



Policy Paper No. 3

# **GOODS MOVEMENT & THE ECONOMY**

May 2004



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## **POLICY PAPER NO. 3 GOODS MOVEMENT & THE ECONOMY**

### **FOREWORD**

The City of Brampton has developed a Transportation and Transit Master Plan. The purpose of the Master Plan is to define the long-term transportation vision, policies and infrastructure needs to meet future transportation demands in an affordable and environmentally sustainable manner. In addition, it will include an implementation strategy and priorities for immediate action.

This Policy Paper is intended to provide additional background on the Master Plan. Your comments on this document are important. To provide your input or to learn more about the Transportation Master Plan you can:

- Visit our website at [www.brampton.ca](http://www.brampton.ca) and follow the links;
- Submit written comments to the address below; or
- Contact us by mail, email, phone, fax or in person at:

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May 2004

## 1.0 INTRODUCTION

Goods movement is closely integrated with the structure of the Greater Toronto area regional transportation system, urban form and the location and conduct of industry and commerce. Trade is the engine of the region's economy and it is highly dependent on an efficient and effective transportation system, particularly the highway networks. Currently the province's highway system accommodates over 50 billion annual vehicle kilometres of travel. Eight hundred and forty million tonnes of goods are transported on highways daily, and this value is ever increasing.

It is estimated that total commercial trucking activity in Ontario creates employment for approximately 200,000 workers, or 4.8 per cent of provincial employment. Of the total, about 90,000 workers are employed in the for-hire and private sectors of the industry (OTA, 2000). For every 100 jobs in the for-hire trucking industry, 67 jobs are created elsewhere in the economy.

Road and highway improvements typically lead to lower operating costs and savings in travel time for users. Road improvements will result in less wear and tear on vehicles, improved fuel efficiency and shorter trip durations, which is of benefit for trucking firms as this permits lower vehicle operating and labour costs. With lower transport costs, trucking firms can direct these savings to reductions in the cost of goods and services, or they can derive a higher profit. An efficient road system can provide savings for local goods manufacturing and shipping industries that will in turn improve the economy of the Greater Toronto Area (GTA) and the City of Brampton.

Given the economic importance of commercial transportation, the safe and efficient movement of goods and services within and through the City of Brampton must be a key element of the Transportation and Transit Master Plan (TTMP). In order to develop an appropriate strategy for goods movement, the TTMP must outline:

- A clear understanding of the nature of goods being transported, both intra-municipal and those originating in and/or destined to areas beyond the City of Brampton;
- An identification of critical issues; and

- The implementation of a plan that addresses the current and future needs of the City.

Although there are a number of viable modes of transportation currently employed in the GTA for the movement of goods and services, this paper will address only the land freight element. In particular, the focus will be on the truck mode given its dominance as both the primary and secondary means of travel (e.g. for rail transport, trucks are typically employed at either the point of origin or destination, or both, to complete the journey).

## 2.0 BACKGROUND

The GTA is Canada's manufacturing heartland, with significant trade to the United States and other Canadian provinces. As such, the GTA experiences a large proportion of truck traffic associated with goods movement. Within the broader Central Ontario region, 11% of the vehicle-kilometres of travel are by truck, equating to approximately 2.4 million vehicle-kilometres per year of truck traffic. In addition, with only 15% of the total lane-kilometres, the Central Ontario region comprises 35% of all truck traffic in the province (Reference 3, Greater Toronto Services Board).

The Region of Peel and the City of Brampton in particular are supported by the densest expressway network in the GTA. Adjoining or internal expressways include Highways 401, 403, 407, 410 and 427. These highways have promoted the City of Brampton as an important industrial district in the GTA. Transportation and warehousing comprises about 10% of total employment in the Region of Peel. In comparison to the national average of 4.5%, this high percentage shows the economic importance of goods movement for the Region as well as the City.

The 1997 *Strategic Goods Movement Corridor Analysis* (SGMC) study, prepared for the Ministry of Transportation, found that daily commercial vehicle volumes on the 400-series highways are substantial and increasing. On each of the major freeway links, the two-way flow exceeds 8,000 trucks per day. At some points on the GTA freeway network, there is an average annual increase of more than 10 percent in truck movements. Truck volumes along Highway 401 in the GTA exceed 35,000 per day (carrying 460,000 tonnes of goods), near Highway 400 and Weston Road; on Highway 427 they range from 8,000 to 26,000.

Although data has traditionally been collected for three classifications of commercial vehicles, referred to as light, medium and heavy trucks, the term "truck" typically refers to medium and heavy vehicles. These include trucks with dual rear tires, box vans, heavy-duty pick-up trucks and tractor trailer units; light trucks are those with characteristics similar to automobiles and small vans. **Table 1** provides the truck volumes and percent of total vehicle traffic realized in the 2001 Cordon Count program across segments of screenlines that highlight developed areas with substantial truck activity in the City. Truck volumes and

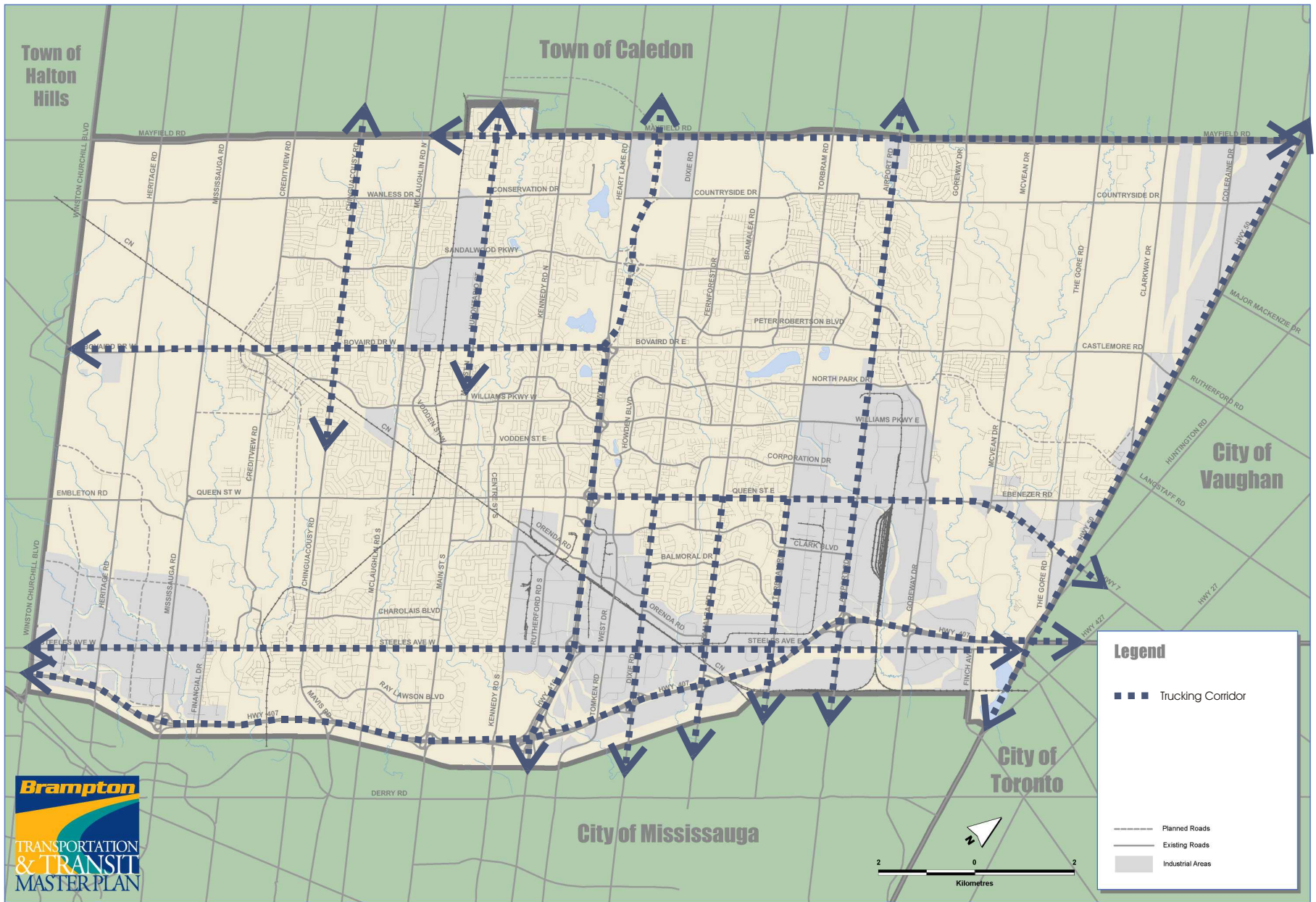
percentages are presented for the morning and evening peak periods and 15-hour period. As can be seen, the truck percentages are quite high across the City, showing the prevalence of truck transportation. The Winston Churchill Boulevard and Highway 50 screenlines show much higher truck percentages than average. This reflects the high level of cross boundary truck traffic demand with York Region, Halton Region and other municipalities. Major truck routes are illustrated in **Figure 1a**. Heavy truck and axle load restrictions are shown in **Figure 1b**.

**Table 1: Truck<sup>1</sup> Volumes and Percentage of Truck Traffic across Major Screenlines**

Screenline	5:30 a.m. – 8:30 p.m. volume (percent)	AM Peak (7-9 a.m.) volume (percent)	PM Peak (4-6 p.m.) volume (percent)
Winston Churchill Boulevard	15,318 (20.7%)	2,795 (18.1%)	2,454 (16.0%)
Steeles Avenue	11,781 (14.0%)	1,543 (10.1%)	1,676 (10.6%)
Mayfield Road	9,460 (15.6%)	1,589 (15.3%)	1,304 (11.1%)
Bovaird Drive	24,038 (12.5%)	3,474 (11.0%)	3,466 (10.0%)
Highway 401/Heart Lake Road	39,039 (17.9%)	6,079 (17.3%)	5,579 (12.9%)
Highway 50	36,171 (22.2%)	5,703 (18.7%)	5,697 (17.6%)
Highway 10/Hurontario Street	33,285 (14.2%)	5,378 (13.9%)	4,685 (10.5%)
Brampton-Mississauga	47,574 (15.6%)	6,459 (12.5%)	6,595 (11.0%)

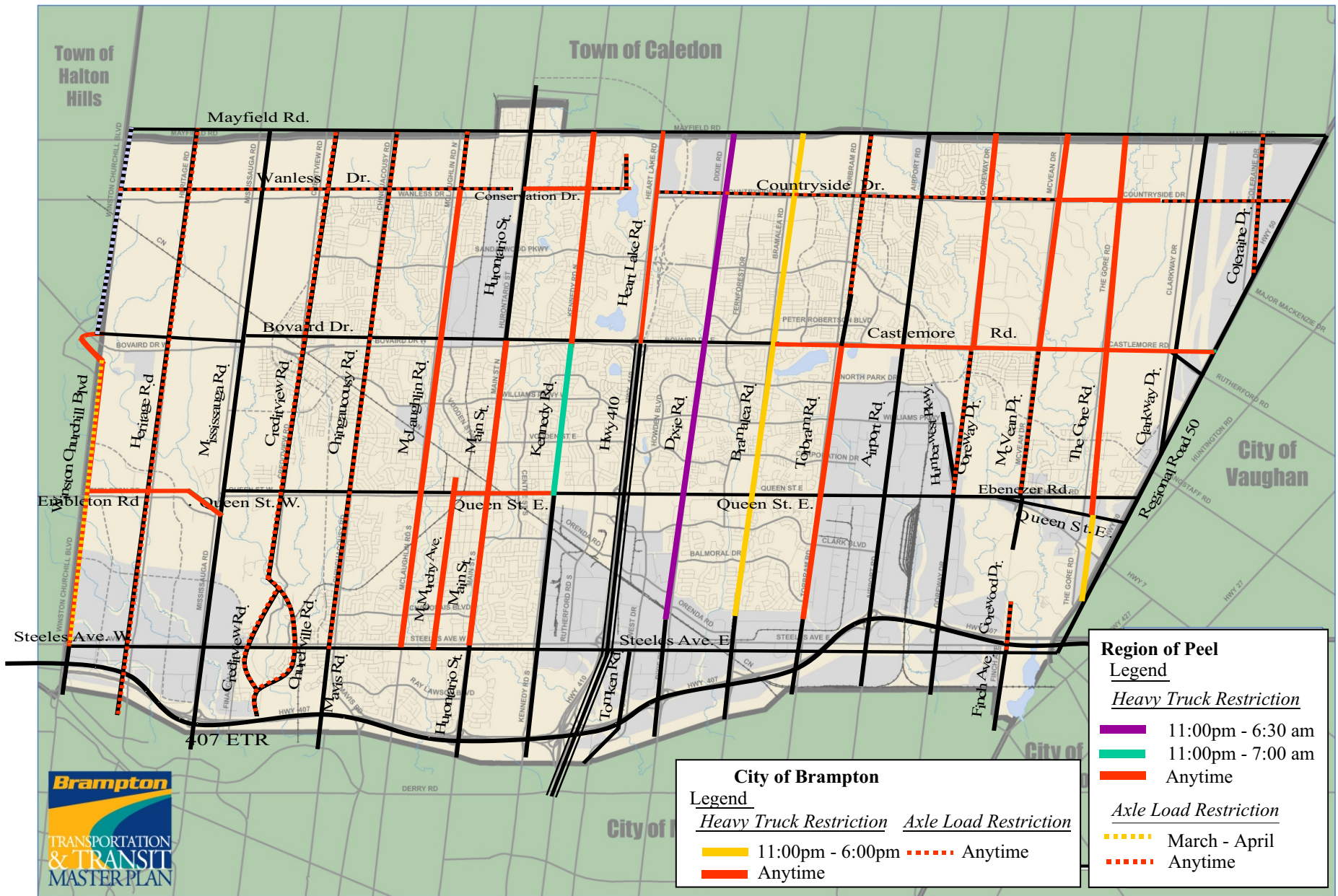
<sup>1</sup> trucks include medium and heavy vehicles only (pick-up trucks and vans are considered autos)

Ontario is forecast to lead all provinces in growth in trucking during the period 1994 to 2010. Ontario's intra-provincial truck traffic is expected to grow by an average annual rate of 2.5%



**Figure 1a: Major Industrial Areas and Trucking Corridors**





**Figure 1b: City of Brampton and Region of Peel Heavy Truck and Axle Load Restrictions**

and its market share by 10%. Similarly, Ontario is expected to continue to lead in terms of its share of inter-provincial trucking. Total Ontario trucking of exports is expected to grow by an average annual rate of 3.7% over the forecast period. Given the predominance of travel, development and road infrastructure in the GTA, these forecast increases are likely to be focussed within the GTA. As such, the growth in truck travel within and through the City of Brampton is expected to be slightly higher than the growth rates predicted for the province. (See Reference 4, IBI Group)

## 3.0 CURRENT ISSUES

### 3.1 Road Network Congestion

The manufacturing, construction and trade industries account for 38% of Ontario's total employment as well as 49% of employment in the City. The strong manufacturing, trade and service sectors gives the region a substantive economic base, providing diversity and stability to the GTA. This serves to enhance the attractiveness of the region as a whole, which increases its competitiveness as a place in which to reside, work and invest. Traffic congestion arising from increases in private automobile commuting and commercial vehicle traffic for goods movement diminishes the relative attractiveness of the region for business and domestic purposes.

Congestion continues to be one of the most important concerns for goods movement vehicles within the GTA, including the City of Brampton. The *GTA Trip Time Travel Survey* study confirms this hypothesis. Of the goods movement firms surveyed, 56% indicated that congestion has a negative effect on the cost of their operation, because of its limiting effect on productivity. The reason for this added cost is the requirement of many trucking companies to meet just-in-time (JIT) delivery schedules. However, this has led to a greater number of commercial vehicles on the road network, and when coupled with an increase in private automobile use, traffic congestion on major arterial roads and highways has increased significantly over time. In the retail sector, JIT is being replaced by quick response (QR), which entails zero safety inventories. Orders are placed with manufacturers as demand materializes and delivery to a point of purchase can occur on the same day.

In order to meet these JIT/QR service requirements, carriers have had to alter their operational practices in the face of ever present, potential or otherwise, congestion. The most common operational practice to resolving the congestion dilemma is to start earlier in the morning and finish later at night. However, longer operating hours, coupled with more frequent trips, results in higher transportation costs. Transportation now accounts for as much as 15% of the final cost of a finished

product. Delays due to congestion can increase this further to approximately 20% (representing a 30% surcharge to transportation costs).

### **3.2 Dangerous Goods Movement**

The transport of dangerous or hazardous goods is an issue that faces the movement of goods in any concentrated urban area, including the City of Brampton. Many regions have designated dangerous goods movement routes on highways and arterial roads, in order to alleviate the concern of spillage or damage occurring within residential neighbourhoods. The City of Brampton does not currently have in place any designated dangerous goods movement routes or policies. The transport of dangerous goods by commercial vehicles occurs mainly on the 400-series highways across the GTA and the CN and CP Brampton rail lines.

### **3.3 Impacts on Residential Areas**

Trucks have other negative effects, including air pollution and noise pollution. Combined, the air and noise pollution can cause harmful effects on residential neighbourhoods.

Truck generators that have the most notable impacts on adjacent residential neighbourhoods are industrial areas located in proximity to these areas. Most of the major industrial land is designated in the vicinity of Highway 7, Highway 407 and Steeles Avenue, east of Kennedy Road and west of Goreway Drive (Williams Parkway and Queen Street East). With their continuity and high capacity across the GTA, these east-west roads serve as major east-west truck routes. Currently neither the City nor the Region has any restrictions on truck traffic on these roads. It has been observed that Highway 10, Highway 410, Dixie Road, Bramalea Road and Airport Road serve as major north-south truck routes. These roads serve both the industrial and residential zones.

Major industrial areas throughout City of Brampton and adjacent residential developments are identified in **Table 2**. The major industrial areas are also illustrated in Figure 1a.

<b>Table 2: Major Industrial Areas in the City of Brampton</b>	
<b>Industrial Area</b>	<b>Adjacent Residential Development</b>
1 Bram West	Credit valley, Huttonville, Churchville area on both sides of Credit River
2 Sandalwood Industrial East	Heart Lake West, Fletchers Meadow
3 North of Countryside Drive between Dixie Road and Heart Lake Road	Sandringham Wellington
4 Steeles Industrial	Fletchers Creek South
5 Brampton East Industrial	Brampton East including Peel Village
6 Bramalea South Industrial	Southgate
7 Bramalea North Industrial and Gore Industrial North	Northgate
8 Highway 427 Industrial	Toronto Gore Rural Estate

In addition to the above industrial zones, the CN rail truck intermodal terminal is located on Bramalea Road at Steeles Avenue.

### **3.4 Highway 407**

Highway 407 is privately owned and operated, and thus any modifications to the current toll structure to increase truck travel on the tollway must realize equal, if not increased, operating revenues to the owners. In other words, the toll revenue that is lost by pricing cars off the road must be recovered through increased truck activity, particularly if commercial tolls are to be reduced. There is no formal mechanism for

the City to cause the toll system to change. The statistics presented above show that in the future, there may be a greater need to attempt to change the toll system, however.

### **3.5 E-Commerce**

E-commerce activities have allowed for purchasing goods over the Internet (e.g. on-line ordering and delivery of such goods as groceries, fast foods, retail and service products). This can serve to decrease discretionary trips by consumers to shopping malls and other retail or commercial outlets. However, counteracting this decrease in trips, goods purchased over the Internet are then required to be shipped to the consumers by commercial trucks (most likely light trucks). A recent study by the Transportation Tomorrow Survey shows that the 7.2% annual growth in truck trips (light and heavy trucks) exceeds that of passenger trips (6.7% per year). This emerging trend, which is forecast to increase in the future, may account for an increase in truck traffic on the arterial road and expressway networks of the GTA and the City of Brampton, contributing to further traffic congestion by commercial vehicles.

### **3.6 Partnerships**

Brampton's goods movement network and systems are tied to those of the Region of Peel and the Province. As the City has grown, the lack of a coordinated approach to goods movement has not been a prominent issue. Now, however, with the City facing congestion issues and high truck volumes on key routes, the need for a coordinated strategy between these partners and the private sector has become more obvious.

Needs in terms of partnerships include a goods data collection system, coordination in terms of truck routes, and, as technology improves, coordination of potential efforts with respect to road pricing or tolling (may be in the longer term).

## 4.0 CITY OF BRAMPTON OFFICIAL PLAN POLICIES

The City of Brampton recognizes the significance of goods movement for the City's economy. The Official Plan identifies the objective of facilitating goods movement, improving the level of safety while providing an economical, efficient system and minimizing the risks associated with the transportation of dangerous goods. The City of Brampton's goods transportation is facilitated by different levels of government. The Federal government is responsible for rail facilities, the Provincial Government is responsible for highways, the Region of Peel is responsible for regional roads, and the City of Brampton is responsible for the local road network. The City recognizes that an effective transportation system requires partnership, consultation and co-ordination and co-operation amongst a various levels of government.

Policies are outlined in the Official Plan regarding a comprehensible and efficient strategy for goods movement within the City of Brampton. A well-organized strategy to provide efficient movement of goods within the City will help to maintain a strong economy and can provide for expansion of City of Brampton's economy in the future. Specific policies include:

- To ensure the provision of adequate roads between Brampton and adjacent municipalities;
- To provide for the safe and efficient movement of goods and services within an integrated automobile, transit, cyclist and pedestrian supportive system;
- To promote a high standard of environmental management and aesthetic quality of routing, design and construction of transportation and associated structures;
- To provide adequate and safe rail facilities and grade separation of railway mainlines from urban roads;
- To co-operate with other levels of government and railway companies in locating, planning and designating new freight or passenger terminals and railway lines to ensure that such facilities are compatible with the transportation network, the environment and other land uses;
- To channel through movements of heavy truck traffic away from residential neighbourhoods and major commercial areas;

- To provide adequate direct access to all truck generating land uses; and
- To encourage land uses that generate heavy truck movements to locate in the proximity of Provincial Highway access points and major arterials.

The City has not established designated truck routes. Rather, it has identified certain links upon which truck traffic is not permitted; truck traffic is thus permitted on all other routes (i.e. all roads can be considered truck routes).



## **5.0 RELEVANT EXPERIENCE ELSEWHERE**

Commercial truck traffic movement is an issue that affects all concentrated urban areas. Other cities and regions in Canada have addressed goods movement in their Transportation Master Plans or through other measures. Examples of policies and programs regarding goods movement in other municipalities are outlined as follows.

### **5.1 Edmonton, Alberta**

The Edmonton Transportation Planning Study addresses long-term transportation needs, including the City's truck route system. The truck route system designates arterial roadways for use by trucks; truck traffic must remain on the designated links for any trip that originates or is destined within the City limits. Trucks may deviate from the truck route system to complete pick-ups or deliveries, but must do so in the most expedient manner possible via the shortest distance from a truck route. Dangerous goods routes are identified whereby trucks carrying hazardous goods must adhere to these designated routes. Such trucks must remain on the designated dangerous goods system unless they are making pickups or deliveries. In addition, the transport of dangerous goods into and out of the downtown core is limited to the hours of 6:00 p.m. to 6:00 am only, unless the Fire Department issues a special permit.

The truck routing system conflicts with the interests of several resident groups and as such a new routing system is required. The Transportation Planning Study identifies that the challenge is to develop innovative strategies to acknowledge the desires of community groups, while addressing industry needs and expectations to provide efficient and flexible goods movement services. (information from Edmonton website, [www.edmonton.ca](http://www.edmonton.ca)).

### **5.2 Vancouver, British Columbia**

Like Edmonton, the City of Vancouver also has a designated network of truck routes, the principle of which is to disperse truck movements over a relatively large number

of arterials so that the impact of truck traffic does not influence one single area of the City. Goods movement in the City is dependent upon the truck route network and good rail access, which work together with land use policies to preserve space for city-serving industrial activities. In an effort to reduce the adverse impacts of trucks on neighbourhoods, the City of Vancouver is investigating stricter enforcement of traffic regulations, restricted hours of truck movement overnight in some residential areas and mandatory truck access plans during major construction projects. (Information from City of Vancouver website, [www.vancouver.ca](http://www.vancouver.ca)).

As the region grows, so will the demand for goods movement on city streets. Containing the growth of car use will be a major factor in providing space on the road network for commercial vehicles. In the longer term, in some instances, priority access to the road network may be needed to maintain an efficient goods movement system. The safety and liveability of neighbourhoods needs to be balanced with the needs of efficient goods movement. A number of the key transportation plan policies adopted by the City, as they relate to goods movement, include:

- Parking and unloading of trucks in the downtown will continue to be reviewed with the intent of improving the use of downtown commercial lanes for commercial vehicles and businesses;
- Warehousing and servicing for the City and downtown are best located close to the businesses which rely on them to help minimize truck traffic (the importance of the city industrial areas as the prime location for these functions is recognized, and they will be retained for these purposes); and
- The impacts of heavy trucks on neighbourhoods will be addressed where practicable by such measures as, stricter enforcement of traffic regulations, time restrictions on some routes, truck movement plans for major truck generators, and roadside mitigation where practical opportunities exist.

### **5.3 Regional Municipality Of Durham, Ontario**

The Regional Municipality of Durham completed a Transportation Master Plan in 2001. This Master Plan in part addresses the goods movement and commercial truck

traffic. Key challenges that drew attention in the Durham Master Plan regarding goods movement are as follows:

- A high-quality arterial road network for goods movement is necessary. The network should be continuous, without truck bans or restrictions, serve typical truck weights and dimensions and be clearly demarcated. Road improvements are necessary at some locations to eliminate impediments to truck travel;
- There is a need for improved connection of the road system to freight terminals, airports and harbours. Also railways should be promoted in order to reduce truck volumes on major roads; and
- Better goods movement information and on-going dialogue with stakeholders are necessary to understand and address the challenges facing the goods movement industry.

The Durham Master Plan recommended actions to address the key challenges:

- Establish a Goods Movement Network by:
  - Determining and signing preferred truck routes;
  - Identifying and promoting potential locations for intermodal transfer facilities; and
  - Disseminating information on the network widely;
- Implement the Goods Movement Network through new road construction, operational improvements and road rehabilitation by:
  - Applying roadway geometric standards that better accommodate trucks;
  - Providing on-street and off-street loading, where appropriate;
  - Avoiding or eliminating by-law restrictions to truck movement, where possible;
  - Upgrading roads and weight restrictions to full load roads; and
  - Reconstructing intersections to eliminate operational impediments.
- Establish a Chairman's Roundtable on Goods Movement to provide a forum for on-going dialogue between industry, affected stakeholders, local municipalities, and the Region; and

- Conduct or participate in goods movement surveys and other data collection initiatives, like Cordon Count programs, on a regular basis to improve understanding of the structure and nature of freight activity.

#### **5.4 Seattle, Washington**

The City of Seattle commissioned a study to compile existing policies related to the movement of freight and goods through the city (Reference 14, TransSystems, 1999). The study identified major freight mobility concerns that required the expansion or alteration of existing policies and identified the basis for making new policy recommendations. The action strategies recommended to address system deficiencies and concerns are described below.

##### **Traffic Congestion Management**

- Encourage goods pick-up and delivery in off-peak hours to the extent possible among affected businesses; and
- Encourage modal separations of trucks, automobiles and trains to reduce traffic conflicts.

##### **Curb Space Limitations**

- Encourage the use of smaller trucks for local pick-ups and deliveries; and
- Regulate commercial curb parking so that trucks performing pick-ups and deliveries can utilize curb space.

##### **Truck Parking Access**

- Provide the necessary infrastructure and facilities for interim truck parking and storage; and
- Encourage rapid truck loading and unloading at warehouses, businesses and factories.

##### **Traffic Operational Concerns**

- Maintain suitable limitations on truck sizes and weights along specific streets and roads with larger trucks; and

- Encourage the optimization of street signs, signals and devices for rapid traffic flow.

### **Central Transfer Terminals**

- Encourage the transfer of freight and goods between large and small trucks at remote terminals.

## 6.0 RANGE OF POLICY DIRECTIONS

A basic requirement in an effective goods movement strategy is good data. A policy direction is incomplete without proper data to identify the requirements and evaluate effective planning procedures. The City of Brampton should participate in and act on data collection programs at regular intervals. This can be achieved in the following ways:

- Leverage sources like ITS/Commercial Vehicle Operations information from the Traffic Management Associations;
- Establish a freight data collection program;
- Work with Peel Region to implement and maintain the data collection programs; and
- Establish an industry/public sector freight advisory council or working group to define data collection needs and programs.

This is discussed further in Chapter 7.

The Region of Peel is conducting a Strategic Study on goods movement in the Region. Interviews conducted with carriers and shippers in the Peel Region showed the following:

- Time is considered the most important planning factor in goods movement;
- Most of the stakeholders are satisfied with the Region's location and existing road network;
- Restrictions on heavy vehicle movement are an issue of concern for some stakeholders; and
- Other issues involve congestion delays at intersections and highways and driver shortages.

In view of the pressing issues concerning transportation in the City, our range of policy directions should be directed to improve the movement of goods and services without sacrificing the level of service to non-commercial traffic. The options can be categorized as follows:

- Expand the current freeway network to significantly increase overall capacity and reduce travel time;
- Implement traffic management schemes to give priority to truck movements or otherwise improve their operating efficiency, particularly during peak periods; and
- Encourage shifts in delivery times and in modes of transportation, both commercial and non-commercial travel to reduce competition for peak period road capacity.

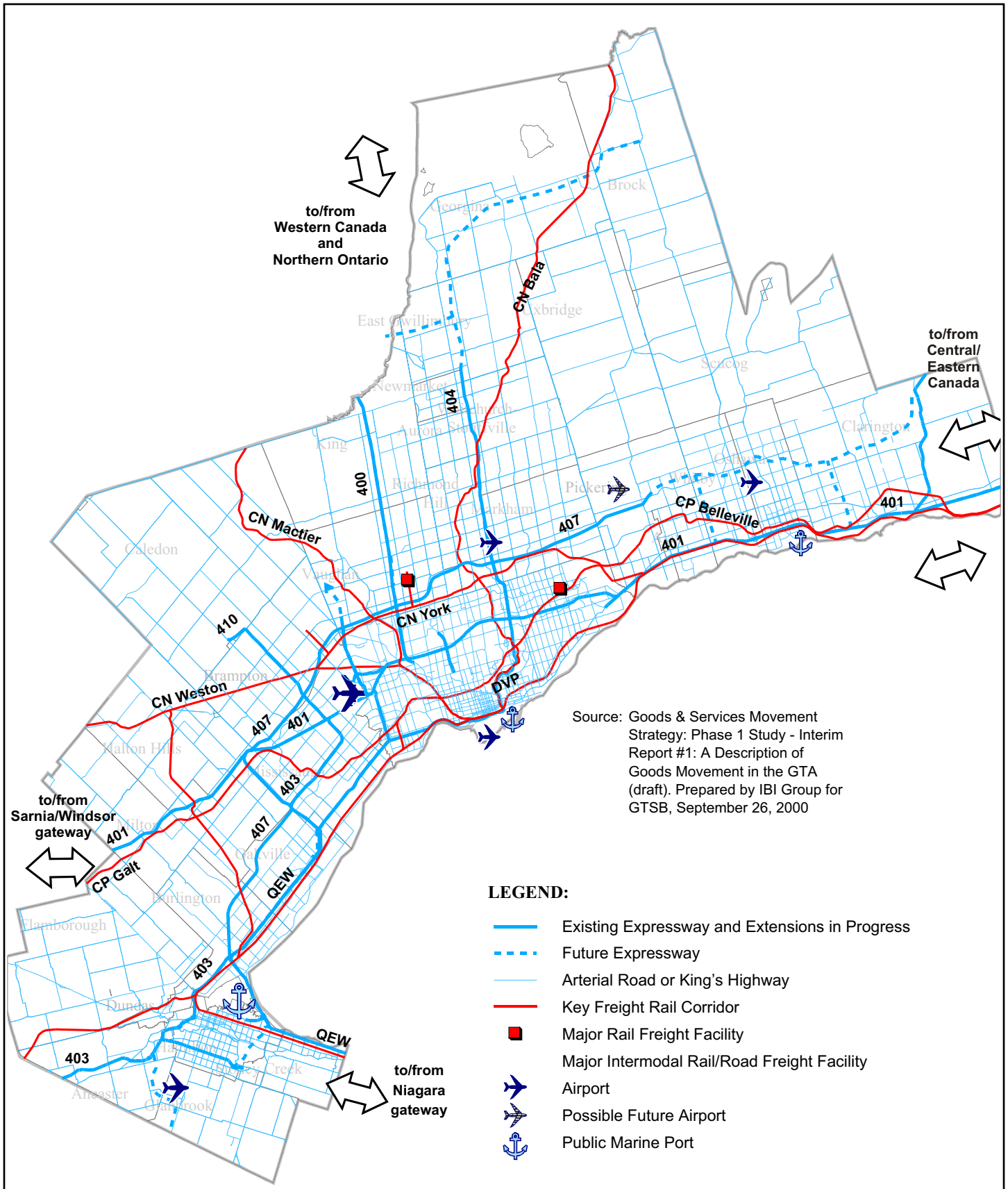
The options are discussed below.

## 6.1 Expand Freeway Network

An extensive goods movement network exists to serve the City of Brampton, comprised of freeways/expressways (including planned extensions by MTO), arterial roadways, railways and the international airport. The same links that comprise the goods movement network are also extensively used by non-truck traffic, particularly commuter traffic during the peak hour periods. In response to business needs, one alternative would be to build new roads. An expanded road system (as indicated in **Figure 2**) can aid in improving the road transportation network for industry by creating a more comprehensive and efficient road network, and by reducing traffic congestion. Examples of freeway expansions include:

- Extension of Highway 427 to accommodate future growth in the adjacent development areas;
- Extension of Highway 410 beyond Mayfield Road; and
- Widenings on the above highways and Highway 407.

However, although building new facilities and expanding those that are most heavily utilized would increase available capacity, on its own this may not be the optimal solution for a number of reasons. First, building new roads alone would simply induce more auto trips, thus failing to provide any relief to existing congestion levels. Second, opportunities for widenings or extensions to existing links are relatively limited, particularly in built up areas. Therefore, in addition to any road expansions, due consideration should also be given to reducing the competition for road space



**Figure 2: Long Term Goods Movement Network**



between commercial traffic and motorists through such initiatives as increased traffic management programs and shifts in modes of travel.

## **6.2 Increased Traffic Management**

As mentioned, increased traffic management programs can be implemented to further improve goods movement through the City of Brampton. Such programs can be specifically targeted at commercial movements and thus provide direct benefits, or alternatively, focus on non-commercial traffic for indirect benefits. As the focus of this paper is on goods movement, only those initiatives focussed on goods movement will be discussed. Further information with respect to additional non-commercial traffic management initiatives is presented in the Policy Paper *Transportation System Management and Intelligent Transportation Systems*.

### **6.2.1 Designated Truck Routes**

In order to provide for the safe, effective and efficient movement of goods and services within and through the City of Brampton, truck routes can be designated to:

- Provide efficient access to commercial and industrial precincts;
- Minimize travel, improve network continuity, accessibility and efficiency, and improve truck operations and safety;
- Match truck weight and manoeuvring to infrastructure geometry and carrying capacity;
- Improve network compatibility with adjacent land uses;
- Direct truck movement to the major arterial system where roadway capacity is greatest;
- Minimize the intrusion of large trucks into residential and environmentally sensitive areas; and
- Continue to facilitate the delivery of goods along commercial streets, reserving street parking for this purpose during specific hours of the day where off-street facilities are not feasible.

As with truck routes in other cities and regions, truck traffic should remain on the designated links, deviating only at points of pick-up and delivery. The obvious drawback to this is that truck activities on the designated truck routes would increase, thereby intensifying the local impacts (e.g. pollution, noise, wear and tear, etc.) along the route.

As previously indicated in Chapter 4.0, the current City of Brampton policy is not to designate truck routes, but rather to designate “alternative routes”. A change of policy would be required should designated truck routes be implemented.

### **6.2.2 Designated Truck Lanes**

Travel lanes in key goods movement corridors and within high truck traffic areas (e.g. near intermodal facilities) can be designated as “truck-only” lanes. On freeways, truck lanes could significantly reduce the weaving interactions between cars and trucks, and therefore reduce the potential for accidents. In addition, the flow and operation of commercial vehicles would be expected to improve given the uniform operating characteristics of trucks. (Trucks tend to operate at more uniform speeds as compared to cars, are less likely to speed and can follow at closer distances as compared to mixed traffic operations). Improved operations could also decrease air pollution associated with truck traffic, as vehicle emissions are reduced when truck movements are uninterrupted.

However, on arterial roadways the effectiveness of truck lanes will be dictated by overall traffic operations and as such, the benefits are not expected to be as great as compared to freeway truck lanes. This is similar to the operations of HOV lanes and can only be remedied through intersection priority measures.

Although the designation of truck-only lanes is likely to improve the goods movement through the City of Brampton, it would effectively reduce the number of lanes available to other vehicles. In most cases, although significant, the amount of truck traffic does not warrant a single lane all to itself; excess capacity would remain within the truck lanes. Simultaneously, the demand for the remaining lanes would

increase as the number of lanes, and hence capacity, available to non-commercial travel would decrease. The public is likely to observe a truck lane that operates half-empty while the remaining lanes experience severe congestion levels, a scenario that would not be ideal to any non-commercial traveller.

Provided that sufficient capacity exists, reserved truck lanes could be combined with HOV lanes to increase the demand for the lane and better utilize its capacity. However, this is likely to have further ramifications given the interaction between trucks, buses and high occupancy passenger cars. Alternatively, such lanes could be restricted to HOV use during the peak periods and available for truck use during the remaining non-peak periods.

### **6.2.3 Intelligent Transportation System (ITS) Applications**

A recent study conducted by Sabounghi & Associates and Delcan (1999), defines ITS “as the application of advanced information processing, communications, sensing and control technologies to improve the way in which ground transportation systems are designed, built, managed, and operated”. ITS is refined into subsystems which include Advanced Traffic Management Systems (ATMS), Advanced Traveller Information Systems (ATIS), Advanced Public Transportation Systems (APTS), Advanced Rural Transportation Systems (ARTS), Commercial Vehicle Operations (CVO), Advanced Vehicle Control & Safety Systems (AVCSS), and Automated Highway Systems (AHS). Most of these subsystems must interact with each other to yield an integrated solution.

The area of greatest potential for ITS to improve urban goods movement is in the application of ATMS and CVO. ATMS would provide the operators with real time information regarding congested areas, trip times via alternative routing, and accident sites to avoid, and therefore address some of the problems facing goods movement within urban areas. CVO builds on ATMS and other ITS systems in providing the services and associated benefits as outlined in **Table 3** (Sabounghi & Associates and Delcan, 1999).

**Table 3: ITS Applications to Improve Commercial Truck Movement**

<b>1</b>	<b>Commercial Vehicle Electronic Clearance</b>	<ul style="list-style-type: none"> <li>Enables transponder-equipped trucks to have cargo customs clearance, driver immigration clearance, safety status, carrier credentials, and weight checked at mainline speeds, minimizing stops; this application includes both provincial highway weigh stations and border crossings</li> </ul>
<b>2</b>	<b>Automated Roadside Safety Inspection</b>	<ul style="list-style-type: none"> <li>Facilitates roadside inspections by accessing the safety performance records of carriers, vehicles, and drivers; and eventually, access the on-board safety monitoring system</li> </ul>
<b>3</b>	<b>On-Board Safety Monitoring</b>	<ul style="list-style-type: none"> <li>Senses and monitors the safety status of a commercial vehicle, cargo, and driver at mainline speeds</li> </ul>
<b>4</b>	<b>Electronic Data Interchange (EDI)</b>	<ul style="list-style-type: none"> <li>Provides electronic communication between shipper, carrier, governments, and service providers; and facilitates commercial vehicle administrative processes, and commercial fleet management</li> </ul>
<b>5</b>	<b>Commercial Vehicle Administrative Process</b>	<ul style="list-style-type: none"> <li>Provides electronic purchasing of credentials and automated mileage and fuel reporting and auditing, reducing the cost for collecting data on mileage and fuel purchased within each province and state</li> </ul>
<b>6</b>	<b>Dangerous Goods (Hazardous Material) Incident Response</b>	<ul style="list-style-type: none"> <li>Provides immediate notification of an incident and the description of dangerous goods involved</li> </ul>
<b>7</b>	<b>Commercial Fleet Management</b>	<ul style="list-style-type: none"> <li>Provides communications between drivers, dispatchers, and inter-modal clearance transportation providers, improving the reliability and efficiency of carrier pickup-and-delivery operations</li> </ul>
<b>8</b>	<b>Intermodal Freight Management</b>	<ul style="list-style-type: none"> <li>Provides tracking of container location across various modes, management of inter-modal transfer facilities, routing and control, freight security etc.</li> </ul>
<b>9</b>	<b>Road Weather Information Systems (RWIS)</b>	<ul style="list-style-type: none"> <li>Provides the driver with information related to microclimate weather conditions in the immediate road ahead</li> </ul>

**Table 3: ITS Applications to Improve Commercial Truck Movement**

<b>10</b>	<b>Truck-Only Toll Lanes</b>	<ul style="list-style-type: none"> <li>• Most often funded with user fees paid by trucking companies, this application enables segregation of truck traffic from other users. In exchange for using the toll lanes, tractor-trailers are allowed to increase the size of their payloads, for example, two or three trailers at a time. This saves a significant amount of shipping costs.</li> </ul>
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A number of these systems are currently in place throughout Canada and the United States. Such programs include:

- COMPASS – This system reduces the impacts of both recurring and non-recurring congestion on Highway 401 through computerized data acquisition and processing, incident detection and management, and dissemination of traffic information to police and travellers.
- HELP (Heavy Vehicle Electronic License Plate) - The goal is to allow a truck equipped with a transponder to drive through the entire network without stopping at weigh stations or ports of entry (a total of 40 sites through the US and British Columbia are employed).
- AVION/Advantage I-75 - The objective of the Project is to automate inspection control systems for weight, safety, cargo and license verifications, and was set up with the intention of moving freight with as minimum a delay as possible. Advantage I-75 involves 22 weigh stations along the I-75 corridor in the United States and 7 weigh stations along Ontario's Highway 401.

The successful implementation of the above projects has illustrated the benefits of ITS systems to goods movement. However, there are barriers to ITS deployment that must be overcome before full benefits can be realized. These barriers can be categorized as issues affecting industry (most of the initiatives must be implemented by the trucking industry), the role of government, and standards development. Lack of industry standards and cost make it difficult to integrate various complementary systems.

### **6.2.4 Changes to Regulations**

Changes to current regulations may be required to implement traffic management programs, such as priority lanes. Presently there are few regulations with regards to the movement of goods across the City. The creation of designated truck routes and dangerous goods movement routes may be necessary to realize efficient and effective flows of commercial vehicles through and within the City of Brampton as it grows.

### **6.2.5 Traffic Enforcement**

Traffic enforcement is an important element in monitoring and regulating implementation. Proper traffic enforcement assists policy makers in facilitating more efficient movement of traffic. In order to reduce the manual ‘policing’ costs, the City may install cameras to automate traffic enforcement. Any automated traffic enforcement installation should be preceded by a traffic engineering study to verify the existence, extent and cause of the problem and to implement traffic-engineering countermeasures. Implementation of traditional enforcement measures, such as ‘dummy camera’ is many times inexpensive and effective. In any traffic enforcement, public safety should remain the primary goal. A detailed education and information effort is also helpful. Traffic enforcement methods themselves need to be monitored over time in order to assess and incorporate efficacy, efficiency and progress of the system.

## **6.3 Foster Changes in Travel Modes and Time of Travel**

With respect to mode of travel, benefits to goods movement can be achieved through changing the mode by which goods are transferred and the time they are delivered/transported, and by changing the mode employed by non-commercial travellers. Again, the focus will be on the initiatives geared towards goods movement. However, it should be noted that for non-commercial travel, encouraging public transit as opposed to the private automobile would effectively increase the available road capacity for goods movement; a single bus is equivalent to approximately 30 cars. From a capacity perspective, reserved bus lanes have 4-5 times the capacity of standard travel lanes. Any initiative to increase the efficiency of goods (and

passenger) movement will likely require incentives to the users and private industry. As a minimum step, the City can provide communications (“social marketing”) outlining the need for business to assist in demand management, and the benefits that can be gained. This communication ideally should take the form of a two-way dialogue between the City and industry, to foster better cooperation. It could take the form of Travel Management Associations. The City can also provide support to the industries that take measures to manage their travel demand (for example: ride sharing, flexible work hours, low cost transit passes etc.). These measures can include municipal awards.

### **6.3.1 Modal Shift**

A modal shift from road transport of commercial goods to transporting goods via rail can decrease traffic congestion on the GTA’s highway and road network. Commercial vehicles have amplified the traffic congestion on the highway network traversing the City of Brampton. As illustrated in Figure 2, the GTA has an extensive rail freight system – the main cross-Canada freight routes for both CN and CP railways transverse the GTA (IBI Group, 2000). Within the City of Brampton, both CN and CP railways are extensively used. Both these railways connect the City to important business hubs in North America. The Brampton intermodal terminal is one of the busiest in the province. Although road travel will be needed in most cases to transport goods from the rail and air-freight facilities to the final destination, length and duration of the trips can be significantly reduced through good railway connections. This could therefore reduce the volume of commercial vehicles present on many sections of highways and arterial roads.

### **6.3.2 Intermodal Travel**

The trend in goods movement is to focus on the integration of modes of transportation into a door-to-door freight service. Trucking has become the dominant mode because it provides flexible, efficient, reliable and timely service required by most shipping companies. Trucking dominates in the short-distance, time sensitive, small shipment marketplace. It is estimated that more than 95% of the goods moved

within Ontario depend on truck transportation, either solely (70-75%), or as part of a truck-rail intermodal shipment (OTA, 1999). Rail dominates in the long-distance, bulk commodity marketplace, where trucks are less efficient and where transit times are less of a concern. Trucking and rail, for the most part, are not in the same business and are not interchangeable. However, by combining the best of both modes, a more efficient means of goods movement can often be achieved through intermodal travel. Removing long-distance hauls from the congested highway network, time and cost savings and greater reliability may be realized in compensation.

Intermodal goods movement refers to the transportation of unitized freight loaded in a container or truck trailer in a move that uses at least two modes of transport. For example, a truck trailer moved via rail to the City of Brampton and via truck within the City of Brampton would be considered an intermodal movement. Faced with recent developments on safety issues, potential changes to the hours a driver is allowed behind the wheel and by the introduction of road pricing regimes, many trucking companies are looking at intermodal travel as a viable option. New technologies introduced by railway companies will also off-set some of the railway inadequacies in terms of pricing, transit time and reliability by eliminating the need to process intermodal equipment at terminals.

Within the GTA, the biggest opportunities for rail are in the intermodal sector, whereby goods manufactured in the surrounding area are assembled in distribution centres and sent out to other locations across Canada. The use of intermodal travel for goods movement is expected to grow by 6 to 8% per year over the next several years (OTA, 1999). However, this is dependent upon the degree to which the required transportation services can be provided at an attractive price; the marketplace will determine the growth of intermodalism. It should also be recognized that intermodal goods movement is not an alternative for all truck shipments.

While there have been significant improvements in intermodal service over the past 10 years, through such means as the introduction of double-stack, road-railers, iron highways, etc., one must recognize the limitations. Intermodal travel cannot compete with trucking in short-haul markets (under 750km); it still has difficulty serving just-



in-time and especially exactly-in-time shipment needs; and shipper concerns over flexibility of schedules, winter shut-downs and equipment shortages persist.

### **6.3.3 Time of Travel**

During the peak periods of travel, freeways through the GTA operate at capacity and thus result in considerable traffic congestion and travel delays. The occurrence of accidents and incidents further exacerbates the problem, resulting in increased congestion. In an effort to combat this, the movement of goods should be encouraged to occur during non-peak hours (the implementation of just-in-time delivery and the nature of certain goods will still require peak hour operations). However, it is recognized that congestion is no longer a “peak hour” phenomenon but rather extends in duration throughout the day. As such, the effectiveness of off-peak operations may be somewhat limited.

## **7.0 MOST PROMISING DIRECTIONS FOR CHANGE**

In response to projected growth in commercial traffic, it will be necessary to implement measures to ensure that safe and efficient transport of goods can be provided and maintained. Brampton currently depends heavily on goods movement for its economy; it is therefore logical to define directions for change that support this industry, while ensuring that the City's infrastructure network is not unduly impacted, that residential communities are protected, and that Brampton's ability to move forward with the balanced road/transit strategy is not constrained.

### **7.1 Goods Movement Data Collection**

The City and Region should work together to collect data needed to track goods movement activity. The key transportation data item would be truck traffic on screenlines, classified by light/heavy trucks. This can be collected as part of a coordinated cordon count program. Data should be collected annually.

The City and Region should also work with industry stakeholders to identify public-private data collection initiatives, which can support safe and efficient goods movement.

One option would be via the system created for the Transportation Tomorrow Survey (TTS), a comprehensive travel survey conducted in the GTA once every five years. For a GTA wide exhaustive goods movement and travel survey needs, the City, the Region and private stakeholders can provide/increase the funding support to the TTS conducting agency for data collection and analysis. A public-private relationship is needed for this initiative. Similar to the TTS, this survey could be conducted once every five years. These data programs can then lead to further co-operative ventures, building on the findings of the data analyses.

## 7.2 Big Picture Initiatives

The former Greater Toronto Services Board (GTSB, 2000) has outlined several opportunities for more efficient access for goods movement that should be considered within the City of Brampton. These include:

- a. Improve connections between arterials and expressways;
- b. Protect connections to intermodal freight facilities;
- c. Rationalize rail lines to consolidate key freight rail facilities on some lines; and
- d. Intensify public transit and intercity rail services on other lines (thus shifting demand from the private automobile to public transit).

A variety of infrastructure and technological improvements have also been recommended to support goods movement across the GTA. These measures, outlined as follows, can promote more efficient traffic flow, and in turn improve access and movement of goods:

- e. Priority lanes for commercial truck traffic;
- f. Improved off-street loading and parking facilities;
- g. Efficient incident management systems;
- h. ITS initiatives aimed at disseminating road information to drivers;
- i. Improved freeway networks;
- j. Traffic management systems; and
- k. Streamlined activities for improved goods movement.

The Region of Peel and the City of Brampton are at the forefront in serving the region's economic vitality through its extensive goods movement system. Yet the City and Region are not deriving any direct benefit from these services. The province and the federal government gain direct benefit from the existing road and fuel taxes and licensing fees. A range of policies thus need to be developed at the provincial and/or federal level so that a portion of these roads and goods movement generated funds can be distributed among the municipal and regional government for the development of infrastructure in the municipal and regional level. But any new tax system for the existing goods industry in the City has to be extensively studied before

its imposition so that the balance between this employment sector and the development funds generated from it is not destabilized.

It is important to establish a working group in the near future (including the Region, local municipalities, the Province, and adjacent municipalities) to develop a coordinated truck route network for the City of Brampton and Region of Peel for improving upon the current “defacto” network evolved from the various truck restrictions that have been put in place over the years.

### **7.3 Summary of Recommendations**

1. The City and Region should work together to collect data needed to track goods movement activity. The key transportation factor would be truck traffic on screenlines, collected through an expanded cordon count program. Ideally, further data collection programs would involve a broader survey of goods movement origins/destination and travel patterns;
2. Work with MTO and 407ETR to introduce incremental goods movement initiatives as needed on the expressway network and at ramp terminals;
3. Work with Peel Region to maintain and enhance an effective trucking and intermodal network, as demands grow. This may involve elements from the list a) through k) above. Initiatives such as truck-only lanes must be balanced against the need for transit priority lanes in the overall TTMP;
4. Establish a working group as described above;
5. Support an effective intermodal network by introducing access improvements as needed; and
6. Pursue an urban agenda with the federal government which includes appropriate support for good movement requirements.

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