

Moving Forward

2018 Transportation Master Plan

June 2019

Moving Forward

2018 Transportation Master Plan

Preface

On behalf of the Steering Committee, I am pleased to present this update to the Region's 2018 Transportation Master Plan: *Moving Forward*. This updated plan is about completing current and planned transportation projects and pursuing a more-sustainable transportation network that supports all modes of travel, enhances accessibility to all residents, and supports the continued economic growth of the Region.

Transportation plays a critical role in building a successful and healthy community in addition to its role in moving people and goods. We've learned that many residents of the Region are interested in using sustainable modes of transportation such as walking, cycling, and public transit to get from one place to another, but are concerned about aspects such as safety, distances between destinations, and transit service frequencies which discourage them from using these modes of transportation. *Moving Forward* has developed new strategies to help encourage more residents to choose to use sustainable modes of transportation such as walking, cycling, and using public transit.

The ION Light Rail Transit (LRT) will be a transformational transit service in the Region, and *Moving Forward* builds on ION with a frequent bus network that reduces waiting time and travel time. *Moving Forward* also identifies future rapid transit corridors beyond ION Phase 2 LRT to Cambridge.

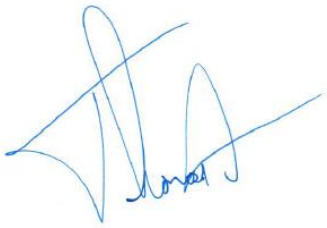
Moving Forward enhances the Region's road network to address gaps and bottlenecks in the road network and accommodate growth. Some previously planned road projects were deferred to ensure that roads recommended to be built or widened are aligned with all of our community goals and objectives established for *Moving Forward*.

I would like to thank the members of the Stakeholder Panel which included representatives from our municipalities, MTO, Metrolinx, and other public and private sector agencies. Their input was invaluable in ensuring the projects and strategies were compatible with their own plans and objectives.

I would especially like to thank the members of the public including participants at meetings, those who provided comments, participants in the surveys, and the members of the General Public Panel. The public input received by staff, including many personal discussions of the trade-offs inherent in building a plan, have contributed directly to the strategy and policy development.

We are looking forward to the directions *Moving Forward* takes the Region over the coming years.

Sincerely,



Thomas Schmidt, P.Eng.

Commissioner, Transportation
and Environmental Services



Acknowledgements

The Team would like to acknowledge the contributions of many individuals and groups who helped shape the directions presented in *Moving Forward* (the 2018 TMP):

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See Consultation Summary Report

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The Team would like to acknowledge the contributions of many individuals and groups who helped shape the directions presented in *Moving Forward* (the 2018 TMP):

Active Transportation Advisory Committee
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Ecological and Environmental Advisory Committee
Grand River Accessibility Advisory Committee
Grand River Conservation Authority
Greater Kitchener-Waterloo Chamber of Commerce
Haudenosaunee Resource Centre
Kitchener Youth Action Council/Cambridge Youth Advisory Committee
Mayors Advisory Council for Kitchener Seniors
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Regional Economic Development Committee
Research & Technology Park
Six Nations of the Grand River
Student Transportation Services of Waterloo Region
Sustainable Waterloo Region
The Accelerator Centre
TriTAG - Waterloo Region
Waterloo Region & Catholic District School Boards
Waterloo Region Home Builder's Association

What is Moving Forward?

Moving Forward is the 2018 Transportation Master Plan Update (2018 TMP) for the Region of Waterloo. It is a strategic document that outlines the needs for active transportation (cycling and walking), public transit, and Regional roads to the year 2041. It includes a series of Regional policies to encourage and shape sustainable travel and economic growth, to support land-use planning, and to support the Region as "a community where people matter and ideas grow."

Time for an Update

The 2010 Regional Transportation Master Plan (2010 RTMP) was a transit-oriented plan with a strong focus on sustainable modes of travel, such as walking, cycling, and public transit. Overall, the Region has kept pace with the infrastructure and transit service improvements and many has completed or is in the process of completing of the action items identified in the 2010 RTMP.

Since the previous plan, exciting changes have occurred. The Region is growing rapidly, new infrastructure has been added, and technology is changing travel behaviour. These changes, combined with the progress made towards transit, active transportation, and road initiatives from the 2010 RTMP, provided a foundation for updating ***Moving Forward*** – the 2018 TMP.

Moving Forward
VISION STATEMENT

Waterloo Region will be a prosperous, sustainable, and healthy community, with viable transportation choices for people of all ages and abilities, and for the goods supporting our economy.

Significant projects in recent years include:

- **ION light rail transit (LRT)** is about to enter service and will be a transformational investment for the Region;
- **Improvements to the Regional road, active transportation, and public transit networks** have been completed, and Environmental Assessments (EAs) are currently underway for future projects;
- Increasing demand for inter-regional travel has led the Province to **expand the highway network** and **increase GO Rail/Bus service** to Waterloo Region;
- **The Cities of Kitchener, Waterloo and Cambridge have new plans and policies to support local objectives and growth.**

An Updated Plan Reflecting Community Input

Developing the plan involved reviewing the goals and objectives from the 2010 RTMP, analysing existing conditions and future needs, and developing transportation infrastructure, services, and strategies to achieve the goals. The plan was developed through an extensive public, stakeholder, and agency consultation process that provided opportunities for the Region to engage in meaningful dialogue with residents.

Moving Forward consulted with the general public and agency stakeholders in multiple formats, including:

- Two public opinion and attitude surveys, reaching approximately 3,000 residents;
- Three rounds of public consultation centres (PCCs) held across the Region;
- Online surveys via the Engage Region of Waterloo platform; and
- Detailed conversations with the General Public Panel (a diverse group of volunteers representing the Region's population) and the Stakeholder Panel (a group of staff and members from local, regional, and provincial agencies).

Key messages we heard from the public include:

- The importance of healthy choices;
- Strong interest in choices other than cars;
- Importance of transportation to the economy;
- The need for better network integration;
- Some barriers limiting the use of sustainable transportation modes, such as long travel times, too many connections/transfers, safety concerns, and limited schedules.





GOALS AND STRATEGIES

Four overall goals for the Plan were carried forward from the 2010 RTMP

GOAL 1



Promote Travel Choice

GOAL 2



Foster a Strong Economy

GOAL 3



Support Sustainable Development

GOAL 4



Optimize the Transportation System

5 broad strategies were developed to achieve the Plan's goals, each serving as an 'umbrella' policy under which various actions should be undertaken:

1
Build a Transportation Network that Supports all Modes of Travel

3
Develop a Frequent Transit Network

5
Position the Network for New Mobility

2
Promote a Healthy Community

4
Enhance Inter-Regional Connections

Strategies and Actions

STRATEGY 1:

Build a Transportation Network that Supports all Modes of Travel

- Complete projects already in progress, including stage 1 of the ION rapid transit project
- Slow implementation of future road widening to match growth and development
- Review corridor design guidelines to ensure they support intensification and accommodate all travel modes
- Review parking requirements for new developments
- Proactively manage transportation demand by encouraging change in travel behaviours

STRATEGY 2:

Promote a Healthy Community

- Update and incorporate the Active Transportation Master Plan
- Emphasize safe, active travel for children
- Emphasize safety in design, monitoring, and enforcement
- Define and measure the health benefits for sustainable travel modes including walking, cycling and transit



STRATEGY 3:

Develop a Frequent Transit Network

- Extend ION rapid transit to Cambridge as part of stage 2 of the project
- Implement an all-day frequent transit network using existing and new iXpress routes
- Identify additional corridors for future rapid transit
- Encourage intensification along transit corridors
- Include transit priority measures in capital budgets
- Investigate smaller scale, more flexible transit types in underserved areas

STRATEGY 4:

Enhance Inter-Regional Connections

- Support and promote GO Rail, GO Bus, and future High Speed Rail
- Support implementation of high-occupancy vehicle (HOV) lanes or high-occupancy toll (HOT) lanes on Provincial Highways
- Support goods movement and undertake a goods movement study

STRATEGY 5:

Position the Region for New Mobility

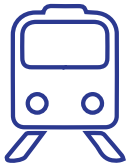
- Integrate mobility services with public transit, such as through a shared payment platform (smartphone app)
- Consider subsidized ride-hailing for areas with limited or no public transit
- Consider rethinking how ride-hailing providers are regulated
- Examine on-demand and dynamically routed public transit service
- Investigate road user charging, parking cost strategies, and other similar policies
- Plan for a pilot program to test driverless ride-hailing
- Develop a New Mobility Action Plan
- Update Regional Council Annually



What this Plan Involves by 2041

Planned Transit Service Enhancements involve:

Completing both stages of the **ION rapid transit project**, providing a seamless light rail connection between Waterloo, Kitchener, and Cambridge



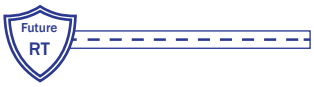
Developing an all-day, high-frequency **bus** network that provides **10-minute or better** service



More than **doubling the transit service** hours provided by Grand River Transit, from 780,000 to **more than 1.7 million** vehicle-hours per year

More than doubling the **bus fleet**, from 269 to nearly **550 buses**

Protecting additional Regional roads for **future rapid transit**



Protecting key corridors for possible **GO Rail** service to Cambridge

Planned Active Transportation Network Expansion involves:

Updating and incorporating the **2014 Active Transportation Master Plan**

Providing **walking facilities** on both sides of all Regional roads in urban areas



Enhancing **walking and cycling connections to ION** rapid transit stations and frequent transit corridors



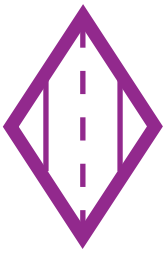
What this Plan Involves by 2041

Planned Road Network Changes involve:

2 new road corridors
5 extensions of existing roads and
32 road widening projects involving additional vehicle lanes



6 road diets, where one or two car lanes are removed from overbuilt corridors to **accommodate new cycling facilities or dedicated transit lanes**



In total,
231
lane-kilometres
will be added to the Regional road network



New or updated strategies were also developed for:

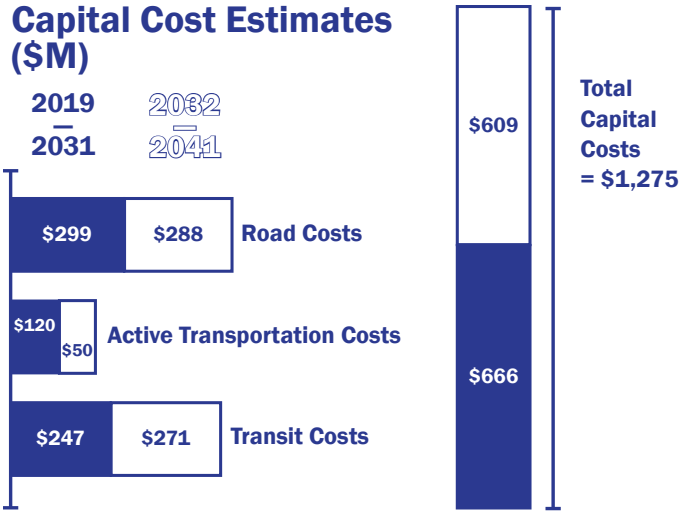
- **Transportation Demand Management**
- **Road Safety**
- **Goods Movement and Curbside Management**
- **New Mobility**

Implementing the Plan

Cost Estimates

As a continuation and extension of the 2010 RTMP and other Council-approved Regional plans (such as the Active Transportation Master Plan and the Grand River Transit Business Plan), ***Moving Forward*** does not present significant new costs to the Region.

As the transportation system expands, additional resources are required to operate and maintain the system at the required levels of service. This involves road work such as snow clearing, road sweeping, pothole/crack repairs, as well as bus servicing work such as cleaning and repairs. While a portion of bus servicing costs are funded using transit revenues, the majority of these operating and maintenance costs are financed through property taxes.



Monitoring Progress and Updating the Plan

A new action item for the Region is to monitor the plan regularly, such as on an annual basis and following major projects. In monitoring the plan, the Region will gauge the effectiveness of the policies, programs, and infrastructure projects in achieving the vision and goals. If necessary, the Region can take corrective action to ensure the plan objectives are met.

Regular updates to the plan are needed to capture changes in the input information.

The 2018 RTMP provides recommendations based on information that is current at the time of its development, and it provides policies developed to support or address current sensitivities and issues. Over time, new issues and sensitivities can arise, and the economy evolves, resulting in changes to the foundational inputs used to develop the plan.

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Chapter 1: Introduction

1. Introduction

What is *Moving Forward*?

Moving Forward is the 2018 Transportation Master Plan (2018 TMP) for the Region of Waterloo (hereinafter referred to as "the Region"). It is a strategic document that outlines the needs for active transportation (cycling and walking), public transit, and Regional roads to the year 2041. It includes a series of Regional policies to encourage and shape sustainable travel and economic growth, to support land-use planning, and to support the Region as "a community where people matter and ideas grow"[1].

Transportation master plans provide municipalities with a list of infrastructure projects and policies to solve transportation issues and to support expected population growth. *Moving Forward* also seeks to be part of a larger integrated planning process where investment and policies are used as a tool to help attain Regional, community-level and local-area level planning objectives.

Time for an Update

Exciting changes are occurring in the Region. The Region is growing rapidly, new infrastructure is being constructed to support growth, and technology is changing travel behaviour. Some significant projects include:

- The ION light rail transit (to be launched) will be a transformational investment for the Region;
- Environmental Assessments (EAs) are completed or underway to increase Regional road capacity, improve safety, and provide active transportation facilities;
- Congestion and increasing demand for inter-regional travel have led the Ontario Ministry of Transportation (MTO) to expand the provincial highway network;
- GO Transit has increased rail and bus service frequency to the Region;

Vision Statement for Transportation

Waterloo Region will be a prosperous, sustainable, and healthy community, with viable transportation choices for people of all ages and abilities, and for the goods supporting our economy.

[1] Region of Waterloo Vision.

- The Cities of Kitchener, Waterloo and Cambridge have recently updated, or are in the process of updating, their transportation plans and policies to support local objectives and growth;
- The Region of Waterloo International Airport Master Plan was approved; and
- A joint Region/Province study on how to extend GO Train service to Cambridge via Guelph through the Fergus subdivision has commenced.

A Transportation Master Plan (TMP) provides a planning 'snapshot' of the future based on the best information available when it is written. The Region has a practice to update its TMP approximately every five years. In less than five years, economic changes or travel trends may not be apparent, and after more than five years, municipalities may find themselves planning and building projects without an overall guiding strategy.

Moving Forward has a focus on all modes of travel – walking, cycling, transit, and driving – in addition to other important considerations including travel demand management and goods movement. It also aligns with the Regional Official Plan goals and vision.

Environmental Assessment Compliance

Moving Forward complies with the province's Municipal Class Environmental Assessment process which must be consultative, consider reasonable alternatives, evaluate effects on all aspects of the environment, and be well documented. Phase 1 of this process broadly establishes the problems and opportunities of the Region's transportation system to 2041 (see Appendix A – Trends, Outlook, and Opportunity Report). Phase 2 then selects preferred transportation planning solutions to address these problems and opportunities (see Appendix B – Network Assessment Report). Solutions involving major construction, such as road widenings or extensions, will require further analysis in Phases 3 and 4 of the process before they can be implemented. This Master Plan provides the need and justification for projects through Phases 1 and 2.

Ambitions and Achievements of the 2010 RTMP

The previous TMP was the 2010 Regional Transportation Master Plan (2010 RTMP). The 2010 RTMP was a transit-oriented plan with a strong focus on sustainable transportation through modes such as walking, cycling, and public transit. Significant progress has been made in many areas, as described by the following sections.

The Plan Identified Ambitious Sustainable Transportation Goals

The 2010 RTMP set out an overarching goal to significantly reduce car driving trips made during the afternoon rush hour, from about 73% in 2011 to 58% in 2031. This 15%

reduction would be achieved by a six-fold increase in the number of public transit and cycling trips, and by doubling the number of walking trips.

The Region Continues to Invest in Transit to Improve Service Levels

Since 2007 the Region has continued to invest in transit service by increasing transit service hours by over 50%. The Region has implemented a number of changes to Grand River Transit (GRT), including route changes, new express bus service, and the ION BRT, which are further described in Appendix A – Trends, Outlook, and Opportunity Report. As a result, annual ridership in 2018 was about 21,000,000, an increase of over 6,600,000 (46%) over 2007.



The Region is Investing in Active Transportation

The Region has made significant progress towards its plan for an integrated active transportation network, with on-road bicycle facilities and sidewalks on both sides of most Regional Roads providing a legitimate travel choice for the Region's residents. For example from 2006–2014, bike lanes have nearly doubled to almost 300 km across the Region. These investments are positive indications that the Region is keeping with its commitment to support active transportation. Further information on these improvements is provided in Appendix A – Trends, Outlook, and Opportunity Report.

Road Improvements have Kept Pace with the Plan

The Region has invested in expanding the road network and improving traffic capacity, safety, and active transportation:

- Road expansions include the Fairway Road bridge, Hespeler Road railway bridge, Maple Grove Road widening and railway bridge, Ira Needles Boulevard widening, Weber Street widening and railway bridge, CNR/ETR railway bridge, and the Fountain Street bridge in Blair;
- Modern roundabouts are increasingly being used on Regional roads (36 added since 2004);
- A number of major road environmental assessments (EAs) have been initiated or completed since 2010, including the River Road Extension, East Boundary Road, South Boundary Road, and Fischer-Hallman Road; and
- 66 pedestrian countdown timers were added at signalized intersections (2009–2014).
- Since 2012, 17 accessible traffic signals were added and 42 retrofitted.

The Region is investing in roads to support development and population growth. All Regional road projects consider transit and active transportation and the majority of recent projects provide improvements to the transit or active transportation realm.

Transportation Demand Management Programs Are Making a Difference

One of the recommendations of the 2010 RTMP was to enhance existing transportation demand management programs and develop new initiatives. Some examples of initiatives implemented since 2010 include:

- TravelWise, the local Transportation Management Association (TMA), has been promoted to more than 8% of the Region's workforce. In one year, 5% of TMA-participating employees surveyed had shifted from driving alone to using more sustainable modes of travel such as walking, cycling, public transit, or carpooling;
- A new park-and-ride and carpooling facility of 125 spaces was built at the GO Bus station at Sportsworld Drive;
- Four residential individualized marketing campaigns carried out since 2009 in various neighbourhoods have achieved a reduction of 8.8 million vehicle-kilometres travelled and 2,200 tons of greenhouse gases (GHG)[2]; and
- The Region has established a Transportation Demand Management team of two full-time staff and integrated it with GRT.

These measures have provided a foundation that is comparable or superior to most peer municipalities. The Region is ahead of the industry and it is a positive reflection of the Region's goals.

[2] UrbanTrans (2011), Advancing Transport Demand Management in Waterloo Region, prepared for TravelWise.

The Region has Kept Pace with 2010 TMP Planned Improvements

Action Items identified in the 2010 RTMP are for the most part completed or underway as further documented in Appendix A – Trends, Outlook, and Opportunity Report**.** This overview indicates that the Region was successful at implementing its 2010 RTMP, ranging from transit investment and travel demand management to active transportation and road improvements. These initiatives and the upcoming rollout of the ION LRT provide an exciting foundation for *Moving Forward*, the 2018 TMP.



An Updated Plan Based on Community Input

An extensive public, stakeholder, and agency consultation process was involved in the development of the 2018 TMP. The Region was able to generate meaningful dialogue between the Project Team and the agencies, stakeholders, and the public through public consultation centres, public opinion and attitude surveys on transportation-related issues, stakeholder and general public panels, and ad-hoc meetings. These various forms of consultation presented forums for dialogue and exchanging of ideas, which led to better decision making. *Moving Forward* has consolidated the trends and analyzed information gathered through these various consultation processes in preparing the 2018 TMP. A full description of events and feedback collected for *Moving Forward* is available in Appendix C – Consultation Summary Report.

Public Consultation Centres

Three separate rounds of Public Consultation Centres (PCCs) were held, each at three different locations in the Region, to provide convenient access to the public to learn about the process, review the developing plans, and provide feedback to the team:

- The first round of PCCs was held over three days in September 2016 to introduce the 2018 TMP and gather initial public input on the Region's transportation vision and goals, as well as public opinions on the current transportation system and emerging transportation trends. Comments received were used to derive the new vision statement for transportation as well as develop strategies for the 2018 TMP.
- The second round of PCCs was held over three days in September 2017 to gather feedback on the Region's 2031 transportation targets established in the 2010 RTMP, identify new transportation trends in the Region, and assess the three transportation network scenarios being studied. Emerging themes from the second PCC included the need for better walking environments on Regional roads, a better goods movement network in Cambridge, and the need to fill in gaps in the Region's cycling network.
- The third round of PCCs was held over three days in March 2018 to gather input and feedback on the Region's 2041 travel targets and recommendations. Input received included project-specific feedback, and added emphasis on the need to complete the Region's active transportation network.

Key Messages from the Public:

The importance of healthy choices;

Strong interest in choices other than cars;

Importance of transportation to the economy;

The need for better network integration;

Barriers limiting the use of sustainable transportation include:

- *Distance between destinations*
- *Safety concerns*
- *Transit schedule incompatibilities*
- *Too many connections required to get to destinations*





Public Opinion Survey

A public opinion survey was undertaken to capture a broad audience and ensure that the plan responds to all residents across the Region, including those unable to attend public events. A statistically-valid telephone survey of 1,500 residents was conducted between December 2015 and January 2016 to collect public opinions related to transportation within the Region. The sample was randomly selected through telephone listings to represent a valid cross-section of the Region's population.

Overall, the survey found that respondents were satisfied with walking facilities in the Region, but dissatisfied with regional road congestion and connections (both road and transit) to the Greater Toronto Area.

When asked about which initiatives would encourage residents to use sustainable transportation options, respondents identified initiatives such as providing additional bike lanes and sidewalks, improving winter maintenance of walking/cycling trails, and providing better transportation alternatives for school children. Township residents also highlighted the importance of additional bus stops and transit service, while residents of the City of Waterloo emphasized the need for more cycling facilities. Cambridge residents identified initiatives that provided more connectivity to the Greater Toronto Area.

Stakeholder and General Public Panels

A Stakeholder Panel (SP) and a General Public Panel (GPP) were assembled to provide opportunities for the Project Team to have in-depth discussions and receive feedback on issues related to the Region's transportation system during the development of the 2018 TMP.

The Stakeholder Panel was designed to include a wide range of representatives from the area municipalities, indigenous groups, private agencies, business owners, developers, community groups, and transportation service providers. A list of these stakeholders is presented in the Acknowledgements page. The General Public Panel was designed to consist of a focus group of residents representing a general cross-section of the Region. Details on how the GPP was formed are presented in Appendix C – Consultation Summary Report.



Alternative Transportation Modes Survey

A survey was commissioned to identify factors (i.e. barriers, behaviours, and attitudes) that influence transportation mode choices in the Region today. This survey gathered public opinions on public transit, walking, and cycling in the Region, and provided insight on what barriers residents currently face when using these modes and what could be done to improve the adoption of these modes. Results of the survey are summarized in Chapter 3: Transportation in Waterloo Region Today, starting on page 3-20.

Online/Virtual Engagement

The Engage Region of Waterloo website was used to engage the general public on various subjects and questions related to transportation through an online platform. Four online surveys were hosted through Engage Region of Waterloo as part of this study:

- Transportation: How will you 'Get Around' in Waterloo Region? (focused on identifying existing conditions of, and potential improvements and future considerations for, transportation in the Region);
- Trade-offs in Transportation Planning (focused on how respondents felt a series of transportation scenarios should be addressed by the Region);
- Planning for the Future of Transportation (focused on a review of the study recommendations for regional public transit, active transportation, roads, and preparation for new mobility); and
- Transportation Choice, Behaviour and Attitudes Online Survey (focused on behaviour and attitudes of the Region's residents towards various modes of transportation).

Summary

The 2018 TMP was developed through an extensive public consultation process. The public was engaged through the panels, surveys, public consultation centres, and also through the Region's online engagement platform. The Project Team also reached out to the public through ad-hoc community events which generally followed a drop-in style. A website was created for the study, which provided access to reports and files as they were produced, public consultation centre materials, and contact information for the project management team. During the course of the study, the team also received commentary and questions about the 2018 TMP via email, telephone calls, and social media platforms. Responses to inquiries were generally provided based on the most up-to-date information available at the time while the study was ongoing. To accommodate and address the multiple comments and ideas brought forward by the public, a "rolling draft" concept was adopted for preparing the reports for the 2018 TMP, whereby members on the Panels were invited to participate and provide feedback on the 2018 TMP reports as they were being prepared.



Chapter 2: Transportation Vision and Goals

2. Transportation Vision and Goals

A vision statement sets the stage for the TMP. Through the consultation process, a new vision statement was developed for the 2018 TMP:

Waterloo Region will be a prosperous, sustainable, and healthy community, with viable transportation choices for people of all ages and abilities, and for the goods supporting our economy.

To realize this vision, the four goals (developed in the 2010 RTMP) were carried forward. These goals helped establish a framework to evaluate the transportation network scenarios and road expansion projects detailed in Appendix B – Network Assessment Report.

Promote Travel Choice

Promoting travel choice focuses on transportation equity, ensuring that everyone within the Region has the ability to make trips in an integrated and seamless manner without having to drive a car. This is especially important for residents who do not have access to a car. This goal also considers whether different ways of making trips, such as walking, cycling, and public transit, are competitive in terms of travel time, cost, and accessibility.

Foster a Strong Economy

The Region's transportation system plays a major role in the Region's economy. In addition to moving goods to, from, or within the Region, it provides essential connections between residents, businesses, and employees. When developing the 2018 TMP, it is important to propose changes to the transportation system that will make the economy more resilient and promote a healthy workforce. These changes may include improving the quality of active transportation (walking and cycling) options in the Region, finding ways to manage congestion, or improving travel times along major goods movement corridors.

Support Sustainable Development

Supporting sustainable development is both an economic and environmental goal as it relates to transportation. Projects proposed in the 2018 TMP were selected with both of these aspects of sustainability in mind, aligning with the Region's sustainable development policies. Specifically, this plan will support sustainable growth in both urban and rural areas while reducing transportation contributions to climate change.

Optimize the Transportation System

The final goal of the 2018 TMP is to optimize the transportation system by making the most of what infrastructure and services 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.



Chapter 3: Transportation in Waterloo Region Today

3. Transportation in Waterloo Region Today

This chapter describes how transportation in the Region works today, to help understand how to develop a plan that will meet the goals and objectives defined for the 2018 TMP. The current network is described, along with population, demographic, and transportation trends affecting the Region. The Region also undertook a survey to identify barriers to walking, cycling, and transit use; this information was also used to inform the plan.

Transportation System Overview

The Region's existing transportation system has a broad range of roadways, trails, and transit networks, which provide transportation options. More information about these are contained in Appendix A – Trends, Outlook, and Opportunity Report.

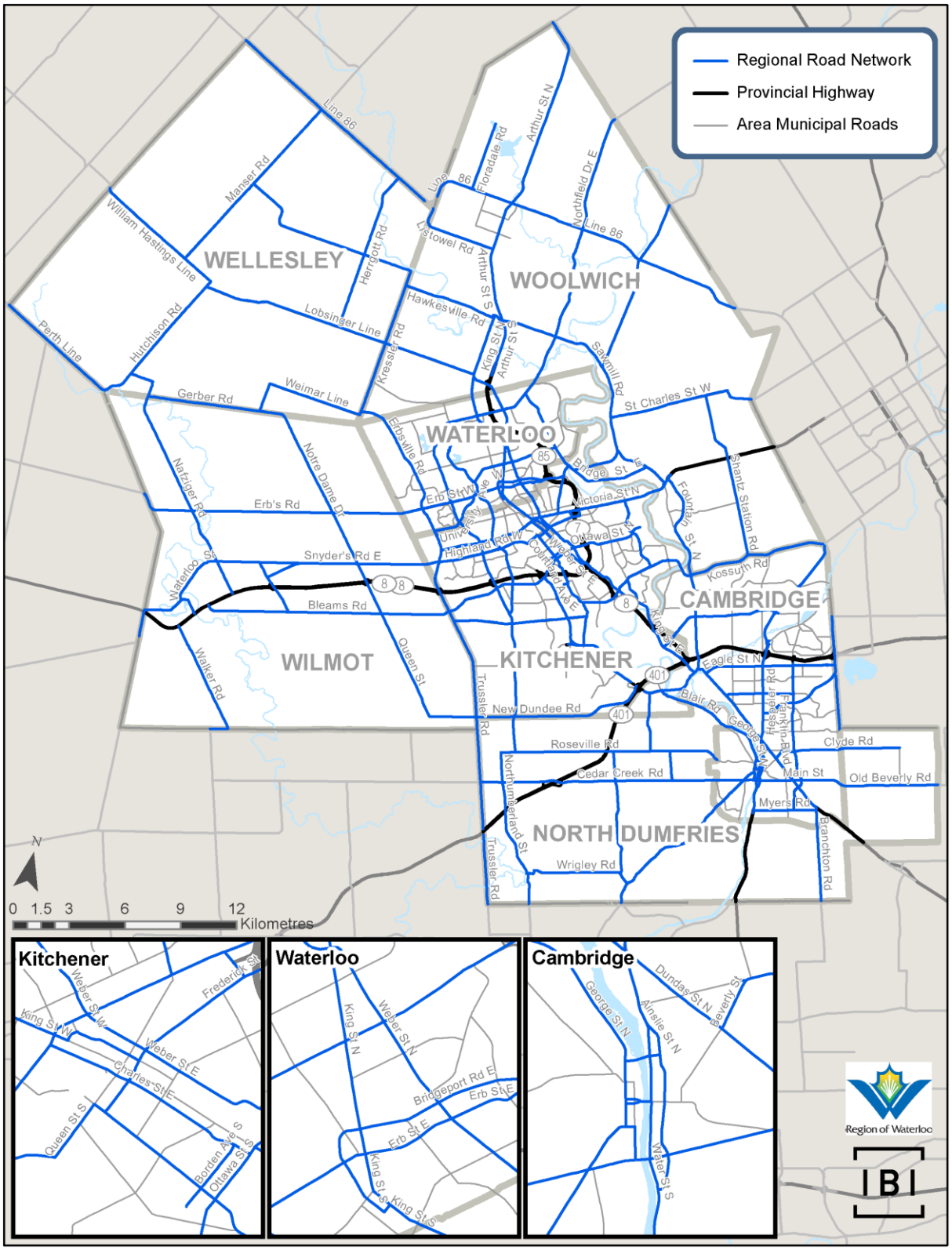
Roads and Highways

The Region manages an extensive network of Regional roads that serve a variety of purposes including local access, regional travel, and access to provincial highways. The Regional Official Plan states that the purpose of Regional roads is to provide safe, direct, accessible and multi-modal transportation links for moving people and goods throughout the Region, and to adjacent municipalities. A map of Regional roads is provided in Exhibit 3.1.

There are five provincial highways within the Region, including portions of Highway 401, Highway 7, Highway 8, Highway 24, and Highway 85. Provincial highways are regulated by MTO, and development and access in close proximity to these highways are subject to provincial permitting and approval.

Lastly, each city and township in the Region operates and maintains its own municipal road network, which connects to the Regional road network. These roads provide connections to and within neighbourhoods, city centres, commercial sites, and industrial lands.

EXHIBIT 3.1: WATERLOO REGIONAL ROADS AND PROVINCIAL HIGHWAYS (2018)



Moving Forward

Local Public Transit

The Region operates Grand River Transit (GRT), providing mobility throughout the Cities of Kitchener, Waterloo, and Cambridge, and the Townships of Woolwich (St. Jacobs and Elmira) and Wilmot (Baden and New Hamburg). Key destinations include the Universities of Waterloo and Wilfrid Laurier, Conestoga College, malls, hospitals, and downtown core areas. GRT operates over 260 conventional buses, which travelled a combined 15 million kilometres and served nearly 20 million annual passengers in 2016. All buses are "low floor" for wheelchair accessibility and are equipped with bike racks. In addition to numerous conventional routes, GRT operates five express routes under the "iXpress" banner. These routes are shown in Exhibit 3.2. Maps in Exhibit 3.3, Exhibit 3.4, and Exhibit 3.5 provide more detailed views of the existing transit network in Waterloo Region.



The launching of ION, a rapid transit system connecting the three cities in the Region with 22 stops along a 36 kilometre long transit corridor, will bring about planned improvements to Regional transit service. ION will initially consist of Light Rail Transit (LRT) operating along a 19 kilometre route between Conestoga Mall in Waterloo and Fairview Park Mall in Kitchener, and Bus Rapid Transit (BRT) operating along a 17 kilometre route between Fairview Park Mall in Kitchener and the Ainslie Street Terminal in Cambridge.

EXHIBIT 3.2: WATERLOO REGION PUBLIC TRANSIT NETWORK (2018)

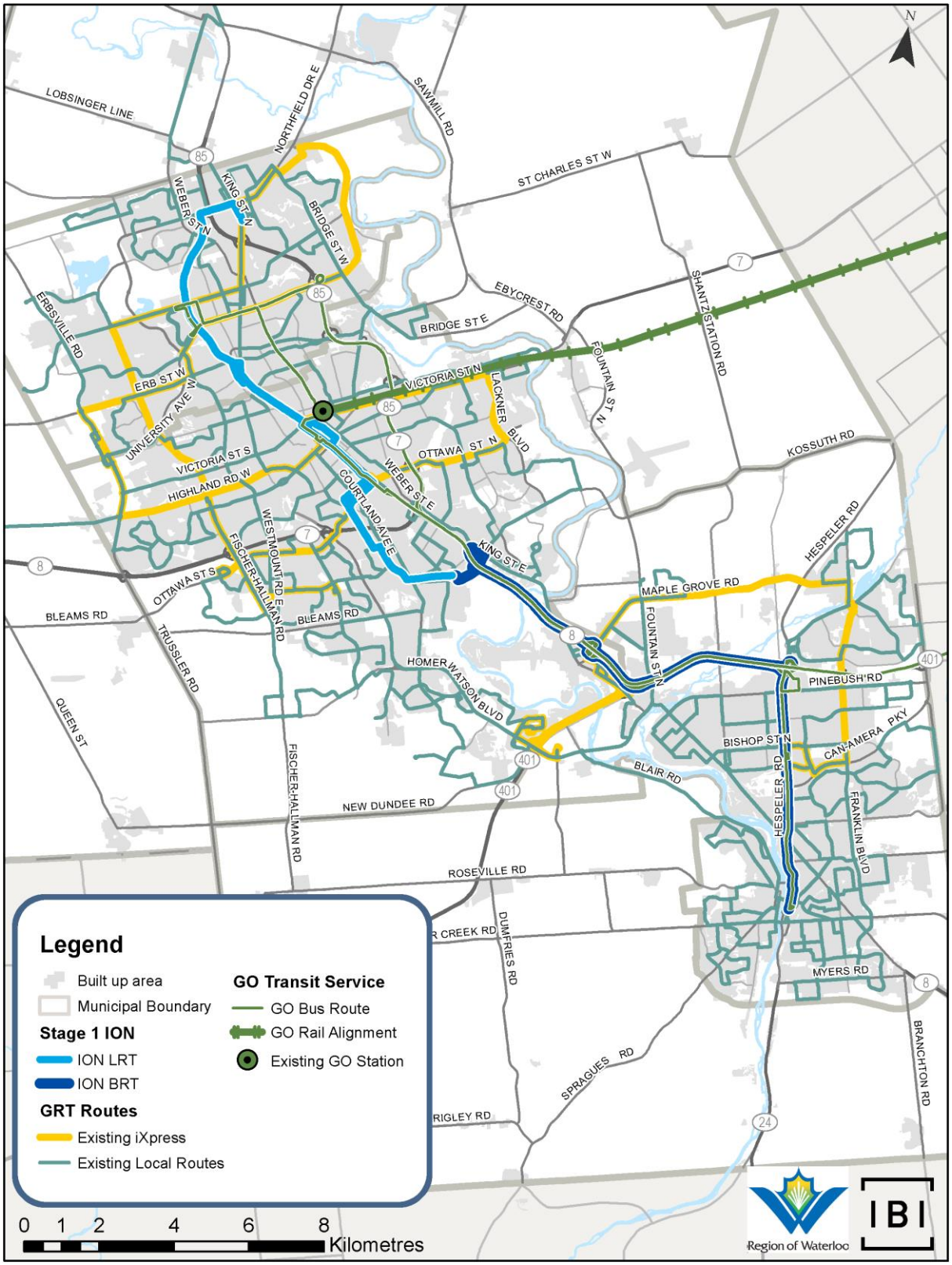


EXHIBIT 3.3: WATERLOO REGION PUBLIC TRANSIT NETWORK IN CAMBRIDGE (2018)

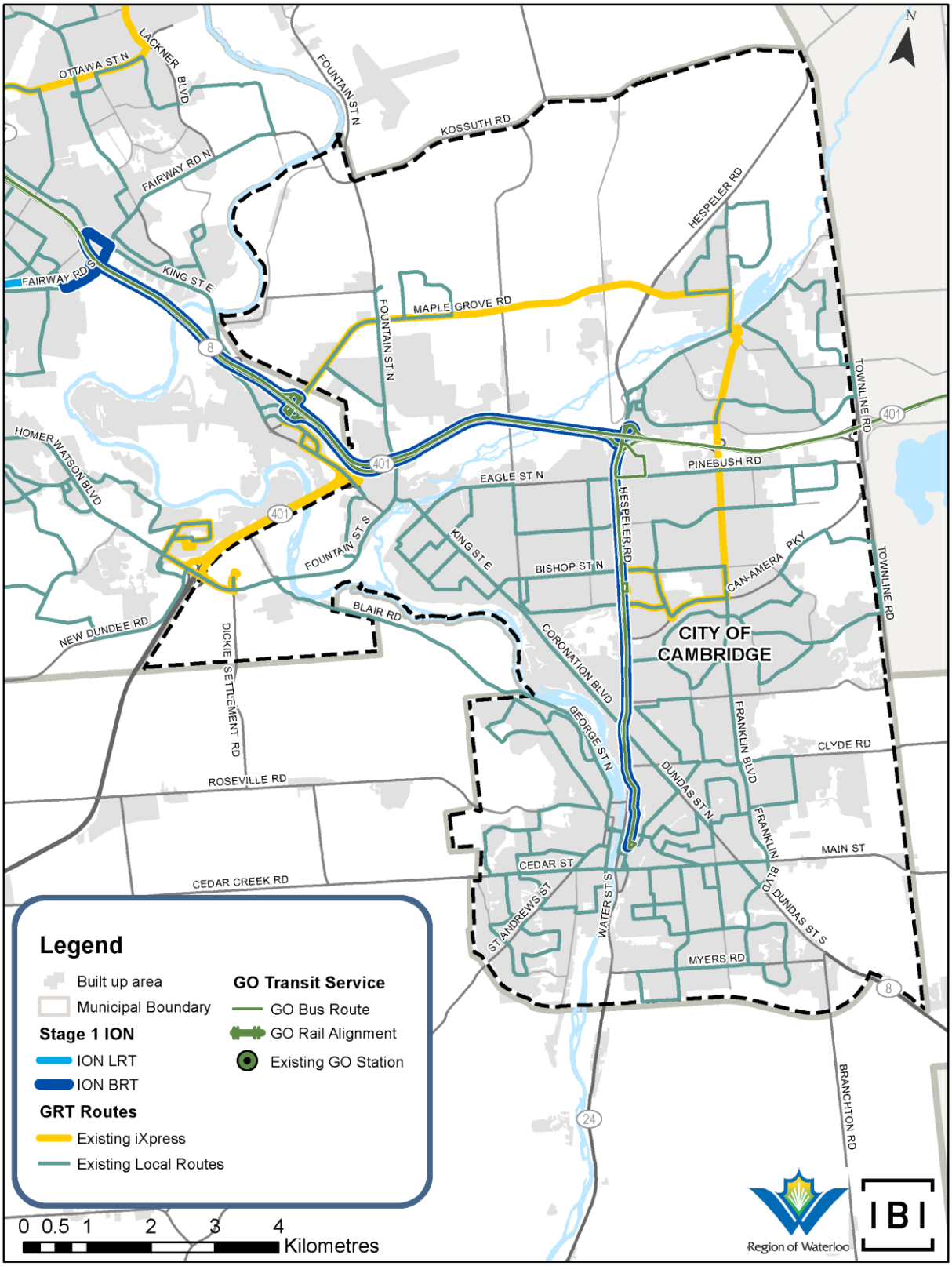


EXHIBIT 3.4: WATERLOO REGION PUBLIC TRANSIT NETWORK IN KITCHENER (2018)

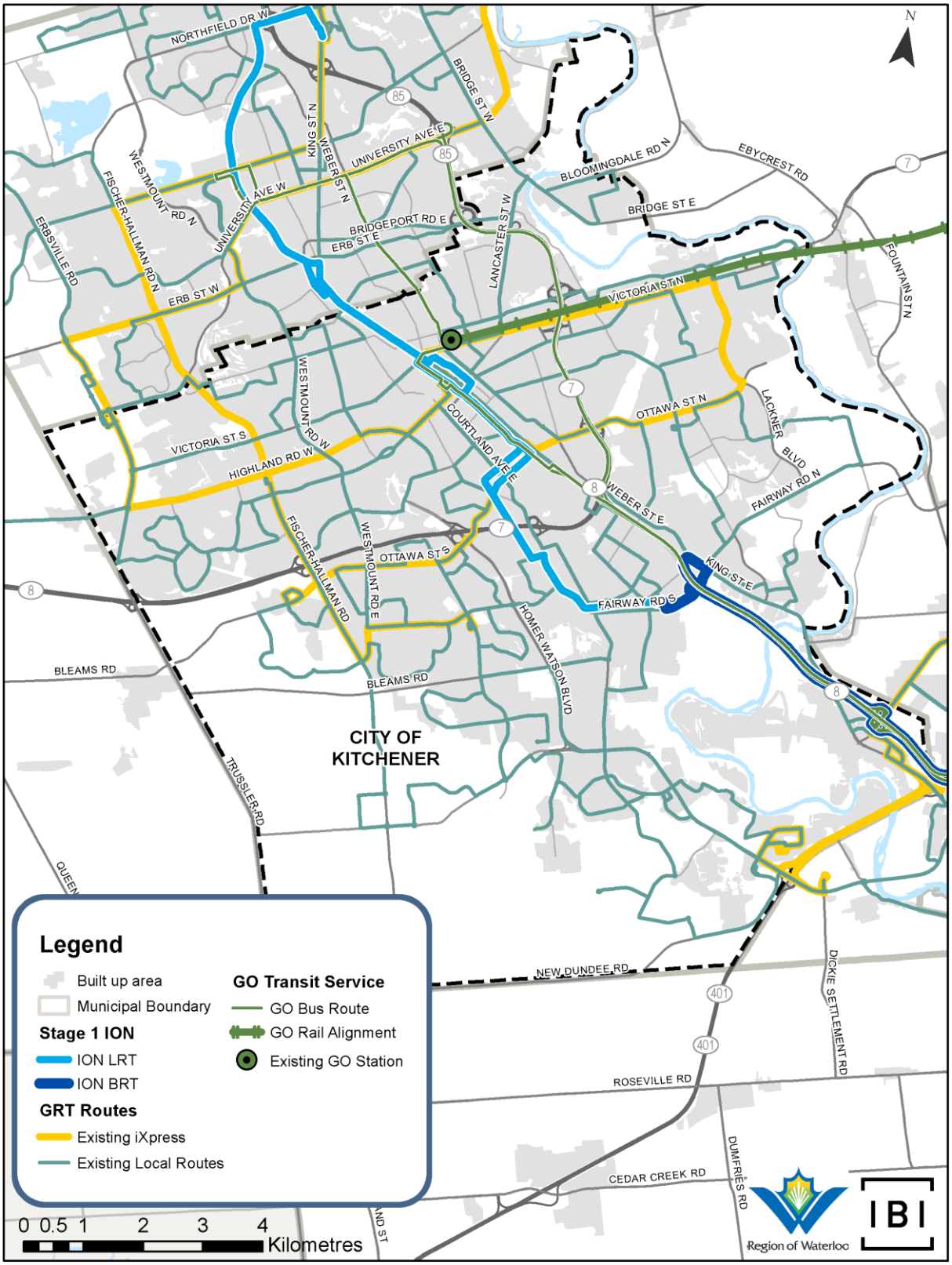
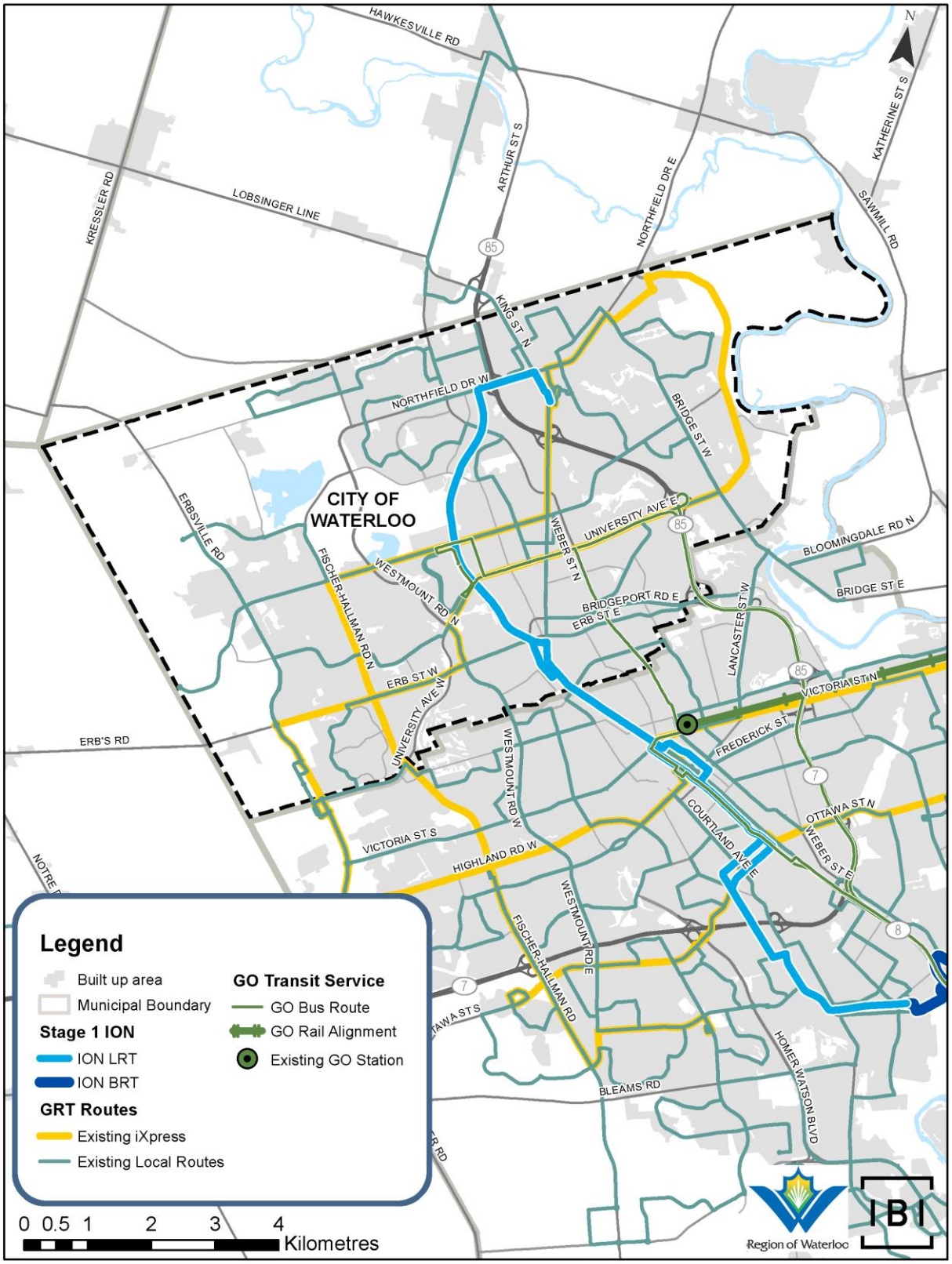


EXHIBIT 3.5: WATERLOO REGION PUBLIC TRANSIT NETWORK IN WATERLOO (2018)



Moving Forward

Inter-Regional Transit

GO Transit, a division of Metrolinx, provides inter-regional transit service to the Greater Toronto and Hamilton Area (GTHA). GO operates five weekday peak hour trains leaving the Region in the a.m. and leaving Union Station in the p.m. GO Transit also provides passenger bus service from the Region to Square One GO Bus Terminal (Mississauga) and Milton GO Station, which provide access to various locations in the Greater Toronto Area. GO Transit buses stop at multiple locations in Waterloo, Kitchener, and Cambridge. GO Transit also operates buses that connect Kitchener GO Station to Bramalea GO Station when train service is not operating.

VIA Rail offers passenger rail service from the City of Kitchener to the Greater Toronto Area and west to other locations in southern Ontario. The VIA rail station is located in downtown Kitchener, near the intersection of Victoria Street and Weber Street.

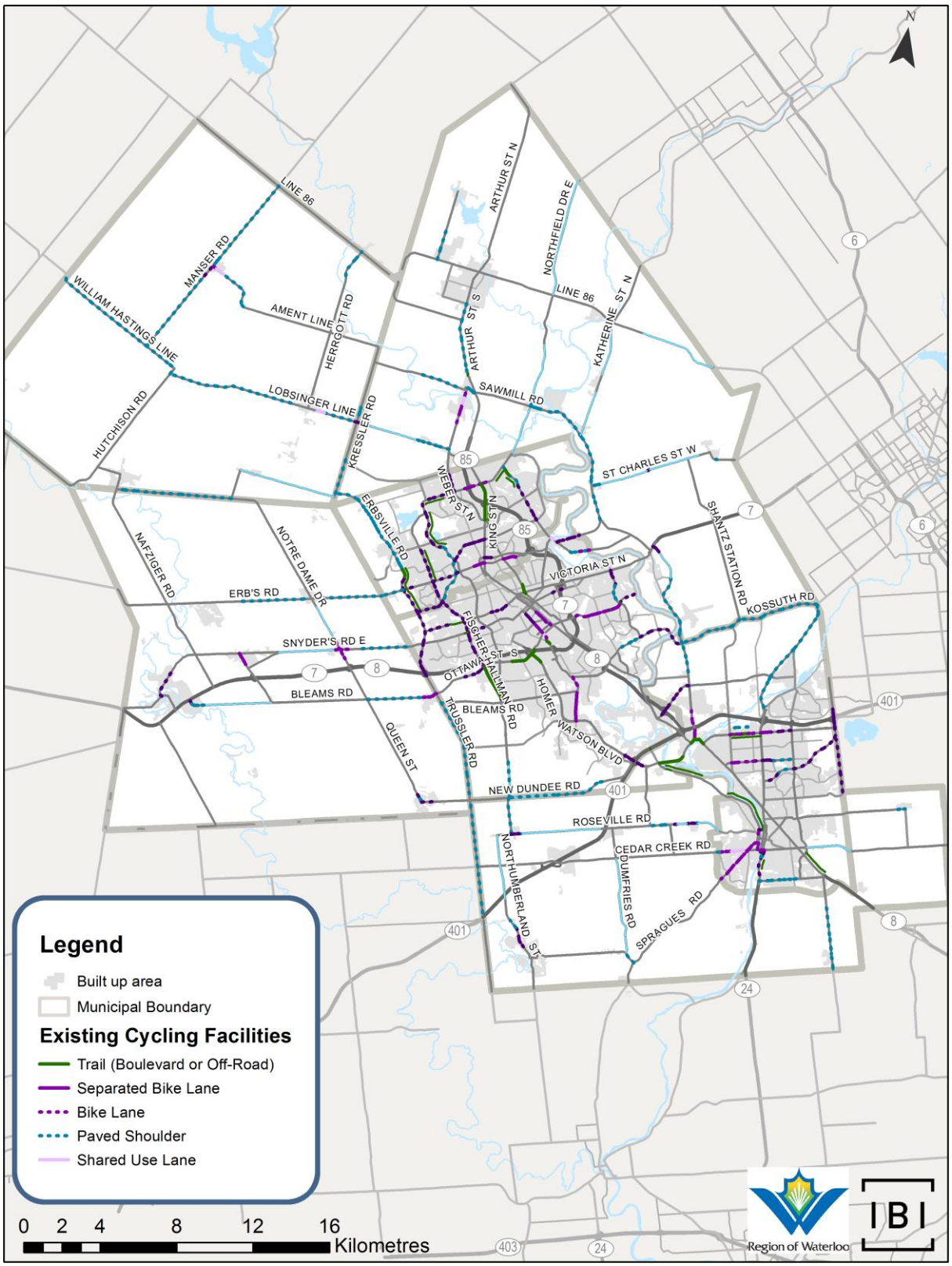
Finally, additional inter-city transit options are offered by private bus carriers, including Coach Canada, Greyhound Bus Lines, and Megabus. These operators provide direct connections to Guelph, London, Hamilton, and Toronto, and many more destinations in Southern Ontario, Quebec, and the United States via transfers. Residents within the Region can access these bus services from multiple locations, such as the Charles Street Terminal, Ainslie Transit Terminal, the University of Waterloo, and Wilfrid Laurier University.

Active Transportation

There exists an extensive active transportation network consisting of bike lanes, sidewalks[3], multi-use pathways, and trails owned and maintained by the Region and its area municipalities. In total, there are nearly 1,000 kilometres of active transportation facilities within Waterloo Region. Major trails include the Walter Bean Trail, which runs near the Grand River through Woolwich, Waterloo, Kitchener, and Cambridge, the Iron Horse Trail and the Spur Line Trail, which both connect Uptown Waterloo and Downtown Kitchener along rail corridors, and the Kissing Bridge Trailway, which runs through Elmira on the way from Guelph to Millbank. Other active transportation routes exist in major parks including Victoria Park (Kitchener), RIM Park (Waterloo), and Churchill Park (Cambridge), conservation areas owned and operated by the Grand River Conservation Authority, and the 17 regional Forests. Walking and cycling routes along major roads under the Region's jurisdiction are shown in Exhibit 3.6.

[3] Sidewalks are owned and maintained by the area municipalities.

EXHIBIT 3.6: WATERLOO REGION ACTIVE TRANSPORTATION NETWORK (2018)



Note: The active transportation network shown in this exhibit only includes regionally-managed corridors.

Rail and Aviation

In addition to passenger rail services operated by GO (Metrolinx) and VIA, two companies own railways and operate rail freight services in the Region. The two main freight railways operating within the Region are:

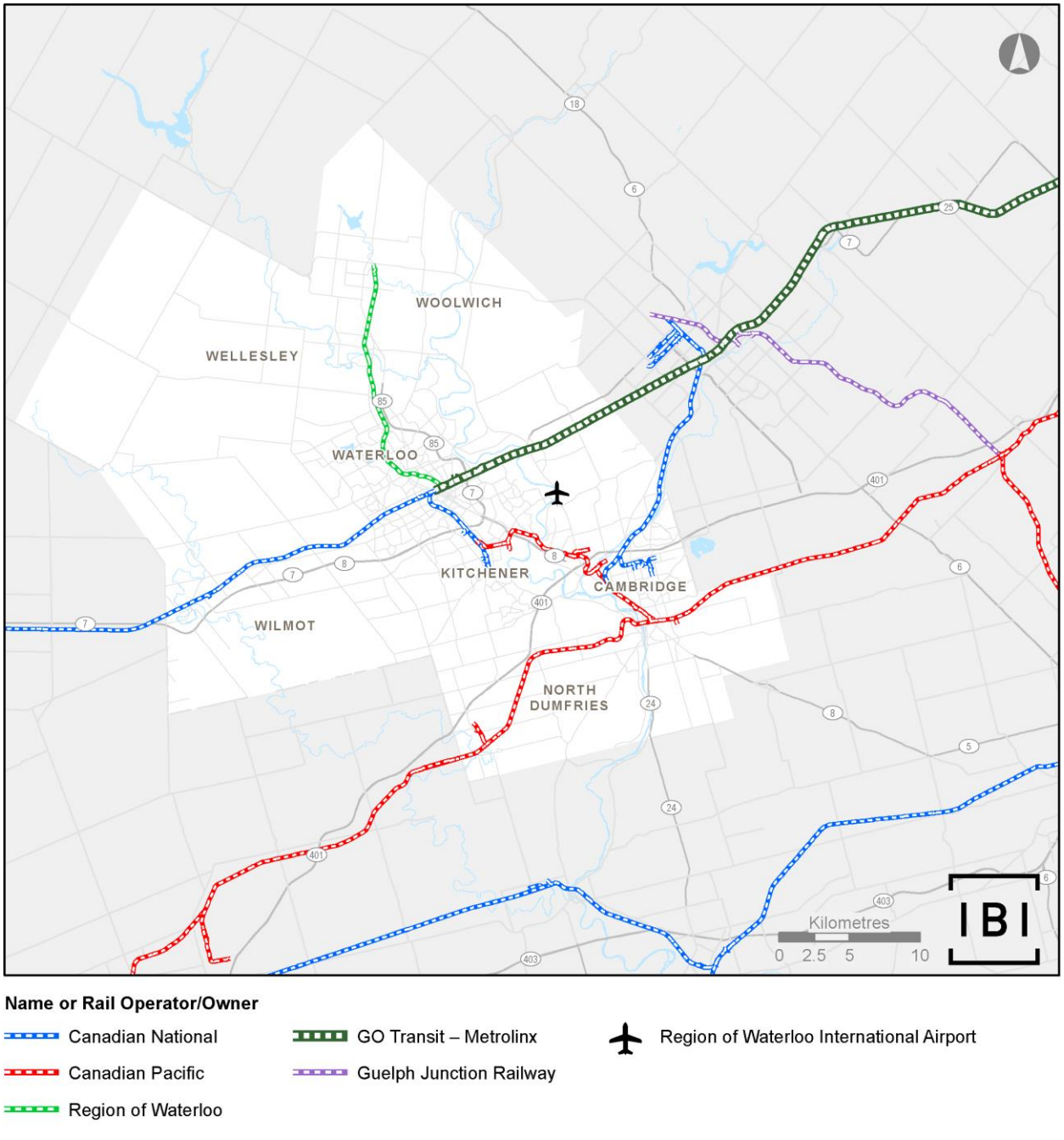
- Canadian Pacific (CP) Railway, which operates the Galt subdivision near downtown Cambridge and spurs to industrial areas in north Cambridge and south Kitchener; and
- Canadian National (CN) Railway, which operates the Guelph subdivision through downtown Kitchener and the Fergus subdivision from Guelph to Cambridge.

The Region owns the Waterloo Spur railway between Kitchener and Elmira. Through an agreement with the Region, Canadian National (CN) Railway maintains the Waterloo Spur and provides freight service. Tourist passenger rail service is also provided along the Waterloo Spur by the Waterloo Central Railway. Although CN Railway previously operated significant freight rail in the Region, its track was sold to Metrolinx and is now used by Metrolinx for GO Rail service and by CN for freight service.

The Region also owns and operates an international airport. The Region of Waterloo International Airport (YKF) is located in the Township of Woolwich, in close proximity to the cities of Cambridge, Kitchener, Waterloo, and Guelph. The airport is a full service facility supporting commercial, corporate, and general aviation. Scheduled flights currently include daily WestJet service to Calgary and FlyGTA to Toronto, plus Sunwing service to the Caribbean in the winter. The airport is classified as an Airport of Entry by the Canada Border Services Agency.

This airport and these railways are an important part of the Region's goods movement network, and are shown in Exhibit 3.7.

EXHIBIT 3.7: WATERLOO REGION RAILWAYS AND AIRPORT (2018)



Trends 2001–2016

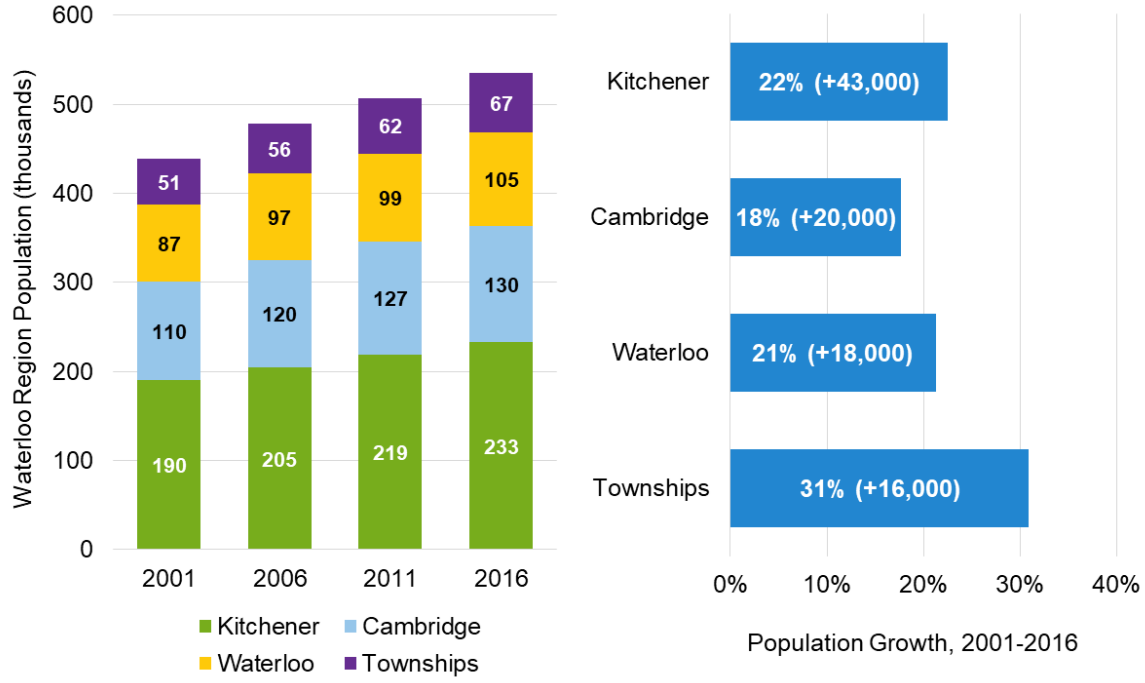
This section reviews population, demographics, and transportation trends and changes since 2001 to provide context as to how the Region is growing and how travel is changing. Demographic changes such as the aging population, and changes to commuting patterns and ridership provide insight into travel behaviour, travel markets, and needs and opportunities for the 2018 TMP. More details about these trends and their impacts on the Region can be found in Appendix A – Trends, Outlook, and Opportunity Report and Appendix B – Network Assessment Report.

Waterloo Region is Growing Rapidly

The Region is one of the fastest growing areas in Ontario, with population growth exceeding the provincial growth rate. Between 2001 and 2016, the Region's population grew by 22%, outpacing Ontario's growth of 18%. Nearly 100,000 new residents have been added as shown in Exhibit 3.8.

Within the Region, greenfield development in the townships (Wilmot, Wellesley, Woolwich, and North Dumfries) has grown at nearly twice the rate of the Region's cities. Between 2001 and 2016, the townships grew by a combined 31%, while the cities grew by 21%. This lower density growth is less supportive of public transit and active transportation, which has implications on the ability to achieve the goals of the 2018 TMP.

EXHIBIT 3.8: POPULATION IN WATERLOO REGION (2001–2016)



Source: Statistics Canada Census of Population, 2001–2016.

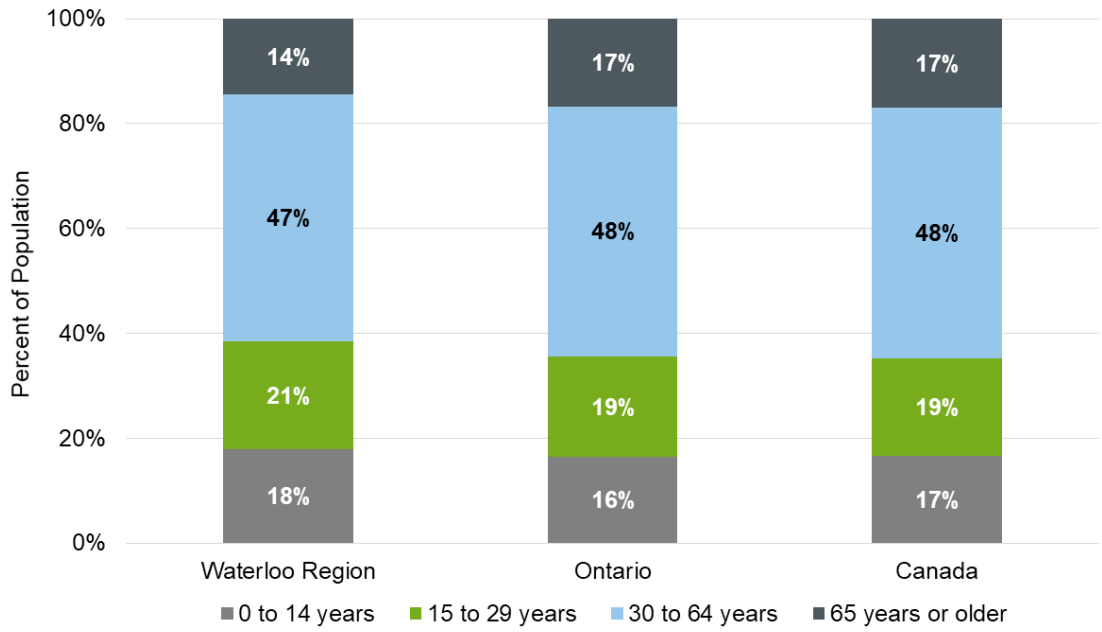
Waterloo Region is Younger than the Rest of the Province

The Region is home to a larger proportion of children, teenagers, and young adults (0 to 29 years old) compared to the rest of the province as shown in Exhibit 3.9. Furthermore, post-secondary students attending the University of Waterloo, Wilfrid Laurier University, and Conestoga College now make up nearly 9% of the Region's population, up from 7% in 2006. These age groups tend to rely on active transportation, transit, and receiving rides from family and friends, as they may not have a driver's license or car.

As of 2016, the Region was also home to a smaller proportion of seniors (65 years and older) than the rest of the province, but this is expected to change as the Region's population ages. As seniors lose their ability to drive, they will require alternative modes of transportation to ensure they can maintain their ability to travel. Again, this presents an opportunity for the Region to encourage sustainable transportation patterns by providing services to support this demographic, such as accessible and demand-responsive transit options.

As the travel behaviours of seniors and youth differ from those of adults, *Moving Forward*, the 2018 TMP, has been developed with these groups in mind.

EXHIBIT 3.9: AGE DISTRIBUTION AMONG REGIONAL, PROVINCIAL, AND NATIONAL POPULATIONS (2016)



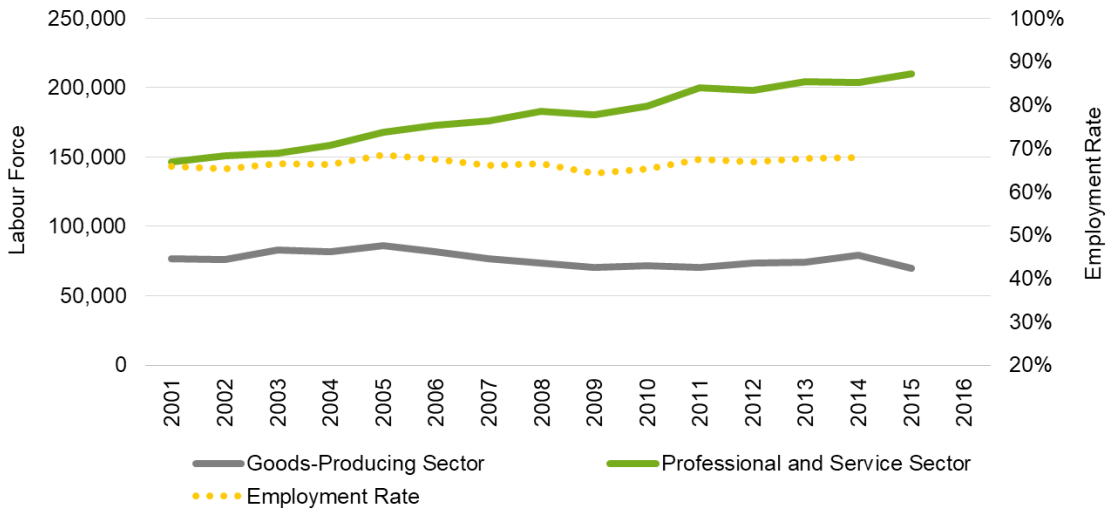
Source: Statistics Canada Census of Population, 2016.

Knowledge Based Employment is Growing

The total labour force in the Region has grown by nearly 50,000 jobs between 2001 and 2015. Unemployment rates have remained relatively steady in the Region over the past 15 years. Professional and service employment continues to grow, while goods-production remains an important sector. Exhibit 3.10 illustrates these shifts in the nature of employment. Exhibit 3.11 illustrates the number of jobs by municipality and employment sector and shows that Kitchener is by far the largest employer with Waterloo and Cambridge following, with key sectors being manufacturing, retail, health, and education.

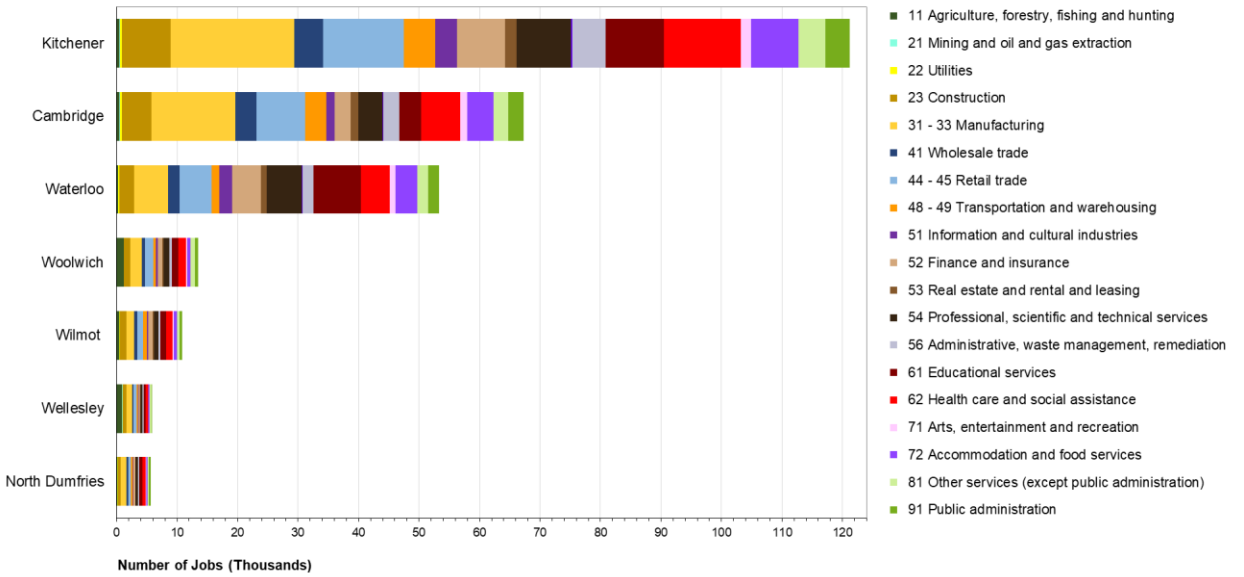
This growth in service sector jobs will affect the Region's transportation network. A survey by the Transportation Association of Canada revealed that employees in manufacturing and trades are more likely to drive to work, compared to employees in sales and service who are more likely to take transit, walk, or cycle to work. This may reflect the lower density of industrial and manufacturing zones, which may not be well covered by transit, sidewalks, or cycling infrastructure. On the other hand, jobs in higher-density downtown areas are often close to high-quality transit options.

EXHIBIT 3.10: CHANGES TO WATERLOO REGION'S LABOUR FORCE (2001–2015)



Source: Region of Waterloo Labour Force Reports.

EXHIBIT 3.11: NUMBER OF JOBS AND EMPLOYMENT SECTOR BY MUNICIPALITY (2016)



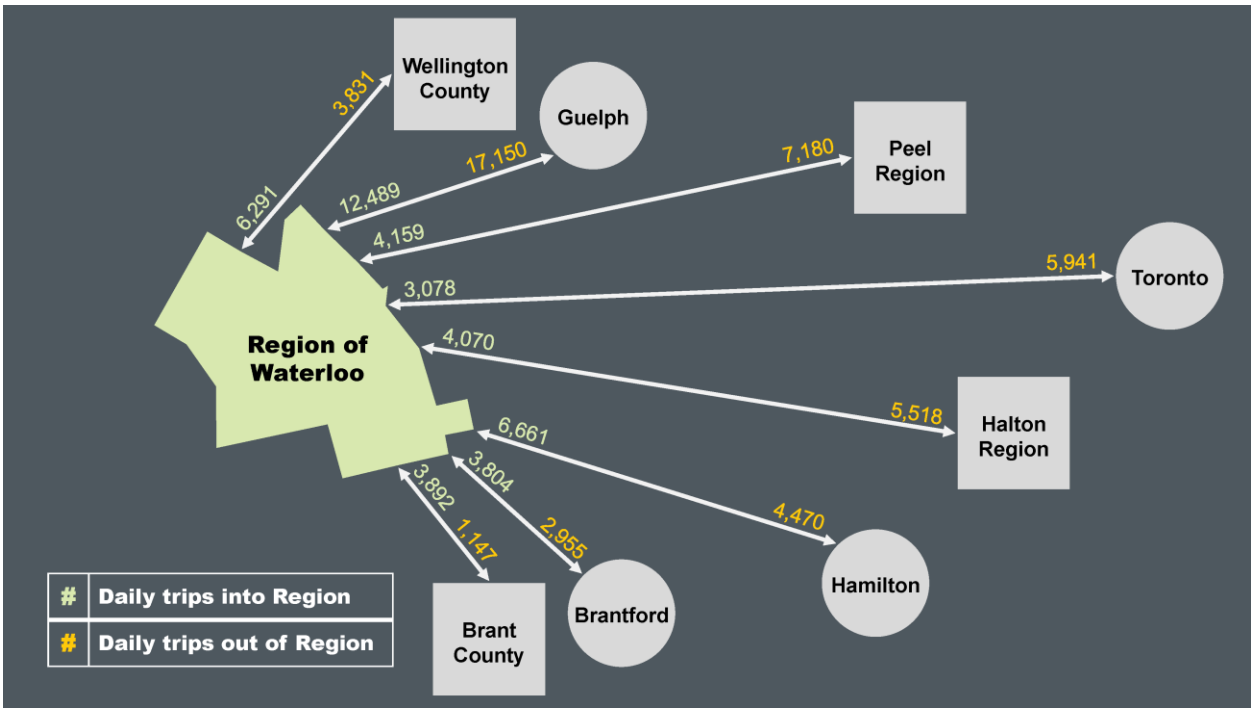
Source: Statistics Canada Place-of-Work data, 2016.

Inter-Regional Travel is Growing

Trips to and from the Region are growing rapidly because of strong transportation links to the GTHA, which reflects the modern integrated economy with interactions across the larger urban area. Between 2006 and 2016, the number of trips destined for external municipalities has grown from 50,000 (4.5%) to 65,000 (6%), representing a sizeable shift in where the Region's residents and employees travel. Accordingly, this also represents a shift in the transportation infrastructure and services required by these travellers.

The number of daily trips in 2016 between the Region and other municipalities are shown in Exhibit 3.12. The largest inter-regional destination is Guelph, followed by Peel Region, Toronto, Halton, Hamilton, and Brantford. Trips to Toronto are generally good candidates for inter-regional transit service because of the concentrated employment district near Union Station. However, the number of these trips is relatively low compared to the combined trips to Peel, Halton, and Hamilton, which are more oriented to private cars because jobs in these regions are generally more dispersed, which drives the need for car travel on provincial highways.

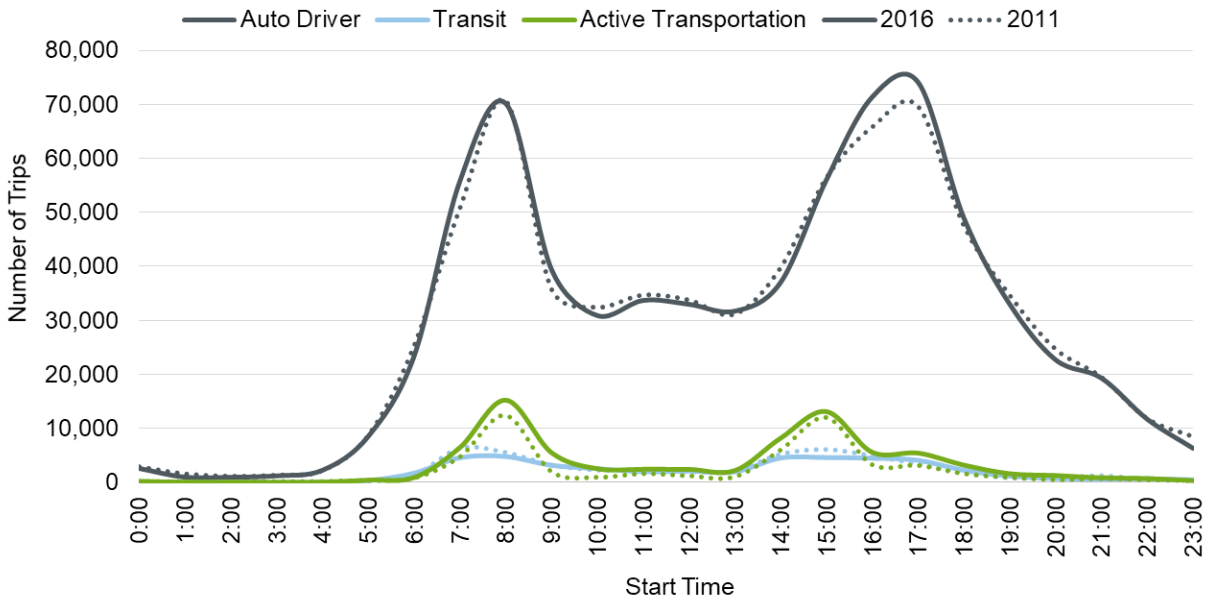
EXHIBIT 3.12: MOST COMMON PLACES OF ORIGIN/DESTINATION FOR INTER-REGIONAL TRAVEL (2016)



Source: Transportation Tomorrow Survey, 2016.

Focusing on trips within the Region, a typical demand profile emerges as commuters and students travel from home to work or school in the morning and return in the evening, while other discretionary travel provides a relatively consistent number of trips throughout the mid-day. Few trips are made during the evening and overnight periods. Transit and active travel is also peaked, but with far fewer trips as shown in Exhibit 3.13. The profile tends to indicate that congestion in the Region is not causing major peak spreading in comparison to other municipalities such as in Toronto, where lack of capacity results in a flatter profile.

EXHIBIT 3.13: HOURLY DEPARTURE DIAGRAM FOR INTERNAL TRIPS IN WATERLOO REGION (2011–2016)



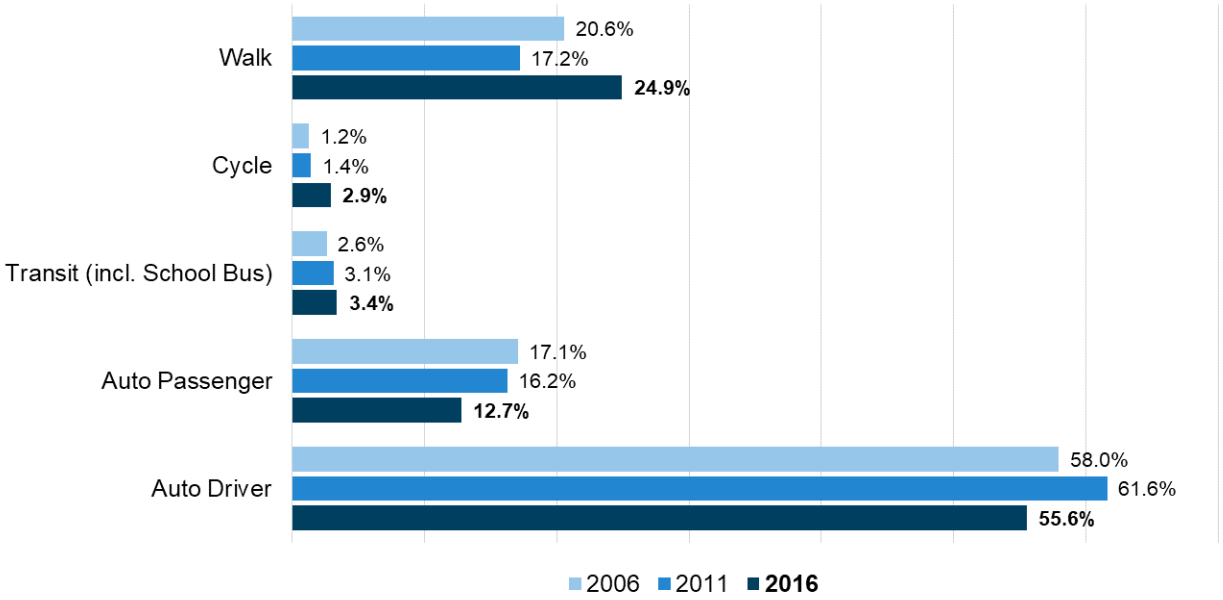
Source: Transportation Tomorrow Survey, 2011–2016.

Short Trips are Becoming Less Auto-Dependent

Short distance trips of less than five kilometres make up nearly 50% of all travel by residents within the Region. Between 2006 and 2016, a growing number of residents have made short trips (less than 2 kilometres in length, shown in Exhibit 3.14) using transit, cycling, or walking, while car use (as either a driver or passenger) has fallen. This growth is a positive trend potentially tied to Regional investment in active transportation, transit, and also tied to land-use changes including intensification of the Central Transit Corridor.

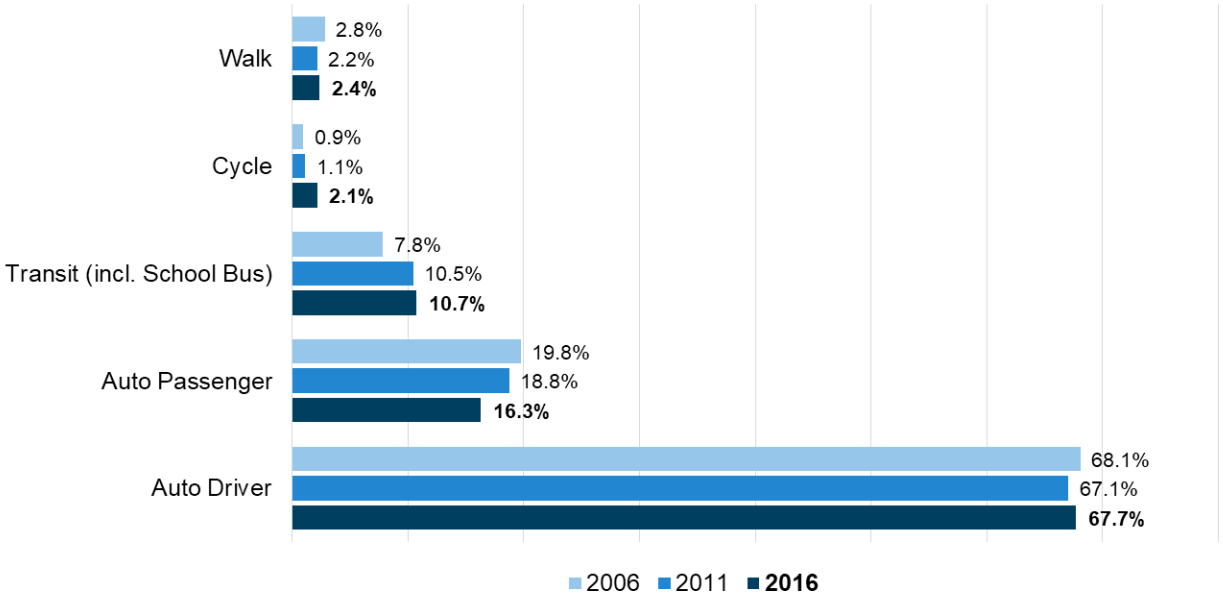
Although slightly longer trips (between 2 and 5 kilometres in length, shown in Exhibit 3.15) present more of a barrier for walking, cycling use has more than doubled for these trips. For all trips less than 5 km in length, transit use has grown considerably, serving about 3.5% of all trips less than 2 km and 10.5% of trips between 2 and 5 km.

EXHIBIT 3.14: TRAVEL MODE FOR TRIPS LESS THAN 2 KM IN WATERLOO REGION (2006–2016)



Source: Transportation Tomorrow Survey, 2006–2016.

EXHIBIT 3.15: TRAVEL MODE FOR TRIPS BETWEEN 2 AND 5 KM IN WATERLOO REGION (2006–2016)

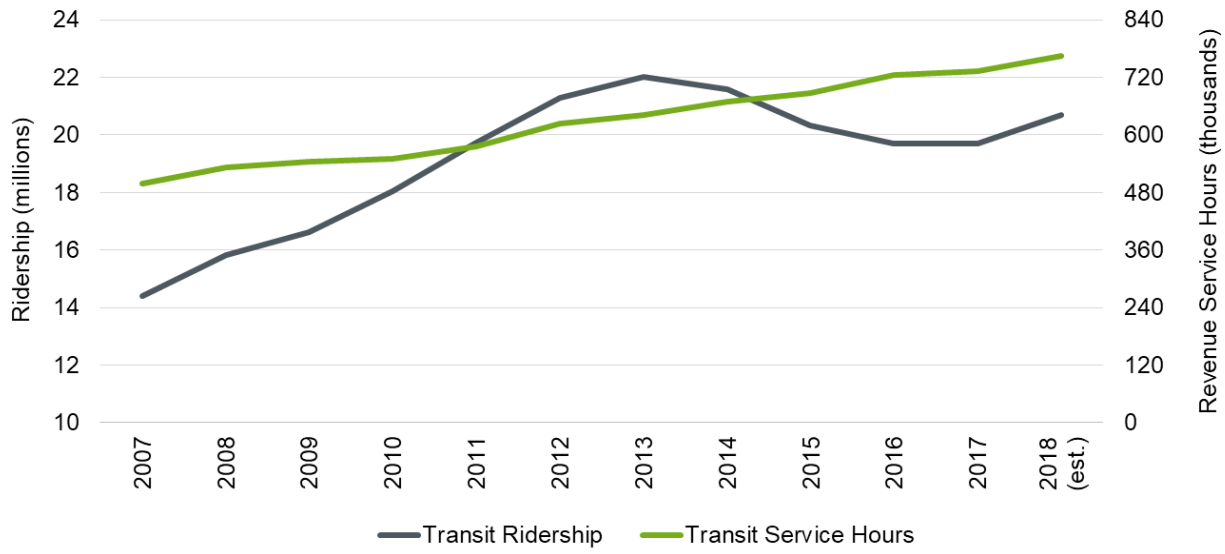


Source: Transportation Tomorrow Survey, 2006–2016.

Transit Ridership Growth was Strong, but Peaked in 2013

Driven by an increase in transit funding and transit service hours, GRT ridership grew from just over 14 million annual riders in 2007 to over 22 million annual riders in 2013. Transit ridership then declined slightly between 2014 and 2016 and has since started growing again. These trends are shown in Exhibit 3.16. The decline may be associated with lower gasoline prices, detours due to ION LRT construction, the cancellation of the contract between GRT and school boards, fare increases, and localized service reductions in 2013 and 2014.

EXHIBIT 3.16: GRAND RIVER TRANSIT RIDERSHIP AND SERVICE (2007–2018)

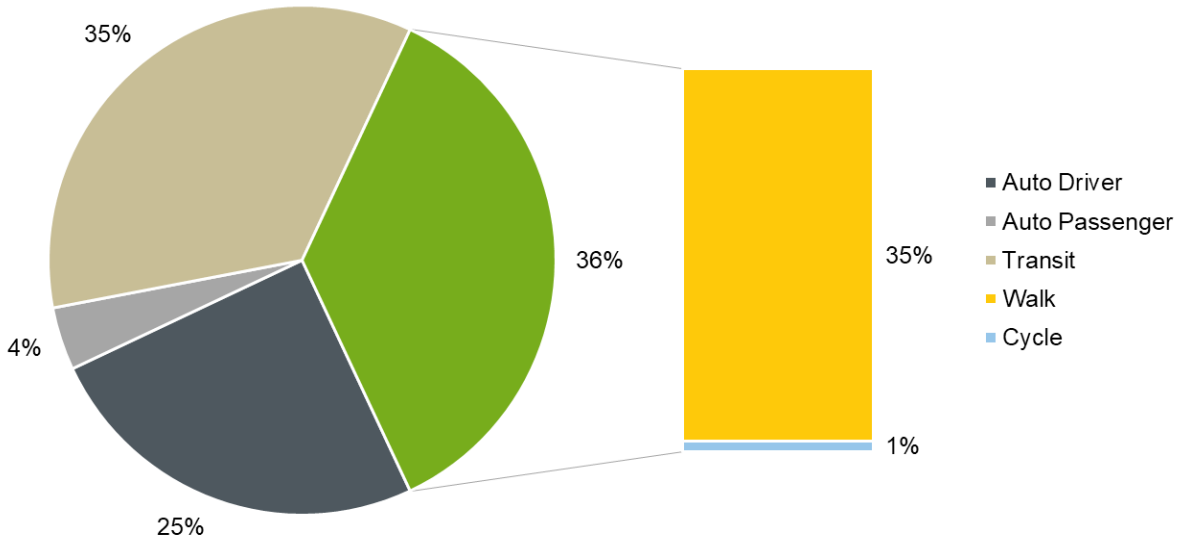


Source: CUTA Canadian Transit Fact Books, 2007–2016, and Grand River Transit, 2017–2018.

Young People Depend on Transit and Active Transportation

Compared to work and discretionary travel, which tends to be car-dependent, trips to school are more frequently made on foot, using a bicycle, or using public transit. While a large proportion of school trips made by students aged 17 and under are on school buses, over 30% of school trips by this group are made using active modes. Among university and college students, walking accounted for 35% of all trips in 2012, according to MTO's 2012 Post Secondary School Travel Survey, shown in Exhibit 3.17. This may likely be as a result of lower auto ownership within the younger demographic. This demographic also presents a good opportunity for the Region to establish sustainable transportation patterns (walking, cycling, and transit use), as it is far more difficult to encourage modal shifts after habits are established.

EXHIBIT 3.17: MODE SHARE FOR POST-SECONDARY STUDENTS IN WATERLOO REGION (2012)



Source: Post-Secondary School Travel Survey, Ministry of Transportation (Ontario), 2012.

Barriers, Behaviours, and Attitudes

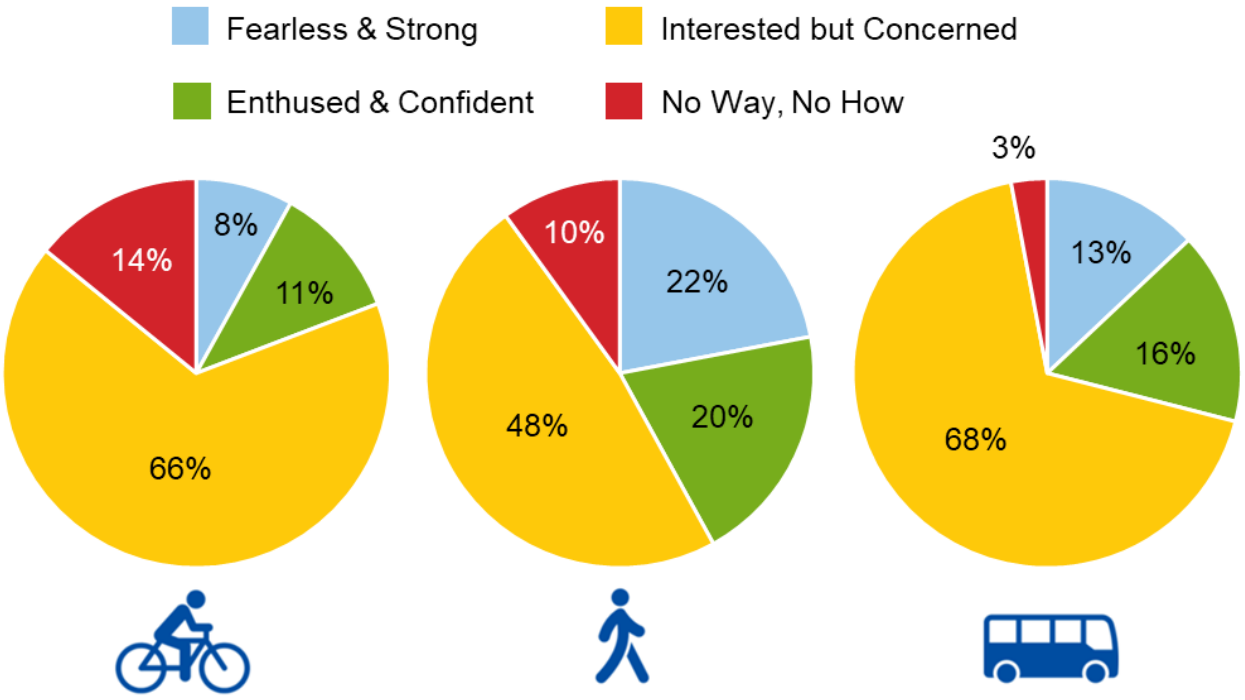
As part of the 2018 TMP, the Region commissioned an Alternative Transportation Modes Study to identify the barriers, behaviours, and attitudes that influence transportation mode choices within the Region. Findings from this survey suggest that residents are generally interested in using sustainable modes of transportation, such as public transit, walking, and cycling, but certain "barriers" were identified as hindrance to their widespread adoption. Respondents were classified into four broad categories:

- **Fearless and Strong:** Included those who rely on walking, cycling, or public transit as their primary mode of transportation;
- **Enthused and Confident:** Included those who would probably consider walking, cycling, or public transit as their primary mode of transportation;
- **Interested but Concerned:** Included those who may consider walking, cycling, or public transit as their primary mode of transportation if barriers to adoption were addressed; and
- **No Way No How:** Included those who would not consider walking, cycling, or public transit as their primary mode of transportation because it would not be feasible even if their barriers to adoption were addressed.

As shown in Exhibit 3.18, the survey found a significant number of residents fell within the "Interested but Concerned" category. This implies they may consider walking, cycling, or public transit if barriers to using these modes were addressed. This suggests there is

considerable opportunity to increase walking, cycling, and public transit use if barriers can be mitigated.

EXHIBIT 3.18: ATTITUDES IN WATERLOO REGION TOWARDS CYCLING, WALKING, AND TRANSIT



Source: Alternative Transportation Modes Study, *Report of* Findings, 2017.

Respondents within the "Interested but Concerned" category identified the following reasons as their top three barriers preventing them from using each travel mode:

Cycling

1. Long distances and travel time between destinations
2. Safety concerns
3. Lack of ability to carry items on a bicycle

Walking

1. Long distances and travel time between destinations
2. Lack of ability to carry heavy items
3. Physically exhausting

Public Transit

1. Long distances and travel time between destinations
2. Incoherence between transit and personal schedule
3. Requires too many connections to get to my destination

Addressing Barriers

The significant potential to increase the use of public transit, cycling or walking by the "Interested but Concerned" group means that all aspects of *Moving Forward* should attempt to address barriers. These barriers can be mitigated, as follows:

- **Long distances and travel time between destinations:** This barrier was cited for all three of walking, cycling and public transit, and generally relates to land use intensification (i.e. providing more meaningful destinations close by), directness of the route (i.e. the effective distance between destinations can be reduced if routes are more direct), and the speed of public transit (i.e. measures such as transit priority can reduce delays for transit vehicles, reducing travel time).
- **Safety concerns:** This barrier was cited primarily for cycling, and has been a consistent finding in surveys of other Canadian cities with respect to cycling. This barrier can be mitigated through enhanced designs, including bike lanes and multi-use trails that are physically separated from traffic to enhance user comfort, and more education for drivers and cyclists.
- **Incoherence between transit and personal schedule:** Addressing these barriers cited for public transit means expanding the hours of service, making transit routes more direct for the majority of trip patterns, and improving the connections from transit stops to travellers' final destinations.



Chapter 4:
Defining Future Directions

4. Defining Future Directions

The preceding chapters provided an overview of the transportation system as it stands today, and trends and issues affecting travel and mode choice in the Region. The next step of the 2018 TMP development was to project growth to the future and determine what kind of network would best meet the goals and objectives of the 2018 TMP. After determining the network, a series of supporting strategies were developed to define specific tasks and policies to help achieve the vision and objectives.

Chapter 4 describes the process used to develop *Moving Forward* (2018 TMP), including a review of Regional population and employment forecasts, a description of the three proposed transportation network scenarios, and the process used to select a preferred network scenario.

Population and Employment Trends

While the Region's growth forecasts form the basis of the analysis and evaluations described in this report, the Region is also required to plan for the Province's Growth Plan for the Greater Golden Horseshoe (2017). The outcome of this separate set of forecasts (referred to as the "Places to Grow" forecasts) on future infrastructure needs were also tested as a sensitivity analysis as detailed in Appendix B – Network Assessment Report. The "Places to Grow" forecasts are higher than the Region's 'moderate growth forecast' by about 11% for population growth and 39% for employment growth when carried out to 2041. A summary of the two population forecasts is presented in Exhibit 4.1, and a summary of the two employment growth forecasts is presented in Exhibit 4.3. A map of the Region's growth forecast for population and employment is presented in Exhibit 4.2.

EXHIBIT 4.1: WATERLOO REGION POPULATION FORECASTS, 2016–2041

Municipality	2016[1]	2041		% Growth	
		Region[2]	Places to Grow[3]	Region	Places to Grow
Cambridge	129,920	185,120	205,480	42.5%	58.2%
Kitchener	233,220	318,330	345,340	36.5%	48.1%
Waterloo	104,990	140,430	149,970	33.8%	42.8%
Townships	67,030	105,500	134,250	57.4%	100.3%
Region Total	**535,150**	**749,380**	**835,040**	**40.0%**	**56.0%**

Source: [1] Statistics Canada, 2016 [2] Region of Waterloo moderate forecast, 2018 [3] Places to Grow, 2017.

EXHIBIT 4.2: WATERLOO REGION POPULATION AND EMPLOYMENT CHANGE, 2011–2041

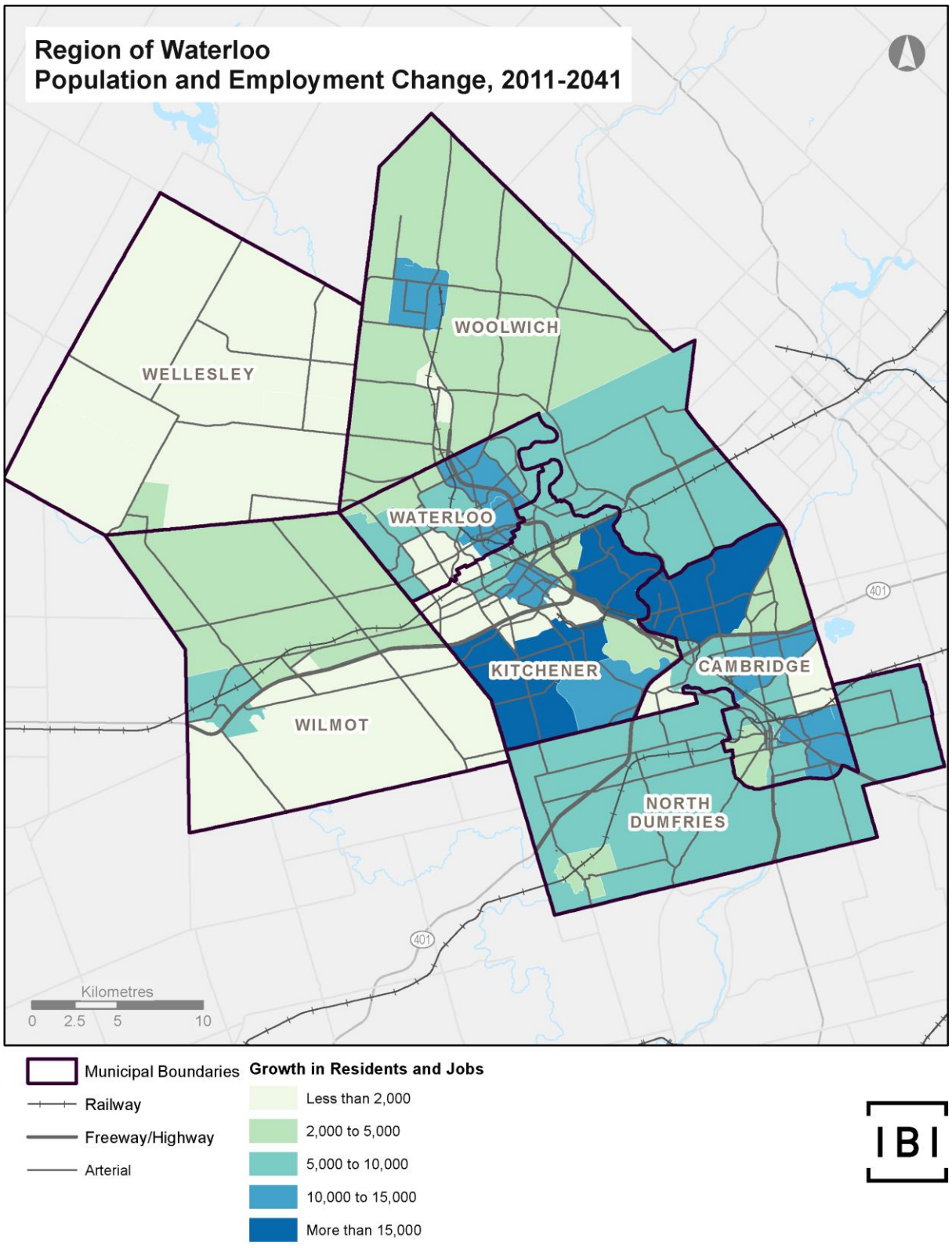


EXHIBIT 4.3: WATERLOO REGION EMPLOYMENT FORECASTS, 2016–2041

Municipality	2016[1]	2041		% Growth	
		Region[2]	Places to Grow[3]	Region	Places to Grow
Cambridge	61,440	87,540	98,470	42.5%	60.3%
Kitchener	82,640	108,880	103,640	31.8%	25.4%
Waterloo	58,340	85,000	84,470	45.7%	44.8%
Townships	24,830	34,890	117,440	40.5%	373.0%
Region Total	**230,220**	**316,320**	**404,000**	**39.2%**	**77.8%**

Source: [1] Statistics Canada, 2016 [2] Region of Waterloo moderate forecast, 2018 [3] Places to Grow, 2017.

Mode Share Targets

Mode share targets for the 2018 TMP were developed based on targets presented in the 2010 RTMP. When revisited in 2018, these targets were determined to be very ambitious in the short term given that population and employment growth within the Region has not kept pace with assumptions made when the targets were developed. Achieving the 2010 RTMP targets by 2031 would require a tremendous modal shift away from private automobiles in the short term, hence it was decided that these targets should be adjusted to better reflect recent transit ridership and mode share trends within the Region.

The 2018 TMP mode share targets, presented in Exhibit 4.4, have been changed in two ways. First, the 2010 RTMP targets have been carried forward to a horizon year of 2041, and second, the targets are now applied across the whole p.m. peak period between 2:30 p.m. and 5:30 p.m. (three hours, compared to one hour). Moving the horizon year to 2041 allows more time for travellers to change their behaviours, while changing the measurement from the p.m. peak hour to the peak period allows for more school and discretionary trips to be included.

In addition to the final 2041 targets, interim 2031 mode share targets were estimated. Although the pace for achieving these mode share targets appears to be slower than what was proposed in the 2010 RTMP, the new targets still require strong investments to be made in transit and active transportation. These mode share targets, specifically transit mode shares, were used as the basis for developing the Region's transit strategy, which is summarized in **Strategy 3: Develop a Frequent Transit Network** and detailed in Appendix G – Transit Strategy Report.

EXHIBIT 4.4: PM PEAK PERIOD (2:30 P.M.–5:30 P.M.) MODE SHARE TARGETS FOR *MOVING FORWARD*

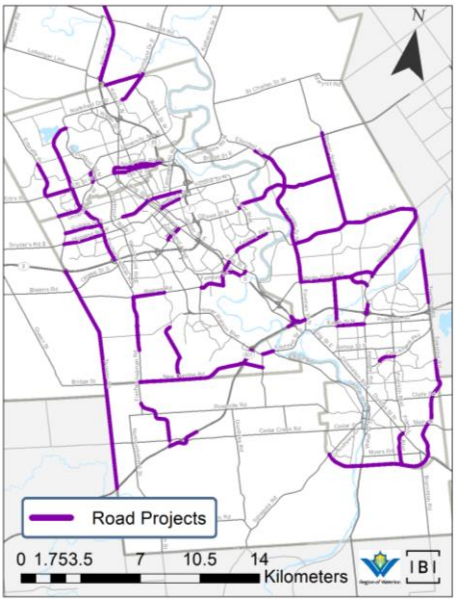
Travel Mode	PM Peak Period Mode Shares		
	2016 (actual)*	2031 (target)	2041 (target)
Auto Driver	69.8%	63.6%	58.0%
Auto Passenger	12.3%	12.3%	12.0%
Transit	4.9%	9.7%	14.8%
Walk	7.2%	8.4%	9.0%
Cycle	1.4%	2.3%	3.0%
School Bus	3.8%	3.1%	2.7%
Other	0.6%	0.6%	0.5%
Total	**100.0%**	**100.0%**	**100.0%**

*** Source:** Transportation Tomorrow Survey, 2016.

Scenario Development and Evaluation

Three scenarios were developed to represent a range of possible alternatives to deliver a future transportation network within the Region. This section describes how the scenarios were developed and evaluated, and how the preferred 'hybrid' transportation network was identified.

Scenario 1: Extend the 2010 Regional Transportation Master Plan to 2041

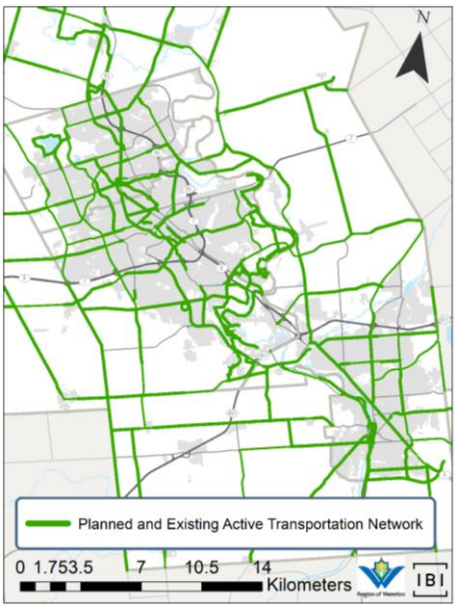


This scenario assumed recommendations from the 2010 RTMP would be extended from the original horizon year of 2031 to a horizon year of 2041. This provided a base to assess the future performance of the transportation network identified in the 2010 RTMP and to determine what additional infrastructure will be required to attain the vision and goals of the 2018 TMP. A "Do-Nothing" scenario was also used to confirm road network needs and performance metrics, as detailed in Appendix B – Network Assessment Report**.** The recommendations in the 2010 RTMP included planned improvements to multiple aspects of the Region's transportation network, with a specific focus on investment in public transit service, improvements to cycling and walking, and expansions of Regional roads. Accordingly, Scenario 1 consists of projects with approved funding in the Region's 10-year Transportation Capital Program, as well as those with a high likelihood of being funded or implemented by 2031. Examples of these include the River

Road extension in south Kitchener, the Region's Active Transportation Master Plan (ATMP), and ION Stage 2 (i.e. extension of light rail transit) from Kitchener to Cambridge.

Scenario 2: More Investment in Transit and Active Transportation

The second scenario builds on Scenario 1 with the addition of more extensive transit, walking, and cycling investments, over and above those in Scenario 1, to provide residents with competitive forms of transportation in order to reduce car dependency and use. Transit projects identified in this scenario include additional rapid transit above that provided in Scenario 1, an all-day high-frequency transit network, more frequent off-peak service, and improved access to low-density areas. Active transportation improvements provided in Scenario 2 include the implementation of road diets, where one or more traffic lanes are removed and converted to separated bike lanes.



Scenario 3: New Mobility

The third scenario differs from the first two, as it reduces emphasis on "conventional" transportation in favour of new mobility options based on technological and social change. This scenario would greatly reduce the Region's investment in new road or transit capacity, instead diverting funds to services such as ride-sharing or autonomous vehicle pilot projects. Although it does not completely remove traditional transportation modes from consideration, Scenario 3 exists within a future where supply regulation, integrated mobility services, on-demand or dynamically-routed public transit, ride-hailing, and driverless transportation services exist and are used. This scenario attempts to determine how these and other new mobility trends can help the Region meet its transportation goals.



Scenario Evaluation

The Region maintains a travel demand forecasting model that associates population and employment with estimated amounts, distributions, and methods of travel within the Region and to/from external municipalities. The Region's model was updated and used to test the performance of the network planning scenarios. Details on the model, inputs, and methodology are provided in Appendix B – Network Assessment Report. The scenario

evaluation was "run" using the Region's 'moderate growth forecasts'. The outcome of the preferred transportation network was later assessed using the higher "Places to Grow" forecasts to identify sensitivities in the network. Mode shares were manually adjusted to the Region's policy mode share targets previously shown in Exhibit 4.4. Outputs from the Scenario 1 and Scenario 2 model "runs" form the basis of the scenario evaluation.

It was not possible to model and evaluate Scenario 3 in the same way as the other two network planning scenarios, as the direction of emerging initiatives in the realm of 'new mobility' may be influenced greatly by factors largely unknown at this time (e.g. rate of technology adoption, level of government regulation). Instead, the initiatives included in Scenario 3 were considered and assessed independently in the context of the recommended 2041 network plan, to determine how to best leverage their benefits in a way that achieves the Region's planning objectives. Results of this analysis are summarized in **Strategy 5: Position the Region for New Mobility** (starting on page 5-40) and are detailed in Appendix H – New Mobility in Waterloo Region Report.

A list of evaluation criteria and associated quantitative and qualitative scoring metrics was developed to test the ability of the network planning scenarios to meet the goals and objectives defined in this 2018 TMP. A summary of the scenario evaluation scoring is presented in Exhibit 4.5, while the complete results can be found in Appendix B – Network Assessment Report.

EXHIBIT 4.5: *MOVING FORWARD* SCENARIO EVALUATION FRAMEWORK AND SCORING

Attributes	Scenario Evaluation Criteria	Scoring Metrics	Scenario 1	Scenario 2
Goal 1: Optimize the Transportation System				
Efficiency of the road network	Roads are neither overbuilt or underbuilt	- % of congested regional roads (high volume-to-capacity, v/c) - % of uncongested regional roads (low v/c)	◕	○
	Delays during peak travel times are manageable	- Total cumulative vehicle delay		
Efficiency of transportation demand	People choose sustainable modes	- Transit mode share - Active transportation mode share	◔	◑
	People make shorter trips	- Average trip length		
Goal 1 Total:			◑	◔

Scoring for qualitative assessments are based on a five-category rating system:

Least Preferred ○ ◔ ◑ ◕ ● Most Preferred

EXHIBIT 4.5: *MOVING FORWARD* SCENARIO EVALUATION FRAMEWORK AND SCORING CONTINUED

Attributes	Scenario Evaluation Criteria	Scoring Metrics	Scenario 1	Scenario 2
Goal 2: Promote Travel Choice				
Quality of active transportation options	More people live near high-quality cycling facilities	- % of households within 1 km of high-quality cycling facilities	◑	●
	Regional roads include reserved space for cyclists	- % of regional roads with on-road cycling facilities		
	Regional roads offer physical separation of pedestrians, cyclists and motor vehicles	- % of regional roads with physically separated active transportation facilities		
Quality of public transit options	More people live near frequent transit service	- % of households within 500 m of frequent transit routes	◑	◕
	More transit service is offered	- Transit vehicle-hours per capita		
	Transit trips are faster and more reliable	- Qualitative assessment reflecting system attributes		
Goal 2 Total:			◑	●
Goal 3: Foster a Strong Economy				
Economic Competitiveness	Goods and services move with less delay	- Total cumulative vehicle delay on primary transit routes	◕	◔
	Employers have better access to labour market by transit	- % of possible home-to-work trips taking less than 45 min. by transit		
	Inter-city travel improvements support growth in employment and population	- Qualitative assessment reflecting system attributes		
	The Region is more attractive to prospective residents and workers	- Qualitative assessment reflecting system attributes		
Costs of Transportation	The total social benefits of transportation are higher	- Annual socio-economic benefit of travel	◑	◑
	User costs are lower	- Annual user cost of travel		
	Government capital costs are lower	- Average annual capital cost		
	Government operating costs are lower	- Average annual operating cost		
Goal 3 Total:			◕	◔

Scoring for qualitative assessments are based on a five-category rating system:

Least Preferred ○ ◔ ◑ ◕ ● Most Preferred

EXHIBIT 4.5: *MOVING FORWARD* SCENARIO EVALUATION FRAMEWORK AND SCORING CONTINUED

Attributes	Scenario Evaluation Criteria	Scoring Metrics	Scenario 1	Scenario 2
Goal 4: Support Sustainable Development				
Impacts on climate, air, land, and water	Less space is occupied by hard surfaces	- New lane-km of vehicle/ transit lanes	◔	◕
	Lower use of motor vehicles reduces emissions and noise	- Auto driver mode share		
Impacts on public health and safety	More travel by active modes reduces death from all causes	- Annual economic benefit of reduced mortality due to active transportation activity	◑	●
	Travel is safer	- Qualitative assessment reflecting system attributes		
Overall resilience	The system can withstand disruptions related to energy supply, security, and extreme weather associated with climate change	- Qualitative assessment reflecting system attributes	◑	◕
Goal 4 Total:			◑	◕
		Average Score (across all attributes):	◐	◐

Scoring for qualitative assessments are based on a five-category rating system:

Least Preferred ○ ◔ ◑ ◕ ● Most Preferred

Scenarios 1 and 2 each present their own benefits and drawbacks. In Scenario 1, Regional roads are neither overbuilt nor underbuilt. The transportation network manages road congestion and travel delays, and goods movement remains efficient even during peak travel times. However, the scenario does not make enough advancement towards addressing the Region's objective of reducing reliance on the automobile through increased use of alternative transit modes. As a result, the scenario does not score as high on goals associated with promoting travel choice and supporting sustainable development.

In Scenario 2, there are clear benefits to walking and cycling, and a shift in mode share towards these active transportation modes provides many health and societal benefits. Additionally, new higher-order transit (e.g. express routes, rapid transit) allows for better speed and reliability of service, making transit more attractive. However, the inclusion of a large number of "road diets" (reducing vehicle travel lanes to accommodate other transportation infrastructure) introduces significant road congestion and delays.

Preferred Hybrid Network

Based on the scenario evaluation, the preferred network was a hybrid of Scenario 1 and Scenario 2 developed by replacing the "low-scoring" projects in Scenario 1 with the "high-scoring projects" identified in Scenario 2. Individual projects, such as transit improvements and road expansions, were scored against the four overall goals of the 2018 TMP; optimize the transportation system, promote travel choice, foster a strong economy, and support sustainable development. Projects with total scores below 60% were identified as "low-scoring" projects, while projects scoring above 80% were identified as "high-scoring" projects. Based on these scores, the preferred 'hybrid' network was developed as follows:

- High-scoring road expansion projects from Scenario 1 were included in the 2041 network plan, while the lowest priority projects were deferred to a later horizon, to ensure that the road network will not be "overbuilt," and better allocate funds to where they are most needed.
- Some transit service enhancements (e.g. frequent bus network) considered in Scenario 2 were brought forward to the preferred network.
- Additional rapid transit routes beyond the Stage 2 ION LRT assessed in Scenario 2 with the highest potential for transit demand were recommended to be protected for future rapid transit service in the longer-term beyond 2041.
- High scoring road diet projects identified in Scenario 2 which addressed critical gaps in the transit or active transportation networks but did not significantly impede automobile use were recommended to be carried forward into the 2041 network plan.
- Initiatives from Scenario 3 were considered and assessed independently in the context of the recommended 2041 network plan to determine how to best leverage their benefits to achieve the Region's planning objectives. This was because of the major uncertainties associated with the state of the new mobility concepts in terms of technology adoption and impacts.

The resulting preferred 'hybrid' network supports a more balanced multi-modal system that best meets the overall transportation goals and objectives.



Chapter 5: New Strategies

5. New Strategies

The previous chapter defined the broad shape of the transportation network in 2041, which is to develop a road and transit network taking the best projects from the 2010 RTMP, deferring some lower performing road projects, and adding some new high-performance active transportation and transit projects that best support the Region's Vision.

Chapter 5 adds necessary details to the TMP, including the specific network elements (road, transit, and active transportation projects), supporting policies, and follow-up studies or plans that the Region will need to undertake.

Through the consultation undertaken for the 2018 TMP, five broad strategies were developed for the Region. These serve as the 'umbrella' policies, under which specific actions or projects should be undertaken. These consist of specific projects and strategic directions for active transportation, transportation demand management, Grand River Transit, roads and transportation system management, new mobility, and goods movement.

Strategy 1: Build a Transportation Network that Supports all Modes of Travel – This strategy orients the Region's transportation network to explicitly support walking, cycling, transit, and traffic, including goods movement.

Strategy 2: Promote a Healthy Community – This strategy supports and builds on the link between active transportation, transit and health. The health aspect of transportation points towards improvements to the walking and cycling network, policies to support walking and cycling to work and school, and other community-building policies and objectives such as enabling denser, more walkable neighbourhoods.

Strategy 3: Develop a Frequent Transit Network – The best and only way to meet the Region's mode share targets is to develop a transit network that supports the travel needs of the broad public. This strategy builds on ION rapid transit and continues an aggressive growth in transit service to 2041.

Strategy 4: Enhance Inter-Regional Connections – This strategy supports the Region's important position in Ontario's economy and encourages growth by strengthening the road and transit linkages to the Greater Toronto Area, the rest of Ontario, and beyond.

Strategy 5: Position the Region for New Mobility – While it is currently early days for connected and autonomous vehicles, it will be important for the Region to support the technology sector while maximizing the benefits of new mobility and minimize the potential negative consequences. This strategy provides some early direction for Regional policy in new mobility.

Strategy 1: Build a Transportation Network that Supports all Modes of Travel

This strategy lays out the transportation network developed through the scenario evaluation of Chapter 4. The network is based on carrying forward the best road, transit, and active transportation projects from the 2010 RTMP, deferring some lower-performing road projects, and adding the best-performing transit and active transportation infrastructure projects from Scenario 2. Road system management and goods movement are also included in this strategy.

Road Network

The recommendations for Regional roads are organized around a principle of "building a transportation network that supports all modes of travel," and include a strategic road expansion program targeted at managing traffic congestion and/or enabling development. The program is responding to allocated growth and development areas in the Region, but also the strong growth in transit and the Region's aggressive active transportation plan. This section describes the results of the individual road project evaluation and how these results inform the development of the recommended 2031 and 2041 network plans. The complete list of potential projects and the evaluation methodology can be found in Appendix B – Network Assessment Report.

Road Expansion Projects

"Road expansions" refer to projects involving extensions of existing roads, new road corridors, and road widenings that involve additional vehicle travel lanes. Many of the potential road expansion projects considered in this 2018 TMP had been previously evaluated as part of the 2010 RTMP, which presented a road network plan out to year 2031. There also exist a number of expansion projects that were not evaluated in the 2010 RTMP, but which have now become evident as valid potential projects given recent insights on travel patterns, future development, and other planning considerations.

As such, projects which were recommended for completion by 2031 in the 2010 RTMP, but were yet to be implemented, were assigned a baseline horizon of 2019-2031. Projects identified in the 2010 RTMP as needed beyond 2031 were assigned a baseline horizon of 2031-2041. These planning horizons were then refined through an evaluation process, which is detailed in Appendix B – Network Assessment Report. Based on the evaluation results, high-scoring projects were recommended for an earlier planning horizon, if possible, while low-scoring projects were recommended for deferral to a later planning horizon period relative to their established baseline horizon period.

Road Diet Projects

"Road diets" refer to projects involving a reduction in motorized vehicle travel lanes, often to accommodate other transportation infrastructure such as cycling facilities, enhanced pedestrian space, or dedicated transit lanes. The 2010 RTMP did not consider or evaluate any road diet projects, and therefore baseline planning horizons could not be assigned. Additionally, findings from the scenario evaluation (as described in Chapter 4) suggest that only the highest scoring road diet projects should be included in the recommended future network plan.

To select road diet projects and assign horizon years, an evaluation process similar to that used for road expansion projects was employed. This process assigned a planning horizon of 2019-2031 to high-scoring projects, while a planning horizon of 2031-2041 was assigned to moderately-scoring projects. Low-scoring projects were not included in the future network plan.

2031 Road Network

Road projects included in the recommended 2031 interim network are listed in Exhibit 5.1 and mapped in Exhibit 5.4. Major projects include the River Road extension, construction of the South Boundary Corridor and its connection to Franklin Boulevard, and the Fountain Street extension. Three road diet projects are also included, while the remaining projects represent road widenings and extensions. In total, the 2031 interim network has an additional 118 lane-km of vehicle travel lanes when compared to the base road network.

EXHIBIT 5.1: 2019–2031 WATERLOO REGIONAL ROAD PROJECTS

No.	Street	Type	Limits
1	Arthur Street South	Widening	Highway 85 to Sawmill Road
3	Northfield Drive East	Widening	Davenport Road to University Avenue
6	Fountain Street North	Extension	Victoria Street to 1.0 km northerly
9	Fischer-Hallman Road/ Bearinger Road	Widening	Columbia Street to Westmount Road
11	Erb Street West	Widening	Gateview Drive / Beechwood Drive to Wilmot Line
12	University Avenue West	Widening	Keats Way to Erb Street
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

EXHIBIT 5.1: 2019–2031 WATERLOO REGIONAL ROAD PROJECTS CONTINUED

No.	Street	Type	Limits
17	Highland Road West	Widening	Highland Hills Mall entrance to Ira Needles Boulevard
23	Trussler Road	Widening	Bleams Road to Highway 7/8
26	Bleams Road	Widening	Strasburg Road to Fischer-Hallman Road
29	Fairway Road North	Widening	River Road to Pebblecreek Drive
36	Fischer-Hallman Road	Widening	Bleams Road to Plains Road
39	River Road	Extension	King Street to Bleams Road/Manitou Drive
41	Fountain Street North	Widening	Kossuth Road to Maple Grove Road
42	Maple Grove Road	Widening	Fountain Street North to Hespeler Road
43	Speedsville Road	Widening	Maple Grove Road to Eagle Street North
49	Fountain Street South	Widening	Blair Road to Dickie Settlement Road
55	Can-Amera Parkway	Widening	Conestoga Boulevard to Franklin Boulevard
57	Townline Road	Widening	Saginaw Parkway to Avenue Road
62	Franklin Boulevard	Widening and Extension	Dundas Street to South Boundary Corridor
63	South Boundary Corridor	New Road	Water Street to Dundas Street
69	Eagle Street North	Widening	Speedsville Road to Hespeler Road
75	Westmount Road E	Widening	Fischer-Hallman Road to Block Line Road
A	Bridgeport Road/ Caroline Street North	Road Diet	Highway 85 to Erb Street West
E	Benton Street	Road Diet	King Street E to Courtland Avenue
F	Frederick Street	Road Diet	Lancaster Street E to King Street E

2041 Road Network

Road projects included in the recommended 2041 network are listed in Exhibit 5.2 and mapped in Exhibit 5.4. The road projects planned between 2031 and 2041 include several road extensions and new roads that will serve areas that are largely undeveloped today, but where significant future development is anticipated. There are also a number of road widening projects planned in the outer parts of Kitchener, Waterloo, and Cambridge, needed to accommodate future development in these areas. Lastly, three additional road diets were included within this timeframe. In total, the 2041 network plan amounts to an additional 231 lane-km of vehicle travel lanes, including 113 lane-km to be constructed in the period between 2031 and 2041.

EXHIBIT 5.2: 2031–2041 WATERLOO REGIONAL ROAD PROJECTS

No.	Street	Type	Limits
10	Erbsville Road	Widening	Erb Street to Columbia Street
20	Fountain Street North	Widening	Kossuth Road to Victoria Street
22	Shantz Station Road	Widening	New Highway 7 to Kossuth Road
28	Fairway Road South	Widening	King Street East to Wilson Avenue
31	Kossuth Road	Widening	Fountain Street to Hespeler Road
35	Hespeler Road	Widening	Maple Grove Road to the Regional boundary
44	Townline Road	Widening	Jamieson Parkway to Blackbridge Road
46	Fischer-Hallman Road	Extension	North of Roseville Road to Cedar Creek Road/ Highway 401
48	New Dundee Road	Extension	Crossing Highway 401, to Dickie Settlement Road
53	Hespeler Road	Widening	Old Hespeler Road to Queen Street West
60	East Boundary Corridor	New Road	Dundas Street to Townline Road
65	Arthur Street South	Widening	Sawmill Road to Listowel Road
66	Victoria Street South	Widening for Transit Lanes	Park Street to Lawrence Ave
67	Ottawa Street South	Widening	Charles Street to Mill Street
76	Homer Watson Blvd	Widening for Transit Lanes	Conestoga College Blvd to Manitou Drive

EXHIBIT 5.2: 2031–2041 WATERLOO REGIONAL ROAD PROJECTS CONTINUED

No.	Street	Type	Limits
B	Erb Street West	Road Diet	Caroline Street to Highway 85
C	Victoria Street South	Road Diet	Fischer-Hallman Road to Belmont Avenue West
D	Victoria Street North	Road Diet	Highway 7 to Park Street (in conjunction with completion of New Highway 7)

Despite road and transit improvements included in the recommended 2041 network plan, there were still a number of areas that the Regional travel demand model indicates will remain congested during peak travel periods based on findings. These areas include:

- **Downtown/Central Areas** (Kitchener, Waterloo, Hespeler, Preston, Galt);
- **University of Waterloo Area** (Laurelwood Drive, Erbsville Road at Columbia Street);
- **Northeast Kitchener** (some localized congestion around Bridgeport Bridge);
- **East Kitchener** (Victoria Street N, Fairway Road N);
- **Southeast Woolwich** (multiple Regional roads in the area);
- **Conestoga College Area** (Homer Watson Boulevard, Doon Village Road, Manitou Drive);
- **West Cambridge** (bridges on Park Hill Road W, Main Street, Concession Street); and
- **South Cambridge** (Water Street, Branchton Road, Dundas Street).

Projects Deferred Beyond 2041

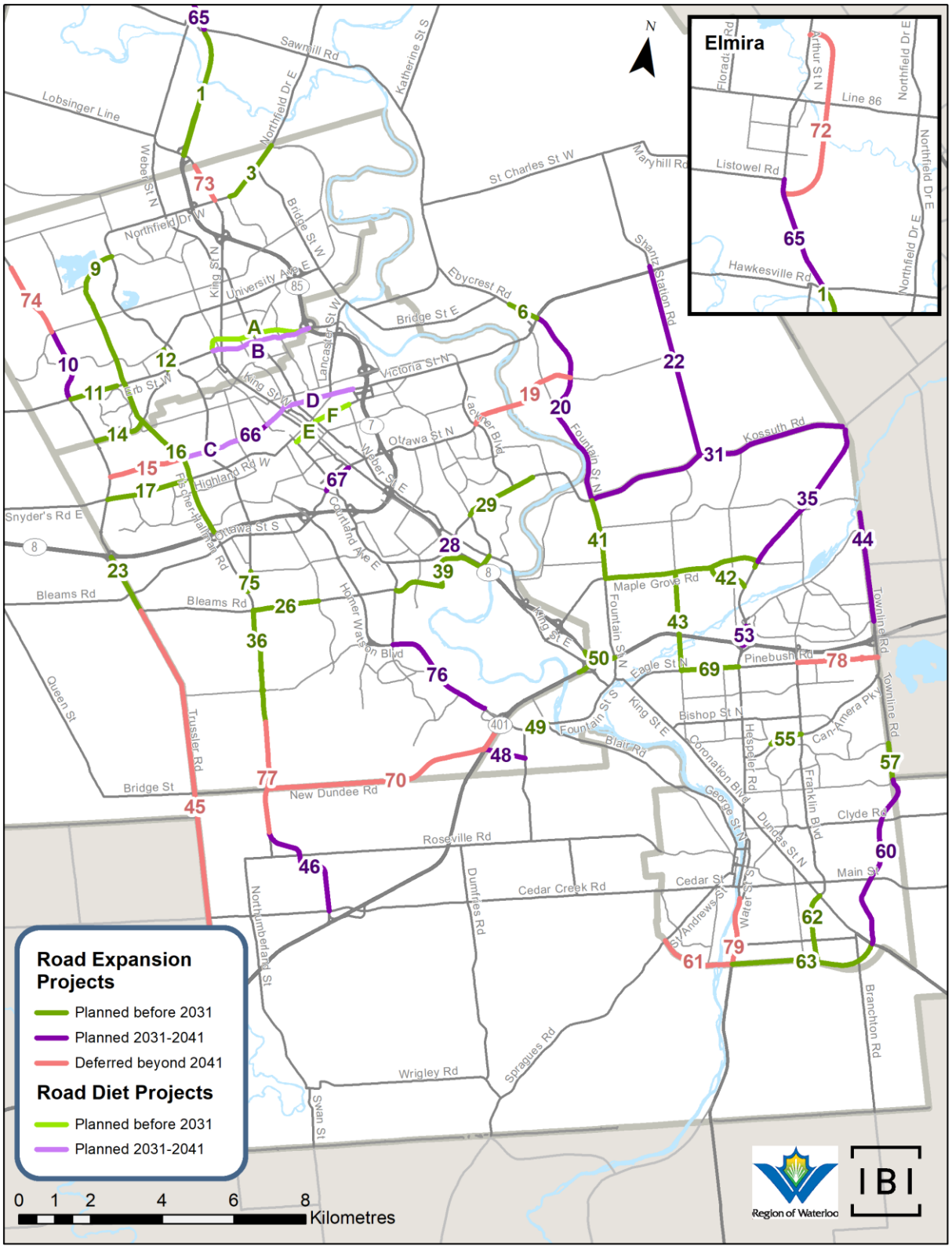
As stated in the planning directions for the development of the 2041 network plan, projects that scored poorly in the project evaluation were deferred to a later horizon year. This meant that low scoring projects having a baseline horizon year of 2031–2041 (i.e. beyond 2031 in the 2010 RTMP recommendations) were deferred to beyond 2041, and therefore were not included in the 2041 network plan.

The projects recommended for deferral beyond 2041 are listed in Exhibit 5.3 and mapped in Exhibit 5.4. The complete project evaluation results included in Appendix B – Network Assessment Report provide details on scoring rationale and reasons for deferral.

EXHIBIT 5.3: WATERLOO REGIONAL ROAD PROJECTS BEYOND 2041

No.	Street	Type	Limits
15	Victoria Street South	Widening	Ira Needles Boulevard to Fischer-Hallman Road South
19	Ottawa Street North	Widening & Extension	Old Chicopee Drive to Fountain Street North
45	Trussler Road	Widening	Bleams Road to Highway 401
61	Cambridge South Link	New Road	Water Street to Spragues Road
70	New Dundee Road	Widening	Fischer-Hallman Road to Homer Watson Boulevard
72	Elmira By-Pass road	New Road	North of Listowel Road
73	King Street N	Widening	Northland Road to Bridge Street W
74	Erbsville Road	Widening	Columbia Street W to Wideman Road
77	Fischer-Hallman Road	Widening	Plains Road to north of Roseville Road
78	Pinebush Road	Widening	Franklin Blvd to Townline Road
79	Water Street	Widening	South Boundary Corridor to Ainslie Street

EXHIBIT 5.4: WATERLOO REGIONAL ROADS EXPANSION PROGRAM, 2019 TO BEYOND 2041



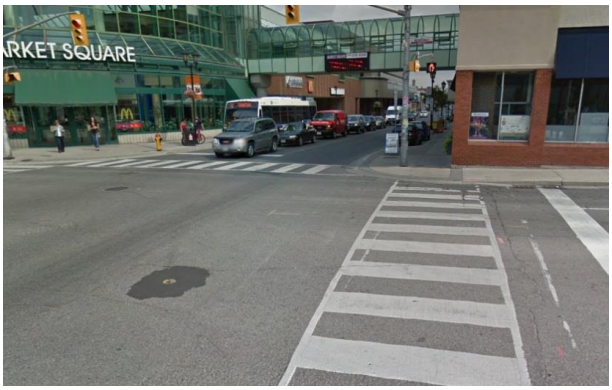
Road Safety

The Region of Waterloo has a comprehensive Road Safety Program with a goal to reduce all collisions, especially those involving serious injuries and deaths. The Region's Road Safety Program includes a multi-disciplined approach that encompasses the three key components of Engineering, Enforcement and Education. The Region's multi-disciplined approach includes collaboration with Waterloo Region Police Services (WRPS), Region Public Health and area municipality staff.

The Engineering component of the Road Safety Program includes a number of ongoing and annual initiatives such as network screening summarized in an annual Collision Report, systemic safety programs such as the Pedestrian Countdown Signal Program and the Leading Pedestrian Interval Program and the incorporation of proven safety countermeasures into all capital projects. Another key initiative is the Countermeasures Program. Following the Region's Annual Collision Report, staff review the top 10 locations for motor vehicle collisions, pedestrian collisions and cycling collisions in detail to determine if there were collision patterns that could be addressed by potential countermeasures. Typical countermeasures considered include:

- Roundabouts;
- Dual left-turn lanes;
- Fully-protected left-turn signal phases at signalized intersections;
- Raised medians and pedestrian refuge islands;
- Offset crosswalks (crosswalks set back further from intersections);
- Rumble strips;
- "Smart" channels;
- Additional illumination;
- Pedestrian countdown signals;
- High-visibility ladder crosswalks;
- Installation of cycling lanes to reduce cycling on sidewalks; and
- Road diets.





The Region's safety program also supports **Strategy 2: Promote a Healthy Community.**

Goods Movement

Most businesses will continue to move goods by truck over the next 20 years. Therefore, a well-functioning system of roads will continue to be critical to the Regional economy. Appendix D – Goods Movement Report includes strategic road capacity improvements designed to accommodate increased movement of people and goods. Many of these road improvements will be designed to improve traffic operations for large commercial vehicles. At the same time, the Region should encourage and support any initiatives by private sector businesses to reduce the volume and impacts of commercial vehicles on Region roads. This many mean using alternative delivery times, methods, or vehicles.

Truck Route Planning Principles

The Region's current truck route policy permits all heavy trucks to use Regional roads unless there are valid reasons for imposing prohibitions or time restrictions on a particular road, as per Schedule 19. The policy specifically states that prohibitions for heavy trucks should be considered for roadways not designed for heavy truck traffic or long vehicles. It goes on to further state that time restrictions should be considered when the section of roadway cuts through front-lotted urban residential areas with numerous driveways where no suitable alternative route (within a four-kilometre radius) is available.

In addition to the above policy, each heavy truck route should still exhibit basic truck route principles described below. A route that does not meet these principles may be considered for further exemption on a case-by-case basis.

- **Consider social, environmental and economic impacts** to determine the best method of routing trucks through the Region with the minimum visual, safety, noise, and traffic impacts, while retaining the most efficient system possible so goods can be delivered expeditiously.
- **Make routing consistency decisions** in a way that is as fair as possible to residents and businesses throughout the Region. For instance, time-of-day truck restrictions after business hours or part-time truck routes can be used to create a compromise between recognized truck route corridors and less compatible land uses.
- **Avoid parallel route duplication** based on the network of provincial highways and Regional Roads so that truck route redundancy (i.e. nearby parallel routes) are avoided where possible.
- **Prioritize transportation corridors** with separated or protected active transportation facilities as part of the goods movement network.
- **Minimize the demand for enforcement** by Waterloo Region Police with a truck route system that is logical to the trucking industry so that the routes do not require high levels of police enforcement to establish and maintain compliance.

- **Provide route connectivity and continuity** with a continuous truck route system that follows the Regional road network.

Appendix D – Goods Movement Report includes data on existing goods movement flows, into, out of, and through the Region. It also recommends that a Goods Movement Study be prepared for the Region and a Terms of Reference for this study was included in the report. The Goods Movement Report also includes further information on goods movement by rail, aviation, and bicycles, as well as emerging trends related to greening goods movement, off-peak delivery programs, automation of goods movement, and aerial delivery drones.

A Strategy for Curbside Management

Curbside management involves policies and practices to allocate the use of space along the edge of public streets. A public curbside, which represents the space along the street between travel lanes and sidewalk, is very valuable especially in downtowns. It is most commonly used for motorized vehicle parking, but is also shared with goods delivery vehicles, pedestrians and cyclists, transit stops, for-hire vehicles (i.e. taxis, Uber), emergency services, curbside waste management, and sidewalk vendors. The use and management of curbside space affects the vitality of adjacent businesses and the overall hospitality of downtowns and local neighborhoods. In Ontario the design of curbside space must also be AODA compliant.

In the Region, the design of curbside space is guided by the Region's Context Sensitive Regional Transportation Corridor Design Guidelines (March 2013). These guidelines provide for safe, convenient and comfortable movement of goods and people including access management. Examples of Regional Roads through downtown areas include King Street North in Uptown Waterloo, Water Street in the Galt core of Cambridge, King Street in St. Jacobs, and Snyder's Road East in Baden.

These streets typically have street-oriented built forms that often constrain the curbside space. Design guidelines for these and other Main Streets also integrate sustainable and active forms of transportation (transit, cycling, walking) within the public right-of-way on Regional Roads. While these guidelines can be applied to the management of curbside space on Regional Roads, they do not provide direction on how this space is used. One of the challenges for curbside management on these types of downtown streets is to balance the need for road mobility with boulevard access, sometimes in a constrained right of way, while preserving key characteristics of streets, including natural and built heritage features.

A further peer review of other municipal curbside management strategies has identified a number of tactics that could be considered for implementation to manage curbsides in the Region in association with the local municipalities:

- Allow taxis (both regular and auxiliary) to use fire hydrants as waiting areas to reduce stopping randomly along the street;
- Include Designated Delivery Vehicle Parking Zones in the municipal Traffic and Parking Bylaws;
- Partner with downtown Business Improvement Areas (BIAs) to undertake a pilot permitting system to control unique loading circumstances in high demand locations;
- Support the expanded use of off-peak deliveries in the downtowns;
- Provide supportive information to couriers and other service delivery vehicles to guide where and where not to park;
- Maximize the use of off-street parking through parking fees, signage, wayfinding and smart phone apps in order to reduce demands for on-street parking; and
- Explore curbside needs of the accessibility community by reviewing the availability of pick-up / drop-off and accessible parking locations for the disabled with the Region's Grand River Accessibility Advisory Committee.

One of the key requirements for the Region in implementing these and other curbside management tactics is the need for a consistent, coordinated approach between the Region and local municipalities. A consistent approach will treat municipalities, businesses and other curbside users equitably and achieve broader and more effective urban design and transportation planning outcomes in a coordinated manner. Therefore, the primary focus of this curbside management strategy will be to develop of a regionally consistent approach, especially in the key Regional corridors where the Region and community are making substantial investment in transportation and streetscape infrastructure.

Strategy 1 Directions

Based on the road projects, road system management and safety considerations, and goods movement strategies discussed in this section, the Region has adopted the following six policy directions to build a transportation network that supports all modes of travel:

1. **Complete projects in progress** (ION, Active Transportation Master Plan, etc.) to provide a foundation for a multi-modal focus moving forward.

2. **Slow implementation of some road widening.** Projects should continue to be driven by development and congestion.

3. **Review Regional Corridor Design Guidelines** to continue to support urban intensification, enhance comfort and convenience for all users, encourage reduced traffic speeds, and accommodate all modes of transportation.

4. **Support reduced or eliminated parking rate minimums** in area municipal zoning bylaws for new developments.

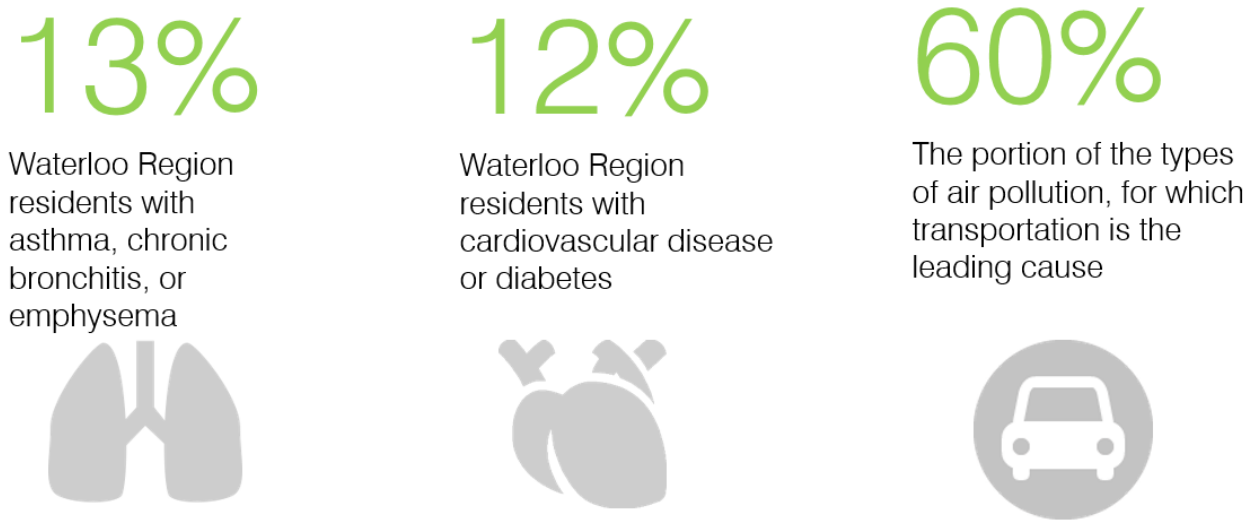
5. **Undertake a goods movement study** to identify how the Region could manage the transportation system differently to respond to local needs (e.g. should some Regional roads prioritize or prohibit trucks?) or changes in society and technology (e.g. does online shopping and delivery significantly alter the Region's needs?).

6. **Proactively manage transportation demand** by funding transportation demand management through capital projects and development charges, to facilitate reducing the need for travel or the shifting of trips to different times, routes, or modes.

Strategy 2: Promote a Healthy Community

One of the key messages heard from the public is the need to support healthy lifestyles and a healthy community. As shown in Exhibit 5.5, there are a number of residents in the Region are at a higher risk of health effects from poor air quality, and less sustainable modes of transportation are a major source of air pollution. This 2018 TMP makes promoting a healthy community one of its feature strategies by encouraging sustainable transportation choices, which have positive impacts on public health, safety, and the environment. This strategy and policy objective is reflected throughout the 2018 TMP through the modal share targets, scenario development and evaluation, network planning, and supporting policies. This section details two specific topics relating directly to public health: active transportation through the recommended walking and cycling network, and travel demand management.

EXHIBIT 5.5: WATERLOO REGION RESIDENTS AT A HIGHER RISK OF AIR QUALITY-RELATED HEALTH IMPACTS



Walking and Cycling Network

The Region's 2014 Active Transportation Master Plan (ATMP) provides a strong basis for the delivery of the active transportation network and supporting strategies. Through the development of the 2014 ATMP, three specific streams for network development were identified under the broader Network Action Plan umbrella:

1. **Transportation Capital Program Action Plan:** The Transportation Capital Program (TCP) Action Plan confirmed the walking and cycling facilities to be included as part of the other transportation projects in the TCP.

2. **Gaps/Infill Action Plan:** The Gaps/Infill Action Plan analyzed the gaps remaining in the network that were not addressed by the TCP in 2014. In other words, it outlined which walking and cycling facilities recommended within Regional corridors were not included in the 10-year TCP at that time.

3. **Fix-It List Action Plan:** This action plan consisted of additional localized or "spot" improvements that fine-tuned existing or planned facilities, but which did not alter the overall network. For example, upgrades to intersections, improvements to interchange ramp crossings or curb cuts to improve transitions between trails and bike lanes.

Network

The 2018 TMP incorporates the 2014 ATMP, and endorses the policy and network recommendations within the ATMP including the network action items above. The following provides a broad description of the 2014 ATMP policy framework:

- Every Regional Road should have walking facilities on both sides in built-up urban areas.
- The 2014 ATMP should be pursued according to schedule. The Region should periodically update it and identify opportunities to upgrade facilities to improve physical separation from motor vehicles, cross major barriers such as highways and rivers, and enhance network connections.
- Enhance walk and bike access to transit to improve first- and last-mile connections, and integrate active transportation with city facilities and destinations.



As part of the 2018 TMP, the 2014 ATMP implementation status was reviewed. The review also included assessment of potential changes to the network, considering recent trends since the ATMP

was prepared, such as increased emphasis on separated bicycle facilities. More details are provided in Appendix E – Active Transportation Network Strategy.

The Region's Transportation Demand Management Program (TravelWise) is described in detail in the following section. The Region should, through TravelWise, emphasize safe, active travel for children and youth travelling to and from school and other locations. The Region should also continue to engage with other sectors to emphasize safety in design and monitoring. This may include working with police to determine opportunities/needs for enforcement including automated speed enforcement (ASE) in school zones, and working with Public Health and Emergency Services to help define and measure the health benefits of cycling, walking, and transit use in the Region.

Cycling Facility Upgrades

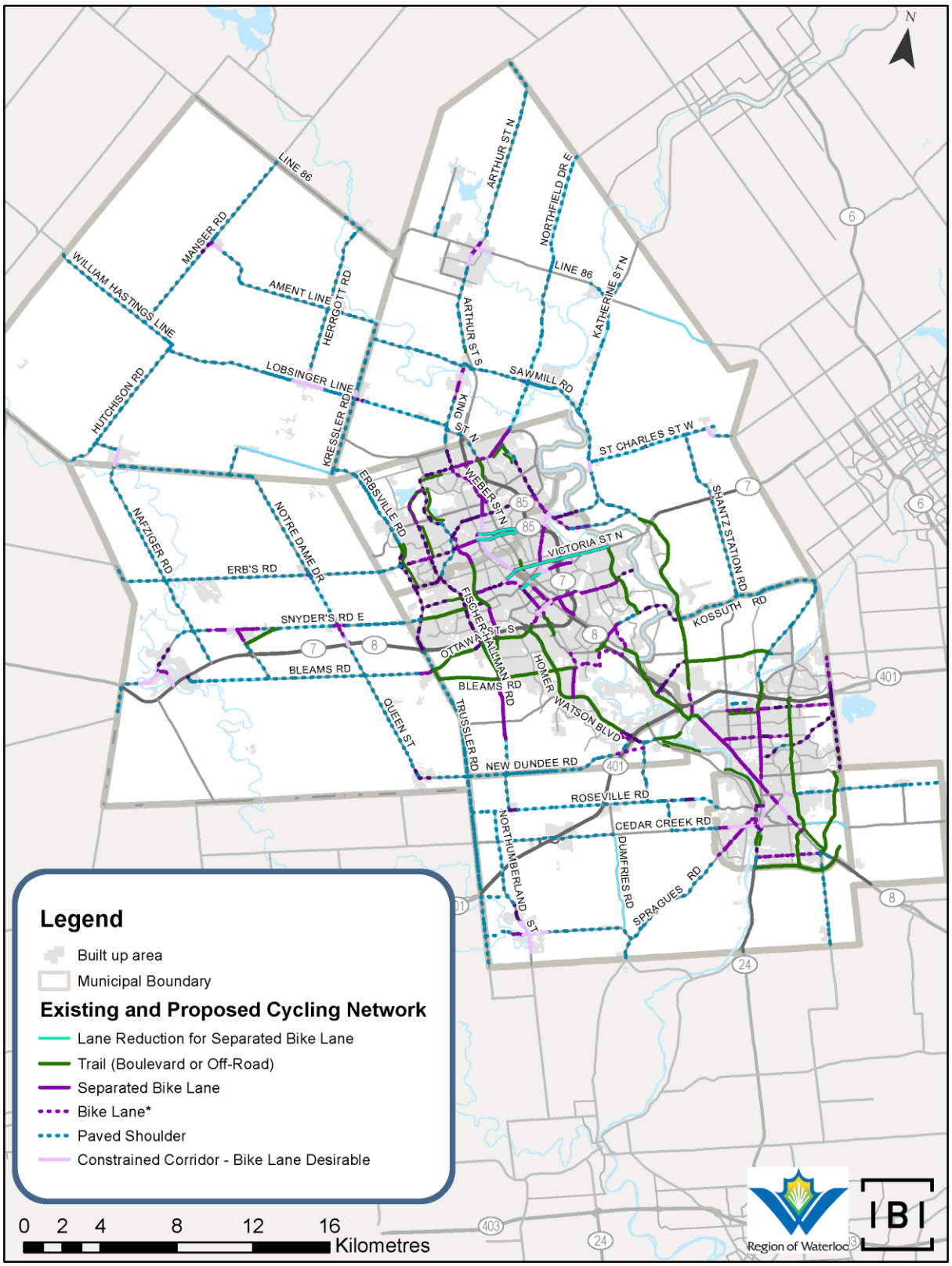
A key policy identified for *Moving Forward* is to increase the physical separation between motor vehicles and cyclists where possible. There are several reasons why this would be desirable:

- Regional roads typically accommodate more than 10,000 vehicles per day at speeds equal to or greater than 50 km/h. These types of roadways can make cycling intimidating or uncomfortable without separation.
- There is a desire to attract the "Interested but Concerned" demographic to cycling, as identified through the Alternative Transportation Modes Study described in Chapter 3 (starting on page 3-20). Emerging best practices in the fields of cycling planning and design recognize the importance of separated facilities in attracting new riders.
- The thoughtful design of separated facilities at intersections provides more opportunities to implement cyclist priority through enhanced intersection designs, such as protected intersections and/or leading and protected cycling signal phases.

Despite the benefits of separated cycling facilities, it is important to note that not all corridors will require or be candidates. Rural roads and roads with lower speeds may not require separated facilities. Where the availability of space is a major constraint, priority for other modes (e.g. walking) may take precedence. In addition, the desire to maintain consistency of the facility (e.g. connected bike lanes) may lead to a preference for bicycle lanes over separated facilities. It is also key that winter maintenance be provided for cycling facilities to enable their safe use year-round.

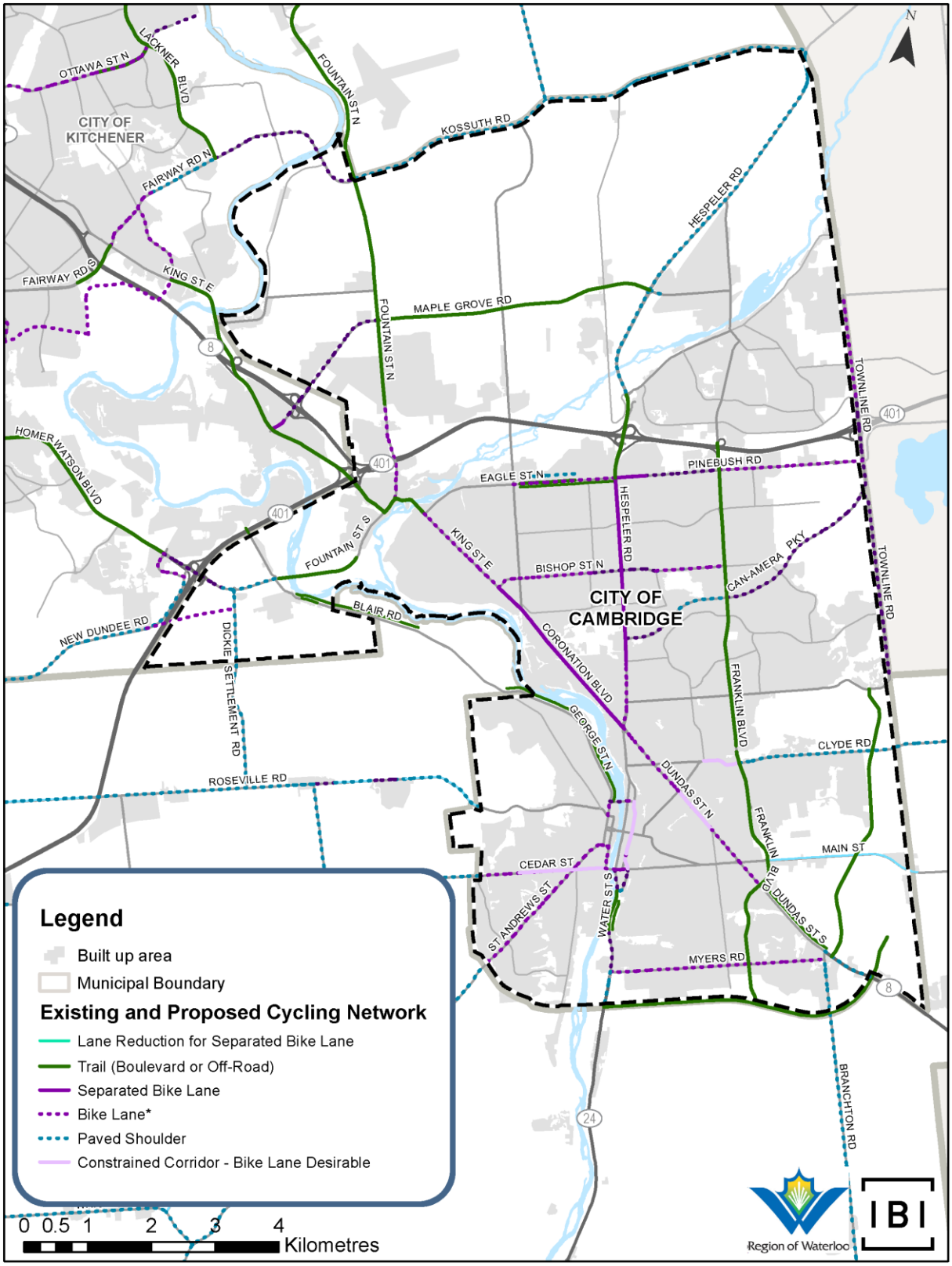
The 2018 TMP review of corridors with potential for facility upgrade is reflected through the recommended network map in Exhibit 5.6. Maps in Exhibit 5.7, Exhibit 5.8, and Exhibit 5.9 provide more detailed views of the recommended transportation network in Cambridge, Kitchener, and Waterloo, respectively.

EXHIBIT 5.6: 2041 WATERLOO REGION ACTIVE TRANSPORTATION NETWORK



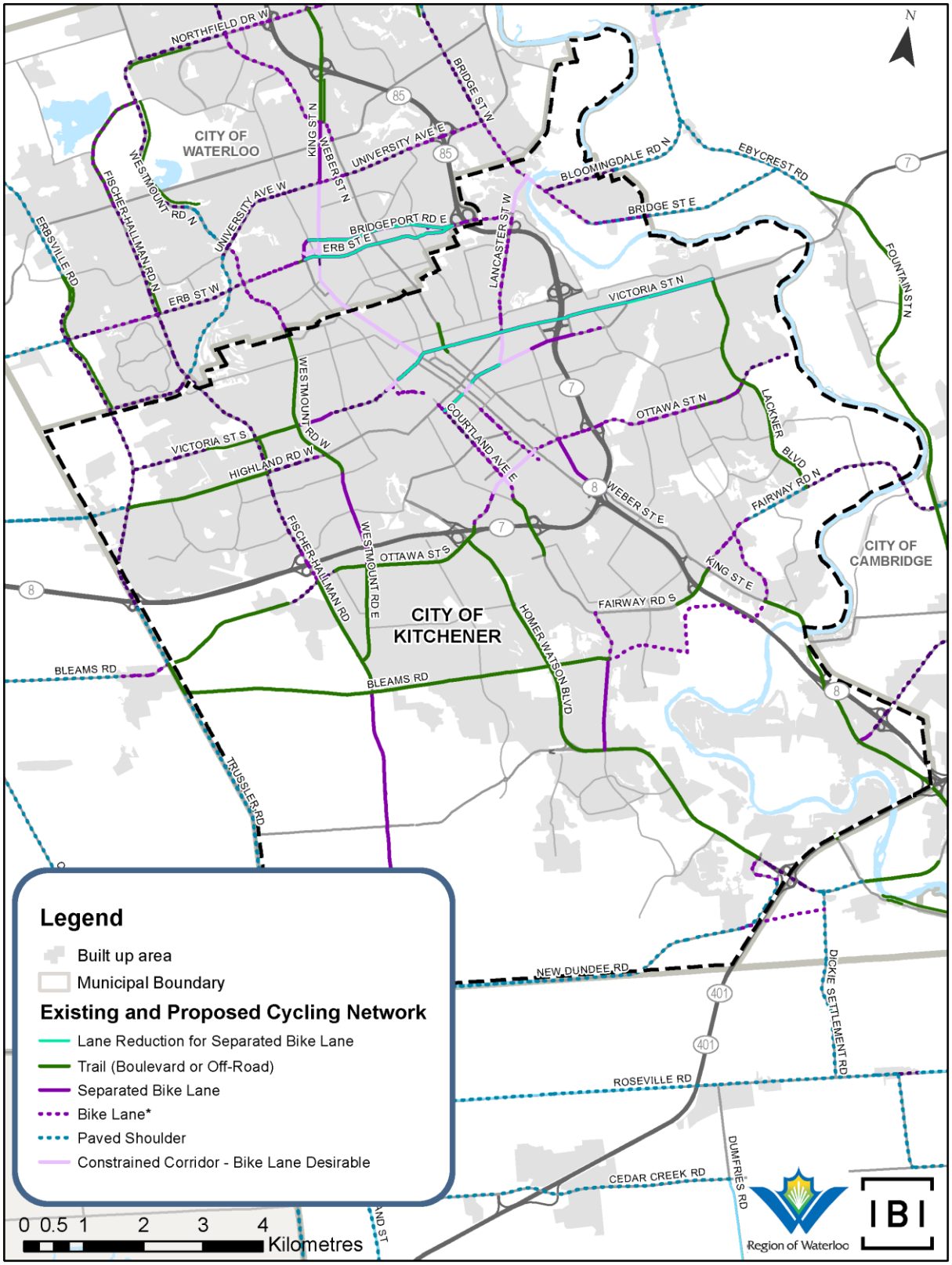
* Opportunities to upgrade proposed bike lanes to protected cycling facilities

EXHIBIT 5.7: 2041 WATERLOO REGION ACTIVE TRANSPORTATION NETWORK (CAMBRIDGE)



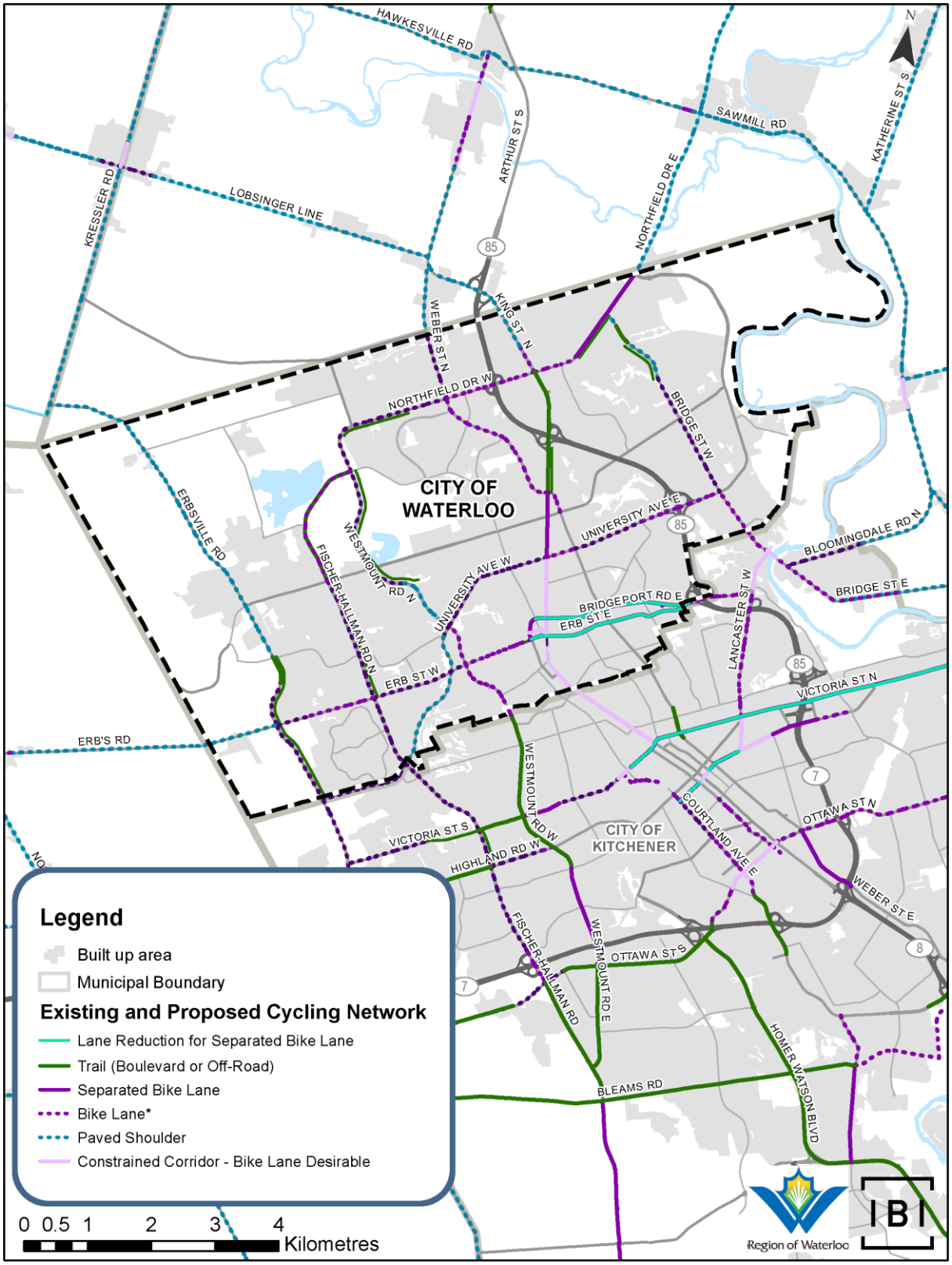
* Opportunities to upgrade proposed bike lanes to protected cycling facilities

EXHIBIT 5.8: 2041 WATERLOO REGION ACTIVE TRANSPORTATION NETWORK (KITCHENER)



* Opportunities to upgrade proposed bike lanes to protected cycling facilities

EXHIBIT 5.9: 2041 WATERLOO REGION ACTIVE TRANSPORTATION NETWORK (WATERLOO)



* Opportunities to upgrade proposed bike lanes to protected cycling facilities



Transportation Demand Management

The overarching goal of transportation demand management (TDM) policies and programs is to create a more sustainable transportation system by influencing personal travel decisions. The objectives of TDM include minimizing the number of people who choose to drive motor vehicles, reducing the length and frequency of their driving trips, and encouraging drivers to avoid travel during congested times. TDM is particularly effective when applied in conjunction with improvements to transportation infrastructure and services.

The TDM strategy developed as part of *Moving Forward* has been developed and evaluated based on nine key themes. These themes relate to three overall Regional TDM focuses – overall program, key audiences, and sustainable modes – and are as follows:

- Program development and support;
- Community programs;
- Workplace programs;
- School programs;
- New development;
- Active transportation;
- Transit;
- Ridesharing; and
- New mobility.

Current Five-Year TDM Program Plan

In 2017, Council approved the *Transportation Demand Management Program Plan 2017-2021*, a comprehensive roadmap for TDM in the Region over the next five years. The plan includes eight program goals, each of which is accompanied by a list of ongoing and proposed TDM initiatives. The plan's eight goals, with short descriptions, are:

1. **Program integration and coordination:** Align TDM programs and services with existing policies while refining program direction to maximize resources.
2. **TravelWise TMA:** Expand services for existing TravelWise Transportation Management Association (TMA) members that provide further incentives and offer greater choice in travel to employees, while promoting membership to organizations located in areas surrounding new and existing transit services.
3. **Development application and review:** Support inclusion of TDM principles in station area planning and development application processes, and encourage developer participation in the TravelWise TMA.
4. **Residential and school-based TDM programs:** Offer a suite of services and TDM planning tools and objectives for residential neighbourhoods and school-based audiences (TravelWise@Home, TravelWise@School).
5. **Performance monitoring:** Provide tangible annual indicators of program activities and monitor uptake of commuter services.
6. **TDM for Regional employees:** Increase and improve commuter options and services to enable Regional staff to lead by example. The TDM Program continues to act as the workplace champion and staff liaison for the internal TravelWise program.
7. **Community outreach:** Provide mode-specific, relevant messaging that informs and educates residents, to foster travel behaviour change.
8. **Transportation network improvements:** Leverage and promote strategic improvements to the transportation network that increase the competitiveness of sustainable modes of transportation.

Recommendations

Building on the existing five-year TDM program plan, *Moving Forward* provides a set of recommended measures based on a thorough evaluation process. The recommended measures have also been categorized based on the nine TDM themes. Detailed descriptions of the candidate measures, the evaluation process, and a list of all recommended measures are provided in Appendix F – Transportation Demand Management Report.

Exhibit 5.10 summarizes the highest-priority TDM measures identified for the Region, relating to the themes of program management, workplace programs, new development, and transit. All high priority TDM measures are recommended to start in the short- or medium-term (2019-2021 or 2022-2026, respectively), and some have been identified as

"foundational steps" or "quick wins." Foundational steps are expected to play an important role in enabling the success of other recommended TDM measures, while quick wins are measures that would offer significant immediate benefits for the Region.

EXHIBIT 5.10: HIGH PRIORITY TDM MEASURES FOR WATERLOO REGION

Theme	TDM Measure	Timing	Attributes
Program Management	Allocate TDM funding from capital project budgets to enable delivery of selected residential, workplace, and school measures	2019-2041	Quick Win
Workplace Programs	Enhance TravelWise TMA services: - Enhance Corporate Pass - Extend advisory services to electric vehicle charging, last-mile freight delivery, and flexible work arrangements Offer selected free services to non-members	2019-2041	Quick Win
Workplace Programs	Build TravelWise TMA membership: - Simplify legal agreement - Enhance recognition program - Conduct membership campaign around ION/iXpress stations - Expand Developer member category Partner with Conestoga College	2019-2041	Foundational Step
New Development	Establish process to involve TDM and GRT staff earlier in development approvals	2019-2041	Foundational Step
New Development	Update the Region's TIS guidelines to integrate multi-modal approaches to LOS, complete streets, and other issues	2019-2021	Foundational Step
Transit	Deliver transit promotions to homes near new rapid transit stations	2019-2041	Quick Win
Transit	Establish processes for GRT and TDM involvement in special event planning, and promote integrated ticketing and other measures by event hosts	2019-2041	Quick Win
Transit	Enhance public outreach including transit training, possible conversion of retired bus for education/consultation	2022-2041	Foundational Step

TDM Delivery Framework

The TDM measures recommended here reflect the desire to create a stronger framework for TDM governance and service delivery based on five key principles. These are:

Transforming the Transit Development Unit into an Integrated Mobility Unit: By adding a new staff resource dedicated to the development of active transportation facilities and services, GRT's Transit Development unit can become an Integrated Mobility unit.

Better Coordinating TDM-Related Activities within the Region's Staff Structure: Creating an internal Active Transportation Coordinating Committee will help connect Transit Development teams and staff to TDM staff.

Better Coordinating TDM-Related Activities with External Partners and Stakeholders: Creating a Regional TDM Working Group that includes a broad range of representatives will raise the profile of TDM, help identify shared objectives, and help deliver initiatives.

Building Support for TDM and Integrated Mobility among Elected Officials: Enhancing the performance measurement and reporting of the Region's TDM and active transportation programs will help strengthen support for the Region's TDM program within Council.

Preserving and Strengthening the Current Partnership with Sustainable Waterloo Region for Workplace TDM Programs: The partnership with Sustainable Waterloo Region has proven to be both effective and efficient over a number of years. It allows SWR to build on important synergies with its workplace-focused programs in other sectors, and to leverage its credibility with employers and its skill in customer relations.

Strategy 2 Directions

Based on the walking and cycling projects and transportation demand management strategies discussed in this section, the Region has adopted the following policy directions to promote a healthy community:

1. **Update and Incorporate the Active Transportation Master Plan:**
    - Identify opportunities to upgrade facilities to improve separation from traffic, such as separated bike lanes or multi-use trails;
    - Identify opportunities for, and implement, crossings of major barriers such as highways and rivers;
    - Enhance network connections, such as more convenient and comfortable trails crossings of Regional roads;
    - Enhance walk and bike access to transit, such as through improved winter maintenance of bus stops and bike parking at major transit nodes; and

- Integrate active transportation with municipal facilities and designations, such as providing more bike parking and enhanced site designs.

2. **Emphasize safe, active travel for children** travelling to/from school and other destinations, through programs such as TravelWise or Active and Safe Routes to School.

3. **Continue to engage with other stakeholders** to emphasize safety in design and monitoring, such as working with police to determine opportunities/needs for enforcement, including automated speed enforcement (ASE) in school zones.

4. **Define and measure** the health benefits for people walking, cycling, and taking public transit in and around the Region, working with Public Health and Emergency Services using epidemiology and health analytics tools.



Strategy 3: Develop a Frequent Transit Network

The new transit strategy for the Region was developed to build on the existing transit network and services provided by GRT. These changes and improvements were selected based on a review of the trends, outlooks, and opportunities identified in Chapter 3, and also consider current plans and projects including the ION LRT, GRT 2017-2021 Business Plan, and Metrolinx Regional Transportation Plan. Appendix G – Transit Strategy Report

describes the details of these changes to the Region's transit network, which have been specifically designed to meet three of the objectives for *Moving Forward*:

- Improve connections to rapid transit for all modes;
- Take advantage of the Region's strengths as an innovation hub; and
- Support economic growth.

2041 Transit Network

The recommended Grand River Transit network and service strategy adopted in the 2018 TMP provides a number of improvements to the Region's existing transit network by 2041. These are shown on the map in Exhibit 5.11 and include:

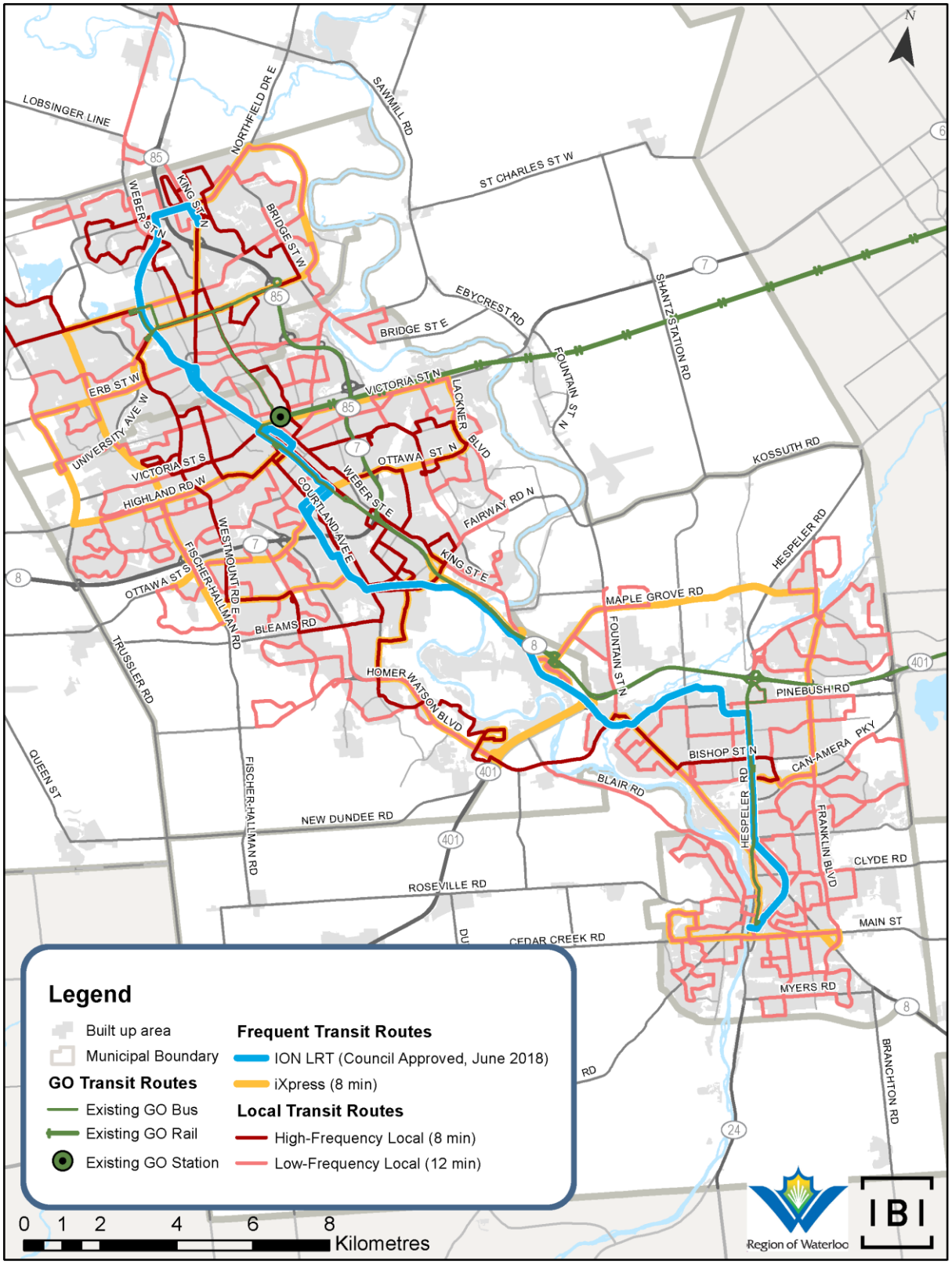
- Completing both stages of the ION rapid transit project, providing a seamless light rail connection between Waterloo, Kitchener, and Cambridge;
- Introducing new iXpress routes in Kitchener and Cambridge to provide high-frequency bus service along major corridors;
- Increasing service along all iXpress routes and specific local routes to develop an all-day, high-frequency bus network;
- Making local route improvements as outlined in the GRT Five-Year Plan, and increasing local bus frequencies in off-peak times; and
- Protecting key roads and corridors for transit service beyond 2041.

The specific transit routes identified in Exhibit 5.11 will be subject to further review and refinement by transit staff prior to implementation. Maps in Exhibit 5.12, Exhibit 5.13, and Exhibit 5.14 provide more detailed views of the recommended transit network.

To provide additional transit service across the Region, GRT must increase the number of buses it operates and the number of hours those buses operate during peak and off-peak times. Today, GRT provides over 780,000 vehicle-hours of service each year with a fleet of 269 buses. By 2041, it is expected that GRT will more than double its service to over 1.7 million vehicle-hours of service per year, and will need to double its bus fleet to 546 vehicles in order to provide these service hours. These changes will contribute to establishing a frequent transit network in the Region, where passengers will have more flexibility for planning and taking trips as they will not have to rely on fixed schedules.

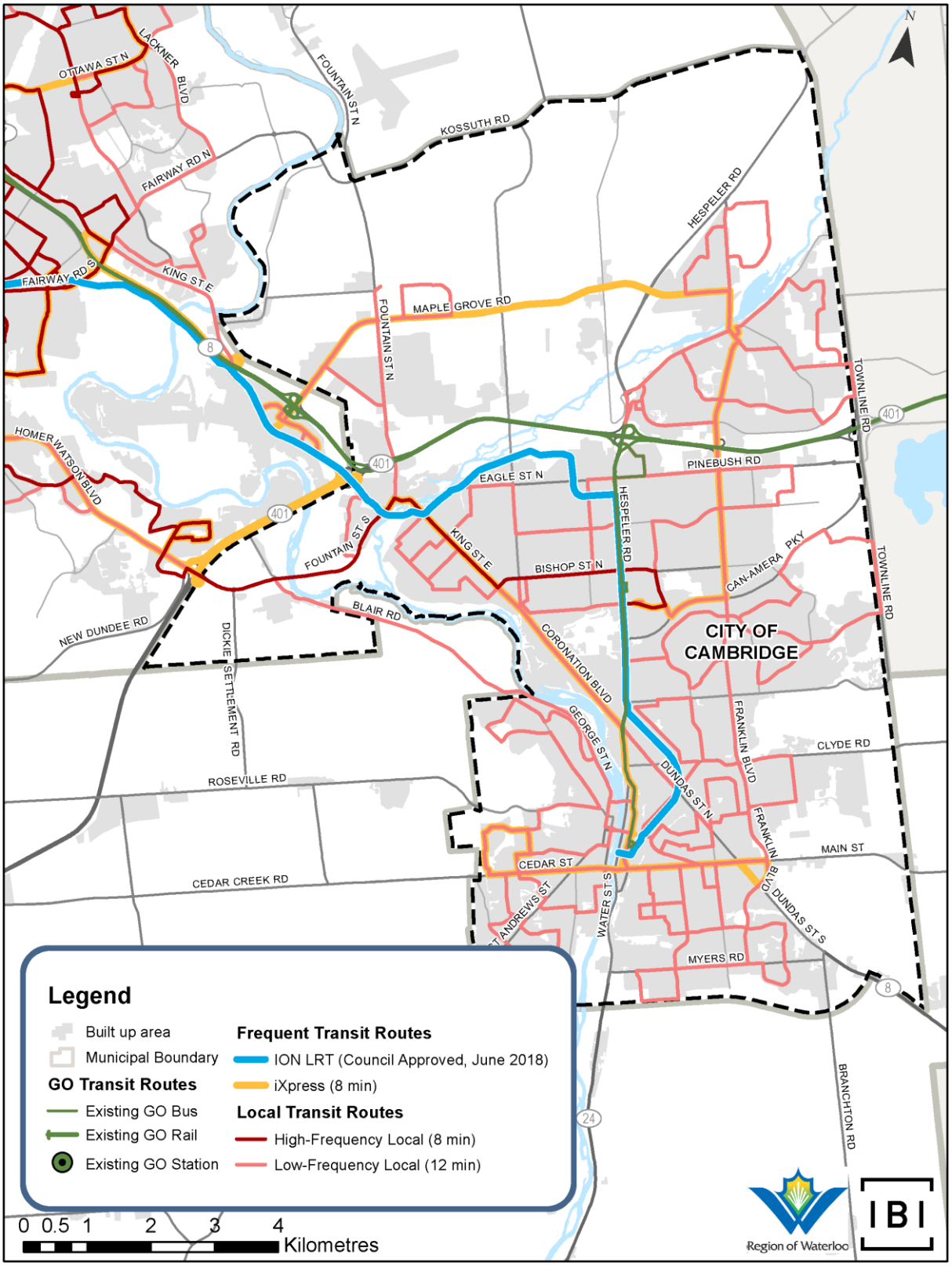
In addition to transit route, network, and infrastructure improvements, the active transportation improvements outlined in **Strategy 2: Promote a Healthy Community** will help increase transit ridership by providing enhanced first- and last-mile connections to GRT and ION routes. The combination of active transportation and transit also benefits the environment through an increased sustainable mode share, and has health and safety benefits for travellers in the Region.

EXHIBIT 5.11: RECOMMENDED 2041 WATERLOO REGION GRT AND ION NETWORK



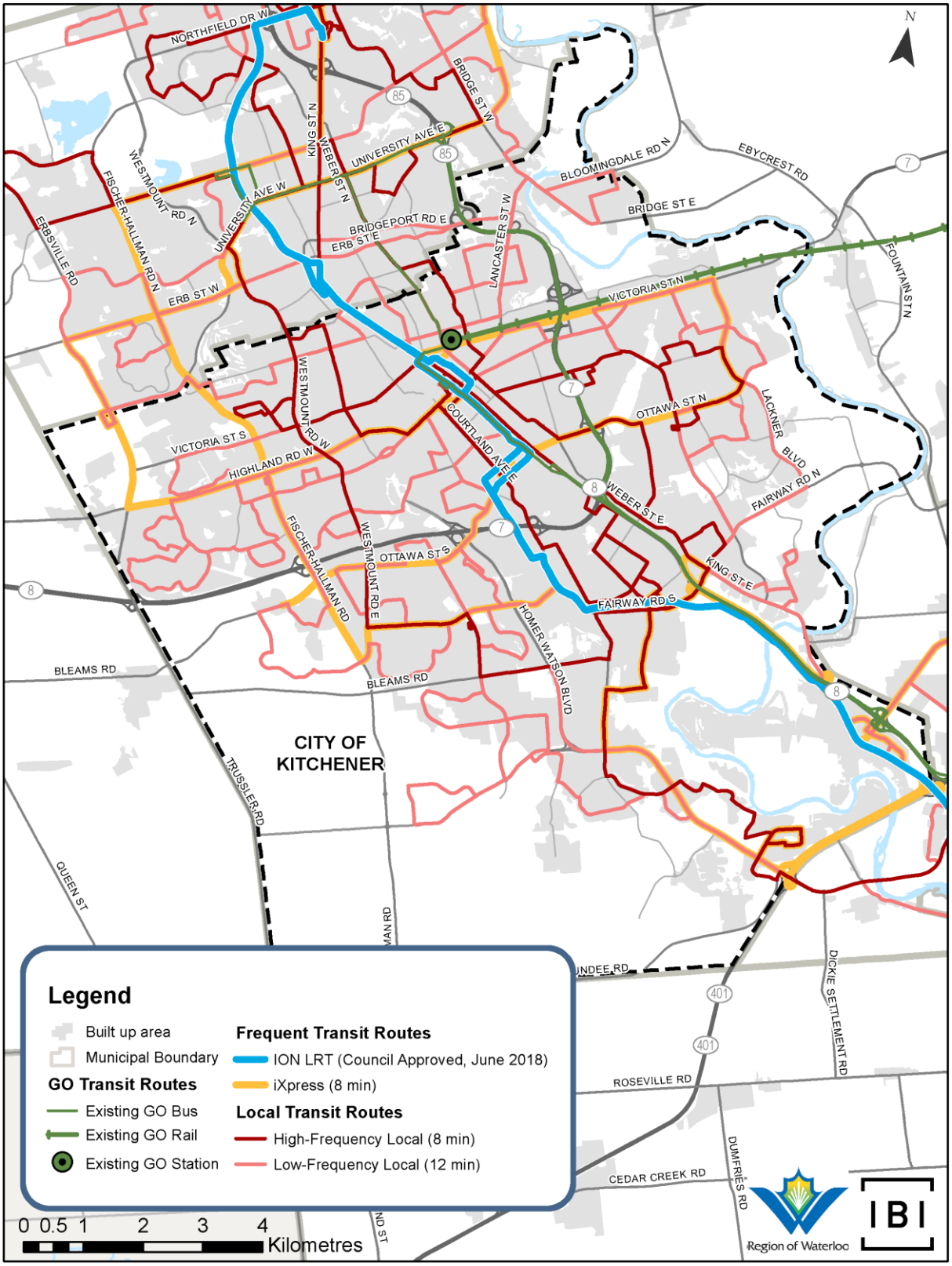
Moving Forward

EXHIBIT 5.12: RECOMMENDED 2041 WATERLOO REGION GRT AND ION NETWORK (CAMBRIDGE)



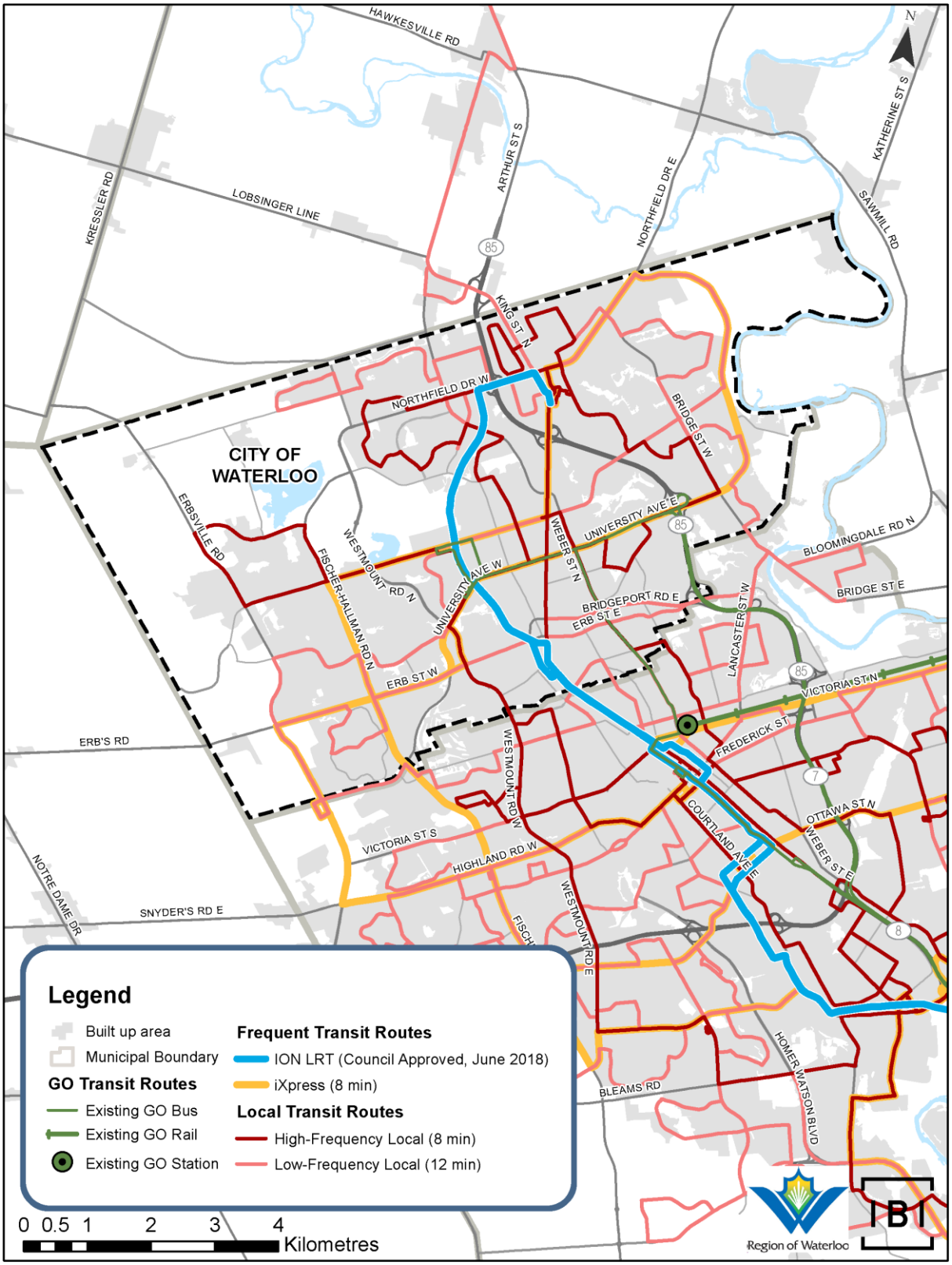
Moving Forward

EXHIBIT 5.13: RECOMMENDED 2041 WATERLOO REGION GRT AND ION NETWORK (KITCHENER)



Moving Forward

EXHIBIT 5.14: RECOMMENDED 2041 WATERLOO REGION GRT AND ION NETWORK (WATERLOO)



Moving Forward



New Routes and Services

As part of the 2041 GRT network, new express transit routes and services will be introduced to the Region, and all bus routes will receive more vehicles and higher-frequency service.

When the first stage of the ION Rapid Transit corridor is launched, it will connect Waterloo, Kitchener, and Cambridge with a combination of Light Rail Transit and Bus Rapid Transit. Initially, LRT service will only be provided between Waterloo and Kitchener, but it is planned that the LRT will be extended to south Cambridge by 2031.

GRT's iXpress bus network will also expand during *Moving Forward*'s horizon. Building on the recently introduced 205 Ottawa route in Kitchener, additional iXpress routes and route extensions are planned to better serve Cambridge and the Region by 2031:

- 201 Fischer-Hallman extension to Conestoga College;
- 206 Coronation, running along King Street and Coronation Boulevard between Fairway Station and Ainslie Terminal;
- 206 Coronation extension from Ainslie Terminal to Southwood Drive; and
- ION Bus, running along Concession Street and Main Street between Ainslie Terminal and the South Cambridge Shopping Centre.

Finally, all GRT routes have been classified as either iXpress, high-frequency local, or low-frequency local based on their ridership, current operating frequency, and the areas they serve. Starting in 2021, specific service frequencies will be assigned to all GRT routes based on these categories, resulting in increasing numbers of buses per hour on each route type

as shown in Exhibit 5.15. The service frequencies are based on planned bus purchases and service hour growth, and will regularly improve to reduce passenger wait times.

EXHIBIT 5.15: GRT BUSES PER HOUR BY ROUTE TYPE

GRT Route Type	2021	2026	2031	2036	2041
iXpress	6 buses	6 buses	6 buses	7.5 buses	7.5 buses
High-Frequency Local	4 buses	5 buses	6 buses	6 buses	7.5 buses
Low-Frequency Local	2 buses	2.4 buses	3 buses	4 buses	5 buses

Transit Infrastructure Improvements

To support GRT's growing bus fleet, a number of transit infrastructure changes are planned for facilities and corridors across the Region. These include changes that will be obvious to riders, such as new transit hubs and terminals, as well as those that will support fleet growth and improve transit operations, such as a new transit garage and transit priority measures.

One of the biggest changes to the Region's transit infrastructure will be the closing of the Charles Street Terminal in downtown Kitchener and the construction of the new multi-modal hub adjacent to the King and Victoria Street intersection. When ION is launched, GRT routes will begin serving the King-Victoria Multi-Modal Hub or other ION LRT stops in downtown Kitchener. The new multi-modal hub will connect GRT bus passengers to the ION LRT, GO Rail, VIA rail, and inter-city bus services. Between the closing of the Charles Street Terminal and the opening of the new King-Victoria Transit Hub, an interim facility will be required for inter-city bus services. Other new bus terminals planned for the Region will be located at the University of Waterloo, with connections to ION LRT and GO Bus services, Conestoga College, with connections to multiple iXpress and local GRT routes, and Frederick Street, which will serve as a major transfer point for trips to and from areas south of Kitchener. Additionally, existing terminals and stations will require upgrades to accommodate new routes and vehicles.

GRT's Northfield transit garage is scheduled to be complete by 2021. This facility will allow GRT to accommodate 500 buses across all of its garages, which is expected to cover all new bus purchases up to 2036. Beyond that date, GRT will likely require another new transit garage to ensure that fleet growth can continue as planned through 2041 and beyond.

GRT will also continue to implement transit priority measures on major Regional corridors, reducing delays for buses and their passengers. These measures include transit signal priority, which involves adjusting traffic signal timings to help buses move through intersections with less delay, and queue jump lanes, which help buses bypass long queues

of traffic at intersections. By 2031, the Region plans to implement transit signal priority at more than 50 intersections, predominantly along the ION corridor, and construct queue jump lanes along Fountain Street, King Street, Victoria Street, and Hespeler Road.

The Region should also continue to work with municipalities to ensure that transit infrastructure, such as GRT landing pads and shelter pads, is provided as part of road reconstruction or retrofit projects. These elements can help advance accessibility compliance at transit stops and improve consistency across the GRT network.

New Transit Service Delivery Models

Some areas within the Region are currently underserved by transit and may not be considered for conventional, fixed-route service due to low densities, narrow or circuitous roads, or physical barriers (highways, rivers, etc.). To connect these areas to the GRT network, the Region will pilot three new service delivery projects in 2018 and 2019. Each pilot project will test a new demand-responsive micro-transit service in a different neighbourhood, with the goal of identifying a preferred service delivery model to use throughout the Region. The services will be:

- Ridesharing in Northwest Waterloo;
- Subsidized taxi service in Central Hespeler; and
- Community bus service in Trinity Village/Freeport Campus.

Following these pilot projects, the Region is encouraged to continue exploring new mobility options, which may include flexible transit or a partnership with existing auxiliary taxi companies (such as Uber or Lyft) to provide first- and last-mile connections to conventional transit. It is key that the Region recognizes that travellers are changing the way they move and plans ahead for these emerging services. The impacts of new mobility on Regional transportation are discussed further in **Strategy 5: Position the Region for New Mobility**.

Transit Beyond 2041

To be prepared for transit needs beyond *Moving Forward*'s horizon year of 2041, the Region should focus on protecting a number of road and rail corridors for potential future transit service. These corridors are presented in Exhibit 5.16, and will be subject to further review and refinement by transit staff prior to implementation.

Two road corridors should be protected for potential ION Stage 3 rapid transit, which would build on the ION LRT (stages 1 and 2) to provide east-west connections in Kitchener and Waterloo. These corridors may feature Bus Rapid Transit or Light Rail Transit, depending on demand and development in the Region. The two recommended corridors are:

- Erb Street West, University Avenue West, and King Street North (from Ira Needles Boulevard to Conestoga Mall); and
- Victoria Street South or Highland Road West, Charles Street, and Victoria Street North (from Ira Needles Boulevard to Lackner Boulevard).

In addition, three rail corridors should be protected for potential GO Rail service, which would provide new and improved connections between the Region and the rest of the Greater Toronto and Hamilton Area. The first corridor runs between the Kitchener GO Line (near Breslau) and the Region of Waterloo International Airport, and would be used to provide an airport rail link. As the airport grows and expands per the Airport Master Plan (prepared in 2017), it will be increasingly important to have better connections to the airport, allowing residents of the Cities and Townships to access this important facility.

The second and third corridors would serve to connect downtown Cambridge with the GO Rail network using two existing rail lines:

- One option would use the east-west Galt Subdivision, connecting Cambridge to the Milton Line west of Milton GO station; and
- One option would use the north-south Fergus Subdivision, connecting Cambridge to the Kitchener Line west of Guelph GO station.

There are also potential station sites along these rail corridors that should be protected, as shown in Exhibit 5.16. This will ensure that land is available for future station development.

Strategy 3 Directions

Based on the enhanced transit service and new transit infrastructure planned in this section, the Region has adopted the following six policy directions to develop a frequent transit network:

1. **Extend ION to Cambridge (ION Stage 2).**
2. **Implement a frequent transit network** that provides high quality 10-minute or better service all day by 2041.
3. **Identify additional corridors for future rapid transit.**
4. **Continue to encourage land use intensification** along transit corridors.
5. **Include transit priority measures in capital budgets** to maintain or improve time-competitiveness with cars.
6. **Investigate smaller scale, more flexible transit** to provide service to underserved areas.

EXHIBIT 5.16: WATERLOO REGION RAPID TRANSIT AND RAIL CORRIDORS FOR PROTECTION BEYOND 2041

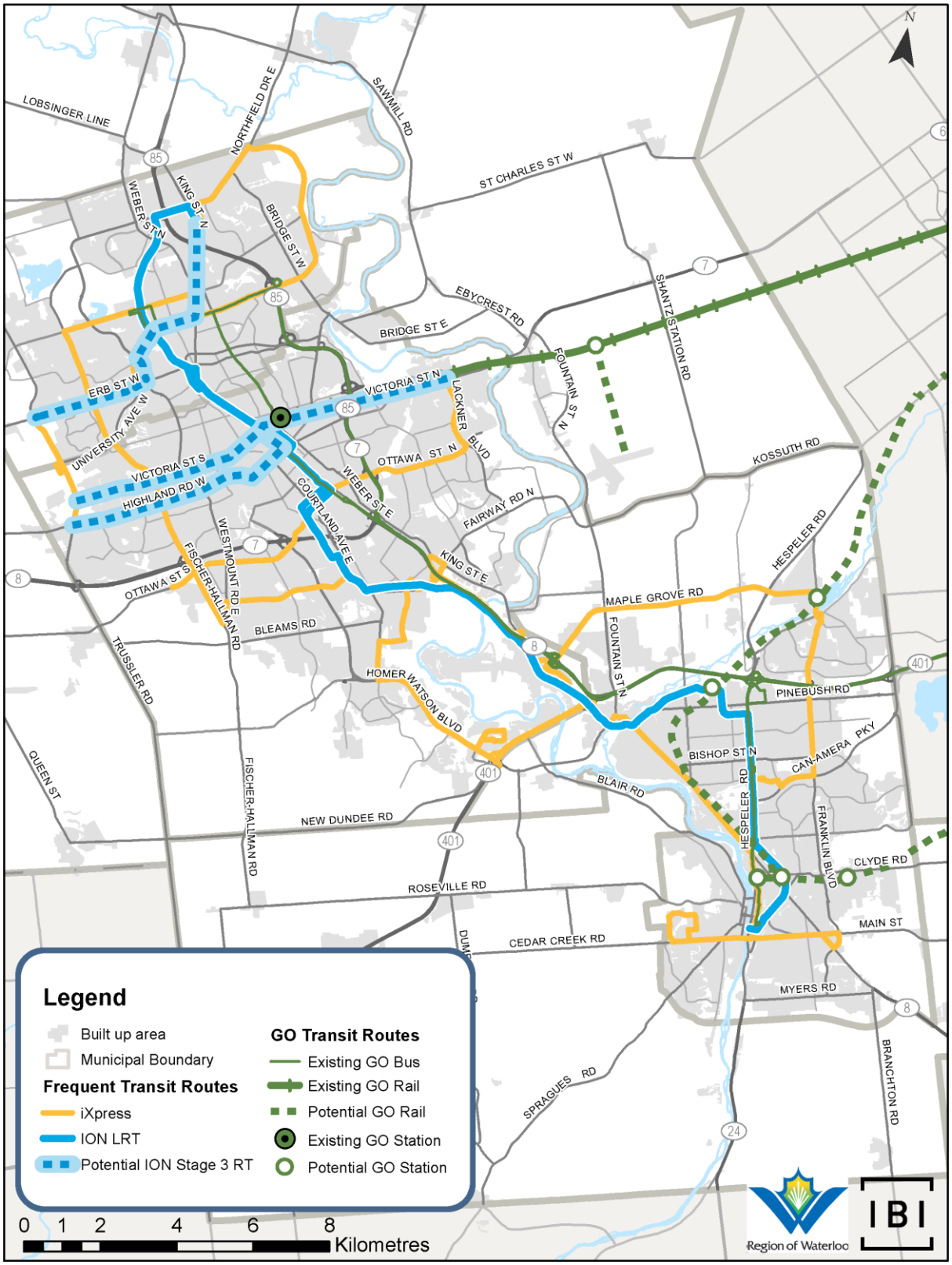


EXHIBIT 5.17: WATERLOO REGION TRANSIT CORRIDORS FOR PROTECTION BEYOND 2041 (CAMBRIDGE)

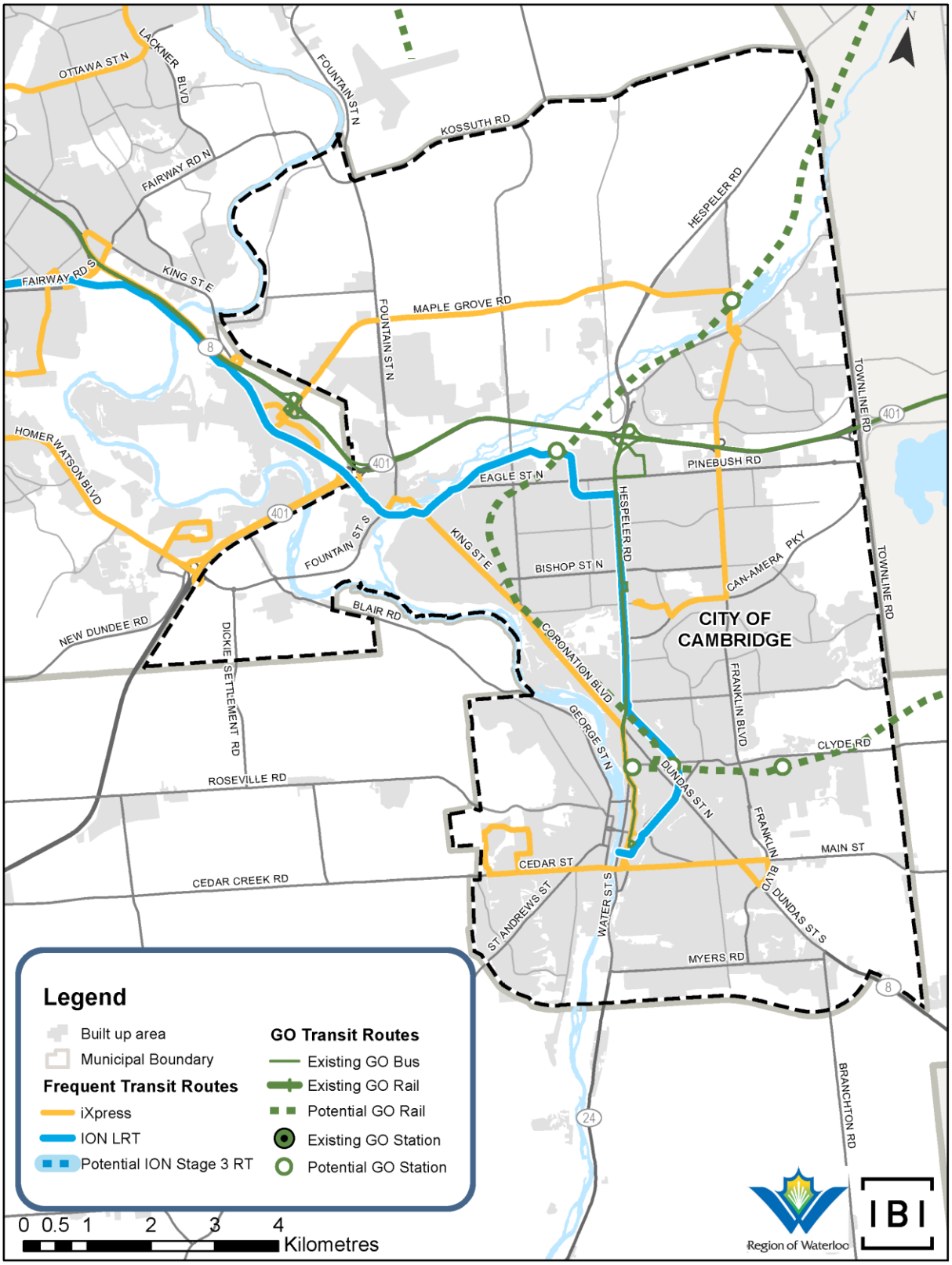
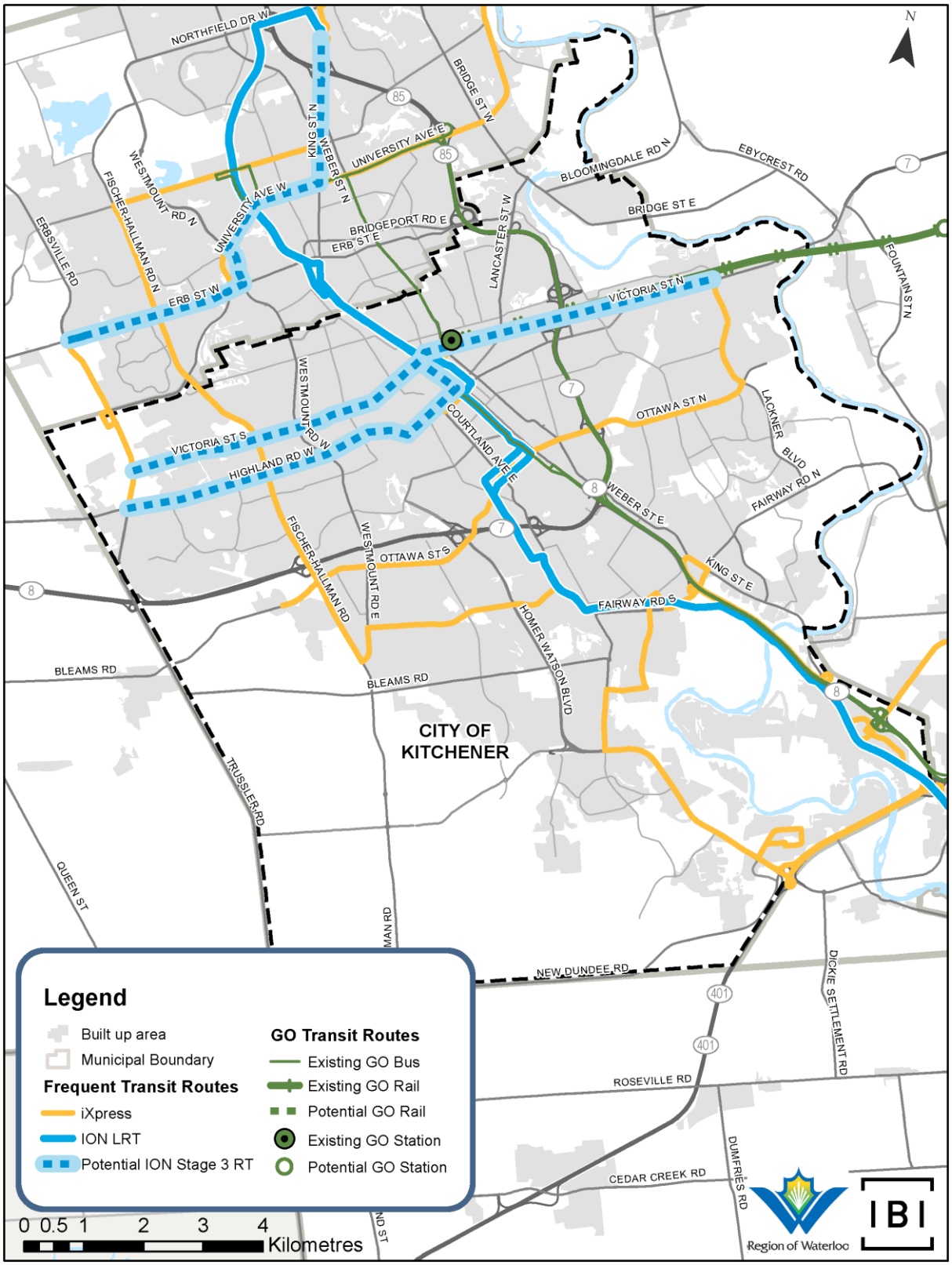
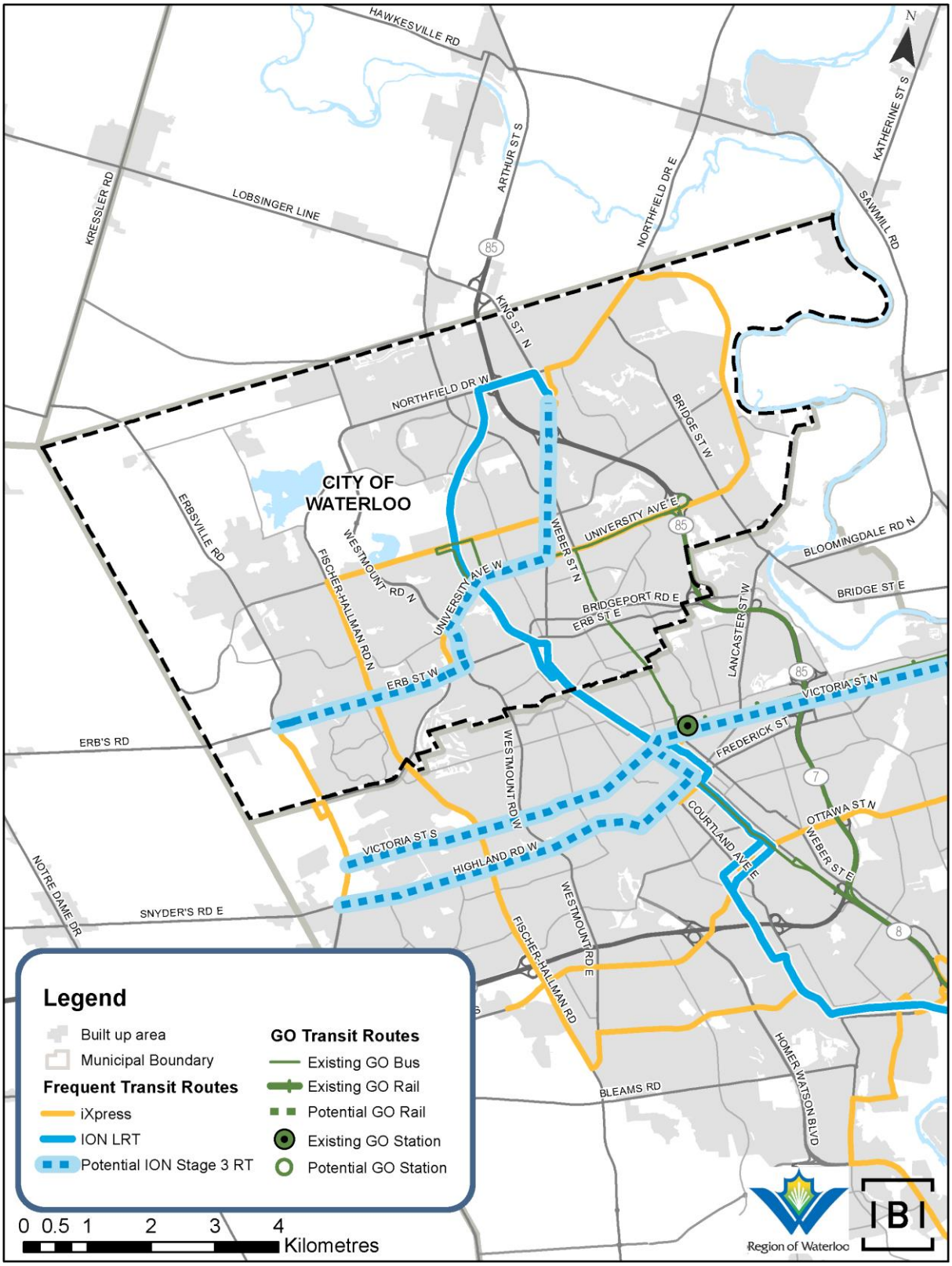


EXHIBIT 5.18: WATERLOO REGION TRANSIT CORRIDORS FOR PROTECTION BEYOND 2041 (KITCHENER)



Moving Forward

EXHIBIT 5.19: WATERLOO REGION TRANSIT CORRIDORS FOR PROTECTION BEYOND 2041 (WATERLOO)



Moving Forward

Strategy 4: Enhance Inter-Regional Connections

One of the findings of the 2018 TMP is the increasing amount of travel to and from the Region. Key destinations for travel from the Region include Guelph, Peel Region, Hamilton, Halton Region, and Toronto. Trips to Toronto are strong candidates for transit service due to the concentrated employment near Union Station. Alternatively, some areas of Peel Region and Guelph are characterized by dispersed employment and therefore road capacity improvements may be a necessary outcome, and are in progress with MTO widening Highway 401 and constructing the new Highway 7. A Regional strategy is proposed to support longer-distance travel and to help plan travel to encourage sustainable modes where possible. This section provides transit, road/highway connections, and broad policy directions.

Transit Connections

As described in **Strategy 3: Develop a Frequent Transit Network** on page 5-31, the forthcoming Central Station multi-modal hub will serve as a key node for regional and inter-regional trips. This facility will connect GRT bus and ION LRT passengers to GO Rail, VIA Rail, and inter-city bus services, providing better access to and connections between all modes.

Planned changes to GO Transit service and infrastructure between 2018 and 2041 primarily target the Kitchener Line. Metrolinx plans to increase the service frequency on this line during peak periods, and eventually provide all-day, two-way service between Kitchener and Toronto's Union Station. A portion of this line (between Mount Pleasant and Union GO stations) is also set to be electrified, improving service and reducing the environmental impact of GO Train movements.

Additional GO Rail infrastructure is also planned for the Kitchener Line within the Region. This includes a new GO station which would be located in Breslau, approximately 7 km east of Kitchener GO station and 3 km north of the Region of Waterloo International Airport. A connector has also been identified that would connect the Breslau station and the Region of Waterloo International Airport. It is recommended that the Region work to identify and protect a preferred corridor for future use.

By 2041, GO Bus services between Kitchener and Guelph and Kitchener and Cambridge will be upgraded to operate as regional express bus. Other regional express bus routes are planned to connect Cambridge with destinations including Guelph (via Hespeler Road), Brantford (via Highway 24), and Hamilton (via Highway 8), in addition to existing destinations within the GTHA. High-Occupancy Vehicle (HOV) lanes will also be constructed on Highway 401, helping reduce times for transit vehicles travelling between the Region and the GTHA. These proposed changes are presented in the Metrolinx 2041 Regional Transportation Plan.Two rail corridors leading to downtown Cambridge are also being protected for future

service but are not part of current Metrolinx plans. These are the Fergus subdivision, running between the Kitchener GO Line west of Guelph and downtown Cambridge, and the Galt subdivision, running between the Milton GO Line west of Milton and downtown Cambridge. The Fergus subdivision is the subject of a current study at the Region. These corridors should continue to be protected.



Road and Highway Connections

A new provincial facility, Highway 7 connecting the Region and Guelph, is in the early stages of construction. The highway will provide a direct, high quality road servicing the largest inter-regional commuter flow to and from the Region. The Region should continue to support the project, however it will be important for the Region to control development patterns along the new highway so that it does not facilitate sprawl in areas currently not designated for development.

By 2021, MTO is expected to have completed widening Highway 401, between Highway 8 and Townline Road, from six lanes to ten lanes (including HOV lanes). This section of Highway 401 is frequently congested and is a vital corridor for the Region and for the province. This project and other Provincial HOV lane projects will help improve existing highway connections to the Region.

Goods Movement Network

At the Provincial level, a number of corridors have been identified as key parts of a Greater Toronto and Hamilton Area goods movement network. This network connects to the Region via three Provincial highway corridors; Highway 7, Highway 8, and Highway 401. Each corridor supports the Region's goods movement network as described in **Strategy 1: Build a Transportation Network that Supports all Modes of Travel.**

Strategy 4 Directions

Based on the development of new and improved road and transit corridors between the Region and surrounding municipalities, the Region has adopted the following three policy directions to enhance inter-regional connections:

1. **Support and promote enhanced connections**, such as GO Regional Express Rail, High Speed Rail and GO Bus, with the Greater Toronto and Hamilton Area and with other destinations such as Guelph, London, Brantford, and the Region of Waterloo International Airport.

2. **Work with the Ministry of Transportation and support managed lanes** on Provincial Highways, such as dedicated high-occupancy vehicle lanes, high-occupancy toll lanes, or truck lanes.

3. **Support goods movement** with a balanced plan that maintains service levels, accessibility, and safety, and accommodates all modes in Regional corridors.

Strategy 5: Position the Region for New Mobility

Unlike the previous four strategies, which rely on existing technologies, positioning the Region for new mobility involves understanding new and emerging transportation options and developing a plan to leverage their benefits and the opportunities they present. This strategy explores a variety of new mobility technologies, including connected and autonomous vehicles, auxiliary taxis, and demand-responsive transit, and identifies ways in which these options can be part of an integrated and sustainable future transportation system in the Region. Additional details about new mobility in the Region can be found in Appendix H – New Mobility in Waterloo Region Report.

An Introduction to New Mobility

New mobility is an umbrella term that classifies new types of on-demand transportation services, including peer-to-peer services (car share and bike share) through auxiliary taxis (such as Uber or Lyft), which connect people using their personal automobile to offer transportation service, and Connected and Autonomous Vehicles (CAVs). CAVs incorporate sensors, wireless communication, and software that allow vehicles to interact with their environment, ideally improving safety and increasing transportation efficiency while reducing or eliminating the need for human drivers. New Mobility also includes new and emerging transportation modes, such as shared electric bicycles or electric scooters, which are already being piloted in the Region.

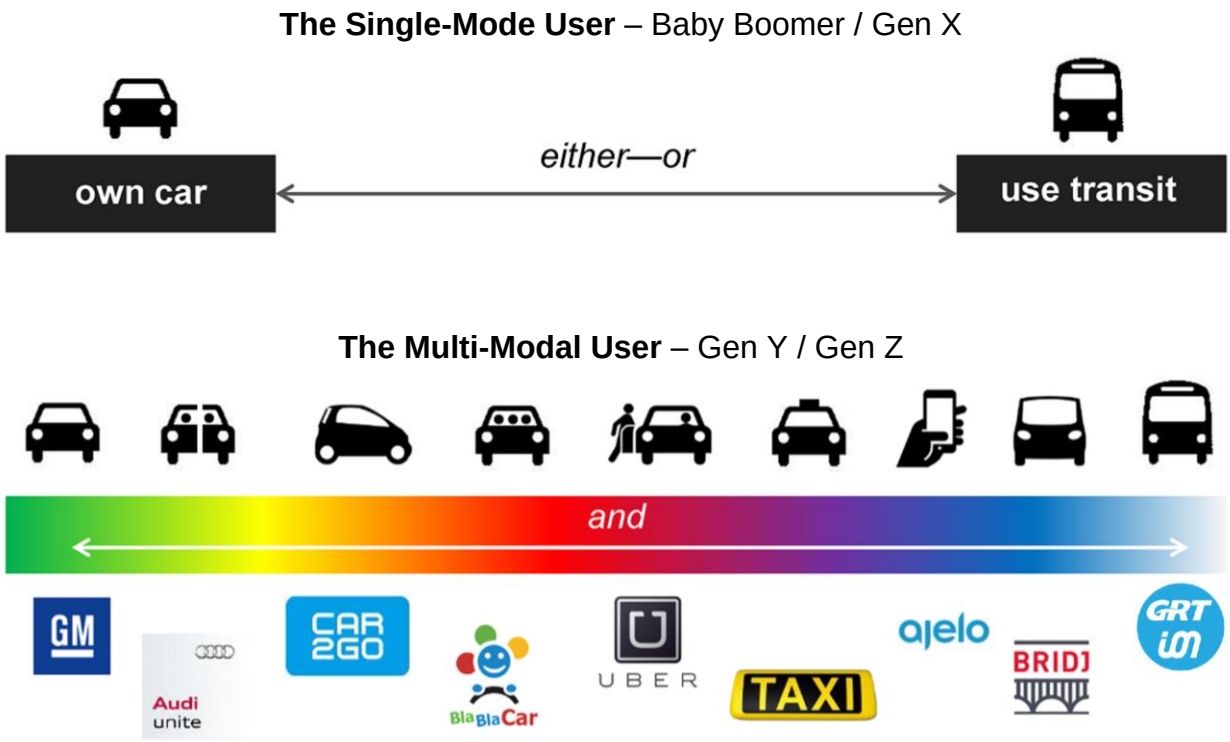
The Emergence of the Multi-Modal User

With the wide-scale adoption of smart phone technology and internet access, a new service industry has emerged. With specific regard to transportation, this has led to an increase of peer-to-peer ride-sharing (TravelWise & Blancride), car-sharing (Zipcar & VRTUCar), bikeshare programs (Dropbike), and on-demand private transportation services (Uber, Lyft and RideCo).

These technological and social innovations are changing the way people access and think about transportation, as what was previously an ownership-driven model is now transitioning to a service-based model. The impending arrival of driverless cars that offer ride-hailing services for a fraction of the price of existing ride-hailing services is expected to accelerate the trend as these services become available.

Between now and 2041, we will see more people moving away from using a single mode of transportation (i.e. exclusively a personal car or public transit) to using a variety of transportation services, where any given trip may be taken by one or more modes that best suits the individual and their needs. As presented in Exhibit 5.20, this represents the transition from today's single-mode users to the multi-modal users of the future.

EXHIBIT 5.20: THE SINGLE-MODE USER AND THE MULTI-MODAL USER



Impacts of New Mobility on *Moving Forward*

New mobility is expected to affect all four goals of *Moving Forward*, and has the potential to do so in both negative and positive ways. Some risks and opportunities for new mobility, as applicable for each goal, are discussed in this section.

Optimize the Transportation System: The introduction of CAVs has the potential to improve traffic flow by optimizing acceleration and braking (facilitated by vehicle connectivity), and CAV-only lanes could further optimize road space once enough vehicles exist. Driverless technology could also be integrated into transit (ION, GRT), bike share, or car share, improving safety and reducing costs. However, CAVs can also enable empty vehicles, which would increase overall vehicle kilometres travelled, and a lack of new mobility regulation could lead to an oversupply of vehicles and draw riders away from more sustainable mobility options.

Promote Transportation Choice: CAVs can be the catalyst to switch people away from single-occupancy vehicles to become multi-modal users by removing the barriers associated with car ownership. On-demand services, including ridesharing and ride-hailing, have the potential to provide mobility options for all. However, private ride-hailing services may become dominant, leading to more congestion, and significant investment in connected infrastructure is required to realize all benefits of CAVs.

Foster a Strong Economy: New mobility has the potential to reduce the personal cost of transport and the cost of public transit subsidies while similarly optimizing the transportation system by reducing operating costs. Service and vehicle types can be better tailored to demand, scalable, and improve access to the Region and GTHA with first- and last-mile transportation options. However, there is a risk of job loss due to automation of driver jobs in both public and private sectors.

Support Sustainable Development: Moving travel to more sustainable modes can reduce carbon emissions, and the growth of multi-modal users with an increased reliance on higher-order transit can encourage continued development along the Region's central transit corridor. However, CAVs could encourage urban sprawl and low-density development, leading to increases in trip lengths and travel times, and increase feelings of isolation with more time spent in private, single-occupancy vehicles.

Leveraging Opportunities and Mitigating Risks

The opportunities and risks described in the previous section can be summarized in the following two exhibits. Exhibit 5.21 summarizes how a number of new mobility risks could catalyze into a transportation system, while Exhibit 5.22 summarizes how the transportation system might look and perform if a number of opportunities are leveraged.

In order for the integrated transportation system, shown in Exhibit 5.22, to be realized, existing transportation services and transit infrastructure will need to be integrated with new and emerging modes and services. This involves leveraging new assets, such as the ION rapid transit system, and integrating them with other transportation service modes, enabling their use by multi-modal users. Driverless mobility, including CAVs, will also need to be integrated into this system to avoid duplication of services and inefficiencies.

Based on a review of best practices in other regions and municipalities (detailed in Appendix H – New Mobility in Waterloo Region Report), a common theme is that agencies are becoming integrated mobility providers. This means that agencies are not only focusing on public transit, but the integration of public transit and several other supporting modes of transport such as bike share and subsidized ride hailing. Similarly, there is a call for public transit agencies to develop partnerships with new private transportation providers so that efficiencies can be maximized and the potential benefits to users are fully realized.

Alternative transit service delivery pilot projects, which are currently underway throughout the Region, are the first step to becoming an integrated mobility provider. The various pilot projects have established partnerships with private transportation providers, enabling other modes and models to support public transit. As discussed in **Strategy 3: Develop a Frequent Transit Network**, these projects will allow for more cost-effective and higher quality service in areas of the Region that cannot be efficiently served by traditional fixed-route transit. The three pilot projects underway are:

- A ride-sharing project in Northwest Waterloo;
- A subsidized taxi model in Central Hespeler; and
- A community bus model in Trinity Village/Freeport.

EXHIBIT 5.21: NEW MOBILITY RISKS – AN INEFFICIENT TRANSPORTATION SYSTEM

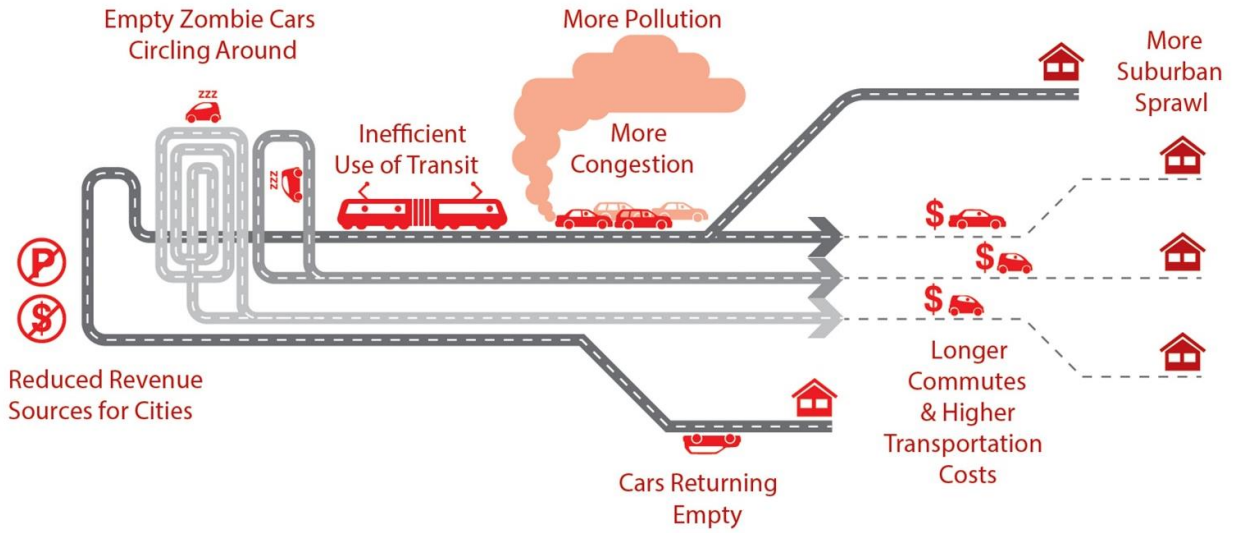
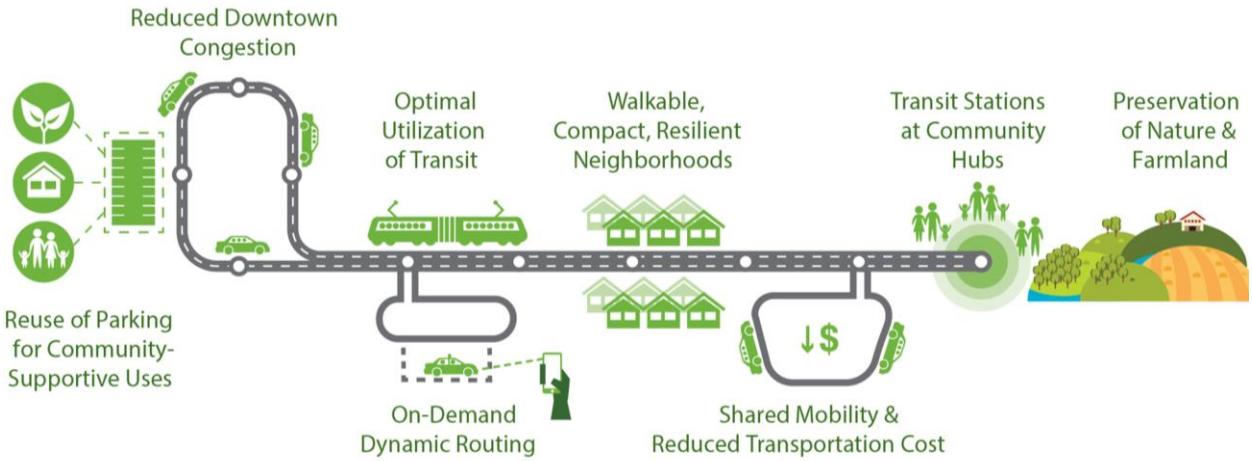


EXHIBIT 5.22: NEW MOBILITY OPPORTUNITIES – AN INTEGRATED TRANSPORTATION SYSTEM



Strategy 5 Directions

Based on the new mobility services and technologies discussed in this section and the potential transportation futures they may bring, the Region has adopted the following eight policy directions to position the region for new mobility:

1. **Integrate mobility services with public transit**, such as through a shared payment platform that would enable users to buy mobility on a variety of different modes. For example, through a smartphone app, users could plan trips and potentially purchase Grand River Transit credits, rent bicycles or cars, and ride taxis or Uber.

2. **Consider subsidized ride-hailing** through auxiliary taxi services such as Uber or Lyft, or conventional taxis, for areas of the Region with limited or no public transit.

3. **Consider rethinking how ride-hailing providers are regulated**. This includes both taxis and auxiliary taxis such as Uber and Lyft. Providers must be large enough to provide economies of scale, but cannot be allowed to monopolize the mobility market.

4. **Examine on-demand and dynamically routed public transit service** that would enable transit services to modify existing routes based on demand. For example, Grand River Transit is already examining a pilot of an on-demand flexible service for customer satisfaction and service effectiveness.

5. **Investigate road user charging and other policies**, such as parking cost, to help manage demand, manage traffic congestion, and provide additional sources of revenue.

6. **Plan for a driverless ride-hailing pilot program** to learn how new technologies and delivery models for transportation can enhance mobility in the Region.

7. **Develop a New Mobility Action Plan** that includes specific objectives and actions to support the above initiatives.

8. **Update Regional Council annually** on any developments in the technology and staff's progress on the New Mobility Action Plan.



Chapter 6:
Implementing the Plan

6. Implementing the Plan

Chapter 6 outlines the actions the Region will be required to take over the next 5 to 10 years to implement *Moving Forward* (the 2018 TMP). This chapter describes action items for the plan, costs associated with various transportation system improvements, and the roles and responsibilities of involved groups.

Action Items

A series of 17 action items were developed for the Region to undertake, along with recommended timelines for these actions:

1. Complete ION Stage 2 corridor planning study (2019);
2. Prepare a Regional roads transit priority strategy, including proposed implementation locations and timing (2018–2019);
3. Complete a feasibility study, and preliminary design and business case if warranted, for GO Train service between Cambridge and Guelph along the Fergus Subdivision (2018–2019);
4. Work with the Ontario Ministry of Transportation to identify Transportation System Management measures, such as ramp metering, to improve traffic operations on Highway 7/8/85 (i.e. the Conestoga Parkway) (2018–2019);
5. Update the Transportation Impact Study Guidelines to align better with the four goals of *Moving Forward* (2019);
6. Update the Context-Sensitive Regional Transportation Corridor Design Guidelines to support urban intensification, enhance safety, encourage reduced traffic speeds, and accommodate all modes (2019);
7. Undertake a goods movement study (2019–2020);
8. Complete a Commuter/Park-N-Ride/Kiss-N-Ride parking lot feasibility study (2019–2020);
9. Define and measure the health benefits of walking, cycling and public transit, for people travelling in and around the Region (2019–2021);
10. Investigate smaller scale, more flexible transit options, including subsidized ride-hailing through auxiliary taxis, as an option to provide transit to underserved areas (2019–2021);

11. Identify additional corridors for future rapid transit and initiate planning along those corridors (2019–2023);
12. Investigate the feasibility of a shared payment platform for the Region that would enable users to buy mobility on a variety of different modes (2020–2021);
13. Complete a transportation network study in southwest Kitchener (2020–2021);
14. Investigate mobility pricing, such as road user charges and parking cost (2022–2023);
15. Update council on progress made towards preparing the Region for New Mobility (Annual);
16. Prepare annual reports regarding the Region's progress towards achieving the goals of *Moving Forward* (Annual); and
17. Incorporate policy initiatives into the Regional Official Plan and other Regional policy documents (Ongoing).

Costs

Moving Forward (the 2018 TMP) is an affordable plan. The original recommendation from the 2010 RTMP, to pursue a "transit-oriented plan with strategic road improvements," significantly reduced the capital costs of road network expansion by eliminating or deferring the road improvements that would have been required to accommodate growth entirely by private automobile. *Moving Forward* continues and builds on that recommendation, further identifying opportunities for building a more efficient road network that enhances choice in transportation.

As a continuation and extension of the 2010 RTMP and other Council-approved Regional plans, such as the 2014 Active Transportation Master Plan and the GRT Business Plan, *Moving Forward* does not present significant new costs to the Region. A significant portion of the identified costs for the 2018–2031 period have already been planned for and reflected in the approved 2018–2027 Transportation and Transit Capital Plans. The projects and associated costs identified in the *Moving Forward* plan are subject to Council approval through the annual budget process.

Roads

As detailed in Exhibit 6.1, *Moving Forward* identifies strategic road improvements totalling $299 million over the 2018–2031 timeframe, representing 118 additional lane kilometres (the current Regional road system is about 1,680 lane-kilometres). Approximately $240 million of this $299 million is currently accommodated within the approved 2018–2027

Transportation Capital Program. The remaining $59 million would be needed within the 2028–2031 timeframe and should be considered in upcoming annual budget discussions.

For the 2031–2041 horizon period, the road network plan identifies 113 additional lane-kilometres totalling $288 million. These projects are subject to Council approval and are predominantly funded by Regional Development Charges.

EXHIBIT 6.1: ROAD CAPITAL COSTS

Road Capital Costs ($M)	2019–2031	2032–2041	Beyond 2041*
Additional Lane-Kilometres by Period	118	113	96
Road Capital Costs by Period	**$299**	**$288**	**$322***
Total Road Capital Costs	**$587**		**$322***

Note: * Beyond the horizon of the 2018 TMP, provided for information only.

As lane kilometers are added and the road system expands, additional resources are required to operate and maintain the system at the required levels of service. The estimated additional lane kilometers and resulting projected incremental operating and maintenance costs for the 2018–2023 period are as shown in Exhibit 6.2.

EXHIBIT 6.2: ROAD OPERATING COSTS AND TAX IMPACTS, 2019–2023

Estimated Incremental Roads Operating, Maintenance & Debt Servicing Costs ($M)	2019	2020	2021	2022	2023
Maintenance & Operations	$0.021	$0.047	$0.061	$0.066	$0.105
Contribution to Rehabilitation Reserve	$0.030	$0.038	$0.050	$0.045	$0.105
Planning & Lifecycle Management	$0.006	$0.014	$0.018	$0.019	$0.030
Total Estimated Incremental Operating Costs	**$0.056**	**$0.099**	**$0.129**	**$0.130**	**$0.240**
Incremental Property Tax Impact	**0.011%**	**0.018%**	**0.022%**	**0.022%**	**0.038%**

Source: Preliminary estimates developed in spring of 2018, through coordination between Regional Transportation and Finance Staff.

The operating and maintenance cost estimates and the resulting incremental property tax impacts are refined on an ongoing basis and subject to Council approval through the annual budget process. Based on the information presented above, the 2019 Roads operating budget requirements could potentially increase by $56,000 which would lead to a 0.011% increase in the property tax levy.

Active Transportation

Estimated capital costs relating to active transportation projects are set out in Exhibit 6.3. The costs to improve the active transportation network are largely funded by Regional Development Charges. Most of the capital expansion for active transportation is targeted to be complete by 2031.

EXHIBIT 6.3: ACTIVE TRANSPORTATION CAPITAL COSTS

Active Transportation Capital Costs ($M)	2018–2031	2032–2041
Network Expansion	$100	$40
Facility Upgrade	$20	$10
Total Capital Costs by Period	**$120**	**$50**
Total Active Transportation Capital Costs	**$170**	

Of the $120 million of anticipated capital costs in the 2018–2031 timeframe, approximately $50 million is currently accommodated within the approved 2018–2027 Transportation Capital Program as part of rehabilitation and reconstruction projects for Regional roads. The remaining $70 million (i.e. $50 million network expansion and $20 million facility upgrades) within the 2019–2031 timeframe will be subject to future budget discussions.

Operating costs relating to active transportation are reflected in the overall Roads Operating budget.

Transit

Moving Forward identifies $247 million in transit-related capital projects over the 2018–2031 timeframe, as presented in Exhibit 6.4. These projects are funded from a combination of Regional Development Charges, grants from higher levels of government and debt financing. *Moving Forward* integrates the capital requirements identified in the Council-approved GRT Business Plan 2017–2021, which, as directed by Council, have been incorporated into the 2018–2027 Transit Capital Program. Of the $247 million of anticipated capital costs in the 2018–2031 timeframe, approximately $217 million is currently accommodated within the approved 2018–2027 Transit Capital Program. The remaining $30 million would be within the 2028–2031 time period and would be subject to future budget discussions.

EXHIBIT 6.4: TRANSIT CAPITAL COSTS

Transit Capital Costs ($M)	2018–2031	2032–2041
Bus Fleet Growth	$80	$140
New Transit Garage	$120	$120
Transit Priority	$7	$5
Ancillary Costs	$40	$6
Total Capital Costs by Period	**$247**	**$271**
Total Transit Capital Costs	**$518**	

As Transit service expands, additional resources are required to operate and maintain the system at the required levels of service. Estimates for transit revenue and operating and maintenance costs are based on the proposed transit service levels as identified in the GRT Business Plan. The estimated incremental net costs and incremental property tax impact over the 2019–2023 timeframe are as shown in Exhibit 6.5. These costs do not include investments required to provide expansion and services for ION to accommodate future growth, given those were already accounted for during the planning stages of ION.

EXHIBIT 6.5: TRANSIT OPERATING COSTS AND TAX IMPACTS, 2019-2023

Estimated Incremental Transit Operating, Maintenance & Debt Servicing Costs ($M)	2019	2020	2021	2022	2023
Operation, Maintenance & Debt Servicing Costs	$3.3	$4.2	$3.5	$3.1	$3.4
Debt Service	$0	$1.7	$2.0	$0.3	$0.2
Revenue	($1.7)	($1.4)	($1.5)	($1.2)	($1.3)
Net Incremental Operating Cost	**$1.6**	**$4.5**	**$4.0**	**$2.2**	**$2.3**
Incremental Property Tax Impact	**0.3%**	**0.9%**	**0.7%**	**0.4%**	**0.4%**

Transit revenue projections as well as operating, maintenance and debt servicing cost estimates and the resulting incremental property tax impacts are refined on an ongoing basis and subject to Council approval through the annual budget process.

Based on the information presented above, the 2019 Transit new operating cost could potentially increase by $1.6 million, which would lead to a 0.3% increase to the property tax levy, if approved. Additional capital and operating costs for LRT Stage 2 are not included in these budget estimates because the route, and associated costs, are not defined.

The importance of addressing the barriers to walking, cycling and public transit use cannot be overstated. As more members of the public adopt these modes instead of private cars,

Moving Forward will become more affordable because of a reduced need for Regional road expansion, and more revenue through public transit fares.

Monitoring Progress and Updating the Plan

A Transportation Master Plan is a living document that needs to be updated periodically. It provides recommendations based on information that is current at the time of its development, and it provides policies developed to support or address current sensitivities and issues. Over time, new issues and sensitivities arise, and the economy evolves, resulting in changes to the foundational inputs used to develop the plan.

A key role of the transportation master plan is to develop a basis on which other plans can be developed. As plans such as the Region's Official Plan and other infrastructure plans such as water and wastewater are updated, inconsistencies naturally arise, requiring a re-visit of the assumptions used and the recommendations of the plan that resulted. Broadly the plan needs to be monitored for adherence and guidance as to Regional transportation priorities, and it needs to be updated periodically to reflect changes in inputs.

Monitoring the Plan

A new action item for the Region is to monitor the plan regularly, such as on an annual basis and following major projects. Monitoring the plan should be done using performance measures that gauge the effectiveness of the policies, programs, and infrastructure improvements in achieving the transportation vision and goals. The performance measures should include those used in scenario development and evaluation which include measures of the efficiency of the road and transit network, quality of the transportation network including active transportation facilities, cost-benefit, and progress towards public health goals. The performance measures are listed in Exhibit 6.6

Monitoring should be done annually or localized to individual projects. An example of project-based monitoring is the upcoming opening of the ION LRT—where travel pattern changes caused by the LRT, and long-term changes such as land-use and travel behaviour changes can be tracked. Results from monitoring can be used for local program changes and strategic plan updates such as changes to transit service levels or changes to mode-share targets for the transit corridor.

EXHIBIT 6.6: PERFORMANCE MEASURES FOR PLAN MONITORING

Performance Measures
% of congested regional roads (high volume-to-capacity ratio, v/c)
% of uncongested regional roads (low v/c)
Total cumulative vehicle delay
Transit mode share
Active transportation mode share
Average trip length
% of households within 1 km of high-quality cycling facilities
% of regional roads with on-road cycling facilities
% of regional roads with physically separated active transportation facilities
% of households within 500 m of frequent transit routes
Transit vehicle-hours per capita
Qualitative assessment of transit trip speed and reliability
Total cumulative vehicle delay on primary transit routes
% of possible home-to-work trips taking less than 45 min. by transit
Qualitative assessment of inter-city travel improvements
Qualitative assessment of Regional attractiveness to prospective residents and workers
Annual socio-economic benefit of public transit travel
Annual user cost of public transit travel
Average annual capital cost of public transit
Average annual operating cost of public transit
New lane-km of vehicle/transit lanes
Auto driver mode share
Annual economic benefit of reduced mortality due to active transportation activity
Qualitative assessment of travel safety
Qualitative assessment of transportation network resilience

Updating the Plan

Regular updates to the Transportation Master Plan are needed to capture changes in the input information. The Municipal Class EA recommends that master plans be reviewed every five years to determine the need for a detailed review or update. Additionally, the Planning Act requires the Region to assess the need to update the Official Plan every five years, unless it is replaced by a new Official Plan which is considered valid for ten years. The Official Plan review and update process tends to go hand-in-hand with updates to the Transportation Master Plan.