



NIAGARA REGION TRANSPORTATION MASTER PLAN

EXECUTIVE SUMMARY

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IBI Group in association with
Parsons and Brook McIlroy

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1 INTRODUCTION

The purpose of a Transportation Master Plan (TMP) is to present a long-term strategy to guide the planning, development, renewal and maintenance of a multi-modal transportation system in a manner that is consistent with projected needs, and aligned with the region's growth and with the overall vision for a sustainable Niagara Region.

Niagara Region (Map 1) is undergoing significant change and by 2041 will have grown and evolved on economic, demographic, social and technological fronts. To prepare for this change, and to maximize the growth potential and opportunities that will accompany this change, Niagara Region is actively planning for new growth, in conformity with Places to Grow – the Province's Growth Plan for the Greater Golden Horseshoe. As part of the Niagara 2041 Growth Strategy, Niagara Region is undertaking three supporting studies that will guide development and accommodate change over the next twenty-five years: a Municipal Comprehensive Review (**How We GROW**), a Water and Wastewater Master Servicing Plan (**How We FLOW**), and this Transportation Master Plan (**How We GO**).

This Transportation Master Plan (TMP) is intended to set out a strategic vision for transportation and its implications in the Niagara Region over the next twenty-five years, and illustrate how effective transportation can enhance quality of life. It will ensure that future transportation needs are addressed through pedestrian and cycling facilities, demand-responsive and conventional transit, and an integrated network of roads and highways.

As the TMP is a guiding document for transportation that will impact Niagara Region's existing and future residents and stakeholders, open consultation was a critical contributor to its development. A range of activities provided opportunities for both stakeholders and members of the public to give feedback and to help shape this document. The activities included Public Information Centres (PICs), online surveys, stakeholder advisory group meetings, targeted meetings, and engagement through social media. Through these consultation activities, many creative ideas were generated and transportation-related issues identified. Consideration was given to all concerns and comments brought forward by stakeholders and the public.

2 A VISION FOR NIAGARA

Niagara Region Council set strategic priorities that focused on economic development, supporting growth and improving Niagara's position globally. Transportation will play a key role in achieving these priorities and the TMP will be the driving force behind initiating the process and articulating the goals. In response to the Council directives, the TMP process has identified and adopted a strategic transportation vision that incorporates these priorities and addresses the key trends expected to impact the Region:

In 2041, Niagara Region will be supported by a transportation network that will help establish Niagara as a leader in: building, preserving and enhancing livable communities; economic development; tourism; sustainable transportation practices; and the emerging shared economy.

In addition to the strategic vision, seven high-level goals, as illustrated below, were identified.

GOALS FOR THE TMP



*Support
economic
development*

2

The transportation network will support the efficient movement of goods, provide adequate connections to support the tourism industry, and provide high-quality access to employment for all residents.



*Improve options
for sustainable
modes of
transportation*

4

A balance between modes will be achieved, minimizing the need for new infrastructure and reducing greenhouse gas emissions.



*Promote the
development
of healthy
communities*

6

The TMP will support and promote active transportation options for all network users.



*Integrate
transportation
and land use*

1

Transportation and land use planning will be coordinated and reflect the unique needs of the Region's communities.



*Enhance
multi-modal
connectivity*

3

Modes of travel will be fully integrated across the Region, allowing seamless connections and more travel choices.



*Maintain and
improve the
efficiency of the
goods movement
network*

5

The transportation network will optimize the efficiency of the freight transportation sector.



*Develop a
realistic yet
innovative
blueprint for
implementation*

7

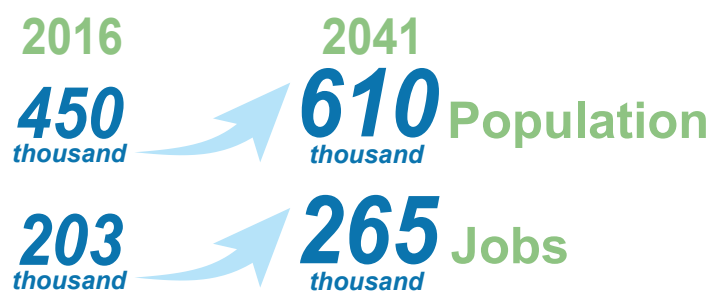
The TMP will provide the blueprint for decision-making that will be transparent, inclusive and accountable, and that will provide better value to households, businesses and governments.

3 TMP DRIVING FORCES

The TMP is driven by what we know about current and future conditions and by how the Region will respond to them.

What We Know About Policy. The current policy and planning environment places a critical emphasis, even an obligation, on the integration of land use planning and transportation planning. Land use policy will be addressed in **How We GROW**, and the Region must develop a transportation policy response that seeks to support the growth that is required to meet the Provincial Growth Plan targets.

What We Know About What People Think. Residents and stakeholders were actively engaged in all elements throughout the duration of the study and were passionate about transportation in Niagara Region. The key messages are clear and the Region needs to develop strategies to respond to these messages, including support for:



Source: How We Grow (Municipal Comprehensive Review)

- Complete Streets road design and complete neighbourhood development;
- Expanded and connected cycle network with consistent wayfinding;
- A solution to QEW congestion, including safe provincial highway alternatives;
- Enhanced GO Rail service to Niagara Region for connectivity to the Greater Toronto and Hamilton Area (GTHA);
- Improved inter-municipal transit to connect more communities in Niagara Region;
- Transportation improvements along QEW, 406, Escarpment Crossing, new South Niagara East-West Arterial Road, and NGTA East Link; and,
- Localized road improvements that improve overall efficiency and operations.

What We Know About the Existing Network. The current transportation network (Map 2) is mature and well-developed, providing a solid base that can accommodate the basic needs of Niagara Region, however performance analysis of the existing network and systems identified a number of opportunities for strategic improvement to better meet future needs including: active transportation expansion and connectivity; transit inter-municipal integration; road extension, widening, and rehabilitation; airport and marine capacity considerations; and rail passenger and freight availability maximization. Many of these issues were also raised during the engagement activities, giving additional credence to the earlier analysis conclusions.

What We Know About Demand for Travel. After a prolonged period of relatively limited growth, Niagara's population and employment are expected to grow more rapidly. The demand for transportation will both increase and become more complex as Niagara Region evolves. In response, the Region will need to strengthen connectivity between its municipalities and to the GTHA, and to provide better options for non-car travel. Without significant action, car travel will remain the overwhelming choice of residents—a situation that could have detrimental impacts on Niagara's quality of life, economy and environment.

4 NEEDS AND OPPORTUNITIES

Discussed below are the four main cross-cutting transportation themes (or opportunities), the needs they produce, the goals they address, and the associated desired outcome. Capturing these, as identified in the Needs & Opportunities Report, is vital to achieving this range of higher-order outcomes fundamental to Niagara Region's long-term quality of life, economic competitiveness, and environmental health.

Transportation as a catalyst for change. The Region’s substantial growth over the next 25 years provides a major opportunity for constructive change. As new land uses develop, transportation can act as a catalyst to support a number of strategic objectives. Transportation systems will influence where people choose to live and work in the region, how business investors perceive it, and how people think about the prospect of moving there. The Region has the opportunity to focus transportation investments to create a more multimodal approach that offers improved choice, reduces effort, maximizes connectivity, and makes Niagara more attractive to potential investors and residents.

GOALS ADDRESSED



DESIRED OUTCOMES

- Attract a talented workforce
- Maintain and attract new business investment
- Create more healthy and liveable communities
- Improve financial sustainability
- Establish leadership on climate change and environmental sustainability

Connecting the Region. Niagara Region’s location, unique geography and urban structure make it an attractive place to live, work and play however it needs a greater degree of transportation connectivity locally - within its communities; regionally - between its communities; and, externally - between it and other regions to make it more prosperous. These connections need to be multimodal, giving maximum opportunity to all residents, including the many who do not own or drive a car. Over time, the Region should aim to reduce the significantly high proportion of daily travel by car across Niagara, which currently sits at 90%, the majority of these being single-occupant vehicles.

GOALS ADDRESSED



DESIRED OUTCOMES

- Increase economic interchange with GTHA and other surrounding municipalities
- Strengthen economic and social connections between area municipalities
- Boost efficiency of goods movement; regional, national and international markets
- Maximize use of walking and cycling for short trips
- Improve international trade
- Increase effective freight capacity through region and reduce QEW congestion

Meeting the needs of residents. Niagara Region’s demographics are changing and by 2041 its current population of seniors will more than double. Older residents will require more age-friendly infrastructure and better alternatives to driving, especially for trips between municipalities and outside peak periods. The number of younger people in Niagara will also grow, and the region’s population of young adults will represent a particularly important factor in terms of attracting business investments in the booming “new economy” knowledge and service industries. In the urban areas young adults are demanding more flexible and convenient alternatives to car ownership. Maximizing transportation affordability for residents of all income levels will boost social equity and economic opportunity.

GOALS ADDRESSED



DESIRED OUTCOMES

- Retain young adults after they complete high school and post-secondary education
- Ensure full participation of seniors
- Promote Niagara Region as a place for families to thrive
- Improve equity for all

Taking advantage of new technologies. Technology represents a “disruptive force” that if managed properly, could positively change how people travel and how businesses move goods. By proactively identifying, testing and adopting technologies that work for its specific needs and context, Niagara Region could enhance its competitiveness in attracting both residents and businesses.

GOALS ADDRESSED



DESIRED OUTCOMES

- Reduced personal and business costs for transportation
- Extended coverage of transit system
- Reduced need for road expansion
- Region seen as leader in innovative transportation solutions

5 A COMPLETE STREETS APPROACH

The purpose of a street should be more than just a route for automobiles. Streets are the defining elements of Niagara's towns and cities and showcase the character of a place. Complete Streets is an approach to street design where the public right-of-way and adjacent lands are designed to equitably and efficiently support all mobility modes as needed, including delivery of goods, and to assist people of all ages and abilities in travelling throughout Niagara Region. Complete Streets serve both a place-making and transportation function, and form the spine of healthy and economically viable communities.

The Complete Streets approach is consistent with the strategic goals of the TMP to integrate land use and transportation, promote sustainable options and healthy communities.

The Region will be incorporating new Complete Streets policies into the Regional Official Plan. By adopting a Complete Streets approach to the development, refurbishment or reconstruction of all road and street projects, Niagara Region is dramatically changing the way it conducts the business of urban and community development. Incorporation of this new approach into the planning process will be a cornerstone of Niagara Region's ongoing development and is a transformative measure in establishing a new identity for Niagara Region as a leader in community design and mobility. This new identity will enable the Region to attract businesses and residents, both contributing to economic growth in Niagara.

Supporting these new policies, the Complete Streets Design Guidelines are intended to provide guidance to the Region and local municipalities in assessing and incorporating, where reasonable, Complete Streets design principles. The guidelines define six road typologies that encompass the range of Regional roads in Niagara, including main streets, wide and narrow urban roads, transitioning roads, rural roads and roads through hamlets.

The Complete Streets concept is not always about accommodating all modes of transportation on a street to the highest level of service. Rather, the aim is to pursue incremental improvement to a street, making it as complete as possible, with a priority for the main function of the road and ensuring network connectivity.

Inclusive design to meet changing needs

The concept of universal design, or inclusive and barrier-free design, refers to a broad-spectrum of ideas that lead to the production of buildings, products and environments that are inherently accessible to all people, including people with

and without disabilities, aging populations and children. The trend is moving from design only in relation to those with mobility concerns, to using an overarching lens on the population as a whole and the impact of the environment in which communities need to live, work and play.

Changing demographics in Niagara Region is one key trend that needs to be addressed through design. In Ontario as a whole, the seniors' population – those aged 65 years and older – is expected to more than double to 3.5 million over the 25-year horizon of this Plan. Older residents will require more age-friendly, accessible infrastructure and better alternatives to driving, and this will have a direct impact on the transportation system in Niagara Region.

According to Statistics Canada, 15% of Ontario's population has some form of disability, rising to 37% for the over 65s.

Age-friendly communities are those that are taking steps to help their older residents remain healthy, active and independent, and encourage them to continue contributing to their communities as they age.

Special considerations must be given to transportation and public transit options as well as public spaces and walkability.

Key Recommendation

It is recommended that the Region plan and design all Regional Road projects identified in the Road Capital Plan, including repaving, using a Complete Streets approach, designing roads to be universally accessible, safe and comfortable for all users.

Key Actions

- Adopt the Niagara Region Complete Streets: Vision and Direction for a Changing Region document which provides decision-making tools to reflect an integrated consideration of land use and transportation issues.
- Implement Complete Streets design guidelines and standards as part of road rehabilitation and reconstruction projects.
- Initiate an accessibility and universal design advisory committee.
- Demonstrate leadership in transportation projects by incorporating barrier-free and universal design principles.
- Retrofit existing infrastructure to remove barriers to access in the transportation network as part of road reconstruction and rehabilitation program.

6 TRANSPORTATION CHOICE

Key goals in **How We GO** are to improve options for equitable transportation choice, sustainable modes, and to enhance multimodal connectivity – a theme echoed in the public consultation. Providing transportation choice and opportunities to access multiple modes of transportation to people of all ages and abilities will improve the quality of life, economic vitality, and system efficiency. The transportation network should promote healthy, vibrant communities where all residents, regardless of age or ability, enjoy a high quality of life. Residents will have a wide range of options available to them for getting around and meeting their daily needs including accessing goods, services, employment and recreation by alternate travel modes (i.e., walking, cycling, public transit and the automobile).

6.1 Active Transportation

Active transportation includes all modes of self-propelled transportation including walking, cycling, rolling, etc.

Active transportation also plays a major role in supporting public transit as the majority of transit users start and end their trip by walking or cycling.

Niagara Region is already a cycling destination, but the TMP aims to make travel by bicycle a realistic option for Niagara's residents and visitors alike. A major focus for this TMP was the creation of a safe, highly connected network of active transportation (AT) facilities that is attractive to both residents and visitors, regardless of age or ability. AT facilities should be designed, developed and maintained to ensure they are safe and accessible for all users while balancing the needs of the different AT modes and trip types that share the network. Supportive walking environments to accommodate pedestrian circulation is discussed under Section 5 Complete Streets. Niagara Region should build on recent success and seek to further

raise the profile of AT through the Active Transportation Sub-Committee.

In 2005, the Niagara Bikeways Master Plan identified a 1,200 km network of cycling facilities, of which 760 km has been implemented to date, primarily through road capital projects. To advance the implementation of the Bikeways Master Plan network, the Region requires a strategy to systematically eliminate barriers and connect gaps in the network. A Strategic Cycling Network (Map 3) was developed to address gaps and underserved areas by providing a high-quality, connected network, in areas where it will most likely be used, within the shorter-term. Guidelines for consistent wayfinding signage were developed to direct cyclists to routes, facilities, and points of interest throughout Niagara Region.

Key Recommendation

It is recommended that the Region invest in active transportation facilities and supporting infrastructure to promote active lifestyles and healthy communities. To advance the development of the Bikeways Master Plan network, it is recommended that the Region adopt a Strategic Cycling Network to address gaps and underserved areas by building a connected network, in areas where it will most likely be used, within a shorter-term horizon. To support the local area municipalities in implementing the municipal components of the Strategic Cycling Network, it is recommended that Niagara Region increase the bicycle facilities grant for Regional Bikeways Network facilities on local roads to \$1 million per year for the next 10 years.

Key Actions

- Implement the Strategic Cycling Network Concept, as part of the Council Approved Bikeways Master Plan.
- Work with Active Transportation Sub-Committee to develop and support cycling education and safety, cycle wayfinding implementation and improving the overall cycling experience for all users including tourists.
- Adopt and implement the Bikeway Identification and Destination Wayfinding Signage for Cyclists guidelines.
- Complete the Niagara Bikeways Master Plan network.

6.2 Public Transit

Transit service levels in Niagara Region are among the lowest in Ontario's regional municipalities. The dispersed communities in Niagara are difficult to serve efficiently and cost-effectively using traditional fixed-route services. Recent technological advances present an opportunity for the Region to provide demand-responsive transit in a more efficient and cost effective manner than was previously possible. However, challenges remain with the local geography and concerted effort and investment will be necessary to create a transit system that is able to support the public's mobility needs and provide an attractive alternative to the car. The transit strategy (Map 4) for Niagara Region is to adopt a new transit model that aims to strengthen core fixed-route transit services and better connects all its local municipalities to support growing demand for inter-municipal travel. In lower-density areas, where traditional, fixed-route transit systems perform poorly, a demand-responsive transit model, using existing and emerging technology and supportive Active Transportation infrastructure, will maximize the efficiency of providing transit service and increase convenience to travellers. The proposed transit strategy will require increased transit service levels for both GO and IMT bus services.

The recommendations of the TMP are meant to complement recent work undertaken by the Inter-Municipal Transit (IMT) Working Group and guide high-level decision making about the Region's transit policy.

As the public transit system evolves and is built out with urban development growth and land use becomes more transit supportive, Niagara Region will move towards rapid transit as a longer-term strategy. The identification of higher-order transit corridors aligned with the Region's urban structure will be a first step to intensify and build ridership in strategic corridors and justify advanced planning (e.g. undertaking of environmental assessment studies, preliminary and detail design) and potential "quick start projects" (e.g. transit priority, express bus services, bus passing lanes) as precursor elements to full rapid transit.

Map 5 presents opportunities for future higher-order transit that may be considered once urban densities and local transit services levels reach levels that can support it, and should be reviewed as part of the next update of the transportation master plan. The future opportunities include north-south and east-west inter-city express transit routes that build on highway and rail corridor infrastructure that is already in place, with running ways protected from traffic congestion.

Key Recommendation

It is recommended that the Region strengthen core transit services and provide transit connections to all of its local municipalities through a combination of fixed-route and demand-responsive transit, using existing and emerging technologies to improve efficiency and cost-effectiveness, to support growing demand for inter-municipal travel and inter-regional transit services.

Key Actions

- Develop transit demand-responsive model/pilot to extend access to Niagara Region Transit service.
- Move towards a consolidated transit model for one transit entity in Niagara Region that can provide better coordinated transit services and fare integration.
- Support the expansion of GO Transit passenger rail service to Niagara Region, and the development / redevelopment of rail stations to serve as major transit station areas.

6.3 Road Network

Niagara Region needs to ensure that it maintains accessibility and connectivity within Niagara and to the Greater Toronto and Hamilton Area (GTHA) through the provision of upgrades/improvements to key links resulting in a prosperous economy and connected population. Niagara Region's mature and well-developed road network is comprised of urban arterials, many with four travel lanes, and rural arterials that connect the many communities spread throughout Niagara.

With forecast population and employment growth, travel by motorized vehicles is expected to grow by 55%, reaching more than 10 million vehicle-km daily in 2041. Future growth and increasing demands to move people and goods within and through the Region will intensify the need for a safe, connected and sustainable



road network. Strategies and initiatives to influence how, how much, when, where, and why people travel and technologies to maximize the capacity of the existing network (discussed in Section 6.4) work hand-in-hand with proposed capacity improvements.

A number of constraints will exist along key corridors, such as the major Provincial and Regional corridors that traverse Niagara, and at key locations, such as the crossings of the Niagara Escarpment and Welland Canal. A program of strategic network capacity improvements is needed to meet the needs of residents and businesses.

The recommended 2041 Road Network (Map 6) includes the following improvements, which will be supplemented by transportation demand and system management:

Provincial Highways

The QEW is the only major provincial highway that traverses Niagara Region and connects the GTHA to the international border in South Niagara. Highway 405 and Highway 420 branch from the QEW to the Queenston-Lewiston Bridge and to the Rainbow Bridge, respectively. The QEW is the main link from Niagara Region to the GTHA, and is a significant constraint on tourist and trucking activities in Niagara. The vast majority of Niagara's truck traffic travels to or from the GTHA on the QEW. Trucks represent about 15% of weekday traffic volumes on the QEW, which is congested during weekday peak periods and off-peak tourist times. Increasing demands on the QEW will lead many truck drivers to look for alternatives.

The MTO is responsible for the provincial highway network including: QEW; Highway 405; Highway 406; Highway 420; Highway 58; Highway 3 and Highway 140, and has identified a program of key projects. Niagara Region must continue to advocate for the delivery of the MTO program.

Niagara-Hamilton Trade Corridor

Over the past 15+ years, multiple studies have examined the existing highway network and possible outcomes for a proposed Niagara to Greater Toronto Area (NGTA) Corridor connecting Niagara Region to Hamilton, Burlington and other municipalities in the GTHA. Analysis shows that such a corridor will be required over the long term to provide necessary capacity and required operational redundancy. However, while planning of this corridor is underway, it has not yet reached the point of identifying a corridor right-of-way. Such a major corridor will take a considerable time to be approved, for the acquisition of right-of-way and for

construction, suggesting an operational NGTA Corridor could still be in excess of 25 years into the future.

In the meantime, the need for a trade corridor as an alternate to the QEW is clear. A Niagara-Hamilton Trade Corridor, which connects Niagara Region from Fort Erie to Hamilton in the vicinity of the Hamilton Airport / Highway 403 would address the more immediate demands of moving goods in and through Niagara Region in the absence of the full NGTA Corridor. The Region should actively advocate for the Niagara-Hamilton Trade Corridor (NHTC) as an alternate route to the QEW that improves Niagara's connection to both Hamilton and the international border. A right-of-way should be designated as soon as possible and safeguarded for the future.

In the interim, while planning for the new Niagara-Hamilton Trade Corridor proceeds, Niagara Region should actively work with MTO to identify a shorter-term solution to provide network capacity and redundancy through an alternate provincial route. This includes a role and function study for the former Highway 20 corridor to assess its potential to accommodate longer-distance, inter-regional travel and goods movement in Niagara Region. Map 7 illustrates a potential "Phase 1" interim trade corridor:

- Phase 1A - South Niagara East-West Arterial Road
- Phase 1B – Highway 58 / Regional Road 23 (Forks Road) / Regional Road 24 (Victoria Avenue) / Highway 20 / Smithville Bypass, connecting to Lincoln Alexander Parkway in Hamilton
- Phase 1B (Alternate) – Highway 58 / Regional Road 23 (Forks Road) / Regional Road 24 (Victoria Avenue) / Highway 20 / Regional Road 65, connecting to Highway 6 and Highway 403 in Hamilton

Interchange Improvements

To support access to the provincial highway network, three interchange projects were identified, including a new Highway 405 interchange at Concession 6 Road, a new Highway 406 Interchange at Third Avenue Louth, and improvements to the QEW / Glendale interchange.

Although not part of the TMP, the Region and MTO are addressing operational improvements to the QEW interchanges at Casablanca Boulevard and at Victoria Avenue.

Regional Roads

Niagara Region has a 10-year road capital improvement program that is endorsed annually by Council, which identifies on-going and planned projects for improving the existing road network and supporting infrastructure, including network expansion where necessary. As a long-term planning document, this TMP has identified transportation needs for the 25-year horizon and, its recommendations goes beyond what Niagara Region may have identified previously.

The recommended road network improvements were identified through a combination of reviews of previous/on-going studies, travel demand forecast modelling, sub-area analyses, input from Regional and municipal staff, and input from stakeholders and the public. The recommended improvements are intended to provide a connected road network that better accommodates economic demands, tourism demands and facilitates travel for Niagara residents.

Key Recommendation

It is recommended that the Region accommodate future growth in travel through strategic network capacity increases and address operational improvements at key constraints. It is recommended that the Region continue to advocate for highway capacity improvements to address inter-regional and international trade and tourism-related demands, including a new trade corridor connecting Niagara to Hamilton and the international border.

Key Actions

- Advocate and work with MTO for capacity improvements to accommodate inter-regional and international travel demand, including:
 - Widening of QEW;
 - Role and function study for Regional Road 20 / Highway 20;
 - Highway interchange improvements;
 - Implementing the NGTA East corridor and extension of Highway 406; and
 - Building a new Niagara-Hamilton trade corridor.
- Undertake and/or complete Environmental Assessment for Niagara Escarpment Crossing and South Niagara East-West Arterial Road,
- Protect non-Regional transportation corridors that provide local benefits and network connectivity including: crossing of QEW (Morrison Street), crossing of Twelve Mile Creek (Carlton Street), and crossing of Welland River (future road).
- Complete the 2041 Road Network.

6.4 Transportation Demand and System Management

Transportation Demand Management (TDM) provides a means to protect the Region's investments by ensuring that transportation facilities are used efficiently and by tapping into currently underutilized capacity. Transportation systems management (TSM) uses technology to maximize the capacity of existing roads and make travel by all modes safer and more efficient. These strategies typically include Intelligent Transportation Systems (ITS) which have been evolving over the course of the past few decades. TDM and TSM typically cost a fraction of the capital costs required for expanding roadway and transit infrastructure.

Transportation Demand Management is a set of policies, programs, services, and initiatives that aim to increase efficiency in the transportation network by changing how, how much, when, where, and why people travel.

Transportation System Management is a strategy to maximize the efficiency, reliability, capacity, and safety of the transportation network economically and environmentally using technology to manage congestion and traffic operations.

TDM is aimed at influencing behaviour to reduce travel - particularly the need to travel alone by car during the peak hours. TDM is an effective tool to defer the need for significant capital investments in new infrastructure by reducing demand and making better use of existing transportation facilities and services. TDM is also an excellent way to reduce greenhouse gas emissions and encourage active lifestyles by promoting sustainable transportation modes. TDM focuses on all modes in the transportation network, but is largely directed at reducing the number and type of trips made using single-occupancy vehicles. Potential TDM initiatives could include carpool programs, park and ride lots, paid parking initiatives, and workplace-based commuter programs.

Niagara Region is currently developing an ITS Strategic Plan to identify actions to improve the efficiency of the transportation network. The initial ITS Strategic Plan findings identified opportunities for Niagara Region to improve traveller information systems, traffic control systems, and corridor management systems that will better support the regional economy and improve user experience. The ITS Strategic Plan, once completed and Council approved, will also provide recommendations for funding and staff resources to support implementation of the plan.

Increasingly, internet access and online services are reducing a portion of travel demand. “New mobility” technologies, such as connected and autonomous vehicles (CAV), and services like ride hailing applications (e.g., Uber), represent major shifts in the delivery of transportation services and the movement of goods. Niagara Region can stay ahead of the curve and maximize its competitiveness by preparing for changes in business models, vehicle fleets and personal tastes. While it is still too soon to be prescriptive on the best approaches for the Region to take, the TMP identifies the need to track developments closely, and to evaluate possible applications as soon as practical.

Embracing new technologies is only possible however, if an internet connection of sufficient bandwidth and reliability is available to support these technologies. Internet services in Niagara Region vary considerably between communities, and between urban versus rural areas. Efforts are underway to improve internet access through the South Western Integrated Fibre Technology (SWIFT) initiative – led by a partnership of 16 regional and local municipalities, including Niagara Region – to build an ultra-high-speed fibre optic Internet network for southwestern Ontario.

Key Recommendation

For Niagara Region to improve sustainability, efficiency and safety for the transportation system, it is recommended that the Region fund and staff programs to adopt and lead TDM and TSM initiatives, and embrace new mobility services and the use of technology to monitor and maximize capacity.

Key Actions

- Develop Business Case for transfer of Niagara Ride Share Program to Niagara Region.
- Provide funding and staff resources to manage and coordinate Regional TDM and TSM programs and initiatives.
- Initiate a Travel Demand Management (TDM) study to identify a TDM program and supporting initiatives in collaboration with local municipalities.
- Complete and implement ITS Study (initiated in 2015) to identify TSM program and supporting initiatives.
- Coordinate policy development related to emerging technologies with local municipalities and neighbouring jurisdictions.
- Advocate for advancement of SWIFT as opportunities arise.

7 GOODS MOVEMENT

Improving the movement of goods through and within the Region is vital to Niagara Region's economic development.

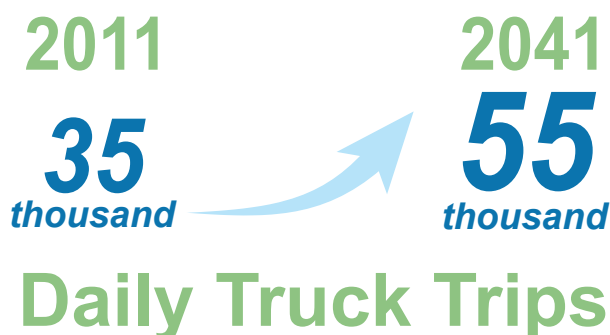
Niagara Region is located on a critical international trade corridor – every day, thousands of commercial vehicles pass through Niagara's international border crossings. The QEW is the main link from Niagara Region to the GTHA, and congestion is a significant constraint on trucking activities in the area. To support Niagara's employment areas and Foreign Trade Zone Point designation, network improvements are required to minimize impedance from commuters and tourists – thereby reducing business costs and increasing the value of operating in Niagara Region.

The number of truck trips in Niagara Region will grow in conjunction with population and economic growth in the region. A majority of those trips will continue to be through trips or trips between Niagara and the GTHA. Minimizing impedance from commuter and tourist traffic improves the efficiency of goods movement which reduces business costs and increases the value of operating a business in the Niagara Region. Potential road improvements that would benefit local business include the Niagara-Hamilton Trade Corridor, better escarpment crossings to accommodate commercial vehicles, and improved connections to the highway network.

Niagara also has considerable marine, rail, and air infrastructure that play an important role in the movement of goods. Recent trends have shown a decrease in goods movement by marine, rail and air, Niagara Region should protect the capacity of the multi-modal freight network infrastructure to support future growth opportunities that could have the added benefit of off-loading a congested, highway corridor and supporting economic development in Niagara Region. The Welland Canal is a strategic international, national and regional freight and passenger marine corridor that supports both transportation and economic benefits to the Region of Niagara. The St. Lawrence Seaway Management Corporation is undertaking a long-range planning study that will maintain the efficiency of the Welland Canal operations and supporting infrastructure to address long term transportation, economic and social commitments and policy mandates.

Emerging technologies will play both a supportive and disruptive role in the goods movement and manufacturing sectors. These technologies present opportunities to improve the efficiency of goods movement and potentially reduce

the demand for transporting goods on the Region's road network. These include connected and autonomous vehicles (increasing capacity by enabling closer car-following as a platoon, driver-less trucking), drone deliveries, and 3D printing which could reduce the demand for goods movement.



Key Recommendation

It is recommended that the Region advocate with the provincial and federal governments to advance the Niagara-Hamilton Trade Corridor and NGTA East Corridor, providing an efficient trade route connecting Niagara Region to the GTHA and USA. In the shorter-term, it is recommended that Region actively work with MTO for continuing improvements to the QEW and undertake a role and function study for Regional Road 20 as an alternate provincial route that can accommodate longer-distance and inter-regional goods movement.

Key Actions

- Initiate a Niagara Trade Corridor Sub-Committee made up of Regional Councillors, Municipal Councillors, and Senior Public Works and Planning Staff to advocate for major infrastructure needs, including the Niagara-Hamilton Trade Corridor, NGTA East Corridor, and a shorter-term solution to provide network redundancy through an alternate Provincial route parallel to the QEW that can accommodate longer-distance, inter-regional travel and goods movement.
- Initiate Goods Movement Study to address trade corridors, truck routes, maritime routes, changing delivery methods and emerging technology, and localized goods movement issues. The study should identify strategies to ensure goods movement by air, rail and marine continue to be vital components of goods movement in Niagara Region, including opportunities for integrated rail services and port activities.
- Protect Niagara Region's marine, rail and air infrastructure for future growth opportunities.

8 IMPLEMENTATION

It is essential to have a comprehensive implementation, funding, and plan monitoring framework as part of the Transportation Master Plan to provide guidance for the actions to be taken by Niagara Region and key stakeholders/agencies in the short, medium, and long term. Most importantly, it provides the framework necessary to evaluate and monitor the progress of the TMP.

Action Plan

The action plan (Exhibit 1) outlines the specific actions to implement the recommendations of this TMP. It reflects the vision and goals and addresses opportunities to support constructive change, connecting all parts of Niagara Region, meeting the needs of the residents today and tomorrow, and taking advantage of new technologies. The action plan comprises a complete list of actions identified in the TMP.

Phasing

The recommended timeframe for actions to be undertaken have been prioritized into three timeframes: short term (2017 to 2021); medium term (2022 to 2031); and long term (2032 to 2041). The recommended TMP capital projects by phase are shown in Map 8.

In the short term, by 2021, the Region will focus on implementing policies that will transform its approach to transportation, addressing existing constraints in the road system, adopting TDM and TSM measures to support the road network, filling in gaps in the active transportation network, and taking the next steps to plan for the major network needs for the future. Specifically, the early actions to be undertaken in the first five years of the program include:

- Incorporating the Complete Streets approach in the Region's design process.
- Constructing AT infill projects to implement the Strategic Cycling Network and working with AT Sub-Committee to support cycling education, safety, and wayfinding.
- Initiating a demand-responsive transit model/pilot, identifying opportunities to expand the transit service area, and identifying potential transit priority measures for Regional roads.








- Advocating for the advancement of a new trade corridor in Niagara Region, and working with MTO to identify a shorter-term solution, including a role and function study for Regional Road 20.
- Implementing the Capital Program.
- Undertaking / completing Environmental Assessment studies for the Niagara Escarpment Crossing, South Niagara East-West Arterial Road, recommended highway interchanges, and St. Catharines CN rail grade separation.
- Funding and staffing TDM/TSM programs and initiatives.








With respect to capital infrastructure, transportation projects are prioritized on an on-going basis through Niagara Region's Capital Budget and 10-year Forecasting process. This process, conducted annually by Region staff, accounts for existing and projected transportation needs, development-driven needs, on-going asset management, and financial envelopes. This TMP provides a longer-term outlook of the road capital program, planning to the 2041 horizon. A prioritization process to balance the needs of travel demand, providing access to new development lands, supporting areas of employment growth and providing value for money was undertaken. Consideration for timing on adjacent or upstream corridors and the status of projects in the environmental assessment process were also factors in the project phasing.

In the medium term, by 2031, Niagara Region will begin to implement major Regional road projects and improve connections to the freeway network, both of which will support goods movement in Niagara Region. The Strategic Cycling Network will be completed and incremental improvements to the cycling network will continue through the roads capital program. Transit service will continue to expand and inter-municipal service will connect all the local municipalities.

In the long term, by 2041, the Niagara-Hamilton Trade Corridor will support economic growth in Niagara Region and provide a significant benefit to the movement of goods in and through Niagara. Inter-municipal connections by road and transit, and crossings of major barriers, will continue to be implemented. Opportunities for higher-order transit need to be considered in the planning process and implemented when the urban densities and local transit services reach ridership levels to support higher-order transit.

Exhibit 1: Action Plan

	Action Plan	Timeframe			Supports Strategic Goals							Addresses Opportunities			
		Short	Med	Long	 Integrate transportation and land use	 Support economic development	 Enhance multi-modal connectivity	 Improve options for sustainable modes of transportation	 Maintain and improve the efficiency of the goods movement network	 Promote the development of healthy communities	 Develop a realistic yet innovative blueprint for implementation	Transportation as a Catalyst for Change	Connecting the Region	Meeting the Needs of Residents	Taking Advantage of New Technologies
	A Complete Streets Approach														
1	Adopt and implement the Niagara Region Complete Streets Policy document which provides decision-making tools to reflect an integrated consideration of land use and transportation issues.	✓			✓		✓	✓		✓	✓	✓	✓	✓	
2	Implement Complete Streets design guidelines and standards as part of road rehabilitation and reconstruction projects.	✓			✓		✓	✓		✓	✓	✓		✓	
	Accessibility														
3	Initiate an accessibility and universal design advisory committee.	✓			✓		✓	✓		✓	✓	✓		✓	
4	Demonstrate leadership in transportation projects by incorporating barrier-free and universal design principles.	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	
5	Retrofit existing infrastructure to remove barriers to access in the transportation network as part of road reconstruction and rehabilitation program.	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	
	Active Transportation														
6	Implement the Strategic Cycling Network Concept, as part of the Council Approved Bikeways Master Plan, giving priority to projects with the greatest cycling impact, balance complexity of work to be undertaken, and taking advantage of opportunities to work jointly with local area municipalities.	✓	✓		✓		✓	✓		✓	✓	✓	✓	✓	
7	Work with Active Transportation Committee to develop and support cycling education and safety, cycle wayfinding implementation and improving the overall cycling experience for all users including tourists.	✓				✓	✓	✓		✓	✓	✓	✓	✓	
8	Adopt and implement the <i>Bikeway Identification and Destination Wayfinding Signage for Cyclists</i> guidelines.	✓					✓	✓		✓	✓	✓	✓	✓	
9	Invest in cycling facilities and supporting infrastructure to promote active lifestyles and healthy communities.	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	
10	Encourage pedestrian- and cycling-supportive site design that provide safe pedestrian and cycling opportunities for all ages and abilities, in all new developments.	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	
11	Promote safe walking, cycling and driving through education, engineering, evaluation and enforcement.	✓	✓	✓			✓	✓		✓		✓	✓	✓	
12	Complete the Niagara Bikeways Master Plan network.			✓		✓	✓	✓		✓	✓	✓	✓	✓	
	Public Transit														
13	Develop transit demand-responsive model/pilot to extend access to Niagara Region Transit service.	✓					✓	✓		✓	✓	✓	✓	✓	✓
14	Complete framework process to move towards a consolidated transit model for one transit entity in Niagara Region.	✓				✓	✓	✓			✓		✓		
15	Undertake a Business Case to review opportunities for extending the inter-municipal transit system beyond the current service areas of St. Catharines, Welland and Niagara Falls.	✓					✓	✓		✓	✓		✓	✓	✓
16	Conduct study of potential transit priority measures along Regional roads and review opportunities for higher-order transit corridors as part of TMP update.	✓					✓	✓		✓	✓		✓	✓	✓
17	Support the expansion of GO Transit passenger rail service to Niagara Region, and the development / redevelopment of rail stations to serve as major transit station areas.	✓	✓		✓	✓	✓	✓		✓		✓	✓	✓	
18	Support the development of major transit station areas, and connections to active transportation and local transit, to stimulate investment in adjacent employment lands, commercial services, and residential development	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	
19	Introduce regular, reliable and coordinated transit connections to GO stations and major transit stations.		✓			✓	✓	✓		✓		✓	✓	✓	
20	Introduce subsidized co-fares between Niagara Region Transit and GO Transit.		✓			✓	✓	✓				✓	✓	✓	
21	Provide inter-municipal transit to all of Niagara’s municipalities through a combination of fixed-route and demand-responsive transit.		✓		✓	✓	✓	✓		✓		✓	✓	✓	✓
22	Develop a detailed policy on the usage of connected and autonomous vehicles for the purposes of public transportation.		✓		✓	✓	✓	✓			✓	✓	✓	✓	✓
23	Implement incremental service improvements to further encourage transit travel between and within Niagara Region municipalities.			✓		✓	✓	✓		✓		✓	✓	✓	✓

Action Plan	Timeframe			Supports Strategic Goals							Addresses Opportunities			
	Short	Med	Long	 Integrate transportation and land use	 Support economic development	 Enhance multi-modal connectivity	 Improve options for sustainable modes of transportation	 Maintain and improve the efficiency of the goods movement network	 Promote the development of healthy communities	 Develop a realistic yet innovative blueprint for implementation	Transportation as a Catalyst for Change	Connecting the Region	Meeting the Needs of Residents	Taking Advantage of New Technologies
Road Network														
24	Implement the 2017 Capital Road Infrastructure Program.	✓			✓	✓		✓		✓		✓	✓	
25	Work with MTO to identify a short-term solution to provide network redundancy through an alternate Provincial route parallel to the QEW that can accommodate longer-distance, inter-regional travel and goods movement, including a Role and Function study of Hwy 20/Regional Road 20 and a study to address the Smithville Bypass.	✓	✓		✓	✓		✓		✓		✓	✓	
26	Advocate and work with MTO for capacity improvements to accommodate inter-regional and international travel demand, including: widening of QEW, implementing the NGTA East corridor and extension of Highway 406; and building a new Niagara-Hamilton trade corridor.	✓	✓		✓	✓		✓		✓		✓	✓	
27	Undertake and/or complete EA for Niagara Escarpment Crossing and South Niagara East-West Arterial Road,	✓			✓	✓		✓		✓		✓	✓	
28	Work with MTO to undertake Environmental Assessments / Detailed Design for interchange improvements including: - QEW / Glendale Avenue - Highway 405 / Concession 6 / Mewburn Road Interchange - Highway 406 / Third Avenue Louth Interchange	✓	✓		✓	✓		✓		✓		✓	✓	
29	Work with City of City Catharines, Metrolinx and CN Rail to undertake Environmental Assessment for the rail grade separation in West St. Catharines.	✓			✓			✓		✓		✓	✓	
30	Work with MTO to progress the widening and introduction of managed lanes on QEW from Hamilton to Hwy 406.		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
31	Work with MTO on progress the widening and rehabilitation of QEW from McLeod Road to Mountain Road.		✓	✓	✓			✓		✓		✓	✓	
32	Work with MTO to progress the NGTA Corridor, NGTA East Corridor and Hwy 406 extension to provide for the efficient movement of people and goods connecting Niagara Region to the GTHA and USA.		✓	✓	✓			✓		✓		✓	✓	
33	Protect non-Regional transportation corridors that provide local benefits and network connectivity including: crossing of QEW (Morrison Street), crossing of Twelve Mile Creek (Carlton Street), and crossing of Welland River (future road).	✓	✓	✓	✓	✓	✓	✓				✓	✓	
34	Complete implementation of the 2041 Road Network.			✓	✓	✓	✓	✓		✓		✓	✓	
Transportation Demand and System Management														
35	Develop Business Case for transfer of Niagara Ride Share Program to Niagara Region and manage program starting October 2017.	✓				✓	✓		✓		✓		✓	✓
36	Initiate a Travel Demand Management (TDM) study.	✓			✓		✓		✓	✓	✓		✓	✓
37	Adopt and lead TDM initiatives through a TDM program that is funded and staffed in collaboration with local municipalities.	✓	✓	✓	✓		✓		✓	✓	✓		✓	✓
38	Develop and implement policies to support the goals of the TDM program.	✓			✓		✓		✓	✓	✓		✓	✓
39	Complete and implement ITS Strategic Plan Study to identify TSM program and supporting initiatives, including recommendations for funding and staff resources.	✓				✓	✓	✓		✓	✓	✓	✓	✓
40	Coordinate policy development related to emerging technologies with local municipalities and neighbouring jurisdictions.	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
41	Advocate for advancement of SWIFT as opportunities arise.	✓	✓			✓		✓			✓	✓	✓	✓
Goods Movement														
42	Initiate a Niagara Trade Corridor Sub-committee made up of Regional Councillors, Municipal Councillors, and Senior Public Works and Planning Staff to advocate for major infrastructure needs.	✓				✓		✓				✓		✓
43	Work with MTO to advance the Niagara-Hamilton Trade Corridor and NGTA East Corridor to provide an efficient trade route connecting Niagara Region to both the GTHA and USA.	✓	✓	✓		✓		✓		✓		✓		
44	Actively work with MTO to identify a short-term solution to provide network redundancy through an alternate Provincial route parallel to the QEW that can accommodate longer-distance, inter-regional travel and goods movement.	✓				✓		✓		✓		✓	✓	
45	Initiate Goods Movement Study to address trade corridors, truck routes, changing delivery methods and technology and addressing localized goods movement issues.	✓			✓	✓	✓	✓		✓	✓	✓	✓	✓
46	Protect Niagara Region's marine, rail and air infrastructure for future growth opportunities that could have the added benefit of off-loading a congested, highway trade corridor and supporting economic development in Niagara Region.	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	

Capital Investment

The estimated capital investment for the recommended network to 2041 is \$494 million for road capacity improvement projects and \$25.8 million for active transportation infill projects, including the annual grant for Regional Bikeways Network facilities on local roads. A summary of recommended road capital investments is provided in Appendix A.

Although the TMP focused on only a limited number of strategic road capacity improvements, the required capital investment to implement the network still represents an increased level of investment for Niagara Region over the next 25 years. The current network in Niagara Region is mature and fairly well-developed but the components of the network that are missing which will be needed to support continued growth and economic development are those that require significant capital investment to construct such as crossings of major barriers (e.g. Niagara Escarpment) or major infrastructure pieces (e.g. South Niagara East-West Arterial Road).

The estimated capital investment for Niagara Region by phase is summarized below. The timing for these investments will be refined through on-going monitoring of transportation system performance, land development and the annual capital budget process.

Phase	Estimated Capital Costs	
	Road Expansion Projects	AT Infill Projects
Short term 2017-2021	\$120.4 M	\$12.9 M
Medium Term 2022-2031	\$267.7 M	\$12.9 M
Long term 2032-2041	\$106.3 M	-
Total	\$494.4 M	\$25.8 M

Plan Monitoring and Updates

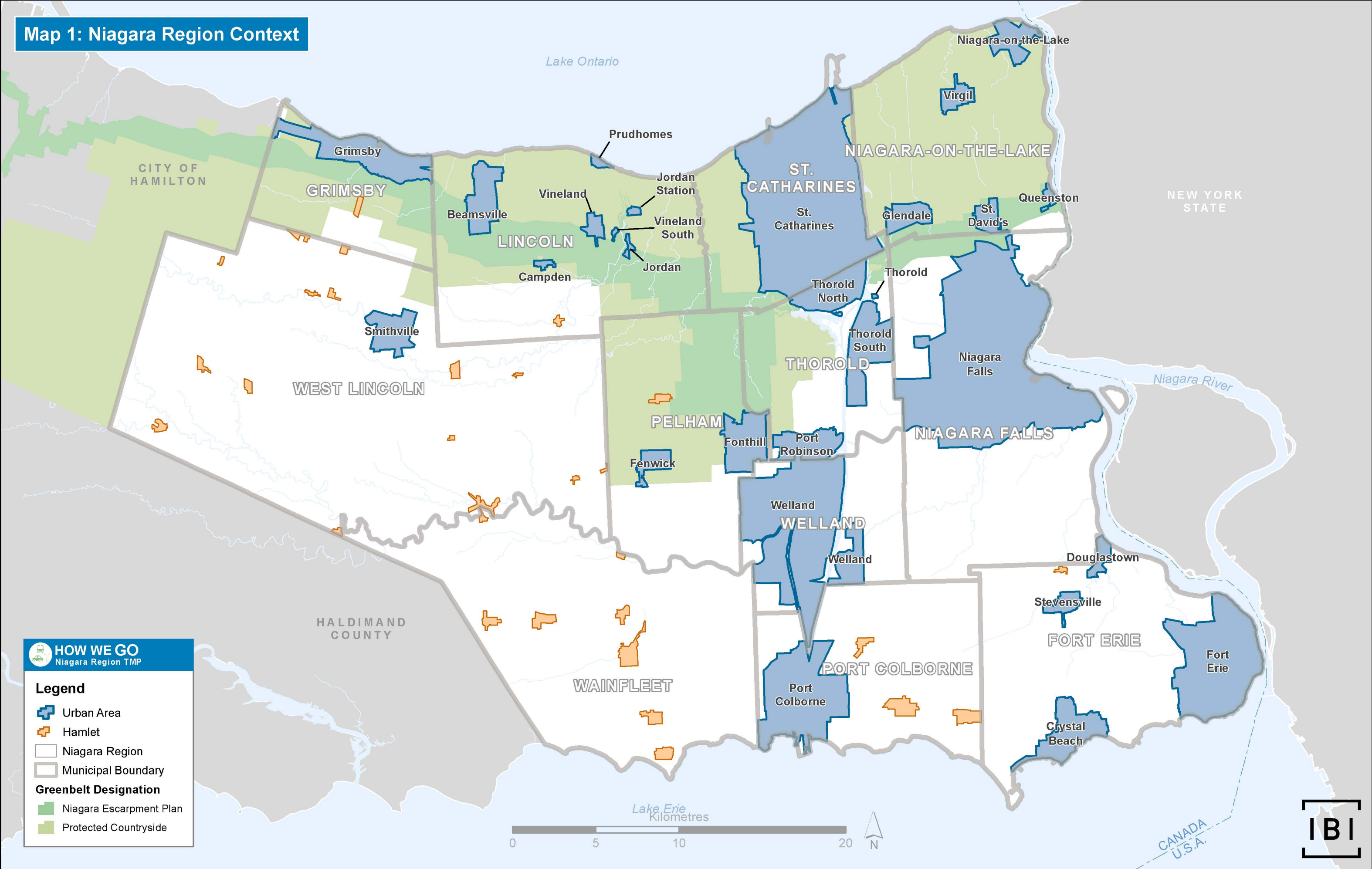
Performance measurement is necessary to gauge the effectiveness of the policies, programs and infrastructure improvements in achieving the Plan's strategic goals and enabling strategies. A performance measurement program, including Key Performance Indicators, provides a framework for the Region to track changes in land use patterns, demographic characteristics, and system performance over time. This information will allow the Region to assess the success of actions taken and provide guidance in further implementation of the TMP.

Regular reviews and updates of this Plan will allow for the on-going assessment of its effectiveness and relevance. Establishing a regular transportation planning cycle ensures the Plan strategies remain flexible to respond to new developments and changes in the planning environment. The Municipal Class EA recommends that master plans be reviewed every five years to determine the need for a detailed formal review and/or update.

The Planning Act requires the Region to assess the need for an update to its Official Plan up to 10 years from when a new official plan comes into effect and every five years thereafter unless it is replaced by a new Official Plan. That review process provides a timely opportunity to revisit the assumptions of the TMP and consider the need for an update.

MAPS

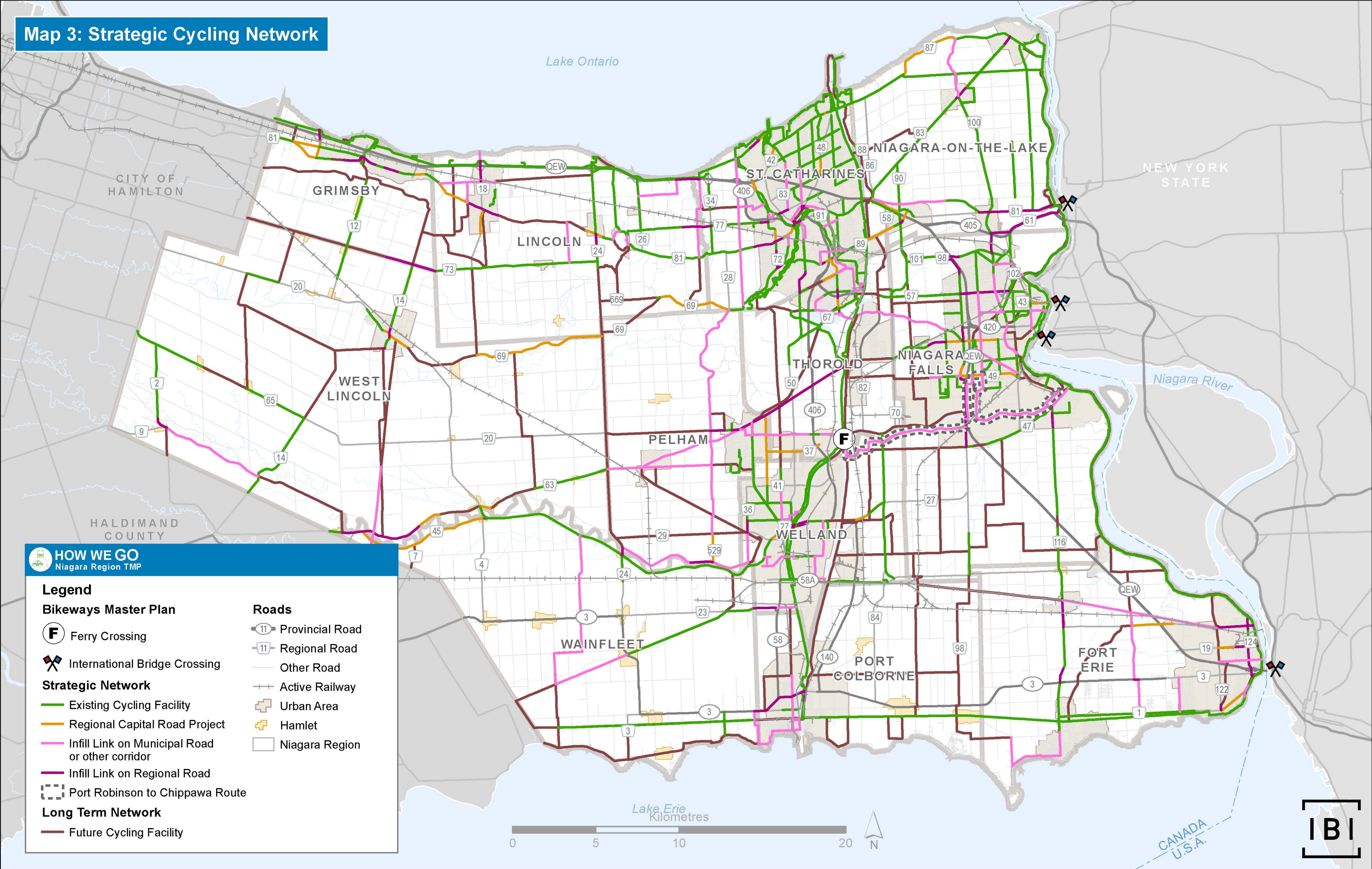
Map 1: Niagara Region Context



Map 2: Transportation Infrastructure



Map 3: Strategic Cycling Network



Map 4: Conceptual Transit Network



HOW WE GO
Niagara Region TMP

Legend

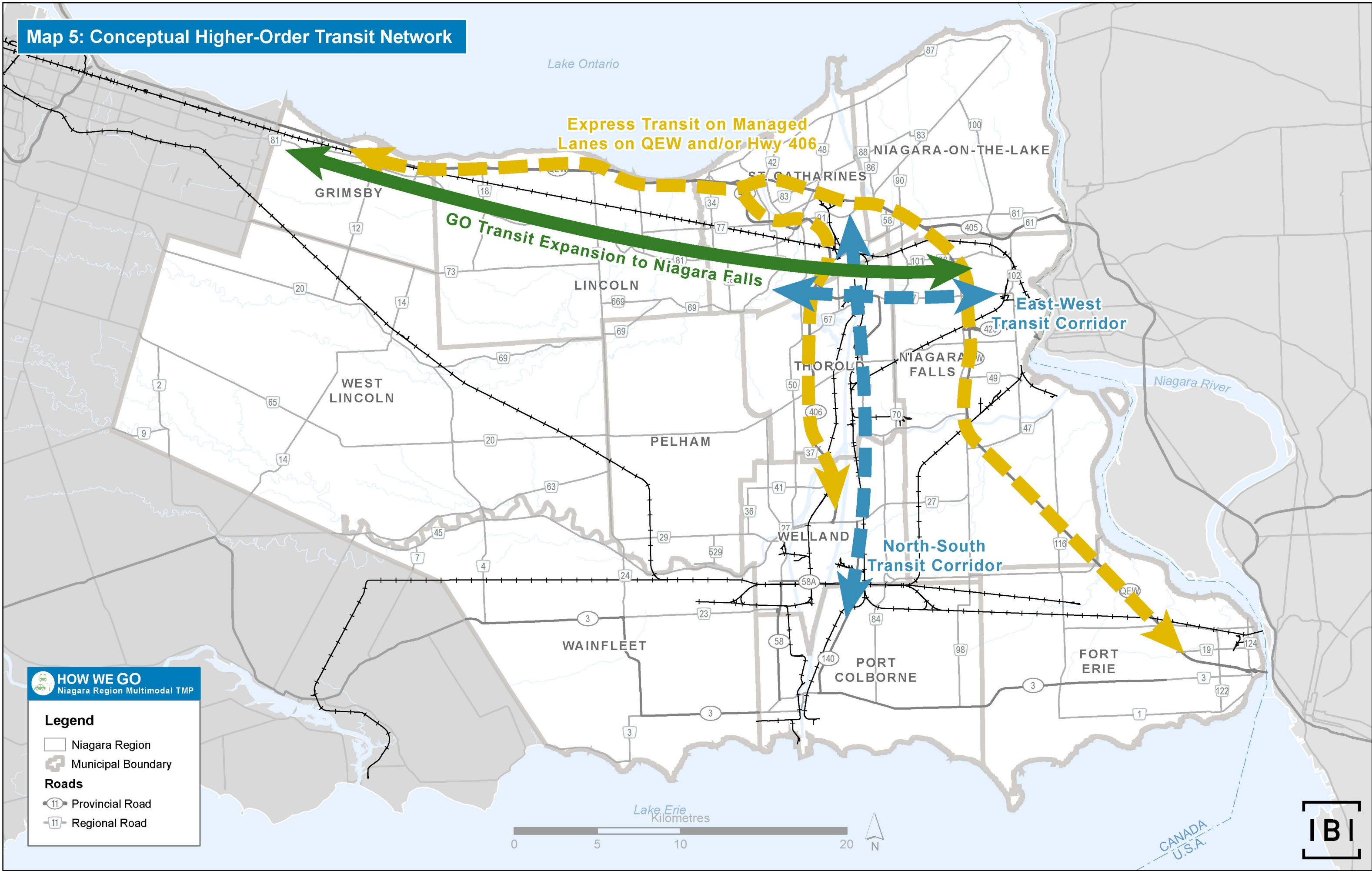
Roads

- Provincial Road
- Regional Road
- Other Road
- Active Railway
- Urban Area
- Hamlet
- Niagara Region
- Municipal Boundary

Transit Concept

- Existing Areas Served by Local Transit
- Improve Fixed-route Transit
- Improve Transit Connection
- Introduce Demand Responsive Transit
- Introduce Fixed-route Inter-municipal Transit
- Improve Inter-regional Transit Service to and from the GTHA (GO)

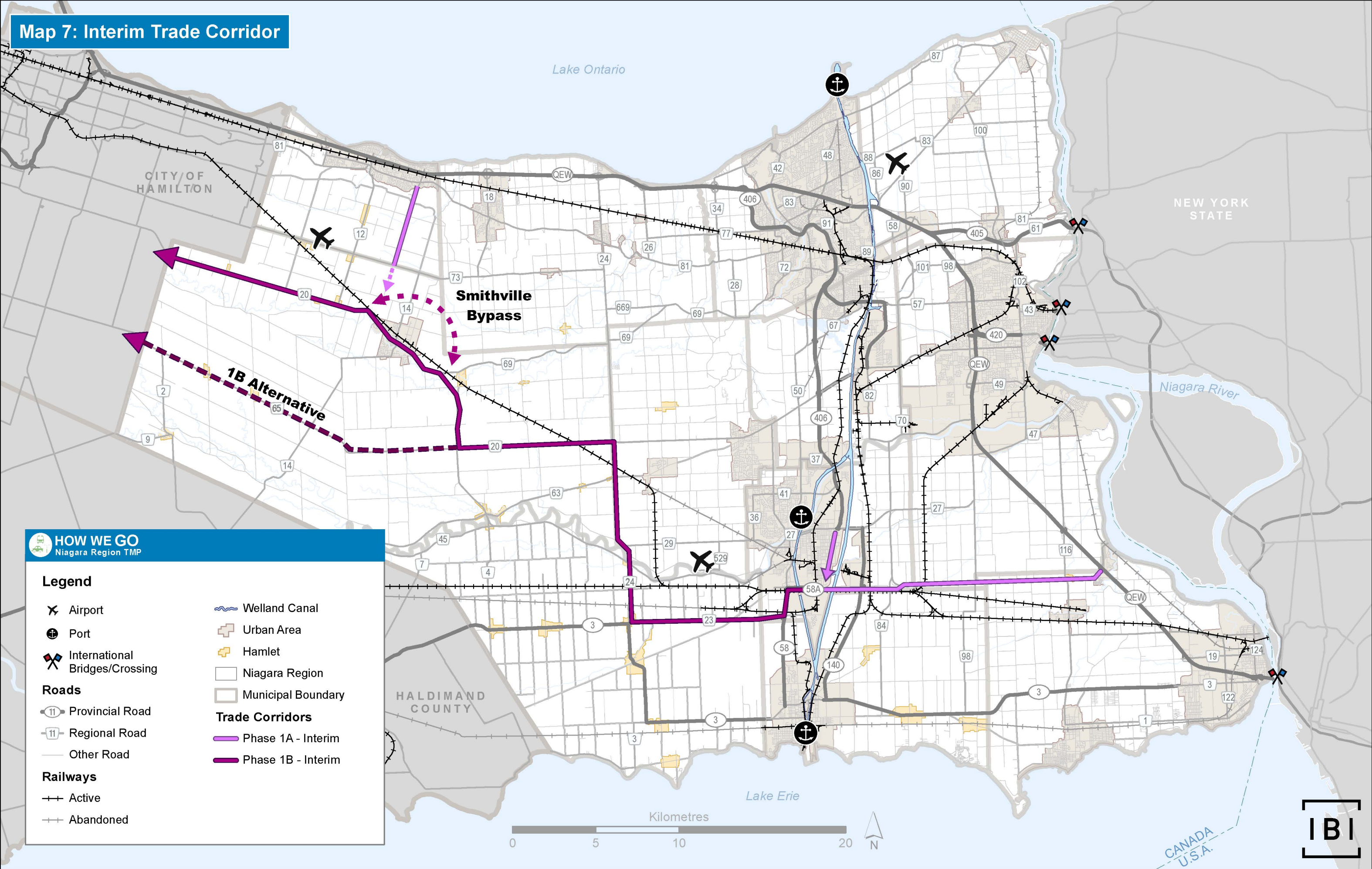
Map 5: Conceptual Higher-Order Transit Network



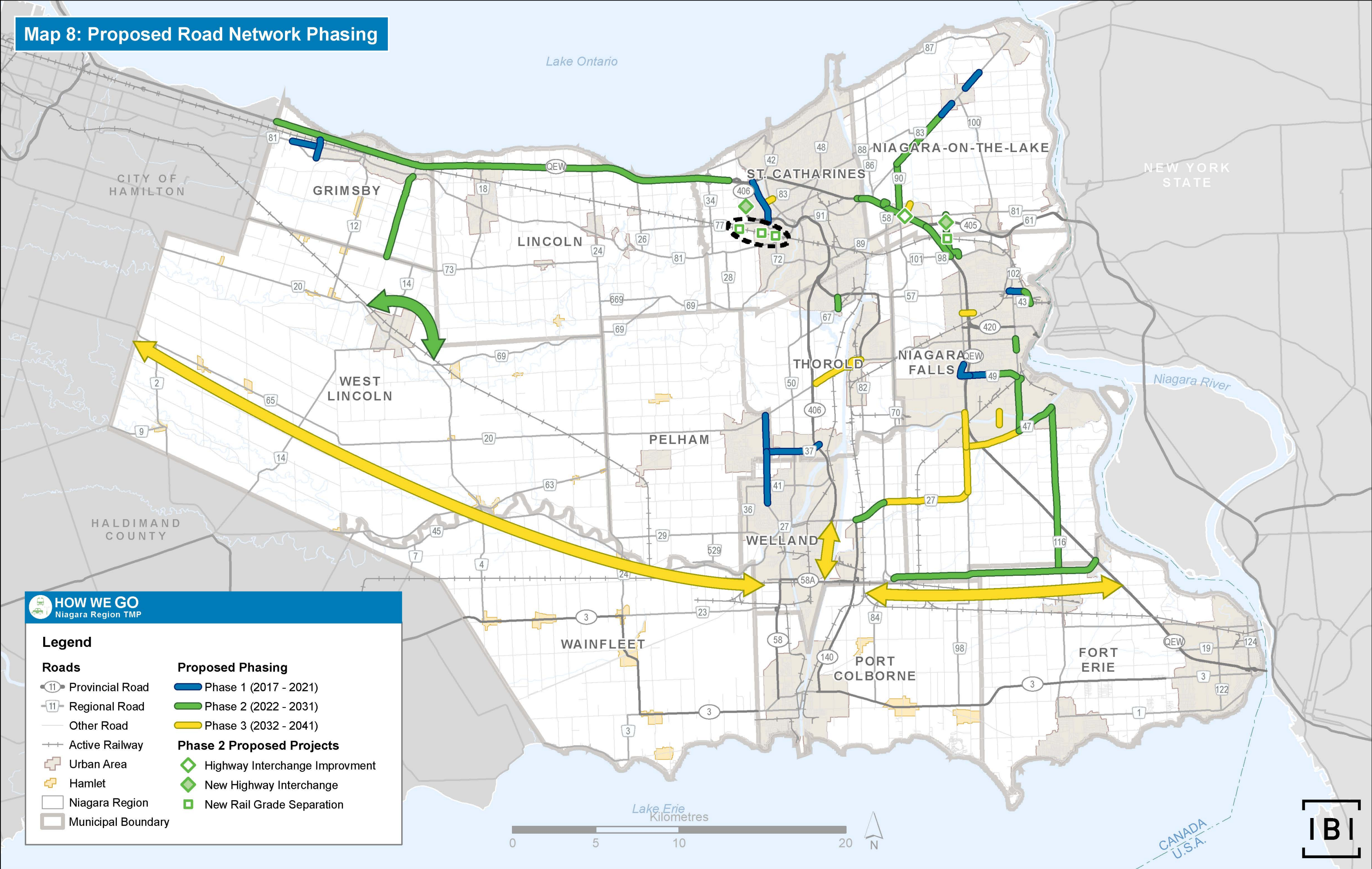
Map 6: 2041 Road Network



Map 7: Interim Trade Corridor



Map 8: Proposed Road Network Phasing





APPENDIX A: SUMMARY OF RECOMMENDED ROAD CAPITAL INVESTMENT TO 2041



Projects in Capital Budget					
Proj #	Corridor	Section	Improvement Type	Phasing	Capital Cost Estimate
10.1	Casablanca Blvd	QEW to Livingston Ave	Capacity	2017-2021	\$ 7,448,000
27.2	East Main St	Hwy 140 to Moyer Rd	Capacity	2022-2031	\$ 2,970,000
37.1	Merritt Rd	Rice Rd to Niagara St	New Road	2017-2021	\$ 8,610,000
37.2	Merritt Rd	Niagara St to Hwy 406	Capacity	2017-2021	
38.1	Martindale Rd	QEW to Vansickle Rd	Capacity	2017-2021	
38.2	Martindale Rd	Vansickle Rd to Fourth Ave	Capacity	2017-2021	
38.3	Martindale Rd	Bridge widening at Hwy 406	Capacity	2017-2021	\$ 31,461,000
49.1	McLeod Rd	Phase 1 - Montrose Rd, Pin Oak Dr. to Hydro Canal	Capacity	2017-2021	
49.2	McLeod Rd	Phase 2 - Hydro Canal to Wilson Cr	Capacity	2017-2021	
49.3	McLeod Rd	Phase 3 - Wilson Cr to Stanley Ave	Capacity	2022-2031	\$ 3,640,000
54.1	Rice Rd	Old Hwy 20 to Merritt Rd	Capacity	2017-2021	\$ 9,828,000
54.2	Rice Rd	Merritt Rd to Quaker Rd	Capacity	2017-2021	\$ 16,200,000
54.3	Rice Rd	Quaker Rd to Thorold Rd	Capacity	2017-2021	
55.2	Niagara Stone Rd	Concession 6 Rd to Line 2	Capacity	2017-2021	\$ 12,528,000
55.3	Niagara Stone Rd	Penner St (Line 1 Rd) to East and West Line	Capacity	2017-2021	
56.1	Collier Rd	Hwy 58 to Beaverdams Rd	Capacity	2022-2031	\$ 5,616,000
57.2	Thorold Stone Rd	East of Stanley Ave	New Road	2017-2021	\$ 11,088,000
57.3	Thorold Stone Rd	Gale Centre to Victoria Ave	New Road	2022-2031	\$ 11,200,000
89.4	Glendale Ave	Interchange at QEW (1/3 contribution)	Capacity	2022-2031	\$ 3,333,000
98.x	Montrose Road	Charnwood to McLeod	Capacity	2017-2021	\$ 1,904,000
406.1	Hwy 406 Interchange	At Third Ave Louth (1/3 contribution)	Highway Improvement	2022-2031	\$ 13,333,000
512.1	Livingston Ave	Main St to Casablanca Blvd	New Road	2017-2021	\$ 8,456,000
803.1	South Niagara East-West Arterial	South Niagara East-West Arterial (1/3 contribution)	New Road	2022-2031	\$ 16,275,000
x.x	Canadian Motor Speedway Infrastructure Improvements			2017-2021	\$ 2,625,000
Subtotal - Projects in Capital Budget					\$ 185,219,000

Additional Projects Identified in TMP					
Proj #	Corridor	Section	Improvement Type	Phasing	Capital Cost Estimate
14.1	Bartlett Avenue extension	Muscat Dr. to Park Rd.	New Road (1/3 Contribution)	2022-2031	\$ 38,733,000
14.2	Escarpment Crossing Improvement	Bartlett St Extension to Mud St	Capacity (1/3 Contribution)	2022-2031	
20.1	Highway 20 Smithville Bypass	Smithville	New Road (1/3 Contribution)	2022-2031	\$ 9,834,000
20.2	Hwy 20	Kottmeier Rd to Davis Rd/Allanport Rd	Capacity (1/3 Contribution)	2032-2041	\$ 25,019,000
27.3	Schisler Rd	Moyer Rd to Montrose Rd	Capacity	2032-2041	\$ 23,179,000
47.1	Lyons Creek Rd	Montrose Rd to Stanley Ave	Capacity	2032-2041	\$ 17,337,000
47.2	Lyons Creek Rd	Stanley Ave to Sodom Rd	Capacity	2022-2031	\$ 25,251,000
55.1	Niagara Stone Rd	Airport Road to Conc. 6	Capacity	2022-2031	\$ 7,180,000
89.6	Glendale Ave	York Rd to Queenston Rd	New Road	2032-2041	\$ 13,732,000
90.1	Airport Road	Niagara Stone Rd to York Rd	Capacity	2022-2031	\$ 9,871,000
98.1	Montrose Rd	Lyons Creek Rd to Schisler Rd	Capacity	2032-2041	\$ 8,917,000
98.2	Montrose Rd	Chippawa Creek Rd to Lyons Creek Rd	Capacity	2032-2041	\$ 18,113,000
102.2	Stanley Ave	Ferry St to Murray St	Capacity	2022-2031	\$ 5,897,000
102.3	Stanley Ave	Marineland Pkwy to Lyons Creek Rd	Capacity	2022-2031	\$ 41,871,000
116.1	Sodom Rd	Lyons Creek Rd to Netherby Rd	Capacity	2022-2031	\$ 27,879,000
405.1	Hwy 405 interchange	Concession 6 Rd	Highway (1/3 contribution)	2022-2031	\$ 3,333,000
406.2	Hwy 406 Extension	E Main St to NGTA corridor	Highway	2032-2041	\$ -
451.2	Garden City Skyway	Bunting Road to York Rd	Highway	2022-2031	\$ -
451.3	QEW	York Rd to Hwy 405	Highway	2022-2031	\$ -
451.4	QEW	Hwy 405 to Mountain Rd	Highway	2022-2031	\$ -
451.7	QEW	Hamilton to Hwy 406	Highway	2022-2031	\$ -
461.1	NGTA corridor	Hwy 403 to Hwy 406 Ext.	Highway	2032-2041	\$ -
461.2	NGTA East Corridor	Hwy 406 extension to QEW	Highway	2032-2041	\$ -
601.1	Concession 6 Rd	York Rd to Warner Rd	Capacity	2022-2031	\$ 4,991,000
601.2	Mewburn Rd	Warner Rd to Mountain Rd	Capacity	2022-2031	\$ 1,885,000
601.3	Mewburn Rd bridge	Bridge over CN Rail	New structure	2022-2031	\$ 1,625,000
607.1	Queenston Road realignment	Queenston Rd to York Rd	New Road	2022-2031	\$ 4,045,000
901.1	West St. Catharines Grade Separation	Louth St / Vansickle Rd / First St Louth	Capacity	2022-2031	\$ 20,500,000
	AT Strategic Network Grant Program	Strategic Network		2017-2026	\$ 10,000,000
	AT Infill Projects	Strategic Network		2017-2021	\$ 7,900,000
	AT Infill Projects	Strategic Network		2022-2031	\$ 7,900,000
	Subtotal - Additional Projects Identified in TMP				\$ 334,992,000
	Subtotal - Capacity Improvement, New Roads and Active Transit Infill Projects				\$ 520,211,000

Intersection Improvement Program					
Proj #	Intersection	Intersection Side Street	Improvement Type	Phasing	Capital Cost Estimate
	Thorold Stone Rd	@ Cardinal Drive	Left turning lane	2017-2021	\$ 1,500,000
	Geneva St	@ St. Paul	Two way traffic reversion - Cost Sharing	2017-2021	\$ 7,000,000
	Niagara Stone Rd	@ Airport Road and Concession 4	Traffic signal and turning lane	2017-2021	\$ 3,000,000
	McLeod Road	@ Drummond	Possible joint contract with NF	2017-2021	\$ 2,000,000
	Four Mile Creek Rd	@ York Rd	New Signal and modifications	2017-2021	\$ 1,400,000
	Falls Ave / Bender Intersection Improvements		Turning lanes and signal mod	2017-2021	\$ 900,000
	Victoria Avenue	@ RR63 Canboro Rd	New signal and turning lane	2017-2021	\$ 1,650,000
	Int. Improve. - Regional Road 20 between Townline Road & South Grimsby Rd 6		Roundabouts EA & Design & Improve for new school	2017-2021	\$ 1,100,000
	Regional Road 20	Phase 1 - South Grimsby Rd 6 to Griffin	Roundabouts and urbanization	2017-2021	\$ 4,250,000
	Regional Road 20	Phase 2 - Industrial Pard Rd to Townline Road	Roundabouts and urbanization	2017-2021	\$ 3,800,000
	King Street	@ Main Street and Nineteenth Street	Cost Sharing for intersection improvement	2017-2021	\$ 2,400,000
	Fourth Ave	@ First	Modifications and NB right Turn Lane	2017-2021	\$ 600,000
	Intersection Improvement Program - 2027-2041			2027-2041	\$ 33,825,000
	Subtotal - Intersection Improvement Program				\$ 63,425,000

Road Rehabilitation Program					
Proj #	Corridor	Section / Location	Improvement Type	Phasing	Capital Cost Estimate
	Canoboro Rd	@ Warner	Embankment stabilization	2017-2021	\$ 5,090,000
	Main Street	Cabernet to Baker Rd & Nelles to Orchard	Reconstruction - Urban	2022-2031	\$ 7,560,000
	York Road	Reg Rd 55 to Airport	Rehabilitation	2017-2021	\$ 1,890,000
	Old Hwy. 8	Vinehaven Trail to 23rd Street	Reconstruction/ streetscaping	2017-2021	\$ 5,270,000
	Ontario Street	Lakeshore Road to Linwell Road	Reconstruction - Urban - 2 Lane	2017-2021	\$ 8,532,000
	St. Paul Street West	Burgoyne Bridge to CNR Tracks	Reconstruction and intersection Imprv	2022-2031	\$ 9,180,000
	Louth Street	Between RR 81 (St. Paul W) & Crestcomb	Reconstruction - urban- 2 lane / GS	2017-2021	\$ 6,156,000
	Lakeshore Rd	Townline Rd to Four Mile Creek Rd	Rehabilitation c/w bike lanes	2017-2021	\$ 8,500,000
	Main Street West	Prince Charles Drive to Niagara Street	Rd Reconstruction / City WM	2017-2021	\$ 4,104,000
	McLeod Road Storm P.S	@ Stanley Ave and CNR	Upgrades to Storm Pumping Station	2017-2021	\$ 1,250,000
	Glendale Ave	Tremont Drive to Burleigh Hill	Road Reconstruct & Widening	2017-2021	\$ 9,396,000
	Riverside Drive	Prince Charles Drive to Lincoln Street	Road Reconstruct / Download	2017-2021	\$ 5,778,000
	Lakeshore Rd Phase 3	Lake St to Geneva & Bradmon Dr to O'Mara	Reconstruction - urban-2 lane	2017-2021	\$ 8,046,000
	Bridge Street	Victoria Ave to Erie	Cost Share with City	2017-2021	\$ 575,000
	Lakeshore Rd West	Third Street to Seventh Street	Reconstruction	2017-2021	\$ 5,778,000
	Canborough Road	Baldwin Road to Coffey Bridge	Embankment stab & Road Recon	2017-2021	\$ 3,277,800
	Pelham Road Phase 2	Effingham Rd to Wessel Drive	Reconstruction	2017-2021	\$ 9,828,000
	Pelham Road Phase 3	Wessell Drive to Centre	Reconstruction	2017-2021	\$ 4,320,000
	Pelham Road Phase 4	Centre to 8th	Reconstruction	2017-2021	\$ 3,240,000
	Niagara St	Carlton to Scott	Reconstruction - Urban - 2 Lane	2017-2021	\$ 7,344,000
	St. David's Road	Hwy 406 to Collier Road	Reconstruction - Urban - 2 Lane	2017-2021	\$ 5,290,000
	Dominion Road	Helena to Lakeshore Rd	Reconstruction - Urban - 2 Lane	2017-2021	\$ 7,587,000
	King Street	Durham Rd to Lincoln Avenue	Reconstruction rural - 2 Lane / Town WM	2017-2021	\$ 6,669,000
	Dick's Creek crossing	@ Glendale Ave	Culvert replacement	2017-2021	\$ 750,000
	Regional Road 20	Griffin St South to Industrial Park Road	Road Rehabilitation	2017-2021	\$ 2,268,000
	Creek Road	RR 4 (Wellandport Rd) to RR 63 Canborough	EA Study, Bridge Replace & Rd Rehab	2017-2021	\$ 405,000
	Creek Road	RR 4 to RR7 & RR7 to RR63	Road Rehab - 2 Bridge Replacement	2017-2021	\$ 15,552,000
	Dominion Road	Burleigh Road to Buffalo Road	Road Rehabilitation	2017-2021	\$ 10,179,000
	Main Street	Locke Street to Ann Street	Road Rehabilitation	2017-2021	\$ 4,158,000

Road Rehabilitation Program (cont.)					
Proj #	Corridor	Section / Location	Improvement Type	Phasing	Capital Cost Estimate
	Glendale Ave	Welland Canal to Homer Road	Road Rehabilitation	2017-2021	\$ 3,780,000
	Townline Road	McLeod Road to Lundy's Lane	Reconstruction rural 2 lane	2022-2031	\$ 6,480,000
	Stewart Road	Lakeshore Road to Carlton Street	Reconstruction rural 2 lane	2022-2031	\$ 7,560,000
	Effingham Street	Webber Rd to River Rod	Reconstruction rural 2 lane	2017-2021	\$ 4,914,000
	Canborough Road	RR27 Wellandport Rd to Community Centre	Reconstruction and Drainage Imp.	2017-2021	\$ 3,996,000
	Lundy's Lane	Highland Ave to Montrose Road	Cost Sharing with City CIP and W/M	2017-2021	\$ 3,450,000
	Burliegh Hill	Glendale Ave to St. David's	Cost Sharing with City Storm Sewer	2017-2021	\$ 2,000,000
	Main Street Old Hwy 8	Oakes Road North to Casablanca Blvd	Reconstruction - Urban - 2 Lane	2017-2021	\$ 5,670,000
	Twenty Mile Road	RR24 Victoria Ave to Mountain Rd	Reconstruction - Rural - 2lane	2017-2021	\$ 8,856,000
	St. David's Road	@ Hwy 406 Interchange	Cost Sharing on MTO project	2017-2021	\$ 2,000,000
	Townline Road	Stanley Ave to Four Mile Creek Road	Reconstruction	2017-2021	\$ 2,052,000
	Sodom Road	Lyons Creek Road to Willick Road	Reconstruction	2017-2021	\$ 2,484,000
	Stanley Avenue	Hwy 420 to Ferry Street	Road Recon. and City CIP / Watermain	2022-2031	\$ 2,160,000
	Stevensville Rd	Eagle Street to Bowen Road	Road Reconstruct Urban	2017-2021	\$ 2,700,000
	Bowen Road	QEW to Thompson Road	Road Reconstruct	2022-2031	\$ 3,780,000
	Roads Reconstruction Program - 2017-2021		Road Reconstruction	2017-2021	\$ 22,680,000
	Roads Reconstruction Program - 2022-2026		Road Reconstruction	2022-2026	\$ 58,320,000
	Roads Reconstruction Program - 2027-2041		Road Reconstruction	2027-2041	\$ 273,026,700
	Subtotal - Road Rehabilitation Program				\$583,881,500

Annual Transportation Programs			
Proj #	Annual Transportation Programs	Phasing	Capital Cost Estimate
	Traffic Signal Annual Program	2017-2041	\$ 51,290,000
	Illumination Annual Program	2017-2041	\$ 12,350,000
	Transportation Studies	2017-2041	\$ 9,925,000
	Road Facility Program / Yards	2017-2041	\$ 14,000,000
	Provision for Additional Vehicles	2017-2041	\$ 6,440,000
	Subtotal – Annual Programs		\$ 94,005,000
	Total Road Capital Program	2017-2041	\$1,261,522,500