



HOW WE GO

Niagara Region Transportation Master Plan Goods Movement Technical Paper



IBI Group in association with
Parsons and Brook McLroy

NIAGARA
2041

Fostering an environment for Economic Prosperity



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1 Purpose

The purpose of this technical paper is to inform the goods movement strategy portion of the Niagara Region TMP.

This technical paper sets the context for the goods movement strategy with a background review on goods movement initiatives within the Region as well as an analysis of the existing conditions, which is detailed in the needs and opportunities report. Future projections are also included in this document and are supplemented with a review of emerging technologies in the manufacturing and freight industry that will likely have a considerable impact on the future of goods movement in Niagara Region. The technical paper will conclude with a summary of recommended goods movement strategies and supporting policies.

2 Background Studies Concerning Goods Movement and Industry in Niagara

This section identifies several of the ongoing and past studies and strategies relating to economic development and manufacturing in the region to set the context for the region's economic growth as well as studies related to improving goods movement in Niagara Region.

2.1 Niagara Region's Economic Growth Strategy 2013-2015

Niagara Region's Economic Growth Strategy identified four key economic growth opportunities for Niagara Region:

1. Manufacturing
2. Agribusiness
3. Tourism
4. Transportation and Logistics

The growth and competitiveness of all four of these sectors is reliant on a high-quality goods movement network to get products to market and for efficient business operations.

2.2 Niagara Transportation and Logistics Sector Development, 2013

Niagara Economic Development retained CPCS to conduct a study that focused on growing the transportation and logistics sector in Niagara Region.

The report identified that transportation and logistics companies choose a location for their operations based on key transportation and non-transportation factors. Non-

transportation elements include skilled labour, land, taxes, and energy costs, and transportation factors focus on the quality of the network infrastructure in the surrounding area. Companies are looking for a transport network that can support optimal travel times and limit risks associated with delivery time reliability.

Niagara Region's should support the growth of the transportation and logistics sector by providing a transportation network that cost-efficient and attractive to these companies, rather than one that hinders their operations.

2.3 2013 Ipsos Reid Survey of Niagara Manufacturers

Niagara Region Economic development conducted a survey of the top decision-makers in the manufacturing industry in Niagara Region to get a sense of how they see their businesses evolving in the future. Some of the main findings include:

- “Three quarters (74%) of manufacturing firm decision-makers expect their business to increase over the next three years, with one-third (34%) expecting an increase by more than 10%.”
- “Looking ahead within the same time frame, more than two thirds (68%) of manufacturing firms expect to see an increase in business profitability as well as future investments in machinery and equipment (68%)”
- “Survey respondents identified a number of issues that are important to consider when expanding their business including: infrastructure, access to new technology and research, as well as government support programs (68% cite as important respectively). Other important issues include the regulatory environment (65%) and the ability to connect with high quality post-secondary institutions (52%).”

That infrastructure was listed as a top priority for expansion indicates the importance of developing a goods movement strategy that can support, rather than hinder, economic development.

2.4 Foreign Trade Zone Point Designation

In 2016, Niagara Region was designated as a Foreign Trade Zone (FTZ) Point by the federal government. The purpose of this designation is to support a business climate that fosters innovation and investment in trade and that encourages international investment in the area. This would be achieved through providing accessible information on the Government of Canada's tax and tariff programs and allowing for regulatory and tariff exemptions to make it easier for businesses to expand and export in Niagara Region.

It is important for Niagara's transportation infrastructure to continue to improve and expand to support these strategic initiatives and to provide leverage for economic development to continue.

2.5 Niagara Escarpment Crossing Study

Niagara Region conducted this study to identify the need to improve road crossings to allow for the safe and efficient movement of heavy trucks across the Niagara Escarpment.

The study recommended several short and long term projects including a recommendation for a new escarpment crossings as well as recommendations for improving the operations on existing crossings.

The study concluded with two primary recommendations:

1. Download Mountain Road (Grimsby) and Mountain Street (Lincoln) from Regional to municipal jurisdiction so that provisions can be made to reduce truck traffic in the built up areas along these roadways.
2. Extend Bartlett Avenue between Main Street East in Grimsby and Mud Street East. The extension alignment could include significant improvements to the Park Road corridor.

As part of the detailed staff recommendations, staff recommended that funds for a Schedule C EA be allocated immediately to allow for the Bartlett extension project to move forward. The completion of the project is currently projected to be between 2020-2024, depending on budget availability and EA timelines.

2.6 Niagara-Hamilton Trade Corridor

In the report to Council on the Regional Council Strategic Priorities – Implementation Plan, pursuing a Provincial commitment to the Niagara to GTA (NGTA) Corridor was identified as one of the key components of the Region’s strategic priority to move people and goods. The Region is actively working with the City of Hamilton and the Regions of Halton, Peel, and Waterloo, through an agreement with these municipalities, to advocate for the NGTA Corridor as a key trade corridor and an alternate route to the QEW (Council Report, CAO 2-2015, January 30, 2015).

The background report titled *Niagara Region TMP – Niagara-Hamilton Trade Corridor Technical Paper* provides a detailed summary of the planning history for the NGTA Corridor and its evolution to the **Niagara-Hamilton Trade Corridor** and should be reviewed in tandem with this document for a better understanding of the trade corridor’s significance to goods movement. In summary, the background report confirms the need for the Province to provide an alternate Provincial facility that connects Niagara Region to the Greater Toronto and Hamilton Area as well as to the international border. This facility would support international trade and tourism by improving access to the international border crossings and to other transportation facilities in Niagara Region.

A major corridor such as the Niagara-Hamilton Trade Corridor will take a considerable time to be approved, for acquisition of the right-of-way and for construction. In the interim period, while planning for the Niagara-Hamilton Trade Corridor proceeds, Niagara Region should lead a joint proponenty role and function study for former Highway 20 (now Regional Road 20) should be undertaken to assess the potential for

Highway 20 to take on a Provincial role in providing network redundancy to the QEW, accommodating longer-distance, inter-regional travel and the movement of goods, particularly during periods when congestion or other incidents interrupt traffic on the QEW.

2.7 Continental 1

Continental 1 is an initiative that stretches across jurisdictional and national boundaries with the goal of improving the safety, speed, and flow of transportation along a continuous corridor between Miami and Toronto. The main stimulus for this study is that there are no north-south interstate highways between Interstates 81 (Syracuse) and 70 (Erie, PA), thus leaving Buffalo without a direct route to the south. While there are still several gaps in the network, various pieces of a more continuous network are underway. The NGTA Corridor study is recognized as an important final northern leg of this initiative.

3 Trends and Projections

3.1 Truck Traffic

Despite a decrease in cross-border truck traffic in recent years, overall truck volumes in Niagara Region have remained steady. This is largely due to economic growth in the GTHA, which is a key destination for Niagara Region's manufactured goods and a growing volume of aggregates. Truck volumes in Niagara Region are expected to grow by 57% from 2011 to 2041, from 35,000 to 55,000 daily trips as shown in Exhibit 1¹. A majority of those will continue to be through trips or trips between Niagara and the GTHA.

The QEW is the main link from Niagara Region to the GTHA, and is a significant constraint on trucking activities in Niagara. Exhibit 2 shows that 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 often in off-peak tourist times. Increasing demands on the QEW will lead many truck drivers to look for alternatives.

Trucking in Niagara is also challenged by the Niagara Escarpment, where steep grades of 6% to 12% create safety and operating concerns, including the movement of trucks through small hamlets and villages. New escarpment crossings may be needed to serve future truck traffic looking for an alternative to the QEW.

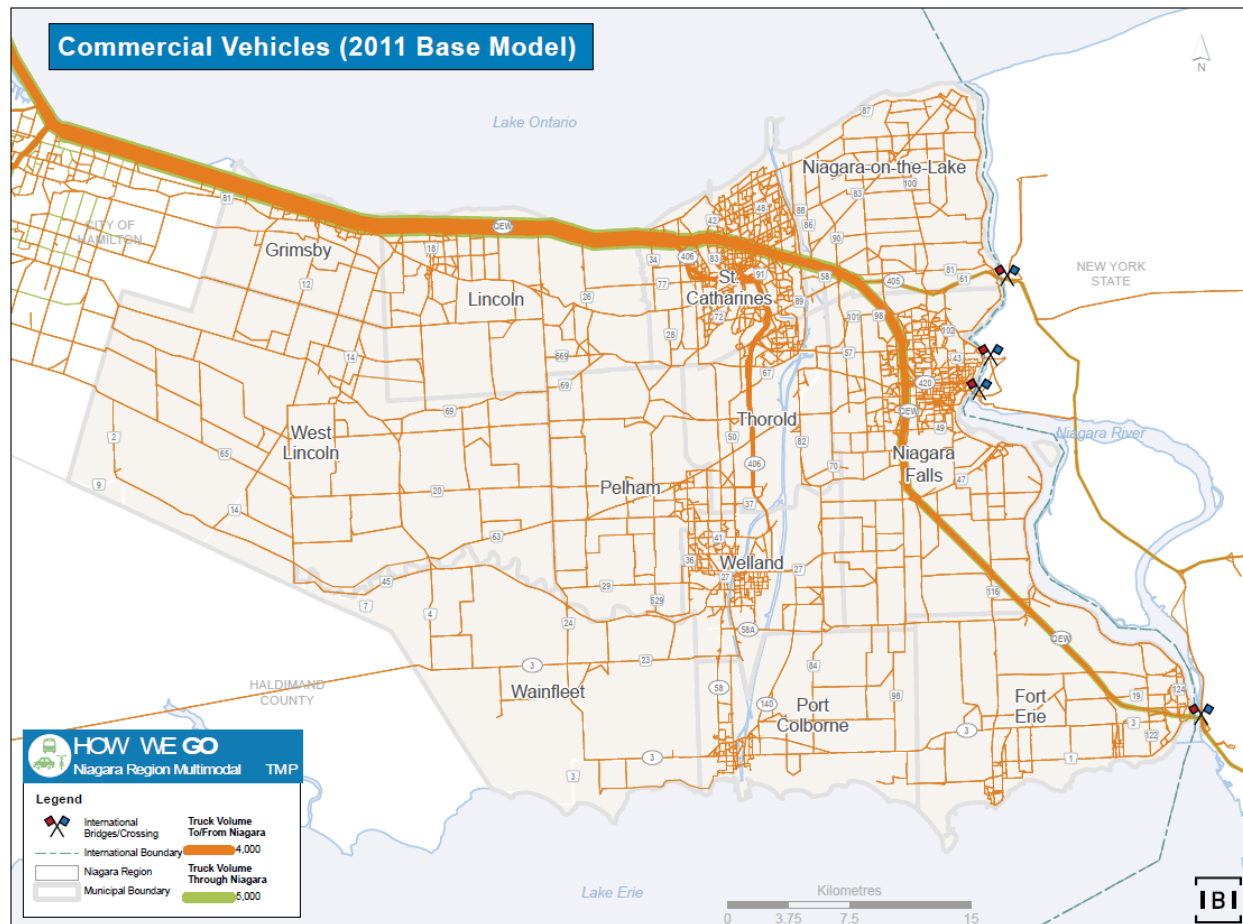
The local economy depends on the safe and efficient movement of commercial vehicles to, from and within Niagara Region. Future improvements will be needed to support truck travel to and from commercial and industrial hubs, and to ensure that road infrastructure can accommodate high truck volumes and the geometric requirements of different commercial vehicle configurations.

¹ Niagara Region Travel Forecasting Model

Exhibit 1: 2011 and Future 2041 Projected Truck Trips in Niagara Region

Origin/Destination	2011 Trips	2041 Trips	Change
Within Same Municipality	8,000	12,000	+49%
Between Niagara Municipalities	14,000	22,000	+57%
To/From External	13,000	21,000	+61%
Total	35,000	55,000	+57%

Exhibit 2: Commercial Vehicles Flows – Niagara Region



3.2 Rail Traffic

Two transcontinental railway systems and several short line railways operate in Niagara Region. In 2015, 2,360 trains entered the United States on the Niagara Frontier carrying 84,280 loaded cars or containers and 33,270 empties². Almost all of this traffic used the International Railway Bridge in Fort Erie as the freight railway network in Niagara Region has been rationalized; the CP Railway bridge in Niagara Falls has been taken out of service and the CN Rail Niagara Falls bridge normally only carries a single daily passenger train in each direction. This represents a 72% decrease in loaded car movements from 10 years previously.

² US Bureau of Transportation Statistics

There are currently no rail intermodal (truck trailer or container) trains crossing the border in Niagara Region.

The City of Niagara Falls is investigating opportunities to reroute freight rail traffic to avoid the urban area of Niagara Falls to minimize disruptions on the road network (i.e. at at-grade rail crossings). Many challenges exist for this proposal, from both feasibility and financial perspectives, and has implications to the flow of rail traffic in Niagara Region.

3.3 Marine Freight

Niagara Region has good accessibility to international marine freight movements via Welland Canal, a vital part of the Great Lakes St. Lawrence Seaway system, which carries mostly bulk commodities on lake vessels plus direct overseas shipments utilizing medium-sized ocean-going vessels. There are no container services on the Great Lakes as most modern container vessels are too large to fit through the Canal locks. Most overseas containers are transferred between rail and ship in Montreal or Halifax.

Over the last two decades, vessel transits and cargo tonnes have slowly declined, a similar trend to other non-truck modes of freight transport.

3.4 Air Freight

Although the two publically owned airports in Niagara Region can accommodate air freight, there are no regularly scheduled flights for air freight; the closest airports with scheduled air freight are Hamilton and Toronto.

4 The Impacts of Technology on Goods Movement

Although it is with high certainty that the number of truck trips in Niagara Region will grow in conjunction with population and economic growth in the region, there are several emerging technologies that will play a disruptive role in the goods movement and manufacturing sectors within the horizon of this study, creating uncertainty regarding the future of goods movement in Niagara Region. This section identifies these technologies and provides a brief assessment of their potential timelines and potential impact on goods movement. Each technology is described below.

Technological disruptions were identified in the *Needs and Opportunities Report* as opportunities that Niagara Region can capitalize upon to improve efficiencies in the movement of goods and people.

4.1 3D Printing

3D printing is poised to be a major disruptor to traditional manufacturing business models with potential for increases in micro-manufacturing, the growth in more localized manufacturing, and even the potential for home based manufacturing³. This will have significant impact on the current manufacturing paradigm, as well as the goods movement industry that supports it.

The technology for 3D printing is available now, but like the timeline of many new technologies, it is still expensive and market penetration is still low. It is projected that the global 3D printing industry (3D printer sales) is expected to grow to \$12.8 Billion by 2018, up from \$3.07 Billion in 2013 and exceed \$21 Billion by 2020⁴. The impact on freight will likely be gradual, but could be significant in 10+ years.

The potential impacts on goods movement are wide ranging but could result in a significant reduction in commercial veh-km travelled as manufacturing becomes increasingly more localized⁵.

4.2 Commercial Drone Delivery

The rapid advancement of drone technology has created a buzz around the wide ranging applications of this technology. One of the most commonly discussed applications is the use of drones for the delivery of small packages, a service that is currently provided by traditional delivery trucks.

Although the technology is advanced, regulation in many cases has prohibited drone use for commercial purposes. Testing of commercial drone delivery as a replacement for traditional deliveries has begun in various jurisdictions, including Australia, Switzerland, Germany, and Singapore. As of January 2017, Drone Delivery Canada has been approved by Transport Canada to expand its drone delivery pilot from Waterloo Region to Alberta⁶.

The emergence of drone delivery has the potential to greatly re-shape goods movement, specifically the final mile deliveries to the end consumer.

4.3 Autonomous and Connected Trucking

Autonomous technology has experienced rapid growth in the past five years and the freight and logistics industry is poised to be one of the early adopters of the technology. There have been several examples in the past two years of connected truck following (platooning) to lower fuel consumption⁷ as well as highway trials with autonomous trucks⁸.

³ <https://blog.integracore.com/freight/the-future-impact-of-3d-printing-on-the-transportation-industry/>

⁴ <http://www.forbes.com/sites/louiscolombus/2015/03/31/2015-roundup-of-3d-printing-market-forecasts-and-estimates/#4acde3951dc6>

⁵ http://eprints.lancs.ac.uk/66198/1/Freight_Miles_Report.pdf

⁶ <http://www.dronedeliverycanada.com/news/>

⁷ <http://www.truckinginfo.com/article/story/2016/04/platooning-is-on-the-way.aspx>

⁸ <https://www.bloomberg.com/news/articles/2016-10-25/uber-self-driving-truck-packed-with-budweiser-makes-first-delivery-in-colorado>

Technology is moving rapidly but regulations and policy have not yet caught up. There will also be significant push back from labour lobbies that will delay the timeline⁹.

Driverless and connected trucking has the potential to improve vehicle throughput. Driverless trucks have the potential to allow for overnight driving and faster long haul delivery times as drivers will not require rest periods. Ultimately, platooning trucks would not just improve fuel efficiency, but also increase vehicle throughput by decreasing following distances and increasing traffic density¹⁰.

5 Goods Movement Solutions

Several opportunities to improve the movement of goods through and within Niagara Region were identified in the *Needs and Opportunities Report*. These opportunities each represent different alternatives to improving the flow of goods in Niagara Region. Ultimately, a combination of these alternatives will need to be integrated into the strategies and supporting policies that will be developed through a subsequent Goods Movement Strategy study. Potential solutions are described below.

5.1 Goods Movement Network (Roads)

Roads leading to the Canada-U.S. border are major routes for goods movement. Minimizing impedance from commuters and tourists is important, as every improvement in efficiency will reduce business costs and improve the value of operating in Niagara Region. Potential improvements that would benefit local business could include the Niagara-Hamilton Trade Corridor, improved Niagara Escarpment crossings, and improved connections to the QEW.

As discussed in the background section of this document, there are several network improvement initiatives that are ongoing that will play a significant role in improving the flow of goods to, through and within Niagara Region. A component of the Goods Movement Strategies will reinforce the importance of these road improvement projects, bring them to the forefront of the planning agenda and identify the need for creating a goods movement network.

5.2 Leveraging Technology

The freight and logistics industry is expected to be one of the early adopters of connected and automated vehicle technologies. Driverless trucks are advancing rapidly, and could provide substantial benefits to freight companies. Niagara Region should pursue policies and infrastructure that would enable it to host this technology. The Region's strategies and policies will need to provide pragmatic actions to prepare Niagara Region for this technology so that it can be leveraged for the improvement of goods movement.

⁹ <http://business.financialpost.com/news/transportation/driverless-vehicles-are-going-to-change-our-world-but-at-what-cost>

¹⁰ <https://www.eutruckplatooning.com/About/default.aspx>

5.3 Recommended Strategy

Based on a review of the existing and future conditions as well as a review of technologies that are becoming available, the TMP's proposed strategies for goods movement are multi-modal in nature and emphasize the need to expand the goods movement capacity of the road network, capitalize on the potential of the multi-modal network, and leverage new technologies.

- Niagara Region will conduct a subsequent study to refine the Goods Movement Strategy and identify a goods movement network.
- Niagara Region will work with the Ministry of Transportation to progress the NGTA Corridor and NGTA East Corridors to provide efficient goods movement routes that connect Niagara Region to the GTHA and USA.
- Niagara Region will consider the needs of goods movement in road planning, design and construction, and support infrastructure initiatives that provide efficient connections to the Provincial highway system, international border crossings, and truck activity centres in Niagara Region, including an improved crossing of the Niagara Escarpment.
- Niagara Region will expand its transportation network in order to optimize, rather than stall the benefits of its FTZ Point designation.
- Niagara Region will pursue policies and infrastructure that will embrace new technologies such as autonomous and connected vehicle technology and drone deliveries. This includes encouraging transportation and logistics companies to adopt truck following technologies and developing partnerships with these freight companies to set up a connected truck pilot study and pilot testing of commercial drone deliveries and build off findings from pilot projects in Waterloo Region.
- Niagara Region will support measures to increase the use of rail, marine and air modes in order to reduce traffic volumes on roads.

5.4 Supporting Policies

The proposed strategies listed above will be supported by the following policies:

- Designate truck routes to serve industry, protect neighbourhoods, and provide connections to the provincial highway system and international border crossings.
- Monitor and consult with the freight industry for mutual benefit including opportunities to partner on pilot studies relating to connected truck and autonomous truck technologies.
- Use area traffic management to resolve public concerns.
- Explore and support opportunities for innovative goods movement and service that respond to changing delivery methods and technology such as electric vehicles and commercial drone delivery

- Encourage deliveries outside of peak-hours in urban centres.
- Evaluate the safety of railway crossings.
- Review street design guidelines to ensure that regional roads support goods movement.
- Support Provincial and Federal initiatives to improve the efficiency of border crossings.
- Encourage lower-tier municipalities to support industrial compatible land uses around marine ports and rail facilities.

6 Proposed Scope of Work for Goods Movement Study

The purpose of this section is to outline a scope of work for a subsequent Goods Movement Study to refine the Goods Movement Strategy presented in the TMP.

The Goods Movement Study should consist of the following elements:

- Background review;
- Inventory of existing conditions of goods movement by road, rail, marine and air;
- Goods movement trends and projections by road, rail, marine and air;
- Stakeholder consultation to identify business needs and opportunities;
- Best practices review; and
- Findings and recommendations.

The following provides an overview of the proposed scope of work:

Background Review

This component of the study will consist of a review of policy documents with goods movement implications. These documents include, but are not limited to:

- Region of Niagara Official Plan;
- Official Plans of all lower-tier municipalities;
- The Growth Plan for the Greater Golden Horseshoe;
- The Niagara Escarpment Plan; and
- The Regional Transportation Plan.

This section of the study should also include of a review of other background studies concerning goods movement and industry in Niagara Region.

Existing Conditions

The existing conditions component of the Study will review current goods movement characteristics in Niagara Region to understand current cargo volumes, factors that influence freight movement within and through the region, and assess data needs and gaps.

The review should focus on the following questions:

- What are the current cargo volumes in Niagara Region by truck, rail, marine and air?
- What are the origins/destinations of goods movement trips within and through Niagara Region?
- What is the Region's role in regional goods movement?
- What factors currently influence goods movement patterns and volumes in Niagara Region?
- What non-transportation factors currently influence goods movement patterns and volumes in Niagara Region?
- What are the major freight trip generators within the region?
- What is the role of rail, marine and air for goods movement in the region?
- What are the opportunities for integrated rail and port services?

The existing conditions should include a freight profile by mode, including a list of existing facilities and current volumes.

Goods Movement Trends and Projections

Goods movement trends and projections will be an important component in refining the Goods Movement Strategy and identifying a goods movement network. Forecasts from the TMP could be used to supplement observed trends and projections by mode.

The Study should also examine factors that will likely have an impact on goods movement, including the potential impacts of technology such as 3D printing, commercial drone delivery, and autonomous and connected trucking.

Stakeholder Consultation

Stakeholder consultation will be used to gain valuable input into the Goods Movement Strategy as well as better understand the needs and concerns of industry and shippers. The stakeholder consultation will consist of two parts: a survey and a stakeholder forum.

The survey will be sent to transportation and logistics companies as well as major industrial employers in Niagara Region identified through contacts at Niagara Economic Development, Ontario Trucking Association, and others. The survey should gather the following information at a minimum:

- The location(s) of the firm within Niagara Region;

- Time at the firm's present location;
- Whether the firm operates a fleet of private trucks, vans, marine vessels, airplanes, etc.;
- Whether the firm ships inbound, outbound, or both;
- The origin and destination of inbound and outbound shipments;
- The modes (road, rail, marine, air) by which goods are moved to/from the origin to final destination
- The factors that influence inbound and outbound transportation arrangements such as "on-time/just-in-time-delivery;"
- The primary commodity(ies) hauled;
- Whether or not firms are able to use the shortest distance between pick-up and delivery points and what factors limit a firm's ability to use the shortest route; and
- Specific transportation issues in Niagara Region that impact goods movement, such as locations with heavy vehicle restrictions that are an undue burden on shippers, physical constraints that reduce or eliminate goods movement, etc.

A stakeholder forum should also be organized to help the Region better understand and respond to business needs for goods movement. The forum should include representatives from shipping companies, manufacturing and distribution companies, government transportation planners, and elected officials.

Best Practices Review

When developing a Goods Movement Strategy it is important to also understand North American and international best practises to design an effective and appropriate Strategy for Niagara Region. Although Niagara Region has a unique context for goods movement, there are also similarities to other regions that Niagara can reference to address a specific planning need, for example other regions that are also located at an international frontier (i.e. Vancouver) or must accommodate a majority of though truck movements (i.e. Durham Region).

Findings and Recommendations

The research and consultation undertaken in the Goods Movement Study will refine, revise or complement the high-level strategy presented in the TMP and identify a strategic goods movement network in Niagara Region.

Specific actions to be undertaken by the Region should be identified and prioritized.