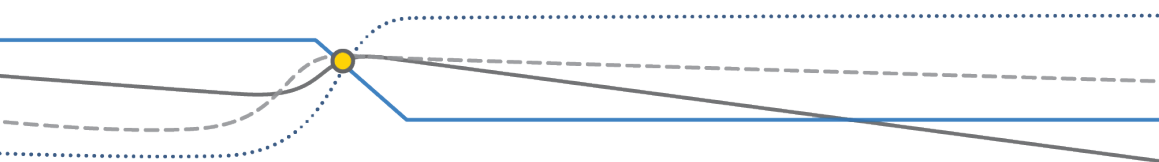
TABLE ES.3: DEVELOPMENT FORECASTS, 2019-2041

Type	2019	2019-2041	
	Existing Estimate	Forecast Change	At 2041
Residential			
Total Occupied Dwellings	42,490	15,778	58,268
Census Population	133,482	26,701	160,183
Non-Residential			
Employment Place of Work	70,625	18,375	89,000

Opportunities and Challenges

The assessment summarized in the preceding sections highlight existing conditions and prevailing trends that will shape and influence the City’s transportation system in the coming years. The following summarizes the key transportation opportunities and challenges the City will face in the coming years:

- ▶ Continued growth and urbanization will change how people move around Waterloo;
- ▶ Commuter trips are still highly car dependent;
- ▶ Short trips are becoming less auto dependent as more people choose active modes for trips under 8 kilometres;





- ▶ Road safety is a paramount concern, especially for active transportation users;
- ▶ Internal travel follows a typical urban demand profile as commuters and students travel from home to work or school in the morning and return in the evening;
- ▶ Multi-modal travel is replacing single mode travel, heightening the need for seamless connections between modes as well as first and last mile options;
- ▶ Change in travel behaviour due to the 2020 Coronavirus Pandemic and growing awareness of social equity will require transition to a new normal;
- ▶ Transportation planning decisions can have significant and diverse equity impacts; and
- ▶ New mobility options are emerging as significant changes arise in the technologies used and attitudes towards moving people and goods.

Vision Statement and Goals

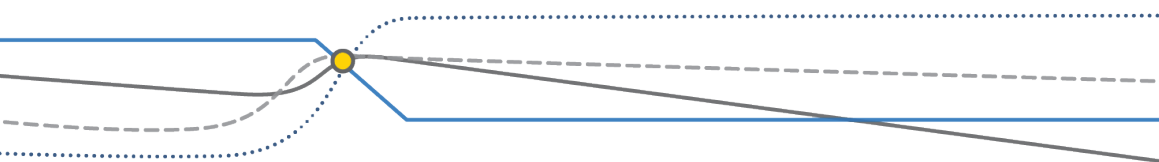
Much has changed over the past nine years since City Council adopted the 2011 WTMP. The 2018 Region of Waterloo Transportation Master Plan and the City's 2019-2022 Strategic Plan focus not only on mode choice but also **equity, inclusion, sustainability, community health, safety, growth, and prosperity**. Travel modes other than the auto will not just be considered "alternatives" but will represent viable transportation options for daily use. Residents and visitors to the City will have the option to travel safely and efficiently within and through Waterloo using their mode of choice regardless of age or abilities. Communities and transportation systems will be developed and maintained with sustainability and healthy living in mind. Existing resources will be used more efficiently or repurposed. A holistic approach to managing the transportation system will allow the City of Waterloo to continue to grow and prosper to 2041 and beyond.

With these objectives in mind, the transportation vision for the 2020 WTMP is as follows:

Waterloo has an equitable transportation system built on the principles of sustainability, choice, and safety.

The vision is supported by the following four goals:

- ▶ **Promote Travel Choice** – All individuals who live, work, visit or undertake recreational activities within the City can make trips in an integrated and seamless manner without having to drive (or own) a car. By achieving transportation equity, different travel modes, including walking, cycling, and public transit, are competitive in terms of travel time, cost, and accessibility.
- ▶ **Create a Sense of Belonging** – Transportation services provide access to equal opportunity and benefits for all citizens. Treating everyone equitably requires an acknowledgement of the unique circumstances different individuals face and provides the basis to eliminate systemic barriers. This helps to support overall neighbourhood livability, enhance quality of life, and build a strong sense of community through primarily active transportation services.





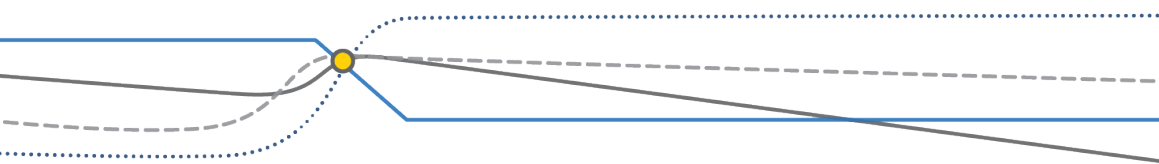
- ▶ **Support Sustainable Development** – The transportation system supports sustainable growth initiatives within the City, benefiting both the economy and environment. Enabling sustainable development patterns helps to reduce transportation contributions to climate change.
- ▶ **Optimize the Transportation System** – Make the most of infrastructure and services that already exist. Managing transportation supply and demand will help to maximize the use of existing facilities and defer the need for new infrastructure that does not support the other goals.

Alternative Planning Strategies

The Municipal Class Environmental Assessment process requires documentation and examination of all reasonable alternatives to address the problems and opportunities and achieve the transportation vision. Consistent with the 2011 WTMP, the following alternative planning strategies were considered:

- Alternative 1: Capacity Focus Strategy** A long-term transportation strategy that continues to provide roadway network capacity in response to growing traffic demands could be considered a “business as usual” approach. Adopting a capacity focus would continue to add vehicle travel lanes and extend roads to primarily accommodate motorized traffic, often at the expense of the expansion and improvement to active transportation infrastructure and services. It would also perpetuate auto use and compete against transit ridership growth.
- Alternative 2: Demand Focused Strategy** A long-term transportation strategy that is demand-focused would concentrate on changing travel characteristics in the movement of people and goods within and through the City. At its extreme, a demand-focused strategy could strategically withhold roadway capacity enhancements to create the functional incentives needed to shift travel demands towards transit and active transportation.
- Alternative 3: Complete Transportation Strategy** A long-term transportation strategy that is complete aims to decrease the growth in private auto use and increase the use of other modes. Private auto use would still be a dominant mode of transportation, but a complete strategy would reduce the amount of road construction needed to serve future travel demands, provide added incentives to optimize the carrying capacity of the roadway network, and offer new opportunities to strategically convert or adjust the auto carrying capacity of selected City streets towards active transportation and/or streetscape uses.

The multiple account evaluation (MAE) completed to assess the three alternatives led to the selection of **Alternative 3: Complete Transportation Strategy** as the preferred planning approach for the 2020 WTMP. Advancing a strategy focused on all modes of travel while optimizing the City’s existing infrastructure reflects the vision of an equitable transportation system built on the principles of sustainability, choice, and safety. A sensitivity analysis confirmed the preferred alternative remained the same regardless of the weight assigned to the criteria.





Active Transportation Strategy

Proposed Networks and Facility Design

The 2020 WTMP primarily focuses on improvements to active transportation in the City. Developing the strategy involved consideration of existing cycling and pedestrian networks, current travel demands and collision history, gaps in the network, and network connectivity in terms of access to transit, schools, and other community destinations.

Pedestrian Network

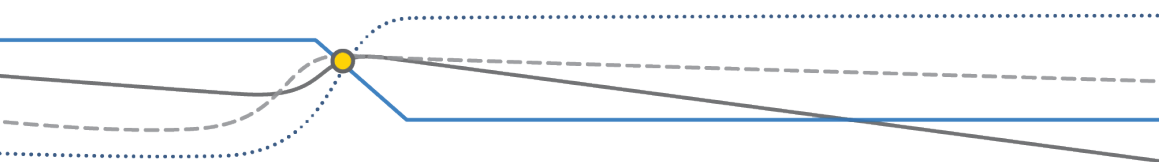
Sidewalk and walkway plans should be addressed through policy, accessibility legislation and by building on the current framework and priority program. The pedestrian network will be enhanced through the work being completed for the proposed ultimate cycling network, as it will help the City clarify existing trail standards and add trail connections to provide low-stress and direct routes for pedestrians.

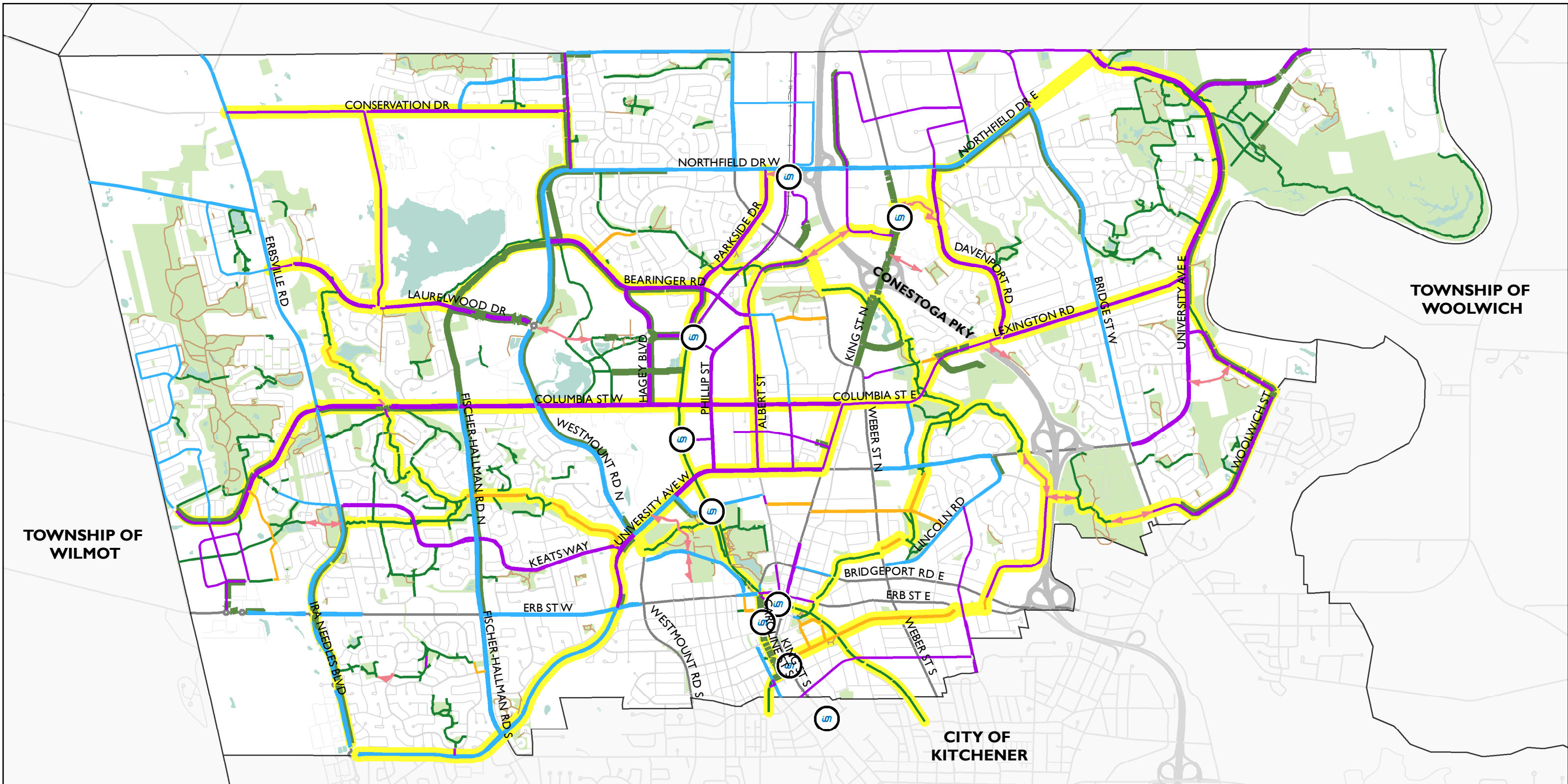
Cycling Network

Improvement and expansion of the cycling network should continue, leveraging past investments to future benefit. **Map ES.1** shows the ultimate cycling network of existing and proposed facilities, which is organized into five classifications that reconciles the terminology for different facility types and better aligns with prevailing provincial and national guidance. The network aims to eliminate missing links and provide continuity for cycling within the City. Consultation with WACAT and input from the public helped shape and confirm the routes. The ultimate cycling network also shows the existing trail network, which has been reclassified to identify trails that provide a transportation purpose based on alignment and connection and taking into consideration existing surface material.

The primary network is the backbone of the cycling system and consists of important cross-town routes providing access to major destinations (such as Uptown, the universities, and ION stations). These routes should be prioritized for maintenance, snow clearing, road crossing upgrades, among other elements.

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 works. In some locations, land constraints and other factors may delay the desired timing for new cycling facilities. An iterative and flexible prioritization process was developed to rank initiatives based on measurable criteria related to goals of the project (quantitative approach) and opportunity to implement the facility (qualitative approach). The process recognizes priorities may change over time as new information emerges or other opportunities arise. In some circumstances, lower cost options should be considered for implementation in the short-term and then updated/upgraded as part of a future capital works project. **Map ES.2** shows the proposed cycling priority projects based on this process.





Map ES.1
PROPOSED ULTIMATE CYCLING NETWORK

Map Version: 3/15/2021

Cycling Facilities

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

Trails

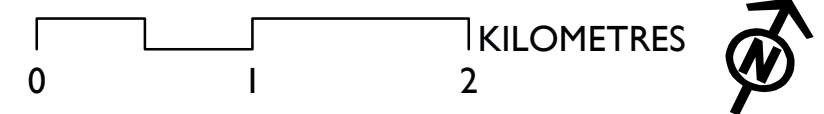
- Multi-Use Path
- Multi-Use Trail
- Recreation Trail

— Primary Network

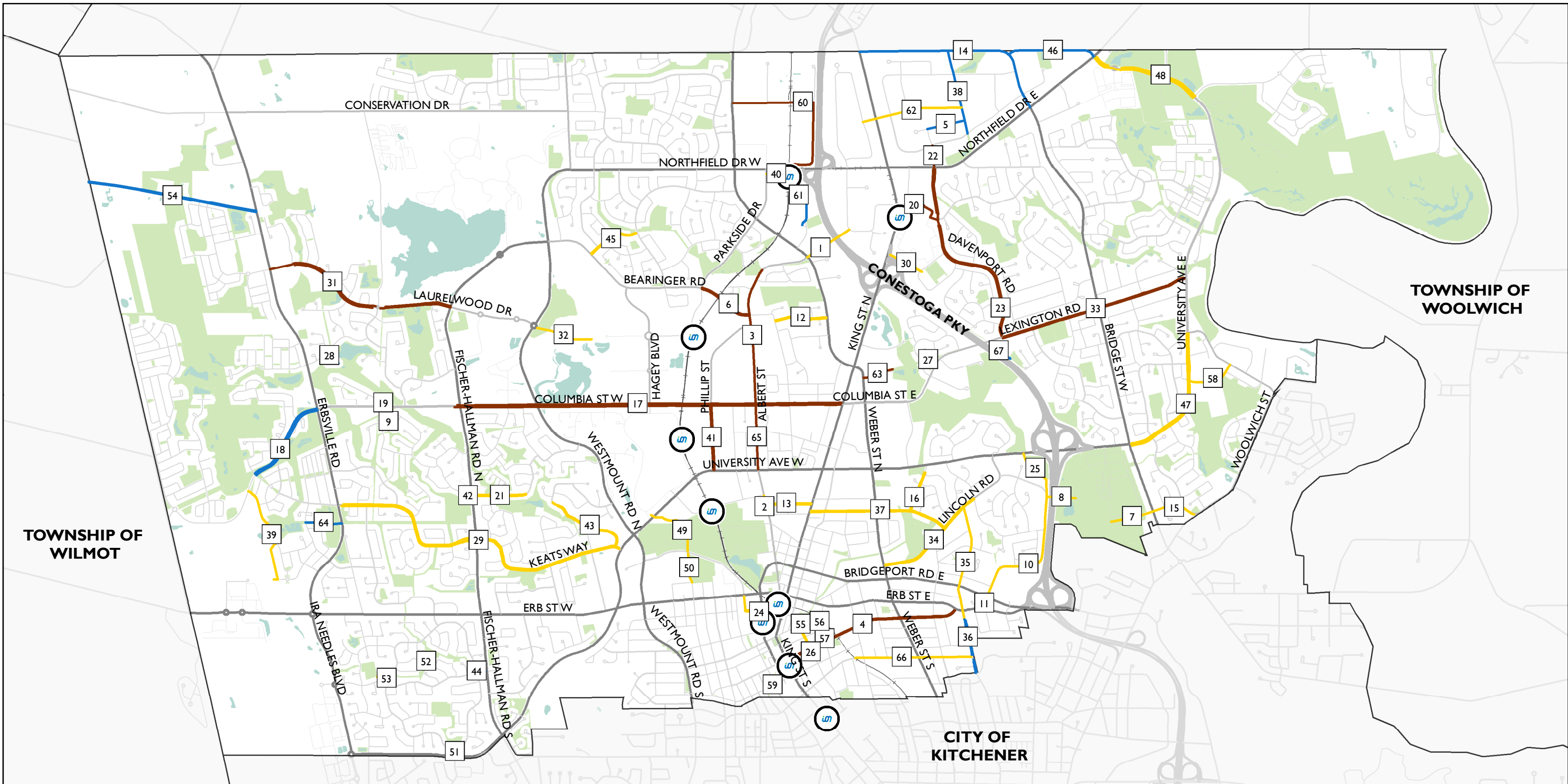
Other

- 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.






TRANSPORTATION MASTER PLAN



Map ES.2
PROPOSED CYCLING PRIORITY PROJECTS

Map Version: 3/8/2021

- Project Priority**
- Short-term
 - Medium-term
 - Long-term
- Other**
-  ION Station
 -  Park
 -  Waterbody





The schedule of unit costs for implementing cycling infrastructure was also updated to reflect prevailing conditions. Initial costs were provided for both capital and retrofit projects where relevant. The updated facility costs represent an increase from the values cited in the 2011 WTMP as a result of inflation and rising construction costs.

Regional roads are shown for context as either existing or planned facilities based on the 2018 RTMP. No changes to the facilities on Regional roads have been proposed although there may be an opportunity for the City to work with the Region to explore new facility classifications for Regional roads. For the priority network, Regional roads are used in isolated cases where they provide an important linkage in the overall network.

Intersections and Crossings

Design concepts of intersection and crossings were developed for five locations in the City to present potential and conceptual ultimate reconstruction conditions and illustrate design and engineering principles and best practices. The widths and geometries of the roadway elements are based on standard dimensions from Ontario Traffic Manual Book 18: Cycling Facilities (2013).

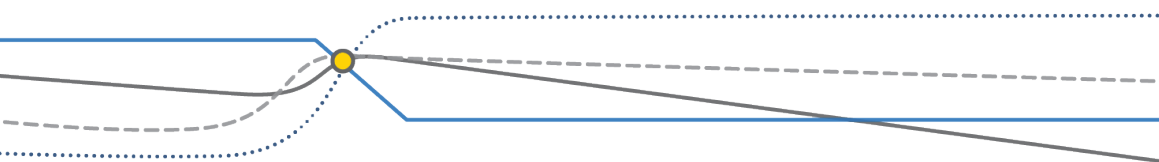
In addition, the WTMP includes a summary of short and long-term intersection and crossing countermeasures that benefit cycling and walking. The short-term countermeasures are intended to be low-cost and easy to implement, while the longer-term measures are to be considered when improvement opportunities arise through reconstruction.

Highway 85 Crossings

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. Potential north (between Northfield Drive West and King Street North) and south (between University Avenue East and Bridgeport Road East) crossings were identified. 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. A more detailed investigation and Class Environmental Assessment for these two crossing options should be pursued.

Trail Lighting

Lighting plays an important role in both the actual and perceived sense of safety and security for trail users. A trail lighting policy should be developed based on facility type and considering scenarios where illumination may be appropriate. Transportation focussed trails should be the priority for lighting. Lighting of other trails with a more recreational focus could impact the experience and/or the surrounding environment. Trails for lighting should be prioritized in sizeable sections so that projects can provide a more significant benefit instead of just a spot improvement.





Wayfinding and Signed Routes

The City's existing wayfinding system uses a hierarchy of destinations, including distances and time to destinations, and sign types that differ by function to help individuals navigate their surroundings and follow a route from one place to another. Although the system already meets most recommended design guidelines, the City should enhance the program by including turn signs at junctions, developing a standard sign template, maintaining a GIS database of signs, integrating the City's system with other signing, avoiding sign clutter, and considering impacts of construction projects. Signing for new and rebuilt recreational trails must also meet the standards set out in the *Accessibility for Ontarians with Disabilities Act*.

Operations and Maintenance

Investing in winter maintenance of bikeways and pedestrian facilities helps remove barriers to walking, cycling, and taking transit in winter months. Currently, the City, at a minimum, maintains active transportation facilities according to the standards set out in with Ontario Regulation (O. Reg.) 239/02 under the *Municipal Act, 2001* (the Minimum Maintenance Standards) including maintenance of all regional roads on behalf of the Region of Waterloo.

The 2020 WTMP provides the policy foundation for an enhanced winter maintenance program for the priority network and offers guidance on other improvements to improve the usability, convenience, and safety of overall active travel throughout the year. The plan recommends introducing sidewalk and cycling network specific winter maintenance practices that exceed the minimum requirements.

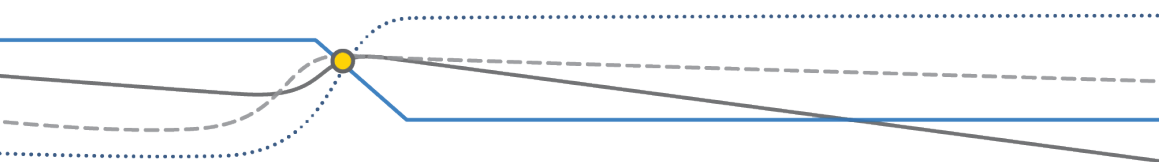
Other recommendations pertaining to ongoing maintenance and repair of the active transportation networks are provided to achieve goals of year-round sustainable transportation. The City needs to build capacity to implement new methods and equipment to better maintain active transportation infrastructure 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.

Roads, Transit and Future Mobility Strategies

Complete Streets

Complete Streets is a broad policy approach typically defined as streets for everyone, purposely designed and operated to allow for safe access for all users. The Complete Streets vision is one of leveraging the potential for streets to support a variety of uses and a more diverse mode share with focus areas of safety, health, multi-mobility, transit, accessibility, sustainability, and equity.

Complete Streets is not new to Waterloo. The 2011 WTMP included a Complete Streets Policy requiring all streets to be planned, designed, operated, and maintained to enable safe access for all users – only the second municipality in Canada to adopt such a policy. But with new transportation





modes, on-demand mobility services, and rapid integration of technology emerging, the 2020 WTMP introduces **Complete Streets 2.0**. The core principles remain the same, but the actions reflect a changing context for the planning, design, maintenance, and operation of the transportation system.

An updated Complete Streets policy approach and corresponding set of tools will assist the City in achieving its defined vision. **Figure ES.1** summarizes the principles of Complete Streets 2.0, which include prioritizing uses on the street, recognizing new modes, and incorporating flexibility.

FIGURE ES.1: COMPLETE STREETS 2.0 PRINCIPLES

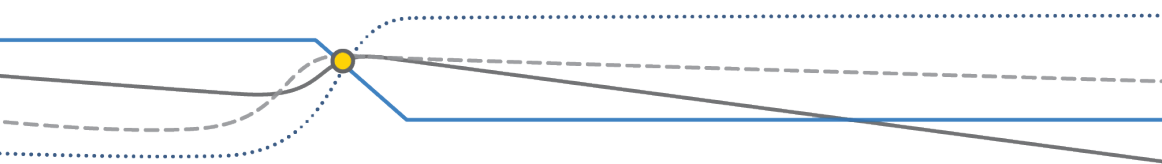


Developing Complete Streets “tools” will help with managing trade-offs that can stall projects and aid design decision-making particularly in constrained spaces. When properly created, these processes can be structured to ensure appropriate attention is paid to factors that historically have not received due consideration, such as equity, green infrastructure, and street trees/urban forestry. Existing tools developed by comparable cities should be used where possible.

Altering lane widths is one tool that can be effectively used in limited rights-of-way to achieve the Vision Zero and Complete Streets policy goals of prioritizing safety for vulnerable users and designing for all modes. Removing centre medians, limiting lane widths to 3.5 metres (or less), and narrowing curb lanes in conjunction with buffered bike lanes help condense roadway cross-sections.

With these new tools and policy approaches, the plan prioritizes:

- ▶ Allocating space to serve specific objectives defined by mode and demand while managing safety;
- ▶ Measuring the right outcomes, for example where person-throughput is prioritized over vehicle-throughput;
- ▶ Using interim treatments and pilot/demonstration projects as alternatives to major capital projects to test ideas and move forward on implementation;
- ▶ Implementing mobility hubs through policies and permitting to support shared mobility services, bike parking, drop-off zones, etc.; and
- ▶ Designing for flexibility and changing time of day or seasonal uses.





Communication is critical to realizing an effective Complete Streets Policy and consistent with the City's current policy framework. Adopting or adapting established communications practices of other municipalities can help frame similar initiatives in Waterloo. Monitoring of a series of defined metrics, such as the criteria created by the National Complete Streets Coalition of Smart Growth America, is best practice and important to policy success.

Vision Zero

Vision Zero is a strategy to eliminate traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. Originating in Sweden in the late 1990's, Vision Zero is based on the philosophy that:

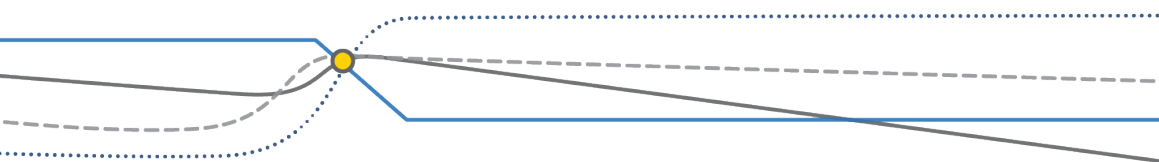
- ▶ No loss of life is acceptable;
- ▶ Traffic fatalities and serious injuries are preventable;
- ▶ People make mistakes so the road system and related policies should be designed to ensure those inevitable lapses do not result in severe injuries or fatalities; and
- ▶ Humans are physically vulnerable when involved in motor vehicle collisions.

The City's existing road safety actions include many of the initiatives cited in typical Vision Zero plans. Like these communities, the City is taking a multi-disciplinary approach, in part through its participation on different committees, and has a range of policies and programs aimed at improving road safety. The City's road network also appears to be performing better than others in Canada and even in Sweden from a safety perspective based on research completed by the Region of Waterloo. But unlike these jurisdictions, Waterloo does not have a comprehensive, structured program with stated objectives, expected outcomes, and committed funding.

One cannot argue against Vision Zero on an ethical basis. Fatalities and serious injuries are unacceptable outcomes of motor vehicle collisions. Formally committing to Vision Zero; however, presents several potential consequences for the City to consider, such as the investment in infrastructure changes and/or electronic enforcement needed to compel drivers to reduce vehicle speeds and comply with other traffic rules. The City also needs to consider the public expectations arising from making a commitment.

City Council has expressed a strong desire to commit to Vision Zero as evidenced by its stated objectives in the *City of Waterloo 2019-2022 Strategic Plan* and commentary provided throughout the WTMP update process. Consistent with this direction, a formal policy on road safety should be articulated that pledges to Vision Zero and captures its key tenets. This policy could read:

As a Vision Zero community, the City of Waterloo, with the support of its partners, aims to eliminate traffic-related fatalities and serious injuries on City roads using a Safe Systems Approach consistent with its Complete Streets Policy.





Along with adopting this policy, a Road Safety Action Plan (RSAP) should be developed, consolidating the City's safety-related initiatives into one comprehensive strategy. The RSAP should follow the Safe Systems Approach, implementing evidence-based measures for safe drivers, safe speeds, safe roads, and safe vehicles. This approach will require the City to pursue new methods of identifying emerging trends and locations with potential for safety improvement for implementation of proven countermeasures. Trial applications of emerging techniques should also be considered on a site-specific basis to evaluate their potential benefit in Waterloo. The availability of new technology, such as automated and connected vehicles, may also have a positive influence on the future of road safety.

Residential Neighbourhood Speed Limits

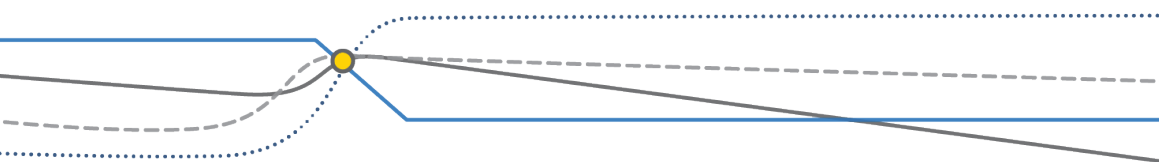
Reducing speeds is key to achieving an improvement in road safety, especially for vulnerable road users like pedestrians and cyclists. The risk of serious injury or fatality for a pedestrian involved in a collision with a motor vehicle increases considerably as speeds climb.

Consistent with its philosophy on Vision Zero, City Council has expressed a strong desire to realize lower vehicle speeds on neighbourhood streets and around schools. Recognizing installing signs alone rarely achieves compliance and sustained long-term change, a comprehensive Speed Management Program is required in concert with a policy of area-wide speed limits on neighbourhood streets and in school zones. Building on the City's current pilot in the Westvale, Eastbridge and Old Abbey neighbourhoods, the program should focus primarily on speed management for local and collector roads (class 4 and 5 roads) within residential communities. Most higher order roads in the City fall under the jurisdiction of the Region of Waterloo or Ministry of Transportation, with the few remaining arterial facilities under City control intended to facilitate the movement of large volumes of people and goods, including truck traffic, at higher speeds.

Proposed Road Works

Similar to most municipalities, the City has historically responded to increasing transportation demand with roadway expansion. With Waterloo reaching a state of maturity, there are few road widening options remaining that would not pose significant environmental and/or community impacts. Through the engagement program, it also became evident that City Council and the public prefer a transportation system oriented more towards sustainable transportation options, with less reliance on the automobile for travel. Consistent with this direction, the 2020 WTMP contemplates a modest road expansion program that focuses on:

- ▶ Completing projects already identified in the 2011 WTMP, the City's 2019 Development Charges Background Study, and approved development plans **but pursuing no new city initiatives**;
- ▶ Working with the Region of Waterloo to implement the road projects identified for Waterloo in the 2018 RTMP; and
- ▶ Undertaking select intersection expansion projects.





The proposed road works program also includes projects aimed at better accommodating all transportation modes and improving the streetscape environment through reconfiguration of the existing cross-section to reduce or repurpose motorized vehicle travel lanes. This practice, called “road reconfiguration”, enables the City to introduce measures such as cycling facilities, enhanced pedestrian space, or dedicated transit lanes into the roadway without expansion.

Table ES.4 details the roadway capacity projects identified in the 2011 WTMP and 2019 Development Charges Background Study. The three City road projects have an estimated total capital cost of \$18.2 million. **Table ES.5** lists the 11 roadway capacity projects, including widenings, extensions, and road reconfigurations, recommended in the 2018 RTMP that fall within the City of Waterloo to 2041 and beyond. Indicative costs were not provided for the projects. **Map ES.3** shows the planned roadway capacity enhancements in the City of Waterloo to the year 2041 and beyond.

As with the 2011 WTMP, the 2020 update anticipated a review and application of the Region of Waterloo Travel Demand Forecasting Model (the Model) to help identify City roads that would experience future capacity pressures due to forecasted growth in population and employment. The Model was also to be used to aid in establishing modal shift targets and corporate objectives for reducing Carbon Dioxide (CO₂) emissions. Prior to commencing the modelling task, discrepancies in the key inputs and assumptions used in the Model were noted for Waterloo. Given these inconsistencies, the modelling was deferred and will be carried out as a separate future project once the Region of Waterloo Official Plan is updated.

Supporting Transit

With the growth and change experienced in the Region of Waterloo over the last few decades and the emergence of activity centres across the Region, the demand for more frequent inter-municipal transit service has grown. Residents attending public open houses and forwarding comments during the study expressed their excitement for the ION LRT, improved transit connections between municipalities, and greater service frequency.

While the City is not responsible for service delivery, the municipality can continue to help facilitate and promote transit through actions such as:

- ▶ Encouraging transit-supportive development through Official Plan policy, Zoning By-law regulations, and site plan control;
- ▶ Creating safe and accessible active transportation connections to and from transit stops by developing the pedestrian and cycling networks;
- ▶ Rehabilitating and upgrading roads used for transit routes to enhance the operational efficiency of buses; and
- ▶ Providing real-time transit information at locations such as the community centres and municipal offices.

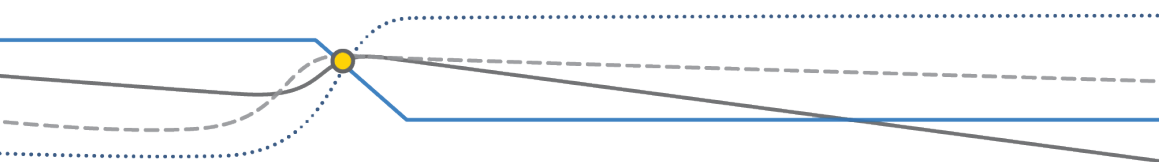


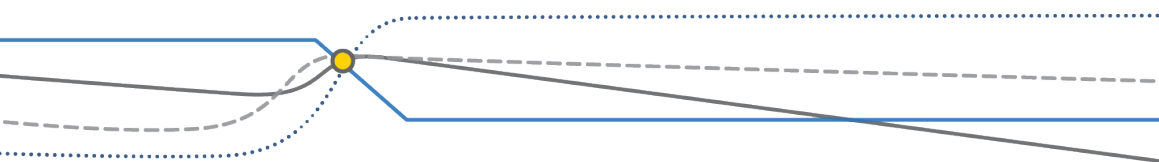


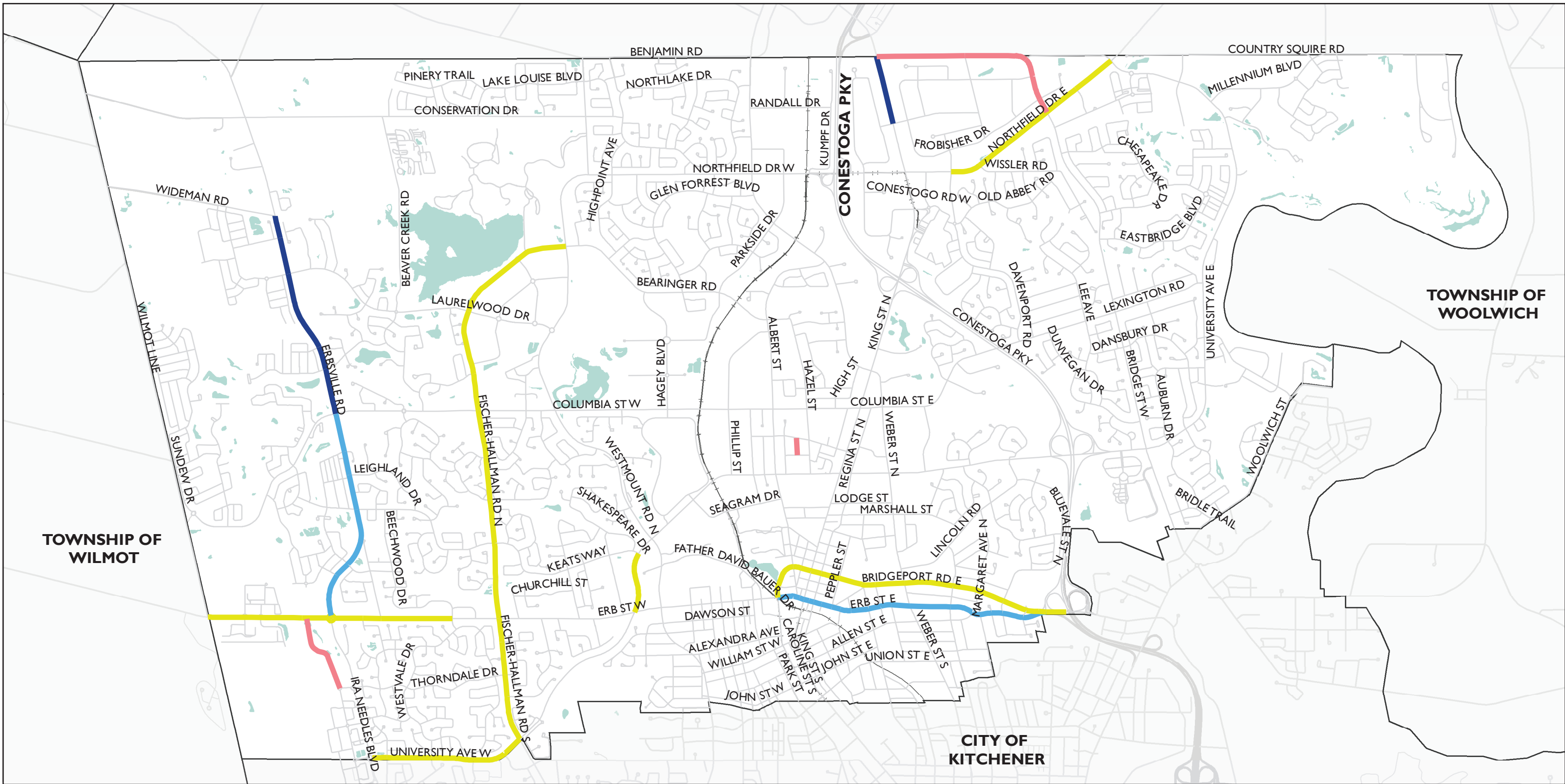
TABLE ES.4: RECOMMENDED ROAD PROJECTS

Street	Type	Limits	Timing	Cost (millions)
2011 WTMP Projects				
Bridge Street	Widening	King Street North to Northfield Drive	2021-2031	\$13.3
2019 Development Charges Background Study Projects				
Ira Needles Boulevard By-pass	Extension	The Boardwalk to Erb Street West	2020	\$4.1
Larch Street	Woonerf	Balsam Street to Hickory Street West	2020	\$1.8

TABLE ES.5: RECOMMENDED ROAD PROJECTS IN THE CITY OF WATERLOO IN THE 2018 REGIONAL TRANSPORTATION MASTER PLAN

No.	Street	Type	Limits
2019 – 2031 Projects			
3	Northfield Drive East	Widening	Davenport Road to Bridge Street (completed in 2019) and Bridge Street to University Avenue
9	Fischer-Hallman Road/ Bearinger Road	Extension	Columbia Street to Westmount Road
11	Erb Street West	Widening	Gateway Drive/Beechwood Drive to Wilmot Line
12	University Avenue West	Widening	Keats Way to Erb Street (completed in 2019)
14	University Avenue West	Widening	Ira Needles Boulevard to Fischer-Hallman Road South
16	Fischer-Hallman Road	Widening for Transit Lanes	Highway 7/8 to Columbia Street
A	Bridgeport Road/ Caroline Street North	Road Reconfiguration	Highway 85 to Erb Street West
2031 – 2041 Projects			
10	Erbsville Road	Widening	Erb Street to Columbia Street
B	Erb Street West	Road Reconfiguration	Caroline Street to Highway 85
Projects Beyond 2041			
73	King Street North	Widening	Northland Road to Bridge Street West
74	Erbsville Road	Widening	Columbia Street West to Wideman Road

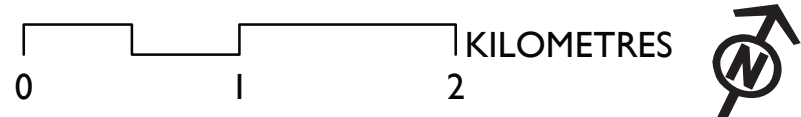




Map Version: 11/13/2020

Map ES.3 RECOMMENDED ROAD PROJECTS

- Project Responsibility and Timeline**
- City - 2020-2031
 - Region - 2020-2031
 - Region - 2031-2041
 - Region - 2041+





In anticipation of needs beyond the 2018 RTMP horizon year of 2041, the Regional plan identifies several road and rail corridors for potential future transit service subject to further review and refinement prior to implementation. Within the City, the Erb Street West – University Avenue West – King Street North (from Ira Needles Boulevard to Conestoga Mall) corridor should be protected for potential ION Stage 3 rapid transit. This initiative would build on the existing ION LRT (Stages 1 and 2) service to provide east-west connections in Waterloo. While potential future transit service in this corridor is beyond the horizon of the 2020 WTMP, the status of ION Stage 3 should continue to be monitored.

Emerging Technologies

The transportation sector is witnessing significant changes in the technologies used and attitudes towards moving people and goods. Municipalities need to develop appropriate responses to these emerging trends, adapting and evolving current transportation and land use planning policies and practices to position their communities to be ready for and (hopefully) benefit from this transformational and disruptive shift in mobility services.

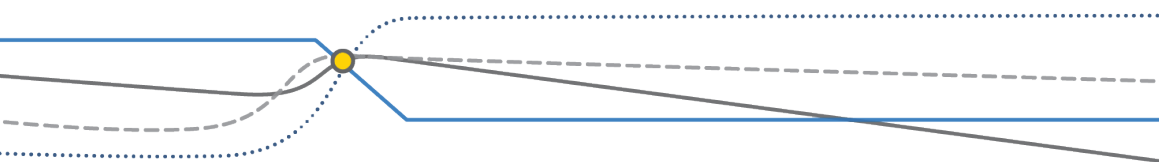
Increased environmental awareness, advancements in technology, rising life expectancies, households working longer, and Generation Z entering the workforce are contributing to fundamental changes impacting mobility. These changes are contributing to converging innovations in shared mobility, digital information and fare payment integration, commodification of transportation, automation, and electrification. Through the 2020 WTMP, the City is establishing the principles and key components of its response to emerging technologies and trends in transportation and provide the foundation for further research and action in the fields of Shared Mobility, Automated, Connected and Electric Vehicles, Smart Cities, and for other supporting initiatives.

Using the Transportation Master Plan

Implementation

The primary purpose of the 2020 WTMP is to guide the City's transportation-related decision making and provide the need and justification for transportation infrastructure projects that require approval under the Municipal Class Environmental Assessment process. Implementation of the plan will be achieved through several measures:

- ▶ **Official Plan Amendment(s)** – Pertinent policy directions recommended in the 2020 WTMP, particularly changes to road classification, should be incorporated into the City's Official Plan by amendment.
- ▶ **Implementation Through the Development Approval Process** – The 2020 WTMP can be implemented through integrated transportation/land use planning that provides incentives supporting Complete Streets and similar initiatives. Transportation infrastructure improvements





identified in the plan may also be implemented through this process if directly related to the subject development.

- ▶ **Future Environmental Assessments** – The 2020 WTMP will be relied upon in completing the Municipal Class EA studies for future projects identified in the plan. It is assumed that these more detailed studies will not result in a complete rethink of the underlying basis for the project, but rather the implementation and adaptation of the initiative.
- ▶ **Capital Budget and Development Charges Background Study** – The 2020 WTMP should direct future capital budget submissions (which could also affect operating budget submissions) and Development Charges Background Study infrastructure projects. The projects and associated costs identified in the plan are subject to Council approval through the annual budget process.
- ▶ **Asset Management Plan** – The Complete Transportation Strategy articulated in the 2020 WTMP focuses on optimizing existing infrastructure while minimizing road expansion to strategic locations. This approach is consistent with the long-term goals outlined in the City’s Asset Management Plan, promoting a balance between competing needs of growth and rehabilitation.

Funding Opportunities

Local transportation system improvements may be eligible for provincial and federal funding programs as they are made available. Outside the General Tax Levy, other sources of financing for transportation programs include Development Charges (for growth-related infrastructure), development agreements, gas tax, user fee pay, cash in-lieu of parking, and focused private sector advertising.

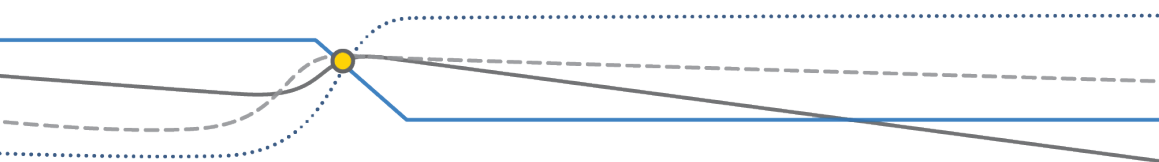
Monitoring

Ongoing monitoring of the transportation system will enable the City to evaluate the effectiveness and overall contribution of the recommended system changes, expansions, and policies in achieving the 2020 WTMP vision. Specific performance measures and targets should be set to provide direction for implementation and measure success. These targets or benchmarks may also be used in marketing campaigns and events to help motivate the community. Regular public and stakeholder consultation should be carried out to help collect information about community satisfaction with transportation.

Results of the monitoring program should be reported to Council and the community through information reports and other publications. Specifically, a “State of the Transportation System” report should be prepared annually to document local transportation conditions, behaviours, needs, and trends. The report could also highlight progress made in implementing the WTMP, summarize the performance measures and targets for the previous period, and outline upcoming initiatives.

Plan Review and Updates

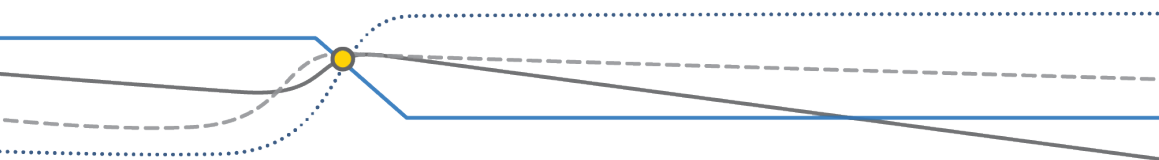
The WTMP must be regularly reviewed to ensure it continues to meet the transportation needs of the City. Changing community expectations or growth and development patterns can necessitate a review of the primary recommendations of the plan. Performance measures indicating progress in the wrong



TRANSPORTATION MASTER PLAN UPDATE *LOOKING AHEAD*



direction can also signal the need for adjustments to the plan. The statutory five-year update of the Official Plan mandated by the *Planning Act* provides a timely opportunity to revisit the WTMP assumptions and consider the need for an update.

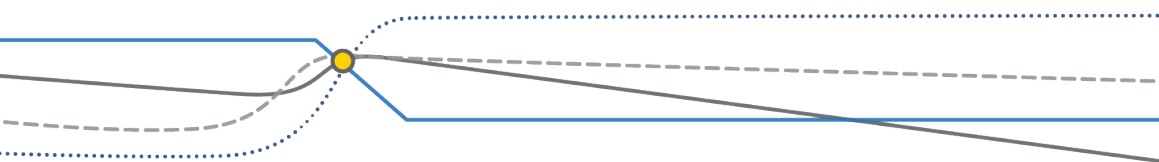




PLAN RECOMMENDATIONS

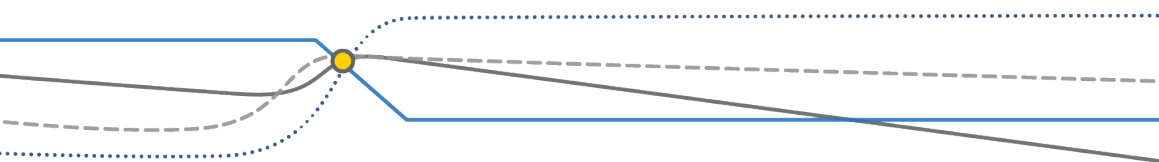
The following table summarizes the 56 recommended actions contained in the 2020 WTMP:

#	Recommendation
Volume I - Foundations	
1	Amend the City of Waterloo Official Plan to implement recommendations 6 and 40.
2	Incorporate the short and long-term projects recommended in the WTMP in the next update to the City's 10 Year Capital Plan and review on a yearly basis.
3	Implement a regular, ongoing monitoring program and set performance measures and targets to track progress.
4	Prepare an annual staff report to City Council on the 'State of the Transportation System'.
5	Review the WTMP every five years, ideally in conjunction with a review of the City of Waterloo Official Plan and Development Charges Studies.
Volume 2 – Active Transportation Strategy	
6	Incorporate the proposed ultimate cycling network summarized in Table 8.4 and Map 8.6 into the City of Waterloo Official Plan.
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	Adopt the Updated Sidewalk Policy in Appendix B to provide clear standards on where sidewalks are built.
9	Implement road crossing and intersection treatments along all route corridors, including mid-block crossings where desired.
10	Continue to study the feasibility and design of the grade separated highway crossings at the recommended locations.
11	Identify opportunities to support the funding and construction of the grade separated highway crossings working with the City's planning group.
12	Program the cycling projects into the capital works plan based on the recommended prioritization and using the planning-level cost estimates.
13	Align design standards and maintenance requirements with existing equipment and methods.
14	Facilitate cross-organizational collaboration as part of facility operations and maintenance.
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.
16	Implement the WTMP recommendations, which will help the City achieve the Platinum level Bicycle-Friendly Community ranking.



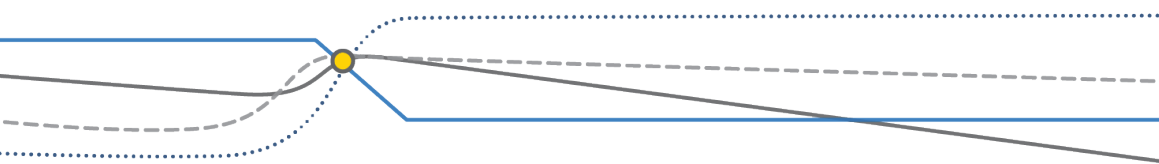


#	Recommendation
17	Address gaps in the cycling network by converting sidewalks in key locations in Region-owned rights-of-way to multi-use paths.
18	Use opportunities such as road reconstruction or site development to widen sidewalks at key locations.
19	Continue to pursue the re-routing of the Great Trail.
20	Explore opportunities to install a controlled crossing facility at Columbia Street West and the Laurel Trail.
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.
22	Consider installing counters as part of all new cycling facility construction, with priority for the Primary Network.
23	Develop a methodology and policy to prioritize the implementation of trail lighting for multi-use paths, coordinating with Transportation, Planning, and Parks departments.
24	Continue to implement the signage family that is currently being used in the City.
25	Develop signage for recreational trails that includes information such as trail length, width, slope, surface, and amenities in legible text.
26	Develop a methodology to prioritize the implementation of wayfinding signage across the City's cycling network.
27	Develop a plan for the implementation of signage on existing and planned facilities.
28	Coordinate implementation of signage with other departments and jurisdictions.
29	Continue to maintain an inventory of signage information, including wayfinding signage in a GIS database.
30	Continue to identify and pursue funding opportunities for active transportation projects to enable the implementation of recommendations in the WTMP.
31	Continue to pursue and implement policies and projects based on the 20-Minute City concept.
Volume 3 – Roads, Transit and Future Mobility Strategy	
32	Update the Complete Streets policy to incorporate Complete Streets 2.0 principles, new tools for implementation, improved communications practices, and defined metric tracking as detailed in Section 9.1.
33	Adopt a Multi-Modal Level of Service framework detailing the process, methodology and tools for assessing the performance of all travel modes, to be applied whenever a level of service analysis is required.
34	Adopt a policy on road safety consistent with Vision Zero principles and develop a Road Safety Action Plan.





#	Recommendation
35	Develop a comprehensive Speed Management Program focusing primarily on local and collector (class 4 and 5) roads within residential communities and assess the effectiveness of the program in achieving compliance with lower area-wide and school zone limits.
36	Based on Council’s additional recommendation #6 to the April 19, 2021 Staff Report IPPW2021-037, that Council will adopt either of the following approaches as part of the Speed Management Program: i) Adopt a uniform speed limit of 30 km/h for class 4 and 5 roads within residential areas; or ii) Adopt a uniform speed limit of 40 km/h for class 4 and 5 roads within residential areas and 30 km/h on roads within school zones in residential areas.
37	Adopt a formal data-driven, evidence-based decision-making process as part of the City’s road safety program.
38	Consider narrowing lane width requirements and reducing roadway cross-sections in three ways: remove centre medians, avoid lanes wider than 3.5 metres and narrow curb lanes in conjunction with buffered bicycle lanes.
39	Update the City’s standard cross-sections to incorporate the recommended lane widths, as well as effectively using the available space for pedestrians, cyclists, transit vehicles and private vehicles.
40	Incorporate the proposed road classification criteria and road classification changes summarized in Table 9.4 , Map 9.1 , and Table 9.5 into the City of Waterloo Official Plan.
41	Commence the transportation modelling work and other technical analyses, including targets for modal shift and CO2 reduction and intersection capacity enhancements upon completion of the Region of Waterloo Official Plan update, targeted fall of 2022.
42	Advocate for the continuation and expansion of GRT and GO Transit services to and within Waterloo with the Region of Waterloo and Metrolinx, respectively.
43	Facilitate and promote transit within the City through actions such as supportive land use, active transportation connections, road improvements, and real-time transit information.
44	Develop a Shared Mobility Strategy for the City in collaboration with the Region, local stakeholders, and potential partners. The strategy should consider the merit of introducing/piloting an of an Ecomobility Hub, as well as assess the potential for a Mobility as a Service (MaaS) system.
45	Facilitate and promote shared mobility within the City through the introduction or modification of by-laws, policies, and guidelines pertaining to the allocation of public rights-of-ways, development and zoning regulations, insurance and for-hire vehicle regulations, and taxation and fees.
46	Develop an action plan identifying the tasks required to prepare the City for the introduction of automated, connected, and electric vehicles, which include changes to by-laws, policies, and guidelines pertaining to testing, infrastructure design, parking, curb management, traffic control, vehicles, and other items.





#	Recommendation
47	Pursuant to the action plan, permit the testing and deployment of automated and connected vehicles on City roads.
48	Continue to develop and implement an electric vehicle charging station program. Explore potential partnership opportunities to develop the network.
49	(Continue to) transition the City’s fleet of vehicles towards electric and low carbon fuels.
50	Continue to explore car parking reform, including reviewing and refining the City’s Zoning By-law policies to discourage excess supply and encourage better use of existing spaces.
51	Explore planning strategies for the eventual repurposing of unneeded transportation infrastructure, parking lots, and roadside parking spaces.
52	Monitor the need to update the Uptown Waterloo Parking Strategy.
53	Continue to explore opportunities to leverage emerging parking management technologies.
54	Develop a Curb Space Management Strategy for the City in collaboration with the Region, local stakeholders, and potential partners.
55	Consider developing a Smart City Strategy for the City in collaboration with the Region, local stakeholders, and potential partners.
56	Facilitate and promote Waterloo as a Smart City through the introduction or modification of by-laws, policies and guidelines, continued monitoring and research of emerging transportation technologies and impacts, collaboration with government, universities and private industry, public education campaigns, staff attendance at conferences and exploring funding opportunities.

