Moving Goods
IN THE NEW ECONOMY

Proceedings and additional research resulting from a series of workshops organized by Moving the Economy and the Canadian Urban Institute
Moving Goods in the New Economy

A primer for urban decision makers

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For more information on Moving the Economy or the Canadian Urban Institute, visit the following web sites:
- MTE <www.city.toronto.on.ca/mte>
- CUI <www.canurb.com>
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Introduction

This primer is the result of a collaboration between Moving the Economy (MTE) and the Canadian Urban Institute. It is aimed at making the urban goods movement connection at this critical time in the life of Canadian cities. It originated with a series of three MTE workshops on urban goods movement.

The first workshop on rail freight, called Railways and the Greater Toronto Area: A Workshop on Goods Movement, Railways and the Future of the Region, was co-organized with the Railway Association of Canada. For the second workshop, international logistics expert Professor Alan McKinnon was invited to give an overview of global logistics trends in his presentation entitled What in the World is Happening to Goods Movement? The third workshop, entitled Goods Movement: Can Industry Help the GTA become More Efficient?, invited the corporate sector and logistics companies to outline emerging issues and trends in urban goods movement. It was co-organized with the Canadian Urban Institute, and became the jumping off point for this primer.

In summarizing all we learned at the workshops, we wanted to demonstrate how much we need to understand about goods movement in cities, and how vital it is that progress be made on this front if our cities are to remain competitive in terms of our regional economies as well as our quality of life and environment. At the same time, we wanted to demonstrate with living examples how some industries and cities are evolving new systems, technologies, and approaches to meet the emerging economic, social and environmental challenges and opportunities related to urban goods movement, with a view to exploring what can be applied in Canadian cities.

Representatives from Transport Canada supported this resolve and kindly agreed to underwrite the preparation of this short primer. Originally intended as a simple summary of the workshops, it has grown to include a mix of commentaries on key trends underlying urban goods movement interspersed with analysis from several presenters at the sessions. Chapters four and five provide insights from the perspectives of rail and truck-based logistics specialists respectively. It should be noted here that the perspectives presented by contributors to the workshops reflect the priorities of their sector or industry. No attempt has been made to balance their arguments.

This primer reflects a wide diversity of contributions in style as well as content, so we have done our best to bring it together in a coherent form that honours this diversity. We have also graphically highlighted the real life examples or case studies for ease of use. To keep the text as free as possible from explanations of industry jargon, we have appended a glossary. Where terminology appears in bold face in the text, definitions can be found at the back of the book.

We sincerely hope that the level of dialogue and action on goods movement in urban centres will be raised as a result of some of the issues identified in this primer.
Urban Goods Movement – Emerging challenges and opportunities for cities

Over the past few decades, transportation policy makers, planners, and city officials in jurisdictions around the world have focused their attention on mitigating the impact of car travel and on encouraging more people to choose public transit and other sustainable modes. The impact and effect of goods movement as an urban phenomenon has received relatively little attention until quite recently. As a result, we enter the 21st century with limited knowledge and little useful data about urban goods movement. To illustrate the extent of the challenges facing cities with respect to goods movement issues, at least 15 of the world’s leading cities are currently developing strategies to deal with goods movement on a priority basis.

The dynamics behind growth in goods movement

The 20th century was a period of unprecedented urbanization. In 1900, there were only five cities with more than one million people (London, New York, Paris, Berlin, and Chicago). By the beginning of the 21st century, there were at least 25 cities with populations of more than 10 million (see exhibit). In all, there are about three billion people living in urban areas throughout the world. These people (some say “consumers”) all need food, clothing, shelter, and access to the vast array of products, goods, and services available today, which means that these items have to be sourced, created, transported, and distributed to their final destinations. With commercial traffic and the general public competing for the same scarce transportation infrastructure, the ability of shippers and logistics specialists to meet delivery deadlines can be put at risk. Little wonder then, that goods movement in cities is moving well up on the agenda.

At the same time, the desire to satisfy burgeoning consumer demand has led the world’s leading manufacturing and retail companies to increase the speed and efficiency of their operations. As firms learn how to reduce the time needed to develop new products, they also compress the time required to turn raw materials into finished goods. This has spawned manufacturing methods such as Just-In-Time (JIT) where production lines are geared to receive parts only when they are needed. In addition to improving production efficiency, this minimizes the time that a manufacturer is liable for the cost of materials before they are turned into a finished product. Processes like JIT result in smaller orders and more frequent deliveries – and in part explain the high levels of congestion in urban areas as the operators of trucks, light vans, and other vehicles struggle to meet delivery targets.

At the retail end of the supply chain, consumers are demanding choice as well
as low prices. The result is that retailers are now expected to provide an unprecedented range of goods in different sizes, styles, and price points. This is why big box stores and large supermarkets have become a major part of the urban landscape. Keeping retail stores stocked with such a wide range of goods is a logistical challenge unique to our times. The most obvious symptom of such trends has been a steady increase in the number of trucks on our roads and highways. Less obvious but as significant is the consumer’s role in freight transport. The World Business Council on Sustainable Development (WBCSD) has recently reported that shopping trips are a major form of freight transport and for example, that the energy required to take a packet of corn flakes from the supermarket to home can involve up to five times the energy involved in getting them to the supermarket.

The internet
The internet has also had a major impact on goods movement, and this impact is on the rise. At the consumer level, firms such as GroceryGateway.com offer home delivery for groceries ordered on-line. Although this may reduce the need for consumers to travel to supermarkets, this new type of business creates major logistical challenges for the "virtual" grocery store. Because consumer expectations are high, the virtual store needs to maintain a fully stocked "bricks and mortar" warehouse and a fleet of delivery vans that can deliver orders quickly. This is just another example of the power of the consumer in shaping the demand for goods movement.

Exhibit 1: The World’s Top Cities

In 1900, there were 5 cities with more than one million people. In 2000, there were 25 city regions with more than 10 million

1900

London, New York, Paris, Berlin, Cairo

2000

Mexico, Sao Paulo, Tokyo, Calcutta, Greater Bombay, New York, Seoul

Rio de Janeiro, Delhi, Greater Lagos Area, Tehran, Cairo, Jakarta, Shanghai

Karachi, Istanbul, Los Angeles, Venice, Milan, Baghdad, Moscow, Bombay, Thessaloniki, Paris, Beijing

Goods movement in downtown areas and central business districts (CBDs)

Road congestion and lack of parking are synonymous with downtown areas in many cities. In high density areas, where it is neither practical nor preferable to increase road infrastructure significantly, demands on road use have to be rationed and shared. In terms of goods movement, downtown areas pose a particular set of challenges, especially as cities grow and densify. The illegal use of curb lanes to load and unload and the difficulties of manoeuvring large trucks in narrow streets with tight corners are daily problems for shippers and for city officials alike. But restraining goods movement in downtown areas without providing alternatives will have an adverse effect on the health and vitality of businesses, not to mention quality of life. To date, at least in North America, little has been done to gear the goods movement strategy to the density and characteristics of the downtown area. The situation that results is akin to an unhealthy human circulatory system — nutrients, or goods, can move relatively freely through the major arteries, but cannot manage to supply the capillaries, starving us of oxygen. Fortunately there is a growing kit of small scale remedies for getting goods to downtown cores that will, in their cumulative effect, be pivotal in keeping our cities and their economies vibrant and free-flowing.

Gearing the strategy to the challenge
The diagram in Exhibit 2 shows in a conceptual way the relationship between
different modes of delivering goods, their relative speed and capacity, and how this affects where in the city the transfer points for these modes tend to be located. This, in turn, helps determine the type of vehicle chosen to move the product closer to its destination. As urban areas grow in size and population, the transfer points for bulk freight have moved further from the core in search of locations less likely to incur conflicts with neighbours as well as to secure benefits of lower taxes and the opportunity to build state-of-the-art facilities in locations that meet requirements. In the case of Toronto, for example, railway yards—originally located in the heart of downtown—moved first to suburbs like Scarborough, then to the outer reaches of the Greater Toronto Area in Milton and Vaughan. The transfer points for trucking have also moved away from the downtown core, primarily to avoid congestion but also to acquire sites with sufficient space to maneuver 53’ tractor trailers. Although major airports function primarily for the benefit of passengers, airports play an increasingly important role in moving freight on a worldwide basis. When Lester Pearson International Airport was built in the 1930s, it was sufficiently far from the urbanized area of Toronto that land use conflicts were rarely an issue. Today, like nearly every major airport in the world, LBPIA has to manage its operations so as to minimize conflict with neighbouring residents. In contrast, nearby Hamilton’s airport has focused on serving the cargo market and offers competitive hours of operation to customers. The common denominator for all modes of goods transport everywhere is that freight operations can rarely escape urban growth. Finding ways to mitigate these impacts is quickly becoming a priority.

New pressures call for new solutions for the movers of goods

The desire to protect competitiveness has inspired the leaders of cities and city regions around the world to address growing concerns about congestion levels, air quality, noise hazards and safety issues related to freight. For our rapidly growing and increasingly dense urban populations, the big challenge in a nutshell is to:

- provide goods and services to more people and more businesses
- within a shared and increasingly finite space and time
- in a way that is cleaner, quieter, safer, and more cost-effective.

While this is no small task, concrete and innovative solutions are beginning to emerge. The push is on for new technologies, systems, services, and institutional partnerships that support the evolution of more sophisticated goods movement strategies to help meet increasingly complex demands. Some of the most advanced thinking about urban goods movement encompasses a wide range of approaches, which prove to be significantly more effective when applied as an integrated package of measures that balances penalties with innovations. The following are just a few examples of current and emerging approaches from cities around the world*.

* for more case studies on sustainable goods movement, visit MTE On-Line, Moving the Economy’s searchable database of sustainable transportation case studies: www.city.toronto.on.ca/mte
**Current and emerging approaches to urban goods movement**

*Reducing the length of trips and avoiding trips altogether by:*
- bundling industrial functions, or creating “freight campuses” that locate firms in the same supply chain on one site
- using advanced telecommunications applications for route and space optimization
- providing incentives and other supports for local production and distribution of food and other consumer products

*Reducing the impact of trips by:*
- using cleaner fuels for truck fleets, trains, and air and marine freight vehicles
- designing and introducing lighter, more streamlined vehicles
- optimizing and innovating rail and marine freight options and connections
- exploring the use of innovative vehicles and fuels including the cargo Zeppelin
- developing air freight strategies that include cleaner fuels and fuel efficiencies, route and space optimization systems, and improved integration with surface freight
- encouraging and supporting reverse logistics practices including reduced packaging
- developing vehicle systems and land use strategies to reduce freight-related noise impacts
- supporting human-powered systems for small enterprises and municipal services (more appropriate in the dense urban core) including electric handcarts for recycling and composting as well as bicycle and motor cycle couriers

*Enhancing supply chain efficiencies by:*

**Integrating systems, including:**
- supporting intermodal systems linking truck freight with train freight
- encouraging publicly owned distribution centres in suburban or edge-city locations from which smaller trucks can be used to dispatch products to the heart of downtown
- identifying and facilitating opportunities for more efficient and seamless links across the entire supply chain, from door to door

*Applying advanced telecommunications technologies, including:*
- capturing real time information about congestion for commercial carriers and others that depend on the road system to stay competitive
- providing web-based services that match available space in trucks to need, reducing “empty running” on return trips following scheduled deliveries
- promoting the use of computer reservations for loading zones in the central city
- improving electronic information processing at border crossings
- aggregating electronic data generated by individual carriers into non-proprietary databanks for use by planners and logistics industry decision makers

**Exhibit 3: Emerging solutions**

- Bundling industrial functions and creating freight campuses can reduce unnecessary goods movement.
- Source: Wuppertal Institute, from MTE Proceedings

- Advanced telecommunications technologies can reduce the length and number of trips and enhance supply chain efficiencies.
- Source: Fairmont Hotels

- Local production and distribution of food and other products can cut down on the need for long distance goods movement. The Royal York Hotel’s chef gathers herbs and salad greens from their rooftop garden.

- Policies and legislation focused on urban goods movement can help to mitigate the kind of congestion that threatens competitiveness in dense urban centres.

- Cleaner fuels and new vehicle designs can reduce the impact of trips and bring trucks into the 21st century.
Introducing, encouraging and consolidating innovative services, including:

- facilitating consolidation of vertical transportation of documents and packages in a multi-tenant building through a central in-building courier service, to significantly reduce loading and unloading time
- providing courier company drop-boxes in strategic locations in the downtown to reduce the frequency and locations for pick-ups.
- encouraging private sector office management companies to book times for delivery to buildings in their portfolio, providing value added to their tenants while helping to reduce congestion on city streets

Developing and applying goods-supportive urban development and land use policies and enforcement including:

- conscientiously incorporating goods movement into the planning of new development or redevelopment projects
- redesigning older buildings to accommodate off-street loading and encouraging sharing of loading facilities with adjacent newer buildings
- providing adequate on-street loading at specified times of the day, reinforced by enforcement to divert the demand away from busy hours.
- instituting smart growth and sustainable transportation policies that reduce goods-related sprawl and address effective location and style of commercial and industrial properties

- develop and apply policies that facilitate reduction of single occupancy vehicle use, freeing limited road space in part for efficient goods movement

Building broad institutional partnerships to address urban goods movement including:

- establishing freight councils to bring together stakeholders to address concerns and innovation opportunities related to goods movement at the regional scale (e.g., U.S. Metropolitan Planning Organizations (MPOs)) and to combine municipal expertise with private sector expertise (e.g., European Community-supported cities working through LEAN — Logistics and Multimodal Transport Management Project)
- developing multi-stakeholder support within the goods movement industry for provision of a broader range of transportation options for people/passengers (including transit), to reduce congestion related to single occupancy vehicles, and to free limited road space in part for the movement of goods and services.

Policy makers, planners, decision-makers and entrepreneurs are now making up for lost time on issues related to goods movement. This primer is aimed at introducing readers to some key issues that relate to goods movement in cities.
The supply chain goes global

The information presented in this chapter is heavily based on Professor Alan McKinnon’s paper titled Global Logistics: Trends and Challenges, as well as his presentation in the second Goods Movement Workshop, titled What in the World is Happening to Urban Goods Movement?

The driving force behind the steady growth in global goods movement is consumer demand, most of which is concentrated in the world’s cities and towns. Even though most cities have a manufacturing base of their own, only a fraction of the goods being delivered to consumers in each city is created locally. The cause of much of the congestion on city streets and highways around the world is in fact related to the process of sourcing, creating, exporting, receiving, transporting and delivering goods to customers. The expansion of these activities in recent years is why goods movement has recently begun to receive more attention. A number of interconnected trends explain this phenomenon:

- An increase in the number and size of corporations able to serve either a world market or source materials and labour on a global basis (or both);
- The steady increase in capacity of all modes (ships, trains, planes, trucks) used to deliver goods and materials, which has caused transportation costs to increase at a significantly lower rate than inventory and other business costs;
- The relaxation of trade barriers and the creation of huge, barrier-free trading blocks such as the European Common Market and NAFTA;

Exhibit 4: Supply chain

Source: The Progress Group
The rapid, constant upgrading of information technologies (IT), software and communications that allow corporations to plan and track logistics-related information concerning the status of materials through to finished goods on a real-time basis;

- The deregulation of transportation in major markets such as the U.K., U.S. and Canada which has resulted in competitive pressures that drive down transport costs as a proportion of total logistics costs;

- The emergence and rapid dominance of firms specializing in transportation, logistics and management of the global supply chain on a third-party basis.

Another explanation for the hyperactivity around urban goods movement is that currently transportation costs comprise a relatively small share of total business costs. Major manufacturing companies are increasingly dependent on automated production lines and the use of robotics, as they seek to drive down both the cost of inventory on hand at the factory and the cost of inputs to finished products. This has necessitated a “systems approach” in the world’s factories, which are now dependent on the creation of integrated units delivered “just in time” that can be easily “plugged” into the production line. At the same time, in order to reduce transaction costs, manufacturers have been dramatically reducing the number of suppliers with whom they do business. In almost every industrial sector, these demands have led to the development of a new “pecking order” among the firms responsible for supplying the prime manufacturers. Industry sectors are organized in a hierarchy of firms known as tiers, where each level (or tier) of firm performs a specific range of tasks or serves a specific role. Each tier in the chain is now taking on more responsibility for integrating parts and components that comprise the system.

For example, an auto manufacturer at the top of the chain sets targets for the cost of delivering integrated units at specific times and locations that tier one suppliers must meet in order to stay competitive. These companies in turn place similar demands on the tier two companies on which they depend, and so on down the chain. This evolution is only possible because of cheap transportation and the increased sophistication of logistics and supply chain management expertise in all major markets of the world. Some critics have also noted that the evolution of these processes is still incomplete, because companies fail to account for the true costs of transportation and related logistics, partly because they are able to pass the economic consequences of meeting their own needs on to others.

What is the supply chain?

The supply chain is the “process through which a company creates and distributes its products.” Over the past 40 years, approaches to managing the supply chain have gone through a process of integration and improved coordination.

In the early 1960s, a dozen or so functions from demand forecasting and purchasing to warehousing, distribution and packaging were treated as independent functions, and were often carried out by different specialists. With the advent of the computer, and advances in management science, these myriad functions were concentrated into two key areas: materials management and physical distribution. These two functional areas were linked by the manufacturing and/or assembly process.

Through the 1980s and into the 1990s, the price of transportation was driven down-
wards while the cost of owning inventory rose. This is due in part to competition resulting from transportation deregulation and cheap energy. As well, there was a steep increase in the number of small entrepreneurs providing transportation services willing to accept low margins. Companies built high capacity distribution systems into new markets and developed expertise in rationalizing different time scales affecting product sourcing and delivery to the consumer. This evolution also relied on low cost labour sources in distant countries. Logistics emerged as a profession in its own right in the 1990s, a change that can be traced through to the organization charts of major corporations, where responsibilities for logistics became a senior management function. More and more, firms recognized that logistics was the key to differentiating their products in the eyes of the consumer. Each actor in the supply chain inevitably placed more pressure on the other areas of the supply chain.

The current situation is that logistics and supply chain management now deal with this process by integrating the activities of many external players. Over the past 15 years, there has been a strong trend to outsourcing the logistics function, which has fueled the rise of third party logistics specialists. These are companies that “design, implement and manage a client’s supply chain and logistics needs.” The value added by third party logistics is information and knowledge. The expansion of this role involves the emergence of contractual partnerships that see logistics specialists intimately integrated and committed to long-term investments of human and physical resource. For some companies, the desire to contract out logistics is based on the desire to shed non-productive assets and reduce costs by employing specialists able to provide a service at a lower cost than could be achieved if the function was carried out internally. Others seek third party logistics specialists in order to improve customer service by providing more on-time delivery. Often, the choice is made for a combination of these reasons.

International third party logistics companies based in Greater Toronto include:

- Exel
- Ryder
- TNT
- Kuehne & Nagel
- Tech Data
- Tippet & Britten
- PBB Global Logistics
- Global Express.

**E-commerce has changed the way we do business**

The rapid adoption of internet-based solutions and other aspects of e-commerce have radically changed the dynamics of corporate growth. In the past, large companies exerted power through control of assets. Today, as a result of the rapid adoption of information technology, we are seeing “communities of enterprise” working together. The traditional key to profitability used to be a company’s ability to move goods faster from point A to point B over its network. But, increasingly, the key to success is the leveraging of the transportation and distribution network through the application of sophisticated information management tools.

According to John Simke, e-business practice leader at PricewaterhouseCoopers, “Value is created...by developing and implementing transport solutions across a network of transportation providers.” Writing in the Globe & Mail in March, 2000, Simke noted that “power will increasingly shift to organizations that own the customer relationships.” Relying on web-based software and other advanced communications, companies are able to track and coordinate the movement of goods around the world on any and all modes of transportation.

Two companies that have taken management of the supply chain to the limit are Nike and Volkswagen. Nike (see sidebar with map) does not manufacture shoes directly but contracts the sourcing, manufacture and delivery to the retail network to others. This is all made possible by sophisticated tracing and tracking systems. Volkswagen (see second sidebar) recently opened a factory in South America to produce trucks and buses where all responsibility for assembly of the cars is contracted to a network of trusted suppliers.

Around the world, in each sector, particularly in sectors that are global in scope such as automobiles and aerospace, the number of suppliers is shrinking at a very
Nike

Chances are the manufacturing process that created your Nike footwear has accumulated more mileage than you will put into it over its entire lifetime. The assembly process of Nike's training shoes is quite complex. Nike shoes are assembled in Indonesia, and comprise over 50 separate components that come from suppliers as far as Japan, South Korea, Taiwan, the United States, and elsewhere in Indonesia. Once the shoes are made and sent to specific distribution centers around the world, packaging materials must be supplied before they get shipped out to stores. Every Nike shoe is a seasoned world traveler before it is ever worn by a customer.

The manufacturing and distribution process involves an extensive network of supply lines which depend on inter-continental freight movement. As a result, the need for precise and highly reliable delivery services that are closely synchronized with marketing, manufacturing and distribution processes are necessary. A strong logistics operation is therefore key to managing these systems successfully and efficiently.

To do this, Nike has joined the worldwide trend of outsourcing its logistics needs. Forming a partnership with a logistics service provider has further improved the company's production and distribution of their products.

In addition, Nike has improved the quality of its distribution services by centralizing inventory. By closing national warehouses and moving to a few central distribution points, Nike has significantly reduced warehousing costs. This new approach has also increased the level of product availability and shortened order fulfillment times.

Nike's competitive strategy and ability to distribute products cheaply and reliably to consumers around the world has helped to make the company an internationally recognized brand.
fast rate. For the surviving successful suppliers, the reward is increased responsibility for a broader segment of business, although the price of success may well include some risk as this approach tends to tie suppliers to specific manufacturing partners.

**Logistics requirements have changed with the times**

Researchers have followed the evolution of global manufacturing and note the following general types of operating style, each of which has implications for local development and logistics requirements.

**Invader:** companies enter the market by assembling kits or parts sent from home base that are then distributed and sold locally. For these companies, the inbound logistics are global in scale, while the outbound links are local. When Volvo opened its factory in Halifax, Canada (long since closed), it operated on this model.

**Settler:** over time, invader companies tend to undertake more complex activities locally. In doing so, they start to draw on local suppliers, and the amount of local content in the finished product increases as local parts are substituted for imported goods. Mitsubishi electronics is an example of this kind of firm.

**Cloner:** this type of firm replicates similar brands or products around the world but relies heavily on local suppliers from the outset. McDonalds is the classic example.

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**Case Study**

**The factory of the future**

Volkswagen’s Brazil-based plant is receiving worldwide praise for its innovative assembly system. The Resende factory, located some 100 miles northeast of Rio de Janeiro, has transformed Volkswagen from a manufacturer to a contractor, overseeing the work of other companies. Instead of a traditional assembly line, on which a vehicle grows part by part into a truck or a bus as it moves from worker to worker, Resende runs sub-assembly lines parallel to the main line. In other words, suppliers position themselves around a u-shaped final assembly line, each ready to install a particular part of the vehicle.

Approximately eight major subcontractors have their own shops along the assembly line, where their workers assemble components, including parts from 400 suppliers. The subcontractors include Brazilian companies like Delga Automotiva Industria e Comercio Ltda., local subsidiaries of transnational corporations like Rockwell International and Cummins Engine of America as well as Motorenwerk from Mannheim Eisenmann of Germany. Another innovation at Resende includes cost-sharing between suppliers and Volkswagen, for the basic overhead services for the factory. Volkswagen claims the plant will help cut costs substantially, and improve quality. The plant’s key differences from today’s auto factories include:

- using auto supplier workers instead of its own to assemble vehicles,
- sharing overhead costs between the company and suppliers,
- slashing the number of suppliers to eight from at least twice that amount for a similar size factory,
- Volkswagen “maestros” who follow the vehicle down the assembly line inspecting suppliers’ work and attach a seal of approval.

The logistical “engine” that makes this approach function is truck-based (90 percent of goods are moved by truck in Brazil) but clearly it is part of a global supply chain, with inbound materials coming from the U.S. and Europe and outbound trucks and buses being shipped around the world.
Baron: this kind of firm concentrates manufacturing exclusively in the home country, delivering the same product around the world. Scotch whiskey is an example of a baron.

Outreacher: this kind of firm centralizes production but sources parts and components globally. The product is also distributed globally. Large aerospace companies typify this approach. Boeing is a classic example.

Cost of transport is often the cheapest part of the equation

The cost of international freight movement is declining in relative terms. A key factor driving this trend is multi-modal shipping and containerization. In addition to satisfying demand for high capacity, containerization made it possible for marine, rail and truck shippers to develop common standards and smooth transfers between different forms of transport. Shipping grain from Mississippi to Rotterdam costs as little as $8.60 a tonne. The primary reason for this decline is that the carrying capacity of ships, aircraft, railcars and trucks has expanded. At the same time, competitive conditions have kept costs low.

In terms of logistics, the cost incurred in shipping goods throughout the world is generally as much as the cost of unloading and storage.

The real cost of freight has tended to drop over time owing to a steady increase in the carrying capacity of various modes such as ships, trains and planes, providing economies of scale. According to logistics specialists, A.T. Kearney, the pace of improvements in transportation as a component of logistics has resulted in logistics costs as a percentage of revenue falling from 14.3 percent to 7.5 percent in 10 years. By providing customers with faster, more reliable service, companies are able to win additional sales and earn customer loyalty. The difference between profit and loss factors for each product can hinge on the extent to which the global supply chain can be optimized. When volumes are extremely large, improvements in performance that shave percentage points off logistics costs add significant sums to the bottom line.

A key concept in logistics theory is “value density.” This is the ratio of value to volume or weight as it pertains to delivery priorities. In other words, goods such as computers, which have a high “value density,” can be shipped by air across the
Alameda

Severe congestion on rail routes along the western coast of the United States prompted the Alameda Corridor Transport Authority (ACTA) to bring forth a new freight expressway project to deal with congestion and conflicts caused by at-grade rail crossings of busy highways. This $2 billion project will link Alameda (in southern California) to Long Beach with a single consolidated rail corridor.

The new 32 km rail line will replace four existing single-track routes, which are currently operated by Burlington Northern Santa Fe Railway and Union Pacific. Once complete, however, the ports of Los Angeles and Long Beach will own the finished route.

The consolidated rail line is grade-separated, and is expected to handle 100 trains a day by the year 2020. The new line will significantly reduce the number of road freight movements a day into the area—which is currently around 20,000 trips.

Expansion of global air freight is driven by technology

The market forces behind the expansion of the global supply chain are clearly illustrated in the growing reliance on air freight to reduce the time lag between order placement and delivery. Few sectors of the economy are more sensitive to customer service demands or more aggressive in embracing new technology to manage information and communications than global courier companies such as Federal Express.

In the past three years, nearly all of the major courier companies have acquired or merged with global logistics specialists. The result is a marriage between the sophisticated systems and commitment to customer service of the courier companies.
and lucrative third party relationships already developed by the logistics companies. The commitment to long distance express air freight can be seen in the size of orders placed with Airbus Industries and Boeing for cargo freighters. Federal Express recently ordered 10 A-380 aircraft cargo planes, a new generation of superjumbos to serve the demand for ultra long distance air freight. UPS recently ordered 60 widebody aircraft from Airbus. By 2019, airplane manufacturers are projecting that 90 percent of the world’s air freight will be carried in widebody aircraft. From a logistics perspective, this will challenge major hub airport that serve international routes to upgrade groundside intermodal freight capacity. Global air freight traffic increased by nearly six percent in 1999 and is projected to increase at this rate until 2019.

The capacity to handle new challenges and sophistication of rail networks is also expanding. In North America, NAFTA has stimulated new partnerships and acquisitions among major rail networks to respond to market opportunities. Improved customer service is made possible by new tracking systems that not only reduce the time required for delivery—thus making rail more competitive—but provide customers with a new level of confidence that delivery promises can be kept. In California, a public private partnership is investing billions to build a dedicated rail freight corridor to overcome regional congestion issues, effectively preserving market share for marine/rail intermodal in this area. (see side bar). Marine facilities are also being expanded to cope with growth on both coasts.
Goods movement in Canada: so much distance, so little space

It is ironic that in a country the size of Canada, one of the most challenging problems facing our cities is a lack of room to handle the movement of goods effectively. But early in the 21st century, this is the reality, as people and goods compete for the same road space. Truck traffic on regional highways in Greater Toronto has increased by 50 percent over the past 15 years, for example. Road capacity has obviously not increased, nor should it. At the same time, development in southern Ontario outside the developed cores has tended to be low density, sprawling single uses. A key factor promoting higher levels of auto ownership with declining average auto occupancies is employment sprawl. The result has been steadily increasing passenger car volumes on highways and the arterial road networks that support urban development. Manufacturers, retailers and other businesses that depend on being able to move goods to and through our cities pay heavily for: congestion, as do city residents who must live with reduced air quality. In the long run, congestion has the potential to limit the efficient flow of exports as well as to severely constrain our ability to offer urban populations a high quality of life.

From the perspective of goods movement, the present and future competitiveness of our cities depends on our ability to achieve a better balance between the movement of goods and the movement of people. The range of options within cities is extensive, but to be effective it will require unprecedented levels of cooperation between government and other sectors of the urban economy. Cleaner fuels and improvements in engine technology will help improve air quality. The use of intelligent transportation systems (ITS) can improve routing capabilities and possibly lead to a range of benefits such as higher space utilization by for-hire and privately-owned truck fleets. Joint distribution centres, logistics campuses and increased reliance on other forms of transport in the inner city can also make a contribution. Getting more people to use transit or share rides (particularly for commuter trips) is obviously a complementary objective. Yet none of these interventions will make a significant difference by themselves or in isolation. Overall, although individual modes of transport are becoming relatively more efficient, energy consumption continues to increase. Overcoming the reality of our geography is a genuine challenge.
Freight transport activity and energy use

Richard Gilbert

The following section is based on the presentation by Richard Gilbert and on data contained in issues of the Sustainable Transportation Monitor, produced by the Toronto-based Centre for Sustainable Transportation.

Transportation’s impacts are mostly related to its energy use, which usually involves the combustion of fossil fuels. Worldwide, energy use for the movement of people and freight have been growing at similar rates. However, as Exhibit 8 shows, energy use for freight is expected to continue to grow, perhaps even at a higher rate in poorer countries. Energy use for the movement of people will begin to decline, especially in richer countries. Thus, by about 2030, given present projections, more energy will be used worldwide for freight transport.

In Canada, unlike most other richer countries, energy use for the movement of freight has been increasing at a higher rate than for the movement of people. This is largely due to the growth in freight transport by road. More freight continues to be moved by rail, particularly between cities, but on average rail freight uses considerably less energy.

There is an important difference in energy use between freight and other road transport. Freight vehicles usually have diesel engines, which use only 75 per cent or less of the fuel used by corresponding gasoline engines. However, emissions of some pollutants are nevertheless higher, particularly nitrogen oxides, a smog precursor, and fine particulate matter. Emissions of these two pollutants from new road diesel vehicles will be substantially reduced from 2007, when much tighter regulations come into effect.

The main impacts of freight transport are felt within cities, where vehicles and people are in close proximity. Moreover, freight is moved less efficiently within cities; freight vehicles are smaller and thus less efficient, they cannot be driven at optimum speeds, and they are more often driven with less than a full load.

In addition to pollution from diesel engines, concerns about freight transportation include:

- accidents, particularly trucks on highways
- noise, from trucks and trains, according to location
- road traffic congestion (although this is at least as much to do with automobiles as trucks)
- damage by heavy vehicles to road beds and other infrastructure

More often than for the movement of people, assessment of freight transport activity and its impacts is made difficult by lack of useful data.
Freight Transport Facts

Drawn from Issues 3 and 4 of the Sustainable Transportation Monitor.

- Transport consumes 29% of energy used in Canada (final energy use). Freight's share of that is 40%, i.e., about 12% of total energy use.

- Fuel costs comprise roughly 25% of road freight transport costs, much less for rail. Thus, as fuel prices rise, as they may with growing constraints on production, rail will be relatively advantaged.

- Almost half the truck trips in the GTA are between local points. Only 11% are through trips. The remainder start or stop in the GTA. Although a third of trucks moving in the GTA are empty. Except on steep hills, an empty truck uses 80% of the fuel used by a full truck; a half-empty truck uses 90%.

- Air freight has been the fastest growing form of freight transport, at 8%/year worldwide. Aviation contributes relatively more to climate change than other modes because of direct effects on the troposphere and stratosphere, where planes' exhaust gases are emitted.

- Ocean vessels use much less fuel per tonne-kilometre than other freight modes, but the huge amount of freight they carry makes water modes the second largest fuel use for freight movement, after trucking.

- A new truck emits about one third of the nitrogen oxides and an eighth of the particulates of an equivalent late-1980s truck. By 2007, emissions of both pollutants from trucks are set to be down to one tenth of late-1980s values. Thus, provided trucks are driven carefully, maintained well, and are not oversized, there should be substantial reductions in truck emissions, provided too that truck activity does not increase so much as to offset the improvements in engine and pollution control technology.
Exhibit 9: Ontario and U.S. trade flows

Ontario – the hub of north/south trade flows

The following section is compiled from multiple sources, including a study carried out for the City of Mississauga by the Canadian Urban Institute and CB Richard Ellis.

Early efforts in building Canada’s economy were devoted to overcoming — some would say defying — geography. The task of connecting small populations across the vast Canadian landscape has consumed the energy of entrepreneurs and policy makers for over a century. For this reason, the focus of policy makers and economists has been on tracking the movement of goods between cities. Today, encouraged by the NAFTA, the focus of our economy is increasingly north-south in orientation. This has increased the emphasis on cities as the engines of economic health, and at the same time, heightened our sensitivity to issues such as congestion. For many, competitiveness and concerns related to climate change are interrelated issues.

While the U.S. has more than 30 metropolitan areas with populations of more than one million, Canada has only four. Where the U.S. has a nationwide network of interstate highways, railways, and more than a dozen major air and marine hubs, Canada relies on a single slender transportation corridor to link the country and a handful of major hubs. For these reasons, not only are the stresses placed on our urban transportation networks relatively more extreme but the stakes are also that much higher. As a nation, unlike the United States, we have little redundant capacity in our transportation systems. If Chicago loses its competitive edge as a transportation hub there are a number of American cities capable of picking up the slack. If the GTA is unable to keep pace, the impact will be felt directly on the bottom line of Ontario, and, to some extent, the nation as a whole.

Statistics Canada reports on intra-provincial, interprovincial and international trade flows by value (dollars) and by volume (tones). Ontario is by far the largest trader in all three categories. As of 1998, the volume of Ontario’s international trade was more than all of the other provinces combined.

Trends in air, marine, rail and truck movements

Canada has one of the most modern and highly developed transportation infrastructures in the world. According to the World Economic Forum’s 1997 Global Competitiveness Report, Canada’s transportation infrastructure is at the national scale ranked first among G-7 countries. But even though much is known about how people move in and between Canada’s major cities, little is known about freight movement.

In Canada, goods and services generate different needs in transportation. The demand for these needs has been increas-
Transportation jobs represent an important sector of the economy which in the past two years has grown by six percent. (These data do not distinguish between freight and passenger-related transportation jobs). While similar rates of growth are not unexpected in sectors such as air transport, it is interesting to note that water transport enjoyed the highest rate of employment/job increase among the sectors tracked by Statistics Canada. Similarly, railway employment has also gained, following difficult years in the early 1990s. This is attributed to the renewed strength of CN and cumulative impact of employment growth in short line and regional railways. Significantly, employment related to truck transport is not growing, even though the volumes carried by trucks continues to expand. In a period of driver shortages, drivers (often self employed) are driving longer hours to take up the slack.

### The impact of third party logistics partnerships

As a result of the severe recession experienced by Ontario in the 1990-92 period, Ontario’s manufacturing and retail sectors were forced to cut costs and find new ways to protect their customer base. Many firms chose to contract out the warehousing and distribution functions (and continue to do so). This both improved their bottom line by shedding unproductive capital assets and opened the door to productive new partnerships with logistics experts. The expansion of the “third party” logistics sector is a global phenomenon, estimated to be growing by 20 percent per annum in the US. Throughout the 1980s and continuing today, affordable new technologies and integrated software solutions are providing firms of all sizes with tools to innovate. At the same time, the higher profile of logistics in the corporate hierarchy is demanding new skills and raising the stakes in terms of educational preparedness to compete for jobs in this fast-changing sector.

The Canadian Professional Logistics Institute estimates the demand for logistics specialists to be growing at a rate of
Moving Goods in the New Economy

Moving Goods in the New Economy

about 100,000 people per year. The GTA is also Canada’s largest urban market and as a result has developed a key role as a point of consolidation and redistribution for retail goods on a national scale. Unlike the US, where there are multiple large hubs, the GTA has developed a unique twin role where one region performs both the retail and industrial functions. It is the synergistic interplay of physical and human resources that has resulted in the GTA’s dominance in the field of logistics in Canada.

In the short term, major physical improvements (such as building a new highway or developing a rail corridor) are not likely, given fiscal constraints and the impossibility of building such facilities in mature urban areas. Therefore, the more prudent improvements for the short-term would be tied to measures that are strategic (e.g. designation of truck-only lanes) and/or technological (e.g. Intelligent Transportation Systems (ITS)) in the goods movement industry, motivated by emerging trends such as ‘just in time’ delivery objectives. The framework for Commercial Vehicle Operations-related ITS applications has been developed recently as part of the Canadian ITS architecture. It is important that the stakeholders in the industry are fully informed in terms of the costs, benefits and issues governing the implementation of these ITS technologies (e.g. access to real-time reporting on traffic conditions across the GTA road network) as part of their fleet management approach.

The GTA as a Canadian logistics hub

Although the true costs of congestion in the Greater Toronto Area are difficult to assess, they are no less real. Estimates by Metro Toronto a decade ago put the cost of congestion to industry at $2 billion annually. More recent estimates suggest that delays caused by congestion add 30 percent to the cost of moving goods in Canada’s largest metropolis. The penalty that cannot be readily measured is the loss of firms that choose to relocate to less congested cities. The global companies that drive the logistics industry, many of

Exhibit 13: The GTA as a logistics hub

Source: GTSR, January 2000
which are headquartered in the GTA, have first-hand knowledge of competitive standards in different metropolitan markets and can be expected to allocate their resources accordingly. Almost by definition, there is no early warning system that detects the breaking point.

With 80 percent market share within the borders of the GTA, trucking is the dominant form of transport for goods. In the rest of Ontario, the share is 90 percent. With 250 million truck movements annually in the GTA, there is clearly an incentive for improvements in efficiency. The challenge of dealing with these high volumes is exacerbated because distribution activity is concentrated in the western part of the GTA on employment lands in Mississauga and Brampton. Anchored by Lester Pearson International Airport (LBPIA) and served by a system of 400 series highways that give direct access to the two busiest border crossings with the U.S., Mississauga is a logistics hub within a hub (see side bar).

The GTA, with a population of more than six million, is Canada’s largest urban market. As a result the region has developed a key role as a point of distribution and redistribution for retail goods on a national scale. Unlike the U.S., where there are multiple large hubs, the GTA has developed a unique twin role where the region performs both the industrial and retail hub functions. It is this synergistic interplay of physical and human resources that has resulted in the GTA’s dominance in the field of logistics. Industrial commercial investment (ICI) brokers indicate that for almost a decade, the quest for investment-grade industrial property has been led by firms requiring “high cube” warehousing capability.

The addition of Highway 407 has served two purposes from the perspective of goods movement. First, it has expanded enormously the amount of employment lands in the western part of the GTA served by 400 series highways and diverted some auto traffic from heavily travelled sections of the 401. At present, truck traffic on 407 is light (precise estimates are difficult because counts on this privately owned highway are not available) but evidence from other jurisdictions suggests that truck traffic will over time begin to use toll roads when congestion on other highways reaches unacceptable levels (and provided that tolling pricing policy continues to evolve). Accordingly, the opening of 407 has effectively preserved the competitive potential of the third largest concentration of industrial space in North America by providing additional highway capacity.

A key tool to help preserve the competitive potential of this region over the long term, however, lies in the rapid adoption of Intelligent Transportation Systems (ITS). Some sectors of industry already rely on a variety of technologies to track their trucks and equipment and to monitor efficiency (see Cancom in chapter five). Innovations such as providing industry access to real-time information on traffic conditions could help industry plan more efficiently. The same ITS network could also be used to designate truck-only lanes when conditions warrant. Truck traffic comprises as much as 20 percent of volumes on High-

Exhibit 14: The GTA North American freight patterns

Source: Ontario Trucking Association, 2000, Strategic Freight Corridor Study
way 401 at certain times. Dedicated truck lanes on the busiest stretch of this system at key times could potentially be used as an incentive for industry to modify its route planning choices.

In the Toronto region, rail companies have continued to adjust their infrastructure over the past 40 years, moving rail yards from downtown to Agincourt (CP) and MacMillan (CN), and more recently have constructed intermodal facilities in Brampton, Milton and Vaughan. The focus of goods movement by rail necessarily has to be on inter-city. Although both companies have introduced new technologies (see chapter four), successes in winning back (or preserving) market share in a growth market cannot by themselves have a significant impact on highway congestion in the GTA.

Air freight is the fastest growing sub-sector in goods movement. Lester B. Pearson International Airport (LBPI) (and to a lesser extent Hamilton Airport) will clearly play a role by continuing to attract industrial users needing ready access to intermodal cargo facilities at both airports. The growing dominance of the logistics field by global courier companies will be felt in terms of land use around LBPIA as companies gear up to cope with increasing volumes of air cargo carried in dedicated cargo freighters. The emphasis in air cargo will necessarily be on goods with high value, although total volumes are not likely to reach levels enjoyed by trucking or rail activity, accounting for less than two percent of volume.

**Scarce data: too many studies, not enough action**

The commentary in this section is based on a presentation made by Stephen Laskowski from the Ontario Trucking Association.

In the last 11 years, there have been many studies conducted regarding intra-urban freight movement in the Greater Toronto Area (visit detour.com to get more studies). They include:

**1989 Toronto Goods Movement Study (TGMS)**

This study determined that on a daily basis, there were 700,000 truck trips and that half of these were generated within
the Toronto area. Since goods movement destinations are dispersed, about 30 percent of the current cost of moving goods in the GTA is attributable to congestion — an annual cost estimated at $1.9 billion. This lessens the attractiveness of investment in Metro Toronto. By 2011, it was predicted, Metro Toronto will suffer economic loss as a result of congestion. (Metro Toronto has now been amalgamated with six local municipalities to form the new City of Toronto.)

Some recommendations from this study were:

- Goods movement must be recognized as distinct and important,
- Funding must recognize the importance of goods movement and the need of the GTA to work with the province, and
- Expenditures designed to improve goods movement will benefit all users of the highway system, not just a small group of truck operators and owners.

1995 Commercial Vehicle Survey (CVS)
In this study, 67 percent of all trucks surveyed were found to have intraprovincial destinations. Metro Toronto dominated as a trip generator and attractor with an even distribution of 12 percent. Average trip length within Ontario is 230 km. The top four commodities were food (18.6 percent), cars and parts (13.3 percent), wood and paper (13.2 percent) and manufactured products (11.3 percent).

1997 Strategic Goods Movement Corridor Analysis (SGMC)
This study looked at road goods movement in the GTA from Hamilton-Wentworth to Durham. Eighty percent of the goods moved to, from and through the GTA is by truck. The road-based goods movement network in the GTA not only serves the regions’ producers and consumers, but it is also an integral part of the Southern Ontario, Great Lakes, Canadian and North American transportation networks.

- At some points along the GTA freeway network, there is an annual increase in truck traffic of 10 percent. Truck volumes along Highway 401 in the GTA exceed 35,000 per day near Highway 400 and Weston Road; on Highway 427 they range from 8,000 to 26,000. Truck volumes along Highways 400, 404 and 410 within Toronto exceed 10,000 per day, as do vehicle volumes along much of the QEW.
- Small Shipments and Often. The final step in goods movement is local delivery. This often requires the use of smaller, lighter trucks but results in a greater volume of trips, often during weekday business hours. When heavier trucks are utilized they use arterial roads more suited to automobile and local traffic.
- Freight Centres. Several Freight Centres identified have limited potential for expansion. All are rail based, including Pearson Super Centre; Concord Freight Centre; Meadowvale Freight Centre.

SGMC Recommendations
- A selective expansion of the road and highway infrastructure would assist goods movement as would the removal of some operational restrictions (such as the banning of truck movements during peak times).
- Congestion information from the City of Toronto’s Freight Truck Movement Survey (FTMS) should be provided to local goods movement managers.
- The definition of HOV should be expanded to include freight vehicles.

1997 GTA Trip Time Travel Survey (TTS)
In this study, 85 percent of trucking industry representatives surveyed indicated that congestion on highways affects their service. It takes approximately one hour to travel west to east through the GTA in the off-peak and nearer to one hour and forty-five minutes in the peak periods. In the Highway 401/Dixie Road area, the main trucking destination/origin points in the GTA can be accessed within 40 minutes during off-peak. The radius of the distance that can be covered in the same time is reduced by 20 km during peak periods.

All highway and arterial road “hot spots” were identified along with reasons for slow down. These data should be used to set priorities and plan for efficient use of the road and highway system.
Removing Roadblocks 2000: Importance of Congestion on Business Development (GTSB)

The GTA and Hamilton-Wentworth will see an increase in truck traffic. Traffic will flow efficiently allowing our economy to flourish, our quality of life to improve and our environment to sustain itself; or traffic will run into roadblocks, in which case business will move to areas where they can succeed, our international competitiveness will fall, our environment will suffer — and the benefits that flow to every Canadian from a prosperous GTA and Hamilton-Wentworth will begin to fade.

The expressway links used by trucks are also routes used by commuters during rush hours. For this reason, the implementation of a GTA transit network will contribute to improved goods movement by reducing competition for road space. Emphasis must be on reducing the competition for road space among motorists and truckers. Measures that support goods movement, such as priority lanes, off street loading and parking facilities, and efficient incident management systems are required. The basis for this is ITS. Transport Canada freight forecasts show that Ontario will lead all other provinces in terms of the growth in trucking over the next decade. Ontario’s intraprovincial truck traffic is expected to grow an average annual rate of 2.5 percent and its market share by 10 percent.

Since these remarks were made, the GTSB has completed another evaluation of goods movement in the GTA. Prepared by IBI Group et al, this study emphasizes the need for coordinated action to reverse distributing trends that threaten the GTA’s competitiveness.
Opportunities for rail: a new vision emerges

This chapter is based on presentations from the MTE Goods Movement Series held in May 2000.

The rail sector’s loss of market share over the past 40 years has been well documented. It is nevertheless important to understand that market share is a dynamic concept. In an expanding market place, even maintaining market share can signal a victory of sorts if improvements to the rail system and the way it is used and perceived by its customers are focused on the right segments of the market.

This chapter provides insights into some of the ongoing challenges for rail such as land use conflicts, and other barriers that hinder competitiveness within the purview of policy makers at the provincial and federal levels. There are also several success stories that illustrate the potential for rail to compete more effectively.

Researching the context for goods movement has only served to emphasize the degree to which goods movement — particularly urban goods movement — has been ignored. In Ontario, cities are required by law to maintain official plans that spell out land use policy and the basis for key strategies such as promoting the use of public transit. But issues related to goods movement have hardly been dealt with at all. Not only is there a lack of equivalent data on intra-urban goods movement to guide policy makers, but major investments made in intermodal facilities or rail yards are made by rail companies in a vacuum — there is no strategic public policy context for their actions.

The description of short line and regional rail potential in this chapter gives some insights into the potential role for this little-known element of the transportation network. The situation is not unlike the battles that preceded the opening up of telecommunications lines. Bell is now required by the CRTC to allow other private firms access to the systems that were constructed and operated for many years under different market conditions. Few municipal decision makers are even aware that a national organization exists to monitor progress and push for improvements in short-line related legislation. The Canadian Industrial Transportation Association (CITA) which represents large shippers such as Noranda and others has primarily been interested in “big picture” issues such as shipping regulations but is also now active in promoting competitive rail access.

Because many short line and regional rail systems are located in urban areas, the success of CITA in lobbying the federal government to allow short line and re-
Regional rail companies more extensive access and running rights over CP and CN lines could be a turning point in urban goods movement. A recent tribunal decision rejected a bid by short line railway companies for improved access to trunk rail systems. A recent example of how shippers can come together to benefit a broad range of interests is the Orangeville Brampton Rail Access Group. Working cooperatively with CPR, municipalities and shippers joined forces to purchase the 55-km line from CP, and to provide key connections to the CP mainline. The project will allow Orangeville to retain four key industries and also to promote the town as a location for other investors that can take advantage of this link. Similarly, the recent strides taken by both CN and CP to introduce new technology that promotes intermodal activity will need to be considered by municipalities as part of their employment and mobility strategies.

Market realities
Bob Balantyne, President of the Railway Association of Canada — Railways, the Economy and the Environment

Railways have been operating commercially in Canada on privately financed infrastructure for 165 years, beginning with the Champlain & St. Lawrence, which began operating in 1836.

Changes that have affected today’s operations include:
- Introduction of income tax,
- Two World Wars
- Bankruptcies, partial nationalization of the railways,
- Massive publicly-financed highway construction, growth of inter-city trucking, and virtually universal automobile ownership,
- Rise of civil aviation and jet aircraft, construction of the St. Lawrence Seaway, and introduction of diesel locomotives,
- Transcontinental oil and gas pipelines, computer and communications technology,
- Free trade/NAFTA and a global economy, and rise of trade unions,
- Partial deregulation, and privatization of Canadian National.

The process of restructuring the North American railway industry has been underway for nearly 20 years. There are now four Class 1 freight railroads in the United States augmented by about 500 regional and short line railroads. In Canada, there are two Class 1 freight railways augmented by 45 short line and regional carriers, plus six passenger and commuter railways. In 1998, there were 50,260 km of route track in Canada. Twenty-five percent of that route track is in Ontario. The Canadian railway industry employs more than 40,000 people. From a peak in 1989, revenue per tonne kilometre (RTK) has fallen to 2.33¢—scarcely enough to justify investment in the view of rail companies.

Railway Productivity Gains
In 1997, rail freight traffic reached an all-time high at 304.2 billion RTK. This volume of freight was achieved with 22 percent less track, 13 percent fewer freight cars, nine percent fewer locomotives, and 38 percent fewer employees than a decade previously. Other measures of productivity gain since 1998 include a seven percent increase in the average tonnes/carload, a 15 percent increase in the RTK/train kilometers, and a nine percent increase in the RTK/litres of fuel.

GHG Emissions
For rail, several factors contribute to the creation of greenhouse gas emissions. These include the amount of fuel burned, and the amount of energy required to overcome resistance to movement. In 1997, railways produced 304 billion RTK, an all time high and 544 billion GTK, slightly more than half of all RTK by Canadian carriers. This was produced with only 3,328 locomotives, burning 2.15
billion litres of fuel. This also resulted in an all time high of fuel consumption of 2150 million litres of fuel.

**RAIL CO₂ Unit Emissions**

<table>
<thead>
<tr>
<th>Year</th>
<th>Kg/1000 RTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>39.857</td>
</tr>
<tr>
<td>1997</td>
<td>27.956</td>
</tr>
</tbody>
</table>

Fuel consumption per 1000 GTK has been declining at an average rate of 1.9 percent since 1990.

Source: Railway Association of Canada, 2000

Though these figures sound high, compared with truck figures, they are relatively low. In 1998, trucks consumed 10.9 billion litres of fuel compared to the 2.15 billion of litres of fuel consumed by rail. This difference has to do with the rolling resistance. Rolling resistance is expressed as a percent of weight on the axles. Trains have a rolling resistance of approximately 0.1 percent. For trucks, it is between 0.5 percent-1.5 percent, depending on tire and road conditions.

Based on rolling resistance, rail is inherently 10 times more fuel efficient than truck. To take advantage of these efficiencies, railway companies have promoted:

- New locomotives and a major fleet upgrade,
- Improved train handling,
- Fuel lubrication, both track mounted and rail mounted,
- More productive freight cars with aluminum coal hoppers, double stack container cars, and steerable bogies,
- Allowable gross weight of cars increasing from 263,000 lbs to 286,000 lbs,
- Improvements to existing locomotives with low idle applications and automatic engine start/stop systems, and
- Continuing research and development in CPR Expressway Intermodal System, wheel tread profile research, and electro pneumatic breaks.

The next decade could prove to be a turning point for rail, where improvements in systems and rail technologies meet changing economic priorities. For specific types of goods movement, rail has the opportunity to regain market share.

**Tax issues that affect the railway industry**

In North America, competition between railways and other modes of transportation is intense. Canadian railways are improving their productivity faster than the rest of the economy, but the cumulative impact of federal, provincial and local taxes is affecting the ability of railways to be competitive.

A basic principle of taxation is that the effect of taxes should be equitable between different transportation modes. Competitors should face similar tax burdens and tax rates should not discriminate between industries. Taxes should also bear a relationship to the value of services provided. Most importantly for industries competing across borders, taxes should be comparable with neighbouring jurisdictions.

From the perspective of railways, property taxes are the most inequitable class of taxation. Not only are Ontario property taxes the highest in Canada but rail corridors are treated differently from highways. Railways pay property taxes in Ontario on railway corridors and non-corridor property such as yards, terminals and buildings. This amounted to $44.9 million in 1998.
Railways expect to pay taxes on non-corridor properties, but taxation of railway corridors is not equitable because unlike the situation with highways, railways do not use public funds to pay for security, snow removal and traffic control to service their rail corridors. Because highways are exempt from property tax, rail transport is inherently more costly than other modes.

From the perspective of the railways, Ontario is uncompetitive in Canada and in the U.S. The situation in Ontario has become worse over the past decade, as a result of increases (up to 50 percent) in the level of property taxes on both railway corridors and other rail properties.

Attempts by the federal government to make the tax situation more equitable through property tax reform had the unintended effect of making things worse when the provincial government introduced market value assessment of land occupied by rail corridors. In contrast, Nova Scotia and New Brunswick exempt railway corridors from property taxes. Quebec grants a 75 percent tax credit on property taxes paid on railway corridors, constituting a $13 million per year tax reduction. Manitoba and Saskatchewan property tax rates on rail corridors are much lower than Ontario. British Columbia implemented a $15 million per year property tax reduction on railway corridor. Ontario property taxes are 56 percent higher than the Canadian average.

South of the border, there are no railway property taxes in the State of Michigan as a result of a tax credit for the maintenance of rights of way costs. New York allows a credit of up to 80 percent of property taxes based on infrastructure costs incurred. Other US states impose minimal property taxes on railway corridors. Ontario property taxes are on average six times higher than U.S. states.

**Where will future investment come from?**

If the industry is to grow, particularly in the GTA, there needs to be continued investment in rail infrastructure. The tax inequities described here are symptomatic of the barriers that hamper the potential for railways in Ontario to be viable. This needs to be recognized at the political level.

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**Exhibit 15: Comparative tax burden**

*Comparative Tax Burden (Tax as % of revenues)*

![Bar chart](chart.png)

Source: Transportation Association of Canada 1993 Study
Land use challenges

Mr. Randy Marsh, Manager, Government and Public Affairs, CPR — On the edge: the railway/municipal interface St. Lawrence & Hudson Railway (CPR)

There are great transportation challenges to be addressed if the Greater Toronto Area is to remain able to respond and keep up with economic growth and attract investment. Efficient and timely goods movement will be crucial for this region to continue to successfully compete for export markets. Railways have a lot to offer in solving these challenges with innovative approaches to goods movement that utilize railway corridors to move cargo that otherwise might be transported on congested highways.

The key to successful railway operations is “fluidity,” meaning that train movements are planned to occur in sequence and according to schedule. A breakdown in communications or any physical delay can throw off coordination between yard and line operations. This can have a negative effect on delivery times to the customer, and, over the long run, affect the railway’s competitiveness. If too many customers shift their business to trucks, not only does the railway suffer financially but the roads in the GTA and surrounding highways stand to become even more congested.

The Canadian Pacific Railway (through the St. Lawrence and Hudson Railway — CPR’s eastern network) operates two mainline corridors through the Greater Toronto Area. The east-west axis includes the Belleville, North Toronto and Galt Subdivisions, part of a corridor from Montreal through to the Windsor/Detroit gateway to Chicago and beyond. The north-south axis is through the Mactier Subdivision, which travels north of the Great Lakes and westward to Vancouver. Both these corridors are today surrounded by residential development, which creates numerous operating difficulties for the railway.

In support of the line haul operations, the CPR also operates rail yards at Agincourt, Etobicoke, West Toronto, Vaughan, Milton, Oshawa and Alliston. The switching yards are used to marshal loaded rail cars into “trains.” The system operates 24 hours a day, seven days a week. On any given day, the CPR operates upwards of 160 trains across the GTA.

Railway operations are inherently noisy. The CPR receives approximately 60–70 calls a year in the GTA from people concerned about noisy operations. When freight trains sit stationary on main lines waiting for the tracks to clear, and when switching yards get congested, the noise of idling engines and the clanking of couplers results in complaints from adjacent residential areas. Other causes of complaint include trains that blow their whistles at night and at level crossings. When people’s travel plans are interrupted by having to wait for freight trains to pass through an intersection, the reaction is universally negative!

Although the public responds positively to explanations about what railways do and why, even the most understanding people often resort to the old refrain, “do it anywhere but not in my backyard please.”

Minimum distance guidelines promotes compatibility

Typical Railway Noise Mitigation
Railway companies know all about catch-22

The CPR provides a toll-free complaint line so that the company can hear from the public and improve in these areas, but there is only so much that can be done to mitigate problems. The guide for what the railway can and cannot do as a federally-regulated railway is set out in the Canada Transportation Act. Subsection 95(2) of the Act states that, in the construction or operation of the railway, “the railway company shall do as little damage as possible.” The term “damage” has been interpreted in an affirmative manner, meaning that some nuisance from operations is inevitable and will have local impacts.

Many mitigating measures are expensive to implement and limit operational flexibility. The trucking industry does not have to bear comparable costs. As a common carrier, the CPR is required to carry cargo for a fee on a demand basis. Although railway companies enter into long-term contracts with individual companies, they are not permitted to turn away business (nor would they wish to). Nevertheless, because there is a legal as well as an obvious business obligation to get the cargo to its destination in a timely manner as possible, sudden increases in traffic levels can reduce operational fluidity. As suggested above, increased congestion leads to noise complaints.

As stated earlier, the benefits of a more efficient railway system include:

- Less congestion on the roads, generally increasing mobility,
- Less wear and tear on the roads, reducing the costs associated with upkeep,
- Potential environmental benefits from lowered greenhouse gas emissions and health benefits from reduction in ground level air pollution, and
- Allowing vital export goods to get to market in a competitive fashion.

Impact of land use planning

In addition to senior levels of government, municipalities also have a role to play to better facilitate rail as a viable option. Land use planning can have a major impact on railway operations. Allowing residential development to “encroach” upon the perimeter of railway operations will almost certainly ensure future conflict and lead to local demands for railways to cut back on operations. Developers are now required to provide greater levels of soundproofing and other mitigation measures, and provide buyer-beware warnings on title, but once people move into these developments, the CPR starts hearing from new residents and their elected representatives, demanding action. If the people responsible for approving development cannot mitigate the situation at the planning stage, it is impossible for the CPR to do so afterwards. It is often not feasible to move operations, or when it is, the cost is prohibitive.

Municipalities need to work with the railway industry in a number of ways to foster mutual benefits including:

- Ensuring that land use planning and development decisions respect the railways’ ability to operate,
- Recognizing how railways assist in meeting the GTA’s transportation challenges,
- Appreciating the significant difficulties of operating railways within the urban context,
- Assisting in the identification and development of future new railway facilities,
- Encouraging the development of rail sidings in new industrial and retail facilities, and,
- Developing tax policies that maximize regional economic benefits from rail goods movement.

Railways are a complex business: to bring rail back into the urban freight mainstream will require a major shift in perceptions and understanding with respect to the challenges facing rail.
Shortline and regional railways

Mr. Peter Valade, Director of Business Development
Rail America

Shortline and Regional Railways play a strategic role

In the United States, the Staggers Act of 1980 started the U.S. rail system on an aggressive approach to downsizing or selling of under-utilized rail lines. Because there were investors ready to seize the opportunity to reposition shortline and other regional railways, there are today more than 500 shortline and regional carriers in the U.S.

Canada's National Transportation Act of 1986 allowed Canadian Class 1 railway companies to take a similar approach. But it was not until the Canadian Transportation Act of 1996 that Canadian companies were allowed to abandon or transfer assets as quickly and easily as they felt was needed in order to remain competitive.

Regional railways such as the Algoma Central, Ontario Northland and BC Rail have been in service since the 1940s, but were owned by the Provincial Government. In 1986, Canada's first privately-owned modern shortline, the Central Western Railway (CWR), began operation in Stettler, Alberta. CWR later became part of RailLink, which is now part of the RailAmerica family. Since 1986, Canada's Shortline and Regional railways have grown to become a major component of the Canadian transportation system. At the end of 1999, the industry numbered some 50 railways across Canada. Shortline and Regional railways are now involved in the movement of between 20 and 25 percent of the 3.9 million carloads and 1.4 million intermodal units originated by the Canadian railway system.

Since 1996, for every kilometre of track that is abandoned, the industry has taken over and revitalized six kilometres of track. The effect has been to help maintain rail as a viable option for the Canadian shipper.

How does the shortline and regional rail system work?

Shortline and Regional Railways acquires under-utilized low to medium density and secondary lines. The company manages and operates these lines as “feeder” systems to the mainline carriers. In some cases, the company’s railway lines are able to originate and terminate the same load, with the mainline carrier moving it across the country. An example is lumber from the company’s Northern Alberta railway which is moved from Edmonton via CN to a sister company in Stratford, Ontario.

Because these rail lines are the company’s only business, it has been possible to invest much-needed capital into the lines. This investment also allows customers to make capital investments, knowing they have a long-term business partner in the area.

Shortline/Regionals operate in one territory and nine provinces and into major Canadian cities such as Montreal, Toronto, Hamilton, Winnipeg, Edmonton and Vancouver, as well as the most easterly and westerly in the country. These are the 230 mile Cape Breton and Central Nova Scotia Railway and the 181 mile Esquimalt and Nanaimo railway on Vancouver Island.
**CASE STUDY**

**Short line and regionals are cost efficient**

A Terminal carrier is an operator that switches within a confined area such as the Port of Montreal or an industry site such as Petro Canada’s Refinery in Clarkson, Ontario.

Shortline operations can cover and switch industries in areas from under 50 miles such as the Southern Ontario Railway that switches the Hamilton area and operates south from Brantford, Ontario to Lake Erie. The term Shortline can also include operations which include distances up to 200 hundred miles, such as the Goderich and Exeter Railway that runs from Goderich into CN’s yard at Keele Street and Highway #7.

Regionals will cover areas that can exceed 600 miles and sometimes cross provincial or territorial boundaries, such as the Mackenzie Northern Railway in Alberta that runs north of Edmonton to Hay River in the Northwest Territories. Another example is the Ottawa Valley Railway that runs through the near north of Ontario and crosses into Quebec.

**Urban benefits**

Shortline and Regionals have a positive impact within cities as well. In the Hamilton area, for example, they have achieved the following benefits:

- Between Concord and Hamilton, the transfer of 3,500 truckloads of steel billets on to rail;
- In the City of Hamilton, switching soybean and scrap metal from truck to rail saves between 140 and 160 truckloads per transaction respectively;
- Also within the City of Hamilton, between Nanticoke and Hilton Works facility, a partnership with Stelco has shifted the transportation of steel coils from truck to rail, for a savings of 7,500 truck movements annually.

**Intermodal beginning to make inroads in winning market share**

Increasing rail market share of inter-city freight transfers has clear benefits for intra-city highway congestion, as each new contract that commits major shippers to use rail instead of trucks reduces through traffic on highways such as the 401. Both of Canada’s major rail companies are investing heavily in intermodal capacity. Although both companies have chosen different technical solutions, the concept is to offer shippers an attractive alternative to relying on trucks to move goods in heavily travelled major corridors. The key to successfully marketing to shippers and suppliers is to overcome perceptions of rail as slow, unpredictable and inflexible. Underpinning the appeal of both technologies is the use of sophisticated scheduling/tracking software and communications technology which not only ensure on-time delivery but provide customers with the comfort of being able to instantly pinpoint the location of goods in transit.

CN recently announced an agreement with Daimler-Chrysler Canada to move new automobiles between the Toronto area and Detroit by rail that will remove the equivalent of 120 tractor trailers per day (more than 30,000 a year). CPR made similar gains with the Hudson Bay Company that will remove the equivalent of 60 trucks per day (or 16,000 a year) after building a new Expressway intermodal centre in eastern Toronto close to the Hudson Bay distribution centre. The capital risk taken by CP should also be noted, as in addition to the cost of the new facility in eastern Toronto, CP is investing $26 million to upgrade the Vaughan intermodal facility. In addition, the company is spending upwards of $100 million in expanded facilities in Vancouver, Calgary, Montreal, Winnipeg, Regina and Chicago. CN is spending $40 million on upgraded facilities in Milton and additional sums in locations such as Hamilton on a steel transfer centre.
Expressway

Mr. Doug Miller
Canadian Pacific Railway (CPR)

Expressway is an innovative intermodal transportation system designed for the short-haul market (which in railway parlance means about 500 km between cities). Expressway operates dedicated trains between dedicated terminals. Expressway railcars combine high-ride quality with flexible loading (using a drive-on, drive-off ramp system) to safely handle standard non-reinforced highway trailers. Expressway is backed by an award-winning computer system that provides easy to use automated reservations and terminal check-in to keep truck turnaround times to a minimum.

Railways attempting to slow down modal shift to trucking

Over the past 40 years, a massive modal shift from rail to truck has occurred in the short and medium-haul corridors. From 1950 to the 1990s, the use of trucks has increased from 18 percent to 72 percent, whereas rail use has declined from 82 percent to 28 percent. Rail lost market share because of uncompetitive pricing and poor service performance.

The opportunity to regain market share is vast. Over three million trailers in North America cannot be safely lifted or moved by traditional intermodal rail. Over 90 percent of available trailer capacity cannot have access to rail. There are over 1.5 million truck loads in the Montreal-Toronto corridor and 2.5 million in the Toronto-Chicago corridor annually. Rail companies are not the only party that could benefit from expanded use of rail. The trucking industry today is facing significant operational challenges. These include:

- Driver shortages,
- Capacity and capital constraints,
- Low operating margins,
- Highway congestion, and
- Changing rules and regulations.

In the view of CP, the trucking industry has to find new ways and new partners to help improve efficiency and increase profitability.

The niche for Expressway

There is a market niche for an efficient line-haul service designed specifically for the short-haul market. Some requirements for or benefits of this service may be:

- Providing consistent market-driven schedules;
- Reducing the overall costs of transportation for the motor carrier;
- Safely handling standard non-reinforced highway trailers;
• Requiring fewer highway tractors or drivers;
• Removing the potential for road traffic accidents and
• Reducing highway congestion.

Expressway benefited from industry input
Customer focus group sessions were held in 1996 to establish criteria for the success of the project. From a motor carrier’s perspective, the service had to:

• Deliver dependable service levels that make business sense,
• Help the carrier to improve its overall cost structure, and,
• Be easy to use.

The Expressway business system
There are five key components in the design of the Expressway business system:

* Linehaul operations,
* Railcar technology,
* Terminal operations,
* Information systems
* A partnership approach.

Linehaul operations: Provide a consistent market-driven scheduled service with competitive transit times and high productivity. Each corridor will have four train starts a day, two in each direction, six days a week. Departure and arrival times are based on the input of CPR Expressway’s trucking partners. Each train has the capacity for 60 53’ trailers. Significant investment has been made in track capacity to ensure a 95 percent on-time performance from terminal to terminal. These operations must also provide trucking companies with comparable transit times. Future growth will be in the expansion of service on CPR controlled lines, as well as increased frequency and capacity and partnerships with other railroads.

Railcar technology: Incorporate superior ride quality and speed characteristics with an integral loading system. The railcars have been designed in partnership with National Steel Car, one of North America’s most innovative intermodal car builders. Prototype car was rigorously tested and displayed excellent ride quality at high speeds. Each platform can handle any type of trailer to a maximum of 57 feet in length. The between car coupler action called ‘slack’ has been minimized. The first order is for 240 platforms.

Terminal operations: Locate independent, dedicated terminals close to the markets and highway system with efficient and simplified terminal operating procedures. There will be additional purpose-built terminals, which will be cost effective. Handling operations will average less than five minutes per trailer (one hour to load a complete train). Ninety-five percent of trucks achieve throughput times of 15 minutes or less. The terminals will be open for pick-up or delivery 24 hours a day, seven days a week.

Information systems: Independent systems designed specifically for Expressway application. The information systems are key: they have been

Exhibit 18: Expressway

Source: Expressway. 2000
designed from scratch and the design is driven by operational efficiency and customer requirements. The entire business process starts with the initial data entry from the automated reservation system. Expressway was the winner of the 6th annual CIPA award in 1998 for an integral customs application for cross-border shipments. An internet-based reservation system and a hand-held radio frequency application and gate controller contribute to the shipment control system.

**Partnership approach:** Partner with the trucking industry instead of competing with it. The business system was developed with the input and direction of the trucking industry. The development and implementation of joint business objectives have been a prerequisite to success. Partnerships must include government, suppliers and other railroads to be successful. Pricing has been structured to encourage the profitable growth of both partners in the corridor.

Feedback from partners in the Montreal/Toronto corridor has been extremely positive. Key strengths identified by motor carriers have been:

- ease of doing business,
- the automated reservation system,
- access to a small dedicated team,
- fast terminal throughput times for trucks and on-time consistency
- fast transit times.
RoadRailer

Mr. Mark Lerner
Canadian National (CN)

RoadRailer is state-of-the-art transportation technology that delivers the flexibility of the highway with the efficiency of rail. It is a unique, lightweight, dual-mode trailer that is making huge waves in the rail and trucking industry. Built by Wabash National Corporation of Lafayette Inc., RoadRailer began operations in Canada in 1999 in the Toronto/Montreal corridor. CN’s new RoadRailer corridor is between Quebec, Southern Ontario and Chicago.

How it works
RoadRailer is based upon a conventional box car system. The trailer incorporates special couplers that provide the connection between trailers when in train mode. An air-ride suspension gives each trailer the self-contained capability to lift itself onto the rail running gear and retract its highway tires. Special mounting pins securely fasten the trailer to the rail bogie (also known as the rail car). RoadRailer equipment requires only a paved track to go from highway to rail and back again. Each bogie is equipped with a spring-applied, air-released parking brake, which is automatically applied when air pressure is lost. There is no need to set hand brakes to keep RoadRailer trailers from moving.

The advantage of RoadRailer is that it is tailored to meet customer needs. The RoadRailer trailer can be built to any size and style. For the first time, intermodal carriers can provide the exact trailer the customer needs, without worrying about matching it to railcars or wagons. The same RoadRailer rail bogie carries every type of trailer, and all trailers can be coupled together.

Exhibit 19: RoadRailer

Exhibit 20: North America’s railroad — a single seamless rail network

Canadian National along with Illinois Central have created a single seamless rail network called the Powertrain, which spans across three countries. This rail network connects the Atlantic, the Pacific and Gulf of Mexico coasts. The Powertrain provides shippers with more options, improve connections and better access to more markets than ever before.

Source: Canadian National, www.cn.ca
**Benefits of RoadRaider**

The equipment is flexible, efficient and inexpensive. The system offers the following benefits:

- runs at express speed, so is faster than conventional boxcars,
- reduces damage to goods,
- offers 97 percent on-time, door-to-door delivery.

The dimension of each RoadRaider container (53' length, 101-1/4" inside width and 111-1/2" unobstructed door opening offering 4,066 cubic feet and 69,500 lb capacity) allows the transport of shipments to be damage-free. RoadRaider offers competitive pricing, is environmentally friendly, overcomes problems related to driver shortages, and allows companies to eliminate private fleets.

Canadian National has invested $13 million in RoadRaider, which covers the cost of 200 trailers and 136 bogies. So far, RoadRaider has captured 10,000 truckloads on an annual basis, comprising manufacturers/distributors, trucking companies, and Intermodal Marketing Companies (IMCs). New business also includes truckload and less than truckload.

RoadRaider has plans to expand west to Vancouver and east to Halifax, as well as south to New Orleans in the future.

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**Exhibit 21: How RoadRaider works**

1. Position trailer onto track
2. Trailer air suspension lifts rear of trailer, tractor backs trailer onto rail bogie,
3. Trailer air suspension is vented. Steel coil springs lift tires to clear the rail,
4. Tractor backs trailer to coupling with balance of train,
5. Tractor leaves leading trailer on landing gear. Air lines are connected and landing gear is raised on second trailer,
6. Rail locomotive backs Coupler to trailer. Air lines are connected and landing gear is raised to all trailers.
Rethinking the way we approach goods movement in cities: logistics, e-commerce and other developments

The movement of goods in and around cities is attracting serious attention from policy makers. Traditionally, planners and municipal decision makers have focused on land uses without focusing in great detail what goes on inside industrial buildings or what drives investment decisions that result in industrial development in the first place. This is beginning to change as policy makers try to respond to problems with congestion and unprecedented levels of urban smog. A line of enquiry that promises to improve our knowledge base in this area is the fast-changing sector of logistics and supply chain management.

The current state of the art in logistics management in Canada is the result of the interplay between several key factors. Ground transportation was deregulated by the federal government in 1987. Many new firms entered the field, putting pressure on traditional transportation providers to expand and adapt the way they did business. This was followed by the severe recession of the early 1990s (combined with restructuring resulting from introduction of the NAFTA). Ontario’s manufacturing and retail sectors were forced to cut costs and find new ways to protect their customer base. Thus began the trend to contracting out the warehousing, distribution and logistics functions. This improved the bottom line for the benefit of shareholders and allowed companies to shed unproductive or non-core assets by developing new partnerships with logistics experts.

The trend to establishing third party partnerships continues to gain momentum. In the United States, where similar pressures to change the business model have been felt, the third party logistics sector is said to be growing by 20 percent per annum. Throughout the 1980s and continuing today, highly affordable new technologies and integrated software solutions are providing firms with the potential to innovate. Experts in the field are now documenting emerging interest in fourth party logistics where logistics specialists are contracting with other firms to carry out key functions. Driving this trend is the influence of courier companies, which have been at the leading edge in terms of adopting new technologies and also developing new customer-oriented relationships. These changes have resulted in new definitions of specialization. Couriers are getting involved in consolidation and assembly. Logistics specialists are responsible for placing orders with
suppliers. Because third party contracts are predicated on meeting performance targets, companies are motivated to monitor and measure progress. This drives the demand for new management tools and the science to implement them.

The logistics field has now extended its reach into supply chain management, creating a demand for new levels of educational preparedness and radically changing the corporate hierarchy. Just as the desire to satisfy consumer demand has emphasized shorter timelines and tighter schedules on a global basis, supply chain management has exposed, for the purposes of improving corporate decision-making, the true extent of the supply chain. This chapter explores some of the individual corporate responses to competing in this new field. It also exposes the potential to take advantage of this huge information flow for public policy purposes. When major retailers are driven by the need to fill customer orders more quickly, for example, the company must also find ways to improve economic performance. This means designing systems that reduce the number of truck trips, that cause those trucks to be fully loaded, and that plan routes to allow trips to be completed on time and at speeds that maximize fuel efficiency. The challenge is to identify such practices and transform them from individual tactical responses to have strategic benefits for the community as a whole. The objectives of the public and private sectors may be stated in differ-
Exel: How the logistics campus can reduce unnecessary trips

Bill Patterson, Manager Solution Development, Exel

How Exel's campus strategy enables the efficient flow of goods to market

Exel Worldwide is an international provider of logistics services, with 34 million square feet of distribution centre space, 43 million cubic feet cold storage capacity, and over 700 operating sites in 30 countries on four continents. The company has 41,000 associates, 16,000 vehicles, and $2.9 billion US 1998/1999 net revenue.

Headquartered in Columbus, Ohio, Exel Americas was established in 1991. Exel Americas operates more than 325 sites throughout Brazil, Canada, Mexico and the United States. There are seven regional campus locations, which account for almost one third of company revenues.

Our business: supply chain management

Core businesses for Exel include warehousing, transportation, packaging, information and workforce management, integrated logistics design and planning services. Our market is focused on the Automotive, Chemical, Electronics and Consumer Industries. For our consumer-oriented customers, we provide regional distribution centre management, freight consolidation, value added services and customized store logistics programs.

Exel America's campus infrastructure

Exel has pioneered the 'campus' concept, which is based upon a collection of multiple manufacturers focused on consumer products with similar distribution channels. The collection of companies in a single location achieves critical mass in several key areas. It allows for the sharing of resources, freight consolidation and flexibility.

Exel regional campuses are located in: Toronto, Ontario; Mechanicsburg, Pennsylvania; Atlanta, Georgia; Dallas, Texas; Chicago, Illinois; Northern and Southern California and Mexico City, Mexico. The Mechanicsburg campus is the single largest shipping location in the Northeast for consumer and health care products, with a market of over 60 million people.
**Exel Americas campus lifestyles**

A campus begins with establishing individual account(s) within a narrow geographic area. The campus grows organically through new business acquisitions.

A real estate strategy is developed and the company identifies potential campus sites. Factors may include:

- price of land,
- taxes,
- proximity to intermodal terminals,
- highways, and labour force.

Campus infrastructure is developed as current leases expire, with a transition to campus facilities. The campus becomes the draw for new customers. Timing depends on the real estate market, length of lease commitments and location as well as the special considerations due to individual accounts, referred to by Exel as “the value equation.”

The benefits of campus synergies include:

- having facilities and resources close to consumer goods customers,
- being able to share labour resources among clients and operations,
- taking advantage of critical mass and proximity to consolidate freight,
- managing labour flexibility, using part time, full time and temporary associates,
- maintaining a positive work environment able to respond to flexible work requirements,
- partnering with clients and their customers to meet market demands and unique requirements,
- developing and refining performance measurements leading to better quality and service,
- an existing relationship network with consignee receivers, and
- sharing packaging equipment/associates/expertise among multiple clients.

Exel also makes a practice of sharing information learned throughout the Exel organization.

**Exel logistics campus advantages**

There are a number of practical advantages to campus operations.

- more frequent service related to freight consolidation,
- improved transit time and reduced order cycle time,
- reduced inventory velocity,
- reduced freight costs through volume leverage,
- improved product integrity attributed to reduced handling by carriers, and
- increased productivity at customer receiving dock.

The Toronto Regional Campus is located in the City of Brampton. It was established in 1996 and now has 1.4 million square feet of high cube space. There are five customers in five buildings, with more than 230 associates. This campus serves Canada coast to coast. Centralized functions include: personnel and human resources; transportation — freight management; information systems, customer service.

The Mechanicsburg Northeast Regional Campus was established in 1961. It now has over 5.8 million square feet divided between 23 buildings. Some 1,600 associates serve 35 customers. This facility serves more than 8,000 shipping points or over 25 percent of US population. The Atlanta Southeast Regional Campus was established in 1990. The campus is 207 acres in size, with significant expansion capacity. There are 12 buildings on campus, for a total of four million square feet. The campus handles 125,000 truckloads inbound, 107,500 outbound, with an additional 8,000 less than truckload shipments.
Current Canadian consumer products trends and issues

As a result of their industry-wide experience, Exel executives have noted the following trends.

Retailer Consolidation – margin creep

Following consolidation in the grocery business, large companies such as Loblaws are leveraging their size to obtain better deals from manufacturers. In the past, if Loblaws requested an order of two truckloads of soup and one truckload of cereal, three trucks would go out. Now, only two trucks go out because the cereal can sit on top of the soup and $600 can be saved by providing one less truck.

Smaller, more frequent orders The “ball is now in the retailers’ court,” allowing the shift from “push” to “pull” inventory. This reduces inventory, (meaning that retailers only order on demand) which reduces carrying costs. Retailers are using more sophisticated means to ‘pull’ orders by offering manufacturers financial bonuses for responding to their needs at short notice.

Growth of alternative channels The emergence of big box stores has been a mixed blessing. It is actually more expensive to service Price Club, Home Depot and the like, but the market is driven by the perceived needs of the customer.

Supply chain integration This trend allows the linking of inbound goods with outbound goods and materials. The result, made possible by more sophisticated software and breakthroughs in tracking media, allows logistics specialists to mix inbound materials with outbound products, so that trucks have a higher load factor.

In the area of Canadian food sales, which amounted to $66.2 billion in 1998, totaling 662,000 truckloads (two thirds of which were in the GTA), there is potential through consolidation to reduce truck movements by up to 30 percent. It is important to note that there is additional room to improve capacity efficiency because an average “full truck load” is 40,000 lbs and 2,300 cube, while the actual capacity is 62,500 lbs and 3,400 cube.

Trends to watch

Customer pick-up can reduce empty miles, with retailers picking up their own freight, through the following emerging mechanisms:

- Co-op logistics groups, or groups of manufacturers that work together to achieve load consolidation benefits to reduce the “impact” of retailers urgent needs,
- Retailer consolidation centres, where retailers are reversing the outsourcing trend (such as Safeway, Sobey’s) by getting back into freight management, and
- Campus consolidation activities — where several third party logistics firms are preparing for consolidation by creating campus locations.
Ryder: New partnerships place logistics specialists in the driver’s seat

Mr. Casey Urbonas, Director, Customer Logistics
Ryder Integrated Logistics, Ryder Canada Inc.

Ryder Canada provides customized supply chain solutions in select industries such as: automotive, industrial, aerospace, high-tech & electronics, telecommunications, consumer and retail. They have a global presence in Canada, the United States, Mexico, Brazil, Argentina, the United Kingdom, Germany, the Netherlands and Poland.

Ryder provides integrated logistics services (RIL), as well as transportation services (RTS). RIL performs logistics planning, transportation, crossdock operations and yard management. They also provide supply chain solutions through asset and non-asset systems which include: ‘milkruns’ (the pickup of more than one supplier on a route), sequenced lanes and crossdock applications.

Ryder’s management philosophy of reducing customer costs includes:

- identifying and implementing supply chain solutions that will increase throughput,
- decreasing inventory and operating expenses,
- implementing value-added opportunities,
- using lean manufacturing principles,
- using common processes and methodologies, and,
- employing “Pillars of Quality”, (customer focus, total involvement, performance monitoring, systematic support and continuous improvement).

Within Ryder’s automotive sector, their global client base includes: Toyota, Saturn, Mazda, Delphi, Cummins Engine, John Deere and General Motors.

Among Ryder’s Canadian clients are: Honda of Canada, Ford, Daimler Chrysler, Arvin Ride Control, Numerous Tier I & II, and General Motors of Canada.

General Motors (GM) Canada Overview
Among Ryder’s most prominent clients is General Motors (GM). Ryder has provided its integrated logistics service to GM for over five years. With ten manufacturing facilities, three crossdocking facilities, two optimization centres and four container management centres, Ryder also manages and coordinates the pick-up and delivery of parts, with value equivalent to approximately $100 million per day for GM.

In order to manage and coordinate GM’s business, which creates nearly one million vehicles per annum across the corporation, Ryder needs powerful tools which include:

- ILPS, (Integrated Logistics Planning Software)
- project management,
- PC Miler, a system that calculates optimum routes and distances between origins and destinations,
- Max Load, determined through the use of 3-D visualization,
- RILS (Ryder Integrated Logistics System), a proprietary automated planning system),
- JIT, a mainframe system that enables Ryder to read GM information on “just in time” priorities.

Ryder relies on a variety of sophisticated methodologies to achieve different objectives. These include:
**Strategic design**
- Inbound supply chain network strategy,
- Optimal Distance Centre (ODC)/Domiciles — location,
- Optimal Distance Centre (ODC)/Domiciles boundaries, and
- Direct to plant or through crossdock.

**Tactical design**
- Optimizing the inbound collection routes,
- ODC/Domiciles (locations can be fixed or changed), and
- Key performance and success metrics.

**Operational design**
- Daily pick-up deliveries, and update assignments on the network,
- Exception planning,
- Data maintenance,
- Outsourcing analysis,
- 3D load planning,
- Supplier ship frequency analysis,
- Resource utilization charts,
- Inventory carrying cost analysis,
- Resource utilization charts,
- Inventory carrying cost analysis,
- Network optimization (cross docking, distribution centre), and
- Mode analysis, design and implementation for milkruns, truckloads, less than truckloads, rail, and inter-modal.

Through the management of Ryder's Integrated Logistics, General Motors has been able to create temporary 'domiciles' or hubs at their supplier bases for their drivers.

The use of consolidation centres reduces unnecessary trips and permits scheduled just in time deliveries.

**Exhibit 23: Ryder/Xerox logistics system**

Source: Koozano & Beekow, Third Party Logistics: Improving Global Supply Chain Performance, 1999
These mid-points allow drivers to avoid driving the entire distance from U.S. locations to Toronto.

Overall, GM Canada manages 850 vendors over four plants and controls the distribution of over 10,000 part numbers. Every part of this operation has a specific inbound and outbound window, and requires the use of 151 tractors, 315 trailers, and 265 route managers.

At the Pickering Crossdock, the inbound statistics are impressive, handling 80 'milkruns', and a variety of other trip combinations. Outbound, the Pickering site handles 148 loads per day.

Performance Measures. Ryder Integrated Logistics Performance metrics for General Motors include:

- Determining optimum locations within the plant for inventory,
- Inventory savings,
- Equipment utilization,
- Average unload times,
- Percent of inventory value on a plan,
- Delay time at suppliers or plants,
- Planned vs. actual miles,
- Premium freight,
- Integrating suppliers with the overall plan,
- Trailer reduction,
- Safety activity,
- Carrier performance, and
- Amount and total number of "expedites" or special deliveries.

The overall impact of Ryder's contribution to a corporation with operations as extensive as GM is that growth and increased volumes of business can be handled more effectively. This has obvious benefits economically as well as environmentally.
Sears: New distribution centre has space to make the right moves but flexibility to expand and tap rail access

Mr. Nazam Khan, National Manager of Distribution Systems Operations, Transportation and Delivery

Sears Canada Inc. is Canada’s largest single full-line retailer of general merchandise, home-related services and catalogue retailing that operates coast to coast. Their mandate is to support the company’s corporate strategy, which is to increase the company’s revenue at twice the market share annually. This objective was achieved in 1999 when total revenues reached $6.13 billion dollars. The company’s success and competitive edge has been attributed to a strong logistics structure. This structure, along with the company’s anticipated future growth encouraged Sears to consolidate two of their GTA facilities together in order to cut costs and improve operations.

Previously, Sears housed their retail and catalogue warehouse facilities in two different locations in the GTA. One facility was located at Albion in Rexdale, and the other at Kenmore in Scarborourgh. The Albion facility handled big ticket merchandise and had 600,000 square feet of distribution centre space as well as delivery operations. The Kenmore facility, on the other hand, handled small ticket merchandise, and had 462,000 square feet of distribution centre space with approximately 78 shipping and receiving doors.

The consolidation of both facilities was further influenced by three key factors:

- space constraints,
- costly operations, and
- advancements in technology.

Exhibit 24: Sears’ new distribution facility north of Toronto

Source: Giffels Development, 2001

Space Constraints
Strain was being created on each building’s resources due to the inefficient use of space in each facility. The layouts of each building resulted in disjointed and unproductive operations. Moving and storing merchandise became increasingly difficult and time consuming because shipping, crossdocking, receiving and storage was all located at different ends of the plant. This ultimately created delays in getting the trucks in and out of the compound on time.

Costly Operations
One of the most important determinants of environmental performance is Load Factor — meaning how
much of the capacity of a truck is used. For Albion and Kenmore (which were both located in close proximity to each other), freight was being sent from each facility to different points across town with half empty trucks. When trucks go out half empty, they end up using more than 90 percent of fuel per kilometer compared to a fully loaded truck. Sears, at this point, was obligated to pay for the underutilized space. The costs of operating half empty trucks are only slightly less than costs of operating fully-loaded trucks. Other expenses also came from additional fees for moving freight from either facility to the railhead. Each trip, for example, was costing Sears $160. Over time, this created a very costly and non-effective operation for the company.

Lastly, advancements in technology have also influenced the consolidation of both facilities. For Sears, 1996 marked the beginning of the company’s Internet presence. This immediately changed the context of business for Sears as more information became available to all parties in the supply chain at once. The Albion facility, for instance, used to be the largest delivery big ticket operation in North America, and made approximately 300 thousand home deliveries in 2000. As advancements in the business environment and in the distribution of merchandise occurred, inefficiencies crept in and the facility fell short of meeting these new changes.

Over the years, the Internet and improvements in logistics have reduced the amount of time that merchandise is in storage. Today, 70 percent of merchandise going to the customer gets crossdocked. If a customer, for example, places an order at nine p.m., that information is sent to the supplier ten minutes later. The supplier builds that product and by the next morning SLH trucks are out there collecting that order and bringing it back to the facility. It would then be crossdocked and sent out either to the store for pick up or to the delivery area for delivery the next morning. This “quick response” big ticket arena accounts for 70 percent of the company’s demand.

In terms of small ticket merchandise, information would be sent to the supplier along with a ticket file. The supplier tickets the merchandise, picks it by store and into store lots, and sends it to Sears. Here, the merchandise is crossdocked again to the company stores.

Meeting these new modes required that the facility expand. However, the resources needed for renovations greatly exceeded the amount necessary to build a whole new facility. So again, technology is what allowed Sears to embark on this new initiative.

The GTA logistics consolidation of both Albion and Kenmore facilities was proposed to deal with the challenges and constraints mentioned above, to create an overall more cost-effective operation. The new building, now located in Vaughan Ontario, has 862,000 square feet, including 123 receiving doors.
Environmentally speaking, this means that fewer trucks will be on the roads for less time—therefore consuming and burning less fuel. There will also be less congestion as a result.

For Sears, getting and staying ahead of competitors required relentless efforts to maximize service and minimize costs. The technological advancements in **supply chain management** and **logistics** have allowed Sears to transform their traditional facility operations into one that is more time and financially efficient. Establishing the right system (methodology, process, and technology) in the new Vaughan complex will result in enormous savings of hundreds of millions of dollars worth of productivity potential in the future. The benefits of this new venture have already greatly reduced company expenses and have increased management and productivity. It goes without saying that this project will in no small measure enhance and reinforce Sears's position as a leader in **logistics** operation. For Sears, more is less.
Cancom: Information is power

Mr. John Groden, Private Fleet Sales Manager
Cancom

For the movement of goods, Cancom is the leader for satellite tracking communications in Canada. In Canada alone, Cancom has over 300 customers and 22,000 units on the road. Much of the technology in place to track goods movement comes from Qualcomm. Qualcomm is currently a 5 billion dollar corporation that had been successful in the past few years making technology called CDMA Technology. CDMA Technology is a co-division multiple access technology that incorporates data and voice.

Cancom’s relationship with Qualcomm started approximately 10 years ago and has flourished in recent years. Bell Mobility and Clearnet, for example, are among the many Qualcomm customers that use CDMA Technologies. In the United States, Qualcomm has over 35,000 customers, and approximately 400,000 units on the road.

Currently, 22,000 units of Cancom’s product are on the road, and function on the “Track System”. This system works through a ‘black box’ which acts like

Exhibit 25: Cancom satellite communication

Source: Cancom, 2000
the brains to the system, and is located inside the dome. The EDU, which is an enhanced display unit, sits inside the cab of the driver. This allows the driver to receive messages anywhere in Canada. Using CDMA Technology and KUAN frequency capabilities, information gets ported to ANIKY satellite. This satellite provides coverage from Alaska, all the way down to the southern States. With this system in place, a customer can contact a driver within a minute once they have sent the driver a message. Unlike older ticket systems, this new technology provides fast and accurate data collection and sensory track capabilities. A recent innovation is Trailer TRACS, which helps carriers maximize the performance of trailers, providing data to improve fuel consumption, and additional safety checks.

Typically, customers relied on cellular technology (cell phones) to manage communication with their drivers across the States. This not only meant that they were hit with expensive roaming charges and huge bills, but they often missed loads. Today, however, this does not have to be the case. The new CDMA technology provides quick and reliable tracking capabilities (that provides information such as load factors, long and short idle, speed, RPM), which saves time and money for both customer and freight driver. The sensor track allows a customer to retrieve all kinds of information from the driver quickly through his vehicle, without having to wait for the driver to reach his destination.

Another tracking business is “Trailer Tracking”. In a nutshell, Trailer Tracking provides access across Canada. The tracking system is set up as a flat antenna that is bolted on top of the trailer. This contains a Global Positioning System (GPS) device. It also contains a load sensor. This allows the customer to find out whether the truck is empty or full, or whether the information was correct or not. Door sensors are also installed for the protection of theft. If anyone is ‘jimmying’ the doors of the vehicle, a message is immediately sent to the dispatch.

This business is still new to Canada and is designed to address problems regarding trailer management. Canadian Tire has about 4,000 trailers, which are domiciled all over Canada. One of the drawbacks for Canadian Tire for example was that they did not know where their trucks were at any point or their load.

Other technologies include a Windows-based CE computer that allows maps to be imported so that directions can be sent out to drivers. This information is ported right into the drivers Windows CE within seconds. This also performs and records driver logs, fuel taxing, and more.

ZATA Technology, which is another real time information product, is essentially an on-board computer. It is not a Windows based CE product, however, it is a fantastic tool for breaking down step by step, what the driver does on a daily basis. It acts more like a driver productivity tool. A driver’s information is monitored (i.e., speed etc.) and sent back to go through a “Learn Standard” system. This allows the company to peg away at the information, and determine a pattern that allows them to contact the dispatcher and let them know that the driver will be late. It targets urban and it’s perfect for less-than-truck load for pick up and deliveries. It is a terrestrial-based product.

Overall, the Cancom systems enjoy 60-65 percent market share of the top 100 fleets in Canada.
Conclusion
Beyond just-in-time policy making

Although the principal purpose of this primer is to provide broad insights into a subject that is poorly understood, we hope the reader will nevertheless be convinced on four principal points:

- The first is that there is almost a complete absence of policy dealing with urban goods movement in Canada, yet goods movement is one of the most critical policy issues facing cities today.
- The second is that there is an appalling shortage of data to help us understand what is happening and where we are headed.
- Third, there is an urgent need for public sector planners and industry to work together to develop a series of solutions to minimize the worst effects of congestion in our cities.
- Finally, there are policies and solutions that have been developed around the world that can help provide a foundation for addressing our economic and environmental priorities for goods movement in Canada.

Policy
One of the dubious advantages of having delayed the creation of policy in the area of goods movement is that Canadian cities and senior level governments can move straight away to an integrated policy framework. Rather like developing countries that are able to skip the pain of incremental change by moving directly to adopt cutting edge technology, Canada is positioned to draw lessons from around the world that link the roles of different levels of government and which benefit from partnerships with the private sector.

Some of the elements that would inform policy have been mentioned in this primer. For the federal government, initiatives could range from strategic investment in trade corridors and intelligent transportation systems to addressing taxation and regulatory issues affecting the relative competitiveness of the rail, marine, air and trucking industries, to the funding of urban infrastructure. Transport Canada released a report in July 2001 recommending a number of innovations in transportation, several of which affect goods movement directly. These policies could then be integrated with provincial initiatives, which, in turn could complement municipal initiatives. As a package, the means to implementation would most likely involve close cooperation with the private sector.

The field of municipal policy is, in fact, wide open. Official plans contain no policy initiatives to support intermodal facilities, and plans for employment areas rarely distinguish between the functional needs of office parks and distribution centres. In future, municipal plans will need to take account of the trend for
logistics facilities to operate 24/7. The concept of truck-only lanes on busy highways has yet to be considered seriously, and the opportunity cost of uncoordinated delivery schedules reducing the capacity of our downtown streets is too high. Coordination between land use, commercial operations and traffic flow management is necessary in the core. More emphasis on local production will also ease the burden on distribution channels.

Commitment to data
The shortage of data on goods movement is not unique to Canada, but compared to the U.S. and Europe, we are poorly placed. Federal and provincial authorities could help position Canadian firms more competitively by acknowledging the need to collect and make available more information on urban goods movement.

As illustrated by examples in this primer, the data shortage is particularly acute in urban areas. This is due in part to the fragmented nature of the urban goods movement industry and also to the practical difficulty of carrying out surveys on city highways and streets. Modern technology may provide an answer to this dilemma. Many firms involved in logistics operations rely on high tech communications that support tracking software. The media range from ground-based to satellite-based systems. At present, the data are utilized by fleet managers and logistics specialists to locate trucks and trains, monitor their speeds to ensure they arrive “just in time,” provide updates to drivers concerning expected delays, facilitate paperless transfer across international borders, verify load factors and many other bits of information. In the aggregate, these data could benefit public sector planners. If we have targets for achieving higher modal splits for transit (that is, getting a higher proportion of people to use public transit), perhaps we could also benefit from equivalent targets for the urban goods sector that promote higher load factors for trucks, or, on a regional basis insist on targets for shifting inter-city goods movement from truck to rail, or to a range of other options.

Working together for a “win-win”
Innovations in the area of Travel Demand Management that complement official plan policies in support of public transit are only now being implemented. Meanwhile, there is considerable potential to benefit from comparable initiatives dealing with goods movement issues. In the United States, Metropolitan Planning Organizations promote public-private working councils that acknowledge the importance of goods movement in economic and environmental terms and work to implement practical local enhancements. In Europe, there are also well-funded working technical committees dedicated to goods movement issues such as facilitating the shift of cargo to rail and marine. There is no reason why similar initiatives could not succeed here, bringing the interests of all transportation modes together to generate practical solutions and improvements for mutual benefit.

And finally...
The development of sophisticated supply chain management applications has made it possible for individual companies to expand the world’s economy based on a precarious economic model that integrates cutting edge technological advances in transportation, goods handling and product planning with new approaches to customer and client relationships. For its success, the model depends on very cheap energy costs and the ability of each player in the supply chain to pass the economic and practical consequences of just in time on to the player lower down the ladder. The same technologies and sophisticated planning expertise can, we believe, be usefully applied to reducing the negative impact of goods movement in cities, and work to grow the economy in a more environmentally responsible and sustainable manner.

Our cities demand it.
Speaker Biographies

R.H. Ballantyne
R.H. Ballantyne is President of the Railway Association of Canada. Prior to joining the RAC in 1988, he was Vice-President of Canadian Pacific Consulting Services Ltd. and was involved in railway projects throughout the world. He has worked in the railway industry for 39 years.

Richard Gilbert
Richard Gilbert is an independent consultant in urban issues, specializing in transportation, waste management, energy systems, and urban governance, with clients in the public and private sectors in Europe and North America. Richard is also the Research Director of the Centre for Sustainable Transportation in Toronto.

John Groden
John is the Private Fleet Sales Manager in Canada for Cancom and is responsible for managing the introduction and enhancement of Cancom products with industry

Nazam Khan
National Manager of Distribution Systems Operations, Transportation and Delivery for Sears Canada. He’s responsible for managing an annual budget of over two hundred million dollars. Nazam has been employed by Sears for over 27 years. He’s previous position within the company included; Manager, Distribution Facilities & Operations, Manager, Quality & Methods, and Project Manager, Materials Handling. He’s the former director of the Canadian Association of Logistics Management and a current board member of the Retail Council of Canada.

Mark Lerner
Mark Lerner is a Senior Director for Sales at Canadian National (CN) for the U.S. and Mexico market. He is based in Ontario and has been with CN for eight years.

Randy Marsh
Randy Marsh is the Manager, Government and Public Affairs for the Canadian Pacific Railway’s Eastern Network. Prior to this position, he held the position of Solicitor with the Toronto office of the Canadian Pacific Legal Services. His career with Canadian Pacific began in 1978.

Alan McKinnon
Alan McKinnon is Professor of Logistics in the School of Management at Heriot-Watt University, Edinburgh and has been researching and teaching in the field of logistics for almost twenty years. He has conducted studies on a range of topics including distribution strategies of manufacturers and retailers, the restructuring of logistics systems, freight traffic growth, energy efficiency in freight transport, and the environmental impact of logistical activity.

Sab Mefle
Sab Mefle is Director of Taxation at Canadian National Railways in Montreal and is the current Chairman of the Taxation Committee of the Railway Association of Canada. His professional practice spans over twenty years. Prior to joining Canadian National Railways, Sab was Vice-President Domestic Program in Taxes for a large Canadian financial institution. Sab is also Vice-President Canada for the Tax Executives Institute, a Washington based association with over 5,000 worldwide tax professionals.

Doug Miller
Doug Miller is Director of Expressway with Canadian Pacific Railway (CPR) based in Ontario. He has been with CPR since the inception of Expressway 11 years ago. Through his work, Doug has spent time in Montreal, Toronto and Vancouver. Most of his time at CPR is currently spent on the intermodal side of business.

Glenn R. Miller, MCIF, RPP
Glenn Miller is a registered professional planner who has been providing advice to the private sector, ngo’s and government for more than 20 years on governance, communications, transportation, infrastructure, economic development and other issues related to the competitiveness of Ontario’s communities. As Director of Applied Research with the Canadian Urban Institute since 1996, Glenn has helped build the CUI’s Canadian programs by publishing research, convening conferences and providing objective commentary on critical urban issues. In 1986, he established the “Ontario Planning Journal,” the professional practice magazine of the Ontario Professional Planners Institute.

Bill Patterson
Bill Patterson joined Exel as Manager Solution Development in 1996 and was promoted to Director of Customer Development in 1998. He has led the Exel Canada team in growing the Exel Campus to five buildings with over 1.3 million square feet and transportation management activities. Bill has eight years of experience in various consumer product marketing functions with Canadian Pacific Railways in Toronto,
and he's an economics graduate from Concordia University in Montreal.

Casey Urbosas
Mr. Casey Urbosas is Director, Customer Logistics with Ryder Integrated Logistics since 1998. He is responsible for the overall operation of the General Motors account and meeting contractual requirements to General Motors Canada. He joined Ryder Canada in 1996 as Director of Transportation. He has twenty years of previous experience with several companies in various positions, including National Private Fleet Manager for Eaton, Managing Director of Operations for Purolator Courier Ltd., National Distribution Manager for Denco and Hub & Linehaul Division Manager with United Parcel Service.

Peter Valade
Peter Valade has worked in the rail industry since 1969 in a wide variety of areas including Marketing, Sales, Services and Operations. He has a diverse geographic background from coast to coast in Canada and also in the Mid-West and Western United States. Currently, Peter is the Director of Business Development, Rail America, for their Canadian and U.S. North Eastern properties.

Sue Zielinski
Sue Zielinski (MSS) is co-founder and Director of Moving the Economy and has worked for over ten years developing sustainable transportation initiatives at the City of Toronto Planning Department. She is a founding member of Transportation Options and the Green Tourism Association and a board member of Canada's Centre for Sustainable Transportation. She advises on a broad range of local, national, and international transportation policies and initiatives.
Glossary

Bar-coding

Bar-coding is the most commonly used form of automatic-identification technology. The bar-code is a series of light and dark bars of different widths that are used to represent a number, letter or symbol. A bar-code reader, really an optical scanner, emits a beam of light and records the pulsed reflection that occurs when light bounces off the black-and-white bands. The scanner then converts the pulsed reflection of light into electronic data.

Bonded warehouse

A bonded warehouse is a warehouse that is approved by Canada Customs and is under bond/guarantee for observance of revenue laws. It is used for storing goods until duty is paid or goods may be released in some other proper manner.

Break of bulk distribution

Break of bulk is the reducing of a large shipment of a single commodity to many small shipments, which then are dispersed to various buyers.

Consolidation

Consolidation is the combining of less-than-carload or less-than-truckload shipments to make carload/truckload movements.

Contract warehouse

A contract warehouse serves the needs of a restricted clientele under contracts of a duration longer than 30 days. In addition to storage, a contract warehouse offers value-added services to adjust to customers’ needs and to provide one-stop shopping.

Cross-docking

Cross-docking is the unloading, sorting and reloading of some or all contents of a vehicle in transit. The cross-docking staging area must be large enough to provide for a direct flow of goods between shipping and receiving. An effective warehouse information system strategy that involves accuracy of incoming receipts identification and subsequent item tracking is critical to efficient cross-docking.

Distribution

Distribution is the shipping of merchandise from manufacturers to retailers, directly or through wholesale warehouses.

Electronic Data Interchange (EDI)

EDI enables computers-to-computer, electronic paperless communication. Although an investment in computer hardware and software is necessary, EDI allows companies to engage in electronic commerce, exchanging information such as purchase orders to better coordinate their logistics operations. Standardized formats define how information is encoded and permit the flow of data from one database in a company to another. Of particular importance to distribution operations has been the development of the EDI-based advance shipment notice. This tells a consignee what to expect in a shipment before the truck even arrives.

Freight forwarding

Freight forwarding is the assembling, collecting, consolidating, shipping and distributing of less-than-carload or less-than-truckload freight; also the transshipping of freight to or from foreign countries and the clearing of freight through customs.

High cube

High cube relates to facilities with a clear height standard of 28 or 30 feet.

ICI – Industrial Commercial Investment

ICI refers to a class of real estate investment that includes industrial, office and retail properties.

Inbound logistics

Inbound logistics includes efficient routing and scheduling, time-scheduled component parts pickup, satellite tracking of shipment movements, bar code verification at pick-up points, supplier coordination, material management, and returnable container control.

Intermodal

Intermodal indicates that two or more modes of transport are used in the continuous movement of goods from origin to destination. It applies to goods transported within containers or trailers, most often to join rail/road moves. But marine and air modes can also be involved.

Just-in-time (JIT)

Just-in-time is an inventory reduction strategy that feeds production lines with products delivered just-in-time. Developed by the auto industry, it refers to shipping goods in smaller, more frequent lots.
Logistics
Logistics refers to all activities involved in planning, implementing and controlling the efficient, effective handling, storage and flow of raw materials, in-process inventory, finished goods, services and related information along the supply chain, from the point of origin to the point of consumption for the purpose of conforming to customer requirements.

North American Industry Classification System (NAICS)
NAICS is the first-ever North American industry classification system. The system is developed by Canada, the U.S. and Mexico to provide comparable statistics across the three countries. It is a “production-oriented” system that is based on a single economic concept: economic units that use processes to produce goods or services are grouped together. NAICS will be replacing the Standard Industrial Classification System – SIC.

Outbound logistics
Outbound logistics relates to product delivery to retail stores, return warranty and scrap product to distribution centre, computerized information management to provide real-time view of the entire operation, and contract warehousing.

Public warehouse
A public warehouse offers its storage services to the public and all companies in the market, typically under short-term contract for 30 days.

Radio frequency (RF)
Radio frequency lets users relay information via electromagnetic energy waves from a terminal to a base station, which is linked in turn to a host computer. The terminals can be placed at a fixed station, mounted on a forklift truck, or carried in the worker’s hand. The base station contains a transmitter and receiver for communication with the terminals. RF systems use either narrow-band or spread-spectrum transmissions. Narrow-band data transmissions move along a single limited radio frequency, while spread-spectrum transmissions move across several different frequencies. When combined with a bar-code system for identifying inventory items, a radio frequency system can relay data instantly, thus updating inventory records in so-called “real time.”

Reverse logistics
Traditionally, manufacturers did not feel responsible for their products after consumer use. The bulk of used products were dumped or incinerated with considerable damage to the environment. Due to new waste management legislation, the emphasis has been shifting toward recovery, due to high costs and environmental burdens of disposal.

Reverse logistics means that firms become more responsible for collecting, dismantling and upgrading used products and packaging material. It stands for all operations related to the reuse of products and materials, as part of the product’s “life cycle.”

Standard Industrial Classification System (SIC)
The SIC system provides standard industrial classification codes to classify companies according to their primary activity. This system is being replaced by the North American Industry Classification System – NAICS.

Supply chain
The material and informational interchanges in the logistical process stretching from acquisition of raw materials to delivery of finished products to the end user. All vendors, service providers and customers are links in the supply chain.

Supply chain management (SCM)
Supply chain management is the practice of controlling all the interchanges in the logistics process from acquisition of raw materials to delivery to end users, including sales, marketing, information technology and strategic planning functions. Ideally, a network of firms interact to deliver the product or service.

Third-party logistics
The use of specialist companies to provide several combined logistics services such as storage, transportation, and inventory management to manufacturers and their customers. Third-party logistics includes mode selection, including truckload, rail, ship, air, intermodal, plus expedited and small packages; carrier management; private fleet management; dedicated contract carriage; information flow; single billing.

Third-party provider
A third-party provider is a firm that supplies goods and services such as transportation and logistics to another company.

Warehousing
Warehousing refers to the storage of goods. A distinction can be made between public warehousing and contract warehousing, the latter offering value-added services in addition to storage.
References


