
URBAN GOODS MOVEMENT

FULL REPORT

Technical Paper 5 to support the ***Discussion Paper*** for the
Next Regional Transportation Plan



DAVID KRIGER

TRANSPORTATION POLICY AND RESEARCH

The text 'DAVID KRIGER' is in a blue, sans-serif font. Below it is a row of seven small icons representing different modes of transport: a truck, a train, a ship, a tractor, a car, an airplane, and a bus. Below the icons is the text 'TRANSPORTATION POLICY AND RESEARCH' in a smaller, blue, sans-serif font.

METROLINX
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Regional Transportation Plan Legislative Review Backgrounder: Urban Goods Movement

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Metrolinx

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Acronyms / Abbreviations

| | |
|-------|---|
| BIT | Brampton Intermodal Terminal |
| DC | Distribution centre |
| DfT | UK Department for Transport |
| DVRPC | Delaware Valley Regional Planning Commission |
| FTDM | Freight transportation demand management |
| GGH | Greater Golden Horseshoe |
| GHG | Greenhouse gas |
| GPS | Global positioning system |
| GTHA | Greater Toronto and Hamilton Area |
| HOT | High occupancy toll |
| HOV | High occupancy vehicle |
| ITS | Intelligent transportation systems |
| KPI | Key performance indicator |
| LCV | Longer-combination vehicle |
| LEZ | Low-emission zone |
| msf | Million square feet |
| MTO | Ontario Ministry of Transportation |
| NAFTA | North American Free Trade Agreement |
| NCFRP | National Cooperative Freight Research Program |
| NOx | Nitrogen oxides |
| OP | Official plan |
| OPD | Off-peak delivery |
| PM | Particulate matter |
| RFID | Radio Frequency Identification |
| RTP | The Big Move Regional Transportation Plan |
| SFN | Strategic rail Freight Network |
| SGMN | Strategic Goods Movement Network |
| SOGC | Southern Ontario Gateway Council |
| T&L | Transportation and logistics |
| TfL | Transport for London |
| TSB | Transportation Safety Board |
| TMP | Transportation Master Plan |
| UFF | Urban Freight Forum |
| UFS | (Metrolinx 2011) Urban Freight Study |
| UGM | Urban goods movement |
| UK | United Kingdom |
| US | United States |
| VKT | Vehicle-km travelled |
| WGHMN | Western Golden Horseshoe Municipal Network |

Executive Summary

The mandate to create a Regional Transportation Plan (RTP) is embodied in the *Metrolinx Act, 2006*. Along with the Greenbelt Plan and Growth Plan for the Greater Golden Horseshoe, the RTP is part of an approach by the provincial government to prepare the Greater Toronto and Hamilton Area (GTHA) for growth and sustainability. Together these three initiatives will lead to the development of more compact and complete communities that make walking, cycling, and transit part of everyday life. Consideration of goods movement is key to the RTP.

The Metrolinx Board of Directors adopted The Big Move RTP in November 2008. A review of the RTP must be completed every 10 years from when the Act came into force. The formal review of the RTP is expected to be substantially completed in 2016. The updated RTP will be released in 2017.¹

The Big Move is the blueprint for a more sustainable transportation future. It reaches out 25 years into the future to guide and direct decision-making. It sets out priorities, policies, and programs for a future of complete mobility. The aim of the RTP is to achieve a transportation system for the GTHA that is effective, integrated, and multi-modal. The RTP presents a vision for the future in which transportation within the GTHA is seamless, coordinated, and efficient, as well as a blueprint for how to get there.

The RTP was built upon nine “Big Moves,” or strategies. The eighth of these addressed goods movement. It called for the development of a comprehensive strategy to improve goods movement within the GTHA and with adjacent regions. Two factors determined the need:

- The adverse financial impact of congestion on the GTHA’s residents as well as on its ability to compete in a global economy, given the real costs that delays impose on the price of consumer products and on business operations.
- The adverse environmental impact of truck-generated greenhouse gas emissions. Trucks are by far the dominant mode used to move goods in the GTHA and, even with improvements in vehicle emissions control technologies, GHGs from heavy trucks are expected to increase significantly as goods movement grows.

¹ The Province is currently reviewing the Growth Plan for the Greater Golden Horseshoe and the Greenbelt Plan, as well as the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan.

The strategy recognized the need for a multi-pronged approach and a strong partnership with shippers (those who generate goods) and carriers (those who move the goods).

To meet this need, Metrolinx prepared the GTHA Urban Freight Study, which the Metrolinx Board of Directors approved in February 2011. The study was driven by extensive consultations with public agencies and private sector thought leaders. It resulted in five strategic directions and 17 actions that provided a strong basis for addressing urban goods movement challenges in the GTHA. This Action Plan comprised a broad range of planning and operational improvements, predicated on increased collaboration and support among and between public and private goods movement stakeholders.

One initial outcome was Metrolinx's establishment of the GTHA Urban Freight Forum (UFF), which regularly brings together a group of public agencies, private industries, intermodal freight terminals, industry associations and researchers to exchange information, generate action, inspire innovation, and review the delivery of the Action Plan.

In November 2012, the UFF issued its first Status Update on the Action Plan. The Update is a compendium of policies, data collection, actions, and research initiatives conducted by Metrolinx and individual members of the Urban Freight Forum. Taken together, the RTP, the GTHA Urban Freight Study and Action Plan, and the Status Update serve as the main points of reference for this Background.

The section that follows provides a summary of the research undertaken for the Background.

The Multi-modal Goods Movement Network and Its Use

Key stakeholders in goods movement include both public sector and private sector entities. Key public sector stakeholders include Metrolinx, the Ontario Ministry of Transportation, the ports and airports, and the municipalities. Key private sector stakeholders include all large goods movement companies operating in the GTHA, including transportation and logistics business such as the railways, trucking companies, couriers, and logistics providers, as well as the shippers such as the major retailers, construction companies, and manufacturers.

The GTHA has a truly multi-modal network of infrastructure. Goods flow by air, marine, pipelines, rail, and road, and are interchanged between modes at major terminals including airports, marine ports, rail intermodal and transload facilities, and pipeline terminals.

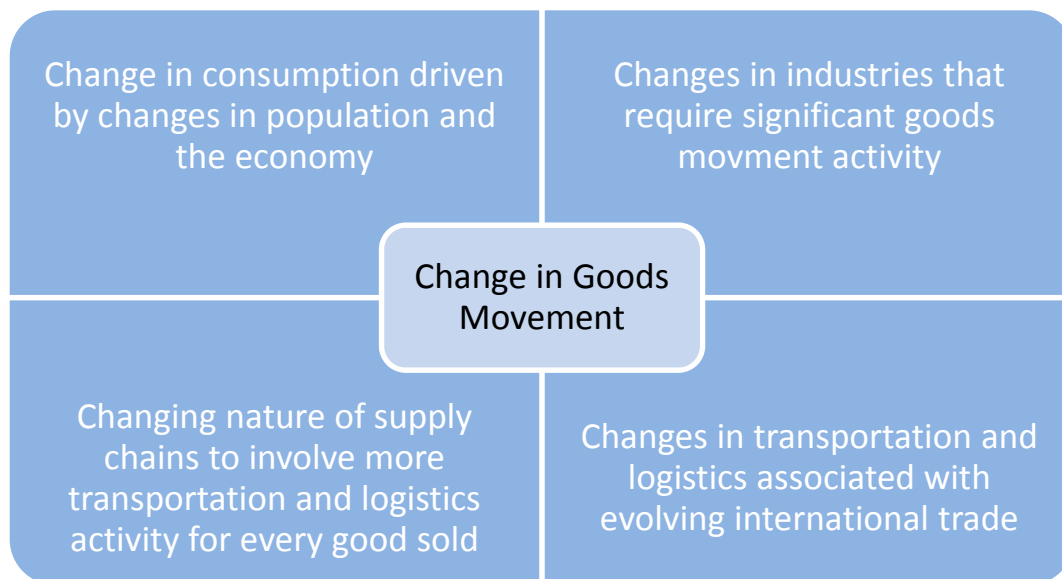
Demographics and Economics

Goods movement is fundamental to the functioning of our economy, and therefore our quality of life. Every good and very many services require transportation to get to market. The cost of transportation is the human and material resources required to move goods and services. This cost buys varying levels of speed, reliability, pollution, and safety. Goods

movement can be said to be cost effective when it achieves desired levels of speed, reliability, pollution, and safety at the lowest possible cost.

Changes in the volume and nature (origin/destination, mode, etc.) of goods movement are driven by four key factors:

Figure 1-1: Key Drivers of Change in Goods Movement



While some trends have an uncertain impact, we believe that the continued growth of consumption (driven by population and income growth) in the GTHA, coupled with the position of the GTHA as Canada’s premier logistics cluster/hub, mean that volume of goods moving in the area will continue to grow over the next 10 years.

Progress to Date on Urban Goods Movement

The Big Move set out a comprehensive set of goals and objectives, but only limited key performance indicators associated with goods movement specifically. On the 17 actions from the regional goods movement Action Plan, progress – much of it spearheaded by Metrolinx – has been made on most fronts. Goods movement performance must be measured with key performance indicators to take into account public and private sector perspectives on travel times, reliability, cost, environmental sustainability, and safety.

RTP Vision for Goods Movement

The RTP articulates a vision in which urban goods movement is quick, efficient, reliable, convenient, safe, low carbon, efficient in its use of resources, including road capacity, seamless across modes and jurisdictions, fair and equitable, and cutting edge.

Visions from other jurisdictions in the GTHA, Canada, the United States, and overseas can inform the development of an RTP vision for goods movement. In terms of the scope of the vision, the examples reviewed for this Backgrounder suggest that the vision must speak to all perspectives: public and private sector, and that the vision must be linkable to the wording of existing Provincial, Metrolinx and municipal policies.

It is recommended that the proposed Goal E of the updated RTP vision introduce the concepts of economy, reliability, and efficiency, which are terms that are especially meaningful to partners from the goods movement industry, while reinforcing safety and environmental sustainability, which are important to everyone.

Goods Movement Challenges Issues and Opportunities

There are three key issues in urban goods movement in the GTHA: congestion, managing land use compatibility, and reducing the environmental impact of goods movement.

For private sector stakeholders congestion is overwhelmingly the most important issue, as it affects their ability to move goods quickly and reliably around the region. Goods movement vehicles shoulder a disproportionate share of the burden of congestion owing to relatively high values of goods transported. Solutions to congestion specifically related to goods movement include off-peak delivery, goods movement priority measures such as truck-priority lane, and the prioritization of goods movement corridors for infrastructure and operational improvements.

Land use planning and goods movement are strongly related. Ensuring that goods-movement-intensive land uses are appropriately located is a major issue for both the public and private sectors. Planning that incorporates goods movement is key to reducing conflicts.

The environmental performance of goods movement is also a key issue. Reducing truck-km and regulatory initiatives are the key opportunities.

Strategic Directions and Actions, and Gaps

Metrolinx, Peel Region, the Southern Ontario Gateway Council, and the Western Golden Horseshoe Municipal Network have all set out goals and objectives for urban goods movement.

All goals and objectives of the GTHA Urban Freight Study are sufficiently high level that they remain relevant to the current challenges of urban goods movement identified in Chapter 6.

The Technical Backgrounder to the Metrolinx Urban Freight Study generally remains current. Chapter 6 of this Backgrounder provides updates to specific elements. The separate project Urban Goods Movement Data Phase II will update data availability and issues.

Many of the actions in the 2011 Urban Freight Study have either been accomplished (Actions 1, 2, 3, and 10) or have been explored and deemed unfeasible at this time (Action 9). Action 16 has been subsumed into Action 15. However, most actions remain relevant today to addressing the key issues in urban goods movement identified above: congestion, land use compatibility, and environmental impact. In addition, MTO has proposed two new actions, regarding the promotion of long combination vehicles and the promotion of road freight safety.

Many of the opportunities identified as potential measures to help address these issues will require new actions beyond those remaining from the 2011 Urban Freight Strategy.

In some cases new actions will result from other processes now underway, such as the separate backgrounder: Scope for a High Level Strategic Goods Movement Network in the GTHA, and the separate Metrolinx project Urban Goods Movement Data Phase II. Others are not currently being addressed.

Finally, in order to measure progress on urban goods movement metrics are required both of the specific actions to be undertaken, but also for the broader performance of the transportation system, as it relates to goods movement. This broader performance is ultimately the reason for undertaking actions. Proposed key performance metrics and the associated outcome they are measuring are set out below.

| Outcome | Metric |
|-------------|--|
| Travel Time | Goods movement travel time |
| Reliability | Goods movement buffer index |
| Cost | Transportation and logistics price index |
| Environment | Goods movement air pollution index |
| Safety | Goods movement vehicle road incidents involving injuries or fatalities |
| | Freight train incidents involving injuries or fatalities |

1 Introduction

1.1 Background

The mandate to create a Regional Transportation Plan (RTP) is embodied in the *Metrolinx Act, 2006*, which established Metrolinx and directed it to create a long-term strategic plan for an integrated, multi-modal, regional transportation system. As defined by the Act, this is a transportation plan that:

- takes into account all modes of transportation;
- makes use of intelligent transportation systems;
- promotes the integration of local transit systems with each other and with the GO Transit system;
- works toward easing congestion and commute times, and reducing transportation-related emissions of smog precursors and greenhouse gases; and
- promotes transit-supportive development and the viability and optimization of transit infrastructure.

The RTP is the third piece in a three-part approach by the provincial government to prepare the Greater Toronto and Hamilton Area (GTHA) for growth and sustainability. It builds on the Greenbelt Plan, which protects more than 1.8 million acres of environmentally sensitive and agricultural land in the heart of the region, and the Growth Plan for the Greater Golden Horseshoe, which manages population and job growth, and curbs urban sprawl. Although the focus of these three initiatives is on the development of more compact and complete communities that make walking, cycling, and transit part of everyday life, the RTP and the Growth Plan both include policies on goods movement.

The Metrolinx Board of Directors adopted The Big Move RTP in November 2008. A review of the RTP must be completed every 10 years from when the Act came into force. The formal review of the RTP is expected to be substantially completed in 2016. The updated RTP will be released in 2017.²

The RTP fulfils the province’s commitment to undertake further work and analysis to implement the transportation network and policies of the Growth Plan for the Greater Golden Horseshoe. It also meets the Growth Plan’s directions that call for the transportation system to be planned and managed to provide connectivity among transportation modes, offer a balance of transportation choices, encourage the most financially and environmentally

² The Province is currently reviewing the Growth Plan for the Greater Golden Horseshoe and the Greenbelt Plan, as well as the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan.

appropriate modes for trip-making, offer multi-modal access to jobs, housing, and services, and shape growth by supporting intensification. The Metrolinx Board of Directors adopted the Big Move Regional Transportation Plan in November 2008.

The Big Move is the blueprint for a more sustainable transportation future. It reaches out 25 years into the future to guide and direct decision-making. It sets out priorities, policies, and programs for a future of complete mobility. The aim of the RTP is to achieve a transportation system for the GTHA that is effective, integrated, and multi-modal. The RTP presents a vision for the future in which transportation within the GTHA is seamless, coordinated, and efficient, as well as a blueprint for how to get there.

The RTP was built upon nine “Big Moves,” or strategies. The eighth of these addressed goods movement. It called for the development of a comprehensive strategy to improve goods movement within the GTHA and with adjacent regions. Two factors determined the need:

- The adverse financial impact of congestion on the GTHA’s residents as well as on its ability to compete in a global economy, given the real costs that delays impose on the price of consumer products and on business operations.
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The strategy recognized the need for a multi-pronged approach and a strong partnership with shippers (those who generate goods) and carriers (those who move the goods).

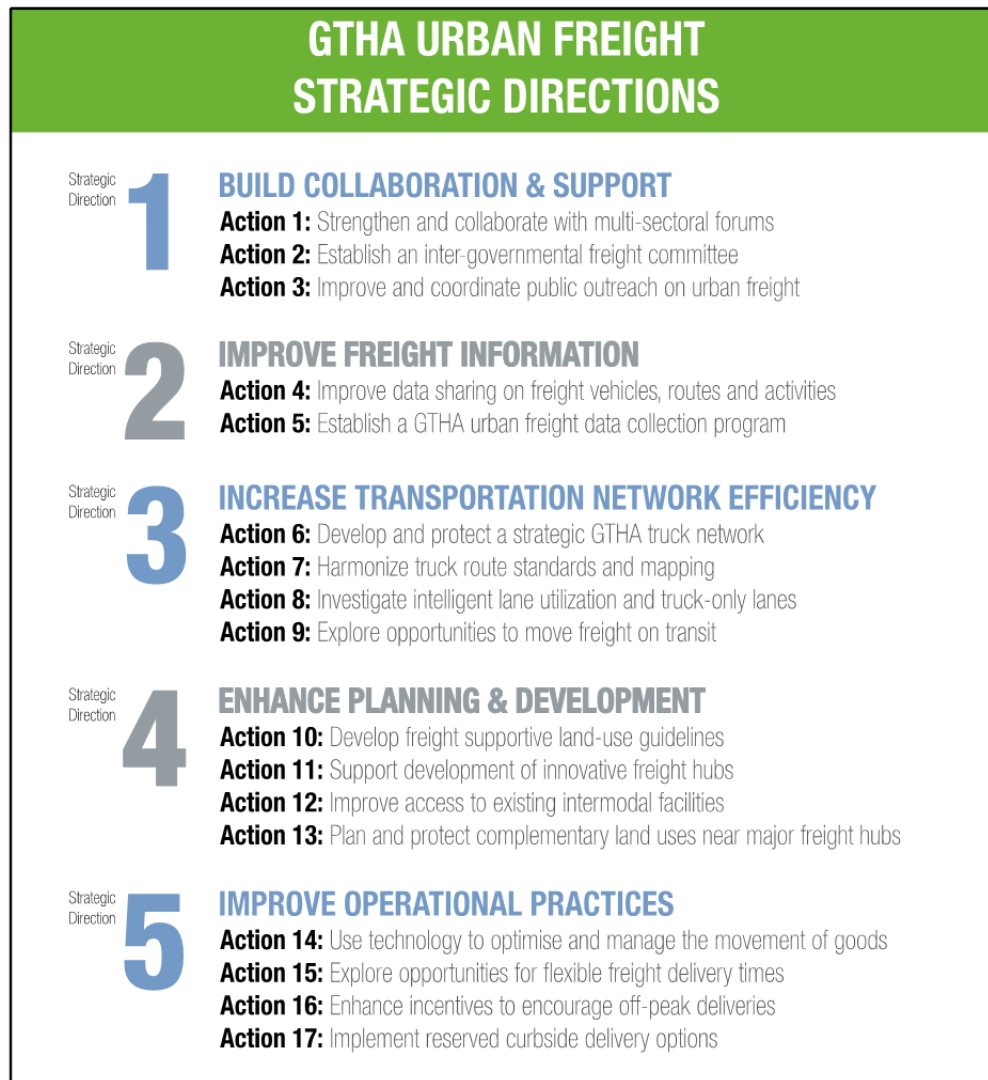
To meet this need, Metrolinx prepared the GTHA Urban Freight Study, which the Metrolinx Board of Directors approved in February 2011. The study was driven by extensive consultations with public agencies and private sector thought leaders. It resulted in five strategic directions and 17 actions that provided a strong basis for addressing urban goods movement challenges in the GTHA. As Figure 1-1 shows, this Action Plan comprised a broad range of planning and operational improvements, predicated on increased collaboration and support among and between public and private goods movement stakeholders.

One initial outcome was Metrolinx’s establishment of the GTHA Urban Freight Forum (UFF), which regularly brings together a group of public agencies, private industries, intermodal freight terminals, industry associations and researchers to exchange information, generate action, inspire innovation, and review the delivery of the Action Plan.

In November 2012, the UFF issued its first Status Update on the Action Plan. The Update is a compendium of policies, data collection, actions, and research initiatives conducted by Metrolinx and individual members of the Urban Freight Forum. Taken together, the RTP, the

GTHA Urban Freight Study and Action Plan, and the Status Update serve as the main points of reference for this Background.

Figure 1-1: GTHA Urban Freight Strategic Directions and Actions



1.2 Objectives

The objective of this project is to prepare a background on goods movement to include analysis and options, as well as potential strategies and action items, to inform the update of the RTP.

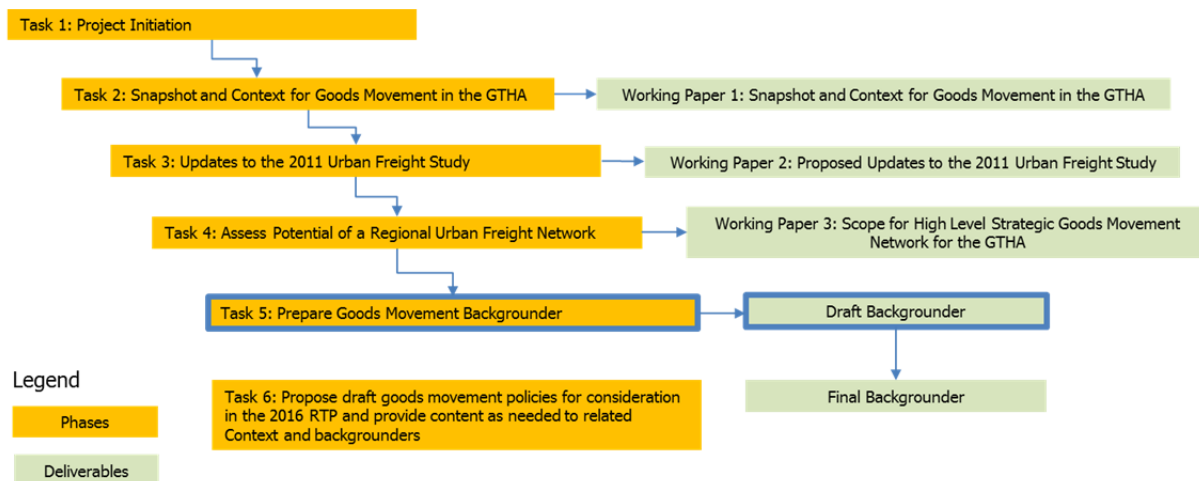
Moreover, the Background on goods movement is to:

- Be based upon quantitative and qualitative analysis as well as consultation with selected stakeholders.
- Use existing data, reports, and information prepared by Metrolinx and other sources. No new data will be collected, although the need for subsequent data collection by Metrolinx or others, as necessary, would be specified as an outcome.
- Account for and incorporate complementary initiatives conducted by or on behalf of Metrolinx over the duration of the preparation of the Backgrounder. These initiatives may include work conducted to support the legislated review, RTP, third-party research, data collection or data analysis, and work conducted by the GTHA Urban Freight Forum.
- Be completed by mid-2015; that is, by 30 June 2015, in order to meet the phasing of the RTP. Follow-on tasks may be required as the RTP moves forward – for example, accounting for comments and modifications to the paper, actions, or strategies as the broader RTP progresses. However, these would be defined separately, if required. We have set aside a portion of the project budget for this on-going work.
- Be usable for public review; that is, no information will be cited in the report that is confidential or which would reveal information or point to an attribution that has been provided in confidence.

1.3 Project Structure

The project is to be developed in six broad tasks, as set out in Figure 1-2. The present Backgrounder is the output of Task 5.

Figure 1-2: Approach to the Study



1.4 Purpose of this Backgrounder

The purpose of this Backgrounder is to answer the following key questions:

- What should be the vision for goods movement in the GTHA?
- What is the state of the goods movement system in the GTHA, and how is it used?
- What changes have occurred since Metrolinx's Goods Movement Status Update was completed?
- What is working well? What needs improvement?
 - What are the on-going and new challenges experienced by good movement in the GTHA?
 - What are the environmental and social considerations and issues associated with goods movement? For example, shared use of passenger and freight rail, and truck/cyclist interactions as part of Complete Streets initiatives.
- What are the global best practices in goods movement policy of relevance to the GTHA?
- What demographic and economic trends are likely to impact the nature and volume of goods movement in the GTHA over the next 10 years?
- What are the economic impacts of goods movement?
- With reference to the regional goods movement action plan in particular, what progress has been made on goods movement in the GTHA since 2008?
- Is the Technical Backgrounder to the GTHA Urban Freight Study still current, in light of the snapshot and context developed in Task 2?
- Do the strategic directions and actions still apply?
 - Have they been accomplished, or changed in some way, and
 - Are new actions needed?
- What are the next steps and policy options?

This Backgrounder is also intended to provide Metrolinx with an overview of progress to date and to solicit comments and other feedback on the structure and content of this document.

1.5 Methodology

This Backgrounder has been developed through several inputs. The primary input was a series of consultations with key public and private sector goods movement stakeholders. These guided telephone discussions highlighted key issues and initiatives, keeping in mind a broad, GTHA-wide perspective. The consultation findings were supported in the text by a profile of current conditions, agency policies, and an update to the Update. The profiles of current conditions relied upon published travel, demographic, and socio-economic data, as well as on data provided by the Ontario Ministry of Transportation (MTO) from its Commercial Vehicle Survey (CVS).

The other major input was a review of published plans related to goods movement in the GTHA: the 2011 Metrolinx Urban Freight Study and the Peel Region Goods Movement Strategic Plan among others. All are referenced in the text.

Taken together, the consultations and the referenced documents provide both a snapshot of current conditions, and a context for examining challenges and opportunities.

1.6 Definition: What Do We Mean by Goods Movement?

The RTP is multi-modal and covers the primary modes for goods movement: air, marine, pipeline, rail, and road. At this point, it is useful to define what we mean by goods movement:³

Goods Movement is the movement of a physical product (e.g., food, gasoline, furniture or clothing), materials that are used to make other things (fabric, rubber, lumber, precious metals, etc.). A Service Movement is a movement by a person who provides services at different locations because of his or her job (e.g. plumbing, carpet cleaning or computer repairs). For the purposes of the RTP Review, we focus on the goods movement as opposed to service movements.

Without excluding inter-urban activity, the RTP focuses on urban goods movement, which has several components. Perhaps most visible and clear to the public are the “first mile” and “last mile,” which reflect, respectively, the initial pick-up of a good from a distribution centre or a manufacturer and its final delivery to a retailer or consumer. However, urban goods movement (UGM) also is pervasive across the transportation system as unfinished goods and raw materials are moved between factories and warehouses, and finished goods move among

³ The terms described here are adapted from *Freight Glossary and Acronyms*, US Department of Transportation, Federal Highway Administration, Freight Management and Operations. Other definitions may be found in this glossary as well. Last Modified December 3, 2013, <http://www.ops.fhwa.dot.gov/freight/fpd/glossary/>.

modes, producers, and distribution centres. These movements are often seen by the public but are not well understood.⁴

Note that many references use the terms “urban freight” and UGM interchangeably. For the purposes of the RTP Review, they mean the same thing. For consistency, the Backgrounder uses “goods movement.”

1.7 Limitations

There are three limitations associated with the sources used for this project:

- In many cases development of the Backgrounder relied on data and information from third parties, notably including demographic, economic and travel data, the CVS and MTO’s iCorridor travel time data. Although the accuracy of any piece of third-party information cannot be warranted, to the extent practical within the scope of the project, attempts were made to validate the information.
- Where required by the source in order to maintain confidentiality, only selected summaries are presented herein. This may result in some aggregation of information and, possibly, in the loss of some detail that was not deemed material.
- The most recent available information was used for the Backgrounder. However, some of the available data may not fully represent current conditions.

⁴ The “last mile” concept informed Metrolinx’s 2011 *GTHA Urban Freight Study*, and so it is appropriate to include it here as well.

2 The Multi-Modal Goods Movement Network and Its Use

Key Messages

- Key stakeholders in goods movement include both public sector and private sector stakeholders. Key public sector stakeholders include Metrolinx, MTO, the ports and airports, and the municipalities. Key private sector stakeholders include all large goods movement companies operating in the GTHA, including transportation and logistics business such as the railways, trucking companies, couriers, and logistics providers, as well as the shippers such as the major retailers, construction companies, and manufacturers.
- The GTHA has a truly multi-modal network of infrastructure. Goods flow by air, marine, pipelines, rail, and road, and are interchanged between modes at major terminals including airports, marine ports, rail intermodal and transload facilities, and pipeline terminals.

This chapter presents a snapshot of the current multi-modal goods movement network and its use. It describes, to the extent possible with the data available, the attributes of the current air, marine, pipeline, rail, road, and goods movement network that serves the GTHA. Stakeholders, infrastructure, goods flows, and safety are each discussed.

2.1 Overview and Key Stakeholders

2.1.1 Public Sector

A number of public sector entities play a key role in goods movement. Metrolinx is the regional transportation agency for the GTHA. The Ontario Ministry of Transportation “strives to be a world leader in moving people and goods safely, efficiently and sustainably to support a globally competitive economy and a high quality of life.”⁵ MTO views goods movement from a system-wide perspective; however, the Province does not have jurisdiction equally over all modes.

The federal government regulates air, marine, pipeline, and rail transportation. Canada Port Authorities (Ports of Hamilton, Oshawa, and Toronto) are governed by the federal *Canada Marine Act* and operate the GTHA’s publicly owned ports as well as the Toronto City Centre Airport. The federal government also regulates airports. Toronto Pearson International Airport is operated by the Greater Toronto Airports Authority. Hamilton International Airport is owned by the City of Hamilton leased to TradePort International Corporation, a wholly owned subsidiary of Vantage Airport Group.

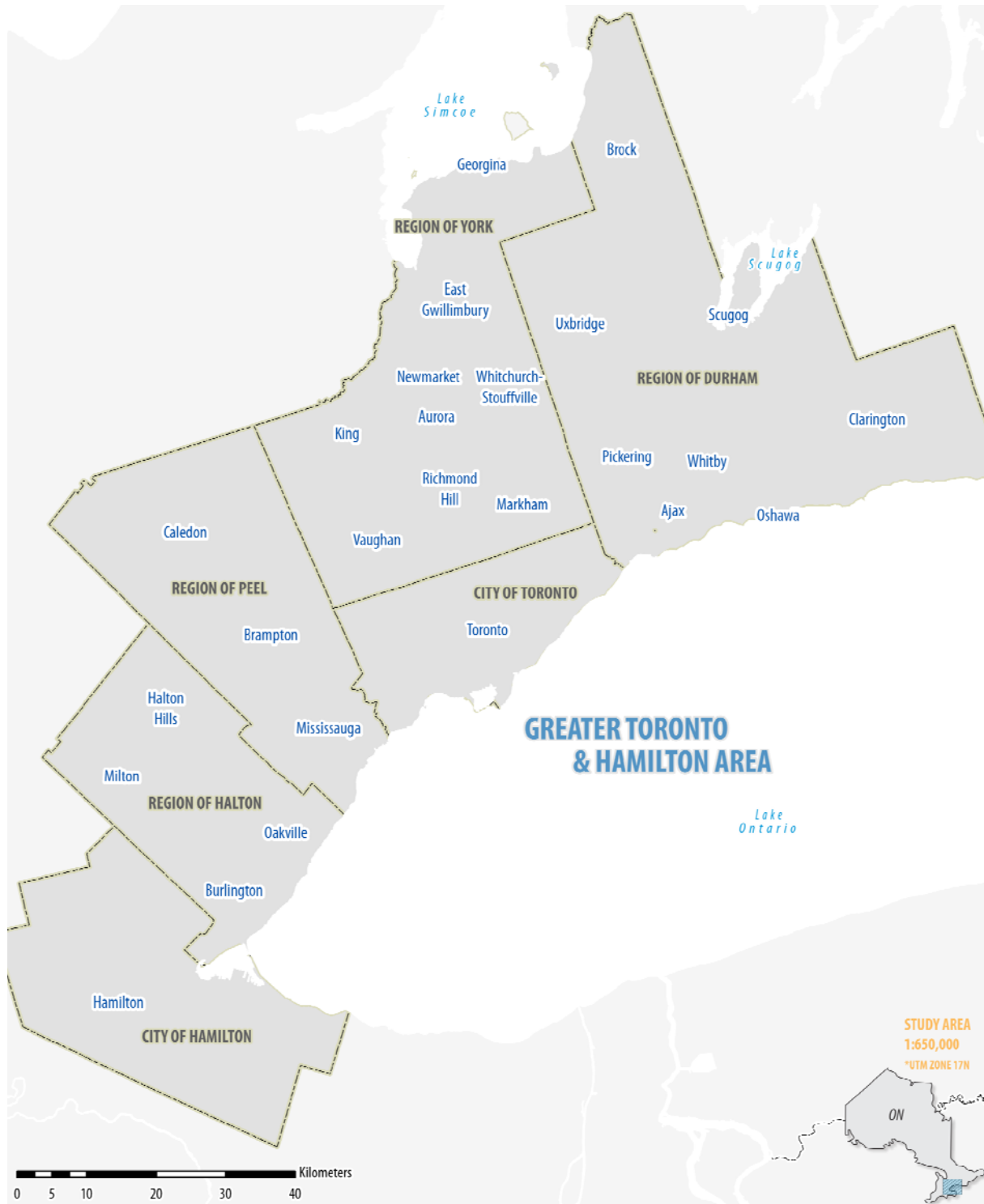
The GTHA is comprised of four regional municipalities (Halton, Peel, York, Durham) and two single-tier municipalities (Hamilton and Toronto) (Figure 2-1). Within the four regional municipalities are 24 lower-tier or local municipalities.

2.1.2 Private Sector

Broadly, there are three types of industries that could be considered of relevance to urban goods movement: shippers, transportation and logistics, and service industries. We refer to transportation and logistics (T&L or carriers) and shippers collectively as goods movement industries. Service industries tend to generate service trips.

⁵ <http://www.mto.gov.on.ca/english/about/about-ministry.shtml>

Figure 2-1: Municipalities Making Up the Greater Toronto and Hamilton Area



2.2 GTHA Goods Movement Infrastructure and Flows

The GTHA has a truly multi-modal network of infrastructure. Goods flow by air, marine, pipelines, rail, and road, and are interchanged between modes at major terminals including airports, marine ports, rail intermodal and transload facilities, and pipeline terminals.

2.2.1 Air

The GTHA has three major airports handling goods (including service) movements within its boundaries (Figure 2-2). Both Toronto Pearson International Airport and Hamilton International Airport are very significant for goods movement, while Billy Bishop Toronto City Centre and the nearby Kitchener-Waterloo Airport are significant for service movements specifically.

Toronto Pearson is Canada’s dominant airport in terms of the tonnage of cargo it handles and the extent of its national and global direct connections. Hamilton, although it has fewer connections, features 24-hour operations, unlike Pearson where overnight operations are limited. In 2013 Pearson handled 346,000 tonnes of cargo (loaded and unloaded), representing one-third (35%) of Canada’s air cargo. In addition to express overnight (including courier) and dedicated cargo flights, Pearson also offers an extensive air cargo network based on freight carried in the holds of passenger aircraft, known as belly freight.

Hamilton handled 94,000 tonnes of cargo, making it the country’s third-largest airport for air cargo in 2013 (10% of the Canadian total).⁶ Of note, Hamilton’s domestic revenue tonnage was only slightly less than that of Pearson in 2013, although Pearson’s cross-border and international tonnages were significantly higher than those of Hamilton (Figure 2-3).⁷ Hamilton airport tends to handle more express overnight service, including acting as a hub for Purolator, Cargojet, and DHL. A multiuser cargo facility is planned, which will provide a location at the airport for non-carriers to consolidate and handle freight.

⁶ *Air Carrier Traffic at Canadian Airports 2012*, Statistics Canada, Catalogue no. 51-203-X, December 2013.

⁷ Table A19C, *Transportation in Canada 2011 Statistical Addendum*, Transport Canada, report TP 14816, 2012.

Figure 2-2: Greater Toronto and Hamilton Area Airports

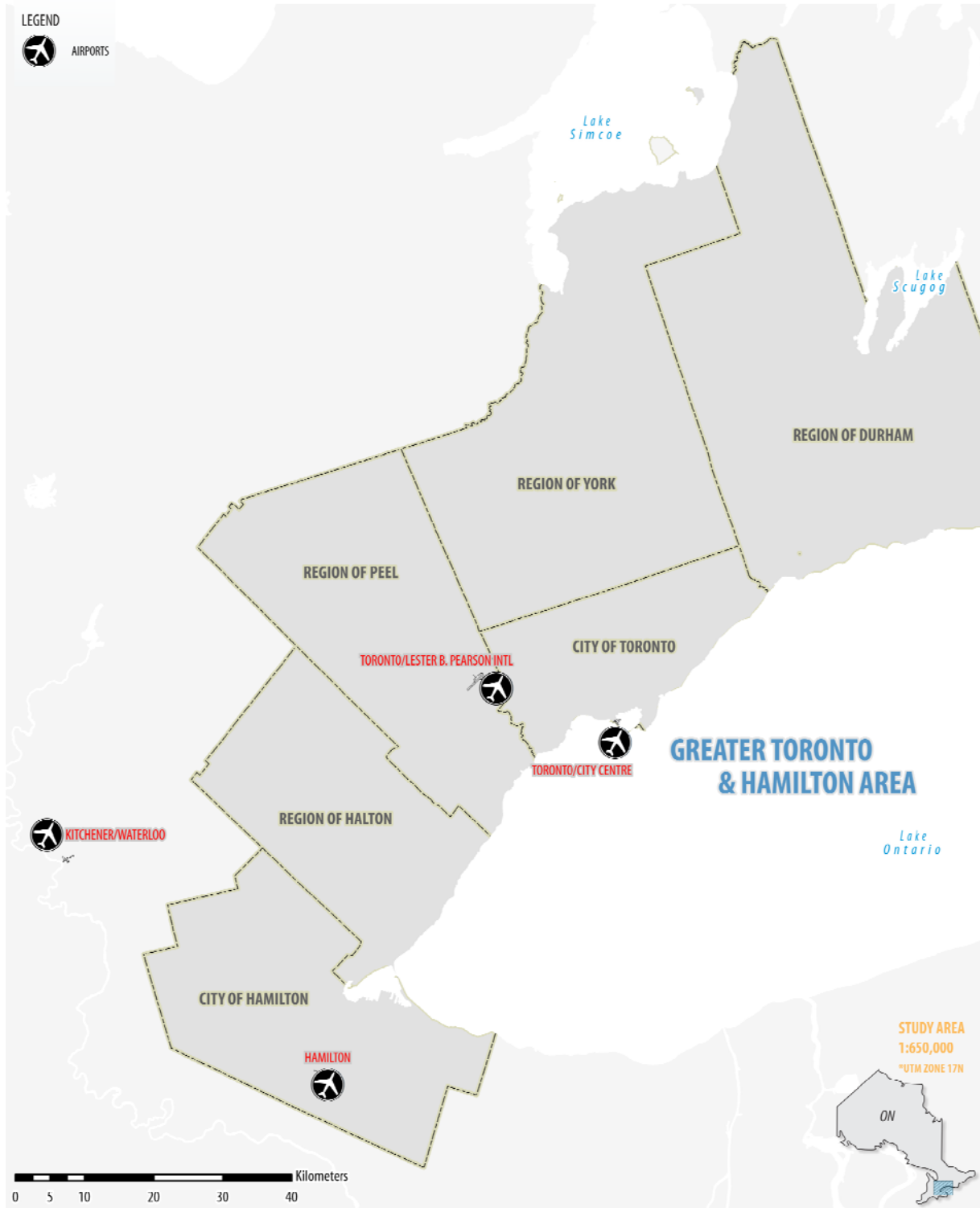
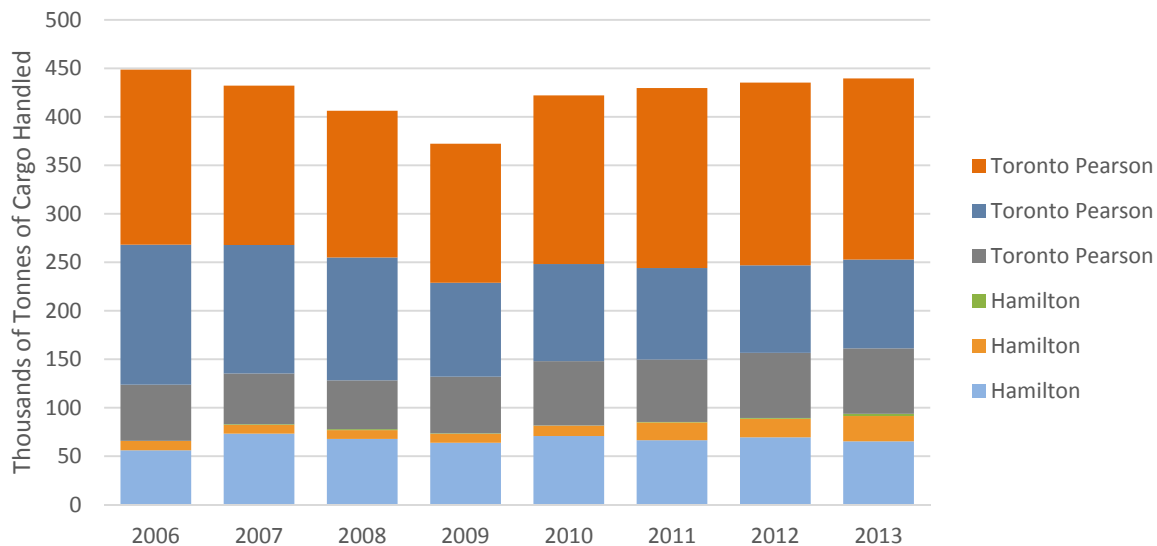


Figure 2-3. Air Cargo Handled at Hamilton and Toronto Pearson Airports, 2013



Source: CPCS analysis of data from Transport Canada (2013) "Transportation in Canada," Table A23, p. A86.

Air cargo volumes handled at GTHA airports have grown since 2009, but have not returned to the level of 2006. Freight to and from the United States at Pearson has notably declined, while international and domestic air cargo handled at Toronto and Hamilton airports has tended to increase. It is notable that GTHA airports face competition from other airports in the Great Lakes basin such as Chicago and Detroit, and it is common to truck cargo into or out of the GTHA to access air cargo services.

2.2.2 Marine

The GTHA has six major marine ports (Figure 2-4): Hamilton, Oakville, Clarkson, Toronto, Oshawa, and Bowmanville. Hamilton, Toronto, and Oshawa are public ports, while Oakville, Clarkson, and Bowmanville are private and focused on unloading refined petroleum products (Oakville) or on serving adjacent cement plants (Clarkson and Bowmanville).

GTHA marine ports handle a wide variety of commodities. These commodities have origins and destinations both within the Great Lakes and St. Lawrence Basin as well as worldwide. At present there is no significant amount of containerized cargo being handled at any GTHA port.

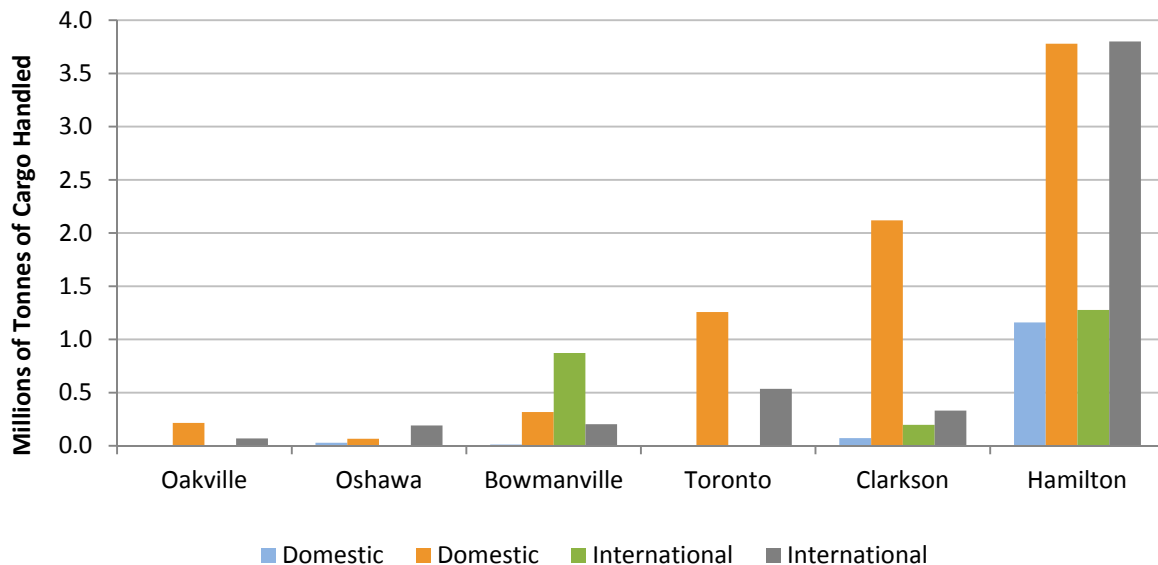
Hamilton is the dominant general cargo port in the GTHA and indeed Southern Ontario (Figure 2-5). Other ports tend to handle more specialized cargos or have operations closely tied to one industry or company (e.g. cement manufacturing in Bowmanville; lubricants and cement in Clarkson; and sugar in Toronto). Most Southern Ontario ports also receive salt for de-icing purposes and cargo for local construction projects.

Figure 2-4: GTHA Marine Ports



Source: CPCS

Figure 2-5: Cargo Handled at Greater Toronto and Hamilton Area Marine Ports



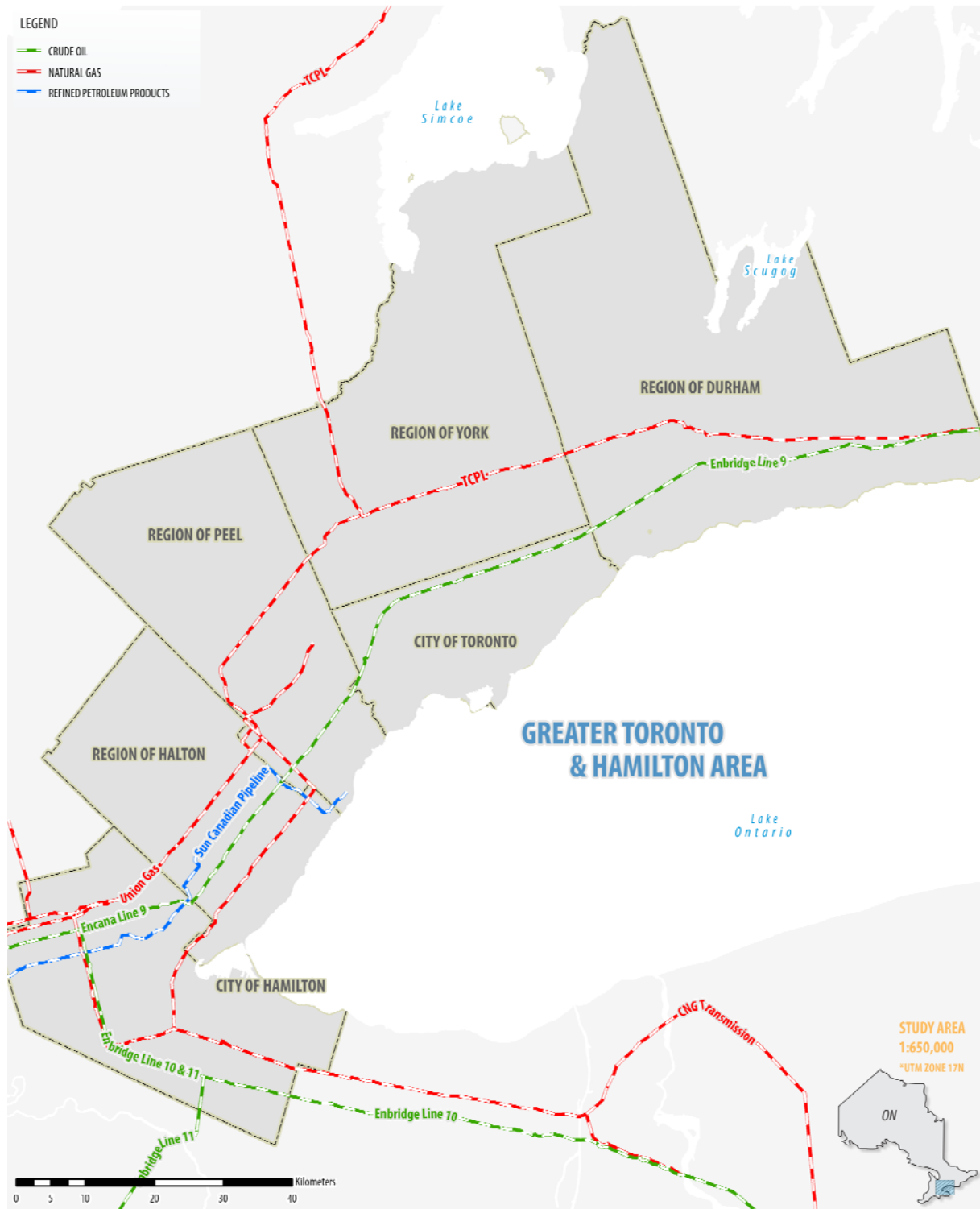
Source: CPCS analysis of data from Transportation Canada Marine Database Data (2011 – most recent available)

2.2.3 Pipeline

Pipelines play an important role in the transportation of liquid and gaseous products, particularly fuels. In the GTHA major pipelines connect the region with refineries and gas production and storage areas. Enbridge’s Line 9 could soon carry crude oil from Sarnia to Montreal. This line would carry up to 300,000 barrels of oil per day.⁸ Sun Canadian is a petroleum products (e.g. gasoline, jet fuel, and other products of refineries) pipeline that connects Sarnia with the GTHA, including a terminal in North York and Toronto Pearson International Airport. Union Gas operates the Dawn-Parkway System natural gas pipeline, which supplies natural gas from the Dawn Hub in Chatham-Kent to the GTHA. TransCanada’s Canadian Mainline natural gas pipeline also runs through the GTHA.

⁸ National Energy Board (2013). “Enbridge Pipelines Inc. - Line 9B Reversal and Line 9 Capacity Expansion Project - OH-002-2013.” <http://www.neb-one.gc.ca/clf-nsi/rthnb/pplctnsbfrthnb/nbrdgl9brvrsi/nbrdgl9brvrsi-eng.html>

Figure 2-6: GTHA Pipelines Network



Source: CPCS estimates based on publicly available information, which is incomplete

2.2.4 Rail

In the most general sense, railways operate systems that consist of lines and terminals. Trains transport goods from terminal to terminal. Terminals can be as modest as a small spur connected to a shipper facility or as large as CP’s Vaughan Intermodal Terminal, which handles more than 700,000 containers per year. Collectively, the GTHA intermodal terminals handle two million containers per year.⁹

Seven railways operate infrastructure and services in the GTHA (Figure 2-7) (VIA Rail Canada is not depicted). The mainline tracks of CN and CP, Canada’s two Class I freight railways,¹⁰ pass through the GTHA. Both CN and CP have connections east to Montreal, north to Northern Ontario, and on to Western Canada, and west and south to Southwestern Ontario and the United States. Short lines provide some local services. Metrolinx is a very important player in the GTHA rail network, not only through its use of infrastructure for GO train operations, but increasingly through the ownership and development of owned infrastructure such as large portions of the Barrie and Lakeshore corridors.

Both CP and CN handle a wide range of products in the GTHA ranging from automobiles assembled in Oakville and Oshawa to steel products transferred from rail to truck in Hamilton (“transloaded”) to a wide range of direct-to-customer (“carload”) shipments. Among the most important interchange points are the three rail intermodal terminals, which are described in more detail in the sub-sections that follow.

CN Brampton Intermodal Terminal

CN’s Brampton Intermodal Terminal (BIT) is Canada’s largest intermodal terminal.¹¹ Sixty percent of CN’s system-wide intermodal traffic touches BIT. A 2010 Transport Canada study found that the terminal receives and ships containers from all of continental North America, with international traffic accounting for 69% of inbound and 43% of outbound container traffic.¹² While data on volumes handled at BIT are not reported publicly by CN, in 2007 BIT was reported to have handled 660,000 intermodal units.¹³ This facility is nearing capacity, necessitating the proposed development of the Milton Intermodal Terminal, see below.¹⁴

⁹ Jones Lang LaSalle (2013) “An Overview of Toronto’s Intermodal Network System” <http://kevinkelley.ca/wp-content/uploads/2013/01/GTA-Intermodal-Overview-2013.pdf>

¹⁰ Class I railways are defined as the largest railways by revenue. Canada has two Class I freight railways, CN and CP, and one Class I passenger railway, VIA Rail Canada Inc.

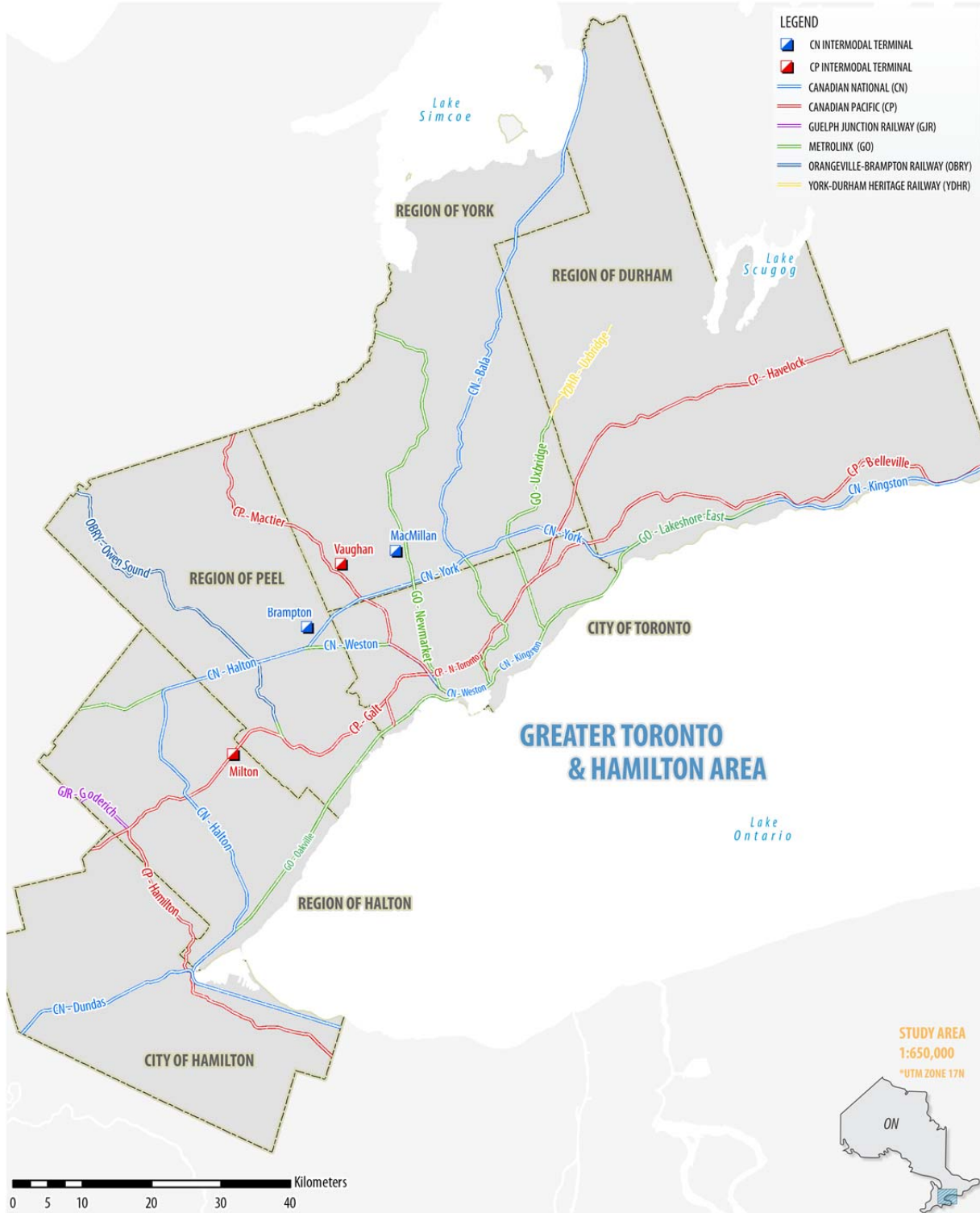
¹¹ CN (2011)

¹² Transport Canada. (2010)

¹³ <http://www.continentalgateway.ca/intermodal-rail.html>

¹⁴ https://www.cn.ca/en/about-cn/2015/03/pressrelease_20150317011634_2091

Figure 2-7: GTHA Rail Network



Source: CPCS

CP Vaughan Intermodal Terminal

The CP Vaughan Intermodal Terminal in York region opened in 1991 and has been expanded to handle more than 700,000 containers per year. Most freight is general freight from West Coast ports, all of which is containerized. International traffic accounts for 60% of inbound and 40% of outbound traffic. Sears and its subsidiary SLH Transport and Consolidated FastFrate are co-located. In May 2013, the Government of Ontario announced the extension of Highway 427 from its current terminus at Zenway Boulevard to Major Mackenzie Drive, 6.6 km to the north. Construction is currently scheduled begin in 2017. Once complete this project will significantly improve truck access.

CP Milton Expressway Terminal

The Expressway service of CP allows shippers to move their standard, non-reinforced trailers in the high-volume corridor between Toronto and Montreal by rail. Trains leave Milton and Montreal every day at 19:30 and arrive in Montreal and Milton at 06:00 the next morning. Trailers are ready for pick 90 minutes after arrival. This service competes with trucking along the Highway 401 corridor. Truckers pick up and drop off trailers at the Expressway terminals. Generally, Expressway cannot provide end-to-end transit times that are faster than a direct truck-only move.

Proposed CN Milton Intermodal Terminal

In March 2015, CN announced plans for a second intermodal terminal in the GTHA at Milton. CN intends the new facility to complement the Brampton Intermodal Terminal by providing additional intermodal capacity and container availability, particularly for shippers located in the southwest area of the GTHA. For instance shippers west of Brampton could experience much shorter travel times to and from Milton than to and from the Brampton Intermodal Terminal. It would also facilitate logistics development in Milton and Halton by attracting distribution centres (DCs) and associated employment. The development is subject to approval by the Canadian Environmental Assessment Agency.¹⁵

2.2.5 Roads and Highways

The GTHA is served by a network of roads owned and operated almost exclusively by municipalities and MTO (Figure 2-8). Provincial highways and arterial roads are of greatest relevance to UGM as they carry the vast majority of truck trips and provide mobility between almost all important origins and destinations for goods movement. The vast of majority of goods movement stakeholder interest is focused on road network performance as no other mode faces similar issues on congestion.

¹⁵ https://www.cn.ca/en/about-cn/2015/03/pressrelease_20150317011634_2091

The currently operating segment of Highway 407 is privately owned and operated by a company called 407 ETR. Tolls for heavy vehicles, including trucks, are charged based on which part of the highway is used, distance travelled, and time of day. Evenings, weekends, and holidays have the lowest rates. An eastern extension is currently under construction and will begin opening in two phases in 2015. Once complete this project will significantly improve the average speed and reliability of the provincial highway system in the Eastern GTHA in the medium term.

Two other major highway projects, currently in environmental assessment, are likely to be developed further in the future: the GTA West Corridor and the Niagara-to-GTA Corridor. Generally, the former would link Milton with Highway 400, while the latter would link Hamilton and Milton with Fort Erie. Both would be significant additions to highway capacity in the GTHA and would have benefits for goods movement in terms of average speed and reliability.

Figure 2-9 shows truck traffic volumes on the provincial highway system. The data presented are for 2006, the most recent comprehensive and consistent available data. The importance of Highway 401 as the backbone of the provincial transportation system is clearly in evidence. Highways 427 and QEW also play key roles in the GTHA.

Figure 2-10 shows flows of goods travelling by road that originate in the GTHA destined to other regions. Which flows are most important depends on whether value or weight is the metric used. On the basis of weight, the most important commodities are aggregates and non-metallic mineral products, waste and scrap, mixed freight, foodstuffs, and base metals. On the basis of value, motor vehicles and parts, electronics and electrical equipment, mixed freight, pharmaceuticals, and mail are much more important. Generally, weight gives an indication of the infrastructure demand that a commodity creates, while value can give an indication of costs, travel time, and reliability. Figure 2-11 shows flows of goods destined to the GTHA from other regions.

Figure 2-12 (p. 26) and Figure 2-13 (p. 27) show the origins and destinations of highway commodities flows to and from the GTHA by value and weight respectively. The overwhelming importance of the adjacent US Mid-Atlantic and East North Central regions as well as of Quebec is clear. The US South Atlantic region is a distant fourth, but notably more important than other Canadian regions. This pattern could reflect relative importance of intermodal rail connections to Eastern and Western Canada, which would reduce reliance on highway transport.

Figure 2-8: GTHA Road and Highway Network



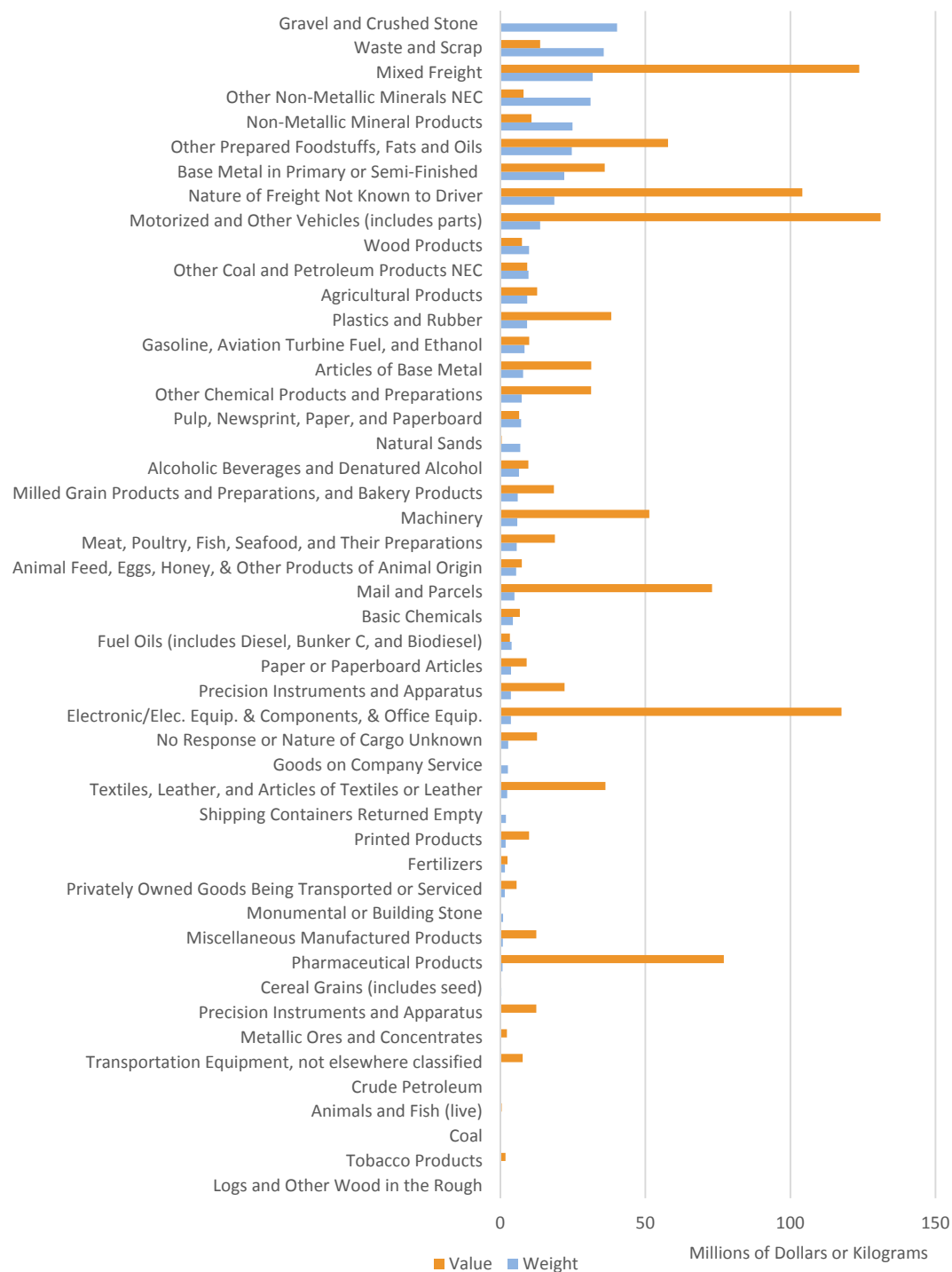
Source: CPCS analysis of data from MTO

Figure 2-9: Average Annual Daily Truck Traffic, Provincial Hihgways, 2006



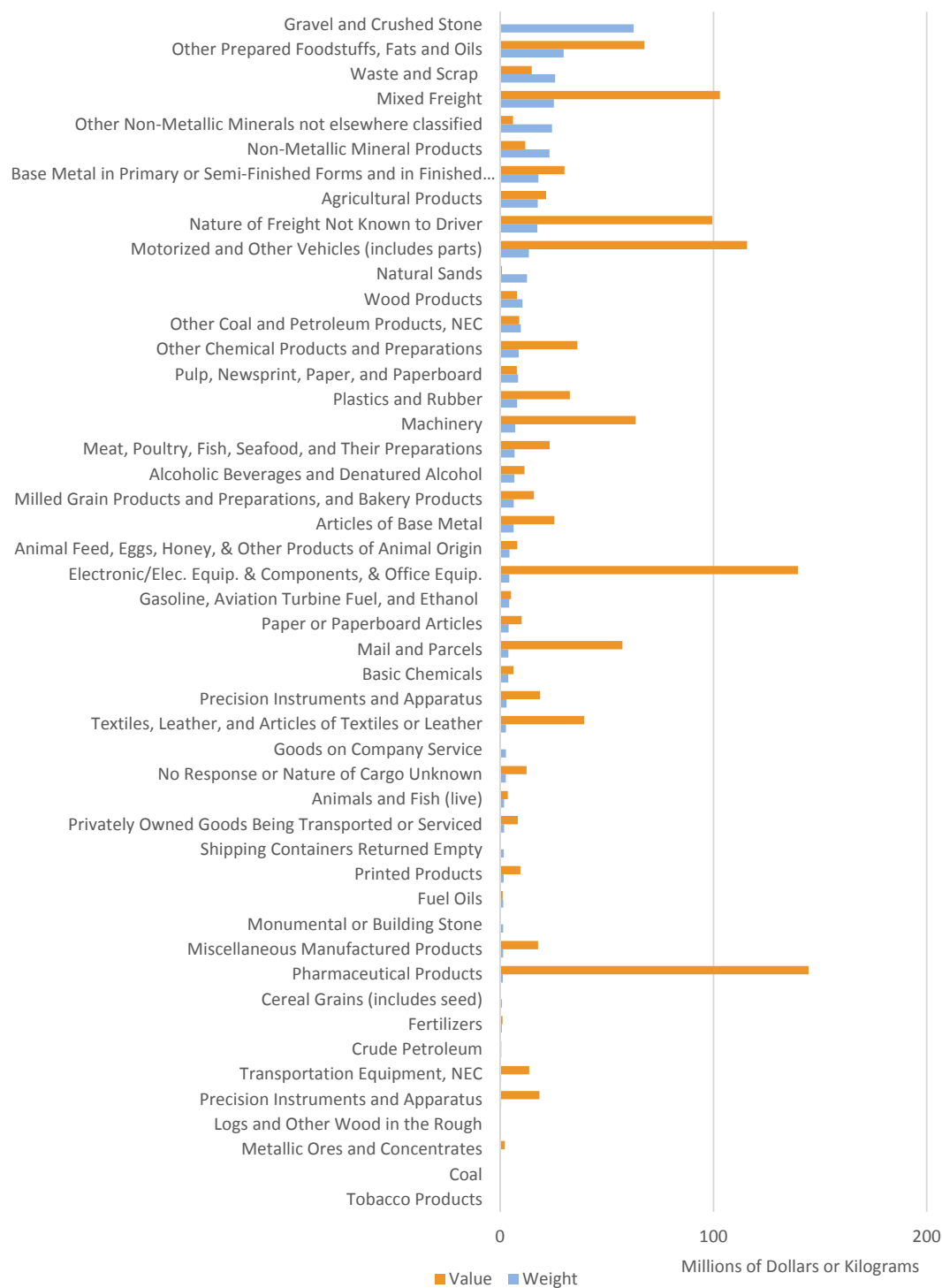
Source: CPCS analysis of data from MTO. 2006 is the most recent year for which consistent truck counts are available.

Figure 2-10: Flows of Goods Originating in the GTHA, 2011



Source: CPCS analysis of the MTO Commercial Vehicle Survey data. NEC = not elsewhere classified.

Figure 2-11: Flows of Goods Destined to the GTHA, 2011



Source: CPCS

analysis of the MTO Commercial Vehicle Survey data. NEC = not elsewhere classified.

Figure 2-12: Origins and Destinations of Goods Flows from/to the GTHA, 2011, by Value



Source: CPCS analysis of MTO Commercial Vehicle Survey data.

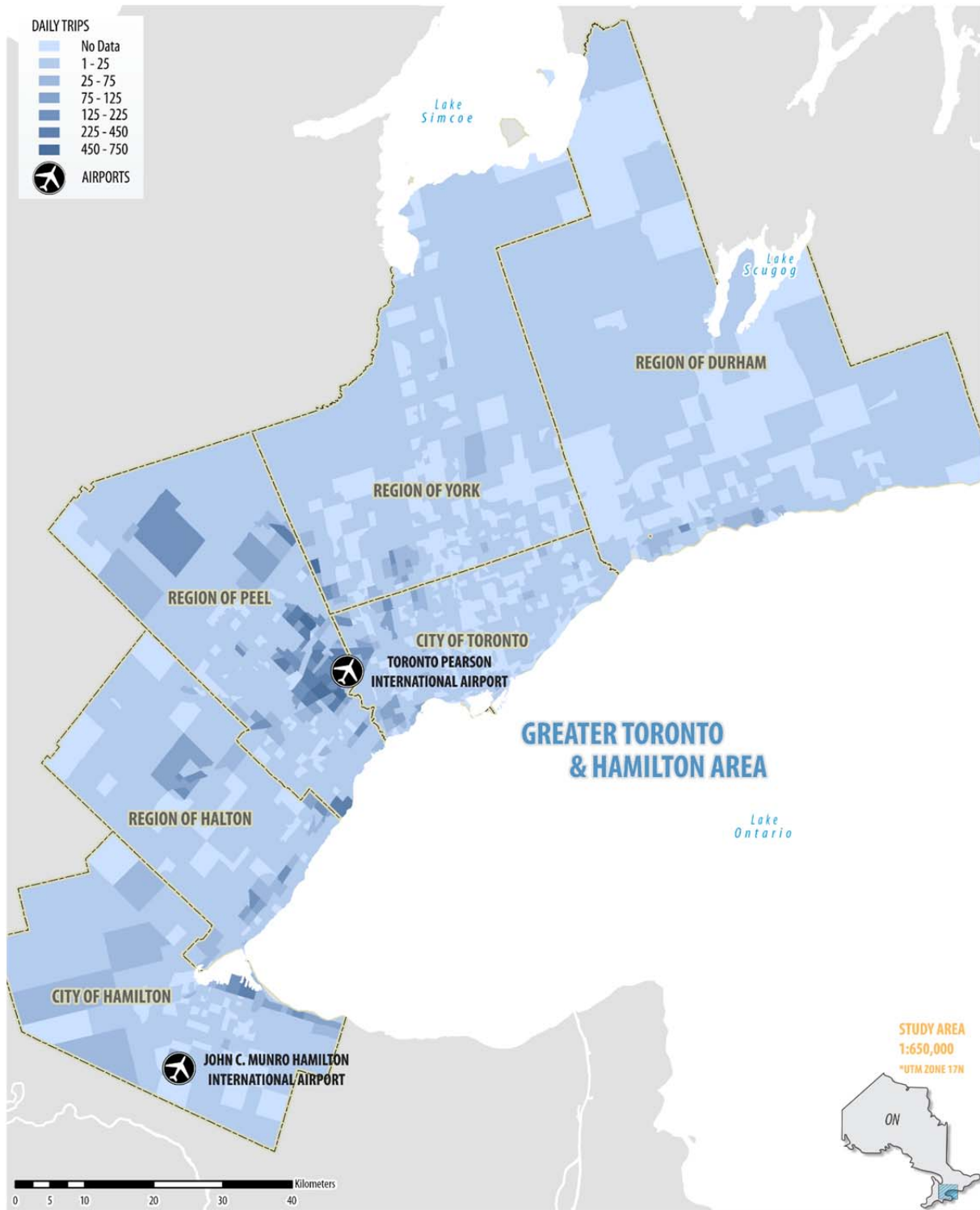
Figure 2-13: Origins and Destinations of Goods Flows from/to the GTHA, 2011, by Weight



Source: CPCS analysis of MTO Commercial Vehicle Survey data.

Figure 2-14 shows daily commercial vehicle trips generated in each traffic zone in the GTHA based on the most recent MTO Commercial Vehicle Survey (CVS) data. Since the CVS provides better coverage of provincial highways than of arterial roads, these data should be interpreted as more representative of inter-regional or long-haul goods movement activity. The importance of Peel Region in general and the Toronto Pearson Airport area in particular, is notable.

Figure 2-14: Daily Commercial Vehicle Trips by Traffic Zone, 2012



Source: CPCS analysis of MTO Commercial Vehicle Survey data

2.3 Goods Movement Safety

The following sections present statistics on pipeline, rail, and road safety in the GTHA. Data on air and marine safety in the GTHA are not available.

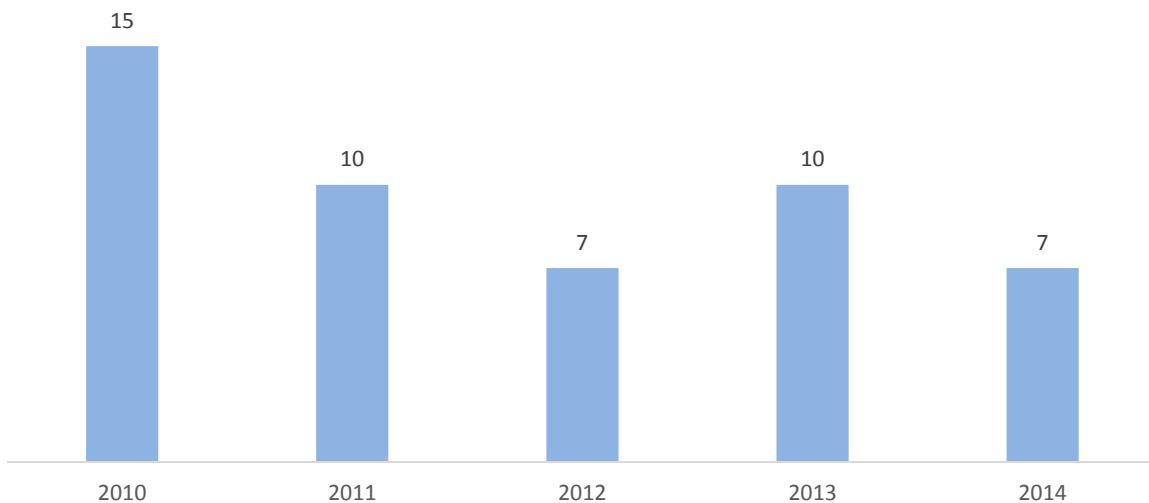
2.3.1 Pipeline

According to Transportation Safety Board (TSB) reports, there have been no serious injuries, fatalities, or evacuations associated with pipeline transportation in the GTHA since at least 2004.

2.3.2 Rail

Figure 2-15 shows fatalities associated with rail incidents in the GTHA from 2010 to 2014. These figures include incidents involving passenger and freight trains. It is not possible with the publicly available data to separate out passenger and freight incidents. Data are also available from the TSB on injuries, derailments, fire, explosions, involvement of dangerous goods, and evacuations, but are not presented here. In order to adjust for changing levels of rail activity, it would be informative to examine incidents relative to a measure of overall rail activity such as train-km or tonne-km, but no such metric is currently available for the GTHA.

Figure 2-15: Fatalities Resulting from Rail Accidents in the GTHA



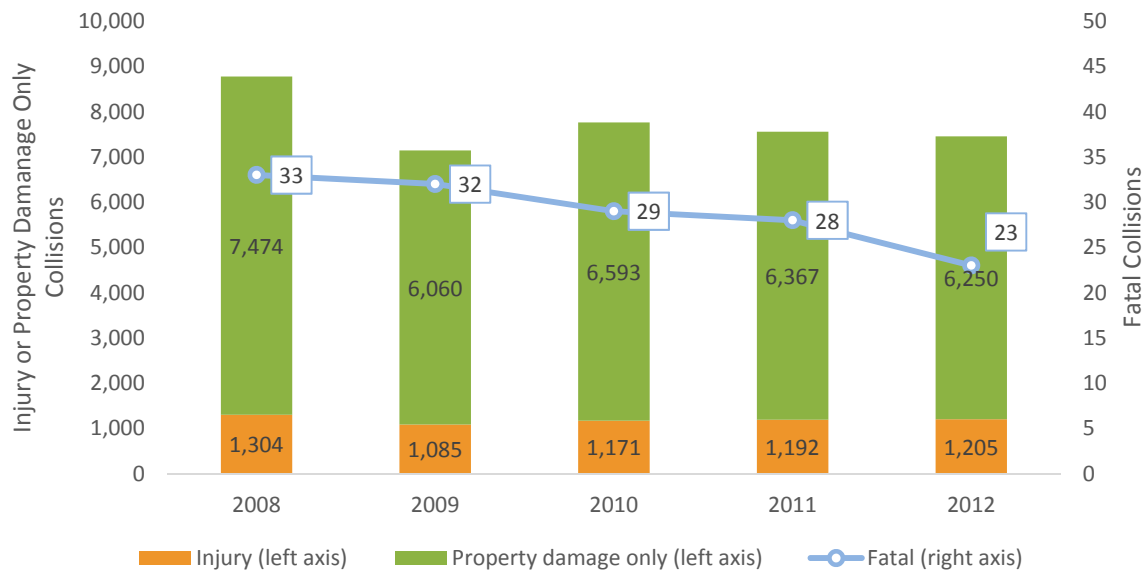
Source: CPCS analysis Transportation Safety Board data

2.3.3 Roads and Highways

Figure 2-16 shows collisions involving large trucks in the GTHA from 2008 to 2012, the most recent year available. There appears to be a decline in fatal collisions, while no clear trend is

apparent in property damage only or injury collisions. In order to adjust for changing levels of truck activity, it would be informative to examine collisions relative to a measure of overall large truck activity such as vehicle km travelled, but no such metric is currently available for the GTHA.

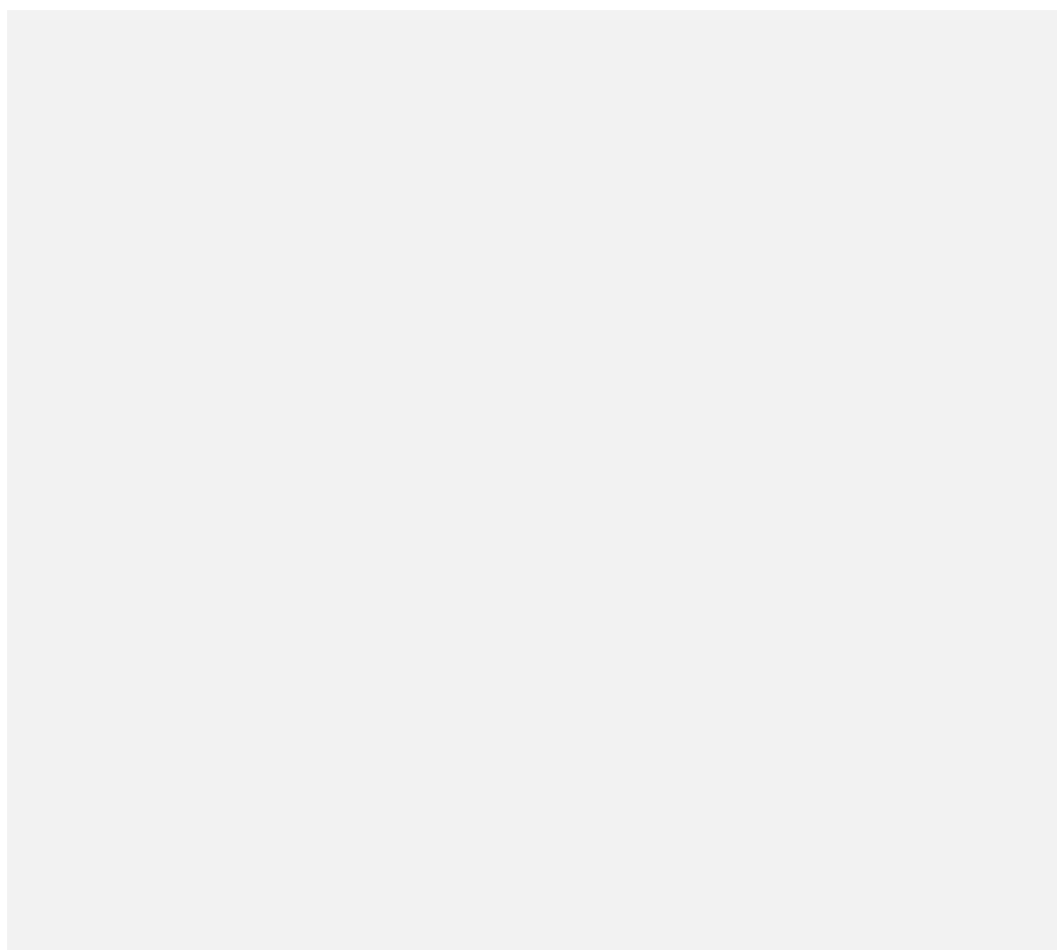
Figure 2-16: Collisions Involving Large Trucks, Greater Toronto and Hamilton Area, 2008-2012



Source: CPCS analysis of data from the Ontario Ministry of Transportation.

3

Demographics and Economics

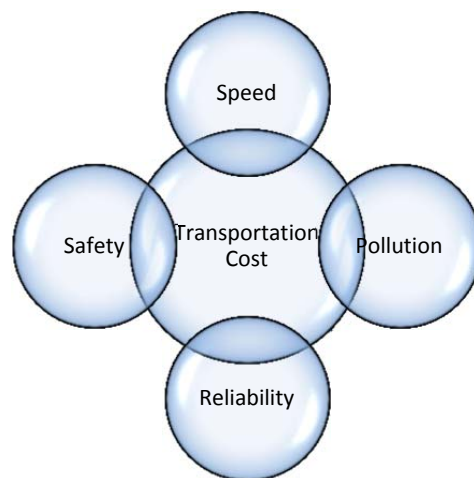


This chapter develops a basic narrative on the economic importance of goods movement. It then explores key demographic and economic trends impacting goods movement in the GTHA.

3.1 The Economic Importance of Goods Movement

Goods movement is fundamental to the functioning of our economy, and therefore our quality of life. Every good and very many services require transportation to get to market. The cost of transportation is the human and material resources required to move goods and services. This cost buys varying levels of speed, reliability, pollution, and safety. Goods movement can be said to be cost effective when it achieves desired levels of speed, reliability, and safety at the lowest possible cost to the economy and the environment (e.g. air pollution).

Goods movement is important economically to individuals as consumers and as workers. For consumers the cost of transportation is an important part of the price of most products from lettuce to new cars to home furnishings. For businesses and the workers they employ, the cost of transportation affects the cost of inputs to production and ultimately how competitive their products and services will be in markets in the GTHA and around the world.



Our ability to move goods and services cost effectively is a cornerstone of competitiveness of our economy. Cost-effective transportation of goods and services means that our region is a more profitable place for business to invest and create jobs. In a world of ever-increasing options for where to invest, the GTHA is competing with regions in every corner of the world.

While moving goods and services is fundamental to our quality of life, such movements are not without negative aspects. Every trip generates pollution including air emission, noise, and vibration. Every trip entails a risk of injury and loss of life for road users and pedestrians. While the ill effects for each trip tend to be small, the collective impact can be very large, from diseases caused by air pollution to the tragic explosion of a train carrying oil in Lac Mégantic, Quebec. These negative aspects of goods movement, sometimes called negative externalities, have real economic costs that are often borne by individuals and families not directly involved in the movement of goods or services.

Box: Transportation and Logistics as Derived Demand and Attracting Investment

The transportation of goods and services is a cost to society and not desirable in and of itself. It is the goods and services that must be moved to be consumed that society wants.

This proposition holds at the level of the economy as a whole. However, at the regional level, transportation activity can be seen as desirable, because of the jobs it creates. Many municipal governments and some provincial governments actively court investment in transportation and logistics facilities for this reason.

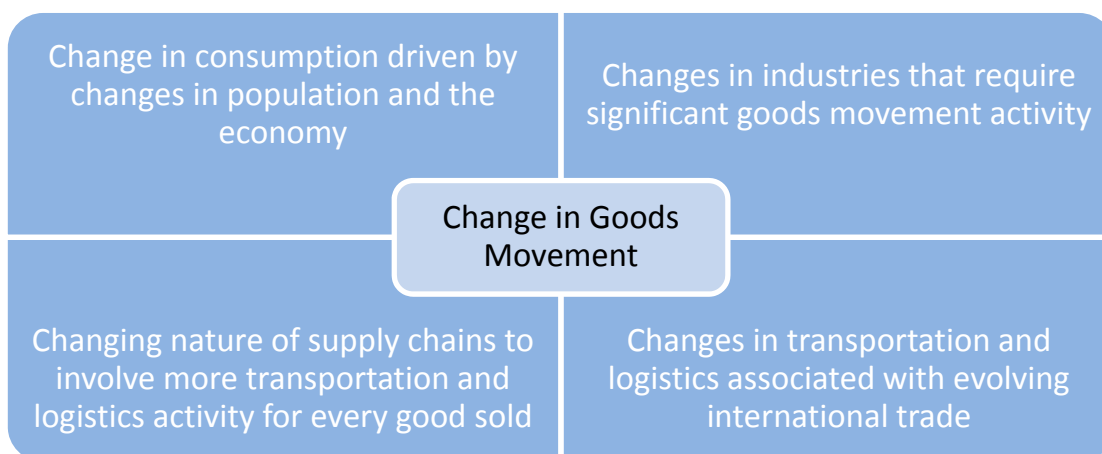
This investment attraction motive is less relevant when larger geographical areas are being considered. For example, for the GTHA as a whole, there is a roughly fixed amount of transportation and logistics activity required to support population and industry at any given time. While regions within the GTHA might compete for investment in transportation and logistics facilities, the region as a whole has a much greater interest in the transportation and logistics system working cost effectively, than in attracting particular investments to particular locations.

That being said, the GTHA is the transportation and logistics hub for Canada. Many products consumed in every corner of Canada are made in or imported through the GTHA. The same is true of many exports. This role as a hub means both that the GTHA has a disproportionate share of the transportation and logistics jobs in Canada and also offers a competitive advantage for shippers.

3.2 Key Demographic and Economic Trends

Demographic and economic trends have a major impact on the volume of goods movement. There are generally considered to be four key drivers of change in goods movement (Figure 3-1).

Figure 3-1: Key Drivers of Change in Goods Movement



Source: CPCS, adapted from Transportation Research Board (2009) "Public and Private Sector Interdependence in Freight Transportation Markets," National Cooperative Freight Research Program Report 1.

The sections that follow examine these trends in the GTHA.

3.2.1 Consumption Growth

Consumption, the spending by people on everyday goods and services, is a function of the size of the population and how much each person consumes. We assess trends in each aspect of consumption separately.

Population Growth

In 2014 the population of the GTHA reached 7.6 million (Figure 3-2). Over one-third of this population was concentrated in the City of Toronto, while the three most populous regions of Toronto, Peel, and York accounted for over two-thirds of the population of the GTHA. In 2014 the GTHA had 22% of Canada’s population and fully 55% of Ontario’s population. Since 2001, Peel and York have seen the largest increases in population, collectively welcoming almost 750,000 new residents (Figure 3-3). Hamilton and Durham have seen much slower population growth. Halton, starting with a relatively low population, has seen the fastest rate of growth (2.7%) after York. The distribution and change in the population of the GTHA is one of the most fundamental drivers of goods movement activity, in terms of the spatial demand for goods and services, as well as the demands placed on transportation infrastructure.

Figure 3-2: Greater Toronto and Hamilton Area Population, Millions, 2014

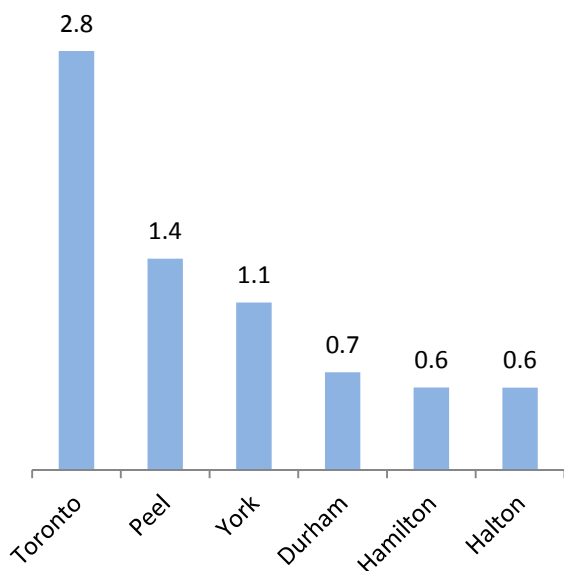
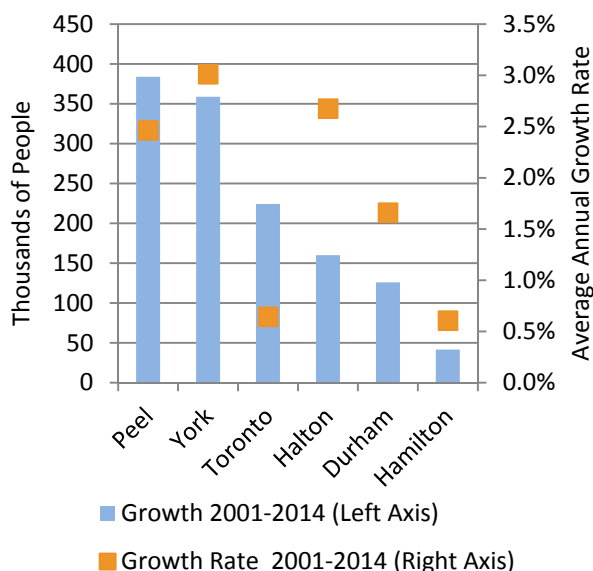


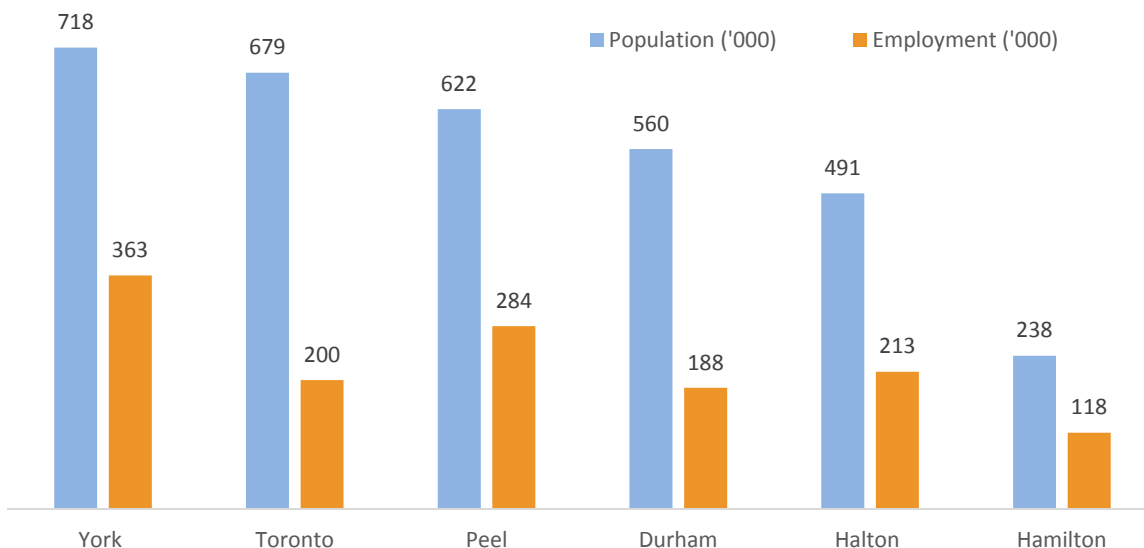
Figure 3-3: Greater Toronto and Hamilton Area Population Growth, 2001-2014



Source: CPCS analysis of Statistic Canada estimates (CANSIM Table 051-0062)

Over the years 2011 to 2041 all regions of the GTHA are expected to experience continued and significant population growth (Figure 3-4). This growth will contribute to greatly increased demand for goods and services, as well as demand for transportation infrastructure.

Figure 3-4: Greater Toronto and Hamilton Area, Projected Growth in Population and Employment, 2011-2041



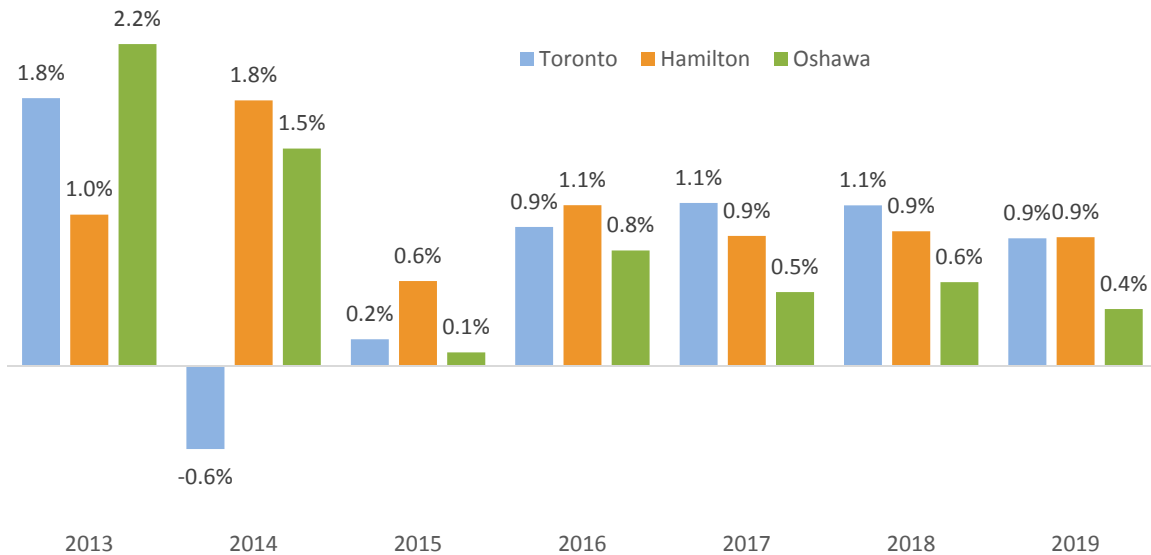
Source: CPCS analysis of Hemson Consulting Limited (2013) "Greater Golden Horseshoe Growth Forecast to 2041: Technical Report (November 2012) Addendum," June.

Consumption

How much each person consumes is related to purchasing power, how much each person can buy. Purchasing power is related to income, which tends to be linked with economic growth.¹⁶ Real personal income capita (i.e. adjusted for inflation, which affects prices and not quantities of goods and service consumed) in the GTHA is forecast to grow in the years ahead, suggesting that the demand for goods will continue to rise (Figure 3-5).

¹⁶ A variety of factors can strengthen or weaken this connection, but this analysis does not delve into this detail.

Figure 3-5: Change in Real Personal Income Per Capita, Census Metropolitan Areas Making Up the GTHA



Source: CPCS analysis of Conference Board of Canada (2015) Metropolitan Outlooks

3.2.2 Goods Movement Industries in GTHA

This section profiles goods movement industries (shippers and transportation and logistics) in the GTHA.¹⁷ Within the GTHA, Peel is the most specialized region in goods movement with over 7.7% (Figure 3-6) of its labour force in transportation and logistics and 33% in shipper industries (Figure 3-7). Toronto is the only outlier on the low side in terms of share of its labour force in shipper industries with 22%, 6 percentage points below the provincial average of 28%.

¹⁷ There is no one comprehensive source of data on these industries. To obtain a sense of the relative importance of employment in goods movement industries in the GTHA we can examine data on employment by industry from the National Household Survey. It is important to note that these data, drawn from the 2011 National Household Survey are based on residence rather than place of employment, and as such may distort the picture to the extent that inter-regional commuting is occurring. We have no data on inter-regional commuting by industry.

Figure 3-6: Share of Labour Force in Transportation and Logistics, 2011

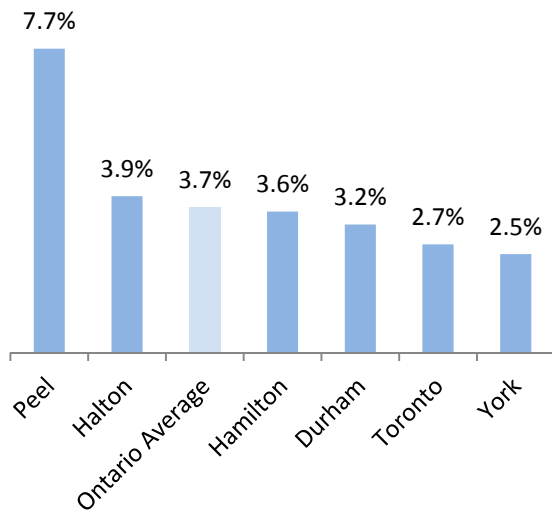
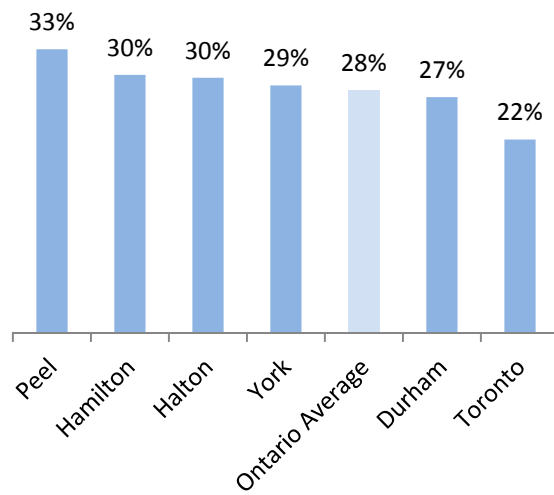


Figure 3-7: Share of Labour Force in Shipper Industries, 2011



Source: CPCS analysis of the National Household Survey, 2011

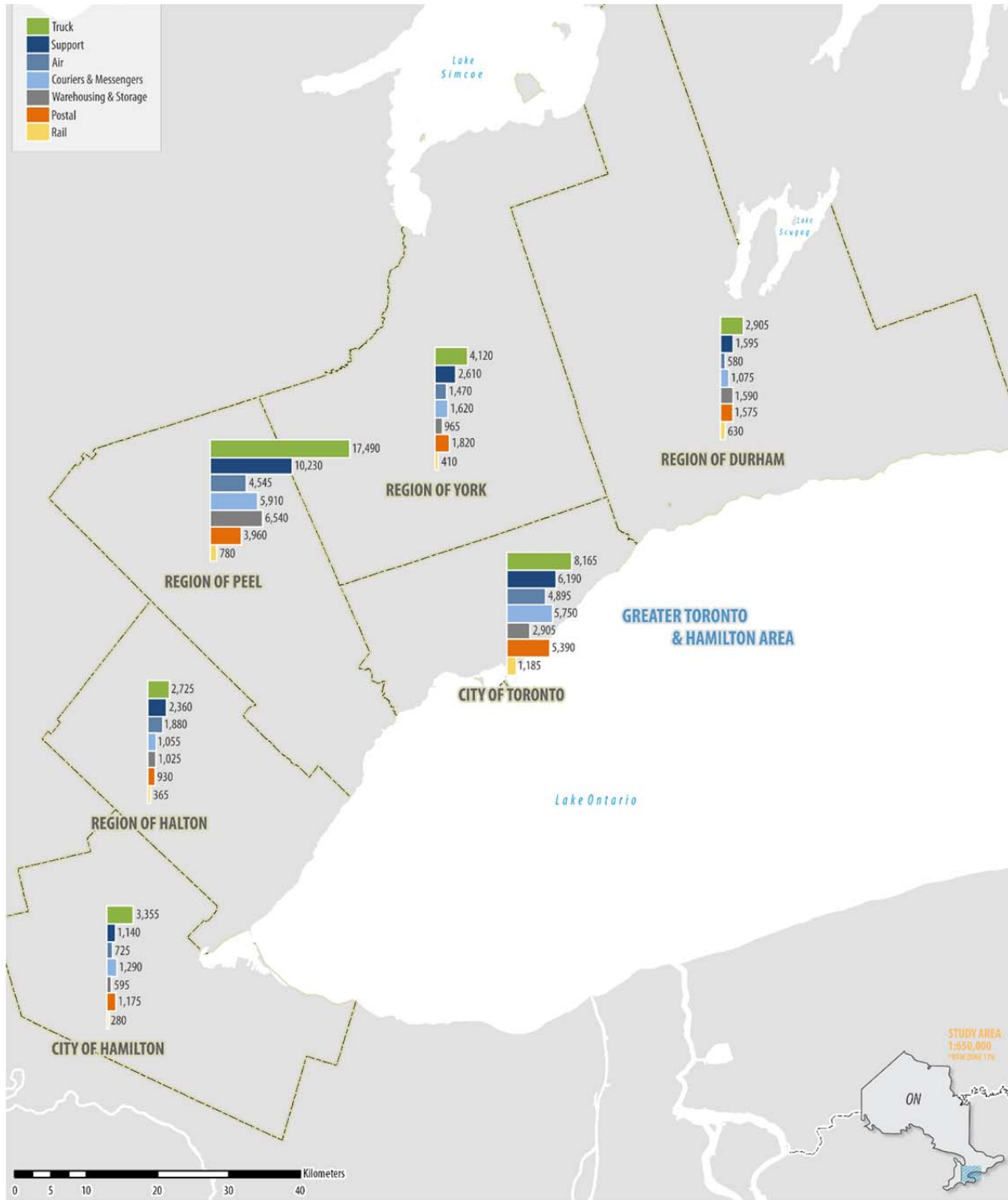
The Conference Board of Canada forecasts continued growth in employment in transportation and warehousing (the key segment of the transportation and logistics industries) of 2.0% per year over 2016 to 2019.¹⁸ Key shipper industries of wholesale and retail trade and industrial are forecast to grow at 1.7% and 2.8% respectively. Overall employment in the Toronto Census Metropolitan Area is forecast to increase at an average rate of 2.4%.

Figure 3-8 shows employment in the transportation and logistics industries by region. Trucking and support to activities for transportation employ the most people, 43,400 and 25,100 respectively. The relative dominance of Peel Region and of the City of Toronto as locations for transportation and logistics activity is also in evidence.

Figure 3-9 on p. 40 shows the employment in the shipper industries by region in the GTHA. Retail trade and manufacturing predominate, employing 43,400 and 25,100 workers respectively. Again, Peel and Toronto are the most important locations in the GTHA for shipper industry employment.

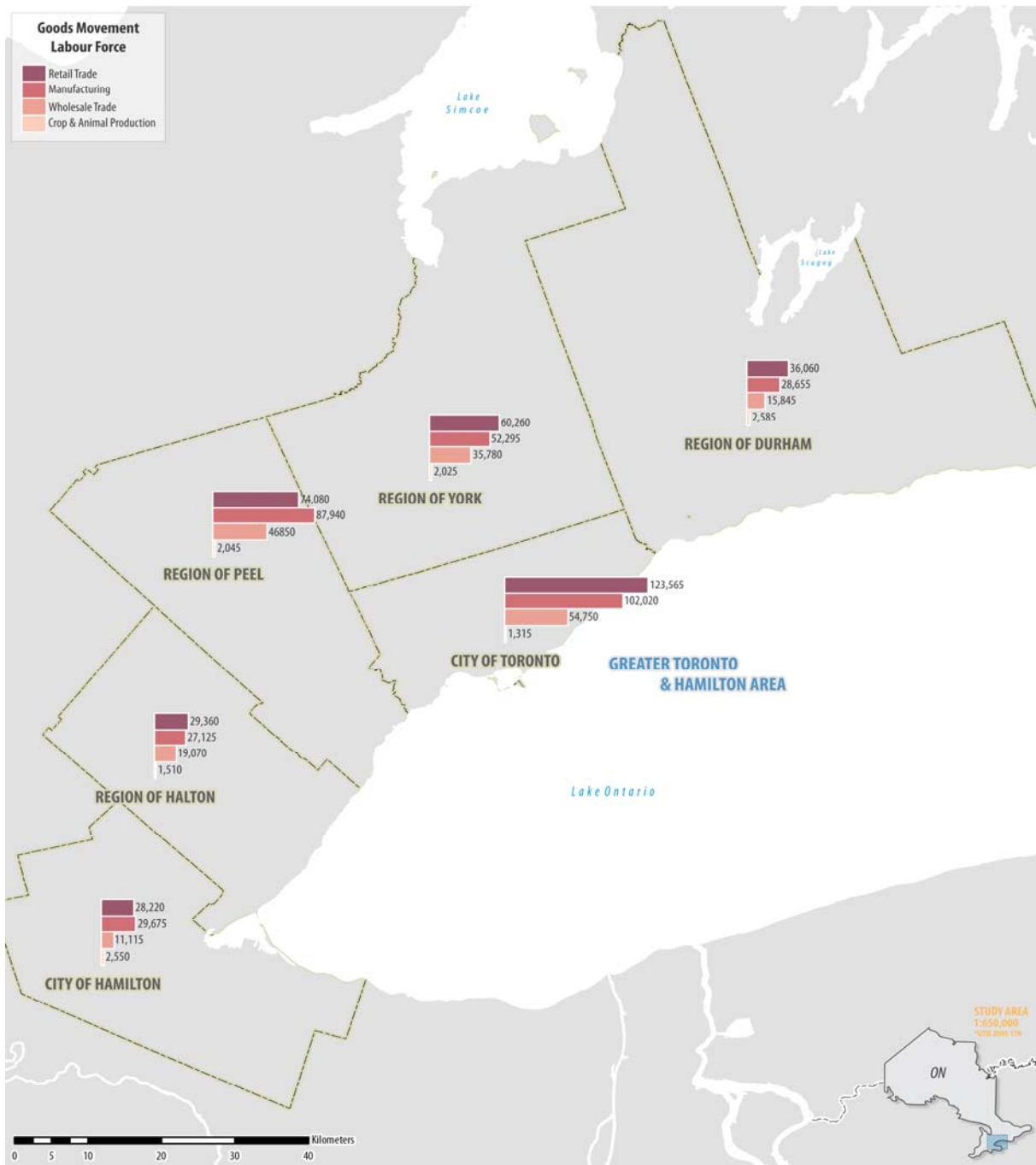
¹⁸ Conference Board of Canada (2015) “Metropolitan Outlook 1,” Winter.

Figure 3-8: Transportation and Logistics Labour Force by Region, GTHA, 2011



Source: CPCS analysis of National Household Survey data

Figure 3-9: Employment in Shipper Industries by Region, GTHA, 2011



Source: CPCS analysis of National Household Survey data

Land Use and Land Values

This section analyzes industrial real estate in the GTHA. Land use is inseparable from goods movement. The price of industrial land is in part determined by the value its location

contributes to goods movement industries. For example, for distribution centres, lands in proximity to large populations will command the highest prices.

In 2014, among the GTHA regions, Peel had the most industrial land with over 289 million square feet (msf) available (Figure 3-10), which represents an availability rate of 8.4% compared to an area average of 4.7%. York also had high inventory levels with over 179 msf available. However, York had an availability rate of only 3.40%, which is below the availability rate average in the GTHA.

Figure 3-10: Greater Toronto and Hamilton Area Industrial Space Inventory, 2014

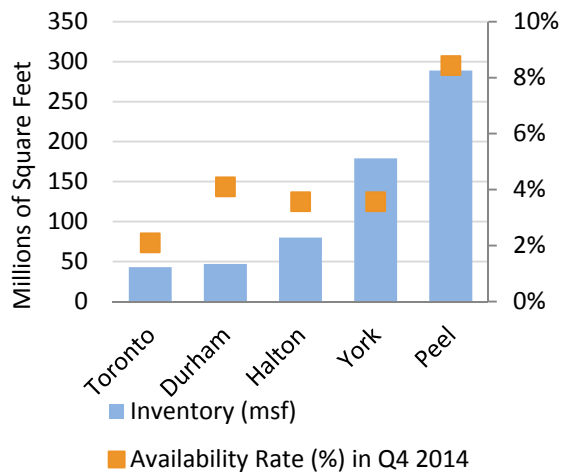
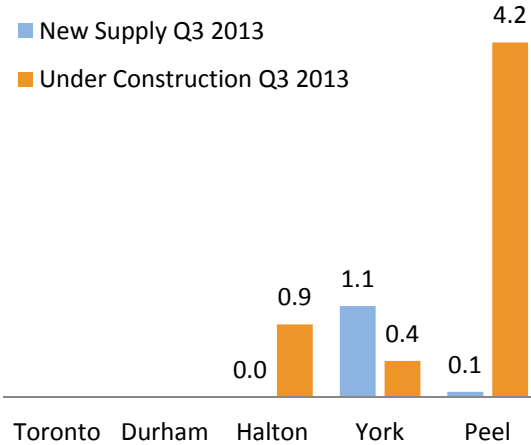


Figure 3-11: GTHA, Industrial Real Estate Development, Millions of Square Feet, 2013



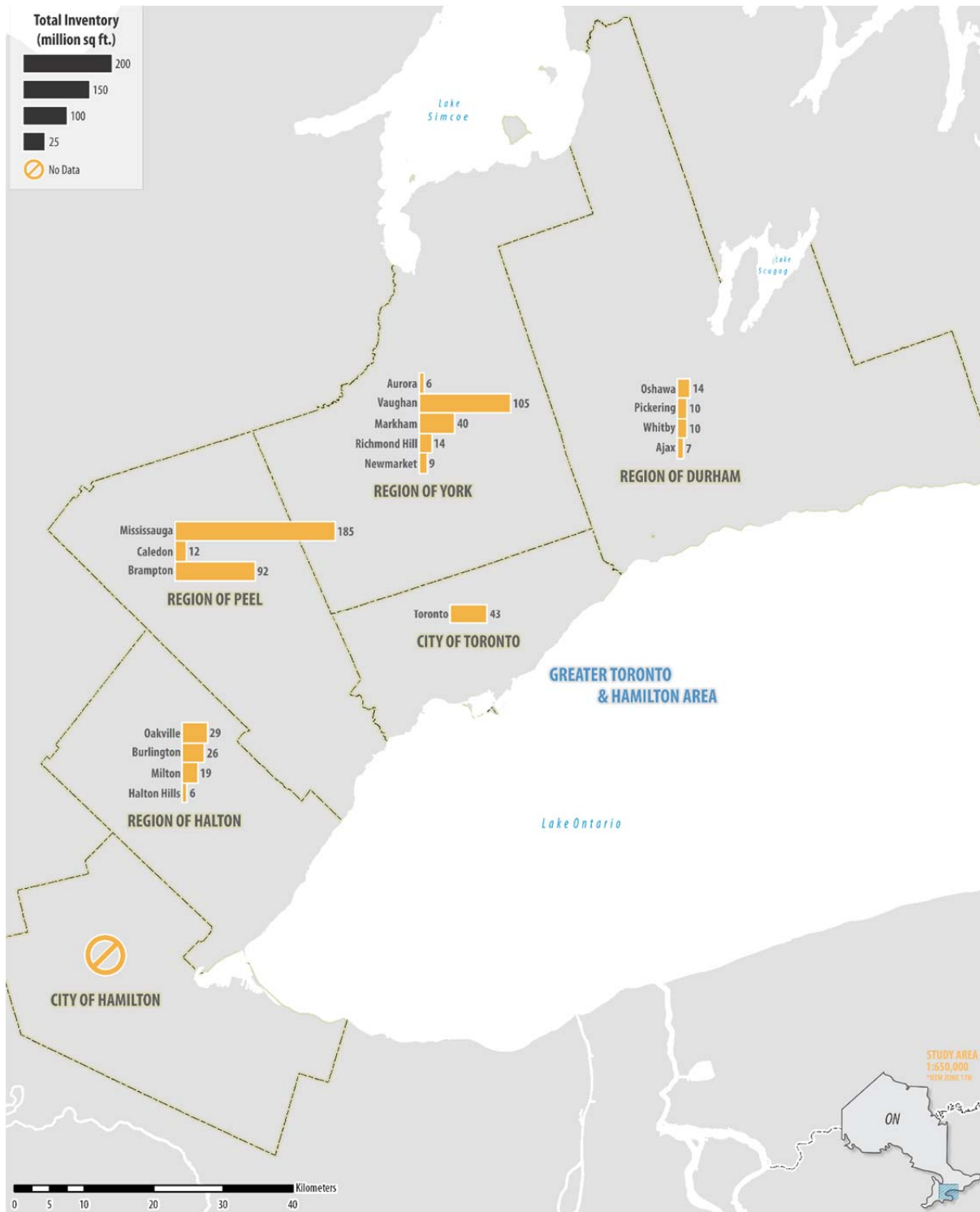
Source: CPCS analysis of Toronto Industrial MarketView for Q4 2013 by CBRE Global Research and Consulting, CPCS analysis of “4th Quarter 2014 Greater Toronto Area Industrial Market Report” by Avison Young, CPCS analysis of Toronto Industrial MarketView for Q3 2014 by CBRE Global Research and Consulting

During 2013, the most recent data available, the GTHA had a total of 1.1 msf of new industrial space supply and 5.5 msf under construction (Figure 3-11). Peel experienced the strongest growth in industrial real estate development with more than 4.2 msf under construction including 1.2 msf in Caledon, 1.9 msf in Brampton and 1.1 msf in Mississauga (Figure 3-11).¹⁹

Figure 3-12 presents industrial space inventory (occupied or not). As mentioned earlier, Peel and York have the highest inventory in the GTHA. There are no data reported for Hamilton.

¹⁹ Toronto and Durham had no industrial development under construction or newly available in 2013 Q4.

Figure 3-12: Greater Toronto and Hamilton Area, Industrial Space Inventory, 2014



Sources:

Source: CPCS analysis of “4th Quarter 2014 Greater Toronto Area industrial Market Report” by Avison Young, CPCS analysis of Toronto Industrial MarketView for Q3 2014 by CBRE Global Research and Consulting. Data were not available for Hamilton.

Another aspect of industrial development is cost. Businesses with intensive goods movement requirements will often seek out regions with the lowest costs. At the same time, higher costs can reflect the greater desirability of a location, including proximity to customers and transportation facilities such as sea and air ports, highways, and rail. Figure 3-13 and Figure 3-14 present some rental and sale pricing for industrial real estate in the GTHA.

Figure 3-13: Rental Asking Price of Industrial Real Estate (Net \$/Square Foot), 2014

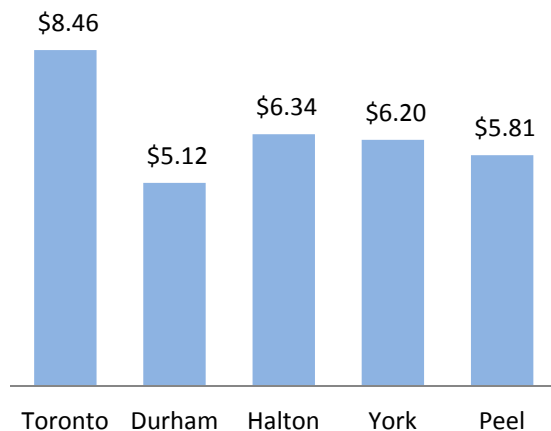
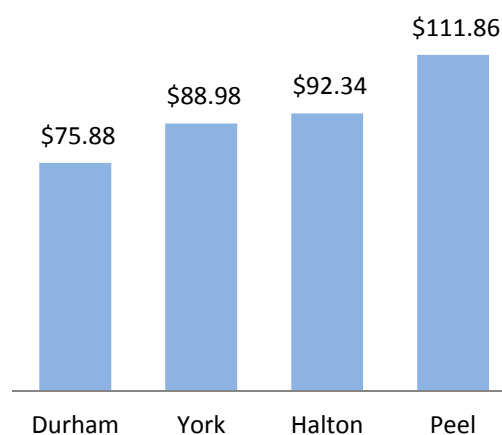


Figure 3-14: Sale Asking Price of Industrial Real Estate (\$/Square Foot), 2013



Sources: CPCS analysis of Toronto Industrial MarketView for Q3 2014 and Q4 2013 by CBRE Global Research and Consulting

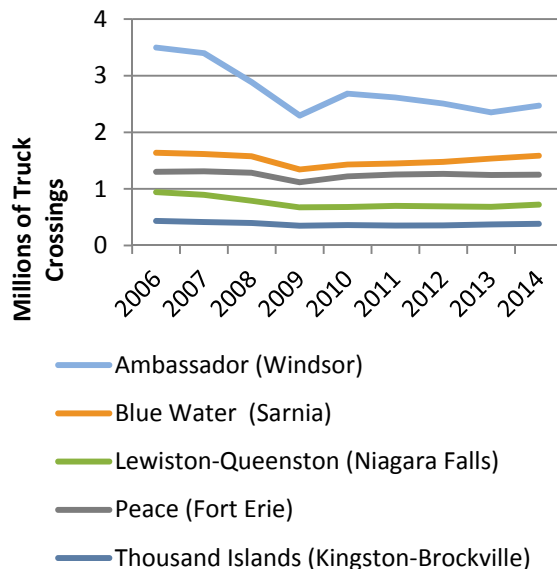
In 2014, Toronto had the most expensive rental asking price for industrial real estate at \$8.46 per square foot (sf) compared to the average of \$6.39/sf for the regions analyzed. The highest sale asking price for industrial real estate in 2013 was in the Peel region at \$111.86/sf, \$19.60/sf above the average of \$92.26/sf for the regions analyzed.²⁰

²⁰ The most recent data available on sale asking prices is from 2013 and no information is given on Toronto.

3.2.3 Changes in International Trade

There are major gaps in the knowledge of the impact of international trade on the domestic movement of goods and associated interaction with infrastructure.²¹ In part this is because relationships tend to be complex. As a real world example, consider the Vaughan Intermodal Terminal which handles containers transported by Canadian Pacific, including from Vancouver, a key entry point for Canada’s imports from Asia. While trade with Asia has grown briskly in recent years, some traditional trade patterns including with the United States have changed and some border crossings are actually seeing less traffic today than 10 years ago. For instance, traffic at major border crossings to the United States that serve GTHA traffic has dropped significantly (Figure 3-15) and has yet to recover the levels of 2006. At the single most important border crossing, the Ambassador Bridge in Windsor, truck traffic has fallen to 29% below the 2006 level, although there was a slight recovery in 2014.

Figure 3-15: Truck Crossings at Key Southern Ontario Border Crossings, 2006-2014



Source: CPCS analysis of data from the Public Border Operators Association

3.2.4 Changing Nature of Supply Chains

A strong commonality among all supply chains is the incorporation of service sensitivity in their design. In general, the goal in supply chain management is to fulfill users’/customers’ needs with as little investment in costly inventory as possible. Companies adjust their supply chains based on their reliability and performance. Often there is larger flexibility in trips that are scheduled for larger distances, with the shortest trips being more sensitive to changes in delivery time or reliability. Congestion is one of the top challenges to supply chain performance.²² In addition to impacting performance, congestion can impact the number of deliveries that can be made by a single vehicle. As delivery time increases, more delivery vehicles are required to be on the road to make the same number of deliveries.

²¹ Bachmann, Chris (2015) “Impact of Trade Agreements on Canada’s Transportation System,” Presentation at University of Toronto Freight Day. Bachmann also sets out some requirements for modelling these relationships in the future involving commodity flow and computable general equilibrium models.

²² National Cooperative Freight Research Program, Transportation Research Board. *Report 14, Guidebook for Understanding Urban Goods Movement*. 2012

Supply chains are constantly evolving in response to technological, commercial, and regulatory developments. This section reviews some ongoing trends in supply chains that are likely of relevance to the Study Area. The subsections that follow describe some of the trends currently affecting supply chains relevant to UGM in the GTHA.

Off-Peak Delivery

Off-peak delivery (OPD) is the delivery of goods outside of normal business hours; that is, during the night, overnight, early morning and weekends. OPD has been proposed by logistics experts as a means of delivering goods more quickly and reliably than is possible during the day, given traffic congestion. The result should be cost savings for carriers and shippers as well as reduced congestion and pollution. However, a recent article argues that market failure is one factor that prevents the expansion of OPD: receivers are unwilling to accept deliveries off peak.²³ The solution in New York City was to facilitate OPD that does not require receiver staff to be available to receive deliveries. In some cases, local noise bylaws have also been cited as impediments to OPD. The results of OPD in New York City have been highly favourable with carriers, drivers, and receivers all in agreement, although it is cautioned that New York City faces unique conditions of extreme traffic congestion and a lack of curbside delivery.

MTO conducted a pilot test of OPD before and during the 2015 TORONTO Pan Am / Parapan Am Games. MTO has been working in partnership with municipalities across the province to test the applicability of this initiative.

Some further analysis of off-peak delivery is provided in Section 6.2.3 of this Backgrounder.

E-Commerce

The rapid growth of e-commerce, i.e. shopping online and having products delivered directly to the customer, has important implications for urban goods movement. E-commerce in Canada is significantly less developed than in the United States or the United Kingdom. In Canada 6% of retail sales are online, while in the United States it is 9% and in the United Kingdom 15%.²⁴ Many predict Canada will close the gap in the years ahead.

E-commerce reinforces the general trend in logistics towards smaller consignments, single orders and higher delivery frequency. However, e-commerce is changing rapidly, as retail practices, consumer purchasing habits and the economy continue to evolve, and so e-commerce can both reduce and increase trip-making. The impact of the expansion of e-commerce on urban goods movement in Toronto is multifaceted. At a high level, traditional

²³ <http://www.civil.engineering.utoronto.ca/Assets/Civil+Engineering+Digital+Assets/aUTTRI/2.2+Jose+Holguin-Veras+Off-Hour+Deliveries+in+NYC+Lessons+Learned.pdf>

²⁴ <http://www.cbc.ca/news/business/e-commerce-explosion-coming-for-2014-holiday-shopping-dianne-buckner-1.2818640>

patterns of deliveries from distribution centre (DC) to retail store will be affected. There will be more DC pick-up by carriers for direct delivery to customers, probably using smaller vehicles than are typically used for store deliveries. But there will also be more shoppers who order products for pick-up at stores, likely affecting the frequency of deliveries to stores. Finally, customers may cut down their own shopping trips. The net result of all of these sometimes offsetting factors means that the impact of e-commerce is not yet knowable, at least in the aggregate.

Some stakeholders suggested that the growth of e-commerce could lead to increases in air cargo volumes, as length of time between order and delivery is often of paramount importance, and some customers pay more for very rapid delivery. Other potential impacts include:²⁵

- Improved bundling (consolidation) of packages and vehicle utilization, especially if packages can be delivered to a central pick-up point.
- Shorter distances for last mile distribution (from establishments that are located closer to the consignee's address), which can make it possible to deliver packages by bicycle or on foot.
- Replacement of shopping trips, if the pick-up point is the home or at a regularly visited location such as a workplace. Further trip reductions can be achieved if multiple orders from different retailers can be delivered to the same pick-up point.

Note that the trip-reduction benefits potentially apply to the movement of both people and goods.

At the same time, longer trip distances and higher vehicle-km travelled (VKT) may occur due to a greater number of pick-up points, bundling may have limits (i.e., not all goods can be bundled together), and DCs may be located remotely from where people live or work, compared with other depots. If people elect to use the workplace as a pick-up point, they may decide to drive to work, rather than take alternate modes. People also might use the time gained from avoiding shopping trips to make trips for other purposes.

New patterns in the last-kilometre distribution of packages are now being observed, through the recent introduction of such as services as:

²⁵ D. Egger, Glücker, C. and Ruesch, M., *Best Practice Handbook Year 2 (2001), E-Commerce and urban freight distribution (home shopping)*, Best Urban Freight Solutions (BESTUFS), Rijswijk, The Netherlands, December 2001.

- Canada Post's FlexDelivery, which allows customers to have packages delivered for them to pick up at a post office of their choice
- UPS' shipping to Access Points, which are designated UPS stores where customers can pick up or drop off packages.
- Loblaws' Click & Collect, which allows customer to order groceries online and then to schedule a pick up at the Loblaws supermarket of their choice.
- Penguin Pick-Up, which allows customers to pick up online purchases from participating retailers (including Walmart and Toys R Us) at five locations in the GTHA.

Infrastructure Rebuilding

Some stakeholders noted that lifecycle reconstruction of major infrastructure, including transportation, water, and waste water, often necessitates lane closures. Lane closures can have very significant impacts on urban goods movement. As a result it was felt that the mitigation of these impacts on goods movement should be a priority. The ongoing repairs to the Gardiner Expressway in Toronto, which have closed lanes, were cited as an example of the effects of lifecycle infrastructure rebuilding. For some stakeholders, these projects are not only a business opportunity, to move construction materials, but also an opportunity to improve the design standard of roads and highways.

Supply Chain Technology

A number of stakeholders highlighted technological improvements as likely to continue or accelerate in the year ahead. In particular, technology that makes supply chains more controllable and adaptable (e.g. to road incidents) was seen as likely and desirable. While acknowledged to be further in the future, the steady progress of autonomous vehicle technology and the associated potential of dramatic improvements in the speed and reliability of supply chains, while reducing costs, are clearly on the horizon of both the public and private sectors.

Public Sector-Private Sector Collaboration





Some stakeholders noted that they view improved collaboration between the public and private sectors as a positive step that has occurred in recent years in the GTHA. In particular, stakeholders identified the Ontario Trucking Association, the Peel Goods Movement Task Force, the Southern Ontario Gateway Council, and the Western Golden Horseshoe Municipal Network as effective means of communication between the public and private sectors. Key concerns with such initiatives are that the public sector is not moving quickly enough, particularly to expand road and highway infrastructure, and also that efforts seem to lack clear focus and priorities. It is important to keep in mind, as will be discussed in Section 6.1, that the public and private sectors have overlapping but different interests with respect to

goods movement. These different interests also reflect different organizational cultures around decision making, risk, and time horizons.

3.2.5 Summary of Key Drivers

Figure 3-16 summarizes key demographic and economic drivers impacting the volume of urban goods movement in the GTHA.

Figure 3-16: Summary of Key Drivers in Demographics and Economics Impacting Urban Goods Movement in the GTHA

| Driver | Impact on Volume of Goods Movement |
|---------------------------------------|---|
| Consumption Growth |  Consumption is forecast to continue growing. As a result, the volume of goods moving in the GTHA will continue to increase over the next five years. |
| Goods Movement Industries in the GTHA |  Consistent with the growth in consumption, employment in the goods movement industries is forecast to continue to increase. Given the benefits of clustering, locations with clusters of goods movement industries such as Peel Region and Milton will likely see faster than average goods movement employment growth. |
| Changes in International Trade |  Currently unpredictable as driving factors could be operating in different directions. |
| Changing Nature of Supply Chains |  Isolating the impact on the volume of UGM of the changing nature of supply chains, as distinct from the other trends, is challenging. The competitive nature of the markets in which supply chains operate means that it is likely that the cost of urban goods movement will fall, while speed will increase, and reliability will improve. Safety and environmental performance should also improve given current regulations. These improvements could be offset by external factors such as worsening congestion (see Chapter 6, below). |

While some drivers have an uncertain impact, we believe that the continued growth of consumption (driven by population and real per capita disposable income growth) in the GTHA, coupled with the position of the GTHA as Canada’s premier logistics cluster/hub, mean that volume of goods moving in the area will continue to grow over the next 10 years.

4

Progress to Date on Urban Goods Movement

Key Messages

- The Big Move set out a comprehensive set of goals and objectives, but only limited key performance indicators associated with goods movement specifically.
- On the 17 actions from the regional goods movement Action Plan, progress – much of it spearheaded by Metrolinx – has been made on most fronts.
- Goods movement performance must be measured with key performance indicators to take into account public and private sector perspectives on travel times, reliability, cost, environmental sustainability, and safety.

This chapter documents progress made by Metrolinx and its partners in goods movement since the 2008 publication of The Big Move Regional Transportation Plan (RTP). The focus is on the regional goods movement Action Plan and its Status Update, and the discussion draws from the consultation interviews with public agencies.

4.1 Regional Transportation Plan and Urban Goods Movement

4.1.1 RTP Framework and Relevance to Urban Goods Movement

The conceptual framework of The Big Move RTP is illustrated in the Figure 4-1. The RTP sets out 13 goals and 37 associated objectives to guide progress towards its vision. Ten strategies – each of which includes priority actions and supporting policies – are then set out to achieve the vision, goals, and objectives of the RTP.

Figure 4-1: The Big Move Regional Transportation Plan Framework



Source: CPCS, with information from RTP

Figure 4-2 shows the goals and associated objectives that are directly relevant to UGM.

Figure 4-2: RTP Goals and Objectives Directly Relevant to Urban Goods Movement

| Goal | Objective |
|--|--|
| D. Safe and Secure Mobility: Getting around will be safer and more secure. Parents will feel comfortable allowing and encouraging their children to walk, cycle, or take public transit to school. | 9. Continued progress towards zero casualties and injuries on all transportation modes 11. Improved safety for cyclists and |

| Goal | Objective |
|--|--|
| | pedestrians |
| F. A Smaller Carbon Footprint and Lower Greenhouse Gas Emissions: The transportation system will operate sustainably within the capacities of – and in balance with – the GTHA’s ecosystems. The GHGs and other harmful emissions related to transportation will be reduced. | 13. Decreased use of non-renewable resources 15. Improved air quality, and reduced impacts on human health |
| I. Prosperity and Competitiveness: The transportation system will respond efficiently and equitably to the needs of the Ontario economy. It will create opportunities for greater prosperity throughout the region and support Ontario in becoming a leader in attracting the best and the brightest from around the world, especially for new green jobs in the transportation sector. Deliveries, imports and exports will be faster and more reliable thanks to a more efficient, integrated, and coordinated transportation system. Residents will be able to get to a greater number of jobs. | 23. Lower average trip time for people and goods 24. Greater reliability of the freight and passenger systems 25. Managed congestion |
| J. Multi-Modal Integration: The transportation system will be fully integrated. It will be easy to make a decision on how to get somewhere or ship something thanks to seamless integration, accurate and timely information, and prices determined in a transparent manner. | 26. Reduced delays, damages and costs in transferring goods from one mode to another, and more seamless region-wide services for travellers and service-providers. |
| L. Efficiency and Effectiveness: The transportation system will be designed to optimize the use of resources and provide better value to households, businesses and governments. Greater emphasis will be placed on moving people and goods, rather than vehicles. | 30. Optimized use of all travel rights-of-way by commercial vehicles through a range of incentives and disincentives |
| M. Fiscal Sustainability: Funding to build and operate the new and existing system will be sufficient, reliable, and predictable. Technology and infrastructure will be selected that promote system productivity and safety, reduce ongoing operating and maintenance costs, and ensure integration across the system. | 35. Competitive shipping cost structure |

Source: RTP, pp. 15-19

The RTP establishes 10 strategies to achieve its stated vision, goals and objectives. Two strategies are directly relevant to UGM:

- Strategy #3: Improve the Efficiency of the Road and Highway Network
- Strategy #9: Improve Goods Movement Within the GTHA and With Adjacent Regions

As noted above, each strategy in the RTP is implemented by a set of priority actions and supporting policies. By far the most relevant for UGM is Priority Action 9.1: A comprehensive strategy for goods movement. It is reproduced in the text box below. Of note, Priority Action 9.1 is one of nine key Priority Actions identified in the RTP as “Big Moves” – defined as actions that would have the largest and most transformational impact on the GTHA’s transportation system.

Box: RTP Priority Action 9.1 – Comprehensive Strategy for Goods Movement

Develop a comprehensive strategy for goods movement within the GTHA, and between the GTHA and other regions, that identifies opportunities and actions to improve efficiency, increase capacity, enhance the region’s competitiveness, and reduce emissions of GHGs and other pollutants. Establish a roundtable to steer the development of the strategy with representatives from the goods movement industry, including shippers, the Ontario Chamber of Commerce, Ontario Trucking Association, Southern Ontario Gateway Council, Canadian National and Canadian Pacific Railways, logistics companies, freight forwarders, manufacturers and exporters, the agricultural community, environmental groups, municipalities, port authorities and the Province. Components of this strategy will include:

- mapping goods movement flows by mode, and identifying bottlenecks in the system;
- accomplishing goods movement using the most environmentally sustainable modes and technologies, and considering modal shifts to arrive at an optimal balance;
- identifying innovative approaches for urban freight movements such as urban logistics centres, centralized lock boxes for end-consumer deliveries, and shared urban freight and delivery centres (e.g., for construction sites);
- identifying innovative approaches for regional freight movements such as logistics villages (e.g., next to intermodal hubs), siting, loading and routing optimization, real-time fleet management systems, and off-peak truck delivery;
- identifying infrastructure needs such as new east-west freight rail capacity, new intermodal facilities, priority measures for truck-based goods movement, and strategic bypasses to get goods around rail and highway bottlenecks;
- a freight corridor optimization strategy that optimizes the use of existing rail infrastructure and the allocation of rail between freight and passenger trains;
- an analysis of constraints and opportunities for marine transport of goods;
- opportunities to promote active transportation-based and other low-impact goods movement in urban areas;
- land use policies for areas around transportation facilities such as intermodal facilities, rail yards, airports, dockyards and major highway interchanges that are compatible with, and supportive of the primary goods movement function of these facilities;
- improving efficiencies of all modes;
- documenting and sharing best practices; and identifying opportunities for coordination with the Continental Gateway Strategy.

Source: RTP, page 55

4.1.2 RTP Key Performance Indicators Relevant to Urban Goods Movement

The 2013 Big Move Baseline Monitoring Report includes a Monitoring Handbook (Appendix A) to track key performance indicators (KPIs) to monitor progress toward The Big Move goals. The KPIs relevant to UGM are presented in Figure 4-3.

Figure 4-3: KPIs From Big Move Baseline Monitoring Report Most Relevant to UGM

| KPI and Metric | Related Goal Being Monitored by KPI |
|---|--|
| Road Safety: annual road-based accidents in the GTHA, covering injuries and fatalities. | D. Safe and Secure Mobility |
| Air Quality: Number of smog advisory days issued annually across the GTHA | F. Smaller Carbon Footprint and Lower Greenhouse Gas Emissions |
| Highway Travel: Average bi-directional vehicle speed on key highways in the morning peak period | I. Prosperity and Competitiveness |

Source: The Big Move Baseline Monitoring Report, Appendix A: Monitoring Handbook. September 2013.

The report notes that additional indicators would need to be developed in future to monitor progress against more goals of The Big Move. In particular, the report recognizes a lack of reliable data to assess whether goods are moving more effectively, and that further study on the availability and quality of goods movement data will continue (as identified in Metrolinx’s GTHA Urban Freight Study, 2011).

4.2 Update on Goods Movement Action Plan and Status Update

The figure below reviews each of the 17 actions from the regional goods movement Action Plan. It can be seen that progress – much of it spearheaded by Metrolinx – has been made on most fronts.

Figure 4-4: Progress on Goods Movement Action Plan and Status Update

| Strategic Direction / Action | Progress |
|---|--|
| Strategic Direction 1: Build Collaboration and Support | |
| Action 1: Strengthen and collaborate with multi-sectoral forums | GTHA Urban Freight Forum introduced in 2012. It meets at least twice per year, and works closely with Peel Goods Movement Task Force and Southern Ontario Gateway Council. |
| Action 2: Establish an inter-governmental freight committee | Inter-governmental freight committees established. |
| Action 3: Improve and coordinate public outreach on urban freight | Metrolinx website includes a goods movement page, which provides links to the 2011 GTHA Urban Freight Study, Action Plan, Status Update and Urban Freight Forum meeting records. |
| Strategic Direction 2: Improve Freight Information | |
| Action 4: Improve data sharing on freight | Informal arrangements have been made, largely initiated through MTO’s iCorridor and CVS data collection activities, in which the Ministry has solicited |

| Strategic Direction / Action | Progress |
|---|--|
| vehicles, routes and activities | the participation of upper-tier and single-tier municipalities in the GTHA. Transport Canada and MTO are also examining the feasibility of a cross-border Commodity Flow Survey, working with US federal agencies. |
| Action 5: Establish a GTHA urban freight data collection program | Metrolinx sponsored a comprehensive data collection plan in 2013. Metrolinx is currently updating this work and developing a second phase. |
| Strategic Direction 3: Increase Transportation Network Efficiency | |
| Action 6: Develop and protect a strategic GTHA truck network | Peel Region developed a Strategic Goods Movement Network in 2013. This multi-jurisdictional initiative is seen as a prototype for the GTHA. Metrolinx is examining the possibility of developing a GTHA Strategic Goods Movement Network. |
| Action 7: Harmonize truck route standards and mapping | No real actions have been taken, although some municipalities have updated or are exploring their own truck systems and regulations. Still many inconsistencies between municipalities. No region-wide map. |
| Action 8: Investigate intelligent lane utilization and truck-only lanes | Metrolinx, Peel Region, and other agencies supported the Transportation Association of Canada's study of Truck Lanes in Canadian Urban Areas, which explored current and best practices. |
| Action 9: Explore opportunities to move freight on transit | Metrolinx supported research to explore this concept. |
| Strategic Direction 4: Enhance Planning and Development | |
| Action 10: Develop freight supportive land use guidelines | In early 2016, MTO released the final form of its Freight-Supportive Guidelines. The guidelines – which feature best practices for incorporating goods movement into land use and transportation plans – are meant to inform municipalities, for use at their discretion. |
| Action 11: Support development of innovative freight hubs | Peel Region, MTO Goods Movement Office and Metrolinx held a November 2014 workshop that explored the potential for freight hubs. Peel is currently investigating the viability of freight hubs as part of its analysis of the economic impact of goods movement. |
| Action 12: Improve access to existing intermodal freight facilities | On a case-by-case basis. Key considerations are the advancement of the planning for the Highway 427 extension. Consideration is being given to an improved Highway 401 access to Pearson Airport's cargo area. Some port authorities have developed master plans for their facilities, including the GTAA and the Port of Hamilton. Several municipalities have introduced specific intersection and road improvements that improve truck circulation generally. |
| Action 13: Plan and protect complementary land uses near major freight hubs | Ongoing as part of regional and municipal Official Plans, which seek the designation of future employment lands close to key highway and rail accesses. However, there continues to be 'leap-frogging' of residential and industrial development approvals in some areas. |
| Strategic Direction 5: Improve Operational Practices | |
| Action 14: Use technology to optimize and manage the movement of goods | Being explored in the context of intelligent transportation systems (ITS) and transportation management plans by various municipalities and regions. |

| Strategic Direction / Action | Progress |
|--|---|
| Action 15: Explore opportunities for flexible freight delivery times | MTO explored these opportunities in the context of its Off-Peak Delivery (OPD) Pilot. |
| Action 16: Enhance incentives to encourage off-peak deliveries | MTO’s Off-Peak Delivery Pilot tested the concept of OPD. However, incentives were not included in the program. Accordingly, and because OPD is considered to have been explored as one among many opportunities for flexible freight delivery times, this Action is considered to have been subsumed under Action 15. |
| Action 17: Implement reserved curbside delivery options | The City of Toronto proposes to examine curbside management, and the topic has come up in other studies, such as the City of Hamilton’s transportation master plan (TMP) update. |

Insofar as the Status Update is concerned, in addition to the initiatives described above, several other actions have taken place since the Status Update was issued in 2012:

- Several regional municipalities and single-tier municipalities have developed, or are in the process of developing, goods movement strategies and plans. Halton Region prepared a draft Goods Movement Strategy in 2015. The new TMPs of Durham Region, York Region and the City of Hamilton all have goods movement components.
- MTO is updating the GGH travel demand forecasting model, which includes a commercial vehicle component. MTO will soon be developing a province-wide multi-modal passenger and freight model – a first in Canada.
- Peel Region introduced a 23-point goods movement Action Plan in 2012. The plan was developed by the Peel Region Goods Movement Task Force. It features operational, planning, and information actions and improvements that aim to yield tangible and measurable results on the regional goods movement network. The Action Plan was developed by consensus of the private and public members of the Task Force.
- Metrolinx and other agencies have sponsored academic research on several topics. These include the McMaster Institute of Transportation Logistics’ analysis of truck generation rates and the University of Toronto’s oversight of an establishment / truck OD survey of small- and medium-sized businesses across the GTHA.

5 RTP Vision for Goods Movement

Key Messages

- The Big Move Regional Transportation Plan (2008) articulates a vision in which urban goods movement is quick, efficient, reliable, convenient, safe, low carbon, efficient in its use of resources, including road capacity, seamless across modes and jurisdictions, fair and equitable, and cutting edge.
- Visions from other jurisdictions in the GTHA, Canada, the United States, and overseas can inform the development of an RTP vision for goods movement. In terms of the scope of the vision, the examples suggest that the vision must speak to all perspectives: public and private sector, and that the vision must be linkable to the wording of existing Provincial, Metrolinx and municipal policies.
- It is recommended that the proposed Goal E of the updated RTP vision introduce the concepts of economy, reliability, and efficiency, which are terms that are especially meaningful to partners from the goods movement industry, while reinforcing safety and environmental sustainability, which are important to everyone.

5.1 Current RTP Vision

The RTP articulates a vision (pp. 13-14) in which urban goods movement is quick, efficient, reliable, convenient, safe, low carbon, efficient in its use of resources, including road capacity, seamless across modes and jurisdictions, fair and equitable, and cutting edge.

As well, it notes that

- priority will be given to moving goods, not vehicles.
- the transportation system will contribute to the creation of attractive, liveable neighbourhoods and complete communities. It will help protect open space and agricultural lands from development while supporting a robust regional economy.

While focused on moving people, the statement

Travellers will have timely and complete information about transportation options and will know and understand the true costs of their transportation choices. They will use this information to choose if, how, where, and when they travel. They will be active partners in planning the transportation system and will view transportation as a shared responsibility.

could also apply to urban goods movement.

5.2 Goods Movement Visions from Other Jurisdictions

Visions from other jurisdictions in the GTHA, Canada, the United States, and overseas can inform the development of an RTP vision for goods movement (see Appendix for details).

There are two types of visions. Some are fairly broad – that is, they are included within a broader transportation master plan and consider goods movement within that context. These provide the connection with passenger transportation and with other societal visions regarding land use, sustainability, the environment, and the economy. Other visions are more specific to goods movement. They make a more explicit connection to the role of goods movement in achieving other societal visions, especially economic development but also sustainability and air quality. They detail various attributes of what an ideal goods movement network looks like and how it fits in more explicitly with other societal visions. They also bring the public and private sectors explicitly into the vision.

The explicitness of these more specific visions (the second group) provides a better model for the Metrolinx RTP, while still ensuring that the vision is linked back to broader policy statements (the first group). Note that several other transportation master plans and goods movement strategies were also reviewed, but are not included, because they do not articulate any vision, let alone one from which visions for goods movement could be derived. This matters because the presence of a vision statement signals its importance to the reader,

increases awareness and education, and helps to engage public and private stakeholders in the eventual implementation of a strategy and its actions.

In terms of the scope of the vision, the examples suggest that:

- The vision must speak to all perspectives: public aspirations such as land use, sustainability, environment, affordability, residents’ quality of life, and the private sector’s economic viability.
- The vision must be linkable to (that is, consistent with and not contradicting) the wording of existing Provincial, Metrolinx and municipal policies.

The recent development of the Halton Region draft Goods Movement Strategy illustrates the importance of these two points. Stakeholders identified the most important elements of the vision as reliability (where reliability means door-to-door travel times that are predictable with a high degree of confidence), cost-efficiency, a system that provides financial benefits (e.g., increases the Region’s attractiveness to employers), a system whose components (corridors) address the needs of all users in a balanced way, and a system that optimizes 24-hour capacity (e.g., through off-peak delivery). It can be seen that these priorities reflect multiple public and private perspectives, while supporting other Regional policies.

In terms of the vision’s content and messaging, our review of other goods movement strategy visions reveals that:

- Goods movement is explicitly recognized as being important and contributing to the well-being of the GTHA’s residents and businesses.
- Goods movement supports economic development aspirations. It does so consistently with aspirations for safety, sustainability, the environment, land use (urban form), and healthy communities.
- Goods movement is explicitly accounted for in the planning, design, and operations of communities, the transportation system and private land uses, and in the prioritization and funding of public infrastructure investments.

Figure 5-1 lists the key roles of a goods movement system, as explained in other goods movement strategies. It can be seen that many of these complement initiatives that are aimed at the efficient movement of people.

Figure 5-1: Attributes of a Goods Movement System

| Attribute | Description |
|---------------------------|---|
| Safe, efficient, reliable | Is safe, efficient, reliable, (free of delays, particularly unexpected delays), affordable (to build, operate/maintain and use), convenient (spatially and temporally) and accessible (to all users). |
| Complementary use of | Complements the movement of people safely, efficiently and reliably, through the |

| | |
|-----------------------------|---|
| corridors | use of shared corridors where appropriate. |
| Offers choices | Offers choices for modes as volumes, origins-destinations, shipping costs, and frequencies change, and in the choice of route (i.e., ensuring reliability by providing redundancy in the road/highway network so that drivers can switch easily to another route if an incident occurs on their primary route). |
| Integrated | Is integrated among all modes and their individual components, with roles and responsibilities of owners, maintainers, and users clearly understood. |
| Multi-modal | Provides seamless transfer among modes, meaning that intermodal terminals are easily accessible and that services operate on convenient schedules. |
| Connectivity and directness | Meets industry’s needs with a well-developed network of direct connections with goods-generating activity centres and with the major goods movement network. |
| Urban and inter-urban | Serves local and inter-regional needs (including access to international ports). |
| Context sensitive | Recognizes and avoids sensitive areas, such as residential neighbourhoods and environmentally protected areas. |
| Broad ownership and buy-in | Encourages cooperative expansion/upkeep and financing from both the public and private sectors. |
| Soft attributes | Is defined as much by the quality, expertise, and skills of the labour force that provides goods movement services as by infrastructure, operations, and network performance. |
| Measurable outcomes | Is defined by measurable outcomes for all perspectives (for example, improving residents’ health and improving the GTHA’s competitiveness by reducing delays and congestion). |

The aforementioned scope, content, and messages inform both the updated RTP vision, described below, and the development of key performance indicators, which is discussed in Section 7.6.

5.3 Updated RTP Vision: Proposed Wording

As part of the Legislated Review, the overall RTP vision is being considered. According to a recent draft,²⁶ the three basic elements of the vision – a high quality of life, a thriving, sustainable and protected environment, and a strong, prosperous and competitive economy – are maintained.

However, the 11 goals that support the vision have been combined and restated into six goals.²⁷ Three of these goals reference moving goods:

²⁶ *The Big Move, Updated Vision, Goals and Objectives, Draft Two* (internal document), 6 February 2015.
²⁷ Note that the 2011 *GTHA Urban Freight Study* developed a series of objectives specific to goods movement, grouped. These were grouped under the 11 Big Move goals, none of which was changed.

- A. Full multi-modal integration and connectivity, making it easy to “ship something” across the GTHA.
- D. A sustainable, well-designed and well-planned region is a “destination of choice for new residents and businesses,” supports a “more efficient use of existing and new infrastructure,” and reduces emission and energy use rates.
- E. The “prosperity, efficiency, and competitiveness” goal speaks most directly to goods movement. As stated, it links the transportation system to productivity, opportunities for prosperity, and the provision value to households, businesses, and governments. It retains the original RTP’s emphasis on moving people and goods, as opposed to the throughput of vehicles.

These vision statements do include goods movement within the broad context of the RTP. This is important because while acknowledging the primacy of people movement in the RTP, it ensures that goods movement is not omitted and promotes the idea that initiatives to move people and goods should be compatible with each other. However, we recommend the addition of wording that speaks more directly to the movement of goods, using wording and concepts that others have used. This is important, because it provides a clear opening to other stakeholders, i.e. governments at all levels and the private sector – to work with Metrolinx and take action to improve goods movement. The recent Halton Region draft Goods Movement Strategy provides a useful, local, and recent example of wording that could be integrated into Goal E, as shown in *italics* below:

The transportation system will respond efficiently to the needs of the Ontario economy and will become increasingly productive. It will support the creation of opportunities for greater prosperity, attracting the best and the brightest from around the world. The transportation system will provide better value to households, businesses and governments ~~and greater emphasis will be placed on moving people and goods, rather than vehicles.~~ *by supporting the safe, economical, reliable, efficient and environmentally sustainable movement of people and goods.*

This wording introduces the concepts of economy, reliability, and efficiency, which are terms that are especially meaningful to partners from the goods movement industry, while reinforcing safety and environmental sustainability, which are important to everyone.

6

Goods Movement Challenges Issues and Opportunities

Key Messages

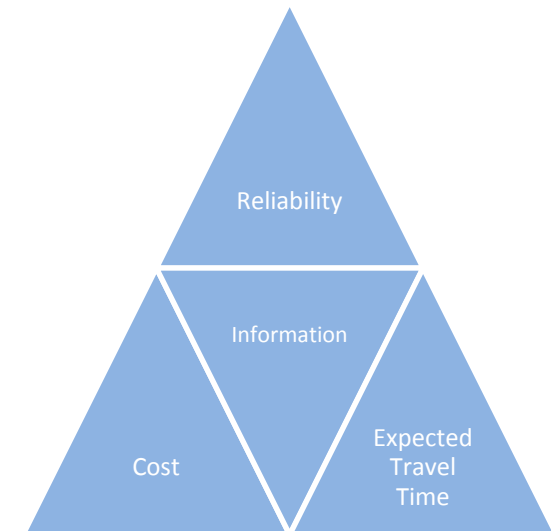
- There are three key issues in urban goods movement in the GTHA: congestion, managing land use compatibility, and reducing the environmental impact of goods movement.
- For private sector stakeholders congestion is overwhelmingly the most important issue, as it affects their ability to move goods quickly and reliably around the region. Goods movement vehicles shoulder a disproportionate share of the burden of congestion. Solutions to congestion specifically related to goods movement include off-peak delivery, goods movement priority measures, and the prioritization of goods movement corridors.
- Land use planning and goods movement are strongly related. Ensuring that goods-movement-intensive land uses are appropriately located is a major issue for both the public and private sectors. Planning that incorporates goods movement is key to reducing conflicts.
- The environmental performance of goods movement is also a key issue. Reducing truck-km and regulatory initiatives are the key opportunities.

6.1 Framework

6.1.1 Private Sector Interests

In the private sector for both transportation and logistics (T&L) providers and shippers, travel time, cost, reliability, and information are key decision factors when locating a T&L facility or in selecting their routings (Figure 6-1). Reliability is the variation in travel times, which includes a predictable and unpredictable component. The unpredictable element of variability is usually considered to be more of a problem than predictable variability. Cost is the transportation cost not associated with travel time and reliability, such as fuel and labour costs. Travel time is the expected amount of time to travel between two points. Information is the information about the other three factors available to a transportation and logistics decision maker. Information is important since decision makers cannot take advantage of locations or routings about which they are unaware.

Figure 6-1: Transportation Decision Factors



Source: CPCS

Different stakeholders can value each of the factors differently. For example, shippers of salt for de-icing roads, which is a relatively heavy, bulky, and lower value product, will likely put the largest emphasis on cost of the transport. It is for this reason that salt is transported from mines to GTHA by ship and only distributed locally by truck. A shipper of very high value goods, such as an urgent document needed to complete a large transaction prior to a deadline, may have little regard for cost, while valuing travel time and reliability at a very high level. The courier and messenger industry tends to operate in this environment.

6.1.2 Public Sector Interests

The public sector has a broader interest than private sector (T&L) providers and shippers. Additional concerns of the public sector include the overall economic efficiency (not the efficiency of a particular supply chain or company), environmental impact, safety, and security of the transportation system. The three pillars of Metrolinx vision (a high quality of life, a thriving, sustainable, and protected environment, and a strong, prosperous and competitive economy) reflect such interests. The vision of Transport Canada for “a transportation system

in Canada that is recognized worldwide as safe and secure, efficient and environmentally responsible”²⁸ is also a good example of public sector interests.

Generally public and private interests are relatively well aligned in terms of urban goods movement, and there are only a handful of areas of conflicting interests. The private sector views safety, environmental performance, and security as important, because deficiencies in these areas can lead to disruptions to operations, which can harm profitability. For instance, wasting resources, by not properly maintaining a truck, both increases long-run costs and has adverse environmental consequences. Operating in an unsafe manner or failing to take security measures can cause costly shut-downs for government investigations when incidents occur. Most well-run goods movement businesses have little issues with most regulations for this reason.

The public sector plays two key roles in urban goods movement in the GTHA:

- **Providing the public transportation infrastructure that the private sector does not or cannot provide.** Examples include most roads and highways, ports, and airports.²⁹ Governments hold powers such as expropriation and land use planning that are necessary to develop large transportation infrastructure projects. Once infrastructure has been developed, or sufficient land has been assembled and regulatory requirements met, there can be a role for the private sector in building, operating, and maintaining large transportation infrastructure. In many cases, quasi-public sector bodies such as port and airport authorities manage major infrastructure.
- **Managing the competitive environment in which the largely private sector shippers and T&L providers operate.** This role is also crucial as the geographical nature of transportation activity can give rise to situations in which market mechanisms do not deliver outcomes that are aligned with public sector objectives. For example, tolls on highways and waterways, safety, and air pollution from vehicles are regulated, as is anti-competitive behaviour.

6.2 Congestion

6.2.1 The Issue

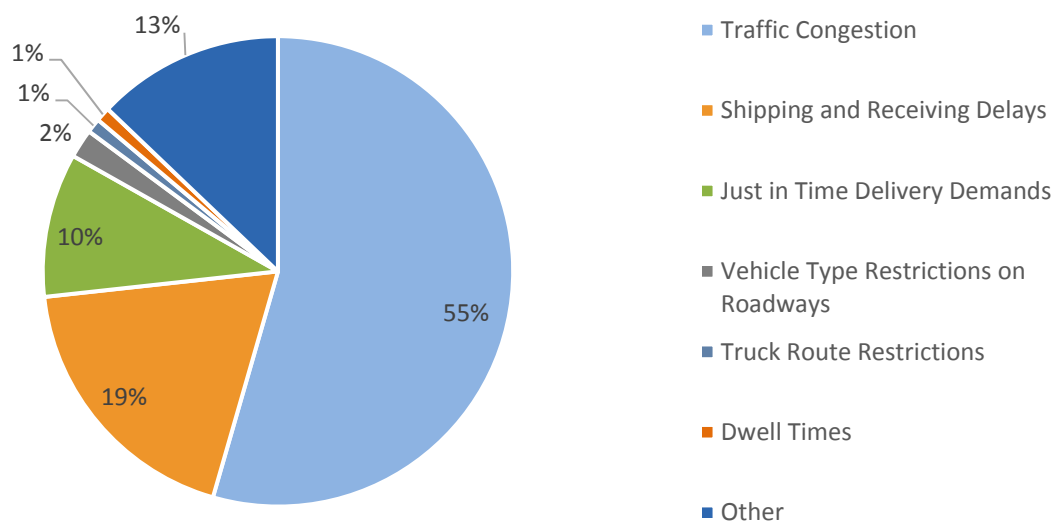
Overall, shippers and their transportation and logistics providers identify a number of issues that affect their ability to move goods and services quickly, cheaply, and reliably (Figure 6-2).

²⁸ <http://www.tc.gc.ca/eng/aboutus-department-overview.htm>

²⁹ It is worth noting the critical government role in setting up the railways as well.

Road and highway congestion, and issues closely related to congestion, is overwhelmingly the most important. No stakeholder consulted failed to mention congestion, and many did not identify any other concerns; notably no stakeholder expressed concern with congestion on any mode except roads and highways. Roughly 85% of the concerns of the private sector relate to speed and reliability. Congestion, delays, and just-in-time delivery demands each have an impact on both reliability and travel time. As noted above, the relative importance of each driver will depend on the supply chain being analyzed. In practice, free-flow traffic tends to lead to high reliability and high speed, while congestion reduces speeds and reliability.

Figure 6-2: Issues Impacting Goods Movement Businesses in the GTHA



Source: Developing Urban Goods Movement Data in the GTHA: Framework and Preliminary Implementation Draft Final Technical Report, Prepared for Metrolinx by the University of Toronto. 2013

The above discussion is not meant to imply that other factors are not important, but rather that the objectives of achieving high speed and, at least equally importantly for most goods movement stakeholders, high reliability, are paramount. As such, speed and reliability should be the focus of any goods movement initiatives that aim to meet the needs of the private sector.

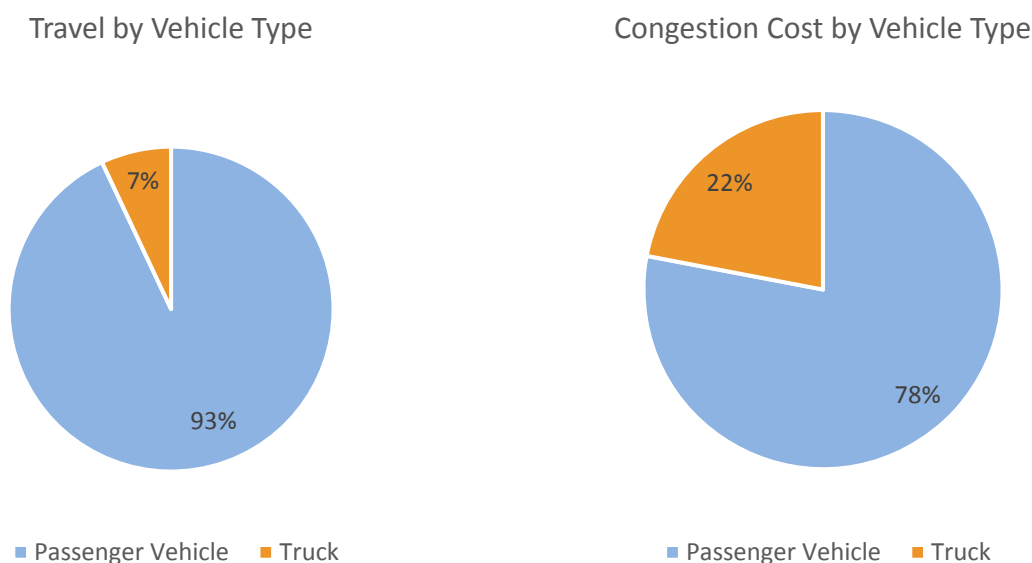
The principal economic and social costs of congestion are well understood. As explained in the 2008 Metrolinx Report “Cost of Road Congestion in the Greater and Hamilton Area”:

1. The costs of reduced economic output and accompanying job loss;
2. The costs of travel delays for auto and transit users and the unreliability of trip times;
3. The increased vehicle operating costs associated with higher traffic volumes; and

- The additional environmental costs of vehicle emissions and higher frequency of accidents.

The estimates of the annual costs of congestion (in 2006) were \$3.3 billion for commuters and \$2.7 billion for the economy. These costs were forecast to rise to \$7.8 billion and \$7.2 billion respectively by 2031. The 2008 study notably also found increased costs for industry of \$260 million per year in 2006 from congestion.³⁰ These estimates suggest goods movement vehicles account for a disproportionately high share of the costs of congestion, since the cost of delay and unreliability is much higher for most goods movement than for people movement (Figure 6-3).

Figure 6-3: Estimates of the Impact of the Cost of Congestion in the United States



Source: Texas A&M Transportation Institute, 2012 Urban Mobility Report

Better managing congestion requires two things. First, there must be a concept of what optimal congestion should be. Second, the tools for managing congestion must be selected in some way.

Optimal Congestion

Determining the optimal level of congestion is not straightforward. As the 2008 Metrolinx congestion study was careful to point out,

³⁰ Metrolinx (2008) “Cost of Road Congestion in the Greater and Hamilton Area,” p. 22.

free-flow travel conditions (no congestion) are not the optimal conditions from a societal point of view, as it is not desirable to eliminate traffic congestion completely... From society's perspective then, a trip is worthwhile if the benefits derived from making the trip exceed the costs of the trip.

The costs of congestion observed by commuters each day are the result of a market failure in the determination of the number of trips taken. For most goods, prices send the correct signals (via the invisible hand) to coordinate supply and demand and facilitate decision making of firms and individuals in order to coordinate an efficient allocation of resources.³¹

This efficient allocation of resources tends to work well across most modes of transportation in the GTHA, including air, marine, pipeline, and rail, as well as along Highway 407. The very significant and important exception is the road and highway network of the GTHA, which is not subject to direct pricing like the rest of the transportation system. As such there is a market failure in road transportation:

The cause of this market failure is the inefficiency in how the decisions of individuals interact to affect wellbeing of society. When an individual considers whether or not to make a trip, they consider the benefit that they will obtain in taking the trip and the costs that they will incur (out-of-pocket expenses such as fuel, as well as implicit "opportunity costs" such as the value placed on time spent travelling). However, in making their travel decisions, individuals ignore the delay that their presence on the road causes other motorists. The level of congestion that would occur if road users took proper account of this effect is the economically efficient level. Congestion above this level (excess congestion) is wasteful, because the benefits from accommodating the additional traffic are outweighed by the cost that reduced travel speed imposes on other motorists.³²

The focus of policy makers must therefore be on addressing excess congestion, and not total congestion. The report noted that in 2006 traffic in the morning was 14-15% above its optimal level resulting in travel speeds that were 19-39% lower than speeds to be expected under optimal congestion.³³

Tools for Managing Congestion

Policy makers possess a wide range of tools for managing congestion, each with advantages and disadvantages. All tools act on either the supply side or the demand side of transportation. Supply-side tools include capacity expansion and improved traffic management systems (such as variable-message signs and improved signal timings). Demand-side tools discourage road use and range from high occupancy vehicle lanes and transportation demand management programs like Smart Commute to road pricing schemes

³¹ Metrolinx (2008) "Cost of Road Congestion in the Greater and Hamilton Area," p. 9.

³² Metrolinx (2008) "Cost of Road Congestion in the Greater and Hamilton Area," p. 9.

³³ Metrolinx (2008) "Cost of Road Congestion in the Greater and Hamilton Area," pp. 10-11.

such as the tolling in place on Highway 407. A key challenge with many tools is that added capacity or reduced demand tends not to address the market failure identified above, and overall congestion tends not to be affected in the medium term as people adjust trip patterns to take advantage of temporarily lessened congestion, ultimately driving congestion back up.

6.2.2 Opportunities and Challenges

There appears to be broad consensus among stakeholders that congestion should be addressed through a combination of opportunities. These opportunities can be grouped into opportunities that improve the efficiency of existing goods movement infrastructure and opportunities to expand good movement infrastructure. While most stakeholders identified specific infrastructure expansion opportunities that would be beneficial for their operations, here we focus on more general opportunities. The opportunities are based on the consultants’ discussions with public sector and private sector stakeholders, complemented by the consultants’ experience and that elsewhere.

Figure 6-4: Opportunities and Challenges Associated with Congestion

| Opportunity | Challenges |
|---|---|
| Opportunities to Improve the Efficiency of Existing Goods Movement Infrastructure | |
| Off-Peak Delivery: Many major carriers and shipper distribution centres operate 24 hours/day 7 days/week. Increased use of off-peak delivery to improve the speed and reliability of goods movement. | <ul style="list-style-type: none"> • Cost to shippers and receivers who do not traditionally operate at night, such as overtime pay and/or infrastructure investments in secure unattended receiving areas. • Community acceptance both in terms of by-laws and informal resident opposition. |
| Mode Shift of People Movement to Transit: most stakeholders felt that shifting the movement of people to transit and away from cars was an important opportunity. They noted that such mode shift would be much more achievable than shifting goods movement off the road network. | <ul style="list-style-type: none"> • Cost of providing additional transit. • Feasibility of such a shift in auto-oriented communities. |
| Use of High-Occupancy Vehicle Lanes by Trucks: given the comparatively high cost of delay for many goods relative to people, a number of stakeholders noted the opportunity of allowing commercial vehicles to use HOV lanes. | <ul style="list-style-type: none"> • Potential reduction in performance of HOV lanes if more traffic were to use them, such as • Concerns with slower trucks merging through higher-speed traffic lanes and the typically higher speeds in the HOV lanes. |
| Coordinated congestion management measures: a wide range of congestion management tools are available. The reader is recommended to consult for example the City of Toronto’s Congestion | Challenges vary by specific measure, but coordinating and prioritizing measures across public and private sector entities is a significant challenge. |

| Opportunity | Challenges |
|---|--|
| Management Plan for an overview of specific measures. ³⁴ | |
| Road pricing: charge for use of some or all road and highway infrastructure. Prices can be adjusted to achieve desired levels of road speed and reliability. | Challenges are largely related to public acceptance. |
| Opportunities to Expand Goods Movement Infrastructure | |
| Goods movement priority lanes: the concept would be the same with HOV lanes, except potentially these lanes could be restricted to goods movement vehicles. Such lanes could also be tolled. | Cost would be a challenge if goods movement priority lanes were not tolled so as to pay for themselves. If tolled there would be no challenge other than physical space constraints. |
| Accelerate existing planned infrastructure improvements: a number of stakeholders expressed support for current expansion plans, particularly RER and 400-series highways, but were concerned about the pace of development. | Infrastructure development is affected by -regulatory processes, chiefly environmental assessment, -funding available, and -construction industry capacity and competence. |

Of the opportunities identified, modal shift to transit, coordinated congestion management measures, road pricing, and accelerating planned infrastructure improvements are opportunities that have primary impacts well beyond goods movement. Our assumption is that these issues will be studied in detail elsewhere. As such, we focus in the next section on reviewing good practices related to the other two opportunities identified, which are specifically focused on goods movement:

- Off-peak delivery; and
- Goods movement priority measures, including the use of HOV lanes by trucks, priority access to goods movement facilities, and truck lanes.

Notwithstanding our focus, it is very important to understand that in the prioritization of broader transportation programs such as mode shift to transit, coordinated congestion management, road pricing, and accelerating existing planned infrastructure improvements, prioritizing corridors with high levels of goods movement activity is likely to generate greater societal benefits than prioritizing corridors with lower amounts of goods movement activity. As such, we incorporate both into a third area of good practice:

- Prioritization of goods movement corridors.

³⁴ Eight groups of measures are identified: intelligent transportation systems, congestion and engineering studies, incident and event response, construction coordination, curbside management, support of all modes of transportation, traveller information, and traffic operations centre.

6.2.3 Good Practices

Off-Peak Delivery

Off-peak delivery (OPD) is not new in the GTHA, and many businesses already deliver off-peak. MTO conducted a pilot test of OPD before and during the 2015 TORONTO Pan Am / Parapan Am Games, as a means to manage peak traffic volumes. The pilot examined several impacts from a shift of daytime deliveries to off-peak hours. Results from the pilot showed a generally positive assessment from participants, with relatively few noise concerns reported. Key factors affecting the willingness and ability of businesses to shift to OPD include product volumes and type, location characteristics and store hours.

Public sector initiatives to encourage OPD have been developed in a number of other cities, notably London and New York. These are described below. Some businesses (e.g. those staffed 24 hours a day) have seen clear benefits, but for many OPD entails an additional cost. Thus, either the benefits in the form of passed-through savings and/or financial incentives must outweigh these costs, or new technologies and systems must bring down the cost. Overall, OPD would tend to reduce travel time and improve the reliability of UGM, although it may have some cost implications.

Case Studies of Off-Peak Delivery Models: London and New York

In London, the higher costs of freight transportation during the 2012 Olympic Games led many businesses to adjust their delivery schedules, including to the night-time. However, when the Games were over these businesses mostly reverted to their previous practices.

In New York, financial incentives were used to attract businesses to a night delivery trial. Receivers moving to unassisted night delivery largely retained these methods after the trial was over, due to the increased convenience and reliability.

London

Over 80% of urban goods movement in London is by truck, with congestion being the biggest cost to goods movement in the city at £800 million (\$1.5 billion) per year. In 2008 33% of warden-issued penalty charges and 59% of camera-based fines for parking/loading were issued to commercial vehicles. In 2007 there were 419 incidents resulting in death or serious injury related to collisions involving commercial vehicles.

London has been a leader in OPD, having implemented a number of OPD trials. Much of the focus has been on making OPD quieter. In November 2014 London hosted the Quiet Cities Global Summit for operators, customers, and policymakers, where Transport for London (TfL)

released guidance for fleet operators making OPDs³⁵ and where exhibitors showcased new urban goods movement products, such as DHL’s bespoke “city quiet” gas-powered truck. TfL’s guidance was based on the experiences of the Re-timing Deliveries Consortium, a joint effort of goods movement industry representatives, retailers, and several London boroughs; the Consortium is conducting trials on quiet delivery technology and practices.

The UK’s Department for Transport (DfT) spearheaded Quiet Delivery Demonstration Scheme (QDDS) trials in 2010 at six retailer premises, predominantly supermarkets, across England.³⁶ A larger trial was led by TfL during the 2012 Olympic Games. Building on these, the DfT has prepared a good practice guide for retailers, operators, and local authorities.³⁷ The Freight Transport Association, one of the partners of these studies, has also prepared a toolkit for implementing night-time delivery trials.³⁸

Surveys found that 57% of businesses and 58% of freight operators made at least one change to their operations during the Olympic Games (1,000 of each were surveyed) – 41% of businesses changed delivery times; 5% retained these changes after the Games. Night-time deliveries were used by 15% of businesses. The biggest barriers to night-time delivery cited by businesses were cost increases (e.g. staffing costs), night-time delivery restrictions, and unsupportive customers. TfL noted that other motivational factors would need to be in place to sustain shifts to night delivery.³⁹

A smaller, separate trial in the borough of Wandsworth was carried out by Sainsbury’s (the third-largest supermarket chain in the UK) working with a local organization called the Noise Abatement Society. Between October and December, the trial was found to have:

- Reduced the maximum recorded noise level by 8-10 decibels by using dock curtains
- Reduced average delivery vehicle journey times by 60 minutes over a round trip from the distribution centre
- Produced a savings in drivers’ time of two hours per day
- Removed 700 vehicle journeys from the road annually
- Increased store sales by 5-6% because of product availability at opening time (as opposed to receiving throughout the day)

³⁵ Transport for London, Re-timing Deliveries Consortium, *Getting the timing right: Making the most of quieter times for deliveries*. 2014.

³⁶ Department for Transport, with the Freight Transport Association and the Noise Abatement Society. *Quiet Deliveries Demonstration Scheme: Case Studies*. 2011.

³⁷ Department for Transport, *Quiet Deliveries Good Practice Guidance* (several documents for various different stakeholders: see http://www.fta.co.uk/export/sites/fta/_galleries/downloads/delivery_improvement.pdf)

³⁸ Freight Transport Association, *Delivering the goods: a toolkit for improving night-time deliveries*.

³⁹ Transport for London. *Olympic legacy monitoring: Adaptations to deliveries by businesses and freight operators during the Games. Travel in London supplementary report*. 2013.

New York

A study for the New York City Department of Transportation (NYC DOT) found that increased truck tolls, for example those implemented on the Tappan Zee Bridge, were minimally effective at changing delivery schedules.⁴⁰ Financial incentives to receivers were found to be somewhat more effective. A 2007 study of Manhattan showed that every \$2,000 in tax deductions to receivers would increase carriers' OPD market share by around 1-2 percentage points.⁴¹ A combination of commercial vehicle tolls and tax deductions would have the largest effect.

New York carried out a 2010 pilot project to shift Manhattan deliveries to night hours with businesses including Sysco, Whole Foods, New Deal Logistics, and Foot Locker. Receivers gained improvements in reliability and higher staff productivity, while carriers saved time and money from faster speeds, shorter unloading times and fewer parking tickets.

The night delivery was of two kinds: staffed and unstaffed. The pilot project found that all of the receivers trying staffed night delivery reverted back after the pilot project, whereas almost all receivers doing unassisted delivery retained night delivery.

The key findings relating to receivers were:⁴²

- Superior reliability of OPD compared to regular-hour delivery
- Ability to rectify delivery errors earlier in the day, with less of an impact on business operations compared to regular delivery
- OPD can be performed safely, with neither the driver nor the business at risk
- Off-peak delivery can have minimal impact on local communities (no noise or other complaints received during the pilot)
- Superior reliability, reduced inventories, and more efficiencies in staff usage resulting from unassisted delivery compared to staffed delivery
- Participants reported that fewer daytime deliveries allowed shops and restaurants to focus more on their customers and staff were more productive since they were not waiting for deliveries

⁴⁰ Cambridge Systematics. Technical memorandum prepared for the New York City Department of Transportation and the New York City Economic Development Corporation. *Congestion Mitigation Commission Technical Analysis: Night Delivery Incentives*. 2007.

⁴¹ Holguín-Veras et al, Journal of the Transportation Research Board, No. 1966. *Effectiveness of Financial Incentives for Off-Peak Deliveries to Restaurants in Manhattan, New York*. 2006.

⁴² Holguín-Veras et al, Transportation Research Board, *Unassisted Off-Hour Deliveries and Their Potential Role in Freight Transportation Demand Management: Results From an Attitudinal Survey*. 2013.

- Time spent by carriers at the receiver’s location was reduced from 1.8 hours to 0.5 hours
- Travel times from depot to the first stop in Manhattan improved by 75%

The attractiveness of unassisted delivery was affected by whether the business had a trusted vendor, and also the risks perceived by the business. It was noted that the optimal level of OPD for a single receiver was typically much less than 100%. Generally, the trade-off between staffed and unstaffed delivery is between cost and risk. Inclination to participate in unassisted delivery was highest for mid-sized companies with 16-20 employees.

In the Manhattan case study, the effects of various incentives on receiver participation in unassisted off-peak delivery were studied. A one-time financial incentive to receivers ranging from \$1,000 to \$9,000 was found to be effective up to \$4,000, above which level financial incentives have little effect. An incentive of \$4,000 increased participation by 16.4% (compared to no incentive), while carrier discounts of 50% increased participation by 20.6% (compared to no discount). Business support services and public recognition had a modest effect of under 5% apiece.⁴³

Some of the systems and technologies that can facilitate unassisted delivery are:

- Giving the carrier access to a receiving area by key or keypad, where the receiving area may be separated by locked door from the rest of the premises
- A “virtual cage” using laser beams that activates an alarm if penetrated
- Giving the carrier a separate key providing access to a box that contains the key to the receiving area

Key Lessons Learned

Although OPD programs may appear simple and straightforward solutions, both the supply chains of industries affected as well as existing laws and regulations can provide hurdles to program implementations. Challenges, for example, include increased noise pollution that may be caused by deliveries (vehicles backing up, vehicles unloading, etc.) especially in mixed-use areas with residents close by.

While transportation costs for carriers are much less during off-peak hours, many receivers are not equipped to receive deliveries at night or in the early morning periods. Generally, receivers do not deem the cost of staffing for overnight deliveries to be worth the benefits of potentially increased transport costs or more reliability and reduced travel time in deliveries.

⁴³ Holguín-Veras et al, 2013

In both London and New York, assisted deliveries (where the receiver paid staff overnight to receive the delivery) were not continued after trial periods were complete. In the New York case, where financial incentives were provided to encourage receivers to invest in technologies to allow for unassisted deliveries, most receivers elected to continue with off-peak deliveries once they had the systems in place to receive them unassisted.

To reach its full potential OPD will require planning for noise reduction strategies on the carrier side and providing programs to encourage receivers to receive deliveries.

Goods Movement Priority Measures

Goods movement priority measures are part of the solution to congestion in the GTHA. Since trucks have different operating characteristics than cars, infrastructure and operational measures that improve the flow of trucks on corridors with large volumes of truck traffic can be beneficial. Such measures were mentioned as potential solutions to congestion by a number of stakeholders. Truck lanes were a particularly popular example for stakeholders consulted; other measures mentioned included truck-friendly turning radii and other design measures. A recent Transportation Association of Canada study was careful to note that truck-friendly treatments might be sufficient by themselves and that “truck lanes should be explored only after truck-friendly treatments have been explored and implemented.”⁴⁴

Goods movement priority measures have many potential applications including shared facilities with HOV lanes (trucks with two or more occupants can currently use HOV lanes in the GTHA), short physically separated connectors, temporary measures relative to construction, access to staging areas for assembly and disassembly of vehicles requiring special permits (e.g. long-combination vehicles), and lanes within the internal road network of an industrial area. Feasibility studies in the United States have generally found that physically separated truck-only lanes on freeways do not generate benefits that exceed the costs of implementation.⁴⁵ Overall, the conclusion of recent Canadian research is that little is known about the benefits of truck lanes or good practice in their development, beyond the need for stakeholder consultation and data as inputs to design. Pilot projects may be a means of gathering data to inform consideration of broader implementation.

The funding of goods movement priority lanes is also an issue. A benefit is being created for both users of the lane, whether they be trucks or trucks and passenger vehicles as in the case of an HOV lane open to trucks. It is not straightforward who should pay to implement goods movement priority measures. Ultimately, most time savings and reliability improvements in the movement of goods are likely to be passed along to consumers in the form of lower

⁴⁴ Transportation Association of Canada (2012) “Truck Lanes in Canadian Urban Areas,” p. 4

⁴⁵ Transportation Association of Canada (2012) “Truck Lanes in Canadian Urban Areas,” pp. 87-88

prices; in some cases, some benefit is likely to be captured by shippers and carriers. Even motorists not using the facility may benefit if other lanes perform better as a result of the goods movement priority measure. Stakeholders consulted were generally sensitive to these issues.

Prioritization of Goods Movement Corridors

The prioritization of goods movement corridors refers to an approach that involves giving priority for transportation improvements to corridors that disproportionately serve goods movement. While the incorporation of a distinct value of time and reliability for goods movement as opposed to passenger vehicles is in its infancy in transportation benefit-cost analysis, the principle that delay and poor reliability are more costly for goods movement vehicles than for passenger vehicles, particularly single-occupant vehicles, seems clear. As such, prioritizing investment in a goods movement network or, less formally, in corridors that have disproportionate goods movement traffic is a good practice, which is explored in more detail in the companion backgrounder entitled Scope for High Level Strategic Goods Movement Network for the GTHA.

6.3 Managing Land Use Compatibility

6.3.1 The Issue

Land use planning and goods movement are strongly related. The Province’s current co-ordinated review of the growth and conservation plans for the Greater Golden Horseshoe recognizes the role of multi-modal infrastructure in promoting compact urban form, while providing strong connections between goods movement modes and to domestic and international markets.⁴⁶ However, many official plans and similar policy documents tend to focus on the activities and movement of people, with the movement of goods – while acknowledged – given a complementary, sometimes secondary role. The planning needs of goods-generating land uses often differ from those of other activities, and the complexity of these needs means that special measures may be required, such as freight supportive land use planning. The emphasis of many official plans on smart growth and of many transportation master plans on complete streets often do not consider the implications on and of goods movement adequately. Finally, there is also a need for outreach with the goods movement community in order to ensure coordinated actions: unlike the urban passenger transport infrastructure (roads and transit), which is largely owned by government, provision of the goods infrastructure and services is fragmented between the public and private sectors.

⁴⁶ *Our Region | Our Community | Our Home, A Discussion Document for the 2015 Co-ordinated Review*, Ontario Ministry of Municipal Affairs and Housing, 2015.

6.3.2 Opportunities and Challenges

As the conflicts between goods movement and land use planning have become more acute and apparent, in recent years there have been several initiatives aimed at understanding the issues and at preparing guidelines that can address these conflicts.

Figure 6-5: Opportunities and Challenges Associated with Managing Land Use Compatibility

| Opportunity | Challenges |
|---|---|
| <p>Smart growth for freight: Promotes the management of growth through compact development with moderate-plus density, mixed land uses and transportation options that promote sustainable travel. For goods movement this means clustering goods movement-intensive land uses to minimize truck-km, such as is now the case in Peel and Milton. Hubs seem to exist around truck and rail terminals.</p> | <ul style="list-style-type: none"> • Incorporation of urban goods movement into smart growth can be an afterthought, or seemingly incompatible with smart growth principles. • Goods-generating land uses may require low-density, spatially large footprints, which tends to move them to urban peripheries due to land availability and costs. • May require an update of road design standards. |
| <p>Complete Streets: Promotes the shared use of transportation corridors by all users, safely and efficiently.</p> | <ul style="list-style-type: none"> • Conflicts between trucks and active transportation lanes, including intrusion on to the lanes and accidents, are a notable challenge. • In some cases, the complete streets concept may not work, especially where there is high truck traffic. Some corridors may require the physical separation of trucks and active transportation. |
| <p>Freight supportive land use: Planning and design that promote the effective siting of goods-generating lands, site development and corridor planning. Avoiding conflicting land uses can greatly facilitate off-peak delivery and operations.</p> | <ul style="list-style-type: none"> • Requires acceptance by municipalities and planners. • Municipalities are under pressure to convert industrial lands to residential or other uses that are less compatible with goods movement (e.g. residential around intermodal terminals). |
| <p>Planning process for goods movement: Refers to the need to incorporate goods movement into the land use and transportation planning process, through public-private freight forums, forecasting models and goods movement data.</p> | <ul style="list-style-type: none"> • Agency roles and mandates must be defined clearly. • Forums require an explicit focus and a commitment for actions in order to keep the private sector engaged. • Goods movement forecasting models can be complex. • Goods movement data can be expensive to collect. |

6.3.3 Good Practices

Smart Growth for Freight

A 2013 US National Cooperative Freight Research Program (NCFRP) report, *Smart Growth and Urban Goods Movement*, examined the relationship between smart growth and urban goods movement.⁴⁷ The research was predicated by the minimal incorporation of goods movement into smart growth planning principles and practice. Five key research areas were identified:

- The need for a reasonable balance between providing adequate access, parking and loading zones, and the smart growth principle of using the required space for other uses.
- Managing the conflict between bicycle and pedestrian accesses and links in a design environment that promotes active transportation, and truck access to and circulation within these environments.
- Effective ways of serving high-density, mixed used environments, the nature of which may result in conflicting demands on goods movement operations: for example, off-peak deliveries, the use of larger, more efficient trucks, and impacts on air quality and noise levels.
- The impact of changing logistics, including e-commerce, on the movement of consumer goods to and from smart growth neighbourhoods.
- The potential of network system management techniques, such as the use of real-time travel information and metered road access, to improve the circulation of goods vehicles.

The report concluded that there were many benefits of smart growth; however, these needed to be explained better to a “sometimes sceptical” goods movement community. Improved truck parking, the provision of improved access from warehousing and distribution centres to urban cores (i.e., locating these centres within easy access of the core) and allowing off-peak deliveries were seen as examples of measures that could enhance the benefits of smart growth to efficiency and the reduction of emissions.

⁴⁷ A. Bassok, Johnson, C., Kitchen, M., Maskin, R., Overby, K., Carlson, D., Goodchild, A., McCormack, E. and Wygonik, E., *Smart Growth and Urban Goods Movement*, National Cooperative Freight Research Program Report 24, Transportation Research Board, Washington, DC, 2013. See also E. McCormack, Goodchild, A. and Bassok, A., *Smart Growth and Urban Goods Movement*, *TR News 295*, November-December 2014, for a synopsis.

Complete Streets

All of the regions and several municipalities in the GTHA are implementing some form of complete streets approach, which promotes the safe and convenient use of road corridors by all users. Hamilton’s current TMP update is developing a “made in Hamilton” approach, which – among other things – recognizes the importance of the city’s downtown corridors as key truck links between the 400-series highways and goods-generating activities, given that there are few alternatives to these links. Peel Region’s Strategic Goods Movement Network acknowledged the primacy of shared corridors as a policy; however, the Region also recognizes that some road sections may require a separation of modes (especially separating active transportation from motorized vehicles), due to the very high volumes of truck traffic. One Regional Municipality suggested that the application of MTO’s Highway Access Management Guidelines needs to recognize the rapid urbanization of lands in the vicinity of its 400-series highways and allow for more urbanized access at freeway ramp terminals.

A demonstration project in Brooklyn, New York, examined ways to accommodate bicycle lanes and on-street loading. The project converted a two-way street with bicycle lanes on each side of the street (which experienced intrusions of trucks for unloading), to a one-way street, with the bicycle lanes paired on one side of the street, and the other side converted to a curbside loading lane. Another treatment moved the loading lane beside the curbside bicycle lanes, meaning that trucks could park adjacent to, but not block, the bicycle lanes. At night, curbside delivery is permitted on the bicycle lane to a 24-hour pharmacy. Evaluations of the initiatives, including interviews with truck drivers, were being conducted.⁴⁸

Another approach was applied in Boston in the Downtown Crossing Area, a section of the downtown with a high level of business and commercial activity. The city’s curbside management policy prohibits commercial vehicles from using certain streets between 11:00 am and 6:00 pm. This helps reduce congestion during the afternoon commuter peak period. Exceptions are made for trucks with time-sensitive cargo, including courier trucks and postal vehicles.⁴⁹

Freight Supportive Land Use

MTO developed guidelines to help municipalities incorporate goods movement into land use and transportation plans. The Freight-Supportive Guidelines, which were released in final form in early 2016, do not have status, and so they are intended only to inform municipalities:

⁴⁸ A. Conway, Faivre, G. and Conway, M., *Accommodating Freight on Mixed-Use Urban Streets*, presentation to the METRANS International Urban Freight Conference, Long Beach, California, 9 October 2013.

⁴⁹ *Tools and Practices for Land Use Integration, Urban Freight Design Guidelines and Intermodal Centers*, Federal Highway Administration, http://www.fhwa.dot.gov/planning/processes/land_use/land_use_tools/page04.cfm#toc380582807

Note that the Guidelines are for implementation at municipal discretion, as the strategies provided are context-specific. However, it should be noted that there is a clear linkage in the Provincial Policy Statement (PPS) to the Freight-Supportive Guidelines. Section 1.1.3.2 of the PPS requires that “land use patterns within settlement areas shall be based on ... densities and a mix of land uses which ... are freight-supportive.” The definition of ‘freight-supportive’ in the PPS references the guidelines, stating that “... approaches may be recommended in guidelines developed by the Province ...”

The Guidelines describe good practices for incorporating goods movement into policy documents such as OPs and zoning by-laws, as well as site-development needs; specifically:

- Land use and transportation planning, with strategies for incorporating goods movement considerations into the municipal planning process in balance with other objectives. The Guidelines also describe the “freight audit,” a process to inform planning decisions to enable the safe and efficient movement of goods.
- Site design, with a range of general measures that can be applied to site plans and specific initiatives that are tailored to different land uses. The approach addresses how site design for goods movement can be coordinated with the design for active transportation and transit.
- Road design and operations, which incorporates goods movement into the design and operation of municipal roads.

Tools and actions are provided to help implement the strategies.⁵⁰

A 2014 Australian report provided guidelines for planning truck access in industrial areas. Among other considerations, the guidelines noted the need to account for changing vehicle sizes in the development of access plans (for example, the growing use of longer-combination vehicles), the use of consistent access standards for both local and arterial sites, and the need to examine both road access and on-site access.⁵¹

Large institutions, office buildings and entertainment destinations generate significant volumes of delivery traffic. In addition, building and infrastructure construction generates high volumes of supply and equipment deliveries. To better manage the impacts of these movements, Transport for London requires that applications for new development submit

⁵⁰ See <http://www.mto.gov.on.ca/english/publications/freight-supportive-guidelines.shtml>.

⁵¹ *Guidelines for Planning and Assessment of Road Freight Access in Industrial Areas*, Austroads Research Report AP-R470-14, Sydney, 2014.

Construction Logistics Plans and Delivery & Servicing Plans that show, respectively, how construction traffic and deliveries made once the facility is in operation, will be mitigated.⁵²

Planning Process for Goods Movement

Several respondents to the public sector interviews recognized the important role that Metrolinx plays in advancing goods movement planning across the GTHA. They saw that Metrolinx could play several expanded and additional important roles in goods movement planning for the GTHA. These included:

- Promoting region-wide goods movement strategies.
- Promoting a highway network plan to complement the transit-oriented RTP: One Regional Municipality noted that, in the absence of an understanding of the Province’s long-term highway plans, it was difficult to plan and implement regional roads to access new communities without knowing if, when and where they could connect with a new highway.
- Sponsoring best practice research that individual municipalities could apply.
- Coordinating goods movement data collection and model development initiatives.
- Serving as a forum for public-private dialogue (the GTHA Urban Freight Forum).
- Promoting goods movement awareness and education with the public, politicians, and business.

Some public agencies also noted the need for expanded resources to help Metrolinx in its goods movement planning initiatives.

One regional agency that has enjoyed long-standing success is the Delaware Valley Regional Planning Commission (DVRPC), which is the Metropolitan Planning Organization for the Philadelphia, Pennsylvania - Camden, New Jersey region. Its freight Task Force has become known as “the place to be in order to coordinate freight transportation plans for all modes.” The Task Force has the ability to directly influence local policies and plans, giving private sector members the incentive to participate in and support the group’s activities. The Task Force enjoys ‘championing’ from senior officials of the two state Departments of Transportation; meaning that the private sector feels its voice is heard in planning and investment decisions. Moreover, DVRPC has emphasized the development of ‘freight

⁵² A Pilot Delivery Servicing Plan for TfL’s Palestra Offices in Southwark: A Case Study, Transport for London, 2009. Cited in J. Phelan, *Strategies to Manage the Environmental Impact of Goods Movement in the City of Toronto*, unpublished report, 29 August 2014.

champions’ among its staff, those of the DOTs and of constituent municipalities, and has used creative educational and awareness sessions to ensure that goods movement is considered at all levels of planning decisions. Finally, the Task Force has charged its private and public sector members in managing planning and data sub-committees with specific deliverables; and Task Force meetings regularly feature best practice presentations on a wide variety of topics of interest to both the public and private sectors. DVRPC’s Task Force has promoted five overarching visions aimed at improving freight operations and infrastructure in the region:⁵³

1. Recognize the value of freight, e.g., by educating decision-makers on the economic benefits and necessity of goods movement, ensuring the availability of funds to support freight and incorporating freight considerations into overall planning (including ensuring that other planning initiatives do not negatively impact freight).
2. Practice “Freight as a Good Neighbour” strategies, by working with communities to mitigate freight operations, promoting “quiet zone” corridors, using landscaping to hide freight “eyesores” and improving communications among public and private stakeholders.
3. Be environmentally friendlier and more sustainable, by increasing truck idle reduction programs and idle-free technology, promoting fuel reduction strategies, continuing “Green Port” initiatives (e.g., reducing ship idling at the Port of Philadelphia), increasing the use of low-emissions rail yard locomotives, and working within other agencies to reduce emissions.
4. Enhance the links between freight-related transportation and land use, by maintaining existing industrial areas (which are subject to redevelopment pressures, especially along the waterfront, but which are already close to multi-modal transportation infrastructure), and continue to promote and support freight villages (clusters of freight-related activities and industries).
5. Make operational improvements, through improved traveller information systems, expanded incident management task forces, supporting planned ITS initiatives, expanding weigh-in-motion capabilities, implementing additional regional security systems across all modes, and promoting advanced reservation systems for deliveries and pick-ups.

⁵³ *DVRPC Long-Range Vision for Freight*, Delaware Valley Regional Planning Commission, Philadelphia, April 2010.

6.4 Reducing the Environmental Impact of Goods Movement

6.4.1 Issues and Current Initiatives

The environmental impact of goods movement have several aspects: air pollution, greenhouse gas (GHG) emissions, noise, and vibration have all been cited among the benefits of shifting goods movement from trucks to other modes, or reducing trucking activity by changing delivery patterns, improving itineraries, etc. These aspects have been considered in transportation plans and policies for several years. A commonly cited aim in goods movement strategies is the shifting of truck-based goods movement to rail, with the intent of reducing both the volume of trucks on the road and the distances they travelled (in effect, reducing truck vehicle-kilometres travelled [VKT]).

In 2015, the Province of Ontario released its Climate Change Strategy.⁵⁴ By 2030, the broad-reaching strategy envisions, among other things, that the demand for goods movement will be met via “road or rail vehicles powered by more efficient, low-carbon technologies.” To reduce emissions from goods movement, the strategy focuses on measures that support the use of natural gas and low-carbon fuels in goods movement, as well as the electrification of goods movement where possible (and noting that low-carbon fuels may be needed to support long- and heavy-haul trucking and marine transportation, which are not easily electrified). The strategy also will work to identify other opportunities for reducing emissions in goods movement generally.

Building on the strategy, the Province released its Five-Year Climate Change Action Plan in June 2016.⁵⁵ Among a comprehensive list of actions is one that aims to reduce the climate change impact of goods movement by increasing the use of low-carbon trucks (and buses), through the following three measures that will be funded by the Province:

- Setting up a new Green Commercial Vehicle Program to provide incentives to eligible businesses towards the purchase of low-carbon commercial vehicles and technologies that can reduce emissions. These include electric and natural gas-powered trucks, aerodynamic devices, anti-idling devices and electric trailer refrigeration. Up to \$170 million in Provincial funding is proposed for these incentives.
- Building a network of low-emissions fuelling stations, working with the Ontario Trucking Association, natural gas providers and others, to establish a network of natural gas and low- or zero-carbon fuelling stations, and thereby increase the accessibility and convenience of low-emissions fuels to truck drivers and others. Up to

⁵⁴ *Ontario’s Climate Change Strategy*, Ontario Ministry of the Environment and Climate Change, November 2015.

⁵⁵ *Ontario’s Five Year Climate Change Action Plan, 2016 – 2020*, Province of Ontario, June 2016.

\$100 million in Provincial funding is proposed for this initiative.

- Examining ways to improve the competitiveness of short-line railways as a possible alternative to trucking that potentially is more energy (and emissions) efficient on a unit basis. Up to \$20 million in Provincial funding is proposed to help improve short-line competitiveness.

Other initiatives not currently funded research on new low-carbon commercial vehicle technology and an examination of ways to remove regulatory barriers to the adoption of alternative-fuel vehicles, such as trucks powered by hydrogen fuel cells.

Recently, air pollution concerns have come to the forefront. Last year, Toronto City Council identified its desire to better manage auto and truck traffic in order to reduce air pollution and its effects on human health. The City has specifically highlighted the pollutants generated by diesel trucks as particularly problematic, because diesel engines tend to emit more particulate matter (PM) and nitrogen oxides (NOx) than gasoline engines.⁵⁶ Although ways to address air pollution have long been a focus of urban transportation plans in the United States, the topic has received much less attention in Canadian transportation plans, at least until recently. The linkage between transportation impacts and human health is also a relatively new development, and – as evidenced by several recent transportation master plans (for example, Ottawa in 2013) – it is becoming an important impetus for promoting sustainable modes and technologies for moving people and goods.

6.4.2 Opportunities and Challenges

It is important to distinguish between local and global impacts of goods movement. For example, GHG emissions have a longer-term effect on climate change. Smog-causing air pollutants such as NOx and PM have more immediate impacts on human health and on the degradation of the natural and human environment. However, many, though not all, of the opportunities and challenges generated by local and global impacts can be addressed in common.

Many of these fall under the topic of City Logistics, which is defined as

The process for totally optimizing the logistics and transport activities by transport companies with the support of advanced information systems in urban areas considering the traffic environment, the traffic congestion, the traffic safety and the energy savings within the framework of a market economy.⁵⁷

⁵⁶ *Path To Healthier Air: Toronto Air Pollution Burden of Illness Update*, City of Toronto Public Health, April 2014.

⁵⁷ Taniguchi, E. and Thompson, R.G. Introduction. In *City Logistics: Mapping the Future*, E. Taniguchi and R.G. Thompson (Eds.), CRC Press, Boca Raton, Florida, 2015.

It can be seen that many City Logistics initiatives also benefit congestion management. Two types of City Logistics opportunities are discussed below: urban distribution (or consolidation) centres, and technological and regulatory initiatives. Note that off-peak delivery and ITS, both described as congestion management measures, also have environmental benefits.

Figure 6-6: Opportunities and Challenges Associated with the Environmental Impact of Goods Movement

| Opportunity | Challenges |
|---|---|
| <p>Urban distribution (or consolidation) centres: Offers a means to bundle goods so as to improve the efficiency of urban goods movement by reducing empty vehicle trips, circuitous routing, delays, etc.</p> <p>Can be the core of a cooperative program that allows similar industries (e.g., consumer retail stores in the downtown core) to handle goods, through consolidation of parking spots and use of environmentally efficient modes for last mile deliveries, including active transportation.</p> | <p>Requires a business case and a substantial investment for shippers and carriers, who compete with each other, to make this work for smaller industries. Also requires available, properly zoned and readily accessible land.</p> |
| <p>Technological and regulatory initiatives: Uses improvements in vehicle and engine technologies to reduce air pollution – for example, through the use of all-electric vans for last mile deliveries, or retrofitting older trucks with filters that remove PM and other pollutants.</p> <p>Also can effect changes through compulsory measures – for example, prohibiting the use of older trucks in downtown areas, or moving vehicle deliveries to less-congested times of day through pricing schemes.</p> | <ul style="list-style-type: none"> • Requires an investment on the part of vehicle owners, which can be significant. • Requires legislation, possibly at multiple levels of government, as well as public / industry acceptance. • Rapid evolution of e-commerce introduces greater uncertainty into urban goods movement planning (e.g. impact of Uber and autonomous delivery systems including drones). |

6.4.3 Good Practices

Urban Distribution (consolidation) Centres

Urban distribution centres are intended to bundle or consolidate goods. There are four types of bundling:

- Bundling in time, in which a given carrier consolidates its loads into fewer scheduled trips.
- Bundling in activities, which aims to consolidate the deliveries of infrequent deliveries.
- Bundling in routing; that is, optimizing the number of stops made on an itinerary.
- Bundling in depots, which allows different carriers to combine their cargos at a central location. The aim is reduce the number of trucks circulating in the city core. This

increases the number of stops made per vehicle and allows the combination of route itineraries or schedules.

In practice, only the last activity has yielded significant gains. It has been promoted in several countries, including The Netherlands, which has supported the establishment of urban distribution centres at the periphery of urban cores. Several complementary measures have been promoted in order to promote the acceptance and use by retailers of urban distribution centres, including shared and secure use of storage space by retailers, the coordination of shipments among retailers, and outsourcing of deliveries. For example, 11 department stores in the Kyoto-Osaka-Kobe area of Japan have been cooperating in the delivery of goods to consumers, although they still compete in sales. The program, in place since 1989, has reduced delivery vehicle kilometres travelled and labour hours. An initiative in Yokohama, Japan, complemented an urban distribution centre with secure parking spaces for trucks, enforcing the removal of illegally parked vehicles, improving street crossings and introducing low-emissions vehicles. Participation is voluntary; however, almost all trucking companies have complied with the system, which uses the distribution centre to transfer goods to compressed natural gas vehicles and human-powered carts for the final trip (about 1 kilometre).⁵⁸

In addition, the potential use of urban distribution centres has been advocated to handle e-commerce deliveries, construction materials and waste removal.

However, many test cases have had only a short lifespan, because the cost of the additional transshipment prevented them from being cost-effective. As a result, there has been greater emphasis on strengthening the business case, notably through increased government support, pricing mechanisms (e.g., road tolls) and the provision of additional services at these centres. As well, ITS offers the potential to implement virtual consolidation centres, through improved communications among and between carriers and retailers. Access restrictions to large vehicles in core areas that are heavily pedestrianized and which have narrow streets (as in some parts of Paris, France), or which have strong security needs (as for retailers at Heathrow Airport in London), have resulted in viable distribution centres – although it is unclear whether or not this would be the case in the absence of restrictions.⁵⁹

Technological and Regulatory Initiatives

Low-emission fuel technologies have become mainstream in recent years, and so the reliability and costs have become more acceptable to industry. Notably, several carriers are

⁵⁸ T. Yamada, *Cooperative Freight Transport Systems*. In *City Logistics: Mapping the Future*, E. Taniguchi and R.G. Thompson (Eds.), CRC Press, Boca Raton, Florida, 2015.

⁵⁹ R. van Duin and Muñuzi, J., *Urban Distribution Centers*. In *City Logistics: Mapping the Future*, E. Taniguchi and R.G. Thompson (Eds.), CRC Press, Boca Raton, Florida, 2015.

testing heavy trucks powered by liquefied natural gas (LNG), and some carriers have introduced electric vehicles into urban delivery service. However, the broader implementation of these vehicles depends on capital costs, fuel (energy) costs, and the availability of supporting infrastructure (e.g., LNG refuelling). Incentives may be needed to expand the use of low- and zero-emission vehicles and to ensure that future infrastructure anticipates the growth in these vehicles.⁶⁰

In addition, the use of longer-combination vehicles (LCVs) has grown. LCVs offer the possibility of increasing per-trip volumes. Their use in Ontario is limited to close proximity to the 400-series highways, and LCVs are prohibited from operating through the City of Toronto at certain times of day.

Technological improvements to engine efficiency and at reducing fuel consumption and emissions have been implemented over the years. However, these are costly, and so combinations of technology and governmental regulations may be needed to implement the desired reductions in emissions. A large-scale example is provided by California's 2010 enactment of strict diesel emission control regulations for all diesel trucks making trips to or from the state's marine ports and rail yards. The legislation required either the purchase of a new truck (post-2007 model, which have improved emission controls) or purchasing and retrofitting 'middle-aged' trucks (post-1993 models) with diesel particle filters. The regulations prompted an accelerated filter retrofit and truck replacement program. The California Air Resources Board and other agencies offered a grant program to help mitigate the costs. The program succeeded in reducing PM emissions (the program's intended aim) as well as NOx (an unintended but beneficial result).⁶¹ The point is that the program has been successful; however, its adaptability to the GTHA must be considered carefully.

Low-emission zones (LEZs) have been used in several European cities. Cordons are established around target areas – such as the urban core – across which high-emitting vehicles are prohibited or are subject to an entry fee. The focus has been on controlling air pollutants, although some recent initiatives are also aimed at reducing GHGs. The impacts have varied, with Berlin experiencing significant reductions in its LEZ program (e.g., a 58% reduction in PM and a 20% reduction in NOx in just a few years). However, these cities have tended to have lower air quality than that experienced in Toronto. Stockholm's prohibition of high-emitters from the central city has reduced pollutants significantly; and it has been estimated that the costs to carriers have increased 1-2% as a result (although it is not clear whether these costs

⁶⁰ J. Phelan, *Strategies to Manage the Environmental Impact of Goods Movement in the City of Toronto*, unpublished report, 29 August 2014.

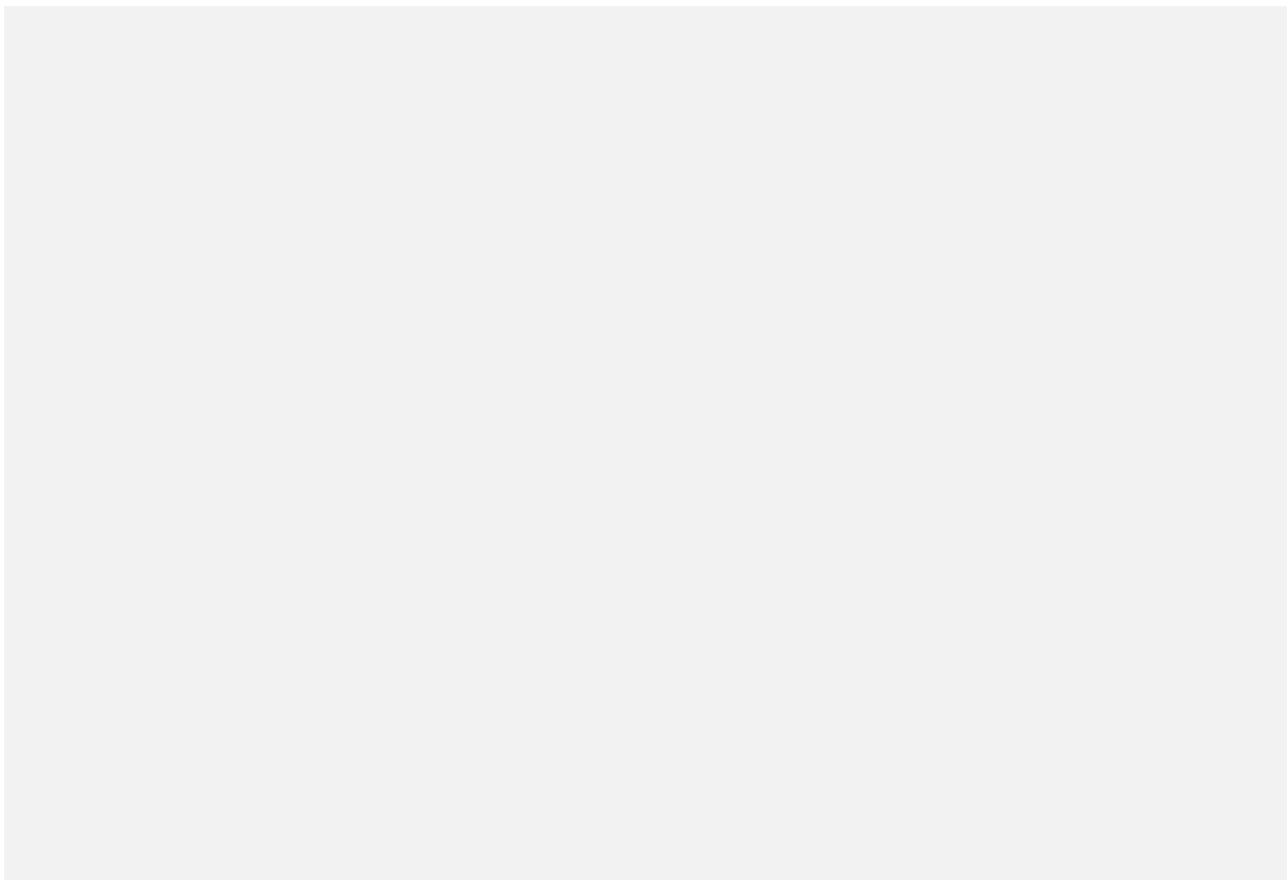
⁶¹ T.R. Dallmann, Harley, R.A. and Kirchstetter, T.W., *Effects of Diesel Particle Filter Retrofits and Accelerated Fleet Turnover on Drayage Truck Emissions at the Port of Oakland*, Environmental Science and Technology, 2011.

include capital expenditures for new vehicles or retrofits, or operating and maintenance costs).⁶²

⁶² J. Phelan, *Strategies to Manage the Environmental Impact of Goods Movement in the City of Toronto*, unpublished report, 29 August 2014.

7

Strategic Directions and Actions, and Gaps



This chapter assesses the appropriateness of strategic directions. It first compares strategic directions from the 2011 Urban Freight Study and actions with current list of needs and desired actions and priorities identified in Chapter 6 from consultation and from the best practices review. It also considers whether events have overtaken planned actions.

7.1 Review of Goals and Objectives

This section reviews the goals and objectives of the 2011 Urban Freight Study. These are considered in light of three other key GTHA initiatives that also have influenced goods movement in the GTHA in the interim: the Peel Goods Movement Task Force, which has been active at a regional level and serves as a prototype in many ways; the Southern Ontario Gateway Council, which is a super-regional forum across the Greater Golden Horseshoe (GGH), and the Western Golden Horseshoe Municipal Network, which is an informal coalition of municipalities. Each offers a different and complementary context to Metrolinx and the 2011 Urban Freight Study.⁶³

We also note provincial and federal initiatives that, while not specific to the subject, nonetheless influence goods movement in the GTHA. The Growth Plan for the Greater Golden Horseshoe and the Greenbelt Plan continue to influence land use and economic development in the GGH. These are currently being reviewed. A recent initiative by the federal government to promote greater international trade (e.g. Trans-Pacific Partnership, Canada-European Union Comprehensive Economic and Trade Agreement) has generated increased interest in the role of urban intermodal connectors in national, bi-national and global freight movement.

7.1.1 GTHA Urban Freight Study

The GTHA Urban Freight Study⁶⁴ sought to identify “opportunities to enhance the GTHA’s competitiveness by improving freight efficiency and capacity, in the context of the goals and objectives of The Big Move.”⁶⁵ The focus was primarily on road freight, but consideration was also given to intermodal connections to the rail, air, and marine modes. The objectives set out by the study were as follows:⁶⁶

1. Increase availability of options for freight transport to:

⁶³ Durham, York, Hamilton, Halton, and the City of Toronto are all working on goods movement goals and objectives, but none have been formally released.

⁶⁴ Metrolinx (2011) “GTHA Urban Freight Study,” Final Draft, February. This study includes a Technical Backgrounder.

⁶⁵ p. 3

⁶⁶ Technical Backgrounder, p. 158.

- Improve competition
 - Improve robustness of the system
 - Remove barriers for all modes
 - Better serve needs.
2. Improve service:
- More information to support shippers' and operators' decision-making
 - Reduced travel time variability
 - Easily accessible and well-publicized routes.
3. Reduce conflicts between modes, and promote active modes where practical.
4. Engage public and private sectors in planning.
5. Better information on energy and emissions and on options to allow improved efficiency.
6. Better management of demand and capacity to:
- Ease peaking (i.e. reduce traffic volumes at peak periods)
 - Reduce bottlenecks
 - Spread load more efficiently.
7. Simplify mode change to reduce handling delays and damage, and encourage use of best mode at each stage.
8. Better integration of land use planning and freight transport so that:
- Freight needs are built into development
 - Development is connected to the right networks
 - Development doesn't impact existing freight facilities.
9. Integrate freight transport investment with overall transport investment planning, and better reflect the costs of transport to all users so investment decisions can be more effective.

7.1.2 Peel Goods Movement Program

Under the guidance of a Goods Movement Strategic Plan (2012-2016), Peel Region has developed a Goods Movement Program whose 23 actions support two goals:⁶⁷

- Support and influence sustainable transportation systems to ensure that goods are transported in an efficient and timely manner; and

⁶⁷ <https://www.peelregion.ca/pw/transportation/goodsmovement/goods-movement-strategic-plan.htm#plan>

- Optimize the use of existing infrastructure and capacity, and minimize adverse environmental, social, and economic impacts caused by goods movement transportation.

7.1.3 Southern Ontario Gateway Council

The Southern Ontario Gateway Council (SOGC)

is a transportation and economic development forum, whose members include most of the major transportation providers in Southern Ontario. Our voting membership includes railways, trucking, marine transport and aviation modes. Our resource membership includes the municipal government in our mandate area, major shippers, industry associations, and the federal and provincial levels of government.⁶⁸

The SOGC describes its mandate as follows:

Through government relations, communications and consensus building, SOGC members support a shared vision: to achieve excellence in an integrated transportation system for the prosperity of Southern Ontario.⁶⁹

Four objectives can be discerned from what the SOGC states to be its key policy areas:⁷⁰

- Infrastructure and Funding—solving the urban gridlock problem.
- Integrated Planning—improving land use policies to protect future transportation routes.
- Network Efficiency—ensuring that the existing network is optimized.
- Borders, Security and Safety—speeding the flow of goods through the NAFTA gateway in order to maintain the competitiveness of the Ontario economy.

7.1.4 Western Golden Horseshoe Municipal Network

The Western Golden Horseshoe Municipal Network (WGHMN) is a caucus of municipalities seeking “to advance common perspectives regarding the need for transportation/transit infrastructure and a more efficient and connected network for the movement of goods and people.”⁷¹ The WGHMN emerged in late 2012 as an initiative of senior officials of several GGH

⁶⁸ <http://gatewaycouncil.ca/about-us/>

⁶⁹ <http://gatewaycouncil.ca/about-us/>

⁷⁰ <http://gatewaycouncil.ca/about-us/>

⁷¹

<http://sirepub.halton.ca/councildocs/pm/16/Jan%2029%202014%20Planning%20and%20Public%20Works%20LP%20S1214%20Western%20Golden%20Horseshoe%20Municipal%20Netw%20%20LPS1214%20Attachment%20%201pdf%20168938.pdf>

municipalities,⁷² with the initial aim of working together to seek provincial and federal support for improved highway connections between the GGH and the US border. According to the WGHMN's 2013 Charter, the goal of the network is

to see an integrated multi-modal transportation network established that:

- Addresses existing highway capacity issues,
- Maximizes the potential of air, rail and marine goods movement modes,
- Provides efficient connections to hubs, employment lands, and local and international markets,
- Incorporates an interregional multi-modal transit network that uses road and rail based modes and connects our communities,
- Provides redundancy to reduce impacts of collisions or maintenance construction work,
- Is planned and implemented in a manner that respects the importance of sensitive natural heritage, prime agricultural, social, cultural and environmental areas, and
- Is planned to keep pace with growth and in a cooperative manner, with active participation by municipalities, the province, the federal government and the private sector.

7.1.5 Assessment of Currency of Goals and Objectives

In our view all of the goals and objectives reviewed remain current and relevant. It is notable that none of goals and objectives put forward is associated with specific quantitative metrics to allow for an assessment of whether a goal has been achieved. As such, a goal or objective would still be relevant and current unless it were highly specific and had clearly either been achieved or explicitly dropped.

7.2 Assessment of the Currency of the Technical Backgrounder

This section assesses whether the Technical Backgrounder to the GTHA Urban Freight Study is still current in light of the snapshot and context developed above. For clarity, this section is structured in the same way as the Technical Backgrounder.

⁷² Initially, the City of Hamilton and the Regional Municipalities of Halton, Niagara, Peel and Waterloo. Other municipalities have since joined.

7.2.1 Introduction and Background

The substance of this section remains current. Notably the major issues identified in the consultations are unchanged.

7.2.2 Freight Planning Initiatives

This section of the Technical Backgrounder discussed many initiatives underway.

At the time the Technical Backgrounder was prepared, the Ontario-Quebec Continental Gateway and Trade Corridor was an active initiative of the Governments of Canada, Ontario, and Quebec. The Metrolinx Urban Freight Study was intended, in part, to be the urban complement to this inter-urban initiative. However, the Continental Gateway had become dormant by 2015. In the meantime, the Government of Canada continues to play a smaller role in the Corridor, primarily focused on border crossing performance in Southern Ontario. More recently, the Government of Canada's desire to increase international trade has focused attention on the role of urban intermodal connectors in national, bi-national and intercontinental logistics chains.⁷³ The Government also has expressed the need for the Pickering Airport sometime between 2027 and 2037.⁷⁴ Figure 7-1 summarizes these initiatives and others.⁷⁵

Figure 7-1: Federal Interests in Urban Freight in the GTHA

- The Federal government has jurisdiction over most rail, air and marine infrastructure and terminals, as well as road border crossings and international trade. Transport Canada does not have any formal policies that specifically address urban goods movement, although the department participates in Metrolinx's Urban Freight Forum and supports goods movement initiatives by Metrolinx and regional governments.
- Ontario-Quebec Continental Gateway and Trade Corridor was a driving force behind the 2011 GTHA Urban Freight Study. It is now dormant.
- Border crossing performance and infrastructure continues to be a key interest of the Federal government, with the aim of promoting smooth flow of passenger and goods vehicles while also maintaining safety and security.
- Transport Canada has developed a Freight Fluidity Indicator, which measures inter-continental transit times (e.g., Shanghai to Toronto via Vancouver, by ship, rail and truck). It provides metrics to prospective shippers to demonstrate Canada's multi-modal transportation network as an effective

⁷³ The role of intermodal connectors in defining a regional urban freight network is examined further in a separate backgrounder.

⁷⁴ <http://news.gc.ca/web/article-en.do?nid=878219>

⁷⁵ Source: consultant's consultation interviews with Transport Canada, March 26 and April 9, 2015.

and reliable alternate to the US in order to access North American markets.

- Current initiatives related to urban goods movement in the GTHA include several data studies:
 - Transport Canada coordinated the 1999 National Roadside Survey (NRS).
 - Transport Canada introduced its GPS/logger-based Canadian Vehicle Use Survey – Heavy Vehicles in 2013.
 - Working with MTO, Peel and other regions, Transport Canada is interested in getting more precise data on the ‘last mile’ transit (travel) times between rail terminals and distribution centres in the GTHA, for its Freight Fluidity Index.
- Transport Canada is looking at managing its assets and landholdings. Transport Canada has identified the need for the Pickering Airport sometime after 2027, for which various studies will be initiated soon.

The Province of Ontario released its final Freight-Supportive Guidelines in early 2016. The Ontario Ministry of Transportation has been active on several fronts, including the Off-Peak Deliveries Pilot in the GTHA and new goods movement modelling and data initiatives (see the Urban Goods Movement Data Phase II project for details). In addition, MTO continues to expand the data analysis layers and functionality within the public-facing iCorridor visualization tool. At the forefront is the production of travel speed performance measures to quantify travellers’ experiences with congestion on municipal and provincial roads with North American coverage. Planning has continued on inter-regional highway connections, including the Niagara to GTA and the GTA West corridors. The Highway 407 East Phases I and II initiatives, to be completed by 2015 and 2020 respectively, will complete the bypass around the GTHA. In addition to expectations of faster travel times, the extension is expected to make the corridor more attractive for goods-generating industrial development. Figure 7-2 summarizes these and other initiatives.⁷⁶

Municipal governments have advanced work on goods movement planning. Peel Region is well into the implementation of its Goods Movement Strategic Plan (2012-2016) as described in Section 7.1.2, and has recently initiated the development of a new plan. The City of Hamilton, Durham Region and York Region are preparing goods movement plans in the context of their transportation master plans. In 2015, Halton Region prepared a draft Goods Movement Strategy that will ultimately inform its future transportation master plan update. The City of Toronto is in the early stages of developing a goods movement strategy.

⁷⁶ Source: consultant’s consultation interviews with MTO, March 12 and April 9, 2015.

Figure 7-2: Provincial Interests in Urban Freight in the GTHA

Interests, Projects and Studies

- MTO worked with Transport Canada and MTQ on the now-dormant Ontario-Quebec Continental Gateway and Trade Corridor study. MTO also participates in Metrolinx’s Urban Freight Forum and in regional goods movement studies.
- The Province, through the MTO, supports all modes, and has jurisdiction over highways, provincial short-line railways and some local airports. MTO also advances Ontario’s interest with respect to federal rail, air and marine freight policy.
- Two Ministry of Municipal Affairs and Housing policies serve as guiding principles:
 - Provincial Policy Statement (2014) – very specifically about land use, designating employment lands near freight modal and intermodal facilities, protecting corridors so that they can be used by all modes, and protecting lands at intermodal terminals.
 - Growth Plan for the Greater Golden Horseshoe (2006, amended 2012 and 2013) – provides linkages to intermodal facilities, efficient highway movement, and land use and transportation planning. Land uses adjacent to transportation facilities are meant to be compatible with uses (e.g., designate employment lands close to the transportation network). The Growth Plan encourages municipalities to designate land for manufacturing and to increase goods movement by rail.
- MTO is developing policies and programs that support goods movement. A draft policy framework was released for public consultation in 2012.
- MTO released its final Freight-Supportive Guidelines in early 2016.
- MTO accounts for truck traffic in facility planning.
- Over the past 12 years, Ontario has ranked either first or second among all North American jurisdictions in terms of highway safety.
- The Province’s Moving Ontario Forward initiative provides nearly \$29 billion over 10 years for dedicated and substantial funding for public transit and transportation infrastructure across the province.
- Ontario has a generous truck weight allowance, which promotes use of longer-combination vehicles, which translates into fuel savings and GHG reduction.
- MTO conducted a pilot test of Off-Peak Delivery in the GTHA before and during the 2015 TORONTO Pan Am / Parapan Am Games.
- MTO provided incentives for companies to purchase alternate-fuel vehicles or fuel-reducing technologies as part of its Green Commercial Vehicle Program. This program ran from 2007 to 2012.
- MTO’s 2012 Commercial Vehicle Survey (CVS), with 45,200 surveys collected between 2010 and 2014, primarily captures inter-city truck origin-destination data supporting provincial model development. However, the 2012 CVS was enhanced with GTHA regional partners (Peel and Niagara) providing funding to bolster the sample and capture inter-urban trips from sampling on

Interests, Projects and Studies

municipal roads of provincial interest.

- As part of the 2012 Commercial Vehicle Survey (CVS), MTO has conducted commercial vehicle intercept surveys at Ontario's 13 international border crossings, along with passenger vehicle intercept surveys.
- MTO is also active in several other data initiatives, notably the iCorridor travel time and transportation planning initiative, traffic counts and travel time surveys. MTO has purchased and is analyzing GPS truck trace data, to help with its iCorridor tool. MTO also is developing new GGH and Province-wide multi-modal travel demand forecasting models.

7.2.3 GTHA Freight Context

This section provided an overview of goods movement data sources relevant to the GTHA. A review of data sources will be undertaken in the project Urban Goods Movement Data Phase II. It then reviewed data on flows of goods, goods movement infrastructure, the economy, demographics, and land use in the GTHA.

7.2.4 Industry Trends and Challenges

This section provided an overview of the trends and challenges affecting the freight industry in the GTHA. The trends and challenges identified generally are the same today (see above), albeit the challenges are presented somewhat differently.

7.2.5 Goals and Objectives

The goals and objectives set out in the Technical Backgrounder informed the goals and objectives of the Metrolinx Urban Freight Study, which were reviewed in Section 7.1.

7.2.6 Best Practice – A Global Scan

This chapter continues to reflect good practice. However, by design these practices covered a wide-ranging set of topics and thus they served as much as a menu of potential actions that could be taken when the need arises, as it was a response to stated problems. The scan of practices still provides a useful reference.

However, in contrast we focus on practices under three main topics: congestion, land use compatibility, and the environment. This approach supports a more directed response that is at once more consistent with the rest of the RTP (recalling that the Urban Freight Study was a stand-alone document), while allowing public and private sector partners to take ownership of the issues and the actions. Chapter 6 provides an up-to-date scan of good practices as they pertain to current urban goods movement issues, opportunities, and challenges in the GTHA.

7.2.7 Issues and Actions

This chapter remains current. Many of the actions identified have been undertaken. Chapter 4 provides an update on the current status of each of the actions that were put forward in the Urban Freight Study, which was based on the Technical Backgrounder and its 2012 Status Update.

7.3 Assessment of 2011 Strategic Directions and Actions

Figure 7-3 assesses the 5 strategic directions and 17 actions of the 2011 Urban Freight Study in light of current needs, and then makes recommendations for further action as appropriate and required.

Note that MTO has proposed the removal of one action (16) and the addition of two new actions (18 and 19).

As explained in the figure, Action 16 (enhance incentives to encourage off-peak deliveries) has been subsumed into Action 15 (explore opportunities for flexible freight delivery times), and so it is now redundant.

New Action 18 concerns the promotion of long combination vehicles (LCVs).⁷⁷ New Action 19 concerns the promotion of road freight safety. Details are provided in the figure.

⁷⁷ MTO's LCV program allows designated commercial operators to pull two full-sized trailers on designated Ontario highways. Subject to municipal approval, designated operators are permitted to transport trailers to and from specified locations a short distance from the highway, following a designated route. The use of LCVs is growing across Canada and the United States.

Figure 7-3: Assessment of 2011 Strategic Directions and Actions

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|--|---|--|---|
| Strategic Direction 1: Build Collaboration and Support | | | |
| <p>Action 1: Strengthen and collaborate with multi-sectoral forums</p> | <p>GTHA Urban Freight Forum introduced in 2012. It meets at least twice per year, and works closely with Peel Goods Movement Task Force and Southern Ontario Gateway Council. These latter two organizations, as well as the Western Golden Horseshoe Municipal Network, have emerged as useful fora for collaboration.</p> | <p>The current number and nature of the fora available seem to provide a good basis for collaboration and are meeting current needs. However, consultations identified the following needs:</p> <ul style="list-style-type: none"> • Allow Metrolinx to build on its unique position as a regional transportation planning agency by continuing to provide leadership on regional goods movement initiatives (e.g., data collection but also policy positions) and by supporting best practice research that municipalities can apply directly. This may require additional resources dedicated to goods movement. • Ensure that the various fora coordinate but do not overlap in their functions and in the interests that they draw. • Ensure that the Urban Freight Forum’s goals and objectives are clearly and uniquely defined, so as to fulfill the two aforementioned needs, establish it as ‘the’ place to be to stay informed, have a voice, and make things happen for urban goods movement in the GTHA, and provide products and outcomes that will continue to be | <p>Action has been achieved. The fora (Urban Freight Forum and the Intergovernmental Subcommittee) and the web site will all continue into the future. No further action recommended beyond continuing to develop the two existing fora and the web site on an opportunistic basis, particularly in the context of other actions presented below.</p> |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|--|--|--|---|
| | | <p>attractive to the public and private sector stakeholders.</p> <p>The fulfillment of these needs is considered as key to maintaining the interest and participation of partnering public agencies and, especially, the private sector.</p> | |
| <p>Action 2: Establish an inter-governmental freight committee</p> | <p>Inter-governmental freight committees established.</p> | <p>The current structure seems to meet current needs.</p> | |
| <p>Action 3: Improve and coordinate public outreach on urban freight</p> | <p>Metrolinx website includes a goods movement page, which provides links to the 2011 GTHA Urban Freight Study, Action Plan, Status Update and Urban Freight Forum meeting records.</p> | <p>The current webpage has established a presence for goods movement as well as a convenient resource on goods movement topics. However, there is an opportunity to provide additional outreach to the public as well as to politicians, policy makers and agency staff on several topics, including the importance of goods movement to the GTHA’s economic well-being and quality of life, a primer on urban goods movement, and help agency staff understand best practices for freight planning.</p> | |
| <p>Strategic Direction 2: Improve Freight Information</p> | | | |
| <p>Action 4: Improve data sharing on freight vehicles, routes and activities</p> | <p>Informal arrangements have been made, largely initiated through MTO’s iCorridor and CVS data collection activities, in which the Ministry has solicited the participation of upper-tier and single-tier municipalities in</p> | <p>Needs for improvement persist. Better data are needed to inform decision making.</p> | <p>Develop Phase 2 of the Metrolinx Urban Goods Movement Data Study: Implementation to identify next steps, etc., including a possible funding and administrative structure for collecting and maintaining data; for example, as an</p> |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|--|--|--|---|
| | <p>the GTHA. Transport Canada and Statistics Canada are also examining the feasibility of a national cross-border Commodity Flow Survey (CFS), working with US federal agencies. MTO is removed from the day-to-day discussions; however, in general, MTO is supportive of the concept for a national CFS.</p> | | <p>arms-length goods movement data management centre or as part of a goods movement Centre of Excellence.</p> |
| <p>Action 5: Establish a GTHA urban freight data collection program</p> | <p>Metrolinx sponsored a comprehensive data collection plan in 2013.</p> | <p>Needs persist.</p> | |
| <p>Strategic Direction 3: Increase Transportation Network Efficiency</p> | | | |
| <p>Action 6: Develop and protect a strategic GTHA truck network</p> | <p>Peel Region developed a Strategic Goods Movement Network in 2013. This multi-jurisdictional initiative is seen as a prototype for the GTHA. Metrolinx will examine the possibility of developing a GTHA Strategic Goods Movement Network.</p> | <p>Assessed in the separate backgrounder: Scope for a High Level Strategic Goods Movement Network in the GTHA.</p> | |
| <p>Action 7: Harmonize truck route standards and mapping</p> | <p>No real actions have been taken, although some municipalities have updated or are exploring their own truck systems and regulations. Still many inconsistencies between municipalities. No region-wide map.</p> | | |
| <p>Action 8: Investigate intelligent lane utilization and truck-only lanes</p> | <p>Metrolinx, Peel Region, and other agencies supported TAC’s study of Truck Lanes in Canadian Urban Areas, which explored current and best practices.</p> | <p>While identified as an opportunity to alleviate congestion in Chapter 6, further study is required.</p> | <p>Goods movement priority features for new and existing corridors should be studied using benefit-cost analysis. Such analysis would be informed by improved data. Such analysis should integrated into a holistic assessment with the ITS and intermodal/port access measures identified below.</p> |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|---|--|--|---|
| Action 9: Explore opportunities to move freight on transit | Metrolinx sponsored research to explore this concept. | Not identified as a priority by stakeholders nor in the literature on good practices. | Do not pursue further at this time in order to focus on measures more likely to impact objectives in a significant way. |
| Strategic Direction 4: Enhance Planning and Development | | | |
| Action 10: Develop freight supportive land use guidelines | In early 2016, MTO released its Freight-Supportive Guidelines. The guidelines – which feature best practices on ways to incorporate goods movement into land use and transportation planning – are meant to inform municipalities, for use at their discretion. | We believe that these guidelines are appropriate and comprehensive, and that further work is required to disseminate knowledge. | Metrolinx coordinate knowledge-sharing activities associated with the Freight-Supportive Guidelines to improve practitioner knowledge of freight planning. |
| Action 11: Support development of innovative freight hubs | Peel Region, with the assistance of Metrolinx and other agencies, sponsored a November 2014 workshop that explored the potential for freight hubs. Peel is currently investigating the viability of freight hubs as part of its analysis of the economic impact of goods movement. | A freight hub is well established in Peel around the Pearson Airport and the CN and CP intermodal terminals. Another hub is emerging in Milton around the Highway 401 and the CP intermodal terminal. If it proceeds the proposed CN intermodal would solidify the position of Milton as the second freight hub in the GTHA. | Application of the relevant actions such as MTO’s Freight-Supportive Guidelines, goods movement priority measures, and Intelligent Transportation Systems (ITS), to freight hubs to further examine their viability. Particularly important will be the need to establish viable and attractive business cases in order to attract the private sector, while also ensuring that the negative externalities can be addressed and that the freight hubs can be situated on and accessed by a future regional urban freight network (see separate background). |
| Action 12: Improve access to existing intermodal freight facilities | On a case-by-case basis. Key considerations are the advancement of the planning for the Highway 427 extension. Consideration is being given to an improved Highway 401 access to LBPIA’s cargo area. Some port authorities have developed master plans for their facilities, | Access to intermodal facilities and ports was identified by stakeholders as a key challenge in relieving congestion. | Improving access to intermodal facilities and ports should be studied using benefit-cost analysis. Such analysis would be informed by improved data. |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|--|---|--|---|
| | <p>including the GTAA and the Port of Hamilton. Several municipalities have introduced specific intersection and road improvements that improve truck circulation generally.</p> | | |
| <p>Action 13: Plan and protect complementary land uses near major freight hubs</p> | <p>Ongoing as part of regional and municipal Official Plans, which seek the designation of future employment lands close to key highway and rail accesses. However, there continues to be ‘leap-frogging’ of residential and industrial development approvals in some areas.</p> | <p>Stakeholders also identified concerns in this area. What is desirable is subjective. However, there is potential for inconsistency between provincial and municipal plans. There is currently limited monitoring of how municipalities are implementing the Growth Plan for the Greater Golden Horseshoe and the Greenbelt Plan.</p> | <p>As in Action 11, municipalities could be encouraged to consider how the MTO Freight-Supportive Guidelines, goods movement priority measures, ITS and other similar initiatives could be applied to freight hubs in order to further assess their viability while managing negative externalities and ensuring that they are appropriately situated on a future regional urban freight network.</p> |
| <p>Strategic Direction 5: Improve Operational Practices</p> | | | |
| <p>Action 14: Use technology to optimize and manage the movement of goods</p> | <p>Improved system management is being explored in the context of ITS and transportation management plans by various municipalities and regions.</p> <p>On the demand side, e-commerce has become a reality for consumer purchases as well as for business-to-business purchases. In addition, load optimization services (Uber for goods movement) are starting to appear.</p> | <p>This area is likely to yield many more high-value and low-cost measures that can improve travel times and reliability of urban goods movement in the GTHA. Of particular note are the potential for collaborative innovation like Uber, and autonomous delivery drones/vehicles.</p> <p>E-commerce is changing the nature of deliveries. However, these changes are dynamic. The changes involve how the goods are delivered (including purchaser pick-up), the numbers of delivery trips (which may go up or down), the types of vehicles used (shifts to small and large vehicles), scheduling of deliveries (including on-demand deliveries), delivery locations</p> | <p>Potential measures should be evaluated using benefit-cost analysis alongside intermodal/port access measures and goods movement priority measures. Regulation should be flexible enough not to discourage beneficial innovation.</p> <p>The dynamics of e-commerce in the GTHA should be examined, in order to provide insight into expected implications for transportation and land use plans. Subject areas should include, at a minimum: establishment surveys on e-commerce practices, carrier surveys on their delivery operations, and implications on land use decisions (site location, etc.). Practices elsewhere also should be reviewed.</p> |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|---|---|--|--|
| <p>Action 15: Explore opportunities for flexible freight delivery times</p> | <p>MTO conducted an Off-Peak Deliveries Pilot. Peel Region’s Smart Freight Association Study is currently reviewing this topic.</p> | <p>(including at pick-up locations), and the location and size of warehouses and distribution centres.</p> <p>Industry stakeholders are very supportive of OPD as a congestion relief measure. There are municipal and local resident concerns with OPD and there are municipal bylaws that prevent or impact OPD.</p> | <p>Metrolinx should review the conclusions of MTO pilot and, if results are promising, work with the MTO, municipalities and other stakeholders to expand OPD.</p> <p>Metrolinx also should examine the broader implications, actual and perceived, on such topics as political acceptance, residents’ acceptance, impacts on bylaws, and impacts on carrier, shipper and receiver operations. The aim is to identify and address the broader impediments to OPD implementation. This examination should be based on quantitative surveys and interviews of municipal politicians, municipal staff, participating carriers, shippers, receivers, residents, etc. As a preparatory step, Metrolinx should develop a scoping plan, for implementation once MTO’s pilot is complete.</p> <p>Municipal initiatives such as Peel’s Freight Transportation Demand Management could be considered as prototypes for possible adaptation and implementation by other municipalities.</p> |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|--|---|--|---|
| Action 16: Enhance incentives to encourage off-peak deliveries | MTO’s Off-Peak Delivery Pilot tested the concept of OPD. However, incentives were not included in the program | None. | Because OPD is considered to have been explored as one among many opportunities for flexible freight delivery times, this Action is considered to have been subsumed under Action 15. |
| Action 17: Implement reserved curbside delivery options | The City of Toronto proposes to examine curbside management, and the topic has come up in other studies, such as the City of Hamilton’s TMP update. | To the extent that such measures can both relieve congestion and make urban goods movement faster, cheaper, more reliable, safer, and more environmentally friendly, they are of interest to the public and private sectors. | Like other specific infrastructure and operational measures, potential measures should be evaluated using benefit-cost analysis alongside intermodal/port access measures, goods movement priority measures, and technological options (such as cargo tricycle deliveries or Cargomatic on-demand pick-up and load consolidation, which are being investigated in New York City and elsewhere). |
| Action 18: Promote use of Long Combination Vehicles (LCVs) | LCVs can provide congestion relief on highways by shifting heavy truck freight movements from peak to non-peak hours. They can also reduce fuel consumption, which is directly linked to GHG emissions. | The regions and municipalities in the GTHA have differing policies and approaches regarding the implementation of LCVs in their own jurisdictions. As a result, the actual usage of LCV routes varies by municipality and region. There is also a lack of consistency in the policies. | <p>A common GTHA-wide approach to the implementation of LCVs would support the seamless movement of goods across municipal boundaries. Specific conditions – such as the avoidance of LCV trips during certain times of day – could be developed on a consensual basis, and a GTHA-wide ‘rules-based’ assessment of the use of LCVs could help to address specific concerns of individual municipalities.</p> <p>To address this, Metrolinx, working together with the MTO, the regions and the municipalities, could:</p> <ul style="list-style-type: none"> Assess the impacts of LCVs on GTHA highway and road traffic levels, traffic safety, business operating costs, fuel use and GHG / CAC |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|---|--|--|--|
| | | | <p>emissions.</p> <ul style="list-style-type: none"> Review and assess current policies, regulations and approaches among all GTHA jurisdictions, and identify points of consistency and difference; Consult all jurisdictions and LCV permit holders to identify their practical concerns and assess how well the system works today, where improvements could be made, obstacles and how these might be addressed. Develop a consensus-based set of 'rules' that could be adapted by each jurisdiction, and identify the criteria that could be used to warrant an LCV. |
| <p>Action 19: Promote road safety for freight</p> | <p>Safety for freight and other road users is a paramount consideration in the mandates and activities of each responsible jurisdiction.</p> | <p>There is a need to reinforce the inclusion and treatment of goods movement safety within the actions, as appropriate. While not replacing operational initiatives that improve road safety for all users, the need is meant to ensure that the safety perspective is always recognized in the actions, and that the actions are consistent with and support road safety principles.</p> | <p>A safety KPI has been proposed in order to measure how the strategic directions and the preceding actions collectively address road and rail safety (see Section 7.7.4). However, this action (Action 19) could elaborate broaden the treatment of road safety the following initiative, which would be coordinated by Metrolinx, working with TC, MTO, the regions and the municipalities:</p> <ul style="list-style-type: none"> List relevant safety mandates, policies and practices of the relevant jurisdictions. Assess how each of the strategic directions and actions impacts or is impacted by the existing safety mandates, policies and practices, and enhance the actions |

| Strategic Direction / Action | Progress | Current Needs | Recommendation |
|------------------------------|----------|---------------|---|
| | | | <p>accordingly.</p> <ul style="list-style-type: none"> Identify any remaining gaps and possible ways to address them – for example, through the development of awareness and education programmes for government planners, the travelling public and truck drivers, or ensuring that goods movement needs are incorporated explicitly into municipal Complete Streets policies and guidelines (given that the Complete Streets initiatives are becoming popular in many municipalities; however, many guides and policies do not fully address conflicts between trucks and other road users). |

From this analysis of the original strategic directions and actions from the 2011 Urban Freight Study, the following remain relevant. As noted, Action 16 has been removed: for convenience, the original numbering has been retained. The two new actions (18 and 19) have been added.

Figure 7-4: Strategic Directions and Actions from the 2011 Urban Freight Study Remaining Relevant in 2015

| Strategic Direction / Action |
|---|
| Strategic Direction 1: Build Collaboration and Support |
| Action 1: Strengthen the UFF’s role, while continuing to collaborate with multi-sectoral forums * |
| Action 2: Continue to work with an inter-governmental committee * |
| Action 3: Continue and broaden outreach on urban freight * |
| Strategic Direction 2: Improve Freight Information |
| Action 4: Improve data sharing on freight vehicles, routes, and activities |
| Action 5: Establish a GTHA urban freight data collection program |
| Strategic Direction 3: Increase Transportation Network Efficiency |
| Action 6: Develop and protect a strategic GTHA truck network |
| Action 7: Harmonize truck route standards and mapping |
| Action 8: Investigate intelligent lane utilization and truck-only lanes |
| Strategic Direction 4: Enhance Planning and Development |
| Action 11: Support development of innovative freight hubs |
| Action 12: Improve access to existing intermodal freight facilities |
| Action 13: Plan and protect complementary land uses near major freight hubs |
| Strategic Direction 5: Improve Operational Practices |
| Action 14: Use technology to optimize and manage the movement of goods |
| Action 15: Explore opportunities for flexible freight delivery times |
| Action 17: Implement reserved curbside delivery options |
| Action 18: Promote use of Long Combination Vehicles (LCVs) |
| Action 19: Promote road safety for freight |

* Represents a rewording and/or refocusing of these specific actions.

7.4 Recommended Approach

Section 7.1 set out the current needs and our recommendations associated with each of the actions set out in the 2011 Urban Freight Study. Taking the list of strategic directions and actions in Figure 7-4,

- Actions 1-3 under Strategic Direction 1 represent a continuation of existing actions, but now with a re-articulated and, in the case of the UFF, perhaps a tightening of the Forum’s focus so that it is uniquely defined and so that it can continue to serve as ‘the’ place to be for urban freight in the GTHA, and continue to attract active public and private sector participation.

- Actions 4-5 under Strategic Direction 2 Improve Freight Information will be the subject of the separate Metrolinx project Urban Goods Movement Data Phase 2.
- Actions 6-7 are the subject of the companion background, Scope for High Level Strategic Goods Movement Network for the GTHA, and are not dealt with further here.
- Actions 8, 12, 14, and 17 all speak to operational and infrastructure improvements that we suggest be the subject of a comprehensive and coordinated goods movement plan, which would prioritize investments on the basis of benefit-cost analysis. Ideally this plan could be coordinated with both The Big Move and with a province-wide multi-modal transportation plan. That being said, these actions should not be delayed by waiting for provincial plans to be developed.
- Actions 11 and 13 can be furthered through the application of the MTO Freight-Supportive Guidelines as well as the operational and infrastructure improvements in actions 8, 12, 14, and 17, if these actions are targeted at the freight hub in Peel and the emerging freight hub in Milton. The implications of e-commerce (Action 14) should be examined in detail.
- Action 15 relates to OPD. Metrolinx could examine the findings of MTO's Pan Am and Parapan Am Games OPD Pilot, before taking further action. Action 16 has been subsumed into Action 15, and has been removed.

In addition, MTO has proposed two new actions: one concerns the promotion of long-combination vehicles and the other concerns road safety. These have been added as new actions 18 and 19.

Metrolinx should articulate these recommendations through an updated Action Plan. The updated Action Plan should:

- Show how the Action Plan fits with Provincial plans and policies, as well as with those of upper- and lower-tier municipalities. In particular:
 - The Action Plan must complement and be consistent with the specific elements of the Provincial Policy Statement, as well as with the Co-ordinated Land Use Planning Review of the GGH Growth Plan and the Greenbelt Plan, which is now underway. It should proposed how these elements would be addressed by regional and municipal governments – notably, the appropriate location and designation of employment lands, separation of these lands from other uses, the protection of corridors for all users, and the protection of lands near terminals.
 - The Action Plan should expand on those actions that could be implemented by regional and municipal governments, helping them to take 'ownership' of goods movement initiatives. It could do this by inventorying issues that are of

specific interest to these governments (which this Backgrounder does: e.g., air quality is of key interest to the City of Toronto), and possible approaches and solutions that they and other urban areas are implementing (e.g., New York City’s off-hours delivery programs, and e-commerce initiatives – also addressed in this Backgrounder). In doing so, Metrolinx must continue to work collaboratively with the regional and municipal governments. Metrolinx also could highlight case studies and best practices, for example in the application of MTO’s Freight-Supportive Guidelines.

- Ensure that the Actions cover all relevant jurisdictions. This means that Actions should cover goods movement infrastructure that is owned and operated by all jurisdictions, as well as private infrastructure if appropriate. It also means that the actions should go beyond physical infrastructure to account, where appropriate, for the ‘soft’ infrastructure, such as regulations, land use, labour supply, and so on.
- Be supported where needed by background or research papers on specific topics (e.g., regarding OPD or e-commerce).

7.5 Connecting 2011 Action to Current Issues, Opportunities, and Challenges, and Gaps Remaining

Chapter 6 identified three key issues along with associated opportunities and challenges. The issues were:

- congestion,
- land use compatibility, and
- the environmental impact of goods movement.

Figure 7-5 assesses the connection between the current issues, opportunities, and challenges and the 2011 Urban Freight Study (UFS) Actions. It goes on to identify any remaining gaps.

Figure 7-5: Goods Movement Opportunities, Challenges, 2011 UFS Actions, and Remaining Gaps

| Opportunity | Challenges | Relevant and Incomplete 2011 Actions | Gaps Remaining |
|--|--|---|---|
| Congestion | | | |
| <p>Off-Peak Delivery: Many major carriers and shipper distribution centres operate 24 hours/day 7 days/week. Increased use of off-peak delivery to improve the speed and reliability of goods movement.</p> | <ul style="list-style-type: none"> • Cost to shippers and receivers who do not traditionally operate at night, such as overtime pay and/or infrastructure investments in secure unattended receiving areas. • Community acceptance both in terms of by-laws and informal resident opposition, including through condo leasing restrictions to hamper OPD. | <p>15. Action 16 subsumed within Action 15.</p> | <p>To be assessed in MTO OPD pilot.</p> |
| <p>Operational and infrastructural goods movement priority measures: including the use of HOV lanes by trucks, priority access to goods movement facilities, and truck lanes</p> | <ul style="list-style-type: none"> • Potential reduction in performance of HOV lanes if more traffic were to use them, such as • Concerns with slower trucks merging through higher-speed traffic lanes and the typically higher speeds in the HOV lanes • Cost would be a challenge if goods movement priority lanes were not tolled so as to pay for themselves. If tolled there would be no challenge other than physical space constraints. | <p>8, 12, 14, and 17</p> | <p>New actions required, including Actions 18 (promotion of LCVs) and 19 (road freight safety). Many ideas exist, but they need to be assessed and implemented in a process that has buy-in from stakeholders and that is cost effective.</p> |

| Opportunity | Challenges | Relevant and Incomplete 2011 Actions | Gaps Remaining |
|---|--|--|--|
| <p>Prioritization of goods movement corridors: prioritizing corridor with high volumes of goods movement traffic for operational and infrastructure improvements</p> | <p>Challenges vary by specific measure, but coordinating and prioritizing measures across public and private sector entities is a significant challenge.</p> | <p>Not addressed</p> | <p>New actions required. Provided in the companion background: Scope for a High Level Strategic Goods Movement Network in the GTHA.</p> |
| <p>Road pricing: Provides a way to reduce congestion by using road pricing to allocate road space efficiently, through tolls, cordon pricing, etc. Potentially also could be applied to manage access at high-volume terminals, although this would require coordination with the facility owners.</p> | <ul style="list-style-type: none"> • Would have to be considered only in the context of a broader road pricing scheme. • Likely would need to cover a large geography in order to be effective, which would require political, public and industry acceptance – a significant effort. • The one existing tolled facility, Highway 407 ETR, is not priced to attract trucks in large numbers, although the attractiveness of the facility could increase once the Highway 407 East is implemented. | <p>Not addressed</p> | <p>New action required, i.e. examine the feasibility of road pricing to improve the efficiency of goods movement. The topic must be considered as part of a broad road pricing initiative that is aimed at reducing congestion as opposed to generating revenues.</p> |
| <p>Land Use Compatibility</p> | | | |
| <p>Smart growth for freight: clustering goods movement intensive land uses to minimize truck-km, such as is now the case in Peel and Milton. Hubs seem to be forming around truck and rail terminals.</p> | <ul style="list-style-type: none"> • Incorporation of urban goods movement into smart growth can be an afterthought, or seemingly incompatible with smart growth principles. • Goods-generating land uses may require low-density, spatially large footprints, which tends to move them to urban peripheries due to | <p>11 and 13 as well as 8, 12, 14, and 17 if targeted at hubs.</p> | <p>New actions required. These could include:</p> <ul style="list-style-type: none"> • Ensure that goods movement is incorporated at an appropriate level of detail in the ongoing review of the Provincial Growth Plan and the Greenbelt Plan. • Examine the factors that influence freight sprawl, including land prices, access to the major goods movement transportation network, zoning, development approval times, local |

| Opportunity | Challenges | Relevant and Incomplete 2011 Actions | Gaps Remaining |
|---|--|--------------------------------------|--|
| | <p>land availability and costs.</p> <ul style="list-style-type: none"> • May require an update of road design standards. • Changes in retailing due to e-commerce, etc., are impacting the need, size and locations of distribution centres, and they are impacting delivery practices generally. The situation is fluid. | | <p>economic development aspirations, etc.</p> <ul style="list-style-type: none"> • Defining the factors that influence the size, need, and location of distribution centres, in light of changing purchasing and “last mile” delivery patterns. These factors include impacts on adjoining land use, carrier costs (which influence vehicle size, etc.), impacts on shipper/receiver operations, etc. |
| <p>Complete Streets: Promotes the shared use of transportation corridors by all users, safely and efficiently.</p> | <ul style="list-style-type: none"> • Conflicts between trucks and active transportation lanes, including intrusion on to the lanes and accidents, are a notable challenge. • In some cases, the complete streets concept may not work, especially where there is high truck traffic. Some corridors may require the physical separation of trucks and active transportation. | <p>Somewhat addressed by 6-7</p> | <p>Assessed in the separate backgrounder: Scope for a High Level Strategic Goods Movement Network in the GTHA.</p> |
| <p>Freight supportive land use: Planning and design that promote the effective siting of goods-generating lands, site development and corridor planning. Avoiding conflicting land uses can greatly facilitate off-peak delivery and operations.</p> | <ul style="list-style-type: none"> • Requires acceptance by municipalities and planners. • Municipalities are under pressure to convert industrial lands to residential or other uses that are less compatible with goods movement (e.g. residential around intermodal terminals). | <p>11 and 13</p> | <p>New actions required to address potential disconnect between Provincial and municipal plans.</p> <p>These should include better awareness and education for municipal planners, engineers, etc., on goods movement requirements for site planning, corridor planning, secondary plans, and so on. The Transportation Association of Canada proposes a “Goods Movement 101” course,</p> |

| Opportunity | Challenges | Relevant and Incomplete 2011 Actions | Gaps Remaining |
|--|--|--------------------------------------|--|
| | | | <p>which would aid the discussion by explaining planning, design and operational issues and how they are addressed. Some years ago, Hamilton International Airport sponsored a workshop for City of Hamilton staff on planning for industrial development – Metrolinx could sponsor a similar initiative across the GTHA.</p> |
| <p>Planning process for goods movement: Refers to the need to incorporate goods movement into the land use and transportation planning process, through public-private freight forums, forecasting models and goods movement data.</p> | <ul style="list-style-type: none"> • Agency roles and mandates must be defined clearly. • Forums require an explicit focus and a commitment for actions in order to keep the private sector engaged. • Goods movement forecasting models can be complex. • Goods movement data can be expensive to collect. | <p>1-5</p> | <p>Redefined and refocused role for the UFF and expanded role for Metrolinx’s leadership, research and outreach needed. New actions required and will be the subject of the separate Metrolinx project Urban Goods Movement Data Phase 2.</p> |
| <p>Access planning to key goods generators: Better methods for assessing the benefits and costs of improved accesses to intermodal rail and port terminals potentially could accelerate the implementation of extensions, widenings and other access improvements, and attract partners for their implementation and financing.</p> | <ul style="list-style-type: none"> • Road improvement analyses typically do not consider the broader implications of accesses to the broader regional, provincial, national and international economy and trade flows. • More generally, in many transportation plans, goods movement generally is given a lower priority, if it is considered explicitly in benefit-cost analyses and project prioritization schemes, for all roads. • Data on truck activity to and | <p>12-13</p> | <ul style="list-style-type: none"> • Awareness and acceptance of the need must be achieved at all levels of government: note that the federal and provincial governments both have interests in the topic because it is a trade issue and because it impacts other modes that are under their jurisdictions. • Methods for incorporating benefit-cost analyses into road project planning and investment strategies must be reviewed, assessed and – ideally – standardized. • MTO’s CVS has surveyed some terminals, but detailed origin-destination data for other modes must |

| Opportunity | Challenges | Relevant and Incomplete 2011 Actions | Gaps Remaining |
|---|--|--|---|
| | <p>from these major generators, and especially on the activity of other modes, are partial.</p> | | <p>be assembled (they exist but are held in confidence by their owners).</p> |
| <p>Environmental Impact of Goods Movement</p> | | | |
| <p>Urban distribution (or consolidation) centres: Offers a means to bundle goods so as to improve the efficiency of urban goods movement by reducing empty vehicle trips, circuitous routing, delays, etc.</p> <p>Can be the core of a cooperative program that allows similar industries (e.g., consumer retail stores in the downtown core) to handle goods, through consolidation of parking spots and use of environmentally efficient modes for last mile deliveries, including active transportation.</p> | <p>Requires a business case and a substantial investment for shippers and carriers, who compete with each other, to make this work for smaller industries. Also requires available, properly zoned and readily accessible land.</p> | <p>Metrolinx, MTO and Toronto Atmospheric Fund funded a study looking at urban distribution centres in the context of the Toronto health sector.</p> | <p>New actions required, possibly a pilot project</p> |
| <p>Technological and regulatory initiatives: Uses improvements in vehicle and engine technologies to reduce air pollution – for example, through the use of all-electric vans for last mile deliveries, or retrofitting older trucks with filters that remove PM and other pollutants.</p> <p>Also can effect changes through compulsory measures – for example, prohibiting the use of older trucks in downtown areas, or moving vehicle deliveries to less-congested times of day through pricing schemes.</p> | <ul style="list-style-type: none"> • Requires an investment on the part of vehicle owners, which can be significant. • Requires legislation, possibly at multiple levels of government, as well as public / industry acceptance. | <p>Not addressed</p> | <p>New actions required, possibly a pilot project. New Action 18 (promotion of LCVs) can have an environmental benefit, because more trailers (cargo) can be transported with fewer power units.</p> <p>Research to gain a better understanding of the potential impacts of E-commerce and autonomous urban freight vehicles.</p> |

| Opportunity | Challenges | Relevant and Incomplete 2011 Actions | Gaps Remaining |
|---|--|--------------------------------------|---|
| <p>E-commerce: Potential to impact delivery patterns for personal and B2B purchases, as well as business location decisions, business operations, transportation and logistics, demand for skilled labour, regulations, and so on.</p> | <ul style="list-style-type: none"> • Situation is in a state of flux, as retailers, consumers and businesses address changing consumer and business purchasing patterns, use of the internet for making purchases, and so on. • The topic is new, and so there are few observable trends or even baseline reference measurements of current conditions. Hence, limited data are available. | <p>Not addressed</p> | <p>New actions required, including:</p> <ul style="list-style-type: none"> • Define the issues. • Collect data and surveys on the topic (see earlier discussion on the nature of the surveys and information requirements). • Analyze industry trends. • Review conditions, identify needs, and review best practice responses elsewhere. |

7.6 Proposed Updated Strategic Directions and Actions

Figure 7-6 relates each of the proposed actions and strategic directions back to

- whether the 2011 UFS contained related actions;
- whether the action is new, but is already being addressed; and/or
- whether the action is new, but further action is recommended now.

Figure 7-6: Recommended Update of Strategic Recommendations and Actions

| Strategic Direction / Action | 2011 UFS Related Actions | New action being addressed | Further action recommended now |
|---|--------------------------|----------------------------|--------------------------------|
| Strategic Direction 1: Build Collaboration and Support | | | |
| Action 1: Strengthen the UFF’s role, while continuing to collaborate with multi-sectoral forums | ☐ | | ☐ |
| Action 2: Continue to work with an inter-governmental committee | ☐ | | ☐ |
| Action 3: Continue and broaden outreach on urban freight | ☐ | | ☐ |
| Strategic Direction 2: Relieve Congestion for Goods Movement | | | |
| Action 4: Promote off-peak delivery | ☐ | ☐ | |
| Action 5: Deploy operational and infrastructural goods movement priority measures* | ☐ | ☐ | ☐ |
| Action 6: Prioritize goods movement corridors for investment | | ☐ | ☐ |
| Strategic Direction 3: Improve Land Use Compatibility | | | |
| Action 7: Encourage smart growth for freight** | ☐ | | ☐ |
| Action 8: Apply complete streets approach** | ☐ | ☐ | |
| Action 9: Apply freight supportive land use guidelines | ☐ | | ☐ |
| Action 10: Improve the incorporation of goods movement into planning process | ☐ | ☐ | |
| Strategic Direction 4: Reduce the Environmental Impact of Goods Movement | | | |
| Action 11: Study urban distribution (or consolidation) centres | | | ☐ |
| Action 12: Study technological and regulatory initiatives* | | ☐ | ☐ |
| Strategic Direction 5: Improve Goods Movement Data | | | |
| Action 13: Urban Goods Movement Data Program Phase 2 | ☐ | ☐ | |

* MTO’s proposed action regarding the promotion of LCVs is considered as a new action now being addressed under Action 5. MTO’s proposed action regarding the promotion of road safety is considered as a new action now being addressed under Action 12. In other words, initiatives are occurring today in both topics, which up now have not been included in the Action Plan. However, further actions are recommended as detailed in Figure 7-3.

**Actions 7 and 8 have elements in common, but they are complementary: Action 7 focuses on land use, where Action 8 focuses on the corridors that link these land uses. Despite some commonalities, neither action can speak for the other. Moreover, the distinction here is consistent with how municipalities treat the two subjects.

7.7 Key Performance Indicators for Urban Goods Movement

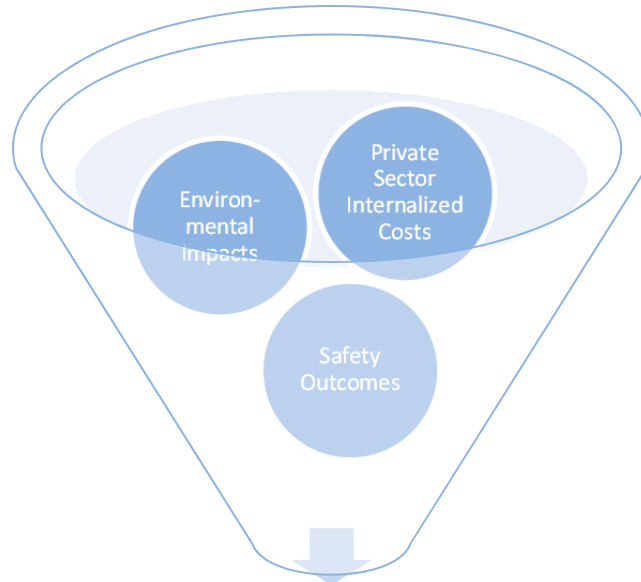
All plans need to be evaluated. However, a plan as wide-ranging as that set out above, should be evaluated at both the micro and macro levels. At the micro level each action proposed in this backgrounder should be developed along with appropriate targets or performance indicators. At a more strategic level it is also desirable to evaluate the overall performance of the goods movement system. This section discusses what macro-level key performance indicators for UGM in the GTHA might look like.

7.7.1 Context for Performance Measurement

As mentioned in Section 4.1, a series of goals and objectives of relevance to goods movement, as well as key performance indicators (KPIs) that are of relevance to goods movement, were identified in The Big Move. Section 6.1.1 provided a framework for understanding private sector interests with respect to goods movement in terms of the relative reliability, expected travel time, cost, and information of alternative supply chains. Of note, private sector goods movement interests are generally in line with many of the same interests identified in the existing goals of The Big Move and even the existing KPI “average bi-directional vehicle speed on key highways in the morning peak period” allows for a measurement of expected travel time.

Generally, the goals identified in The Big Move that are not reflected well in this framework revolve around costs of goods movement that are not given a weight reflective of their true societal value. For example, while greenhouse gas emissions have real economic and ecological costs, these costs are usually not considered (or at least not given due weight) by private sector goods movement stakeholders when making decisions. In order to develop a complete framework of KPIs, we need to situate the private sector interests, which mostly represent factors that are internalized to the private sector, within the wider framework of costs of goods movement to be considered. Broad societal KPIs must reflect both the factors that are internalized to the private sector as well as the factors that are externalized and impact the wider economy and community.

Figure 7-7: Goods Movement Outcomes



Goods Movement Outcomes to be Monitored via KPIs

Figure 7-7 situates the private sector framework of key concerns for goods movement within the wider context of outcomes of goods movement that are also of relevance to be monitored.

7.7.2 Private Sector Internalized Costs

Transportation factors that impact the private sector are:

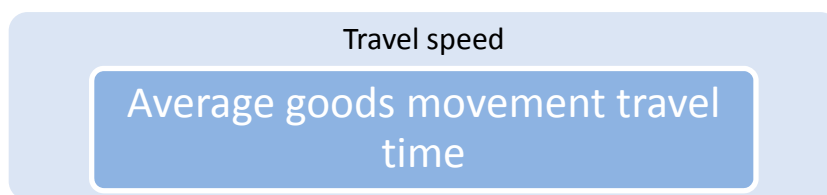
- travel times
- reliability
- cost

This section identifies KPIs to measure each of these elements.

Travel Times

Travel times are already being observed today and the 6:00-9:00 am morning peak travel time is already identified as a KPI in the RTP. Specific factors including stopping and starting, turning radii, and other network design issues may create different outcomes on travel times for commercial vehicles that are more sensitive to these differences than smaller passenger vehicles. For this reason, average speed of travel for commercial vehicles should be measured as a distinct KPI in order to monitor the outcome of goods movement travel time.

In order to calculate summary metrics, it is necessary to sum up these average travel speeds both over time and across every segment of the road network in the geography of interest, with segments weighted by truck-km travelled on that segment. Data on average commercial vehicle speeds based on GPS are available from MTO for 2009 and 2011 for every segment of the arterial (municipal and regional) and highway (provincial) road network in the GTHA. At present, data on truck-km travelled are only available for the provincial highway network and selected major arterials, and only for 2006 in comprehensive form. This data gap is one of the most important in goods movement data in the GTHA.



Reliability

While many goods movement stakeholders may understand reliability as a component of travel time, reliability can have impacts on goods movement distinct from those of average travel time (Figure 7-8). In both scenarios, the average travel time is 45 minutes. In the left panel reliability is lower, so a buffer time of 10 minutes above average travel time is scheduled to ensure that goods arrive at the expected time. In right panel the shipper only needs to schedule a buffer time of four minutes to achieve the same standard for the same number of trips. Although the green (average time) line is at the same point in the left and right panels, the shipper is concerned about the orange line, the amount of time it needs to schedule in order to ensure its goods arrive predictably.

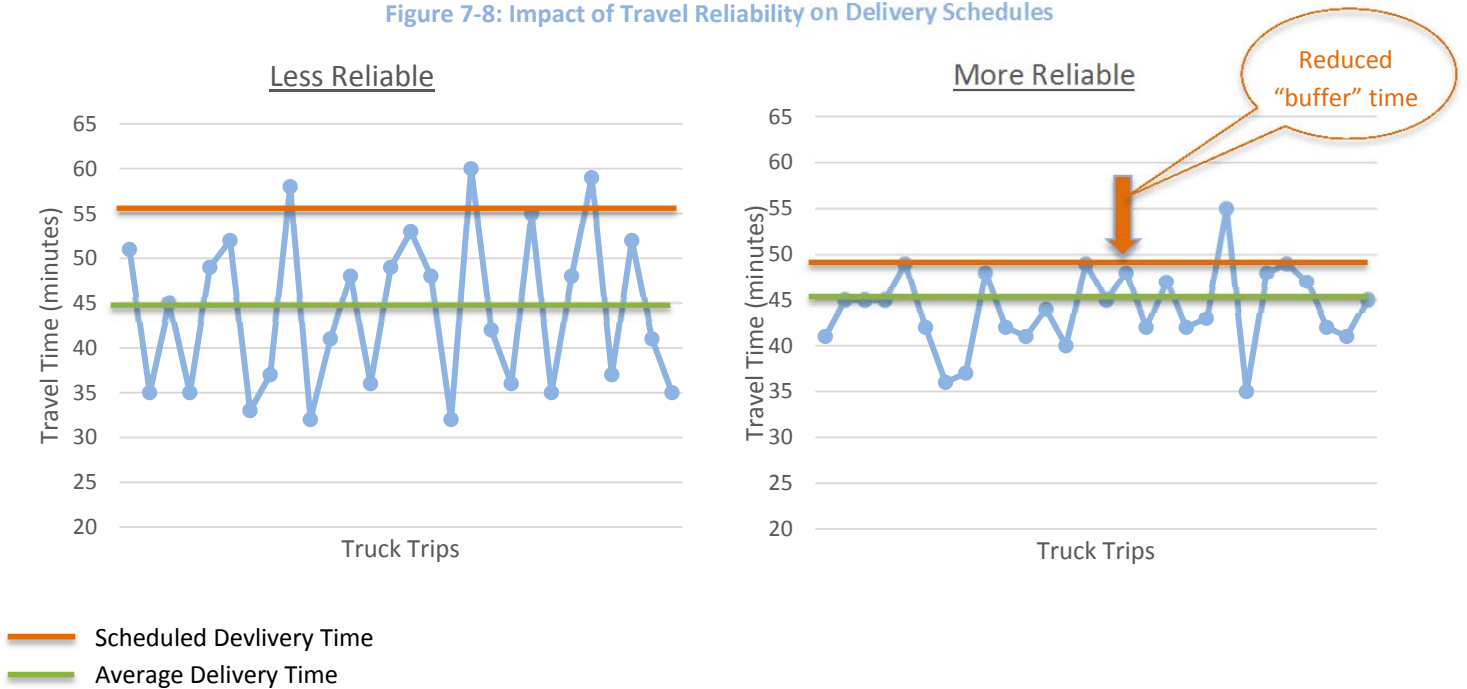
The measurement of travel time is a fast evolving area of transportation research. Commonly, reliability is measured as the 95th percentile trip duration. For example, for a goods movement trip that occurs at the same time each day, the 95th percentile would represent the longest trip duration of every 20 trips that occurred. In general, in order to better understand the reliability performance of a transportation network, the 95th percentile is compared to something else in order to contextualize what this means. The planning time index is calculated as the 95th percentile travel time as a share of the free flow travel time:

$$\text{Planning Time Index} = \frac{\text{95th percentile travel time}}{\text{Free Flow Travel Time}}$$

The buffer index is calculated as the 95th percentile as a share of the average travel time:

$$\text{Buffer Index} = \frac{[\text{95th percentile travel time} - \text{Average travel time}]}{\text{Average Travel Time}}$$

Figure 7-8: Impact of Travel Reliability on Delivery Schedules

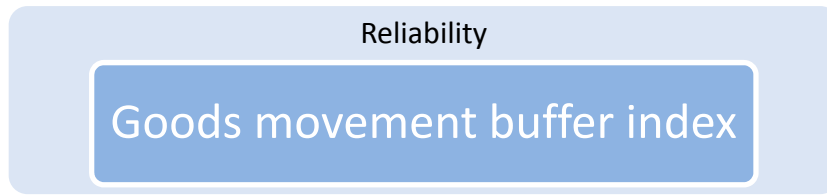


Source: CPCS

Both the planning time index and the buffer index allow for a measurement of the reliability of travel, one comparing to free flow speeds and one comparing to average travel speeds. The buffer index gives us a sense of how much extra time must be scheduled as a buffer to ensure a trip arrives on time due to unreliability. The planning time index gives us a sense of how much time should be planned as compared to if there were no traffic. This measure naturally also counts normal and predictable congestion in its measure. For this reason, the buffer index is a more appropriate measure of the reliability of trip times.

MTO currently estimates a commercial vehicle buffer index for provincial highways and municipal and regional arterial roads in the GTHA. However, as with the speed metric, truck

volume data are only available for provincial highways and selected arterials, and only in comprehensive form for 2006. As a result, calculating summary metrics is not possible.



Cost

In addition to travel time and reliability, goods movement stakeholders are also concerned with the overall cost of moving goods. While cost can be affected by travel time and reliability, it is also affected separately by a number of other factors that make it worthwhile to measure separately from travel time and reliability, e.g. fuel costs, rising driver and material handler wages, road tolls, taxes, utility costs, and land costs. However, total transportation and logistics costs may not be a good indicator of goods movement outcomes. For example, in 2009 total transportation and logistics costs as a percentage of GDP fell to its lowest ever recorded level.⁷⁸ This was likely not due to any fundamental reductions in the transportation and logistics costs, but due to the economic slowdown during the Great Recession that led to lower goods movement activity. For this reason, transportation and logistics costs must be compared to something that allows us to understand how costs of moving goods are changing.

One potential measure could be transportation and logistics costs per tonne-km. The challenge with this measure is that changing trip patterns (increase or decrease in average trip length) may also impact such a measure. The best metric is a transportation and logistics price index, reflecting the prices charged for transportation and logistics services. In practice, these indices are not available for the GTHA, but only at the national level, limiting their usefulness. Nonetheless, it is possible in the future that such indices could be developed for the GTHA, probably in cooperation with Statistics Canada.



7.7.3 Environmental Impacts

One of the largest impacts of the movement of goods that is not internalized by goods movement industries is air pollution associated with the movement of goods. The reduction of greenhouse gas emissions is one of the goals identified in The Big Move. This is already being monitored through a KPI: number of smog advisory days per month.

⁷⁸ Council of Supply Chain Management Professionals 2010 *Annual State of the Logistics Report*

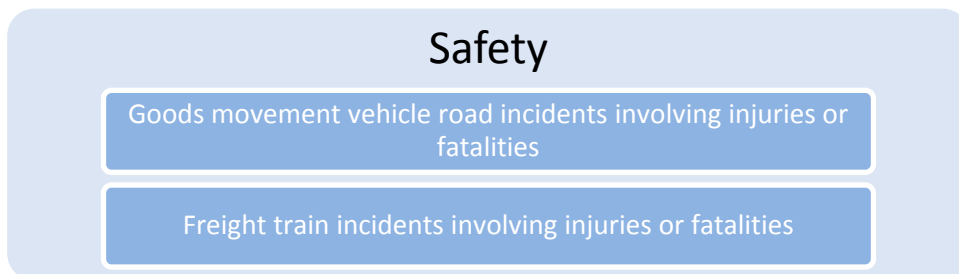
In order to isolate the impact of the movement of goods on air pollution, a calculation of the air pollution due to the movement of goods should be calculated. This can be done using a combination of information on goods movement trips such as: commercial vehicle trip length, commercial vehicle trip speeds, and type of vehicle being driven.



7.7.4 Safety

Another additional concern separate from those factors fully valued by goods movement industry is safety. Safe and secure mobility is identified as a goal in the RTP, with “continued progress to zero casualties and injuries on all modes” as an associated objective of this goal.

A KPI and sub-KPI have been established to measure overall road safety: annual road-based collisions in the GTHA, covering both injuries and fatalities, and annual collisions including all other reportable collisions. In order to isolate the safety outcomes of goods movement, a separate metric can be established to measure the number of road-based collisions in the GTHA, involving either injuries or fatalities that involve a commercial vehicle. A similar indicator should also be created for rail-based goods movement. In both cases the metrics would be more useful if they were calculated relative to overall levels of activity, i.e. truck km travelled and rail tonne-km and car-km.



Indicators are not proposed for air, marine, or pipeline transportation, as rates of death and injury are much lower than in road and rail transport. As well, these modes tend to involve fewer km of travel within the GTHA, making them less important for UGM and less impactful for GTHA residents.

7.7.5 Summary of Goods Movement KPIs

Below are the six KPIs recommended to measure goods movement outcomes in the framework of RTP.

Figure 7-9: Recommended KPIs for Goods Movement and Available Data

| Outcome | KPI | Information Available? |
|-------------|--|---|
| Travel Time | Goods movement travel time | Partial. Average travel speeds for all provincial highways and arterials are available, but truck volume data, which are required for a summary metric, are only available for provincial highways and selected arterials and only for 2006 on a comprehensive data. Truck count data by hour for all arterials are required. |
| Reliability | Goods movement buffer index | Partial. Goods movement buffer indices for all provincial highways and arterials are available, but truck volume data, which are required for a summary metric, are only available for provincial highways and selected arterials and only for 2006 on a comprehensive data. Truck count data by hour for all arterials are required. |
| Cost | Transportation and logistics price index | Not currently publicly reported |
| Environment | Goods movement air pollution index | |
| Safety | Goods movement vehicle road incidents involving injuries or fatalities | Partial. MTO reports heavy truck accidents by location. However, truck volume data would be required to estimate aggregate KPIs for the GTHA. |
| | Freight train incidents involving injuries or fatalities | Partial. The Transportation Safety Board of Canada reports train incidents for the GTHA, however, estimates of tonne-km and car-km are unavailable. As well, incidents involving passenger trains would need to be separated from incidents involving freight trains (based on GO Transit and VIA Rail information). |

Proposed strategies to address data gaps are the subject of a separate Metrolinx study currently underway. The most important urban goods movement KPI data gap is the absence of up-to-date truck volume counts for highways and arterial roads in the GTHA.

Appendix: Goods Movement Strategy Visions

Figure A-1 summarizes how several other jurisdictions have described their vision for goods movement. The examples are drawn from other jurisdictions in the GTHA and elsewhere in Canada, the United States, and overseas. The figure also describes what each example potentially contributes to the definition of a goods movement vision for Metrolinx.

Figure A-1: Vision Statements from Other Jurisdictions

| Source | Potential Vision elements | Relevance to the Metrolinx RTP |
|--|---|--|
| Peel Long Range Transportation Plan Update, 2012 ⁷⁹ | “Peel Region will have a safe, convenient, efficient, multi-modal, sustainable and integrated transportation system that supports a vibrant economy, respects the natural and urban environment, meets the diverse needs of residents and contributes to a higher quality of life.” | Vision from neighbouring region, adding in additional network attributes (multi-modal, safety, convenience and efficiency) and identifies natural and urban environments distinctly. Adds community attributes (vibrancy, diversity). |
| Hamilton Goods Movement Study, 2005 ⁸⁰ | <p>Short Term – 1-5 years (<u>selected</u>)</p> <p>“All land use planning decisions adequately consider direct and indirect impact on the ability for businesses to move goods and acknowledge the critical importance of supporting and promoting industry as the major generator of employment in Hamilton.</p> <p>“Programs to prepare the workforce to respond to existing and future job opportunities in goods movement and related fields are being implemented by governments, educators and industry working together.”</p> <p>Medium Term – 5-10 years (<u>selected</u>)</p> <p>“Industries that rely on just-in-time delivery are moving to Hamilton to take advantage of the availability of 24 hour operations at air, marine and intermodal facilities, placing Hamilton at an advantage compared to its neighbours. Sufficiently large employment lands are assembled, serviced and ready for these new industries</p> | <p>Vision from neighbouring city, specific to goods movement. Brings in relationship with land use and labour force, and adds network attributes (seamless, integrated). Builds on locational and infrastructure attributes. Unique in that it evolves the vision over time.</p> <p>The vision and the goods movement component of Hamilton’s Transportation Master Plan are now being reviewed as part of the TMP</p> |

⁷⁹ Peel Long Range Transportation Plan Update 2012, Final Draft, Region of Peel, Brampton, 2012.

⁸⁰ Excerpted from Hamilton Goods Movement Study, Final Report – Executive Summary, City of Hamilton, Hamilton, June 2005.

| Source | Potential Vision elements | Relevance to the Metrolinx RTP |
|---|---|--|
| | <p>comprising a variety of economic clusters.”</p> <p>Long Term – 10-15 years (<u>selected</u>)</p> <p>“Hamilton is benefiting to full advantage from its transportation network and strategic location which enable goods movement providers, industry and businesses exploit the many cost and time effective transportation modes available while minimizing energy costs and supporting environmental goals.”</p> | <p>update. It is not expected that the review will result in broad changes in direction.</p> |
| <p>Halton <i>Goods Movement Strategy</i>, 2015⁸¹</p> | <p>“The goods movement strategy will support a network that is safe, economical, reliable, efficient, and environmentally sustainable.</p> <p>“Within Halton, goods movement is widely recognized as an essential contributor to the economic, social, and environmental well-being of residents and businesses. “</p> | <p>Recent example of a GTHA goods movement strategy. Focuses on the transportation network, and links operational, economic and sustainability concepts, as well as recognizing the interests of public and private sector perspectives.</p> |
| <p>Vancouver <i>Moving the Economy, A Regional Goods Movement Strategy for Metro Vancouver</i> (draft), 2015⁸²</p> | <p>“As a region, we maintain our global position as one of the best places in the world to live and do business because we deliver goods and services efficiently and reliably in a way that meets the needs of our growing economy and protects the environment, public health and safety, and the livability of our neighbourhoods.”</p> | <p>Relates efficiency and reliability of goods movement to quality of life, the environment, public health and safety.</p> |
| <p>Edmonton <i>Goods Movement Strategy</i>, 2014⁸³</p> | <p>“The Edmonton region is a major manufacturing, logistics and distribution centre and a hub for the oil and gas industry in Alberta. ... It is vital to the economy that commercial transportation moves efficiently through the city and region. Efficiency means the provision of a road network that connects all major goods-generating activity centres and intermodal terminals with each other and with the major highway system directly, safely and with minimal delays, minimizing truck intrusions through sensitive areas.”</p> | <p>Recent example of a goods movement strategy elsewhere in Canada. Adds connectivity and avoidance of sensitive areas.</p> |
| <p>Southern California, <i>On the Move, Southern California</i></p> | <p>“A world-class, coordinated Southern California goods movement system that accommodates growth in the throughput of freight to the region and nation in ways that support the region’s economic vitality, attainment of clean air standards, and the quality of life for our communities.”</p> | <p>Recognizes role of trans-shipment (port) activities in local economy. Links goods movement to air quality, as well as to economic and</p> |

⁸¹ *Halton Goods Movement Strategy, Final Study Report* (draft), Halton Region, January 2015. (Draft final. Not for public release.)

⁸² *Moving the Economy, A Regional Goods Movement Strategy for Metro Vancouver*, draft, TransLink, New Westminster, BC, January 2015. (Draft. Not for public release.)

⁸³ *Edmonton Goods Movement Strategy*, City of Edmonton, Edmonton, June 2014.

| Source | Potential Vision elements | Relevance to the Metrolinx RTP |
|--|---|--|
| <i>Delivers the Goods, 2012.</i> ⁸⁴ | | community vitality. |
| Philadelphia – Camden, <i>Connections 2040, 2013, and 2020 Freight Vision, no date</i> ⁸⁵ | <p><i>Connections 2040 (TMP)</i> <i>Connections 2040</i> envisions a seamless multi-modal passenger and freight system that is safe; convenient; sufficient in its capacity; attractive and affordable to its users; accessible and equitable for all citizens and visitors to locations throughout the region; and incorporates sound growth management, urban revitalization, and environmental and economic competitiveness planning principles.</p> <p><i>2020 Freight Vision (selected)</i> “In the Delaware Valley, the region boasts the nation's finest goods movement system without qualification. Freight speeds efficiently and safely to ultimate destinations by plane, railroad, ship, and truck. Facilities form a cohesive whole and connections between different modes of transportation are seamless. Freight and passenger transportation needs are skillfully meshed together. Philadelphia is synonymous with intermodalism and is the recurring subject of international scrutiny and inquiry.</p> <p>“The region's status as a freight mecca is not accidental. Public and private sector cooperation is unparalleled. Investment in physical and procedural improvements, while judicious, is sufficient and expedient. The available labor pool is talented, highly skilled, and dedicated.”</p> | <p>Example of major US area with long-established goods movement planning program. Long-range plan adds network attributes (sufficiency in capacity, attractiveness, affordability, equitable accessibility).</p> <p><i>Freight Vision</i> is widely cited as a US prototype. Adds network attributes (network cohesion, meshing with passenger network). Further defines labour needs (talented, skilled). Notes that deliberate actions are required to achieve the vision, as well as cooperation between the public and private sectors.</p> |
| Chicago <i>GO TO 2040</i> ⁸⁶ | “The increased investment in our freight system called for in GO TO 2040 will improve economic competitiveness by reducing travel delays and pollution and by improving safety. The private sector will fund some improvements through the normal course of business, but public investment is needed to promote economic growth as well as residents’ health, safety, and welfare.” | Adds economic competitiveness as a key outcome of an improved freight system. |
| Columbus, Ohio <i>2012-2035 Metropolitan Transportation Plan, 2013 update</i> ⁸⁷ | “Vision [for the MTP’s freight program]: Economic development will be advanced through freight transportation infrastructure, investment and policies. The planning process will place emphasis on economic development. Transportation policies, regulations and projects will support the needs of the global supply chain. The freight network is recognized as the cornerstone of efforts to foster a flourishing regional economy.” | Identifies economic development as the desired focus, and directly links improvements in the goods movement network to support this. |

⁸⁴ *On the Move, Southern California Delivers the Goods, Final Report*, Southern California Association of Governments, Los Angeles, December 2012.

⁸⁵ *Connections 2040 Plan for Greater Philadelphia*, Delaware Valley Regional Planning Commission, Philadelphia, July 2013; and *2020 Freight Vision*, Delaware Valley Regional Planning Commission, Philadelphia, Pennsylvania, no date.

⁸⁶ *GO TO 2040 Comprehensive Regional Plan*, Chicago Metropolitan Agency for Planning, Chicago, October 2010.

⁸⁷ *2012-2035 Metropolitan Transportation Plan*, Mid-Ohio Regional Planning Commission, Columbus, Ohio, 9 May 2013 update and amendment.

| Source | Potential Vision elements | Relevance to the Metrolinx RTP |
|---|--|--|
| Portland, Oregon <i>Central City Sustainable Freight Strategy</i> , 2012 ⁸⁸ | “Increase efficient movement of goods while supporting a green economy with family wage jobs and sustaining Portland’s status as a healthy, thriving community.” | Ties efficiency in goods movement to Portland’s sustainability objectives and to the types of jobs it wants in its core areas (‘green economy’). Adds community attributes (healthy, thriving). |
| Houston-Galveston Area Council <i>Regional Goods Movement Plan</i> , 2013 ⁸⁹ | “The vision for the goods movement system in the [Houston-Galveston] region is to be a connected, multi-modal, world-class system that enhances the region’s economic vitality while supporting the mobility and livability needs of its citizens.” | Recent example of US region that has global connections (in this case, through the Port of Galveston). |
| Auckland <i>Regional Freight Strategy</i> , 2006 ⁹⁰ | <p>“Freight movement is recognised as an essential contributor to the economic, social and cultural well-being of all Aucklanders, and is facilitated by a transport system where:</p> <ul style="list-style-type: none"> • People and goods are able to move when necessary • Transport supports vibrant town centres • Streets are important civic spaces • Getting around by all modes is integrated, safe and effective • People have choices which enable them to participate in society • The environment and human health are protected.” | Explicitly states importance of goods movement to the overall well-being of residents. Recognizes role of transportation in developing town centres and of roads as part of the urban fabric. Recognizes need for choices. |

⁸⁸ *City of Portland Central City Sustainable Freight Strategy, Report and Recommendations*, City of Portland, Portland, Oregon, October 2012.

⁸⁹ *Regional Goods Movement Plan, Final Report*, Houston-Galveston Area Council, Houston, Texas, June 2013.

⁹⁰ *Auckland Regional Freight Strategy*, Auckland Regional Council, Auckland, New Zealand, December 2006.