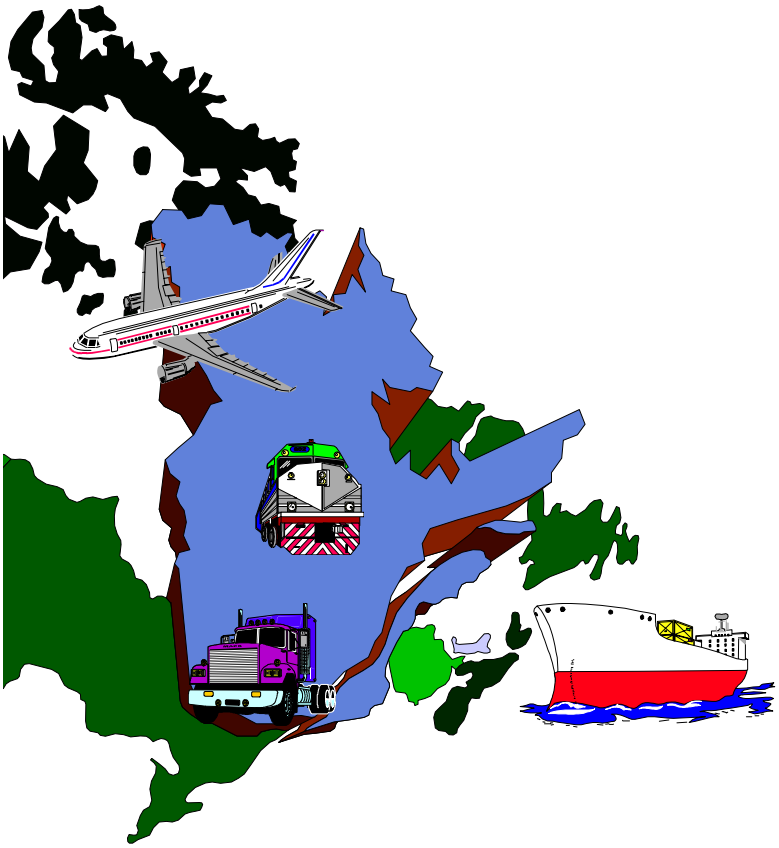
AGRA Monenco Québec
INGÉNIERIE DE SOLUTIONS GLOBALES

Québec Freight Transportation System Study

Final Report



Montréal
December 22, 1999
03-85058/DAMcK/fap

Table of Contents

List Of Tables

List Of Figures

List Of Abbreviations

AADT	Average Annual Daily Traffic
AIT	Agreement on Internal Trade
AVION	Automated Vehicle Identification Ontario
CCMTA	Canadian Council of Motor Transport Administrators
CDAC	Canadian American Railroad
CFBC	Chemin de fer de la Baie-des-Chaleurs
CFC	Chemin de fer Charlevoix
CFVM	Chemin de fer de la Vallée de la Matapédia
CN	Canadian National
CP	Canadian Pacific
CTQ	Commission des transports du Québec
EBTC	Eastern Border Transportation Coalition
EDI	Electronic Data Interchange
FTA	Free Trade Agreement
GDP	Gross Domestic Product
HCM	Highway Capacity Manual
ITS	Intelligent Transport Systems
MTQ	Ministère des Transports du Québec
NACTAP	North American Commercial Trade Automation Prototype Project
NAFTA	North American Free Trade Agreement
NQISL	Northern Québec Internal Short Line Railway

OCS	Occupancy Control System
QGRY	Québec Gatineau Railway Inc.
QSR	Québec Southern Railway
QTA	Quebec Trucking Association
RCM	Regional County Municipalities
SAAQ	Société de l'assurance automobile du Québec
SL&H	St. Lawrence and Hudson Railway
TEA-21	Transportation Equity Act for the 21st Century
TEU	Twenty Foot Equivalent Unit

Executive Summary

This study is part of the process conducted under the auspices of Transport Canada for the purpose of taking stock of the Canadian transportation system and ensuring that gateways and connections to international markets are in adequate condition. Transport Canada divided the country into six regions, including Québec, to facilitate the review and analysis of the Canadian freight transport system. The Ministère des Transports du Québec assisted in defining the content of the study and contributed to its funding.

Study objectives

Study objectives are briefly stated as follows:

- describe Québec's current surface freight transport system (specifically, the highway and rail systems) as well as linkages to marine and air transport;
- conduct an inventory of transportation freight flows, by product and mode, and prepare forecasts to 2008;
- establish and identify future plans, including proposals for north-south trade corridors;
- pinpoint current and future areas of congestion;
- determine new facilities or infrastructures required to alleviate identified problems;
- prepare maps or charts depicting the modal networks in the Province and their connections.

Current status of freight transport in Québec

The four modes of freight transportation, namely, highway, rail, marine and air, play a key role in the Québec economy.

In 1997, the total volume of freight handled by the four modes within Québec was 226 million tonnes: 29.4% by truck, 23.4% by rail, 47.2% by marine and less than 1.0% by air.

Québec's unique geographic situation within North America makes Montréal a freight traffic node in which intermodality plays a pivotal role. The Port of Montréal handled 8.2 million tonnes of containerized goods in 1997 and thus was the leading Canadian port in terms of containerized freight.

In the nineties, rail transport declined in relation to truck transport (following a trend began in the sixties). As a result, the Québec rail system underwent extensive rationalization either through the abandonment of lines (Québec lost over 2,500 km of track, nearly 30% of the total system over the past 15 years), or through the sale of lines by the two major carriers (Canadian National and Canadian Pacific) to short line railways.

Highway system

The Québec public highway system comprises 120,000 km of roadway (excluding public forestry roads) covering a major portion of the Province. Roads are more limited and sparser in the northern parts of the Province and the network is more tightly meshed as one moves south. In total, the Ministère des Transports du Québec (MTQ) has jurisdiction over approximately one quarter of the 120,000 km of roads within the Province, the remainder being for the most part under municipal jurisdiction. The share of roads under federal jurisdiction is low, although it includes the Jacques Cartier and Champlain bridges, two of the system's key linkages of the Montréal Métropolitain region.

The highway system is generally well developed outside the Greater Montréal area. However, some heavily used roads, such as routes 117 in the Abitibi, 138 on the north shore of the St. Lawrence River and 155 in the Haute-Mauricie, no longer meet the requirements of the trucking industry over their entire length.

Maximum system density is attained on the outskirts of and within urban areas, chiefly Montréal and Québec City. The Montréal region, hub of provincial economic activity, is both the head and the focal point of the major components of the upper tier provincial highway system. Levels of traffic to and from Montréal or in transit through the region merely underscore the magnitude of problems caused by the system's shortcomings in the region.

Principal axes

Autoroutes 20 and 40, running along either side of the St. Lawrence River and extending west to Ontario, are the main east-west axes of the Québec highway system. Autoroute 20, which connects with Route 185 in New Brunswick, provides a link between the Atlantic Provinces and Canadian provinces West of Québec. The analysis of freight flows within the highway system confirms the prominent role of the Autoroute 20 corridor as a major axis used for highway freight transport in Québec.

Autoroute 10, which travels through the Eastern Townships to Montréal, is a major corridor linking the southern part of the Province to the northeastern United States. Three roads branch off Autoroute 10 (i.e., Autoroutes 15 and 55, Highway 133) and provide access to the northeastern states of New York, Vermont, New Hampshire and Maine.

Border crossings

Québec shares 28 border crossings with the United States. Of these, four (4) accommodate some 80% of all provincial cross-border truck traffic. They are Lacolle (Interstate 87 in New York), Philipsburg (Interstate 89 in Vermont), Rock Island (Interstate 91 in Vermont) and Armstrong (Route 201 in Maine).

Traffic through the Lacolle crossing alone accounts for close to 6% of total freight traffic traveling between Canada and the United States. Practically half of Québec exports shipped by road to the United States and Mexico transits through Lacolle where Autoroute 15 joins up with Interstate 87, and through the Philipsburg crossing, where National Highway 133 meets Interstate 89.

Highway/port linkages

The Port of Montréal is the main link in the intermodal container transport system for the international and intercontinental markets. Rail and highway infrastructure serving Canada and the American Midwest are the extension of this system on the continent. Over 40% of containers handled by the Port of Montréal travel to and from the Port by truck, while the remainder is carried by rail.

The Port of Montréal is adequately served (disregarding general system congestion problems that affect the entire region and not only the Port) and any problems encountered are mostly operational in nature. With respect to the two other major ports handling freight—Québec and Trois-Rivières, traffic generated at both locations is low and no capacity problems have been identified which would hamper service to these infrastructures.

Highway/airport linkages

Dorval and Mirabel airports generate low freight traffic levels and both locations can be easily accessed by truck outside peak hours. Some problems have been encountered, however, at the Côte-de-Liesse/Dorval interchange, which links Dorval Airport, Autoroute 20, Autoroute 520 and the city of Dorval. Traffic light management must be improved and road alignment must be adjusted to the various uses made of the infrastructure. There is every indication that truck traffic in the vicinity of Mirabel Airport is in no way constrained at present.

Highway/rail linkages

The main intermodal terminals are Canadian National's Monterm terminal located in west-central Montréal, near the Autoroute 20 and Autoroute 15 interchange, as well as the St. Lawrence & Hudson's (Canadian Pacific) terminal located in Lachine, close to Dorval Airport. These intermodal terminals are well served and no particular problems have been identified other than those caused by traffic congestion of the Montréal area highway network.

Transport community concerns

Concerns expressed by the transport community over the Québec highway system do not differ significantly from those raised in most other provinces and northeastern states. They are related first and foremost to highway system underfunding and secondly to system conservation and development. These concerns may be summarized as follows:

- **Significant funding requirements.** Following two decades of intensive development in the sixties and seventies, little further development was carried out on the Québec highway system in the eighties and nineties.

- **Sources of funding.** It is necessary to substantially increase funding for the conservation and development of the Québec highway system. Consideration could be given to creating a special dedicated fund for this purpose and/or private sector involvement.

- **Significance of the highway system.** The importance of a reliable, safe and effective highway system must be recognized as a prerequisite for remaining competitive. According to several sources, the principal weak links in the Québec transport system relate to the highway system.

Conclusion

The incomplete state of the Montréal area highway system unquestionably constitutes the most pressing problem facing the Québec transportation industry. Other concerns are virtually the same as those raised elsewhere.

Other regions, interprovincial gateways, border crossings, ports, airports and intermodal terminals continue to be well served.

Rail system

A few years ago there were only two major rail carriers in Québec: Canadian National (CN) and Canadian Pacific (CP). They are still in operation but they have been joined by several new carriers in the form of short line railways. Short lines are local or regional carriers that operate secondary lines.

The Québec rail system comprises 6,059 km of line. CN (and its independent division known as the Northern Québec Internal Short Line Railway) operates 50% of the rail system and remains the industry's principal carrier. The St. Lawrence & Hudson Railway (SL&H), a CP subsidiary created as a result of a 1996 restructuring, conducts its activities in eastern North America and operates 260 km of line, or 4% of the system in the Province. Short line railways now account for over 28% of the system. Railway companies operating on the Québec north shore which are subsidiaries of mining companies, as well as the Roberval & Saguenay Railway Company, a subsidiary of Alcan in the Saguenay–Lac-St-Jean region, remain important Québec rail carriers. They handle the products of their respective parent companies, either exclusively or on a priority basis.

There are three other rail freight carriers in Québec. They are the Nipissing Central Railway, responsible for sections of line located in Québec belonging to the Ontario Northland Railway, a provincial corporation operating in northeastern Ontario that provides service to Rouyn-Noranda, CSX Inc., an American company operating a line between Montréal and the U.S. border, as well as the Montréal Port Authority.

Eight railway companies were examined in detail for the purpose of this study: they are Canadian National (as well as the Northern Québec Internal Short Line Railway), St. Lawrence & Hudson Railway and six short lines, namely, Québec Gatineau Railway Inc.; the two Bangor & Aroostook System short lines located in Québec (Québec Southern Railway and Canadian American Railroad); and the three short lines owned by the Québec Railway Corporation at December 31, 1998 (Chemin de fer de Charlevoix, Chemin de fer de la Vallée de la Matapédia and Chemin de fer de la Baie-des-Chaleurs).

Rail/port linkages

Generally speaking, rail access to the three main freight-handling ports in Québec, those of Montréal, Québec City and Trois-Rivières, is satisfactory. However, congestion could become a problem at Trois-Rivières should traffic levels continue to increase. At the Port of Montréal, off-island expansion of container handling facilities could impact upon future levels of service provided by the highway and rail systems to the new terminal.

Railway industry concerns

The main concerns raised by the railway industry on the current state of the Québec rail system are summarized below:

Taxation. Transcontinental railway companies believe that Canada's current taxation systems (for example, capital cost allowance and fuel taxes) continue to negatively impact their competitive position in relation to the trucking industry and American rail carriers.

Short line railway budget limitations. Most officials of short line railways interviewed stated that budget restrictions impeded more effective system management. Examples given included infrastructure improvements, construction of new level crossings and increasing track capacity levels.

Port rail services. The fact that the Old Port is a tourist destination is a source of conflict at the Port of Montréal. At the Port of Québec, business differences between rail carriers concerning rights of access is an issue.

Short line dependency on transcontinental rail carriers. A short line railway's dependency on the transcontinental rail carrier from which it purchased the line could hinder its potential to maximize revenues.

Conclusion

At present, the Québec rail system is underutilized and thus offers abundant capacity for freight transport. Little use is made of intermodal rail in Québec, despite its rapid expansion elsewhere. This situation provides an opportunity to increase rail system traffic levels and thereby contribute to reducing the number of trucks operating on the Québec highway system.

Observations and recommendations

In order to remain competitive, shippers are increasingly paying attention to logistics in the marketing of their products and are reevaluating their supply and distribution methods. Transport is an essential component of the logistics system and hence on the economic competitiveness of a business, a region or a territory.

Generally speaking, changes in freight transport demand characteristics over the past two decades (just-in-time, door-to-door, increased frequency, greater reliability, shorter transit times and increased flexibility) as well as market internationalization have favoured trucking in the Québec and Canadian freight transport markets, as well as across the continent.

Trucking is therefore bound to play an increasingly important role in freight transport and it is thus essential that its importance be recognized. To this end, a sound and safe highway system and one that provides sufficient capacity for passenger and freight transport must be maintained.

However, forecasts show that rail transport will become increasingly important and will grow at a greater rate than that of the trucking industry. The revitalization of rail transport in Québec is mainly due to intermodal transportation. It is necessary, therefore, to protect the rail system and to promote intermodality and integration of the various modes to achieve optimum use of surface systems.

In view of information compiled on the current situation and future plans in the surface transport sector, and taking into account forecasts by mode, one may identify those elements that are essential to increasing the effectiveness of surface freight transport and to improving linkages with marine and air transport.

Reliable and effective highway infrastructure

In order to conserve and improve the operational reliability of the Québec highway system, we recommend:

- that, given the important role of highway transport in economic development, the various levels of government give priority to funding projects which preserve and develop the system and consider partnerships with the private sector for this purpose;

- that ways be examined to complete the Montréal area highway system to solve the problem of system discontinuity and to improve reliability;

- that sections of travel corridors located in Québec possess all the necessary features to encourage external trade in order to ensure effective transport of freight with interprovincial and international markets;

- that highways be designed to support truck traffic levels sufficient to ensure effective freight transport in the intraprovincial market, as well as effective and reliable transport of primary products originating in the regions;

- that initiatives are undertaken with respect to system deterioration caused by heavy vehicles through adequate regulation and control of loads and reinforcement of highway infrastructure when road improvement work is performed.

Using new technologies

To assess the feasibility of ITS use in Québec, we recommend:

- that Québec give priority to developing an action plan for applying ITS to the transport of goods within the province to meet industry needs, which are essentially identical to those of its neighbours to the South. In the short run, the action plan should initially emphasize electronic audit and validation systems;
- that the above-mentioned plan be undertaken in conjunction with that put forward by the federal government (ITS Plan) to promote Intelligent Transport Systems development and deployment;
- that active participation in Intelligent Transport Systems demonstration projects conducted by Québec's partners be carried out in order to derive maximum benefit from these efforts;
- that the action plan be jointly validated by stakeholders and that the exchange of views for this purpose be supported by specialized associations (such as the Association québécoise du transport et des routes—AQTR) to achieve the widest possible consensus.

Harmonized regulations

In order to ensure effective transport of freight in interprovincial and international markets, priority must continue to be accorded to harmonizing standards as specified in the AIT and NAFTA respectively.

Preservation and operation of the rail system

Preserving the Québec rail system is a concern for the Ministère des Transports du Québec, and an action plan is being developed with respect to short line railways.

Regarding border crossings, close cooperation is required among the federal governments of Canada and the United States, Québec and neighbouring provinces to implement customs clearance procedures and mechanisms which support effective train operations and the expeditious shipping of goods.

Intermodality and modal integration

In order to increase modal integration which can permit a better utilization of infrastructure for the transport of freight in Québec, it is necessary to promote the collaboration of all stakeholders in the transport chain and put in place information mecanisms which present to shippers, the available transportation options. In addition, it would be advantageous to closely examine methods to favour transport chains which include an efficient marine segment.

Competitive position of the St. Lawrence River and its ports

Efforts must be made to ensure that the St. Lawrence River and its ports maintain their competitive position in international markets for the transport of containerized and non-containerized goods. Governments must recognize the importance of the St. Lawrence River for the economies of Canada and Québec and the pivotal role played by the Port of Montréal within the river system. The Port of Montréal must maintain its competitive position in international markets for the transport of containers if the Montréal area is to remain a freight traffic node.

Freight transport data availability

It is recommended that all levels of government take action to improve the availability and reliability of data for all transport modes in order to enhance their planning initiatives in support of an effective and efficient transport system for Québec and for Canada.

I

Introduction

This study is part of the process conducted under the auspices of Transport Canada for the purpose of taking stock of the Canadian transportation system and evaluating the state of its connections and gateways to international markets. Transport Canada divided the country into six regions, including Québec, to facilitate the review and analysis of the Canadian freight transport system by taking into account differences in transportation requirements, the state of existing infrastructure and traffic levels among regions. The Ministère des Transports du Québec ("MTQ") assisted in directing the content of this study and contributed to its funding.

A. Study background

Globalization of trade relations and increased trading activity among the three North American countries who are party to the Free Trade Agreement (FTA) and the North American Free Trade Agreement (NAFTA), have made an efficient and effective Canadian transport system essential to this country's productivity and competitiveness in world markets and economic growth.

External trade growth in North America has had a significant impact on the Canadian transport system, as witnessed by the following developments:

- proposals to establish "trade corridors" designed to upgrade North America's north-south trade axes. These proposals involve highway infrastructure, expedited clearance at border crossings, implementing intelligent transport systems and streamlining customs and immigration procedures;

- the harmonization of North American transportation systems, including equipment standards and utilisation, inspection and other operations at border crossings and requirements for vehicle entry and operation;

- railway line rationalisation, prompting mergers and consolidation among main line operators in Canada and the U.S. (Canadian National and Illinois Central, for example). This has accelerated the introduction of more direct and specialized services in North America and increased the scope for development of short line railways;

- increased strategic alliances between American and Canadian highway carriers, as well as acquisitions and mergers (for example, the purchase of Reimer Express by Roadway Express and, in Québec, the purchase of Transport Papineau by Cabano-Kingsway).

Furthermore, the U.S. *Transportation Equity Act for the 21st Century* (TEA-21) provides for funding programs in support of trade corridor and border gateway planning, and research and deployment programs for intelligent transportation systems.

In light of the above, the federal and provincial governments are taking a greater interest in the renewal and maintenance of Canada's highway infrastructure and in ensuring the compatibility of the Canadian national highway and freight transportation networks with U.S. trade corridors.

B. Study objectives

The study objectives are as follows:

- to prepare a detailed report describing the existing freight transportation system in Québec, including highway, rail and intermodal networks, and air and marine facilities not otherwise included above, with special reference to infrastructure conditions and constraints, and U.S. border crossings;

- to assess the flow of goods, by commodity and mode, in terms of origin-destination, equipment used, route taken, traffic volumes, value of trade, extent of intermodal use, and carrier or shipper constraints;

- to prepare freight transportation forecasts by mode to the year 2008;

- to identify and describe modal plans for the future (public or private), including north-south trade corridor proposals, and their components or connecting routes with U.S. systems, and east-west and north-south routes within Canada;

- to identify current and potential (to the year 2008) areas of congestion, constraint, or other concerns, with respect to interprovincial and international transportation. To identify operational, institutional or other constraints that influence interprovincial and international freight transport or will do so in the future;

- to determine what new facilities or upgraded infrastructures would be required to alleviate the above problems and concerns;

- to prepare maps or charts depicting the modal networks in the province and their connection to the rest of North America.

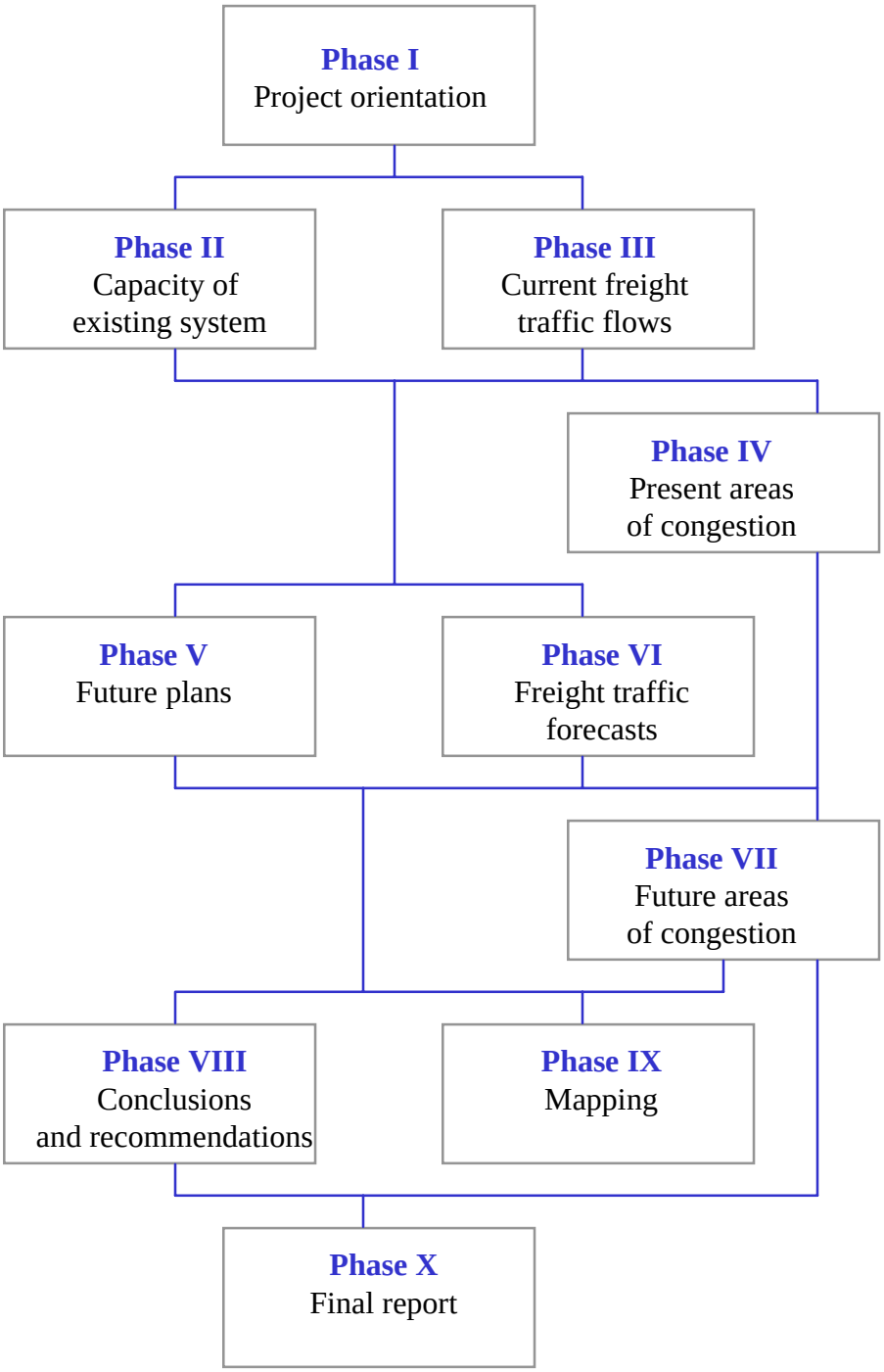
C. Scope

This study is primarily focused on the surface freight transport system (specifically involving truck, rail and intermodal carriage) within Québec and at the main gateways to interprovincial and international markets that affect the overall effectiveness of the transport system. Linkages between marine and air transport and the surface transport system are also reviewed. Passenger traffic is considered to the extent that it impacts on, or contributes to, system or facility congestion.

D. Study approach

The approach comprised ten phases as set out in Table I-1.

Table I-1
Study approach



Phases I to IV involved a review of the current Québec freight transport system infrastructure and freight transport demand in the province. In Phases V to VII, we developed freight transport projections and assessed their likely impact on the existing and proposed infrastructures. The results of our work and our recommendations are documented in Phases VIII to X.

Maximum use was made of existing data sources such as:

- Statistics Canada publications and databases on highway, rail, marine and air transport;
- Transport Canada freight transportation trends and forecasts to 2010;
- the inventory and description of the highway infrastructure maintained by the MTQ.

A comprehensive bibliography of study reference documents is provided in Appendix A.

Québec carriers (for example, rail and trucking companies) as well as port and airport authorities also played key roles in providing information on existing traffic levels, infrastructure and future plans.

E. Presentation of results

Chapter 2 sets out the economic context and the legislative framework for freight transport in Québec. Chapter 3 presents the current freight traffic flows within the Québec surface transport system. Chapters 4 and 5 describe the highway and rail systems respectively. Forecasts of freight transportation in Québec are provided in Chapter 6. Chapter 7 presents future plans for highway networks in Québec and in bordering provinces and states, as well as those of the railway companies. Our observations and conclusions based on our research, are presented in Chapter 8.

II

Québec Freight Transportation Context

A number of factors have a bearing on the evolution of freight transportation in Québec. This chapter provides an overview of the influences exerted by economic factors and the legislative and regulatory framework on surface freight transportation within the Province.

A. Economic context

The economic environment is well described in a report published by the Ministère des Transports du Québec.[1] The report classifies economic changes under the following headings: internationalization of the economy, structural changes and territorial distribution of economic activity. Its main points are set out hereunder.

1. Internationalization of the economy

The Québec economy's openness to external markets has always been a distinctive feature. Over the last decade, the rules of trade have been made more flexible to emphasize this openness and to strengthen the province's economic integration within North America on three levels: multilaterally with the World Trade Organization, at the continental level with the FTA and NAFTA, as well as within Canada with the Agreement on Internal Trade (AIT).

Consequently, according to data from the Ministère des Finances du Québec,[2] the level of openness of the Québec economy in terms of the value of trade (both international and interprovincial) as a per cent of the gross domestic product (GDP) rose from 91% in 1981 to 116% in 1995. Moreover, this evolution in external trade increased mainly as a result of stepped-up international trade, which rose from 43% to 71% of the GDP, whereas interprovincial trade fell from 48% to 45%. In 1995,

---

1 Ministère des Transports du Québec, *Le transport des marchandises au Québec—Problématique et enjeux*, April 1999.

2 Ministère des Finances, *The Québec Economy*, 1996.

trade with the United States accounted for 51.8% of the total value of external trade, while trade with the rest of Canada totaled 33.7% (of which 22.6% was with Ontario) and 14.5% with the rest of the world.

2. Structural changes to the Québec economy

The Québec economy has been strongly influenced by the development of the service sector over the past few decades. From 1961 to 1994 the share of the GDP accounted for by the service sector rose from 56.6% to 72.4%, whereas the shares of the manufacturing sector and of primary industry both fell, from 37.0% to 24.6% and 6.3% to 3.1% respectively.[1]

The share of the GDP accounted for by the transport industry declined significantly between 1961 and 1994, from 7.4% to 3.7%. This change can be explained by structural factors (development of the service sector) and by increased productivity in this sector.

Changes within the manufacturing sector relate to an increase in the relative share of high-value high technology industries (aerospace, electronics and communications equipment, computers and pharmaceuticals), which accounted for 11.8% of production in 1992, compared to 4.4% in 1976. The importance of high technology industries in Québec is significantly greater than it is in the rest of Canada (6.4% of manufacturing GDP).

This growth occurred at the expense of low technology industries (traditional or natural resources sectors related to lumber, paper, primary metal, food and textile) whose share of manufacturing GDP declined from 58.2% to 52.5% over the same time period. These industries remain significant nonetheless in Québec compared to the rest of Canada (45.8% of production). This reflects the continued prominence of natural resource industries within the Province.

3. Territorial distribution of economic activity

The pattern of distribution of Québec's economic activity and population is highly disproportionate across the province's vast land mass.

---

[1] Ministère des Finances, *The Québec Economy*, 1996.

In 1995, 60% of Québec jobs were located in Montréal and its surrounding area, 24% were found in the central regions[1] while outlying areas accounted for 16%.

Resource-dependent and outlying regions are mainly characterized by a forestry- and mining-based primary sector, as well as a secondary sector based on primary processing (pulp and paper, lumber and aluminum). A major part of their production is shipped outside the Province and they are thus subject to international market fluctuations.

Central region economies are much more diversified. Their primary sector is mostly agriculture-based whereas their processing sector is comprised mainly of low and medium technology firms and the pulp and paper and aluminum industries.

The economy of the Greater Montréal region is also highly diversified. Firms make much greater use of technology than do those of other Québec regions. While 65% of all Québec manufacturing jobs are located in the Montréal area, 85% of those belong to the medium (chemicals, automotive and electrical products) and high (aerospace, electronics, computers and pharmaceuticals) technology based industries.

B. Legislative and regulatory framework

The various levels of government share jurisdiction over freight transportation. As a general rule, interprovincial and international transport comes within the purview of the federal government, whereas interprovincial transportation, with the exception of air transport, is the responsibility of the Province.

1. Federal government

In recent years, the federal government has divested itself of its important role in the financing and operation of rail, marine and air transportation infrastructures and services, either by privatizing certain activities, or by transferring its responsibilities or infrastructures to local, regional or provincial authorities.

As regards rail transportation, the *Canada Transportation Act of 1996* promotes railway company profitability by simplifying railway line abandonment and sale procedures. Privatization of Canadian National provides a good example of federal government divestment of rail operations.

---

[1] The central regions include the Québec City area, the Chaudière-Appalaches and Mauricie-Bois-Franc regions and the Eastern Townships.

The federal government exercises jurisdiction over highway transport through the *Motor Vehicle Transport Act, 1987*. However, responsibility for enforcing the act is delegated to provincial governments. In security matters, the federal government is responsible for the *Transportation of Dangerous Goods Act*. Furthermore, the federal government introduced the *National Safety Code* in 1988, an interprovincial accord that the provinces agreed to enact in their respective legislatures, given that they have jurisdiction over highway safety.

2. Québec government

a) Highway transport

Québec exercises jurisdiction over firms whose operations are restricted to the province, as well as over the Québec operations of trucking firms based outside the province through delegation of federal powers. Additionally, Québec has the right to enact legislation regarding the use of highways and highway safety. However, jurisdiction is shared as regards regulating safety of operations of a trucking firm based outside the Province.

Laws and regulations governing highway freight transportation under Québec jurisdiction can be grouped under two headings, the first being economic in nature, the second relating to safety and security.

i) Economic regulation

The Québec government enacted the *Act respecting Truck Transportation*, which took effect on January 13, 1988, in order to harmonize Québec legislation with the federal *Motor Vehicle Transport Act, 1987*. The *Act respecting Truck Transportation* was repealed on July 21, 1998 in keeping with commitments made by Québec under the AIT and was replaced by the *Act respecting Owners And Operators Of Heavy Vehicles*.

Bulk trucking is governed by a separate economic framework under the *Motor Vehicle Transport Act*. This act applies to the truck transportation of bulk goods and to bulk trucking brokerage. In this area, market access, as well as rates and tariffs, remain extensively regulated. However, the transport of certain goods (for example, wood chips) was partially liberalized recently.

Federal and Québec trucking legislation empowers the Commission des transports du Québec (CTQ) to issue, suspend or revoke trucking permits or licenses. Furthermore, the Commission has the power to set bulk trucking rates and tariffs in certain areas.

ii) Security and safety

The Québec *Highway Safety Code* and related regulations set out standards of safety and highway system protection that apply to carriers, operators, freight highway transport vehicles and loads. The existing trucking safety regulatory framework is largely a result of harmonizing the Québec *National Safety Code* and the federal *National Safety Code*, which served as a reference point.

The ministère des Transports du Québec (MTQ) is responsible for developing highway system protection standards. The MTQ is also responsible for certain safety features of vehicles and their loads, as well as for highway infrastructure safety.

The Société de l'assurance automobile du Québec (SAAQ), on the other hand, is responsible for managing the *Highway Safety Code*.

b) Rail transport

Québec has jurisdiction over companies incorporated under its laws whose facilities are located entirely within the Province. However, such companies come under federal jurisdiction if they are declared to be in the general interest of Canada.

Railway operations under provincial jurisdiction are governed by two acts: the *Railway Act* and the *Act to Ensure Safety In Guided Land Transport*.

The *Railway Act* specifically promotes the development of short line railways, following the withdrawal of the two major railway companies from providing local and regional service. Implementing regulations came into force in September 1994. Regulations provide for issuance of a certificate of qualification by the CTQ once certain requirements are met (for example, providing proof of civil liability insurance and a description of infrastructure and proposed transportation services).

The purpose of the second act is to ensure the safety of rail infrastructure, operations and railway equipment (rolling stock) under provincial jurisdiction. Companies that operate railway equipment are required to file their safety rules with the MTQ. Consequently, the MTQ inspects companies whose operations come under its jurisdiction.

C. Current status of freight transportation in Québec

The four transportation modes, namely, highway, rail, marine and air, play an important role in the Québec economy. Research conducted for this study shows that 1997 traffic levels of freight shipped by mode in Québec were as follows:

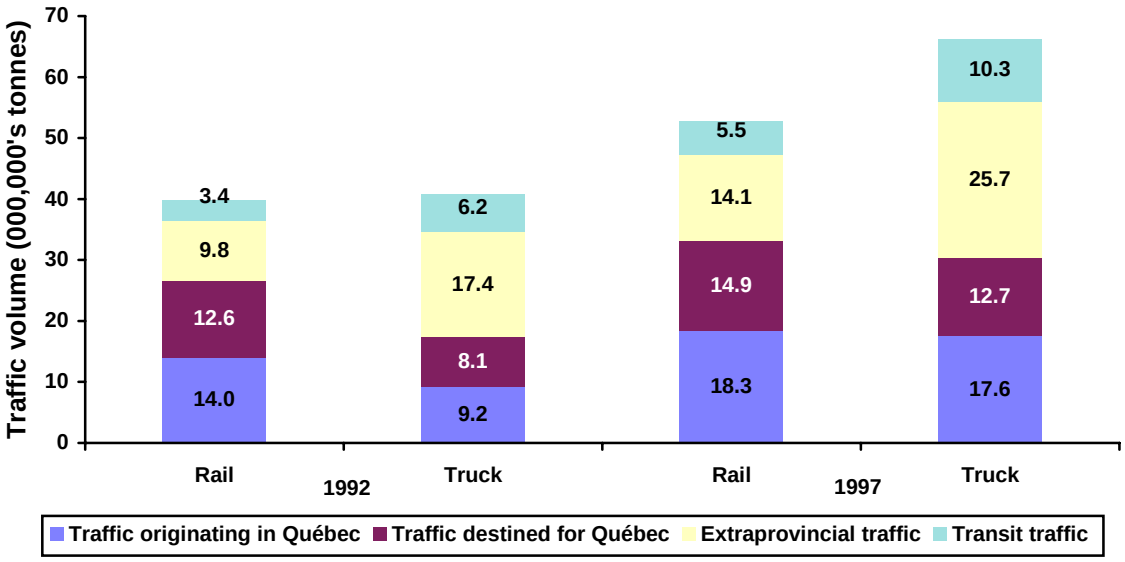
Mode of transport	Volume (millions of tonnes)
Trucking	66.3[1]
Rail	52.8[2]
Marine	106.5[3]
Air	0.2[4]
Total:	**225.8**

[1] *Common carriers with annual revenues greater than one million dollars.*
[2] *Excludes iron ore volumes transported by mining companies located on the Québec north shore.*
[3] *Handled by Québec ports.*
[4] *Montréal airports only.*

Intermodal freight transportation also plays an important role in Québec because of the province's unique geographic location in North America, the proximity of the Seaway and the significant available draught of the St. Lawrence River to Montréal. Montréal's existing transport infrastructure (Port of Montréal, airports, etc.) makes the city a traffic node for freight transport in which intermodality plays a primary role. The Port of Montréal is a major hub in terms of containerized freight traveling across the North Atlantic. In 1987, 8.2 million tonnes of containerized freight, or 870,000 TEU's (twenty-foot equivalent units), were handled by the Port, the highest level of containerized freight traffic of any port in Canada.

Figure II-1 presents the recent evolution of truck traffic versus rail traffic.

Figure II-1
Changes in Québec rail and highway traffic



Sources: Statistics Canada, Transport Canada.

In the nineties, rail transport declined in relation to highway truck transport (a trend which began in the sixties). Rail volumes increased by 32.2%, whereas truck transport rose by 62.1% from 1992 to 1997. Rail transport lost ground in all market segments, especially within Québec. However, railway companies still carry more tonnage to and from the Province than do common carrier trucking firms.

It should be noted however that these statistics underestimate the importance of the trucking industry within the Québec economy. Traffic figures do not reflect private trucking nor common carriers whose revenue is less than $1 million per year. Secondly, in terms of the value of goods carried, trucking's share of the surface freight transportation market is much greater than in terms of tonnage.

The strong growth of the trucking industry was due in part to its ability to respond to the just-in-time scheduling of industry in an economy where client service needs are becoming increasingly demanding and inventory costs must be kept to a minimum.

Economic deregulation of the trucking sector which occurred in 1988 is another factor underlying recent trends in the trucking industry. As a result, regional carriers were required to deal with new competition in their traditional territory while they themselves were extending the boundaries of their conventional markets.

Both major Québec rail carriers (Canadian National and Canadian Pacific) streamlined their operations extensively following considerable operating losses due to network

overcapacity, operating conditions and increasing competition by the trucking industry. Their rationalization efforts led to the abandonment or selling of lines deemed to be unprofitable. Rail abandonment which began 15 years ago, resulted in the loss of more than 2,500 kilometers of track, or nearly 30% of the total Québec railway system. The two major carriers also sold lines to short line operators which were no longer profitable but could be if operated by a smaller company with a lower cost structure.

III

Current Freight Traffic Flows

This chapter presents the volumes of freight traffic transported by the Québec surface transportation system (i.e., truck and rail transport) over the past five years as well as the linkages between this system and marine and air transport. The freight classification used in this analysis is based on freight categories established by Transport Canada for the study of the flow and levels of freight shipped by various modes in Canada. Appendix B reconciles the freight categories used by Transport Canada and those used for the purposes of this study.

A. Truck traffic

As is the case in the rest of Canada, trucking and transport in general constitute a sector of activity that exerts an important influence on the Québec economy.

The following section presents the evolution of truck traffic[1 and 2] by market segment (destination-origin) and by major freight category. Zones within the United States are defined in Appendix C.

1. Truck traffic originating in Québec

As demonstrated by Table III-1, the 91% increase in tonnage of freight shipped by truck from Québec origins is especially due to a sharp increase (133%) in tonnage shipped to the United States.

---

1 Common carriers with annual revenue levels of $1 million or more.

2 It should be noted that changes made by Statistics Canada in 1996 and 1997 to the origin-destination survey, specifically with reference to the definition of long distance and use of data from a different defined source to establish the survey universe, may affect direct comparisons with 1990 data.

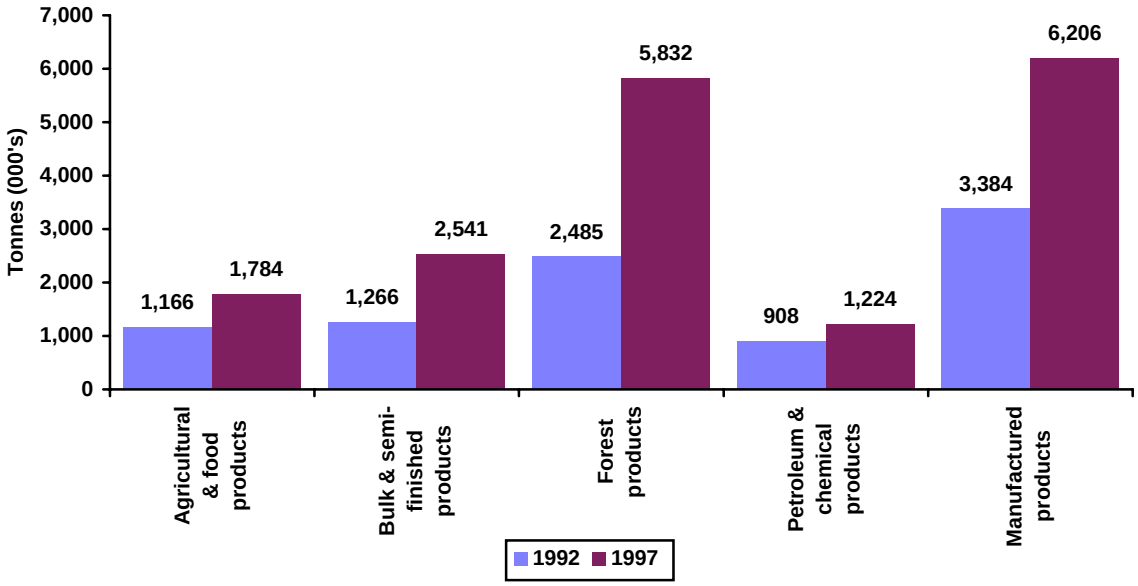
Table III-1
Major truck traffic destinations (000's of tonnes)

Destination	1992	1997	% Variation
Ontario	4,612	7,802	69.2
Maritimes	1,017	1,623	59.6
West	285	487	70.9
Sub-total Canada	**5,914**	**9,912**	**67.6**
North	647	1,875	189.8
North-East	2,105	4,368	107.5
West	47	104	121.3
South	495	1,327	168.1
Sub-total United States	**3,294**	**7,674**	**133.0**
Total	**9,209**	**17,587**	**91.0**

Sources: Statistics Canada, Transport Canada.

Growth in major classes of freight shipped by truck from points in Québec is set out in Figure III-1. Forest products increased most sharply, by 135%, followed by bulk and/or semi-finished products, which grew by 101% from 1992 to 1997. Petroleum and chemical products had the slowest rate of growth.

Figure III-1
Québec originating truck traffic by commodity category (000's of tonnes)



Sources: Statistics Canada, Transport Canada.

The principal types of manufactured products shipped by truck from points in Québec were automobiles and land vehicles, containers, tires, textiles and industrial machinery.

2. Truck traffic destined to Québec

As Table III-2 illustrates, volumes of freight shipped by truck to points in Québec as well as related growth rates were less than the traffic levels and growth rates of originating truck traffic. Once again, traffic from the U.S. grew more sharply than traffic from points in Canada and in more dramatic fashion than traffic originating in Québec.

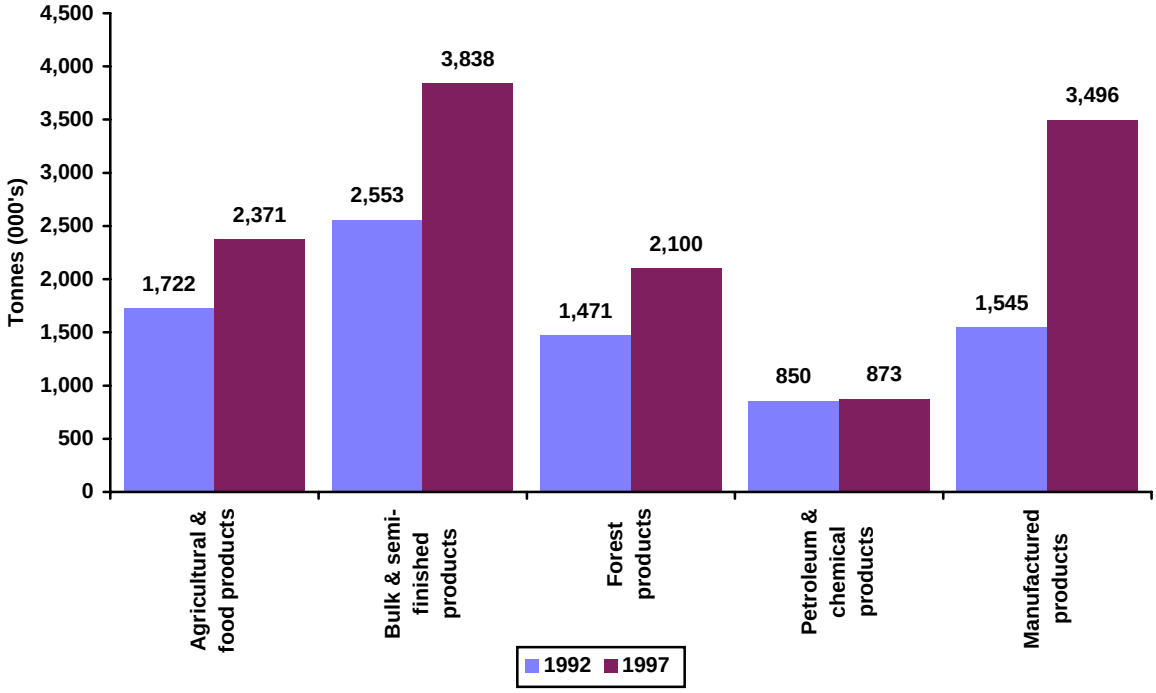
Table III-2
Major origins of truck traffic (000's of tonnes)

Origines	1992	1997	% Variation
Ontario	5,266	6,951	32.0
Maritimes	771	953	23.6
West	250	385	54.0
Sub-total Canada	**6,287**	**8,289**	**31.8**
North	277	909	228.2
North-East	1,135	2,258	99.0
West	57	194	240.0
South	384	1,028	167.7
Sub-total United States	**1,853**	**4,389**	**136.4**
Total	**8,141**	**12,678**	**55.7**

Sources: Statistics Canada, Transport Canada.

Figure III-2 shows that manufactured products had the strongest rate of growth, increasing by 126% from 1992 to 1997, followed by bulk and semi-finished products, which rose by 50% over the same period. Automobiles, containers, toiletries and textiles were the main incoming manufactured products.

Figure III-2
Truck traffic destined to Québec by commodity category (000's of tonnes)

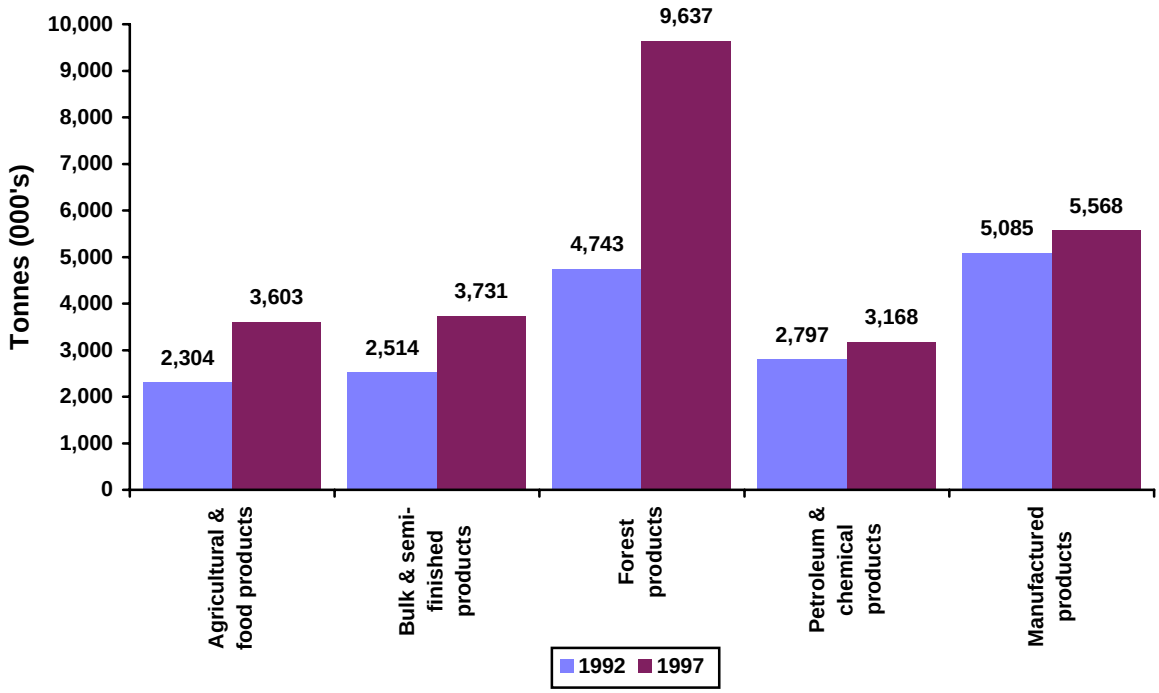


Sources: Statistics Canada, Transport Canada.

3. Intraprovincial truck traffic

Truck transport within the Province is the prime market segment of the trucking industry (accounting for 25.7 million tonnes in 1997). However, this segment grew at a lesser pace (47.4%) from 1992 to 1997 than did inbound or outbound traffic. Figure III-3 compares traffic levels broken down by commodity category between 1992 and 1997.

Figure III-3
Québec intraprovincial truck traffic by commodity category (000's of tonnes)



Sources: Statistics Canada, Transport Canada.

The analysis of truck traffic within Québec shows that forest products ranked first among goods shipped. Its rate of growth reached 104%, greater than that of any other commodity category. Agricultural and food products ranked second in terms of rate of growth, rising by 56%. Manufactured goods grew at the slowest pace, although they remained second overall in terms of volume.

4. Québec in-transit truck traffic

In-transit truck traffic also increased significantly in Québec, gaining 46.3% from 1992 to 1997. As shown in Table III-3, the greatest increase occurred in the Maritime Provinces-Ontario corridor. Nonetheless, traffic levels remained the greatest between Ontario and the northeastern United States.

Table III-3
Québec in-transit truck traffic (000's of tonnes)

Origines	Destinations	1992	1997	% Variation
Ontario	Maritimes	840	1,063	26.6
Maritimes	Ontario	440	879	99.8
North-East U.S.	Ontario	1,952[1]	2,964[1]	51.8
Ontario	North-East U.S.	2,968[1]	4,167[1]	40.4
Total		**6,200**	**9,073**	**46.3**

Source: Transport Canada.

[1]*Note: Only a portion passes by Québec.*

B. Rail traffic

As stated at the outset of this chapter, rail traffic declined relative to tonnage shipped by truck, from 49% of overall traffic levels in 1992 to 44% in 1997. However, tonnage shipped by rail still increased from 39.8 million tonnes in 1992 to 52.8 million tonnes in 1997, a 33.2% increase.

Detailed data sheds light on the strengths and weaknesses of the rail transport market in Québec, in terms both of major classes of products and origin-destination traffic flows.

1. Québec originating rail traffic

Table III-4 compares major destinations of rail traffic from Québec between 1992 and 1997. As is the case with truck transport, American market growth outpaced that of the Canadian market.

Table III-4
Rail traffic by major destination (000's tonnes)

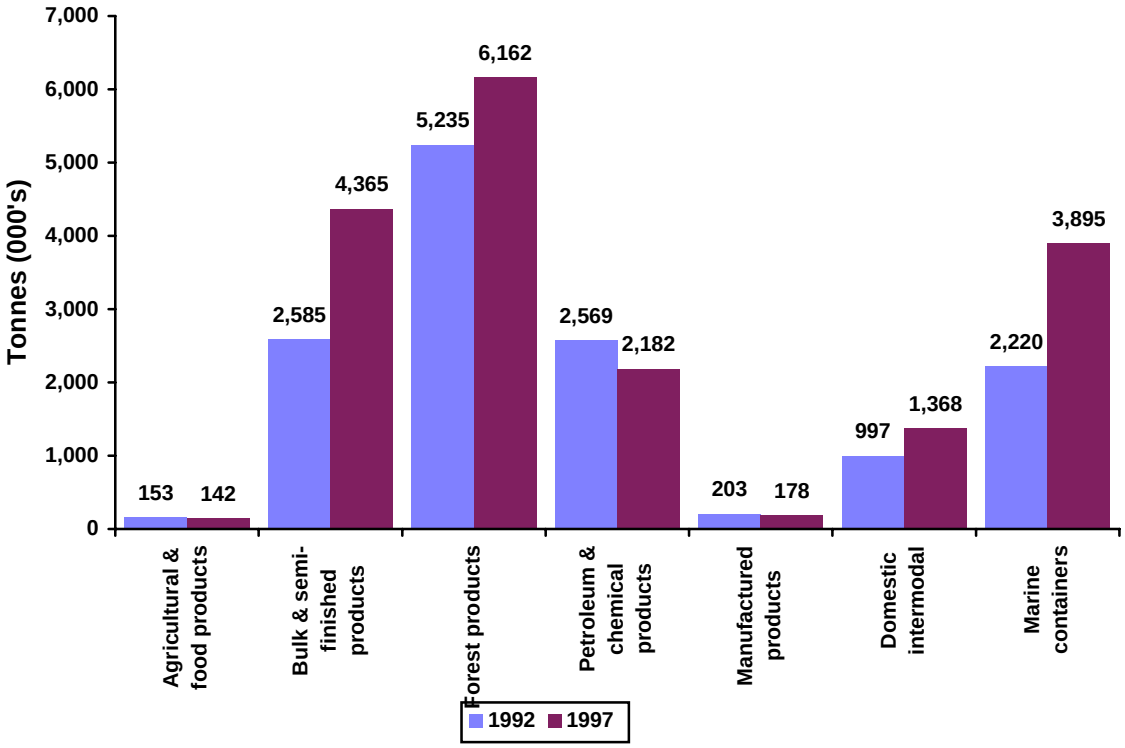
Destination	1992	1997	% Variation
Ontario	2,500	2,855	14.2
East	1,339	1,456	8.7
West	1,499	2,081	38.8
Sub-total Canada	**5,338**	**6,392**	**19.7**
North	1,949	4,522	132.0
North-East	4,777	3,690	(22.8)
West	60	357	495.0
South	1,837	3,332	81.4
Sub-total United States	**8,623**	**11,901**	**38.0**
Total	**13,962**	**18,293**	**31.0**

Sources: Statistics Canada, Transport Canada.

Total rail traffic levels from points in Québec increased by 31.0% from 1992 to 1997, from 13.96 million tonnes to 18.29 million tonnes. This increased tonnage is largely due to increased trade with the United States, up 38.0% over the past five years. The same trend applies to highway transport. Part of the rail traffic increase is also a result of increased volumes to Western Canada, which gained 38.8% from 1992 to 1997.

Statistics Canada data show that the leveling off of railway freight volumes between Québec and other regions is largely attributable to a downturn in manufactured and petroleum and chemical products. As shown in Figure III-4, growth in railway freight is mainly due to increases in domestic intermodal traffic (up 37.2%), bulk and semi-finished products (up 68.9%) and marine containers (up 75.5%). Marine containers travel from the Port of Montréal to inland North American markets as well as from points in Québec to the ports of Halifax and Vancouver for export.

Figure III-4
Québec originating rail traffic by commodity category (000's of tonnes)



Sources: Statistics Canada, Transport Canada.

2. Rail traffic destined to Québec

Rail traffic to Québec increased at a slower rate than traffic originating in Québec. The same trend was observed for truck transport. Table III-5 once again demonstrates the greater importance of the American market. Levels of freight from Canadian markets remained practically unchanged between 1992 and 1997.

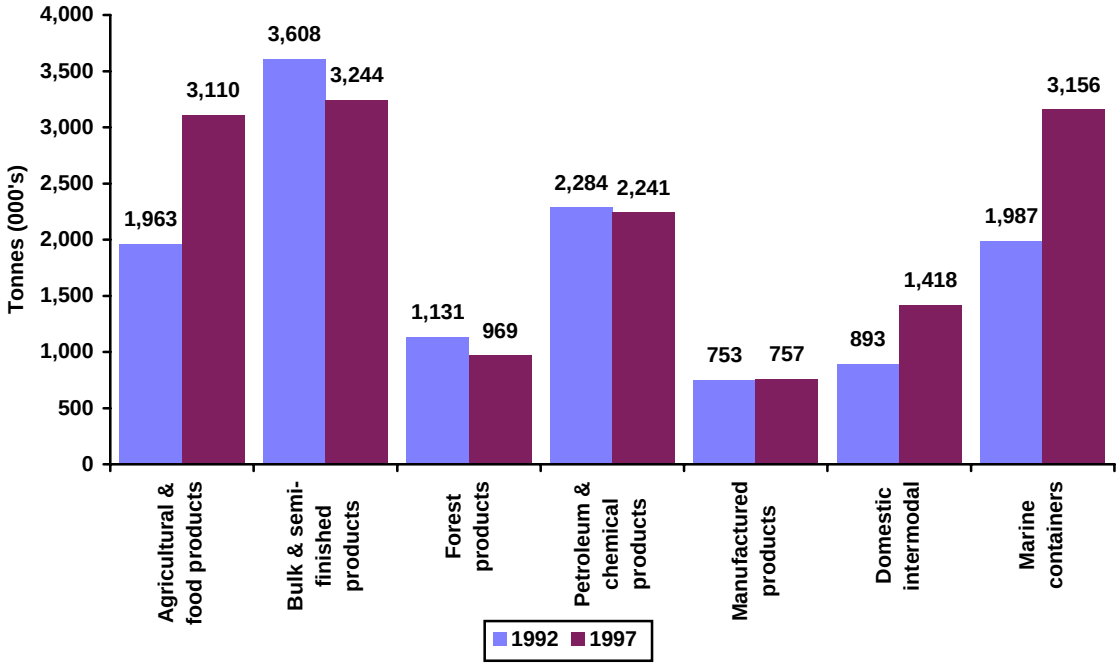
Table III-5
Rail traffic by major origin (000's of tonnes)

Origine	1992	1997	% Variation
Ontario	5,361	4,983	(7.1)
Maritimes	951	1,250	31.4
West	2,757	3,413	23.8
Sub-total Canada	**9,069**	**9,646**	**6.4**
North	2,130	3,254	52.8
North-East	461	336	(27.1)
West	249	222	(10.8)
South	710	1,438	102.5
Sub-total United States	**3,550**	**5,250**	**47.9**
Total	**12,619**	**14,896**	**18.0**

Sources: Statistics Canada, Transport Canada.

Figure III-5 shows that the 18.0% increase over the 1992-1997 period is a result of increased levels of marine containers (up 58.9%), intermodal rail traffic within the North American domestic market (up 58.9%) and agricultural and food products (58.4%).

Figure III-5
Rail traffic destined to Québec by commodity category (000's of tonnes)

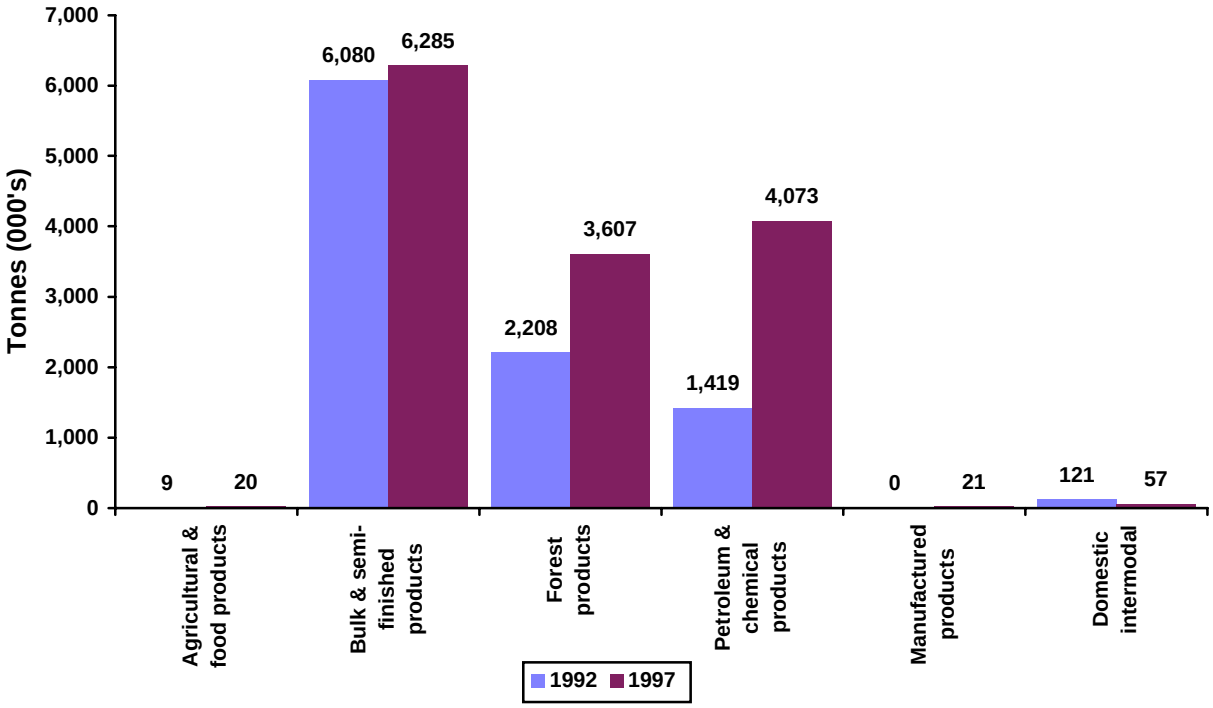


Sources: Statistics Canada, Transport Canada.

3. Québec intraprovincial rail traffic

Rail freight transport within Québec rose from 9.8 million tonnes in 1992 to 14.1 million tonnes in 1997, a gain of 43.4%. This increase was mainly caused by a growth in petroleum and chemicals (up 187.0%) and forest products (up 63.4%), as shown in Figure III-6.

Figure III-6
Québec intraprovincial rail traffic by commodity category (000's of tonnes)[1]



Sources: Statistics Canada, Transport Canada.

[1]*Note: Excludes iron ore volumes transported by the mining companies located on the North shore but includes the volumes of the Roberval–Saguenay Railway.*

4. Québec in-transit rail traffic

Table III-6 summarizes rail traffic in-transit through Québec traveling east to west and vice versa. There are two main classes of through traffic: exclusively Canadian traffic traveling between the Maritime Provinces and Ontario and Canada/U.S. or transborder traffic. In-transit volumes increased by 63.8% from 1992 to 1997%.

Trade between the Maritime Provinces and the United States grew at the faster rate between 1992 and 1997 than between the Maritime Provinces and Ontario.

Table III-6
Québec in-transit rail traffic (000's of tonnes)

Origin	Destination	1992	1997	% Variation
Ontario	Maritimes	1,344	1,534	14,1
Maritimes	Ontario	886	1,678	89,4
United States	Maritimes	385[1]	757[1]	96,6
Maritimes	United States	752[1]	1,545[1]	105,5
Total		**3,367**	**5,514**	**63,8**

Sources: Statistics Canada, Transport Canada.

[1]*Note: Only a portion passes by Québec.*

Exclusively Canadian traffic movements are the most significant, accounting for over half (58.3%) of all rail freight in-transit through the Province in 1996. Québec through traffic includes a significant level of intermodal transport between the Maritimes and Ontario. Traffic between Ontario and the Maritimes is currently 1.5 million tonnes in an easterly direction and 1.7 million tonnes in a westerly direction.

C. Transborder traffic

Customs Canada provides another important source of data to use as a basis for a detailed analysis of transborder traffic in terms of value of goods shipped. In 1997, the value of trade in goods shipped between Québec and the United States by truck and by rail was $41 billion. Table III-7 presents the distribution of traffic by mode and by direction.

Table III-7
Transborder traffic—1997($M)

Direction	Truck traffic	Rail traffic	Total	% du total
Outbound	26,538	8,415	34,953	**85.4**
Inbound	5,018	967	5,985	**14.6**
Total	**31,556**	**9,382**	**40,938**	
% du total	**77.1**	**22.9**		

Source: Statistics Canada.

It is worthy of note that the marketshare of transborder truck traffic is 77.1% in terms of value of goods versus 41.6% in terms of tonnage. Detailed analyses of origins and destinations as well as classes of goods shipped to/from the United States are provided hereunder.

1. Destinations of freight traffic

The value of goods shipped by truck from points in Québec to the United States exceeded $26.5 billion in 1997. Table III-8 lists the ten most important U.S. states, which account for nearly 70% of the total value of goods carried by truck from points in the Province. New York (21.4%) and Vermont (14.1%) were the most important states.

Table III-8
States of destination for goods transported by truck

State	Value (M$)	% of total
New York	5,671	21.4
Vermont	3,751	14.1
Michigan	1,458	5.5
Pennsylvania	1,418	5.3
Massachusetts	1,227	4.6
New Jersey	1,187	4.5
Ohio	1,116	4.2
Illinois	1,064	4.0
Texas	819	3.1
California	739	2.8
Others	8,088	30.5
Total	26,538	100.0

Source: Statistics Canada.

The value of goods shipped by rail from points in Québec was in excess of $8.4 billion in 1997. Table III-9 sets out the most important U.S. states, accounting for nearly 69% of the total value. Michigan (21.4%) and Pennsylvania (10.7%) were the most important states.

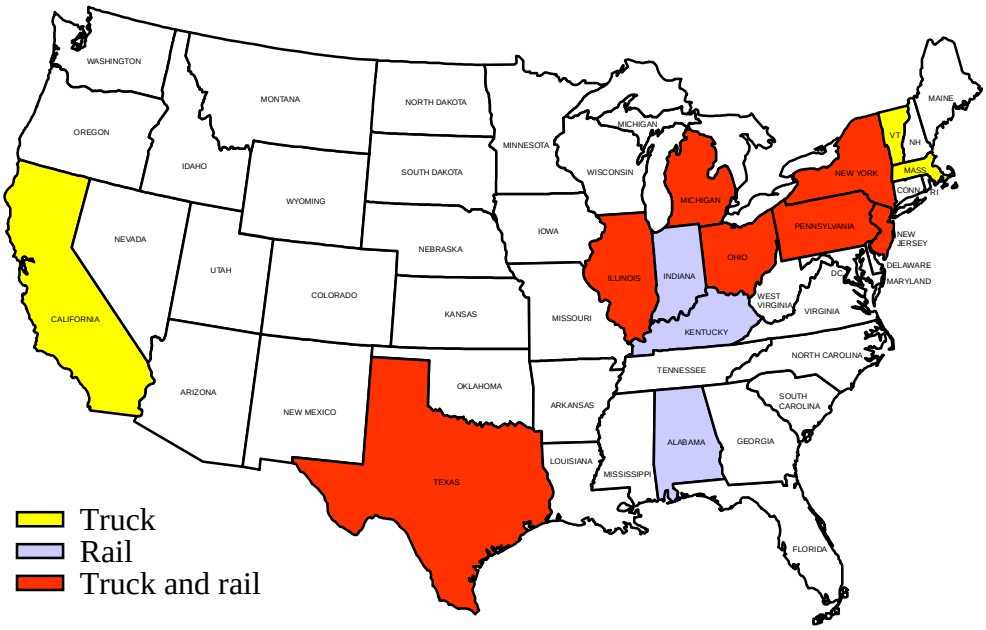
Table III-9
States of destination for freight transported by rail

State	Value (M$)	% of total
Michigan	1,799	21.4
Pennsylvania	899	10.7
New York	604	7.2
Illinois	404	4.8
Kentucky	398	4.7
Ohio	387	4.6
Indiana	348	4.1
Texas	331	3.9
New Jersey	303	3.6
Alabama	301	3.6
Others	2,641	31.4
Total	**8,415**	**100.0**

Source: Statistics Canada.

Figure III-7 illustrates the primary recipient states of Québec exports, by rail and by truck.

Figure III-7
Principal states of destination



2. Types of freight originating in Québec

Table III-10 presents the principal types of freight carried by truck in 1997 in terms of value.

Table III-10
Main types of freight originating in Québec—Truck transport

Freight type	Value (M$)	% of total
Electrical machinery equipment parts	5,710	21.5
Paper and paperboard	2,689	10.1
Mechanical appliances, engines	2,393	9.0
Aluminum and articles	2,051	7.7
Wood and articles of wood	1,863	7.0
Vehicles	1,537	5.8
Plastics and aritcles thereof	982	3.7
Articles of iron and steel	645	2.4
Rubber and articles thereof	619	2.3
Apparel and clothing	597	2.3
Others	7,452	28.1
Total	**26,538**	**100.0**

Source: Statistics Canada.

Table III-11 lists the most significant types of freight carried by rail from points in Québec to the U.S. in 1997 according to value.

Table III-11
Main types of freight originating in Québec—Rail transport

Freight type	Value (M$)	% of total
Aluminium and articles	1,961	23.3
Paper and paperboard	1,855	22.0
Vehicles	1,652	19.6
Wood and articles of wood	1,051	12.5
Woodpulp	347	4.1
Copper and articles thereof	334	4.0
Inorganic chemicals	237	2.8
Rubber and articles thereof	200	2.4
Zinc and articles thereof	173	2.1
Articles of iron and steel	143	1.7
Others	462	5.5
Total	**8,415**	**100.0**

Source: Statistics Canada.

3. Origins of freight traffic

The value of goods shipped by road to points in Québec was in excess of $5 billion in 1997. Table III-12 lists the ten most important U.S. states, accounting for nearly 70% of overall value. New Jersey (13.2%) and New York (12.7%) were the most significant states of origin.

Table III-12
States of origin for freight transported by truck

State	Value (M$)	% of total
New Jersey	663	13.2
New York	636	12.7
Massachusetts	395	7.9
North Carolina	377	7.5
Pennsylvania	363	7.2
Maine	297	5.9
South Carolina	215	4.3
Connecticut	202	4.0
Vermont	186	3.7
Florida	157	3.1
Others	1,527	30.4
Total	**5,018**	**100.0**

Source: Statistics Canada.

Close to $1 billion in freight was shipped to Québec by rail in 1997. Table III-13 lists the ten most important American states in this regard, accounting for nearly 69% of total value. Texas (14.9%) and Louisiana (9.8%) were the most significant.

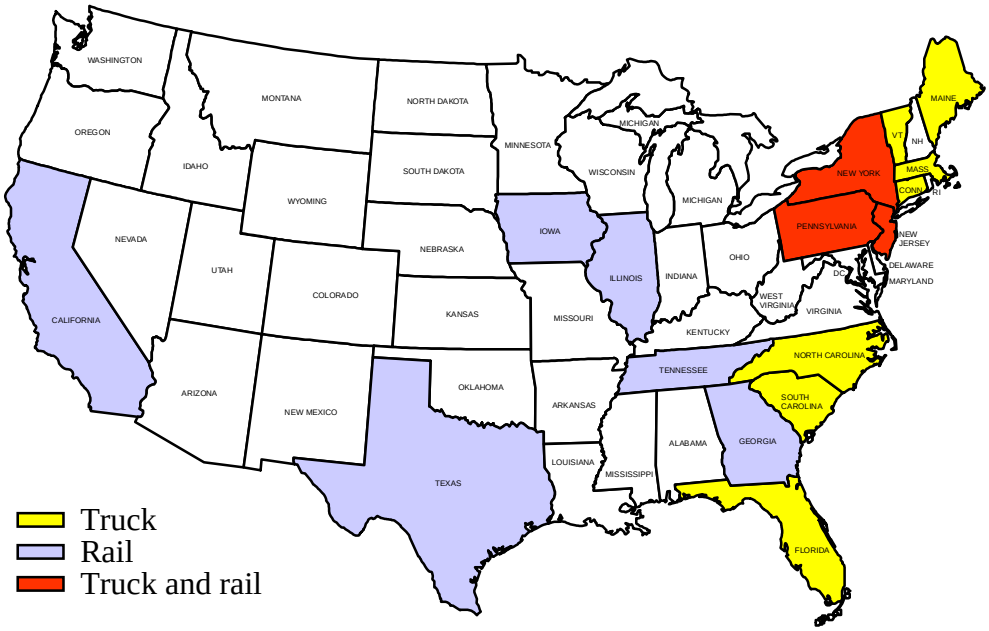
Table III-13
States of origin for freight transported by rail

État	Value (M$)	% of total
Texas	144	14.9
Louisiana	95	9.8
Illinois	73	7.6
New York	52	5.4
Pennsylvania	52	5.4
California	50	5.2
Tennessee	49	5.1
New Jersey	38	3.9
Iowa	38	3.9
Georgia	33	3.4
Others	341	35.3
Total	**967**	**100.0**

Source: Statistics Canada.

Figure III-8 illustrates the principal states of origin for goods transported to Québec by truck and by rail.

Figure III-8
Principal states of origin



4. Types of freight destined to Québec

The most important types of goods shipped to Québec by truck in 1997, in terms of value, are listed in Table III-14.

Table III-14
Main types of freight destined to Québec—Truck transport

Freight type	Value (M$)	% of total
Plastics and articles thereof	563	11.2
Wood and articles of wood	491	9.8
Paper and paperboard	416	8.3
Pharmaceutical products	203	4.1
Organic chemicals	197	3.9
Man-made filaments	196	3.9
Textile fabrics	149	3.0
Articles of iron or steel	148	3.0
Cotton	147	2.9
Copper and articles thereof	146	2.9
Others	2,362	47.1
Total	**5,018**	**100.0**

Source: Statistics Canada.

The principal types of freight shipped by rail to Québec in 1997 are presented in Table III-15.

Table III-15
Main types of freight destined to Québec—Rail transport

Freight type	Value (M$)	% of total
Plastics and articles thereof	263	27.2
Miscellaneous chemical products	89	9.2
Organic chemicals	82	8.5
Paper and paperboard	62	6.4
Inorganic chemicals	57	5.9
Residues and waste (food industry)	45	4.7
Woodpulp	39	4.0
Fertilizer	34	3.5
Rubber and articles thereof	31	3.2
Cotton	30	3.1
Others	237	24.5
Total	**967**	**100.0**

Source: Statistics Canada.

D. Marine transport

Québec ports handled 106.5 million tonnes of freight in 1997. In terms of tonnage, the Port of Sept-Îles ranked first in the Province with 24.4 million tonnes, followed by Port-Cartier with 20.8 million tonnes, Montréal with 20.6 million tonnes and Québec with 15 million tonnes. In the case of Sept-Îles, 75% of the traffic was international in nature.

Table III-16 provides a breakdown of domestic and international traffic, both containerized and non-containerized, for major Québec ports in 1997.

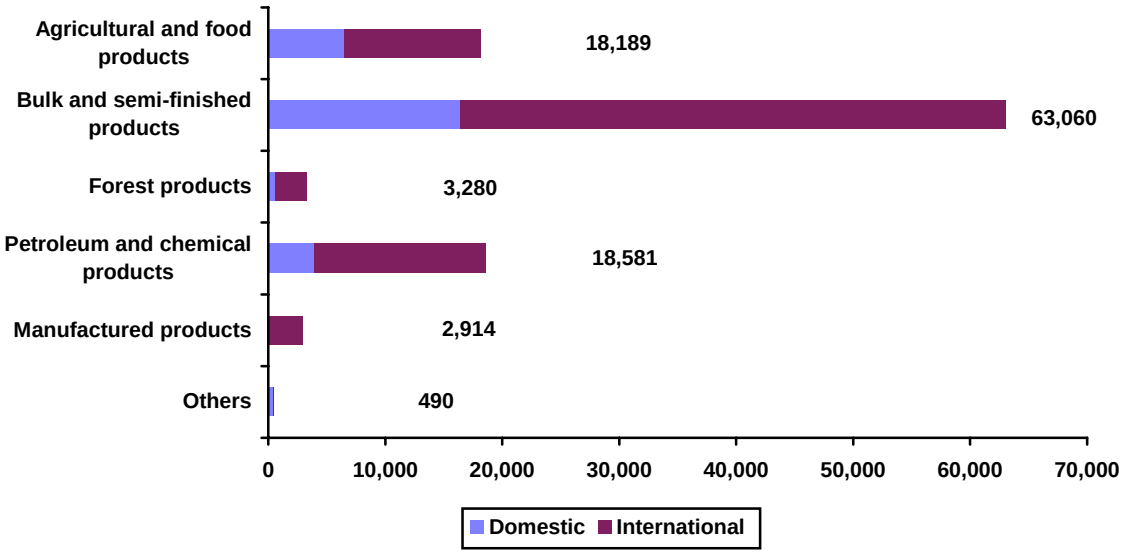
Table III-16
Maritime traffic by major Québec ports in 1997 (000's of tonnes)

	Domestic		International		
Port Majeure	Containerized	Non-containerized	Containerized	Non-containerized	Total
Montréal	247	5,358	7,944	7058	20,607
Québec City	0	2,578	147	12,229	14,954
Trois-Rivières	0	622	0	1,753	2,375
Port Cartier	0	5,364	0	15,513	20,877
Sept-Îles	0	3,546	0	20,924	24,470
Others	31	10,316	5	12,912	23,264
Total	**278**	**27,780**	**8,096**	**70,389**	**106,543**

Source: Statistics Canada.

Volumes of freight by major freight category handled by Québec ports in 1997 are illustrated in Figure III-9.

Figure III-9
Maritime traffic by type of freight in 1997 (000's of tonnes)



Source: Statistics Canada.

In terms of linkages with the Québec surface freight transport system, the province's primary ports are Montréal, Québec and Trois-Rivières, excluding the rail systems of the

mining companies. Freight volumes generated by the three above-mentioned ports and shipped by truck or by rail are described in greater detail below.

1. Port of Montréal

The Port of Montréal ranks second among Canadian ports in term of tonnage. Montréal's distinctive feature is the handling of containers and it was first among Canadian ports in this area, ahead of Vancouver and Halifax in 1997. Containers accounted for nearly 40% of overall tonnage handled at the Port in 1997, setting a new record. It should be noted in this regard that the firms Maersk, Sealand and P&O Nedloyd began operations to the Port of Montréal in September 1997.

Due to its geographic location within North America (1,600 kilometres from the Atlantic Ocean and on the shortest land-sea route between continental Europe and the industrial heartland of North America), the Port of Montréal has the largest market share (approximately 35%) of containerized traffic in the North Atlantic trade corridor.

Another feature sets Montréal apart from other Canadian ports. It is the only major port whose total volume of freight includes the largest share of domestic traffic (St. Lawrence River traffic). Approximately 40% of the 12 million tonnes of non-containerized goods handled by the Port of Montréal is transported either to or from other ports in the Province. Montréal captured the largest share of St. Lawrence River traffic (30%), followed by the Port of Québec (21%).

Traffic levels handled by the Port of Montréal from 1993 to 1998, broken down by major freight category, are presented in Table III-17.

Table III-17
Traffic volumes handled by the Port of Montréal (000's of tonnes)

	Liquid bulk		Dry bulk		General freight		
Year	Petroleum products	Others	Grain	Others	Containerized	Non-containerized	Total
1993	4,008	308	2,040	3,530	5,948	666	16,500
1994	5,884	586	1,919	3,722	7,075	898	20,083
1995	4,536	1,070	1,595	4,311	7,142	572	19,224
1996	4,066	1,204	1,401	4,781	7,948	526	19,927
1997	3,034	1,291	2,809	4,658	8,218	693	20,703
1998	4,407	928	1,852	4,265	8,697	802	20,952

Source: Port of Montréal.

The Port of Montréal does not keep records of goods transported by rail or by truck. However, containerized goods represent the majority. It is known that about 60% of

containerized traffic, or 5.5 million tonnes, is transported by rail. The American Midwest and Ontario are the main markets served by rail. The remainder of containerized traffic (40% or approximately 3.2 million tonnes in 1997) is shipped by truck to markets in Québec, Ontario and the northeastern United States. In total, 53% of containerized tonnage originates or terminates in the United States. Québec (26%) and Ontario (17%) are the prime Canadian markets.

With respect to grain, nearly 160,000 tonnes were delivered by rail to the Port in 1997, whereas close to 500,000 tonnes were shipped by truck to local markets.

2. Port of Québec

Traffic volumes handled by the Port of Québec from 1993 to 1998, by major commodity, are shown in Table III-18.

Table III-18
Traffic volumes handled by the Port of Québec (000's of tonnes)

	Liquid bulk		Dry bulk		General freight	
Year	Petroleum products	Others	Grain	Others		Total
1993	8,375	68	2,737	2,131	420	13,731
1994	10,617	69	2,934	2,132	312	16,063
1995	10,753	163	3,667	2,892	282	17,756
1996	10,635	237	3,169	2,910	265	17,217
1997	9,095	206	2,860	3,063	228	15,452
1998	9,508	247	2,238	3,462	72	15,527

Source: Port of Québec.

Québec is a deep water port enabling seagoing vessels to travel 1,400 km inland within North America. The port regularly receives fully loaded ships with a deadweight capacity of 150,000 tonnes.

The Port of Québec is divided into four different sectors, three of which are located on the north shore, namely, Beauport, Estuaire and Anse-au-Foulon, the fourth being the south shore. The south shore port sector is dedicated to the private docks of the Ultramar refinery, where virtually all petroleum products are handled.

The three north shore sectors specialize in the transshipment and storage of dry bulk cargo such as cereals and ore.

In 1996, the Ministère des Transports du Québec conducted a study[1] which included a detailed review of highway and rail traffic generated by the Port of Québec. In 1994, volumes hauled, broken down by mode, were as follows:

Mode	Volume (tonnes)
Rail	904,316 tonnes
Truck	4,840,469 tonnes
Total	**5,744,785 tonnes**

Grain traffic bound for the Port of Québec accounted for nearly 80% of total rail traffic. Primary products hauled by truck were petroleum products, cereals, salt and miscellaneous goods.

Rail traffic levels probably increased between 1994 and 1997 following Ultramar's decision taken in 1996 to transport refined products by rail (CN) rather than by ship to Montréal area markets.

3. Port of Trois-Rivières

The Port of Trois-Rivières is located on the north shore of the St. Lawrence River, midway between the ports of Montréal and Québec. Traffic levels handled by Trois-Rivières from 1994 to 1998, by major commodity, are shown in Table III-19.

Table III-19
Traffic volumes handled by the Port of Trois-Rivières (000's of tonnes)

	Liquid bulk		Dry Bulk			General Freight		
Year	Petroleum products	Chemical products	Grain	Ore	Salt	Pulp and paper	Others	Total
1994	120	300	513	605	100	50	4	1,692
1995	80	350	1,140	755	160	60	24	2,569
1996	120	170	804	880	110	100	20	2,204
1997	150	230	865	650	140	210	26	2,271
1998	120	330	586	790	100	320	27	2,273

Source: Port of Trois-Rivières.

[1] Services des politiques en transport multimodal, *Plan de transport de l'agglomération de Québec—Le Transport Multimodal*, January 1996.

The port mainly services nearby industrial activity such as the pulp and paper and aluminum industries. According to port estimates, nearly one million tonnes of a total 2.3 million tonnes handled at the Port of Trois-Rivières in 1998 were transported by truck, while close to 700,000 tonnes were carried by rail.

E. Air transport

A major share of air freight enplaned and deplaned in Québec is handled by the Montréal Airports at Dorval and Mirabel. Freight traffic handled at both above-mentioned airports over the past five years is presented in Table III-20.

Table III-20
Freight enplaned/deplaned at Dorval and Mirabel airports (tonnes)

	1997	1996	1995	1994	1993
Dorval	58,677	38,091	49,780	49,329	32,713
Mirabel	152,448	162,186	163,928	147,573	109,927
Total	**211,125**	**200,277**	**213,708**	**196,902**	**142,640**

Source: Montréal Airports.

It is important to note that international flights were transferred from Mirabel to Dorval in September of 1997, prompting an increase in air freight volumes handled at Dorval versus Mirabel. Results of this shift are already apparent for 1997 and will be more fully evident for 1998 when data are made available.

IV

Highway System Characteristics

This chapter describes the physical and operational characteristics of the Québec highway system with respect to freight transport.

A. Methodology

1. The highway system defined

This study examines the primary freight transport corridors. These corridors are the major axes of the Québec highway system that forms part of the upper tier road network. For the purpose of this study, therefore, only relevant components of the upper tier roadway network are reviewed. We thus defined a basic provincial highway system comprising interurban axes best suited to accommodate high levels of freight traffic. We also defined a regional network for the Montréal and Québec City metropolitan areas to more clearly delineate access to intermodal transfer points.

It is for reasons described above that the various analyses performed in the following pages to do not encompass the entire Québec highway system but deal rather with a subset of highways made up of those interurban and urban axes of the provincial system best suited to accommodate significant freight traffic.

2. Physical and operational characteristics

The highway system retained is described in terms of its physical and operational characteristics. Data used in characterizing the system are drawn from studies and traffic counts conducted by the Ministère des Transports du Québec (MTQ). System physical characteristic data is reflective of current conditions. However, as regards vehicle traffic characteristics, available data represents system conditions observed in 1996. The following parameters were selected for the purpose of characterizing the highway system under review:

- length of various road sections, compiled from data supplied by the MTQ;

- number of lanes, defined based on our knowledge of the highway system and validated by reference to other sources;

- system constraints related to bridges and tunnels, load limitations, dangerous goods carriage, etc., according to the map of the Québec trucking system as a primary reference;

- the average annual daily traffic (AADT) volume, the thirtieth highest annual hourly volume and a preliminary assessment of truck traffic according to the MTQ compilation of data by highway, road segment and road section (1996);

- a summary classification of trucks according to data supplied by the MTQ, validated through comparison with the results of other surveys;

- major network repair or reconstruction projects according to current or upcoming capital investments planned by the MTQ.

3. Capacity and service levels

a) Capacity

Road segment capacity is defined as the maximum number of vehicles per hour traveling in one direction on a highway. Capacity will vary according to the road's geometric features such as lane and shoulder width, lateral clearance, the existence of service lanes and ramps, horizontal and vertical road alignment, and condition of the road surface, as well as according to traffic conditions such as the relative number of trucks, buses and recreational vehicles and the hourly fluctuations of traffic levels.

Capacity analysis performed for this study is based on the methodology described in the *Highway Capacity Manual* (HCM) published by the Transportation Research Board, third edition, updated in 1997. This computation method has two basic components:

- definition of six (6) service levels reflecting quality of service provided to highway users, taking into account traffic levels;

- definition of parameters and coefficients for the purpose of determining maximum hourly traffic rates for each service level on the basis of highway characteristics.

b) Service levels

As traffic increases on a highway, driving conditions deteriorate and a general reduction in traffic speed occurs. This phenomenon continues until traffic flow attains the maximum level the highway can accommodate. Level of service is a qualitative measure of driving conditions determined by a large number of factors, including speed and travel time, traffic flow interruptions, freedom of movement, safety, comfort, etc.

The HCM defines six (6) levels of service as follows:

A: free flowing traffic, each user is virtually unaffected by other vehicles on the highway;

B: beginning of steady traffic flow, individual users are beginning to be affected by other vehicles in the traffic stream;

C: steady flow zone, individual users are markedly affected by other vehicles on the highway and must remain extremely alert to maneuver in the traffic stream;

D: traffic is heavy though the flow remains steady, but speed and freedom of movement are greatly restricted;

E: operating conditions are at or near capacity and freedom of movement is extremely limited;

F: traffic is congested and traffic flow is strained, vehicle queues are building due to tie-ups ahead.

Table IV-1 presents hourly traffic rates for each level of service by class of highway and share of trucks. These data were obtained using HCS software. Each highway type's capacity value is based on the upper limit of service level E.

Table IV-1
Traffic rate limits by level of service and class of highway

Level of service		Autoroutes			National and regional routes			
		4 lanes 10% trucks	4 lanes 5% trucks	6 lanes 5% trucks	2 lanes 5% trucks	2 lanes 10% trucks	4 lanes 5% trucks	4 lanes 10% trucks
A	lower limit	0	0	0	0	0	0	0
	upper limit	1,178	1,206	1,809	401	383	1,418	1,384
B	lower limit	1,179	1,207	1,810	402	384	1,419	1,385
	upper limit	1,883	1,929	2,894	714	676	2,363	2,307
C	lower limit	1,884	1,930	2,895	715	677	2,364	2,308
	upper limit	2,815	2,884	4,330	1,137	1,076	3,201	3,124
D	lower limit	2,816	2,885	4,331	1,138	1,077	3,202	3,125
	upper limit	3,532	3,618	5,427	1,708	1,630	3,766	3,777
E	lower limit	3,533	3,619	5,428	1,709	1,631	3,767	3,778
	upper limit	3,982	4,078	6,397	2,668	2,546	4,299	4,197
F	lower limit	3,983	4,079	6,398	2,669	2,547	4,300	4,198

Source: Transportation Research Board, Highway Capacity Manual (HCM), 1997 update, third edition.

c) Analysis reference rates

Generally accepted traffic management practice states that the thirtieth and hundredth highest annual hourly volumes may be used as reference levels for highway system planning and use characterization purposes. Thirtieth highest annual hourly volume is the thirtieth highest hourly rate among those recorded at a given point of the system throughout the year; the hundredth highest annual hourly volume is that of the hundredth busiest hour.

The 1996 traffic data bank supplied by the MTQ includes the thirtieth hourly volume for practically every part of the highway system under study. We therefore selected this rate as a reference point for measuring the levels of service attained on the axes under study. Therefore, by comparing the thirtieth hourly volume to peak service levels of a highway infrastructure of the same class (having the same characteristics), it is possible to establish the service level attained relative to the thirtieth hourly volume on a given axis. It may be noted that the hundredth hourly volume is also used as a reference point to define the need to take action within the highway system. For the reader's information, the hundredth hourly volume is 87% to 91% of the thirtieth hourly volume.

4. Truck traffic

The MTQ traffic database contains truck volumes for 1996. However, the MTQ has warned that the trucking data are preliminary and experimental in nature. It is, in fact, the first attempt to measure truck traffic. Given that no further assessments have been carried out at the same sites, it has not been possible to validate the reliability of actual data and the estimation methods used.

Therefore, data cannot be analyzed for the purpose of assessing specific components of traffic on particular and strictly defined highway segments. The information may, however, be applied to large and non-specific groupings such as the Montréal–Drummondville link, provided that users are well aware that actual data value has yet to be confirmed.

However, because this database is the only readily accessible source of statistical information, we have attempted to evaluate the data, to a certain extent, by comparison to other available sources.

Initial validation was performed by comparing the above rates to those recorded in 1996 at border crossings. Table IV-2 shows the results of the comparison. It can be observed that volumes provided by the MTQ correspond with those recorded at the province's three main border crossings, where truck traffic is relatively heavy. It may therefore be concluded that truck traffic volumes provided for highways leading to the crossings are realistic.

Table IV-2
Comparison of daily truck traffic rates at border crossings

Border crossing	MTQ Study[1] (trucks/day)	TC Study[2] (trucks/day)	Difference	%
Lacolle	1,690	1,717	-27	-2%
Philipsburg	580	626	-46	-8%
Rock Island	560	540	20	4%
Armstrong	250	351	-101	-40%
Woburn	144	120	24	17%

Sources: 1) MTQ, Recueil 1996, "Données sur la circulation par numéro de route, de tronçon et de section".
2) Transport Canada, "Les transports et le commerce nord-américain", nov. 1998.

Unfortunately, we did not have access to the information required to characterize truck traffic in other parts of the system. However, fragmentary results of origin-destination surveys conducted within the Laurentians-Lanaudière territory as well as data collected during the assessment of the Montréal expressway traffic

management system indicate that MTQ database traffic volumes are consistent with valid percentages of truck traffic within the system in the Montréal area and along the Route 117 corridor.

5. Breakdown of truck movements on the highway system under study

While vehicle counts and other surveys provide a glimpse of the magnitude of truck traffic at a given point of the highway system under study, they give no indication of the characteristics of travel, especially regarding distribution of points of origin and destination. For example, though we are aware that trucks abound on Montréal region expressways, very little is known of the breakdown between through traffic and vehicles making local trips.

In order to characterize truck movements within the provincial highway system, we analyzed the flow of goods to and from Québec, as well as in transit for the Province, based on Statistics Canada data for common carrier trucking by knowing the:

- share of total truck traffic involving Canadian common carriers;
- average truckload size; and
- characteristics of operating schedules.

These factors served as the basis for assessing major truck traffic flows within the system under study.

A zone system was then developed to define both internal trips and those made between Québec and other provinces and states. Canadian provinces and American states, as well as Mexico, are the basic external zones. Based on these zones, potential truck routes are assigned to Canada-U.S. and interprovincial border crossings on the assumption that the shortest route will be taken. Figure IV-1 identifies international and interprovincial border crossings used in this analysis. Table IV-3 matches Québec highway axes with those of neighbouring provinces and states.

Figure IV-1
Main Québec/U.S. and interprovincial border crossings

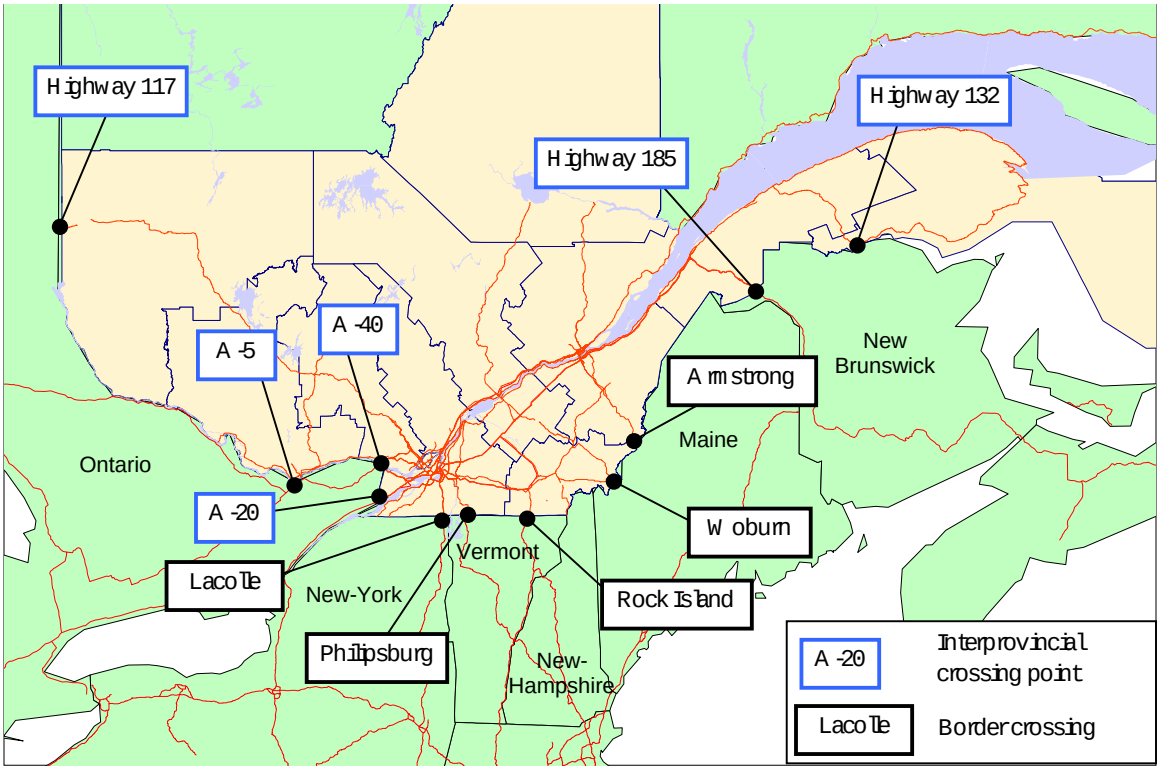


Table IV-3
Matching Québec highways with those of neighbouring provinces and states

Border crossing or interprovincial gateway	Québec highway	External highway
New Brunswick	Route 132	Route 11
	Route 185	Route 2
Ontario	Autoroute 20	Highway 401
	Autoroute 40	Highway 417
	Autoroute 5	Highway 17B
	Route 117	Highway 66
Lacolle	Autoroute 15	Interstate I-87
Philipsburg	Provincial route 133	Interstate I-89
Rock Island	Autoroute 55	Interstate I-91
Woburn	Provincial route 212	State highway 27
Armstrong	Provincial route 173	State highway 201

Tables IV-4 and IV-5 document assigned routes for travel between Québec and the other provinces and American states. If needed, an assumption is made as to distribution of movements where two or more corridors may be used to travel between Québec and a neighbouring province or state; such distribution is implicitly based on truck traffic data along the same axes. The tables also define the relationship between basic zones and the regional zone system established to facilitate the analysis. Regional zones are shown in Figure IV-2.

Table IV-4
Main highways to leave/enter Québec, by origin-destination of goods elsewhere in Canada

Province	Regional zone	Main highway	Comments
Canada			
Newfoundland	Maritimes	R-185	Via Route 2 in New Brunswick
Nova Scotia	Maritimes	R-185	Via Route 2 in New Brunswick
Prince Edward Island	Maritimes	R-185	Via Route 2 in New Brunswick
New Brunswick	Maritimes	R-185	90% of New Brunswick traffic
		R-132	10% of New Brunswick traffic
Ontario	Ontario	A-20	90% of Ontario traffic
		A-40	5% of Ontario traffic
		A-5	3% of Ontario traffic
		R-117	2% of Ontario traffic
Manitoba	Western Canada	A-40	Via Highway 417 in Ontario
Saskatchewan	Western Canada	A-40	Via Highway 417 in Ontario
Alberta	Western Canada	A-40	Via Highway 417 in Ontario
British Columbia	Western Canada	A-40	Via Highway 417 in Ontario
Northwest Territories	Western Canada	A-40	Via Highway 417 in Ontario
Yukon	Western Canada	A-40	Via Highway 417 in Ontario

Figure IV-2
Major regions zone system

Table IV-5

Defined highways to leave/enter Québec, by origin-destination of goods in the United States

Regional zone	State	Main highway	Comments
Central United States	North Dakota	A-40	Via 417
	South Dakota	A-40	Via 417
	Illinois	A-20	Via 401 and Windsor
	Indiana	A-20	Via 401 and Windsor
	Iowa	A-20	Via 401 and Windsor
	Kansas	A-20	Via 401 and Windsor
	Michigan	A-20	Via 401 and Windsor
	Minnesota	A-40	Via 417
	Missouri	A-20	Via 401 and Windsor
	Nebraska	A-20	Via 401 and Windsor
	Ohio	A-20	Via 401 and Windsor
	Wisconsin	A-40	Via 417
Northeastern United States	Connecticut	A-15	
	Delaware	A-15	
	District of Columbia	A-20	Via 401 and Landsdowne
	Maine	R173	
	Maryland	A-15	
	Massachusetts	A-55	
	New Hampshire	A-55	
	New Jersey	A-15	
	New York	A-15	
	Pennsylvania	A-20	Via 401 and Landsdowne
	Rhode Island	A-55	
	Vermont	R-133 & A-55	50% R133 and A55
Western United States	Alaska	A-40	Via 417
	Arizona	A-20	Via 401 and Windsor
	California	A-20	Via 401 and Windsor
	Colorado	A-20	Via 401 and Windsor
	Idaho	A-40	Via 417
	Montana	A-40	Via 417
	Nevada	A-20	Via 401 and Windsor
	New Mexico	A-20	Via 401 and Windsor
	Oregon	A-40	Via 417
	Utah	A-20	Via 401 and Windsor
	Washington	A-40	Via 417
	Wyoming	A-20	Via 401 and Windsor
Southern United States	Alabama	A-20	Via 401 and Windsor
	Arkansas	A-20	Via 401 and Windsor
	North Carolina	A-15	
	South Carolina	A-15	
	Florida	A-15	
	Georgia	A-15	
	Kentucky	A-20	Via 401 and Windsor
	Louisiana	A-20	Via 401 and Windsor
	Mississippi	A-20	Via 401 and Windsor
	Oklahoma	A-20	Via 401 and Windsor
	Tennessee	A-20	Via 401 and Windsor
	Texas	A-20	Via 401 and Windsor
	Virginia	A-15	
	West Virginia	A-15	

A similar approach is taken to assign internal travel routes to the provincial highway network using a system of zones based on the Québec government's administrative regions. These zones are defined and the main highways identified in Figure IV-3. Routes are established according to the assumption of the shortest distance between points of origin and destination. Where two or more routes are possible (for example, autouroutes 20 and 40 between Montréal and Québec City), figures are broken down according to the total truck traffic on these routes. The distribution is adjusted as required to account for specific constraints within the corridor.

B. Overview of the Québec highway system

1. Overall description

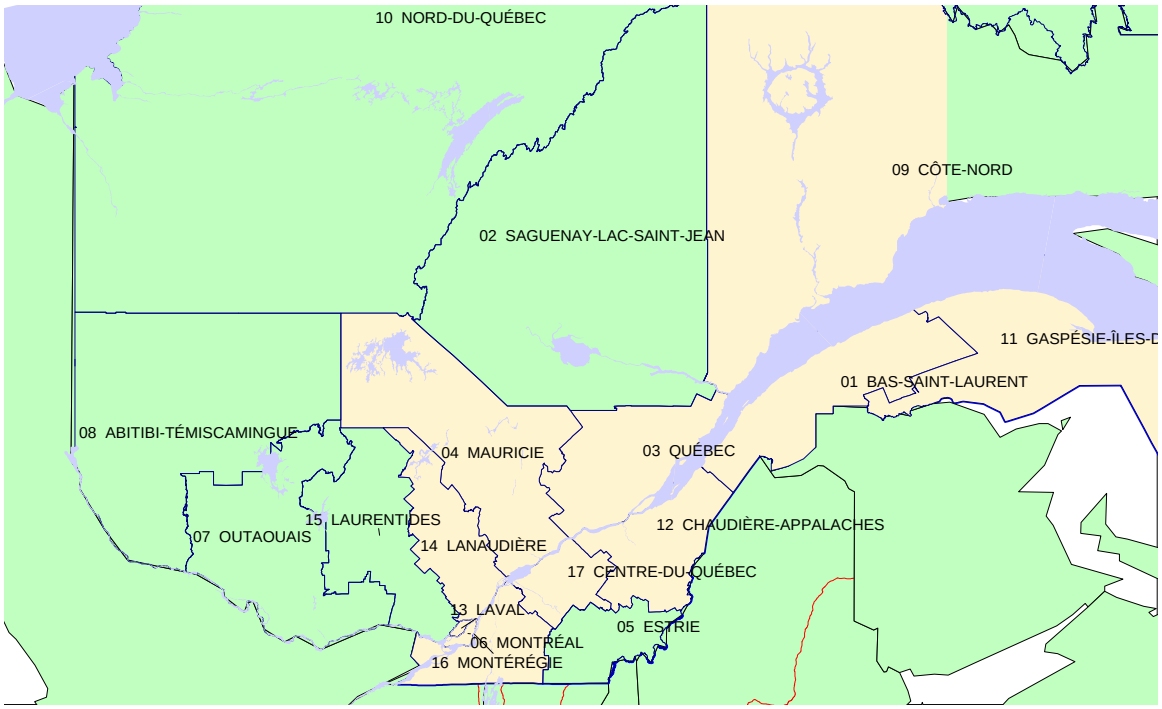
The Québec public highway system comprises 120,000 km of roads (excluding public forestry roads) and covers a large part of the Province. The network is not as extensive and roads are sparser in the northern regions but the system becomes more tightly meshed as one moves south.

Maximum system density is achieved in and around urban areas, specifically in Montréal and Québec City. The Montréal area, being the hub of the province's economic activity, is both the head and the focal point of the greater part of the province's upper tier highway system. Its location, its numerous manufacturing industries, its significant intermodal connections (Port of Montréal, airports and intermodal rail terminals) as well as its population make it a traffic mode for freight traffic. Indeed, all segments of the Québec highway system converge toward the Island of Montréal.

Main highways located along the St. Lawrence and those that serve the Eastern Townships and the southern Outaouais regions are built on relatively flat land, whereas those that lie along a north-south axis and serve the Abitibi–Témiscamingue, Laurentians or Saguenay–Lac-St-Jean regions as well as those that run in an easterly direction toward the Gaspé, are built on hilly terrain. The same is true of the Chaudière-Appalaches, as the Appalachian Mountains extend through the region.

Autoroutes 20 and 40, located on either bank of the St. Lawrence and extending west to Ontario, are the primary east-west axes of the Québec highway system. Autouroute 20, connecting to New Brunswick's Route 185, is the link between the Atlantic Provinces and provinces located west of Québec.

Figure IV-3
Internal Québec zone system



Code	Zone	Main highway axes
1	Bas-Saint-Laurent	A-20, R-185
2	Saguenay-Lac-Saint-Jean	R-169, R-175
3	Québec	A-20, A-40, A-73
4	Mauricie	A-40, A-55, R-155
5	Estrie	A-10 , A-55
6	Montréal	A-10, A-15, A-20, A-40
7	Outaouais	A-5, A-50, R-105
8	Abitibi-Témiscamingue	R-117
9	Côte-Nord	R-138
10	Nord-du-Québec	R- 109, R-113
11	Gaspésie-Îles-de-la-Madeleine	R-132
12	Chaudières-Appalaches	A-20, A-73, R-173
13	Laval	A-10, A-15, A-20, A-40
14	Lanaudière	A-25, A-40
15	Laurentides	A-15, R117
16	Montérégie	A-10, A-15, A-20, A-40
17	Centre-du-Québec	A-20, A-55

Autoroute 40 connects with the northern highways leading to the Saguenay–Lac-Saint-Jean, Mauricie, Lanaudière and Laurentians regions. Where Autoroute 40 ends, Route 138 takes over east of Québec City and extends along the St. Lawrence River to beyond Sept-Îles. It is the only highway link providing direct access to the Côte-Nord region.

Furthermore, an important corridor links southern Québec and the Eastern Townships to the Laurentians and the Abitibi regions in Québec as well as to the northern border of Ontario. Autoroute 10 runs through the Eastern Townships to Montréal, where Autoroute 15, followed by Route 117, provides a link with the more northerly regions. Three highways connect Autoroute 10 with the northeastern United States, namely the states of New York, Vermont, New Hampshire and Maine.

Québec shares 28 border crossings with the United States. The main ones are located in the Autoroute 15 corridor south of Montréal (Lacolle, Interstate 87 in the United States) and the Autoroute 55 corridor south of Sherbrooke, becoming Interstate 91 on the U.S. side, as well as that of Route 133, which joins up the Montréal highway system to the north and extends to the U.S. border, where it joins Interstate 89.

Ferries operated by the MTQ provide highway system continuity on both sides of the St. Lawrence River. The following ferries are important in terms of freight transport:

Tadoussac/Baie-Sainte-Catherine,
Matane/Baie-Comeau/Godbout, and
Rivière-du-Loup/Saint-Siméon.

Villages of the Basse-Côte-Nord region, native villages in Québec and Magdalen Islands communities are not linked by road to the rest of the province. Freight is forwarded to and from these localities by sea and air shuttle.

Figure IV-4 identifies the main axes which compose the Québec highway system.

Figure IV-4
General Map of Highway Network and Ferries

2. Jurisdiction and responsibilities

a) Shared jurisdiction

Federal, provincial and municipal governments share jurisdiction over the Québec highway system. Overall, the Québec government and municipalities are responsible for most of the system, which comprises nearly 120,000 km of roads. According to Transport Canada's 1997 Annual Report, 534 km are under federal jurisdiction, or less than 0,5%, while the Québec government (29,344 km) and municipalities (approximately 90,000 km) are responsible for 24.5% and 75% respectively. The provincial government is responsible for the upper tier highway system, whereas municipalities are in charge of local roads and city streets.

b) Federal government

The federal government plays a limited role with respect to the highway system. It is responsible for four areas of activity: ownership of a small number of roads and bridges, financial contributions to other levels of government for road construction, regulation of international borders, and research and development activities. In fact, responsibility for managing most of the highway system lies with the provinces and municipalities.

The federal government enacts legislation and sets standards dealing specifically with passenger and freight transport vehicle safety. The *Motor Vehicle Transport Act* (MVTA) empowers provinces to regulate domestic or foreign highway carriers whose operations span provincial and international boundaries.

In 1987, the Council of Ministers Responsible for Transportation and Highway Safety commissioned a study on the development of a national highway system. Under established criteria, the resulting network encompassed the main international, interprovincial and interurban highways as well as links leading to the principal intermodal infrastructures. The system as defined had an overall length of 24,450 kilometers and included 3,534 bridges. The Québec national highway system covered 2,874 kilometers of road and accounted for 12% of the overall Canadian system.

A recent study[1] conducted for the federal, provincial and territorial governments estimated that close to 40% of the national highway system was

---

1 Council of Ministers, *National Highway Policy Study of Canada, update of Condition of the National Highway System and Cost Estimates to Upgrade the NHS*, December 1998.

deficient and investments required to restore it to an acceptable level totaled $17 billion.

Provincial and territorial transport ministers jointly developed a resolution requesting that the federal government include in its 2000–01 budget substantial funding for the development of a national transportation investment strategy whose main component would be a national highway program. This resolution underscores the urgent need for the federal, provincial and territorial governments to achieve a partnership agreement in order to preserve the existing infrastructure, promote economic prosperity in support of social programs, enhance domestic productivity and increase Canada's global competitiveness in international markets.

c) Québec government

i) Ministère des Transports du Québec (MTQ)

In April 1993, the MTQ transferred responsibility for a large part of the Québec highway system to municipalities. It is henceforth responsible for slightly less than one fourth of the overall weighted length of the Québec roadway system. The MTQ is responsible for 97% of the upper tier network (less than 28,000 km), which includes expressways, national and regional highways and collector roads. The MTQ also manages the natural resource access road network (approximately 1,350 km).

The MTQ is responsible for construction, reconstruction and maintenance of the highway system. It has jurisdiction over carriers whose operations are restricted to the Province and exercises powers delegated by the federal government over the Québec operations of highway carriers who conduct business outside the province.

On June 19, 1998, the National Assembly enacted the *Act respecting owners and operators of heavy vehicles* (Bill 430). The act sets out an entirely new framework for the operation of motor vehicles in Québec. Heavy vehicle highway transportation is now, in effect, subject to a highway use privilege management system, the purpose of which is mainly to improve road safety and to protect the highway system. It is intended, among other things, to rid Québec roads of chronic lawbreakers and to allow all companies to compete equitably. Not only does the act require owners and operators to register with the heavy vehicle owners and operators registry, it also provides for follow-up and assessment of the behaviour of heavy vehicle operators on the

roads and prescribes penalties for those whose road behaviour is deemed unsatisfactory.

The MTQ is also responsible for developing highway protection standards and for particular vehicle and load safety controls. In this respect, it regulates load and dimension standards, special travel permits, and standards for securing and transporting hazardous goods. Highway infrastructure safety (signage, lighting and landscaping) also fall under the MTQ's jurisdiction.

ii) Société de l'assurance automobile du Québec (SAAQ)

The SAAQ is responsible for management of the *Highway Safety Code*, driving permits, registration and driver safety standards (e. g., authorized vehicle operating periods) within Québec. It is also responsible for enforcing legislation and regulations governing highway transport of goods, both on the road and in company facilities. Through its enforcement operations, the SAAQ aims to improve commercial vehicle safety, protect the Québec highway system and ensure that highway carriers compete on an equal footing.

Highway control officers enforce legislation and regulations by stopping and inspecting vehicles and by checking operator and carrier documentation and records.

iii) Commission des transports du Québec (CTQ)

The CTQ is responsible for transport company registration and for issuing and reviewing safety ratings, a procedure whereby the government intends to manage the privilege of using the highway system (Bill 430). The CTQ also hands down decisions and imposes administrative measures where a safety rating is unsatisfactory or is granted on a conditional basis.

The SAAQ assesses the record of every heavy vehicle owner and operator and performs follow-up procedures as required. It is thus empowered to address violations of the *Highway Safety Code* and other legislation by dealing directly with owners, operators and drivers.

d) Municipalities

Municipalities are now responsible for approximately 75% of the Québec public highway system. Their powers are comparable to those of the MTQ in

that they can restrict heavy vehicle access to roads under their jurisdiction. Any such restrictions must, however, be consistent with the trucking system established by the MTQ and must not hinder the free movement of goods.

3. Functional classification and numbering system

a) Functional classification of highways

The MTQ functional classification system comprises a hierarchy of highways based on their respective functions. Ranking was determined on the basis of demographic and socio-economic criteria. Table IV-6 describes the specific characteristics of each functional class of the Québec highway system.

The classification framework of the overall system is set out below:

- Expressway system: Comprising all expressway (autoroute) infrastructures.
- National system: Groups essentially all interregional roads and those linking large communities (with populations generally greater than 25,000).
- Regional system: Links moderate-sized communities (with populations of 5,000-25,000) as well as to large communities.
- Local system: Links smaller communities to one another and provides property access.
- Resource access system: Provides access to forestry and mining operations, hydroelectric facilities and areas under government jurisdiction.

b) Classification of the truck transport system

The MTQ launched an initiative for the purpose of developing a truck transport system on highways under its jurisdiction. To this end, the Ministry joined forces with the trucking industry as well as certain municipalities and regional county municipalities (RCM) to draw up an inventory of highways or highway sections where through truck traffic was a problem. Following the analysis of the inventory, the MTQ produced a map to improve itinerary planning by carriers and to identify both authorized and prohibited routes.

The goals of the initiative included the following:

- direct heavy traffic to an appropriate highway system in order to minimize infrastructure damage and avoid the annoyance caused by truck traffic on roads other than major thoroughfares;

- facilitate road checks and thus support the goals of system protection, highway safety and carrier equity;

- enable municipalities to more easily plan heavy vehicle traffic movements;

- enable the MTQ and municipalities to focus action aimed at improving levels of service on most heavily traveled roads.

Thus, heavy vehicles are not free to use all roads within the Québec system. In the interest of consistency, the government adopted the *Regulation respecting road signs*, under the *Highway Safety Code*, which defines signage intended for truck drivers, to be used by the Ministry or by a municipality. The map of the trucking system defines the following classes of roads, in addition to the functional classification:

- **transit roads**: roads accessible to all heavy vehicles with minimal restrictions on their movement. The minimal restriction level of transit roads should encourage truckers to use the system as often as possible;

- **restricted roads**: roads that are accessible to all heavy vehicles though vehicle movement is restricted in some respects. Truckers should travel the shortest possible distance within this system as a means of reaching the transit road system;

- **prohibited roads**: roads whose access is prohibited to heavy vehicles. Some exceptions are allowed for purposes of local transport. Such roads place many restrictions on heavy vehicle traffic;

- **other roads or roads bearing municipal signage**: roads maintained by a municipality or another authority where heavy vehicle traffic may be prohibited.

The trucking road map also identifies bridges with weight limitations, structures likely to cause clearance problems, steep grades greater than 7% and tunnels where the transport of hazardous goods is prohibited.

Table IV-6
Functional classification of the Québec highway system

		Traffic	Property access	Traffic levels	Traffic flow	Base speed (km/h)	Average travel speed (km/h)	Classes of vehicles	Common links
Expressways (E)	rural	Maximum fluidity	None	>8,000 v./day	free flowing, layered	100-120	80-110	all classes, maximum 20% trucks	E, N, R
	urban	Maximum fluidity	None	>20,000 v./day	free flowing, layered	70-100	70-100	all classes, maximum 20% trucks	E, N, R
National highways (N)	rural	Traffic flow is paramount	None in new corridors: Limited access on existing highways	500-15,000 v./day	free flowing, except at traffic lights	80-110	60-100	all classes, maximum 20% trucks	E, N, R
	urban	Traffic flow is paramount	None in new corridors: Limited access on existing highways	5,000-30,000 v./day	free flowing, except at traffic lights	50-80	50-70	all classes, maximum 20% trucks	E, N, R, C
Regional roads (R)	rural	Traffic flow is paramount	Traffic more important than property access	200-10,000 v./day	free flowing, except at traffic lights	70-100	50-90	all classes, maximum 20% trucks	E, N, R, C
	urban	Traffic flow is paramount	Traffic more important than property access	2,000-10,000 v./day	free flowing, except at traffic lights	50-80	50-70	all classes, maximum 20% trucks	E, N, R, C
Collector roads (C)	rural	Traffic flow and property access are equally important	Traffic and access equally important	<5,000 v./day	irregular movement	60-90	50-80	all casses	N, R, C, L
	urban	Traffic flow and property access are equally important	Traffic and access equally important	>1,000 v./day	irregular movement	50-70	40-60	all classes	E, N, R, C, L
Local roads (L)	rural	Traffic flow is secondary	Paramount	<1,000 v./day	irregular movement	50-80	50-70	Mainly automobiles, small and medium trucks, occasional heavy vehicles and farm vehicles	L, C
	urban	Traffic flow is secondary	Paramount	<3,000 v./day	irregular movement	30-50	20-40	Mainly automobiles and service vehicles	L, C

c) Numbering

Québec highways are numbered according to a system based on expressways or autoroutes, main highways and secondary highways:

- expressways are numbered from 1 to 99 in the case of main arteries and from 400 to 999 in the case of collector or belt arteries;
- main highways are numbered from 100 to 199;
- secondary highways north of the St. Lawrence River are numbered, as a rule, from 200 to 299, whereas those located south of the river are numbered from 300 to 399.

Numbering also depends on road direction. As a general rule, those that are parallel to the river or that follow an east-west axis are given an even number, whereas those that are at right angles to the river or follow a north-south axis are given an odd number.

Numbering also varies according to the relative location of a specific highway in the province. That is to say, odd numbers are assigned in ascending order from west to east, while even numbers are attributed from south to north.

A final feature considered in road numbering is continuity. Although the MTQ has made every effort to assign the same number to continuous road sections, it is not uncommon for highway segments to have two or three numbers. Where extra numbers exist, roads are considered to overlap. This occurs when a section of a main or secondary highway coincides with an expressway section, when a section of a secondary highway is identical to a section of a main highway or when two highways belonging to the same class share a common section.

C. Physical characteristics of the defined highway system

1. Highway infrastructure

Physical characteristics of the primary linkages of the highway systemn as defined for this study are shown in Table IV-7. These are components of the highway system most likely to be capable of accommodating heavy truck traffic. Figure IV-5 shows the number of lanes per system component and therefore provides an appreciation of system capacity. Highways and highway segments defined for the purpose of this study are described in general terms below.

a) Expressways

A-5, Autoroute de la Gatineau

Autoroute 5 provides a link between northern regions and the Hull-Ottawa area. Forty kilometers in length, it extends from the McDonald-Cartier Bridge, runs through the city of Hull, borders Gatineau Park and comes to an end, for the time being, in the municipality of La Pêche.

A-10, Autoroute Bonaventure, Autoroute des Cantonnes de l'Est

Autoroute 10 links the Eastern Townships to the Montréal region. It originates in the city of Fleurimont (near Sherbrooke), runs through the cities of Sherbrooke and Magog, and crosses the Champlain and Clément bridges to Montréal. Its overall length is 160 kilometers, and it terminates at the junction of autoroutes Bonaventure and 720.

A-13, Autoroute Chomedey

Autoroute 13 begins in Boisbriand, crosses Laval and ends at the junction of Autoroute 20 in Montréal. It is a six-lane expressway, 20 kilometers in length, the purpose of which was to link the Dorval and Mirabel airports. Its northern stretch remains to be completed. It is characterized by a reversible lane on the bridge between Laval and Montréal.

A-15, Autoroute des Laurentides, Autoroute Décarie, Autoroute Champlain

Autoroute 15 originates in Sainte-Agathe in the mountainous Laurentians region north of Montréal. It travels in a southerly direction, spans the Island of Laval and reaches Montréal at Autoroute 40. The section north of Montréal is part of the Trans-Canada Highway.

It then shares a four-kilometer section with Autoroute 40 prior to veering off in a southerly direction to the Champlain Bridge. This last section is known as Autoroute Décarie, while the length located on the Champlain Bridge is called Autoroute Champlain and overlaps with autoroutes 10 and 20.

Figure IV-5
Number of Traffic Lanes on Highway Network Sections

Table IV-7
Characteristics of segments of the highway system defined for study purposes*

Highway number	Total length of the highway (km)	Principal segments				
		From	To	Length (km)[1]	Number of lanes[2]	Maximum speed
Autoroutes						
5	40	Hull	Ottawa	0.34	6	100
10	160	Montréal	Sherbrooke	142	4	100
13	20	Basses-Laurentides	Montréal	20	6	100
15	160	Montréal	St-Jérôme	41	6	100
		St-Jérôme	Ste-Agathe	45	4	100
		Montréal	New York (U.S.)	51	4.6	100
20	530	Montréal	Québec	243	4	100
		Québec	Rivière-du-Loup	206	4	100
25	50	Laval	Montréal	8	6	100
30	110	Montréal	Sorel	88	4	100
35	20	Chambly	Iberville	20	4	90
40	340	Montréal	Trois-Rivières	142	4	100
		Trois-Rivières	Québec	130	4	100
50	70	Hull	Masson	30	4.6	100
		Lachute	A-15	6	2.4	100
55	200	Drummonville	Sherbrooke	72	2	90
		Magog	Vermont (U.S.)	35	4	100
		Trois-Rivières	Shawinigan	43	4	100
73	90	Québec	St-Joseph-de-Beauce	58	4	90
National highways						
117	620	Ste-Agathe	Mont-Laurier	140	4.2	90
		Mont-Laurier	Rouyn-Noranda	400	2	90
132	1600	Rivière-du-Loup	Rimouski	104	2	90
		Rimouski	Mont-Joli	34	2	90
		Mont-Joli	Pointe-à-la-Croix	170	2	90
133	130	St-Jean-sur-Richelieu	Vermont	40	2	90
138	1200	Sept-Iles	Baie-Comeau	232	2	90
		Baie-Comeau	Québec	422	2	90
148	320	Masson	Lachute	90	2	90
155	310	Shawinigan	Chambord (Lac-St-Jean)	202	2	90
173	140	St-Joseph-de-Beauce	Maine	75	2	90
175	230	Québec	Chicoutimi	211	2	90
185	90	Rivière-du-Loup	Route 2 (N.B.)	101	2	90

[1] *Distances are from centre to cetre. This is the true length of the segment.*

[2] *The number of existing lanes on the greatest portion of the highway. Can vary in certain sections.*

** Given their short distance, collector and bypass routes are not included.*

A final segment of this autoroute commences at the Champlain Bridge, runs through the Montérégie region and ends at the Lacolle border crossing, where it links to Interstate 87 in the State of New York. It overlaps initially with Route 132.

A-20, Autoroute Jean-Lesage

Autoroute 20, which is 530 kilometers in length, begins at the Ontario border, where Highway 401 ends, runs through Montréal, then parallels the St. Lawrence River to Drummondville, Québec City and Rivière-du-Loup.

It crosses the south part of the Island of Montréal, including the cities of Sainte-Anne-de-Bellevue, Dorval, Lachine and Verdun, prior to reaching the Champlain Bridge. South of the bridge, it runs along the river and overlaps with Route 132 all the way to the Louis-Hippolyte Lafontaine Bridge-Tunnel, where it takes an east turn towards Québec City.

The stretch located between the intersection of Autoroute 25 (Louis-Hippolyte Lafontaine Bridge-Tunnel) and Route 132 at Saint-Georges-de-Cacouna (near Rivière-du-Loup) is part of the Trans-Canada Highway.

A-25, Autoroute de Lanaudière

This expressway serves the Lanaudière region beginning at a point east of Laval where the northern stretch ends at Autoroute 440. A second stretch of Autoroute 25 links Autoroute 40 at the Anjou interchange to the south shore via the Louis-Hippolyte Lafontaine Bridge-Tunnel. This final stretch is part of the Trans-Canada Highway.

A-30, Autoroute de l'Acier

This four-lane highway is broken into four non-contiguous segments covering an overall distance of 110 kilometers. A first segment circumvents Salaberry-de-Valleyfield west of Montréal, a second bypasses the Kahnawake Reserve, also located west of Montréal, a third links Autoroute 55 (south of the Laviolette Bridge at Trois-Rivières) and Bécancour, and a fourth and final segment extends from Sorel to Saint-Constant. Of the four, only the last one is part of the system under study.

A-35, Autoroute de la Vallée-des-Forts

Autoroute 35, formerly known as Autoroute de la Nouvelle-Angleterre, is one of the shortest expressways in Québec. A mere 20 kilometers in length, this four-lane expressway lies between Autoroute 10 near Chambly and Route 133 south of Iberville.

A-40, Autoroute Métropolitaine, Autoroute Félix-Leclerc

Autoroute 40 begins at the Ontario border, where it links up with Autoroute 417, and bisects the Island of Montréal prior to crossing over to the St. Lawrence north shore. It then parallels the river to Québec City, passing through Trois-Rivières.

Autoroute 40 is part of the Trans-Canada Highway from Ontario to the Autoroute 25 intersection at Montréal. It is called Autoroute Métropolitaine at the Island's centre, between the Côte-de-Liesse and Anjou interchanges. It then becomes Autoroute Félix-Leclerc when it exits Montréal and remains so to Québec City, where it ends.

A-50, Autoroute de l'Outaouais

This expressway, which covers 70 kilometers, is comprised of two segments that are not as yet linked. The western segment, between Hull and Masson-Buckingham, is completed. Another complete segment provides a bypass around Lachute and joins up with Autoroute 15. The latter segment includes a ten-kilometer stretch between Mirabel Airport and the Route 148 interchange where a single road surface provides one lane in either direction.

A-55, Autoroute Transquébécoise

Autoroute 55 is 200 kilometers in length. It meets up with Interstate 91 at the Québec/Vermont border to the south, at the Rock Island border crossing, then travels north to the city of Magog. At Magog, it shares an east-west stretch of Autoroute 10 between Magog and Sherbrooke. Finally, at Sherbrooke, it shifts northward once again to the city of Drummondville. Another segment of this expressway begins at Saint-Célestin, crosses the Laviolette Bridge to Trois-Rivières, then ends at the bridge over the St. Maurice River at Grand-Mère.

A-73, Autoroute Robert-Cliche

This 90-kilometer, four-lane expressway is divided into two segments: a first runs from Charlesbourg, north of Québec City, to Stoneham at the junction of Autoroute 40. A second is an extension of Autoroute 573 to the north, spanning the Pierre Laporte Bridge and meeting up with Autoroute 20. It then travels through the Beauce region to the south to the Saint-Joseph-de-Beauce area.

A-440, Autoroute Laval and Charest Boulevard

The Québec highway system includes two entirely distinct sections of Autoroute 440: the first, known as Autoroute Laval, serving the Laval urban area, is an extension of Autoroute 25 and extends to Route 117.

The second stretch of Autoroute 440 is located along the St. Lawrence River at Québec City and is part of Charest Boulevard as well as of Autoroute Dufferin–Montmorency.

A-520, Autoroute Côte-de-Liesse

Autoroute 520 is located in the west-central part of the Island of Montréal. It is the expressway linking Dorval Airport to the Décarie interchange and is only 10 kilometers in length.

A-540, Autoroute Vaudreuil and Autoroute Duplessis

As is the case with Autoroute 440, Autoroute 540 also comprises two sections. The first, west of Montréal, links autoroutes 20 and 40. The second, located at Québec City, links Autoroute 40 to the Pierre Laporte Bridge. Its overall length is 10 kilometers.

A-640, Montréal's northern bypass expressway

Autoroute 640 runs along the north shore of the Milles-Îles River, from Charlemagne to Oka, and travels through the Lower Laurentians. It thus circumvents the urban community by way of a 50-kilometer loop.

A-573, Autoroute Henri-IV

This short expressway is a ten-kilometer extension of Autoroute Henri-IV, northwest of Québec City.

A-720, Autoroute Ville-Marie

Autoroute 720, built along an east-west axis south of Montréal, is a ten-kilometer expressway between the Jacques Cartier Bridge and Autoroute 15. It runs through the Ville Marie Tunnel beneath downtown Montréal.

b) National highways

Route 117

This 620-kilometer road travels through mountainous country from Sainte-Agathe in the Laurentians region in a northerly direction, runs through the Outaouais region and the Réserve faunique de la Vérendrye, to the city of Rouyn-Noranda in Abitibi–Témiscamingue. It then extends from Rouyn-Noranda to the Québec/Ontario border. Route 117 is part of the Trans-Canada Highway along its entire length.

Route 132

Route 132 is Québec's longest national highway, stretching over 1,600 kilometers. It originates at Dundee near the American border to the west, runs along the St. Lawrence River, serving Montréal's South Shore and large communities in the St. Lawrence Valley such as Sorel, Bécancour, Québec City, Rivière-du-Loup, and loops around the Gaspé Peninsula. At Matapédia, in the Gaspé, Route 132 meets up with Route 11 at Campbellton, New Brunswick.

Route 133

This two-lane, 130-kilometer highway stretches from Sorel to the Philipsburg border crossing near Lake Champlain, at the Québec/Vermont border.

Route 134

This ten-kilometer highway originates at Notre Dame Street in Montréal, crosses over the Jacques Cartier Bridge, runs through Longueuil and Brossard and ends at Candiac. The system under study only includes the Jacques Cartier Bridge and its five lanes, including one reversible lane.

Route 138

Route 138 extends from the Québec/New York State border to Montréal, then runs parallel to Autoroute 40 along the St. Lawrence River, through Trois-Rivières and Québec City. It then travels to the Côte-Nord region, through Charlevoix, Manicouagan and Duplessis, linking Québec City, Baie-Comeau, Sept-Îles and Natashquan. A ferry provides service between Baie-Sainte-Catherine and Tadoussac, at the mouth of the Saguenay River.

Route 148

Route 148 is 320 kilometers in length and begins at the Ontario border, on Allumettes Island in the Pontiac, thence along the Ottawa River through the Hull/Ottawa region to Route 117 in Laval. The segment defined for the purpose of this study is that which lies between Masson and Lachute.

Route 155

This 310-kilometer road begins at Autoroute 20, then proceeds north where it is intercepted by Autoroute 55 which crosses the Laviolette Bridge. Autoroute 55 extends from Trois-Rivières to Grand-Mère and is in turn intercepted by Route 155 which rolls on through to the Mauricie region, goes by La Tuque and ends up in the Lac-Saint-Jean area.

Route 173

Also known as "Route du Président-Kennedy," this two-lane highway winds its way over 140 kilometers of the hilly Chaudière-Appalaches region from Autoroute 20 to the Armstrong border crossing between Québec and the State of Maine. The segment defined for study purposes lies between the municipality of Saint-Joseph-de-Beauce and the American border.

Route 175

Route 175 provides a link between Québec City and Chicoutimi. It is 230 kilometers in length and travels through the mountainous terrain of the Réserve faunique des Laurentides over several kilometers.

Route 185

Route 185, part of the Trans-Canada Highway, travels over 90 kilometers from Rivière-du-Loup to Route 2 in New Brunswick. Transportation of goods between the Maritimes and the rest of Canada occurs over this two-lane highway.

Although the MTQ has commissioned extensive reinforcement work on the above-mentioned highways, some high-traffic roads, such as the 117 in Abitibi, the 138 in the Côte-Nord region and the 155 in the Haute-Mauricie, do not meet the requirements of trucking operations along their entire lengths.[1]

---

[1] Ministère des Transports du Québec, *Le transport des marchandises au Québec, Problématique et enjeux, Service du transport ferroviaire, routier des marchandises,* April 1999.

2. Bridges and viaducts

Over 8,500 bridges and viaducts providing a clearance of 4.5 meters or more are part of the Québec highway system and close to 4,000 are under the jurisdiction of the Ministère des Transports du Québec, the rest having been transferred to municipalities in 1993.[1] The system also includes other bridges belonging to Canadian National and Canadian Pacific, Hydro-Québec and the ministère des Ressources naturelles.

Most major bridges within the upper tier system are under the jurisdiction of the MTQ, with the following exceptions:

- the Jacques Cartier and Champlain bridges, between Montréal and the south shore, are under the responsibility of the federal government and are administered by Les Ponts Jacques-Cartier et Champlain Incorporée;
- the Victoria Bridge infrastructure is under the jurisdiction of Canadian National (CN);
- responsibility for the Mercier Bridge is shared by the ministère des Transports du Québec and Les Ponts Jacques-Cartier et Champlain Incorporée.

3. System operation

As is the case in the rest of Canada, carriers must comply with standards and regulations established by highway system management authorities in order to protect the highway infrastructure and enhance freight transport safety. Québec standards and regulations deal with the following issues:

- driving permits;
- hours of operation and work;
- mechanical and vehicle maintenance inspection programs;
- truck movements within the system (road signs);
- transportation of dangerous goods;

---

1 ACRGTQ, *Les infrastructures routières du Québec, proposition de financement, préparé par Les Conseillers ADEC Inc.*, July 1996.

- securing of loads;
- maximum vehicle loads and cargo dimensions;
- bulk goods trucking permits;
- special travel permits for non-standard transport operations.

Some of the above regulations affect the carriage of goods within the Province. Such is the case of prohibition on the transport of dangerous goods in tunnels and limited operating permits for certain classes of vehicles such as longer combination vehicles (LCV's).

Bans on tunnel transport prohibit the use of two important links of the upper tier highway system, namely, the Louis-Hippolyte Lafontaine Bridge-Tunnel and the Ville Marie Tunnel in Montréal. These restrictions are an added burden for carriers operating in the Montréal area.

Specific restrictions also apply to the movement of LCV's, which are only authorized to travel on routes specified by a special permit and must do so between midnight Sunday and noon Saturday. Furthermore, they are banned from roadways on the Island of Montréal during morning peak hours as well as from certain segments of autoroutes 73, 40 and 440 in the Québec City region.

On a final note, load restrictions are in effect during the spring thaw when the highway system is particularly vulnerable. They are intended to protect the infrastructure. Three spring thaw zones are defined due to the geography of the Province. Dates when restrictions are imposed and lifted in each zone are determined and may vary among zones and from one year to the next. During the spring thaw, restrictions apply to axle loads and may very according to class of axle by as much as 20% of normal load.

4. System maintenance

Québec's extreme weather conditions aside, trucks are the second most important cause of highway system deterioration. This is why load restriction regulations are applied. Heavy use is made of the upper tier system, especially along major axes and bridges serving the large communities of Montréal and Québec City.

The MTQ relies on the U.S. government's *Highway Performance Monitoring System*, adjusted according to the specific needs and geography of the Province, to plan for medium- and long-term actions regarding the highway system. The aforementioned monitoring system supports the assessment of various investment strategies over time with reference to the state and functionality of the highway system. In order to set road reconstruction priorities, the Ministry examines road

surface parameters such as rutting and fissuring, and traffic parameters such as traffic levels, causes of accidents, queuing, percentage of trucks and road capacity.

Reference material resulting from studies conducted for the purpose of developing the Montréal regional transportation plan show that Québec lagged behind other Canadian provinces in the eighties in terms of highway maintenance. However, early in the nineties, the MTQ established significant maintenance programs that were helpful in stabilizing and even improving roadway quality.

On the other hand, roadway quality will be difficult to maintain, largely because a significant proportion of infrastructures is now at or near maturity, 25 to 35 years after being commissioned. Significant and continued investment will be required to maintain the quality of the upper tier highway system: the MTQ estimates that the annual level of investment needed for this purpose is $260 million.[1] Moreover, the transfer to municipalities of large portions of the regional and local highway network throughout the province raises particularly difficult problems for small municipalities that quite often do not possess the expertise required to maintain highway infrastructures and structures. This, however, does not affect the upper tier highway system where freight transport is concentrated.

D. Principal gateways

1. Interprovincial crossings

Truck traffic between Québec and New Brunswick to the east and between Québec and Ontario to the west enters and exits the province at a limited number of crossings. The main points of exchange with New Brunswick are: 1) Route 185, which links up with New Brunswick's Route 2 and is also part of the Trans-Canada Highway corridor; 2) Route 132 at the Matapédia Bridge in the Gaspé, where it joins up with New Brunswick's Route 11.

West of the province, the location where traffic is heaviest is undoubtedly the stretch of Autoroute 20 which provides access to Ontario's Highway 401 and which is used by a high proportion of traffic bound for Ontario or the central, southern and western United States. The second most important point is located on Autoroute 40 at the junction with Highway 417 towards Ottawa and northern Ontario. Trucks en route to western Canada also travel through this point. Two other locations complete the network, the junction of Autoroute 5 and King Edward Avenue

---

[1] *Étude d'impact des nouvelles normes de charges et dimensions de 1998 sur le camionnage lourd au Québec*, December 1998.

between Hull and Ottawa and that of Route 117 in the Abitibi region and Highway 66 in Ontario.

2. Québec/United States border crossings

Québec shares 28 border crossings with the states of New York, Vermont, New Hampshire and Maine. Four of them accommodate approximately 80% of all cross-border trucking in the province, namely, Lacolle, Philipsburg, Rock Island and Armstrong.

The Lacolle crossing alone accounts for nearly 6% of all freight traffic between Canada and the United States. Almost half of Québec exports carried by road to the United States and Mexico transit through Lacolle, where Autoroute 15 meets Interstate 87, and through Philipsburg, where national highway Route 133 joins up with Interstate 89.

Table IV-8 sets out the physical, operational and traffic characteristics describing the four (4) most heavily used border crossings between Québec and the United States.

Table IV-8
Characteristics of border crossings between Québec and the United States

Crossing	Location		Number of trucks/day[1]	% daily truck traffic of total[1]	Hours of operation[2]	Number of audit stations[2]	Number of truck lanes[2]	Number of truck parking spaces[2]	Number of lanes approaching Québec[2]
	Québec	**United States**							
Lacolle	A-15	I-87	1,717	43%	24h/7d	3	3	20-24	4
Philipsburg	Route 133	I-89	626	16%	24h/7d	2	2	12	2
Rock Island	A-55	I-91	540	13%	24h/7d	1	2	6-8	4
Armstrong	Route 173	Route 201	351	9%	24h/7d	2	2	8-14	2
Others			784	20%	-	-	-	-	-
Total			4,018	100%	-	-	-	-	-

Sources:

[1] *Transport Canada, Transportation ad North American Trade, November 1998.*

[2] *Transport Canada, International Border Crossing, Infrastructure Inventories, April 1998.*

Figure IV-6
Daily truck traffic at principal Canada/U.S. border crossings, 1996

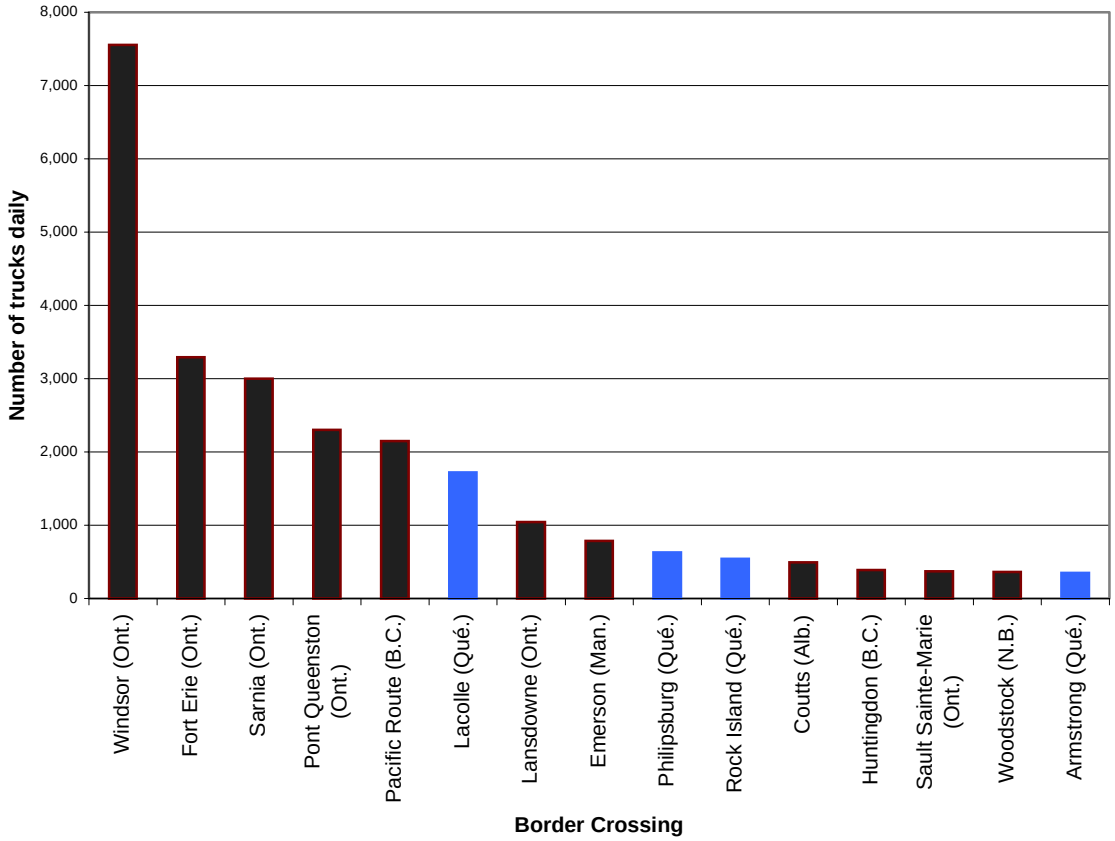


Figure IV-6 describes daily truck traffic recorded in 1996 at the principal border crossings between Canada and the United States. Those located on the Ontario/United States border are the most heavily used, accommodating over 60% of total truck traffic between the two countries. Québec ranks second with 13.5% and British-Columbia, third with 12.3%.

The North American Trade Automation Prototype (NATAP) came into effect as a result of a joint initiative among Canada, the United States and Mexico, the purpose of which was to simplify customs clearance of goods. Additionally, the project provides for testing of Intelligent Transport Systems (ITS) technology such as the use of transponders to automatically identify vehicles and electronic data interchange (EDI) for the exchange of information on intercompany trade, including among the three customs authorities.

Such systems result in time and cost savings for carriers and also benefit customs organizations and brokerage firms. They enable customs services and brokers to computerize file processing, greatly reduce hours of work and improve information management, public relations and overall quality of service. At this time, prototypes are being tested at two (2) Canada/U.S. border crossings, at Windsor and Fort Erie in Ontario, and four (4) Mexico/U.S. crossings.

Provincial governments (especially Ontario) and several American states are encouraging greater productivity of their highway transport industry by taking part in new technology research, demonstration and implementation projects, including ITS. For the time being, there are no Intelligent Transport Systems at Québec/United States border crossings. However, assessment of projects currently under way indicates that such systems will greatly facilitate the management of freight movements between Québec and the United States in a few years' time.

E. Highway system traffic characterization

1. General characteristics

Figure IV-7 shows the distribution of AADT for all linkages of the highway system under study. Highest levels are observed in the Montréal and Québec City metropolitan areas. Service levels on the highway system segments defined for study purposes are provided in Figure IV-8.

2. Provincial highway system

Tables IV-9 and IV-10 show the AADT, the thirtieth highest annual hourly volume and estimated service level for major expressway and highway segments of the highway system under study for which information is available. The data does not

include information on linkages located outside large communities. Levels of service are estimated based on the thirtieth hourly volume. Results therefore reflect traffic conditions observed in peak periods.

Data provided in Table IV-9 indicates that the level of service is generally equal to or greater than “C” at almost every point of the system except on the outskirts of the Montréal metropolitan area and, to a lesser degree, on the outskirts of Québec City. This is in agreement with what is commonly held to be true and numerous observations made by various stakeholders in the transport community, specifically that the main problems truckers encounter in Québec are concentrated in the Greater Montréal area, an area that transit traffic is unable to avoid due to the lack of bypass highways.

Figure IV-7
1996 AADT in the highway system under study

Figure IV-8
Level of service index for thirtieth highest annual hourly volume on segments of the highway system under study

Table IV-9
Traffic characteristics of expressway segments under study located outside large communities

Expressway	Between	and	AADT* min	AADT* max	Rate 30th hour* min	Rate 30th hour* max	Level of service min	Level of service max
A-10	Brossard	Chambly	58,000	58,000	6,277	6,277	D	D
	Chambly	Sherbrooke	15,700	27,000	2,113	3,088	A	B
	Sherbrooke		27,000	27,000	2,697	2,697	B	B
	Sherbrooke	Fleurimont	7,900	14,700	928	1,654	A	A
A-15	Boisbriand	St-Jerôme	61,000	107,000	7,383	9,723	C	C
	St-Jérôme	Ste-Adèle	33,000	44,000	3,608	4,864	B	C
	Ste-Adèle	Ste-Agathe	13,500	19,400	1,526	2,658	A	B
	Candiac	Lacolle	9,500	19,800	757	1,178	A	B
	Poste frontière Lacolle		7,200	7,200	1,200	1,200	A	A
A-20	Rivière-Beaudet	Vaudreuil-Dorion	20,300	31,000	2,391	3,394	A	B
	Boucherville	St-Hilaire	50,000	66,000	5,423	7,638	C	E
	St-Hilaire	Lévis	19,400	40,000	2,891	4,355	B	C
	Lévis		20,200	65,000	3,232	7,587	B	E
	Lévis	Rivière-du-Loup	8,400	16,100	981	2,565	A	B
A-30	Boucherville	Sorel	9,500	19,000	1,099	2,113	A	A
A-35	Chambly	Iberville	29,000	31,000	3,181	3,394	B	B
A-40	Pointe-Fortune	Vaudreuil-Dorion	15,300	30,000	1,854	3,287	A	B
	Charlemagne		83,000	83,000	8,502	8,502	C	C
	Repentigny		56,000	59,000	6,064	6,384	A	C
	Repentigny	Trois-Rivières	16,100	22,300	2,086	3,003	A	B
	Trois-Rivières		39,000	58,000	4,248	6,277	C	D
	Trois-Rivière	Québec	11,700	39,000	1,432	2,827	A	C
A-50	Hull		85,000	85,000	8,604	8,604	C	C
	Gatineau	Masson	16,800	19,200	2,113	2,356	A	B
	Lachute	Mirabel	5,200	5,200	na	na	na	na
A-55	Vermont	Sherbrooke	2,410	6,900	388	1,156	A	A
	Sherbrooke		15,600	17,700	2,137	2,832	B	B
	Sherbrooke	Drummonville	5,300	8,000	842	1,156	B	C
	Bécancour	Trois-Rivières	5,900	16,700	713	2,100	A	A
	Trois-Rivières		29,000	29,000	3,181	3,212	B	B
	Trois-Rivières	Grand-Mère	13,000	19,900	1,568	2,209	A	A
A-73	St-Joseph-de-Beauce	Charny	3,900	15,200	479	979	A	A
	Charny		22,400	27,000	2,476	3,240	B	B

** MTQ, Données sur la circulation par numéro de route, de tronçon et de section, recueil 1996.*

Table IV-10
Traffic characteristics on segments of national highways under study located outside major communities

Highway	Between	and	AADT* min	AADT* max	Rate 30th hour min	Rate 30th hour max	Level of service min	Level of service max
R117	Ste-Agathe	St-Jovite	12,300	15,600	1,509	2,475	A	A
	St-Jovite	Rouyn-Noranda	1,670	9,600	288	1,527	A	C
	Rouyn-Noranda		5,300	7,100	842	912	B	B
	Arntfield (Ont. border)		700	700	105	105	A	A
R132	Rivière-du-Loup	Rimouski	1,190	6,200	190	1,042	A	B
	Rimouski		na	na	na			
	Rimouski	Pointe-à-la-Croix	2,600	8,300	331	1,355	A	C
	Pointe-à-la-Croix	Campbellton (N-B)	2,600	2,800	331	354	A	A
R133	Philipsburg Border Crossing		3,100	3,100	439	439	A	A
	Philipsburg	Iberville	4,000	7,400	595	1,097	A	B
	Iberville		8,400	13,400	1,372	1,654	C	C
R138	Québec	Beaupré	18,500	23,500	2,351	3,760	D	E
	Beaupré	Baie-Comeau	2,270	9,700	390	1,233	A	B
	Baie-Comeau		8,000	19,100	938	2,124	B	C
	Baie-Comeau	Sept-Iles	1,190	2,800	198	379	A	A
	Sept-Iles		5,000	5,000	618	618	A	A
R148	Masson-Angers	Lachute	4,700	9,600	737	1,165	A	B
R155	A-20	Saint-Célestin	5,800	6,600	655	1,112	A	A
	Grand-Mère	Chambord	1,370	3,500	219	598	A	A
R173	Saint-Joseph-de-Beauce	St-Georges	6,800	10,300	810	1,090	B	B
	St-Georges		15,700	15,700	1,962	1,962	C	C
	St-Georges	Maine (R201)	1,600	4,600	219	575	A	A
	Armstrong Border Crossing		770	770	131	131	A	A
R175	Québec	Chicoutimi	3,300	6,700	583	809	A	B
	Chicoutimi		8,800	44,000	1,065	4,782	B	C
R185	Rivière-du-Loup	N.B.	4,500	7,600	565	1,021	A	B
	N.B.		4,900	5,700	760	975	A	B

** MTQ, Données sur la circulation par numéro de route, de tronçon et de section, recueil 1996.*

3. Montréal region highway system

Because of the magnitude of economic activity in the Montréal region, the upper tier highway system must accommodate traffic originating both locally and in surrounding cities. The highest traffic levels in the Province are found in Montréal. For example AADTs on Autoroute Décarie sometimes total up to 184,000 vehicles per day. On Autoroute Métropolitaine, rates vary between 100,000 and 160,000 vehicles per day. The same may be observed on autoroutes 20 (135,000 vehicles/day) and 13 (110,000 vehicles/day).

Major axes, including bridges, are congested at peak hours. Congestion radiates from the heart of Montréal to the north and south suburbs. Bridges between the Island of Montréal and Laval, the north shore and the south shore are especially vulnerable to traffic build-up. Congestion is a recurring problem despite efforts to minimize its impact (commuter trains, separate lanes for buses and high-occupancy vehicles, as well as an expressway traffic management system).

Expressways compose a fragmented network that does not cover the entire territory. Breaks in the system limit the number of possible routes in several locations. They are also the cause of route overlap, as is the case of Autoroute Métropolitaine (east-west axis), which links Autoroute des Laurentides and Autoroute Décarie to north-south axes, although its layout is not suited for this purpose.

The quality of service provided by the highway system is undermined by the absence of alternative routes for travel within the region, especially for the purpose of transit traffic. This is demonstrated by the fact that Autoroute 40, the backbone of the regional system, is the only unbroken expressway across the Island of Montréal built along an east-west axis; additionally, it is linked to all major north-south axes, a condition which greatly increases traffic levels on this expressway.

Highway system congestion in the Montréal area significantly and, at times, inordinately increases travel time on expressways in the heart of the region. It follows that transport costs increase accordingly and unquestionably have a negative impact on the economy.

F. Truck movement characteristics

1. Data sources

There is no freight database comparable to automobile traffic databases that may be used to characterize truck traffic flows in the Québec highway system (as is the case in other jurisdictions).

On the other hand, information is available from various sources. In addition to ad hoc studies, three separate sources of information allow us to construct an adequate base for analysis purposes. They are as follows:

- results of the annual Statistics Canada survey of common carriers;
- results of the survey conducted in 1995 by the Canadian Council of Motor Transport Administrators (CCMTA);
- truck traffic volumes recorded in the MTQ registry of traffic data by highway, segment and section number.

It should be noted that CCMTA survey results provide a profile of highway freight transport on the Canadian national highway system for one week in the fall of 1995. It may be reasonably assumed that the situation is largely the same in 1996 (the last year for which data was compiled by the MTQ) and 1997 (year of the latest survey by Statistics Canada). Our work is predicated on this assumption.

Using data from the various sources mentioned above, we attempted to develop a matrix of freight flows between the major regions of Québec and other points in Canada and the United States. Traffic distribution among major axial highways may be determined based on such a matrix.

2. Classes of carriers

The CCMTA survey conducted in 1995, recognizes two major classes of carriers: private carriers and common carriers. The 1997 survey conducted by Statistics Canada, on the other hand, is aimed at a particular type of common carrier, those firms based in Canada that report revenue of $1 million or more and that derive at least half of their sales figure from the transport of goods over distances greater than 80 km.

Finally, according to the impact study of new load and cargo dimension standards of 1998 governing heavy vehicles, companies are grouped into the three following classes:

- general common carrier trucking;
- bulk common carrier trucking; and
- private carrier trucking.

It would seem that this last classification is the one that is generally used by the MTQ and that it is in agreement with surveys conducted in the Montréal area from 1992 to 1994 by the MTQ and the Montréal Urban Community.

According to the same impact study of new load and cargo dimension standards, major carriers (those with 20 or more heavy trucks) comprised slightly less than 1% of the total number of Québec firms, though they accounted for nearly 24% of vehicles.

The share of total traffic accounted for by freight transport surveyed by Statistics Canada may be estimated based on the above data, knowledge of traffic makeup and characteristics of travel within the system, as well as cross-referencing to other information sources. This then permits an estimation of total freight traffic on the principal highways of the system.

3. General characteristics of traffic movements

a) Movement characteristics by class of carrier

Detailed Québec results of the CCMTA survey conducted in 1995 provide an indication of movement breakdown, tonnage of goods carried and tonne-kilometers moved by class of carrier and by market type. Results shown in Table IV-11 indicate that intraprovincial movements account for approximately 60% of total movements, though only 50% or so of tonnes moved and slightly over 20% of tonne-kilometers carried. Conversely, while international movements only represent 15% or so of total movements, they account for nearly 20% of goods carried and almost 40% of tonne-kilometers moved, taking into account total distance traveled.

Furthermore, it may be observed that trucks used for common carrier transport represent over 75% of interprovincial movements (75.6%) and over 80% of international movements (81.4%), although only slightly more than 50% of intraprovincial travel may be ascribed to them. Along the same vein, these trucks carried over 80% and 88% of interprovincial and international tonnage respectively, whereas they only transported 63% of intraprovincial freight.

Table IV-11
Movement, tonnage and tonne-kilometer breakdown by class of carrier and market type

Carrier Class		Intraprovincial			Interprovincial			International		
		No.	%	CV	No.	%	CV	No.	%	CV
					Movements (number)					
Common carrier		44,420	52.5%	3.9%	26,667	75.6%	2.7%	17,968	81.4%	11.6%
Private		37,536	44.3%	4.0%	8,285	23.5%	5.8%	3,825	17.3%	21.1%
Unknown		655	0.8%	35.7%	57	0.2%	18.7%	26	0.1%	44.4%
No reference		2,076	2.5%	17.8%	246	0.7%	29.4%	253	1.1%	82.6%
Total		84,687	100%		35,255	100%		22,072	100%	
Grand total	142,016		59.6%			24.8%			15.5%	
					Weight of freight					
Common carrier		441,821	62.9%	6.1%	351,715	80.3%	2.8%	237,565	88.1%	14.0%
Private		257,984	36.7%	5.1%	85,906	19.6%	6.7%	31,636	11.7%	35.0%
Unknown		3,057	0.4%	63.4%	618	0.1%	39.3%	331	0.1%	66.1%
Total		702,862	100%		438,239	100%		269,532	100%	
Grand total	1,410,635		49.8%			31.1%			19.1%	
					Tonne-km (thousands)					
Common carrier		120,310	67.1%	7.1%	278,744	83.0%	3.9%	285,799	91.4%	8.5%
Private		57,790	32.2%	6.8%	56,411	16.8%	7.3%	26,281	8.4%	24.3%
Unknown		1,229	0.7%	73.2%	613	0.2%	24.8%	691	0.2%	65.8%
Total		179,329	100%		335,768	100%		312,772	100%	
Grand total	827,871		21.7%			40.6%			37.8%	

Source : MTQ, CCMTA Survey, Detailed Results for Québec - Tale 5.5.1

CV : Coefficient of variation.

b) Characteristics of movements by distance

Table IV-12 indicates other results from the CCMTA survey, specifically those dealing with distance traveled. It is worthy of note that close to 70% of intraprovincial trips cover a distance of 250 km or less. This proportion falls to slightly more than 20% in the case of interprovincial movements and to some 15% when international trips are taken into account. The breakdown of tonnage of goods and tonne-kilometers moved essentially follows the same pattern. Given that common carrier trucking accounts for a very large share of interprovincial and international trips, it follows that the longest trips are made by trucks in this class of vehicles used for this purpose. Such trucks should therefore constitute a very large part of interurban traffic on major axial highways.

c) Characteristics of movements by class of vehicle

The CCMTA survey also provides information on the type of vehicles used. Table IV-13 shows a breakdown of travel by major class of trucks. As was to be expected, tractor-trailers account for an extremely large share both of international trips (93%) and interprovincial trips (86.5%). Moreover, use of tractor-trailers for intraprovincial movements remains relatively high (approximately 60%). One could have expected a higher proportion of straight trucks would have been used for this purpose. It is likely that this result reflects the fact that surveys were generally conducted outside large urban areas.

CCMTA survey results would therefore provide a relatively accurate picture of long distance travel while underestimating short distance movements.

Table IV-12
Breakdown of movements, tonnage carried and tonne-kilometers moved by distance traveled and market type

Length of movement		Intraprovincial			Interprovincial			International		
		No.	%	CV	No.	%	CV	No.	%	CV
					Movements (number)					
250 -		57,840	68.3%	1.9%	7,544	21.4%	4.6%	3,364	15.2%	14.0%
251 - 750		22,933	27.1%	3.9%	18,383	52.1%	3.5%	7,756	35.1%	24.3%
750 -1500		2,372	2.8%	15.1%	6,726	19.1%	4.6%	5,919	26.8%	14.9%
1500 +		91	0.1%	55.0%	2,424	6.9%	7.1%	5,043	22.8%	8.6%
Unknown		1,450	1.7%	32.8%	177	0.5%	42.3%	0	0.0%	10.9%
Total		84,686	100%		35,254	100%		22,082	100%	
Grand total	142,024		59.6%			24.8%			15.5%	
					Weight of freight					
250 -		392,476	55.8%	4.6%	63,495	14.5%	5.7%	22,652	8.4%	20.8%
251 - 750		264,511	37.6%	7.5%	229,432	52.4%	3.5%	90,304	33.5%	34.5%
750 -1500		30,211	4.3%	14.5%	105,466	24.1%	5.1%	85,207	31.6%	14.1%
1500 +		441	0.1%	75.6%	36,468	8.3%	8.0%	71,369	26.5%	10.2%
Unknown		15,224	2.2%	42.0%	3,377	0.8%	44.2%	0	0.0%	0.0%
Total		702,863	100%		438,238	100%		269,532	100%	
Grand total	1,410,635		49.8%			31.1%			19.1%	
					Tonne-km (thousands)					
250 -		49,341	27.5%	3.8%	11,261	3.4%	6.9%	3,187	1.0%	18.8%
251 - 750		101,963	56.9%	8.6%	126,121	37.6%	3.2%	50,553	16.2%	36.4%
750 -1500		27,221	15.2%	15.0%	106,466	31.7%	4.7%	86,322	27.6%	11.9%
1500 +		804	0.4%	72.5%	91,920	27.4%	10.3%	172,710	55.2%	9.6%
Unknown		0	0.0%	0.0%	0	0.0%	0.0%	0	0.0%	0.0%
Total		179,329	100%		335,768	100%		312,772	100%	
Grand total	827,871		21.7%			40.6%			37.8%	

Source : MTQ, CCMTA Survey, Detailed Results for Québec, Table 6.11.4

CV : Coefficient of variation.

Table IV-13
Movement distribution by market type and vehicle category

Category		Intraprovincial			Interprovincial			International		
		No.	%	CV	No.	%	CV	No.	%	CV
Tractor and 1 trailer		51,996	61.4%	3.1%	30,487	86.5%	3.0%	20,547	93.0%	11.2%
Tractor and 2 trailers		1,803	2.1%	12.8%	1,990	5.6%	10.5%	475	2.2%	23.9%
Straight truck		27,948	33.0%	4.2%	2,206	6.3%	6.9%	804	3.6%	38.2%
Straight truck and one trailer		793	0.9%	14.8%	295	0.8%	25.7%	2	0.0%	100%
Tractor only		2,146	2.5%	19.9%	246	0.7%	29.4%	253	1.1%	82.6%
Other configuration		0	0.0%	0.0%	31	0.1%	44.1%	2	0.0%	100%
Total		84,686	100%		35,255	100%		22,083	100%	
Grand total	142,026		59.6%			24.8%			15.5%	

Source : MTQ, CCMTA Survey, Detailed Results for Québec, Table 4.10.1

CV : Coefficient of variation.

4. Distribution by firm and vehicle type

According to the new load and cargo dimension standards impact study conducted in 1998 involving heavy vehicles, Québec-based carrier firms are broken down as follows:

Transporters	Total		Large company[1]		
	No.	%	No.	%	% of total
General common carrier	2,509	5.7%	110	29.5%	4.4%
Bulk common carrier	6,418	14.7%	16	4.3%	0.2%
Private	34,778	79.6%	247	66.2%	0.7%
Total	**43,705**	**100.0%**	**373**	**100.0%**	**0.9%**

The makeup of the vehicle fleet of the above companies is set out below:

Vehicles	Total		Large Company[1]		
	No.	%	No.	%	% of total
General common carrier	14,229	14.1%	6,902	28.8%	48.5%
Bulk common carrier	11,094	11.0%	581	2.4%	5.2%
Private	75,284	74.8%	16,512	68.8%	21.9%
Total	**100,607**		**23,995**	**100.0%**	**23.9%**

[1] *Company with more than 20 vehciles of 3 000 kg or more.*

It may be observed that major common carriers operate nearly half of all trucks used for general common carrier shipping. These carriers represent close to 30% of the large trucking firms.

5. Flow of goods

As observed, common carriers account for a major portion (63%) of movements on major highways. The share is even higher in the case of tonnage (73%) and tonne-kilometers (83%) moved. Thus, one can conclude that 75% of goods shipped on major highways in Québec is handled by common carriers.

	Movements		Weight of freight		Tonnes-km	
	No.	%	Tonnes	%	1000 t-km	%
Common carriers	89,055	62.7	1,031,101	73.1	684,854	82.7
Private	49,646	35.0	375,526	26.6	140,482	17.0
Unknown	738	0.5	4,006	0.3	2,533	0.3
No reference	2,575	1.8	0	0.0	0	0.0
Total	142,014		1,410,633		827,869	

Source: MTQ, CCMTA Survey, Detailed Results for Québec, Table 5.5.1

The flow of goods through the main connections and gateways of the highway system may be estimated on the basis of tonnage handled by trucks belonging to firms whose sales figures are in excess of $1 million per year (according to the Statistics Canada survey), assuming a more or less balanced distribution of traffic makeup (which is likely on major highways, outside urban centres).

Table IV-14 provides a matrix of annual flow of goods among major regions of Québec. Tables IV-15 and IV-16 set out the same information on the freight to and from these Québec regions at gateways with neighbouring provinces as well as at border crossings providing access to other Canadian provinces or to American states. A review of these tables confirms the relative weight of the Montréal Metropolitan area and the magnitude of the flow of goods between Québec and Ontario on Autoroute 20 (Highway 401 in Ontario).

It may also be observed that traffic between regions located east of Montréal and Ontario totals 4.3 million tonnes per year in a westerly direction and 2.5 million tonnes per year in an easterly direction on Autoroute 20. Assuming a 20-ton truckload, this lane is handled by 1,000 trucks per day that would benefit by the availability of a bypass highway around Montréal. Transit traffic amounting to some 300 trucks per day traveling between the Maritimes and western parts of the country can be added to this figure.

Figure IV-9 demonstrates the relative magnitude of traffic flows on the highway system under study, assuming that trips are made along the shortest available route between point of origin and destination. It highlights the prevailing use of Autoroute 20 as a freight transit route. The figure also emphasizes the extent of trade between Québec and Ontario as well as Québec and the United States, either directly or via Ontario. Table IV-17 provides details by segment of the system under study.

The database sample obtained from Statistics Canada details type of freight handled. Quite often, however, the sample is not large enough to support movement analysis by class of goods.

6. Truck traffic

The matrices illustrating flow of goods and an assumption of the average weight per truckload provide the information required to estimate truck traffic over the highway system. Figure IV-10 shows the overall results of the analysis. Table IV-17 provides details by road segment. In total, results obtained amount to approximately half of the activity observable on the highway system according to highway, segment and section data obtained from the MTQ. The analytical model would seem to underestimate truck traffic. That being said, underestimation appears to be consistent.

Table IV-14
Goods flow matrix among main regions of Québec (000's tonnes per year)

Origins		Destinations														
#	Zone	1	2	3	4	5	6	7	8	9	12	14	15	16	17	Total
1	Bas St-Laurent et Gaspésie	35.6	7.6	43.6	69.0	0.3	280.2				19.7			6.9	3.8	467
2	Saguenay - Lac-Saint-Jean	26.5	10.7	110.9	213.6	20.8	374.6	0.1	1.7	34.9	1.2			21.2	90.9	907
3	Québec	630.6	778.1	271.0	434.4	157.2	1485.6	10.8	12.5	149.8	149.4	63.3	116.0	225.6	443.4	4,928
4	Mauricie	38.5	196.9	109.3	3904.6	37.7	677.2	64.9	1.7	7.5	11.3	7.4	26.0	87.2	26.8	5,197
5	Estrie	3.8	12.3	35.5	11.0	211.8	617.3	1.5	1.8	6.4	1.9	20.1	2.8	22.4	6.4	955
6	Montréal et Laval	486.0	460.2	2366.0	2086.8	712.6	5483.1	594.0	1053.4	246.3	177.8	311.8	366.2	936.9	345.8	15,627
7	Outaouais	0.1	0.3	0.7	120.9	0.1	266.4	52.0					0.2	0.1	0.1	441
8	Abitibi-Témiscamingue Nord du Québec		0.3	4.7	1.7	53.5	718.6	0.0	203.3	1.3			111.1	37.4	1.1	1,133
9	Côte-Nord	1.0	0.3	102.6	207.4		345.7	0.5		48.2	0.1		0.0	0.0		706
12	Chaudières Appalaches	1.0	2.2	35.9	17.5	1.5	798.0			0.6	2.9		0.0	39.6	2.2	901
14	Lanaudière		29.3	54.8	246.4	5.3	1089.9	25.1	100.6		0.3		17.9	65.8		1,635
15	Laurentides	8.6	10.4	12.5	4.2	2.7	110.3	28.2	4.1		0.0	1.2		20.9	9.3	212
16	Montérégie	6.2	23.3	163.7	186.6	43.8	948.0	90.3	48.6	0.6	14.4	7.0	15.7	154.8	19.9	1,723
17	Centre du Québec	1.9	19.4	34.5	7.9	18.4	233.6	0.1	4.7	1.1		0.5	0.0	4.4	3.0	329
	Total	1,240	1,551	3,346	7,512	1,266	13,428	867	1,432	497	379	411	656	1,623	953	35,161

Note: A value of 0.0 signifies that the quantity is less than 50 tonnes.

Table IV-15
Goods flow matrix between main regions of Québec and access points (000's tonnes per year)

Origins #	Zone	Destinations 18	19	20	21	23	24	25	26	27	28	29	Total
1	Bas St-Laurent et Gaspésie	0.3	56.5			64.5	63.5		13.4				198
2	Saguenay - Lac-Saint-Jean	15.1	711.1			8.5	187.7	0.1	54.6	2.2			979
3	Québec	39.5	737.5			373.4	304.3	6.4	64.2	105.5			1,631
4	Mauricie	44.5	1,071.4			52.9	276.8	25.4	79.9	115.1			1,666
5	Estrie	34.2	171.3			21.9	94.2	16.7	38.7	20.5			398
6	Montréal et Laval	740.5	9,351.1			1,495.6	2,263.8	183.7	615.5	224.4			14,875
7	Outaouais	3.6	5.1		138.0	4.0	53.4	26.8	32.2				263
8	Abitibi-Témiscamingue Nord du Québec	2.0	3.1	1.3	331.8	0.7	76.2		0.7				416
9	Côte-Nord	4.7	449.9			33.3	90.1		2.0	0.0			580
12	Chaudières Appalaches	8.3	72.1			4.5	32.3		0.1	43.9			161
14	Lanaudière	28.6	184.9			2.7	52.0	12.4	6.2	170.7			458
15	Laurentides	17.2	139.6			14.6	56.4	4.1	40.0	7.6		12.5	292
16	Montérégie	21.1	1,219.4			115.9	351.6	26.8	76.9	71.0			1,883
17	Centre du Québec	29.1	175.2			31.4	34.7	4.0	9.4	35.1			319
	Total	989	14,348	1	470	2,224	3,937	307	1,034	796		13	24,117

Note: A value of 0.0 signifies that the quantity is less than 50 tonnes.

Table IV-16
Goods flow matrix between access points and main regions of Québec (000's tonnes per year)

Origins #	Zone	Destinations 1	2	3	4	5	6	7	8	9	12	14	15	16	17	Total
18	Ontario, A-417; A-40	1.6	12.9	31.3	1.2	2.3	499.1	0.0	6.9	2.7	0.3	9.2	1.1	17.2	20.9	607
19	Ontario, A-401; A-20	31.3	152.6	747.1	211.8	283.5	8,688.1	0.0	20.5	196.8	52.8	47.3	163.6	652.9	239.6	11,488
20	Northern Ontario; R-117								324.0							324
21	Ontario, Ottawa; A-5							161.7	102.6							264
23	New Brunswick; R-185	37.0	10.3	199.1	24.0	16.7	869.1	1.1	15.2	4.3	4.8	0.0	14.5	76.0	33.6	1,306
24	Lacolle; A-15	0.7	10.7	185.7	75.2	38.4	1,557.4	13.2	19.1	0.5	8.0	8.4	27.2	187.7	52.3	2,184
25	Philipsburg; R-133				27.7	0.0	423.9	0.0	7.3	0.0		6.8	1.8	82.1	0.6	550
26	Rock Island; A-55	2.1	5.2	74.2	37.9	22.3	240.4	0.6	20.0	1.6	21.2		5.8	14.6	23.5	469
27	Armstrong; R173		74.7	55.1		0.2										130
28	Woburn				8.9							0.2		4.0	5.9	19
29	Ontario, Hawkesbury												30.1			30
	Total	73	266	1,292	387	363	12,278	177	516	206	87	72	244	1,034	376	17,372

Note: A value of 0.0 signifies that the quantity is less than 50 tonnes.

Table IV-17
Volume of goods forwarded on major arteries of the highway system

Autoroute or route	From	To	M tonnes per year	Traffic trucks/day
5	Int. with A-50 (Exit 2 on A-5)	End of Bridge MacDonald-Cartier à Ottawa	0.4	55
10	Sherbrooke (Exit 143 on A-10)	Magog (Exit 115 on A-10)	2.6	351
10	Magog (Exit 115 on A-10)	Chambly (Exit 22 on A-10)	3.2	445
10	Chambly (Exit 22 on A-10)	Jct. with A-30 (Exit 11 on A-10)	3.5	475
15	Sainte-Agathe (Exit 86 on A-15)	Saint-Jérôme (Exit 39 on A-15)	3.4	470
15	Saint-Jérôme (Exit 39 on A-15)	Jct. with A-640 (Exit 20 on A-15)	4.8	653
15	Jct. with A-30 (Exit 42 on A-15)	I-87 (U.S.)	11.0	1,507
20	Rivière-du-Loup (Exit 499 on A-20)	Québec (Exit 312 on A-20)	8.3	1,136
20	Québec (Exit 312 on A-20)	Drummondville (Exit 173 on A-20)	13.8	1,885
20	Drummondville (Exit 173 on A-20)	Int. with A-30 (Exit 98 on A-20)	13.7	1,880
20	Jct. with A-540 (Exit 29 on A-20)	A-401 (Ont.)	29.2	3,998
35	Chambly (Exit 22 on A-10)	St-Jean-sur-Richelieu (Jct. with Route 133)	0.9	116
40	Québec (Exit 305 on A-40)	Trois-Rivières (Exit 197 on A-40)	7.2	986
40	Trois-Rivières (Exit 184 on A-55)	Exit 122 a-40 (Jct. 31)	10.9	1,487
40	Exit 122 a-40 (Jct. 31)	Jct. with A-640 (Exit 96 on A-40)	12.3	1,690
40	Jct. with A-540 (Exit 32 on A-40)	A-417 (Ont.)	1.7	236
50	Hull (Exit 2 on A-5)	Gatineau (Exit 139)	1.3	183
50	Mirabel	A-15 (Exit 35 on A-15)	1.3	183
50	Chatam	Lachute	1.3	183
55	Drummondville (Exit 173 on A-20)	Sherbrooke (Exit 143 on A-10)	0.8	105
55	Magog (Exit 121 on A-10)	I-91 (U.S.)	1.6	219
55	Jct. A55/Route155 (between T-R & A-20)	A-40 (Exit 182 on A-55)	0.2	30
73	Québec (Exit 312 on A-20)	Saint-Joseph-de-Beauce (Exit 72)	2.3	321
73	Québec (Exit 313 on A-40)	Jct. 73/175	3.7	504
73	Jct. with A-540 (Exit 9 on A-540)	Jct. with A-20 (Exit 312 on A-20)	12.3	1,688
105	Route 117 to Grand Remous	End of Autoroute A-5	0.4	60
117	Sainte-Agathe (Int. 86 on A-15)	Saint-Jovite (Int. with montée Ryan)	2.3	319
117	Saint-Jovite (Int. with montée Ryan)	Labelle	2.3	319
117	Labelle	Mont-Laurier (Int. with Route 309)	2.3	319
117	Mont-Laurier (Int. with Route 309)	Rouyn-Noranda (Int. with Route 101)	2.8	379
117	Rouyn-Noranda (Int. with Route 101)	Route 66 (Ont.)	0.3	45
132	Rivière-du-Loup (Exit 499 on A-20)	Rimouski (Jct. with Route 232)	1.8	252
133	St-Jean-sur-Richelieu (Jct. with A-35)	I-89 (U.S.)	0.9	117
138	Sept-Iles	Baie-Comeau (Jct. with Route 389)	1.9	254
138	Baie-Comeau (Jct. with Route 389)	Québec (Exit 323 on A-40)	1.9	254
148	Masson (Jct. with Route 309)	Lachute (Jct. with Route 327)	1.3	184
155	Jct. A55/Route155 (between T-R & A-20)	A-20	0.2	33
173	Saint-Joseph-de-Beauce (Jct. Route 276)	Route 201 (U.S.)	0.9	124
175	Jct. 73/175	Chicoutimi (Exit 47 on Route 170)	3.7	504
185	Rivière-du-Loup (Interchange with A-20)	Route 2 (N.B.)	6.6	904

Figure IV-9
Annual flow of goods on the highway network under study

Figure IV-10
Average daily truck traffic on the highway network under study

G. Connections with other modes

1. Highway/port linkages

a) Port of Montréal highway access system

Port facilities on the Island of Montréal

The Port of Montréal provides the primary link with the intermodal container transport system for international and intercontinental markets. Rail and highway infrastructure serving Canada and the American Midwest are the extension of this system on the North American continent.

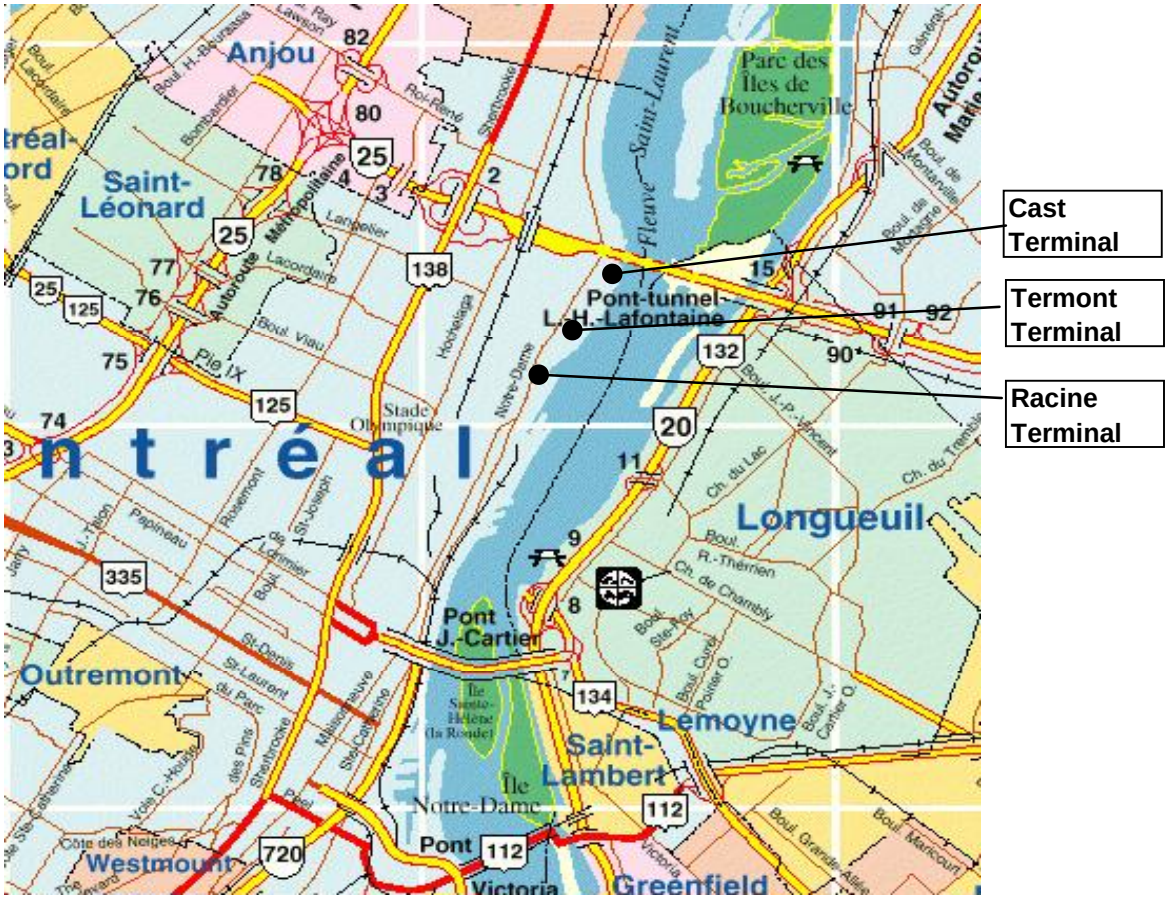
Five major terminals handle containers in the Port, the major ones being Cast, Racine and Termont. The Port also contains facilities for handling non-containerized general commodities (some forty berths), as well as petroleum products (approximately fifteen berths). The Port of Montréal is both the origin and the destination of a large volume of goods hauled on Québec highways.

The port's main installations and highway access system are identified in Figure IV-11. Some fifteen roads provide access to port facilities located on the island as follows:

- eight roads provide access to the offices of the Montréal Port Authority, the Bickerdike Terminal and various mooring berths where non-containerized and bulk dry cargo are handled at facilities located in the western part of the Port;
- two roads provide access to the main container terminals; and
- six roads provide access to liquid bulk handling facilities located in the eastern part of the Island of Montréal.

Practically all of the above access roads are directly linked to Notre Dame Street, which is the preferred route to and from the Port for vehicles traveling to or from arterial highways of the upper tier system.

Figure IV-11
Port of Montréal facilities and access roads



Source: Le Québec à dos de souris

In June 1997, the Service des inventaires et du plan of the Direction territoriale de l'Île-de-Montréal (MTQ) surveyed truckers en route to the three most heavily used terminals—Racine, Cast and Termont—where over 900,000 containers (twenty-foot equivalent units or TEU's) are transshipped every year. The survey produced the following principal results:

- the majority of vehicles are registered in Québec (82%) and comprise two units (85%);
- trucks originating principally from the Montréal administrative region (Montréal: 47%; Montérégie: 18%). Trips also originate in

other regions such as Ontario and the United States. The same breakdown may be observed respecting truck destinations;

- the distribution of incoming traffic by route for 75% of the truck trips is as follows:
  - Autoroute 40 and Autoroute 25 South to Boucherville Street entrance (26%);
  - Autoroute Ville-Marie and Notre Dame Street to Bossuet Street entrance (22%);
  - Louis-Hippolyte Lafontaine Bridge-Tunnel to Boucherville Street entrance (14%); and
  - Autoroute Ville-Marie and Notre Dame Street to Boucherville Street entrance(13%);
- the distribution of outgoing traffic by route for 73% of the truck trips is as follows:
  - Bossuet Street exit and Notre Dame Street/Autoroute Ville-Marie (27%);
  - Curateur Street exit and Notre Dame Street/Autoroute Ville-Marie (14%);
  - Curateur Street exit and Autoroute 25 North/Autoroute 40 West (11%);
  - Boucherville Street exit and Autoroute 25/Autoroute 40 West (7%);
  - Curateur Street exit and Des Futailles Street/Louis-Hippolyte Lafontaine Bridge-Tunnel (7%); and
  - Bossuet Street exit and Des Futailles Street/Louis-Hippolyte Lafontaine Bridge-Tunnel (6%).

It is noteworthy that only two access routes (access and egress) lead to the container terminals from Notre Dame Street, namely, Bossuet and Boucherville streets, Curateur Street being of use only to trucks exiting the Cast terminal.

Over 40% of the containers handled at the Port of Montréal are hauled in or out by truck; the remainder are transported by rail principally to the American Midwest. Given annual traffic levels of 900,000 TEU's, the above percentage represents an overall peak period rate in the order of 200 to 300 trucks per hour entering and exiting the Port by the access routes mentioned above. The peak period does not generally coincide with peak travel times on the adjacent highway system. Moreover, in its current configuration Notre Dame Street can easily accommodate over 1,500 vehicles per hour in either direction. It is heavily traveled, therefore, by trucks exiting the port, either over long distances in the direction of the Ville Marie Tunnel or over short distances to Curateur or Des Futailles Street as a means of access to Autoroute 25 North or South. Other than in peak periods, however, this access can accommodate demand generated by the Port of Montréal. Survey results also indicate that trucks doing business in the Port make little use of city roads as alternative routes to and from expressways.

As a matter of note, the Québec Trucking Association indicated that traffic density on Notre Dame as well as the narrowness of port access routes inhibit the effective transport of goods. It was added that, due to the characteristics of port operations, queuing of trucks as far back as Notre Dame Street was quite frequent.

South shore port facilities

The Port of Montréal also operates two berths at Contrecoeur and has significant landholdings that could be developed should the need rise. Canadian National provides rail service to this location. As well, Route 132 provides access to the Contrecoeur Maritime Terminal. It may also be reached via Autoroute 30 which connects to a local arterial road (Montée Lapierre) leading to Route 132.

b) Highway system access to the Port of Québec

Description of system

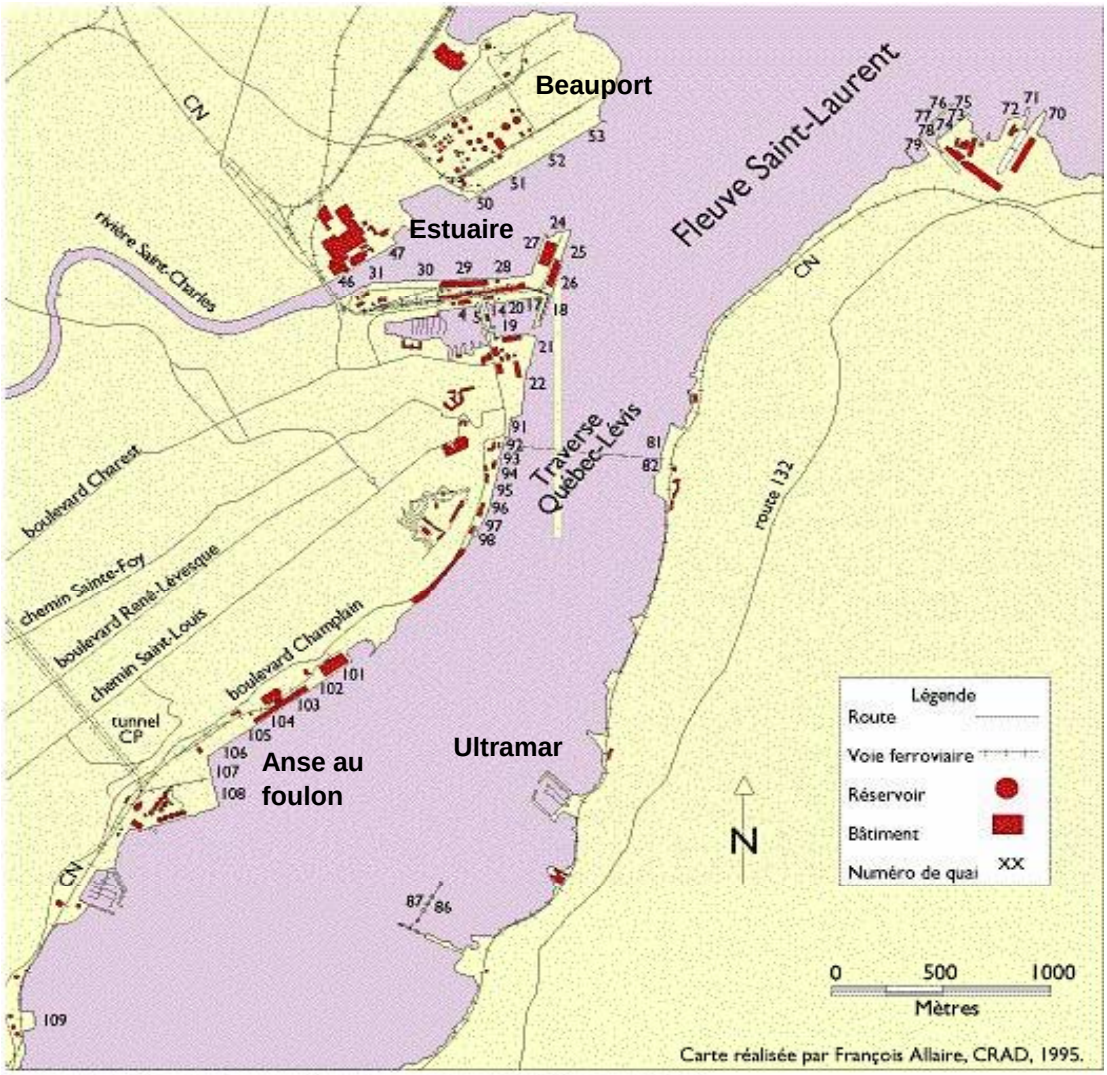
The Port of Québec is the primary multimodal node of the Québec City area with transshipping operations involving various bulk commodities. It is supported by a graded, functional highway system managed both by the MTQ and municipalities adjacent to the port area. Figure IV-12 shows the layout of major port facilities and identifies the main access roads.

Access to the various freight handling areas of the Port of Québec is provided by the following routes:

- Estuaire and Beauport areas:
  - west by Autoroute de la Rive-Nord (40), Autoroute Charest (440) and Autouroute de la Capitale, followed by Henri Bourassa Boulevard:
  - east on St. Anne Boulevard and Autoroute Dufferin-Montmorency;
  - north and south on Autoroute Laurentienne and Autoroute Henri-IV, thence on the Pierre Laporte Bridge;
- Anse-au-Foulon and Irving wharf area:
  - Autoroute Henri-IV and Pierre Laporte Bridge, via Champlain Boulevard;
- South shore facilities (Saint-Romuald):
  - access by Autoroute Jean Lesage (20) and Autoroute Robert Cliche (73).

Heavy vehicle traffic continues to be allowed in the immediate vicinity of the three north shore port areas. Several of the intersections leading to the wharves of the Québec Port Authority are equipped with traffic lights and many provide approaches from three directions. At Beauport, Henri Bourassa Boulevard extends directly into the port area to the waterside.

Figure IV-12
Port of Québec facilities and access routes



Sources: Carte topographique numérique du gouvernement du Québec au 1:20 000.
Société du port de Québec, Guide du port de Québec, 1992.

The Estuaire sector, bisected by the Louise Basin, has three access routes. The four access roads to the Anse-au-Foulon area intersect with Champlain Boulevard. The Irving and Ultramar oil companies have their own docks with direct access to the public road system.

Certain restrictions apply to truck traffic in the vicinity of port facilities in the Limoilou-Sud neighbourhood. Trucks are prohibited on all east-west axes and, as a result, travel is restricted between Autoroute Laurentienne and Des Capucins Boulevard, making access difficult to the Estuaire. In addition, an east-west axis, Prince Édouard Street, is closed to trucks, and the only remaining link between Autoroute Laurentienne and the Estuaire area is Charest Boulevard.

On the south shore, Des Îles Road is closed to trucks. This restriction does not apply to vehicles belonging to Ultramar but rather to through traffic.

Traffic description

According to the Plan de transport de l'agglomération de Québec, truck traffic in the Beauport area averaged 25,800 vehicles per year between 1991 and 1994, broken down to 7,400 incoming and 18,600 outgoing. Over 90% of trucks entering Beauport carried recycled metal for the export market, while exiting vehicles carried coal, gas and fuel oil.

Truck movements in the Estuaire area averaged 4,850 incoming vehicles and 10,115 outgoing vehicles between 1991 and 1994. Trucks traveling out of the area generally hauled grain and salt for the local market. Those traveling into the area were mostly carrying dry bulk cargo (forest products and concrete). Estuaire differs from the three other port areas in that several traffic generators are located close by, namely Daishowa, Canada Post Corporation, the intermodal train station, the Musée de la civilisation and cruise ship companies. These generators contribute to the deterioration of the service level on the Cap Diamant belt road.

In the vicinity of Anse-aux-Foulons, over half of all loaded truck trips were made by vehicles carrying salt, for a total of nearly 14,000 trips per year (1994), for the most part in the Fall and Winter. Grain and fertilizer account for an average of 10,000 truck exit trips per year and are thus the second most important commodities at this site.

Private docks located on the south shore generate over 3,000 incoming and outgoing trips per week.

In total, 5.7 million tonnes of goods were handled by the Port of Québec, 84% (4.8 million) having been brought in or carried out by truck, the rest by rail. According to the Québec Trucking Association, nothing currently prevents trucks from providing effective service to the Port of Québec.

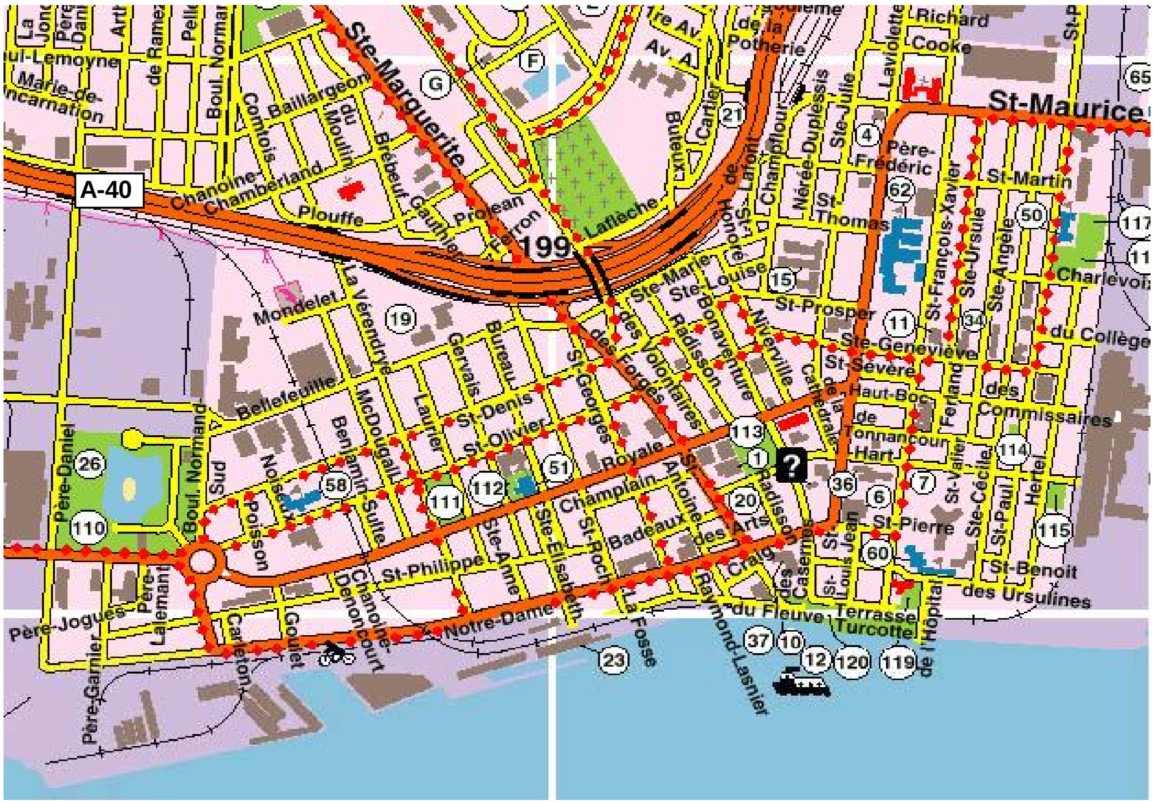
c) Port of Trois-Rivières

Located on the north shore of the St. Lawrence River, midway between Montréal and Québec City, the Port of Trois-Rivières specializes in the warehousing and the transshipment of forest products and general commodities related to local industrial activity. Main commodities are newsprint and aluminum.

Along with Montréal and Québec, the Port of Trois-Rivières is part of the national port system. Its facilities include over 20 piers and numerous warehouses. They also include a grain elevator. Some 2 million tonnes of goods are handled every year at Trois-Rivières, of which approximately 1 million tonnes (44%) are shipped by truck. Figure IV-13 shows port facilities as well as its highway access system. Incoming and outgoing traffic travels either along Notre Dame Street or Des Ursulines Street.

It should be noted that Port of Trois-Rivières officials pointed out that certain sections of Notre Dame should be widened to provide easier access. However, traffic generated is relatively light and requires no additional capacity.

Figure IV-13
Port of Trois-Rivières facilities and access routes



Source: *Le Québec à dos de souris*

2. Highway/airport linkages

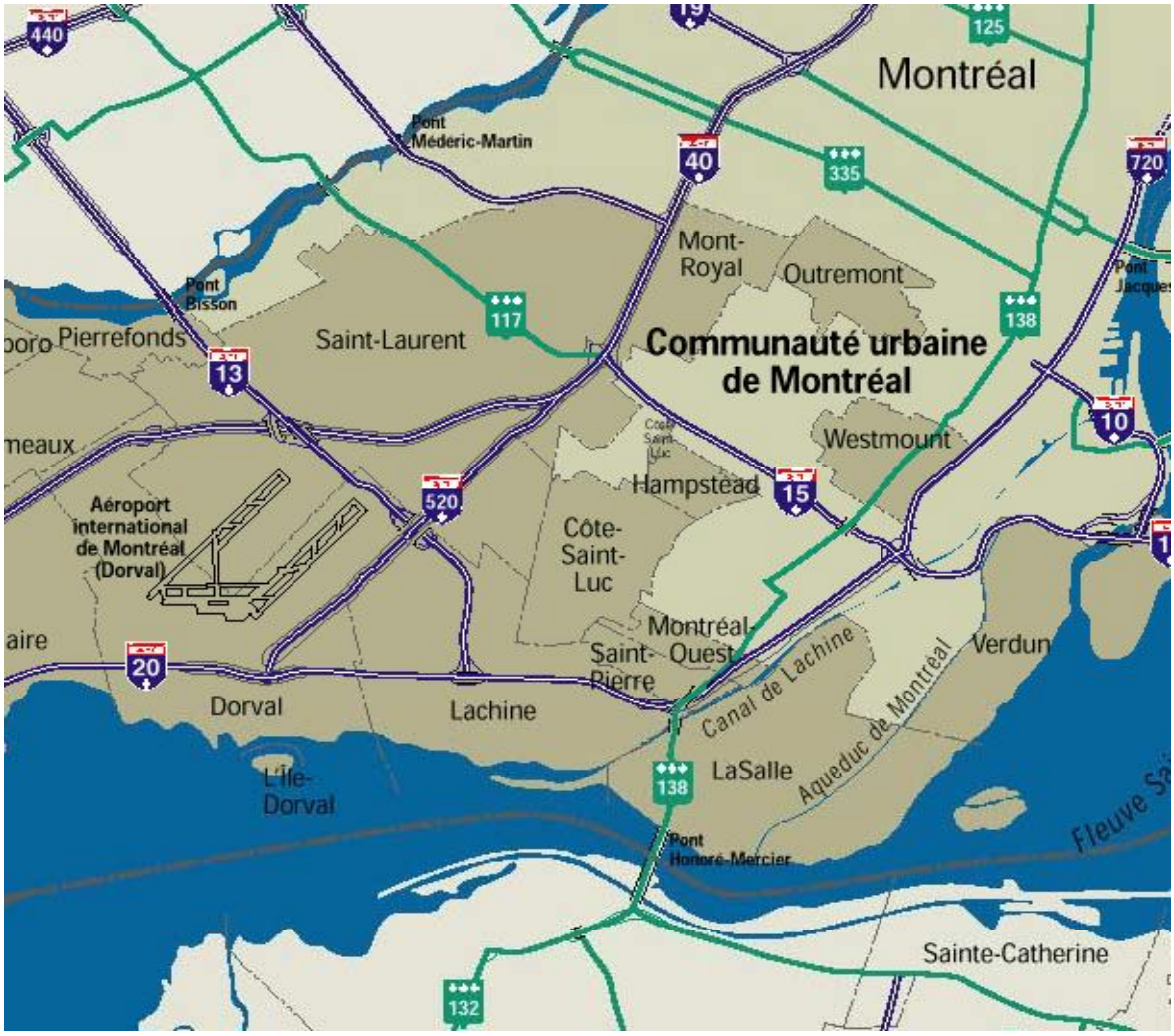
a) Montréal–Dorval International Airport

Dorval Airport is located 20 km west of downtown Montréal, between autoroutes 13 and 20, north of Autoroute 520. Figure IV-14 shows the airport's location and identifies the main access routes of the highway system.

In 1997, prior to the transfer to Dorval of all regular flights, slightly less than 60,000 tonnes of merchandise were on-loaded/off-loaded at the airport. This represents a relatively light level of hourly truck traffic. That being said, vehicles traveling to and from Dorval International Airport must contend with a chronically congested road network. Travel time may even double at peak periods if accidents occur or weather conditions are bad. Alternative routes are

available, however, at the Côte-de-Liesse/Dorval and Côte-de-Liesse/ Autoroute Métropolitaine interchanges.

Figure IV-14
Montréal–Dorval International Airport facilities and access routes



Source: *Dimension DPR Inc. (1998). Carte « Montréal régional », préparée pour le Service des Travaux publics, section de la géomatique.*

The Côte-de-Liesse/Dorval interchange links Dorval Airport, Autoroute 20, Autoroute 520 and the city of Dorval. It includes numerous interweaving road sections, tight turns and traffic lights. Level of service is a problem in this location and traffic light management must be improved and road design must be upgraded in keeping with the various uses of the infrastructure.

The MTQ is in the process of finalizing the conceptual design and developing a project brief. The related environmental impact study is also under way. The development scenario will provide the following benefits:

- segregating local and transit traffic;
- a high level of service;
- maintaining the traffic circle for local traffic;
- direct airport access and egress at A-20 and A-520;
- eliminating interweaving lanes;
- minimal property acquisition.

However, construction work cannot be phased and will encroach on part of lands of the Montréal Airports located along the airport access route. An elevated lane is also planned above the railway lines.

The Côte-de-Liesse/Autoroute Métropolitaine interchange also hinders effective airport access. The MTQ intends to implement changes which will eliminate delays caused by traffic lights and also improve travel time, especially for traffic traveling west. Easterly movement depends on traffic congestion at the Autoroute Décarie/Autoroute Métropolitaine interchange. The development design concept is now being prepared.

The Québec Trucking Association Inc. pointed out the problem caused by the Dorval interchange, now operating at full capacity, as well as congestion on Autoroute 20 West, causing traffic jams at Saint-Pierre as well as at the Autoroute 13 intersection. These comments relate to the general congestion of the highway system and are not intended to single out problems related to airport access, which is unrestricted outside of peak hours.

b) Montréal–Mirabel International Airport

Mirabel Airport operates 24 hours a day. Located 60 km north of downtown Montréal, it is accessed via Autoroute 15 from the south and Autoroute 50 from the west. It is worthy of note that the original airport access design provided for extension of Autoroute 13 to the terminal buildings via a tunnel under the runways. This extremely costly undertaking was never carried out. For the time being, Autoroute 13 ends at Autoroute 640, which connects to Autoroute 15 slightly further to the east. Highway system access to Mirabel Airport facilities is shown in figure IV-15.

One of the thrusts suggested by Montréal Airports to revitalize Mirabel Airport is to concentrate cargo traffic in this location. In 1997, 150,000 metric tonnes of airfreight were transshipped at Mirabel Airport. Assuming 240 business days per year, this figure represents average daily traffic of 625 tonnes, which in turn translates into truck traffic roughly equivalent to 20 to 30 loads per day.

It goes without saying that trucks now travel quite freely in the vicinity of Mirabel Airport. However, truckers traveling to or from the Montréal Metropolitan area in peak periods can expect lengthy delays.

3. Highway/rail links

a) Canadian National intermodal terminal

Montréal is well located in the Canadian National rail system. This is due to the concentration of CN conventional intermodal activities in Brampton, Ontario, and at the Monterm terminal in Montréal.

The Monterm intermodal terminal handles containers for the domestic and import/export markets. Containers traveling to and from the Port of Montréal are not transferred at Monterm but rather at the port facilities proper.

The Monterm terminal is located in west-central Montréal, near the Autoroute 20 and Autoroute 15 interchange. Proximity to major arterial highways provides for ease of truck traffic to and from all parts of the metropolitan area. There is a direct link to the terminal from Pullman Street via a road system leading to six access points.

Figure IV-15
Montréal–Mirabel International Airport facilities and access routes

Source: *Dimension DPR Inc. (1998). Carte « Montréal régional », préparée pour le Service des Travaux publics, section de la géomatique.*

Traffic levels to and from the terminal average 500 trucks per day with peak levels of 700. The terminal has six loading lanes and employs 200 workers.

Trucks appear to travel freely in the vicinity of the terminal other than on Autoroute 20 during morning and evening rush hours.

b) St. Lawrence & Hudson Railway

The Lachine intermodal terminal of the St. Lawrence & Hudson Railway is located near Dorval Airport. Land surrounding the facilities is completely developed and no space is available for expansion. Service to the Montréal–Toronto market generates a daily traffic level of approximately 500 trucks

traveling to and from the terminal. On average, each truck spends 30 minutes at the terminal site. There do not appear to be access or congestion problems at these facilities.

Trucks access the terminal via Forty-third Avenue in Lachine. There are six services lanes in all, two for the domestic market and four for the import/export market. The latter market accounts for 50% of total operations. As is the case with Monterm, the Lachine terminal handles no containers from the Port of Montréal. The terminal employs over 170 workers.

H. Highway carrier perspective

1. Sources of information

The viewpoint of highway carriers is partly derived from responses to a questionnaire administered to the Québec Trucking Association (QTA) for the purposes of this study. The questionnaire was designed to record highway carriers' opinions on the highway system (traffic conditions, system fragmentation, physical characteristics, signage, etc.), existing regulations, current truck operating conditions and other factors that could potentially hinder the effective transport of goods over Québec highways.

Furthermore, the QTA has confirmed that it maintains the viewpoints expressed in the brief on freight transport in the Montréal area filed with the Table métropolitaine des transports in January 1996. Both sources of information were analyzed with a view to identifying factors that carriers consider impediments to freight transport.

2. Traffic congestion in the metropolitan area

According to the QTA, Montréal area infrastructures are operating at capacity levels and congestion has become an ongoing issue. The existing system cannot accommodate forecasted growth in traffic levels in the years to come. For this reason, traffic conditions are gradually deteriorating in the metropolitan area, entailing heaving costs to the community and the local economy, especially the trucking industry. In 1996, the QTA estimated that incremental costs caused by traffic congestion totaled some $1 billion per year. The problem is exacerbated by the availability of a single continuous east-west arterial highway in the Montréal area, namely Autoroute Métropolitaine—and the fact that traffic traveling between regions east of Montréal and western parts of the Province and the country is required to cross the Island of Montréal.

Carriers estimate that every operator is delayed approximately 45 minutes per day (in 1996) by traffic problems in the Montréal area. This is a source of additional expenditure borne initially by transport companies then passed on to clients in the form of higher transport costs. In an era when total quality and just-in-time are the watchwords, traffic congestion is blunting the competitive edge of trucking companies and firms in general.

The QTA has suggested several solutions to the problem, including changes to traffic scheduling. However, progressively longer peak periods are constraining carriers' ability to take action in this regard.

3. Beltways for transit traffic

The QTA also believes that, while carriers make use of alternative routes at their disposal, MTQ survey results indicate they are inefficient and of limited benefit. The aforementioned survey results also describe delays caused by tie-ups on Autoroute Métropolitaine and estimate that detours taken to avoid snarls increase travel time by an average of 84%.

The QTA states that carriers especially appreciate the option provided to use Autoroute 30 as an emergency bypass when traffic slows down as truckers approach one of the south shore bridges. The Association therefore deems it important that Autoroute 30 be completed between Candiac and Valleyfield in order to meet up with Autoroute 20 in the direction of Ontario and numerous points in the U.S. Transit traffic on Autoroute Métropolitaine is estimated at 15% of overall registered truck traffic.

The QTA also raised the issue of gaps in other axes, such as autoroutes 720, 25 and 13, that force truckers to travel secondary roads whose layout and surroundings are not always well suited to heavy traffic.

The fact that no second continuous east-west highway is available on the Island of Montréal is a problem for truckers. The extension of Autoroute Ville-Marie (Autoroute 720) to the Louis-Hippolyte Lafontaine Bridge-Tunnel would disentangle traffic on Autoroute Métropolitaine. This solution would also reduce heavy truck traffic on Notre Dame Street.

4. Highway alignment

On a more detailed level, the QTA raised the need to review the alignment of certain components of the expressway system (left-hand exits at the Décarie and Turcot interchanges, interweaving of entry and exit lanes on Autoroute Métropolitaine), access to company property (on-loading and off-loading docks) and access to the Port of Montréal.

The association also mentioned expressway ramps and interchanges in the Québec City area, which members find to be to narrow and hazardous. As well, Autoroute 55 between Drummondville and Sherbrooke would appear to be very hazardous over stretches where separate road surfaces are unavailable.

5. Regulations

Regulations currently in force also impede freight transport. Regarding regulations on load and cargo dimension standards applicable to highway vehicles, the QTA recognizes a need to harmonize load standards among Canadian provinces. Effective compliance enforcement is also essential.

Regulations regarding maximum load per axle and maximum allowable combined weight are generally more restrictive in Québec than in Ontario, especially as applied to a seven-axle configuration, maximum authorized loads being greater in the latter province than in most others.

In Canada, truckload and cargo dimension restrictions are under the sole jurisdiction of the ten provinces and two territories. Variations among existing regulations hamper the effective transport of freight.

A first set of national standards governing weights and dimensions of heavy vehicles was established in 1988 by a Memorandum of Understanding ratified by the Council of Ministers Responsible for Transportation and Highway Safety.

The Memorandum was amended initially in 1991 and again in 1994. It sets minimal requirements to be applied to all heavy vehicles traveling on Canadian roads. Individual provinces are free to set higher load restrictions.

In 1993, the six eastern Canadian provinces concurrently established the Eastern Provinces Working Group on Vehicle Weights and Dimensions. The draft agreement put forth in the fall of 1995, including an option providing for a bilateral Québec-Ontario agreement on the use of a four-axle semitrailer, remains in limbo due to Ontario's refusal to reduce authorized loads on its highway system. In 1997, the Ontario Ministry of Transport published the results of a study showing that Ontario would have to bear additional costs of $172 million per year if it agreed to the draft accord proposed by the eastern Canadian provinces. Québec itself has undertaken a study of restrictions on load limits during spring thaw.

Finally, pending agreement by all Canadian provinces, Québec also amended its regulations in 1998 to better protect its road system and further reconcile its regulatory framework with those of neighbouring provinces. Table IV-14 sets out maximum loads authorized in Québec, as well as those in effect in adjacent provinces and states.

Maximum trailer length authorized in Canada was increased from 45 feet (1970s) to 48 feet (1980s) and again to 53 feet in the 1990s. Maximum authorized length is now set at 57 feet in over fifteen American states.

Table IV-18
Comparison of 1998 load limitations between Québec and other jurisdictions*

Common Configurations[1]	USA[2] kg	New York[3] kg	Michigan kg	Maine kg	Ontario kg	Québec kg	Maritimes kg	Interprovincial Agreement[4] kg
Tracter semi-trailer 5 axles	36,000	46,000	36,000	40,500	41,500	41,500	41,500	39,500
Tracter semi-trailer 6 axles (6'-6')	36,000	48,500	37,500	45,000	48,000	49,500	49,500	46,500
Tracter semi-trailer 6 axles (10'-6')	36,000	48,500	40,000	45,000	52,500	49,500	49,500	[6]
Tracter semi-trailer 7 axles (8'-6'-6')	[5]	48,500	53,500[7]	[6]	61,000[7]	55,500	Under study	[6]
A-Train	36,000	48,500	61,000[7]	[5]	61,000	53,500	53,500	53,500
B-Train	[5]	[6]	61,000[7]	[5]	62,500, or 63,500	62,500[8]	62,500	62,500

[1] Loads are for the most commonly used axle spreads in the highway network. Values are rounded to the nearest 500 kg.

[2] Maximum load on the U.S. national system (essentially the interstates). However certain states can authorize higher load limits.

[3] Regulatory limit is 36,000 kg. Higher limits are authorized by permit.

[4] Minimum load limits permitted by the Interprovincial Agreement. The Agreement is under review.

[5] Generally not used considering the 36,000 kg limit.

[6] Configuration not recognized.

[7] Particular axle spread.

[8] By special permit outside of the autoroutes and Highway 185.

[*] Source: Ministère des Transports du Québec: "Étude d'impact des nouvelles normes de charges et dimensions de 1998 sur le camionnage lourd au Québec," December 1998, page 20.

Current regulations governing hours of service are overly restrictive and do not allow for effective management of operator fatigue. Authorized hours of service should be reviewed across North America.

While freight transport standards (mechanical and others) have grown in number, compliance enforcement has not increased accordingly. The QTA believes that highway control increasingly emphasizes mechanical systems (the cause of 14% of accidents involving heavy vehicles) at the expense of "human and behavioural" factors (the cause of 86% of accidents). Greatly increased human and financial resources should be devoted to the latter. Among other issues, enforcement of heavy vehicle speed limits must receive increased attention.

According to the QTA, the behaviour of American and Ontario highway control authorities is highly protectionist. Results of a study conducted by The Research and Traffic Group included the identification of restrictions imposed by the U.S. government on cabotage by Canadian companies on U.S. soil. Abolishing such restrictions would provide the trucking industry with an advantage over the rail industry and would afford it a strong competitive edge in the Québec-Ontario corridor.

On a final note, the QTA expressed the belief that the MTQ must enforce compliance with Bill 430 and, to this end, take quick action to penalize lawbreakers.

6. Operating costs

The QTA is of the opinion that Canadian trucking companies have higher costs than their American counterparts and are therefore at a definite disadvantage in the international market. A 1991 study also showed that costs borne by carriers were greater in Québec than they were in other areas of Canada. The Association suggests that Québec companies register with the International Registration Plan and that vehicle registration costs in Québec be lowered.

7. Other items raised by the QTA

In its 1996 brief, the QTA mentions other measures aimed at improving freight transport:

- partnerships with others carriers in order to reduce the number of vehicles;
- situating the transport base in a strategic location providing quick and effective access to the upper tier highway system;
- use of Intelligent Transport Systems, especially real time locating systems;

- promotion of a dedicated trucking system supporting more effective highway control operations and directing heavy vehicles to heavy-duty highways;

- use of longer combination vehicles (to reduce the number of vehicle movements over the road system).

The QTA also mentions the unfair situation of carriers who comply with standards and regulations compared to habitual lawbreakers and emphasizes the need to increase driver awareness of the importance of sharing the road with trucks (safe cohabitation).

I. Concerns, observations and conclusions

1. Transport community concerns

Daily concerns aside, views aired by the transport community and action taken by stakeholders show that general concerns surrounding the Québec highway system are not significantly different from those expressed in most other provinces and states. Main areas of concern involve underfunding of the highway system generally and relate, in the first instance, to system conservation, and in the second, to system development. These concerns may be summarized as follows:

- **Major funding requirements.** After two decades of rapid development in the 1960s and 1970s, little additional development occurred over the next 20 years. Considerable investments are required to meet current and future transportation needs. Given the fiscal problems faced by all levels of government and the zero-deficit target that each is pursuing, it will no doubt be several decades before required rehabilitation and construction projects are carried out.

- **Identifying sources of funding.** Capital investments in Québec highway system preservation and development must be substantially increased. Consideration should be given to setting up a special fund for this purpose. Finally, several governments have turned to the private sector to obtain new funding and to continue developing their expressway infrastructures.

- **Significance of the highway system.** It must be recognized that, if we are to remain competitive, a reliable, safe and effective highway system must be available. According to several sources, Québec's highway system is the weak link in the province's transportation chain. Trucking will play an increasingly important role in view of the gradual opening up of North American trade and the importance of door-to-door and just-in-time

delivery. Nonetheless, trucks are primarily responsible for highway system deterioration. We must, therefore, take the necessary steps, through investment, to maintain the existing system and to develop it in order to meet current and future needs.

2. Observations

Study results to date permit the formulation of certain observations concerning highway freight transport in Québec:

- with few exceptions, truck traffic is concentrated for the most part on the major axes of the upper tier highway system;
- this highway system is generally well developed outside the Montréal Metropolitan area. However, some heavily traveled highways, such as the 117 in Abitibi, the 138 in the Côte-Nord and the 155 in the Haute-Mauricie, do not meet the requirements of truck transportation along their entire lengths;
- in the Montréal area, the highway system is incomplete and the Island of Montréal cannot be bypassed when traveling either east to west or west to east;
- the Ministère des Transports du Québec has jurisdiction over about one quarter of the 120,000 km of roads within the province, the remaining roads being for the most part under municipal jurisdiction;
- the share of roads under federal jurisdiction is very small, though it includes the Jacques Cartier and Champlain bridges, two critical links in the highway system;
- highway infrastructure alignment generally complies with standards in effect in Québec (that are largely harmonized with standards of neighbouring jurisdictions) and does not affect truck traffic;
- alignment planning deficiencies are to be found for the most part in older components of the highway system, on Autoroute Métropolitaine in Montréal, for example;
- concrete steps are being taken to ensure that Québec regulations and those of adjacent jurisdiction are consistent;
- despite industry perceptions, access to the Port of Montréal remains adequate (not taking into account problems with general system

congestion affecting the entire region and not only the port area) and problems encountered are more of an operational nature;

- traffic generated by the ports of Québec and Trois-Rivières is light and no capacity problems have been identified with respect to infrastructure access in these locations;

- Montréal rail/highway intermodal terminals are also well served and are not subject to particular problems other than the effects of highway system tie-ups in the Montréal area;

- Dorval and Mirabel airports generate low freight traffic levels and are easily accessible by truck outside of peak hours;

- analysis of highway system freight flow confirms the prominent role of the Autoroute 20 corridor as a major axis used for highway freight transport;

- the concentration of traffic to and from Montréal as well as in transit through the area merely highlights the magnitude of problems caused by the regional highway system deficiencies.

3. Conclusion

The incomplete state of the Montréal area highway system is undoubtedly viewed as the paramount problem by the Québec transportation industry. Other concerns do not differ markedly from those found in other regions.

Other regions, interprovincial crossings, border crossings, ports, airports and intermodal terminals are well served.

V
Railway System Characteristics

This chapter describes the physical and operational characteristics of the Québec railway system.

A. Québec railway system

A few years ago, there were only two major rail carriers in Québec, Canadian National (CN) and Canadian Pacific (CP). However, after extensive rationalization, they have been joined by several new carriers operating short line railways, as shown in Figure V-I. Short line railways are local or regional carriers that operate secondary lines.

1. General system description

With respect to the major railway companies, CN (and its independent division, Northern Québec Internal Short Line Railway) operates 50% of the rail system and remains the principal carrier. The St. Lawrence & Hudson Railway (SL&H), a CP system subsidiary created in 1996 when the company restructured, operates in eastern North America and runs 260 km of track in Québec, representing 4% of the system. Overall, short line railways now operate over 28% of the system.

In addition to CN, the SL&H and the new short line railways, rail carriers operating on the Québec North Shore that are subsidiaries of mining companies, as well as the Roberval & Saguenay Railway Company, a subsidiary of Alcan in the Saguenay–Lac-St-Jean region, are rail carriers that play an important role in Québec's rail transport industry. They handle the products of their respective parent companies either exclusively or on a priority basis.

Figure V-1
Québec railways

The Cogema train ferry[1] links the St. Lawrence north and south shores between Baie-Comeau and Matane. From there, the Canada & Gulf Terminal Railway Company[1] line joins up with CN's continental system at Mont-Joli.

Three other companies provide rail transport service in Québec. They are the Nipissing Central Railway, providing service over the Québec sections of the line owned by the Ontario Northland Railway, a provincial corporation located in northeastern Ontario whose service extends to Rouyn-Noranda; CSX Inc., an American company operating a rail line between Montréal and the U.S. border; and the Montréal Port Authority.

The Québec railway system covers 6,059 km of line, broken down as presented in Table V-1.

Table V-1
Québec railway system*

		Length of rail line (km)
Canadian National		
Main system	1,287	
Northern Québec Internal Short Line	1,756	3,043
St. Lawrence & Hudson		260
CSX		89
Nipissing Central Railway		40
Port of Montréal		15
Short line railways (see Table V-2)		1,799*
Private railways (see Table V-3)		813
Total		**6,059**

**At December 31, 1998. The most recent short line railways that have been created, are excluded.*

Table V-2 lists the short line railways doing business in the Province as at December 31, 1998. It should be noted that other short line railways were established in 1999, for example, the purchase by the Québec Railway Corporation of the CN line linking Matane and Rivière-du-Loup (190 km).

1 Purchased by the Québec Railway Corporation in 1999 and now an integral part of the Chemin de fer de la Matapédia et du Golfe.

Table V-2
Short line railways operating in Québec**

Chemin de fer de Charlevoix (CFC)	Limoilou–Clermont	–	145 km
Chemin de fer Baie-des-Chaleurs (CFBC)**	Matapédia–Chandler	–	235 km
Corporation du Chemin de fer de la Gaspésie (CCFG)	Chandler–Gaspé	–	90 km
Chemin de fer de la Vallée de la Matapédia (CFVM)*	Mont-Joli–Matapédia	–	151 km
Chemin de fer Lanaudière (CFL)	Joliette–Saint-Félix de Valois	–	15 km
Canadian American Railroad (CDAC)*	Sherbrooke–Mégantic–Frontière	–	130 km
St. Lawrence & Atlantic Railroad Company (SLR)	Sainte-Rosalie–Stanhope	–	152 km
Québec Southern Railway (QSR)	Région de l'Estrie	–	253 km
Québec Gatineau Railway Inc. (QGRY)	Rive Nord du Saint-Laurent	–	502 km
Ottawa Valley Railink (OVR)*	Matawa–Témiscamingue	–	70 km
Chemin de fer de Mantane et du Golfe (CFMG)	Mont-Joli–Matane	–	56 km
Total			**1,799 km**

**Federal jurisdiction.*

***Excludes the Québec Central Railway system (380 km) which is not in operation.*

Table V-3 lists the rail carrier subsidiaries of mining and industrial companies.

Table V-3
Private rail carriers

Roberval & Saguenay Railway Company (RS)	Alma–La Baie	–	61 km
Québec North Shore and Labrador Railway (QNS&L)*	Sept-Îles–Schefferville (Québec portion)	–	256 km
Arnaud Railway (Arnaud)*	Pointe-Noire–Arnaud Jonction	–	38 km
Chemin de fer de la Rivière Romaine (CFRR)	Havre St-Pierre–Lac Allard	–	42 km
Cartier Railway (CRC)	Port-Cartier–Mont Wright	–	416 km
Total			**813 km**

**Federal jurisdiction.*

However, this study deals only with the "public" system and excludes private rail carriers who are subsidiaries of other companies.

2. Montréal region rail system

Four different companies operate rail lines in the Montréal region: CN, SL&H, the Montréal Port Authority and CSX Inc.

The CN system is the region's largest, serving industrial zones in the metropolitan area and being the exclusive provider of rail service to the immediate eastern and

south shore sectors. It has direct access to the port and operates several marshalling yards and freight transfer centres.

The Taschereau and Turcot (Monterm) facilities are the two largest marshalling yards. The Taschereau Yard extends to the limits of Saint-Laurent and Lachine and is the focal point for conventional railway car operations. The Turcot Yard is located in southwestern Montréal beside Autoroute 20 and is an important intermodal centre where all truck transfer operations involving truck trailers and containers are handled.

The SL&H system serves the southwestern area of the urban community, Laval, the western and northern parts of the region, as well as a part of the south shore. It also includes several transfer centres and marshalling yards, notably those of Côte-Saint-Luc and Lachine. The Côte-Saint-Luc Yard is east of the Taschereau Yard and specializes in handling conventional railway cars. The Lachine Yard comprises two intermodal centres, one for truck trailers, the other for containers, where truck transfer operatons are carried out. Furthermore, CN and SL&H share a facility between the Taschereau and Côte-Saint-Luc yards, namely the Parsley interchange which is used for the transfer of conventional railway cars between both companies.

The Port of Montréal rail system services the container, general cargo and dry bulk terminals, as well as warehouses and plants located on port land.

The system belonging to the American company CSX Inc. provides service to the western part of the south shore over a single line. It provides rail linkages with the eastern and central United States.

3. Rail transport legislative framework

Rail activities under federal jurisdiction are governed by the *Transport Act*, which took effect in July 1996. Generally speaking, the federal government has exclusive jurisdiction over companies providing interprovincial or international rail service.

The *Railway Act* and the *Act to Ensure Safety In Guided Land Transport* govern rail operations under provincial jurisdiction. The *Railway Act* covers corporate and commercial aspects of railroad activity. Among other things, it provides for the incorporation of railway companies operating in Québec.

The second act mentioned above, namely, the *Act to Ensure Safety In Guided Land Transport*, defines the responsibilities of the MTQ concerning the safety of infrastructure, operations, rolling stock, communications, etc. It applies to rail companies under Québec jurisdiction as well as to mining and other companies that use rail equipment.

B. Railway company descriptions

Eight railway companies are examined in greater detail hereunder. They are Canadian National, St. Lawrence & Hudson, as well as six short line railways, specifically the Québec Gatineau Railway Inc., the two Bangor & Aroostook System short lines located in Québec (Québec Southern Railway and Canadian American Railroad) and the three short lines operated by the Québec Railway Corporation at 31 December, 1998 (Chemin de fer de Charlevoix, Chemin de fer de la Vallée de la Matapédia and Chemin de fer de la Baie-des-Chaleurs).

1. Canadian National

Canadian National (CN) and its independent division known as the Northern Québec Internal Short Line Railway (NQISL) services almost all regions of the Province. Figure V-2 presents the CN and NQISL system. CN tracks in Québec are also used by traffic in transit, between the Maritimes, Ontario and the United States.

a) Infrastructure description

Table V-4 describes each of the CN subdivisions.

Table V-4
CN Rail system in Québec

Subdivision	From	To	Notes	Single track	Double track	Total length (km)	Signaling system[1]	Speed limit (km/h)
Mont-Joli	Mont-Joli	Rivière-du-Loup	—	✓	—	133.6	OCS	89
Montmagny	Rivière-du-Loup	Charny	Jct. with Diamond Sub. and Bridge Sub.	✓	—	199.6	CTC	97
Diamond	St-Charles	Joffre	Jct. with Montmagny Sub and Bridge Sub.	✓	—	27.4	CTC	80
Bridge	Québec	Joffre	Jct. with Montmagny Sub. Diamond subdivisions and La Tuque Sub.	✓	—	25.8	CTC	56
La Tuque	Cap-Rouge	St-Adelphe	Jct. with Bridge Sub. and Lac St-Jean Sub.	✓	—	87.0	OCS	64
Drummondville	Charny	Ste-Rosalie	—	✓	—	186.7	CTC	97
Bécancour	Aston Jonction	Bécancour	—	✓	—	41.8	OCS	64
St-Hyacinthe	Ste-Rosalie	Montréal	Jct. with Sherbrooke Sub, Sorel Sub and Montréal Sub.	—	✓	54.7	CTC/OCS/ ABS	97
Sorel	Tracy	Bruno Jonction	Jct. with St-Hyacinthe Sub.	✓	—	74.0	OCS	64
Rouses Point	Rouses Point	Castle Gardens	Jct. with Swanton Sub.	✓	—	64.4	OCS	64
Montréal	Montréal	Dorval	Jct. with St-Hyacinthe Sub.	—	✓	19.3	CTC	64
Pelletier	St-Marc	St-André Jct.	—	✓	—	98.0	CTC	72
Kingston	Dorval	Coteau west	—	—	✓	56.0	CTC	96
Valleyfield	Cécile	Coteau	—	✓	—	12.9	OCS	64
Deux-Montagnes	Montréal	Montfort	Jct. with Montréal Sub.	✓	✓	35.4	CTC	[2]
St-Laurent	Cour Taschereau	Pointe-aux-Trembles	—	✓	—	29.0	CTC	72
Joliette	Pointe-aux-Trembles	Garneau Yard	—	✓	—	141.6	OCS	80
Total						**1,287.2**		

Source: CN

[1] *CTC = Centralized Traffic Central.*
OCS = Occupancy Control System.
ABS = Automatic Block System.

[2] *Suburban trains only.*

Table V-5 describes the NQISL subdivisions.

Table V-5
Northern Québec Internal Short Line Railway system

Subdivision	From	To	Notes	Single track	Double track	Total length (km)	Signaling system	Speed limit (km/h)
Chapais	Barraute	Chibougamau	Jct. with Matagami Sub and Cran Sub.	✓	—	173.8	OCS	56
Cran	Triquet	Faribault	Jct. with Roberval Sub and Chapais Sub.	✓	—	214.0	OCS	48
La Tuque	St-Adelphe	Fitzpatrick	—	✓	—	115.0	OCS	64
Lac St-Jean	Garneau	Arvida	Jct. with Roberval Sub and La Tuque Sub.	✓	—	328.3	OCS	64
Matagami	Franquet	Matagami	—	✓	—	98.2	OCS	56
Roberval	Chambord	Dolbeau	Jct. with Lac St-Jean Sub and Cran Sub.	✓	—	93.3	OCS	48
St-Maurice	Fitzpatrick	Senneterre	—	✓	—	413.6	OCS	64
Taschereau	Senneterre	La Sarre	—	✓	—	157.0	OCS	40
Val d'Or	Senneterre	Noranda*	—	✓	—	162.5	OCS	48
Total						**1,755.7**		

Source: CN

**Interconnection with the Ontario Northland Railway.*

b) Marshalling yards

CN operates three main marshalling yards in Québec:

- Taschereau Yard in Montréal,
- Joffre Yard in Charny, and
- Garneau Yard in the Shawinigan region.

Operational characteristics of these three marshalling yards are set out below.

Name	Overall track length (km)	Average cars per day
Taschereau	Not available	Not available
Joffre	48	600-750
Garneau	29	375-450

c) Intermodal terminals and services

As indicated in Chapter III, the Monterm intermodal terminal now handles containers and trailers for the North American market as well as marine containers for the international market traveling to and from Québec.

Container and trailer traffic transferred at Monterm in 1997 is shown below.

	Outgoing	Incoming	Total
Containers/trailers	118,500	98,000	216,500
Tonnes (000's)	2,181	1,855	4,036

The Monterm terminal can accommodate approximately 350,000 containers/ trailers per year. This capacity appears adequate and no new terminal construction projects will be considered in Québec in the near future. However, over the years CN has invested millions of dollars in its freight handling facilities and equipment at Monterm.

In addition to conventional intermodal services, Ecorail, a CN wholly-owned subsidiary, operated until quite recently, the 3R system between Drummondville, Québec, and Mississauga (Malport), Ontario. However, the 3R system was withdrawn from service and will be replaced shortly with RoadRailer technology in 1999 (see Chapter 7). The RoadRailer system will be operated between terminals located at the Taschereau and Malport marshalling yards.

2. St. Lawrence & Hudson Railway

The St. Lawrence & Hudson Railway (SL&H) is a regional carrier whose operations are focussed on two major axes, one being a north-south axis between Montréal and Washington, the other being an east-west one between Montréal and Chicago. Within Québec, SL&H mostly services the Montréal area and only operates 260 km of track. Figure V-3 describes SL&H activity in Québec. The company plays an important role in the handling of containers and trailers to and from Québec. For example, it carries a majority of the marine containers handled by the Port of Montréal.

a) Infrastructure description

Table V-6 describes the SL&H subdivisions in Québec.

Table V-6
SL&H system in Québec

Subdivision	From	To	Notes	Single track	Double track	Total length (km)	Signaling system	Speed limit (km/h)
Adirondack	St-Jean	Outremont	—	✓	✓	46.8	OCS/CTC	64
Lachute	Outremont	Mille 28,0	Jct. with CFQG	✓	✓	37.5	OCS	64
Lacolle	Rouses Point Junction	Delson	—	✓	—	43.6	OCS	64
M&O	Dorion	Rigaud	—	✓	—	27.0	OCS	64
Ste-Agathe	Ste-Thérèse	St-Jérome	—	✓	—	21.1	OCS	48
Vaudreuil	Montréal West	Dorion	—	✓	—	30.4	CTC	56
Winchester	Dorion	Saint-Télésphore	Contunues to Smith Falls	✓	—	37.0	OCS	80
Connection Farnham	Wentworth	North Junction	—	✓	—	3.1	CTC	32
North Lead Junction	Montréal West	North Junction	—	✓	—	1.8	CTC	40
South Lead Junction	Montréal West	South Junction	—	✓	—	1.1	CTC	40
St-Luc Branch	St-Luc Junction	Ballantyne	—	✓	—	3.4	CTC	48
Westmount	Windsor Station	Montréal West	—	✓	—	7.4	CTC	56
Total						**260.2**		

Source: SL&H

b) Intermodal facilities and services

Until recently, SL&H operated three intermodal terminals in Québec, one each in Lachine, Lacolle and Québec City. However, the Lacolle terminal has closed now that SL&H provides a direct link with the Port of New York. The

Québec Gatineau Railway Inc. has been operating the Québec City terminal since 1998 (see the following section).

The Lachine terminal provides for the transfer of trailers and containers for the North American market, as well as marine containers. However, incoming and outgoing containers at the Port of Montréal are all shipped directly to/from the port's rail facilities.

The following table provides the domestic[1] container and trailer traffic transferred at Lachine in 1997.

	Outgoing	Incoming	Total
Containers/trailers	17,352	20,462	37,714
Tonnes	222,000	420,000	642,000

As well as providing conventional services, SL&H has been using "Iron Highway" or "Expressway" technology between Montréal and Toronto for over a year. This technology is a cooperative arrangement with the trucking industry and offers a valuable alternative for shipping semitrailers between cities with distances of 500 to 1,000 km. At present, two 20-platform trains per day make the trip in either direction between Montréal and Toronto. There are plans, however, to significantly expand this type of intermodal service in 1999 (see Chapter 7).

3. Québec Gatineau Railway Inc.

Québec Gatineau Railway Inc. (QGRY) operates the former SL&H lines linking Hull, Trois-Rivières and Québec City and their ports. The QGRY's system is illustrated in Figure V-4.

a) Description of infrastructure and operations

Table V-7 describes each QGRY subdivision.

[1] Note: SL&H did not provide data on marine container traffic transferred at Lachine.

Table V-7
Québec Gatineau Railway Inc. system

Subdivision	Description	Length (km)	Speed limits	Signaling system
Lachute	Hull to St-Augustin	146.9	8km@16km/h 24km@40km/h 114km@64km/h	OCS
Trois-Rivières	St-Martin Jct. to Québec	246.1	5km@16km/h 109km@48km/h 132km@64km/h	OCS/ABS
Montfort*	St-Scholastic to St-Jérôme	29.0	10km@16km/h 19km@48km/h	OCS
St-Maurice	Trois-Rivières to Grand- Mère	42.3	15km@16km/h 27km@40km/h	OCS
Embranchements		38.1	16km	OCS
Total		**502.4**		

Source: Québec Gatineau Railway.

** Mirabel Railway.*

Frequency and average length of trains operated in each subdivision in 1998 are shown below.

Subdivision	Frequency	Average number of cars/train
Lachute	4 per day	45
Trois-Rivières	10 per day	50
Monfort	3 per	7
St-Maurice	2 per day	15

b) System interfaces

Traffic levels at interconnection points with other railways in Québec are as follows:

Interface	Cars delivered (per day)		Cars received (per day)	
St-Luc–Montréal(CP)	60		60	
St-Luc–Montréal (CN)	2		2	
Shawinigan (CN)	18		15	
Québec City (CN)	6		2	
Ottawa (CP)	4	(per week)	4	(per week)
Joliette (CN)	2		2	

c) Marshalling yards

The main QGRY marshalling yards in Québec are described below.

Marshalling yards	Track length (km)	Average cars per day
Outremont	7.7	160
Gatineau	5.3	90
Trois-Rivières	21.2	160
Québec	29.6	70

d) Other terminals

QGRY also operates an intermodal terminal and transfer centres for automobiles and lumber at Québec City.

e) Traffic levels

Traffic levels handled by QGRY in 1998 by commodity are presented in Table V-8.

Table V-8
QGRY traffic levels (000's of tonnes)

Product category	Loaded/ unloaded within the system	Loaded & delivered to CN or CP	Unloaded & received from CN or CP	Total
Agricultural & food products	—	—	798	**798**
Bulk & semi-finished products	478	—	472	**950**
Forest products	—	1,125	—	**1,125**
Petroleum & chemical products	—	109	204	**313**
Domestic intermodal	—	308	—	**308**
Marine containers	—	23	—	**23**
Manufactured products	—	—	91	**91**
Total	**478**	**1,565**	**1,565**	**3,608**

Source: Québec Gatineau Railway.

4. Bangor & Aroostook System

Bangor & Aroostook System includes four short line railways, two of which are located in Québec:

- Québec Southern Railway (QSR) which operates railway lines entirely located in southern Québec;
- Canadian American Railroad (CDAC) which operates the railway line linking Lennoxville, Québec, to Brownville Junction, Maine. A 130-km length of track is operated in Québec.

a) Infrastructure description

Figure V-5 illustrates the QSR and CDAC systems. Subdivision descriptions are provided in Table V-9.

Table V-9
Bangor & Aroostook rail system in Québec

CFIL	Subdivision	Description	km	Speed limit (km/h)	Signaling system
CDAC	Moosehead	Mégantic to la frontière	24.0	72	OCS
	Sherbrooke	Mégantic to Lennoxville	106.0	72	OCS
	Sub-total		**130.0**		
QSR	Sherbrooke	Lennoxville to Brookport	96.1	72	OCS
	Adirondack	Brookport to St. Jean	32.2	80	OCS
	Newport	Brookport to Mile 26,3	42.3	48	OCS
	Newport	Glen Sutton to Highwater	17.0	48	OCS
	St-Guillaume	Farnham to Ste-Rosalie	45.2	64	OCS
	Stanbridge	Stanbridge to Farnham	19.8	40	OCS
	Sub-total		**252.6**		
Total			**382.6**		

Source: Bangor & Aroostook System.

b) System interfaces

System interconnections with other Québec railways and related traffic levels are as follows:

System interface	Cars delivered and received (per day)
St-Jean (CP)	175
St-Jean (CN)	23
Ste-Rosalie (CN)	11
Sherbrooke (CN)	21

c) Marshalling yards

Bangor & Aroostook System's main marshalling yards in Québec are the following:

Marshalling yards	Track length (km)	Average cars per day
Sherbrooke	7.4	25
Farnham	7.2	250
Sortin (Montréal)[1]	2.7	20

[1] SL&H leases this intermodal terminal to the QSR for handling containers and trailers traveling to and from New Brunswick.

d) Traffic levels

Table V-10 presents the traffic levels carried by QSR and CDAC in 1997 in Québec.

Table V-10
Traffic levels (000's of tonnes)—QSR and CDAC

Product category	Loaded/ unloaded within the system	Loaded & delivered to CN or CP	Unloaded & received from CN or CP	Total
Agricultural & food products	1.5	17.0	309.4	**327.9**
Bulk & semi-finished products	—	90.9	49.1	**140.0**
Forest products	0.3	83.6	52.2	**136.1**
Petroleum & chemical products	—	128.9	101.7	**230.6**
Domestic intermodal	—	—	0.4	**0.4**
Marine containers	—	26.9	1.5	**28.4**
Manufactured products	—	14.7	1.4	**16.1**
Total	**1.8**	**362.0**	**515.7**	**879.5**

Source: Bangor & Aroostook System.

5. Québec Railway Corporation

The Québec Railway Corporation owned three short line railways in the Province at December 31, 1998.

- Chemin de fer de Charlevoix (CFC)
- Chemin de fer de la Vallée de la Matapédia (CFVM)
- Chemin de fer de la Baie-des-Chaleurs (CFBC)

Figure V-6 illustrates the Québec Railway Corporation system at December 31, 1998.

a) Chemin de fer de Charlevoix (CFC)

i) Infrastructure and operations

Facilities are described below.

- Main line track length — 145 km

- Branch line length — 8 km
- Maximum speed — 48 km/h

Two trains make the trip daily between Clermont and Limoilou (one in either direction). Each is comprised on average of 25 cars.

The only system interface is with CN at Limoilou. Each day, 25 cars are delivered and 25 are received. The Limoilou marshalling yard has 8 tracks totaling 2.7 km.

ii) Traffic levels

Traffic loaded and unloaded within the CFC system in 1998 totaled 4,827 cars or 295,000 tonnes of goods, broken down as follows:

	Cars	**Tonnes**
Traffic loaded and delivered to CN	3,912	250,000
Traffic unloaded and received from CN	915	45,000
Total	**4,827**	**295,000**

Most of the goods carried were forest products.

CFC forecasts a 10% increase in traffic.

iii) Current constraints

The main constraint at this time is the maximum carload weight restriction of 263,000 pounds.

iv) Future plans

Short-term plans involve improving bridge structures.

v) Future constraints

Major constraints inhibiting effective system management are the maximum carload weight of 263,000 pounds and budgetary constraints preventing increasing system capacity.

b) Chemin de fer de la Vallée de la Matapédia (CFVM)[1]

i) Infrastructures and operations

Facilities are described below:

- Length of main and branch lines — 150.3 km
- Maximum speed — 32 km/h to 80 km/h, depending on the zone

Two trains having an average length of 70 cars per train run each day.

There are two system interfaces:

- At Mont-Joli with CN
- At Clark Brook with the Chemin de fer de la Baie-des-Chaleurs (CFBC)

Average number of cars delivered or received daily at each interconnection point is as follows:

	Mont-Joli	**Clark Brook**
Cars delivered	43	20
Cars received	26	20
Total	**69**	**40**

Total track length at marshalling yards is 12 km. Yards handle an average of 208 cars per day.

[1] Merged with the Canada & Gulf Terminal Railway Company in 1999 to become the Chemin de fer de la Matapédia et du Golfe.

ii) Traffic levels

The main classes of freight traffic carried are forest products and bulk and semi-finished goods. Traffic levels were as follows in 1998:

	Cars	Tonnes
Traffic loaded and delivered	1,754	110,000
Traffic unloaded and received	115	7,600
Total	**1,869**	**117,600**

A 10% increase in traffic levels is expected in the short term.

iii) Current and future constraints

Effective management of CFVM is constrained by a lack of skilled and qualified labour in the region.

iv) Future plans

The acquisition of the line running between Matane and Rivière-du-Loup in February 1999 will have the greatest impact on future system operations.

c) Chemin de fer de la Baie-des-Chaleurs (CFBC)

i) Infrastructures and operations

Following is a description of facilities:

- Track length — 235 km
- Maximum speed — 64 km/h for freight trains
- Signaling system — Occupancy Control System

Average train traffic is 2.8 trains/day and average train length is 10.8 cars.

System interface is with the CFVM. Number of cars delivered or received daily is 18.

ii) Traffic levels

Freight is mostly comprised of forest products. Traffic levels were as follows in 1998:

	Cars	Tonnes
Traffic loaded and delivered	5,235	320,000
Traffic unloaded and received	424	37,000
Total	**5,659**	**357,000**

According to CFBC, traffic levels should increase to 900,000 tonnes by the year 2002.

iii) Current and future constraints

Effective system management is mostly constrained by:

- municipal by-laws prohibiting the use of herbicides on the railway right-of-way;
- the carload weight restriction of 263,000 pounds on track and on bridges. Major railways are increasing the load capacity to 285,000 pounds and several clients have inquired whether CFBC can meet the new standards.

C. Rail/port linkages

This section reviews rail access to the three main Québec ports, namely, the ports of Montréal, Québec and Trois-Rivières.

1. Port of Montréal

The Port of Montréal operates its own railway system which is 100 km in length. It services practically all berths. Switching capacity is 1,000 cars per day. In 1997, approximately 130,000 cars were handled by the port railway, 80% of which were container cars. The port has six locomotives. Some 60% of Port of Montréal container traffic is hauled by rail to North American markets.

The port railway system is connected to the marshalling yards of the two transcontinental railway companies, Canadian Pacific Railway (CP) via its subsidiary, St. Lawrence & Hudson Railway (SL&H), and Canadian National Railway (CN). Both companies have direct access to piers and no intermediate

transfer is required as is the case in many ports. CN cars are interchanged at the Pointe Saint-Charles marshalling yard. CN trains are thus required to travel through the Old Port, creating a difficult situation given that the area is a tourist destination. CP trains are interchanged at Hochelaga yard. CP assembles entire container trains directly at the port and no further marshalling is required at Montréal area yards. This advantage provides the Port of Montréal with excellent rail links for the transport of containers, providing transit times of 10 hours to Toronto, 25 hours to Detroit and 30 tonnes to Chicago.

The two berths located on the south shore at Contrecoeur are only served by CN rail services. At this time, cars to and from Contrecoeur are interchanged at the Taschereau marshalling yard on the Island of Montréal and must cross the St. Lawrence River via the Victoria Bridge.

2. Port of Québec

Three railways companies provide service to the Port of Québec, CN and two short line railways, the Québec Gatineau Railway Inc. (QGRY) and the Chemin de fer de Charlevoix (CFC). QGRY serves North American markets in close cooperation with the SL&H. The three companies' facilities are in close proximity to the three north shore port areas (Beauport, Estuaire and Anse-au-Foulon). Nonetheless, CN is the only company having access to the three areas, via the Limoilou yard at Beauport and Estuaire and through the Sainte-Foy yard at Anse-au-Foulon. The Anse-au-Foulon area, on the other hand, is the only port sector directly serviced by QGRY and the SL&H system. CFC provides a rail link between Côte-de-Beaupré and Charlevoix firms through the Limoilou yard. CN is the only rail carrier serving the south shore.

The three north shore facilities of the Port of Québec handled about 800,000 tonnes of freight in 1994, which was carried to or from the port by rail. Rail freight traffic levels generated by the three sectors in 1994 were as follows:

Sector	Cars	Tonnes
Beauport	1,446	118,813
Estuaire	5,301	502,845
Foulon	2,650	178,385
Total	**9,397**	**800,813**

Grain (Estuaire) accounted for 60% of rail freight volumes in 1994, followed by fertilizer (17%) handled at Anse-au-Foulon and concentrates (10%) transferred at Beauport.

The 1994 report concluded that rail access to the port is well-designed and can potentially accommodate higher traffic levels. Rail access to the wharves is provided in all areas and the number of level crossings is relatively low overall. Business relations between CN and QGRY with respect to switching services at Beauport and Estuaire, where QGRY does not have the benefit of direct access, appears to be the only bone of contention. The companies disagree on the interpretation of the former business arrangement between CP and CN governing service to the Port of Québec. QGRY believes it has direct access rights to the port. CN, on the other hand, charges QGRY interswitching fees for the rail services that it provides.

3. Port of Trois-Rivières

Only one railway, QGRY, services the Port of Trois-Rivières. The port generated nearly 700,000 tonnes of rail traffic in 1998. Products shipped by rail were mainly pulp and paper, chemicals, minerals and general freight. Capacity and services provided currently meet requirements. However, rail congestion may occur if traffic levels continue to increase and rail access to the port is not improved accordingly.

D. Carrier concerns

Carriers' main concerns stemming from the current state of the Québec railway system are summarized below.

1. Taxation

Transcontinental railway companies believe that Canadian taxation system (such as those related to capital cost allowance and fuel taxes) continue to hamper their ability to compete with the trucking industry and their American counterparts. The Québec government has performed an in-depth study of the situation in Québec and has taken certain measures to remedy unfair treatment, especially as regards municipal taxation.

2. Short line railway budget constraints

Most short line railways surveyed stated that they were unable to better manage their systems due to budgetary constraints. They were hindered, for example, from improving infrastructures, building new level crossings and increasing track load capacity.

3. Port rail services

Problems potentially affecting rail service at the ports of Montréal and Québec have already been raised.

At the Port of Montréal, for example, CN is required to travel through the Old Port, creating problems given that the area is a tourist destination. In the longer term, port facility development off the Island of Montréal could restrict the ability of the transcontinental rail carriers to provide levels of service at new terminals comparable to those that are currently offered.

At the Port of Québec, QGRY and CN should resolve their business differences in order to provide improved service to the Beauport and Estuaire sectors.

4. Short line railway dependency on transcontinental rail carriers

Short line railway company dependency on the transcontinental rail carrier from which the line was purchased (for example, supply of cars, tariff structures) can prevent the smaller company from maximizing its revenues, especially if an opportunity arises involving the competing transcontinental carrier.

E. Observations and conclusions

It is apparent that the Québec rail system is under-utilized. For this reason, rail congestion is rarely a problem. The CN line between Montréal and Québec City is the only line where traffic levels are near capacity. CN stated that it plans to increase the line's rail capacity.

Railway officials did not raise any issues involving Québec border crossings which would impede effective operation of trains between Québec and the Unites States. However, random inspection of marine containers for customs clearance at the Detroit border crossing has caused significant delays. Much of the container traffic from the Port of Montréal to the American Midwest passes by to this particular crossing.

Extensive restructuring of the Québec rail system has occurred over the past several years and several short line railways have emerged. Of particular note, the Québec government, in its last budget, announced a $19-million, five-year plan supporting short line railways through branch line rehabilitation and restructuring, as well as infrastructure improvements for lines showing intermodal transport potential.

There is substantial freight traffic capacity available in the Québec rail system. Little use is made of intermodal rail transport in the Province, although this form of transportation is rapidly gaining ground outside Québec. The stage is set, therefore, to increase rail system traffic levels and contribute to reducing the number of trucks operating on the province's highway system.

VI

Surface Freight Traffic Forecasts

This chapter presents the surface freight (truck and rail) traffic forecasts in Québec.

A. Approach and methodology

General forecasts developed by Transport Canada for each mode of transport to 2010 served as the basis for this analysis. Historical data is taken from Statistics Canada. Assumptions and methodologies are documented in a report titled *Freight Transport Trends and Forecasts to 2010*.[1] Forecasting[2] was carried out for twenty commodity groups in a matrix format showing individual provinces' incoming and outgoing traffic, movements within each province and traffic between each province and the United States. For study purposes, Transport Canada forecasts were augmented with information provided by the railway companies and port authorities, especially concerning domestic intermodal and marine container traffic.

The classification of commodities is the same as used in Chapter III. Transport Canada traffic forecasts by commodity were used to project the traffic patterns according to the commodity classifications used in this study.

B. Truck traffic

Truck traffic forecasts[3] by commodity classification and by major origin and destination are subdivided as follows:

- Québec outbound traffic

---

1 *Freight Transport Trends & Forecasts to 2010*. Report prepared for the Economic Analysis Branch—Transport Canada, TAF Consultants, April 1998.

2 Transport Canada is in the process of revising its forecasts.

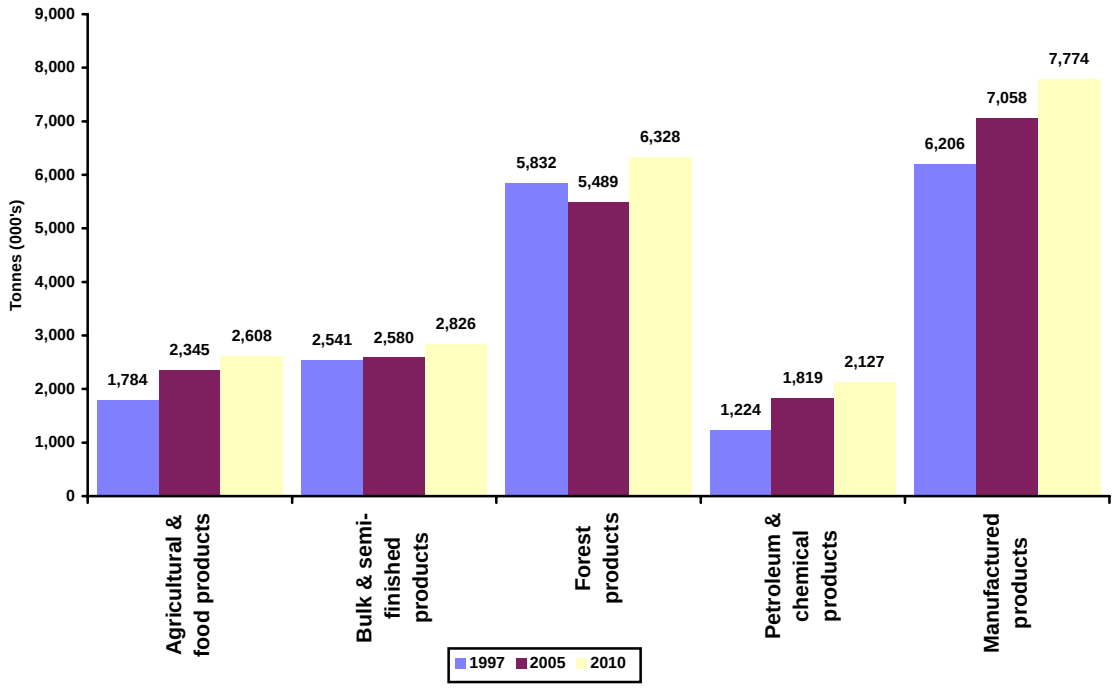
3 The base year for highway traffic forecasts is 1995.

- Québec inbound traffic
- Québec intraprovincial traffic
- Québec in-transit traffic.

1. Québec outbound truck traffic

Figure VI-1 presents Québec's outbound truck traffic forecasts by commodity classification for the years 2005 and 2010. Growth rates for each class are provided in Appendix D. Annual growth rates for outbound traffic are 1.6% from 1997 to 2010, compared to 13.8% from 1992 to 1997. The fact that the economy was in a recession in 1992 explains why the growth rate was exceptionally high between 1992 and 1997. Changes in sampling techniques made by Statistics Canada within this time period may also have affected results. The slowdown in growth rates was reflected in all land freight transport forecasts presented in this chapter.

Figure VI-1
Québec outbound truck traffic forecasts by commodity category



Source: Transport Canada.

Forecasted annual rates of growth from 1997 to 2010 for each commodity category are shown below:

- Agricultural and food products — 3.0%
- Bulk and semi-finished products — 0.8%
- Forest products — 0.6%
- Petroleum and chemical products — 4.3%
- Manufactured products — 1.8%

Forecasts by major destination are provided in Table VI-1.

Table VI-1
Québec outbound truck traffic forecasts by major destination
(000's of tonnes)

Destinations	1997	2005	2010	Annual growth rate 1997–2010
Ontario	7,802	8,818	9,919	1.9
Maritimes	1,623	1,563	1,650	0.1
West	487	440	463	(0.4)
Sub-total Canada	**9,912**	**10,821**	**12,032**	**1.5**
North	1,875	2,196	2,743	3.0
North-East	4,368	4,977	5,472	1.8
West	104	96	103	(0.1)
South	1,327	1,201	1,313	(0.1)
Sub-total United States	**7,674**	**8,470**	**9,631**	**1.8**
Total	**17,586**	**19,291**	**21,663**	**1.6**

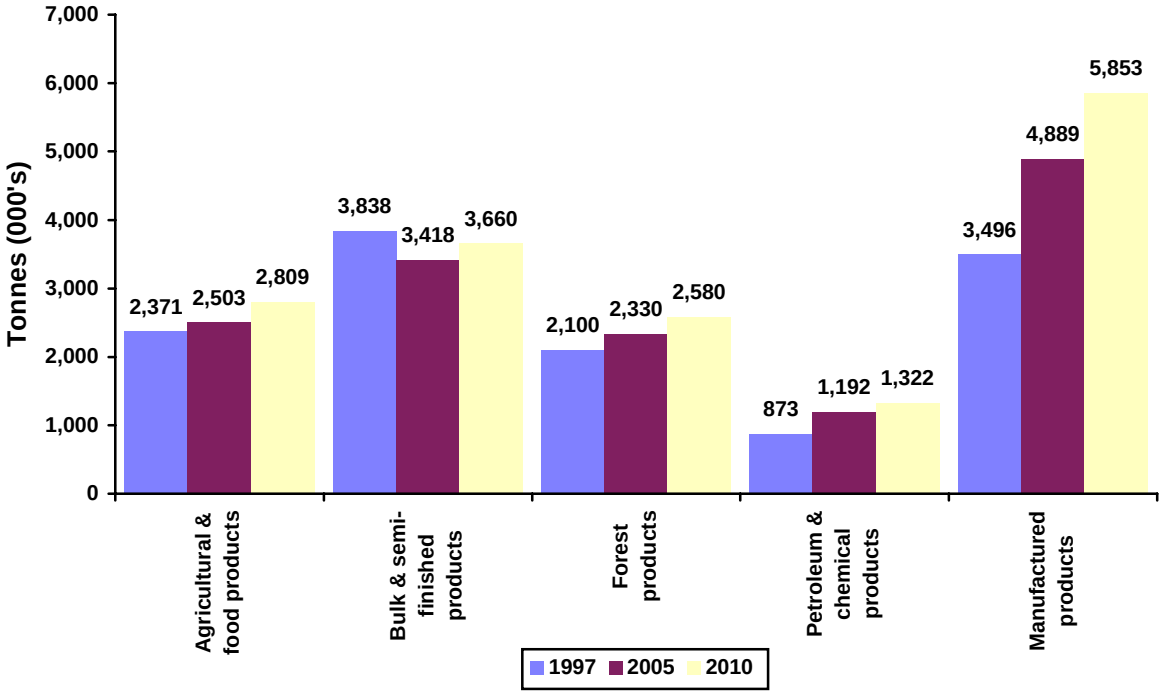
Source: Transport Canada.

The rate of growth of traffic to the United States from 1997 to 2010 is consistently higher than that of traffic to other Canadian provinces, which is in keeping with the trend observed between 1992 and 1997.

2. Québec inbound truck traffic

Figure VI-2 presents forecasts for Québec inbound truck traffic by commodity category for the years 2005 and 2010. Growth rates for each class are provided in Appendix D. The annual rate of growth for this traffic is 1.9% from 1997 to 2010, as compared to 9.3% from 1992 to 1997. Thus, the growth of inbound truck traffic is expected to outpace that of outbound traffic.

Figure VI-2
Québec inbound truck traffic forecasts by commodity category



Source: Transport Canada.

Forecasted annual growth rates for each commodity category from 1997 to 2010 are as follows:

- Agricultural and food products — 1.3%
- Bulk and semi-finished products — (0.4)%
- Forest products — 1.6%
- Petroleum and chemical products — 3.2%
- Manufactured products — 4.0%

Forecasts by major origin are provided in Table VI-2.

Table VI-2
Québec inbound truck traffic forecasts by major origin (000's of tonnes)

Origins	1997	2005	2010	Annual rate of growth 1997–2010
Ontario	6,951	8,105	9,075	2.1
Maritimes	953	1,083	1,167	1.6
West	385	348	370	(0.3)
Sub-total Canada	**8,289**	**9,536**	**10,612**	**1.9**
North	909	872	972	0.5
North-East	2,258	2,740	3,203	2.7
West	194	133	139	(2.5)
South	1,028	1,050	1,298	1.8
Sub-total United States	**4,389**	**4,795**	**5,612**	**1.9**
Total	**12,678**	**14,331**	**16,224**	**1.9**

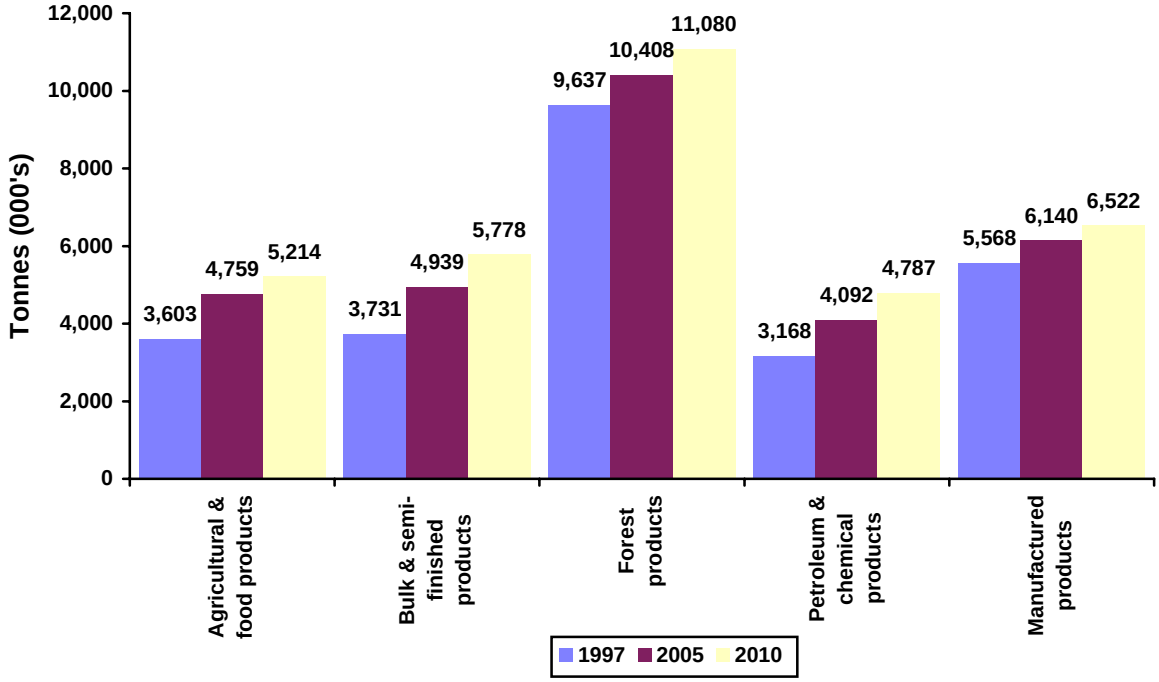
Source: Transport Canada.

Traffic from points in the U.S. is predicted to grow at the same rate as traffic from other parts of Canada.

3. Québec intraprovincial truck traffic

Truck traffic within Québec is expected to grow at a rate of 2% between 1997 and 2010. This rate is slightly greater than that of either outbound or inbound traffic. Results are presented in Figure VI-3.

Figure VI-3
Québec intraprovincial truck traffic forecasts by commodity category



Source: Transport Canada.

Projected annual growth rates for each commodity category carried by truck within Québec between 1997 and 2010 are as follows:

- Agricultural and food products — 2.9%
- Bulk and semi-finished products — 4.4%
- Forest products — 1.1%
- Petroleum and chemical products — 3.2%
- Manufactured products — 1.2%

4. Québec in-transit truck traffic forecasts

Québec in-transit truck traffic forecasts are provided in Table VI-3. This category of truck traffic will grow at a greatest rate between 1997 and 2010. Trade between Ontario and the northeastern United States accounts for this growth.

Table VI-3
Québec in-transit truck traffic forecasts (000's of tonnes)

Origins	Destinations	1997	2005	2010	Annual rate of growth 1997–2010
Ontario	Maritimes	1,063	1,247	1,345	1.8
Maritimes	Ontario	879	800	839	(0.4)
North-East U.S.	Ontario[1]	2,964	4,028	4,427	3.1
Ontario	North-East U.S.[1]	4,167	5,376	5,867	2.7
Total		**9,073**	**11,451**	**12,478**	**2.5**

Source: Transport Canada.

[1] *Only a portion of this traffic will transit by Québec.*

C. Rail traffic

Forecasted rail traffic[1] by commodity category and major origins and destinations are sub-divided in the same manner as the truck traffic forecasts. They are as follows:

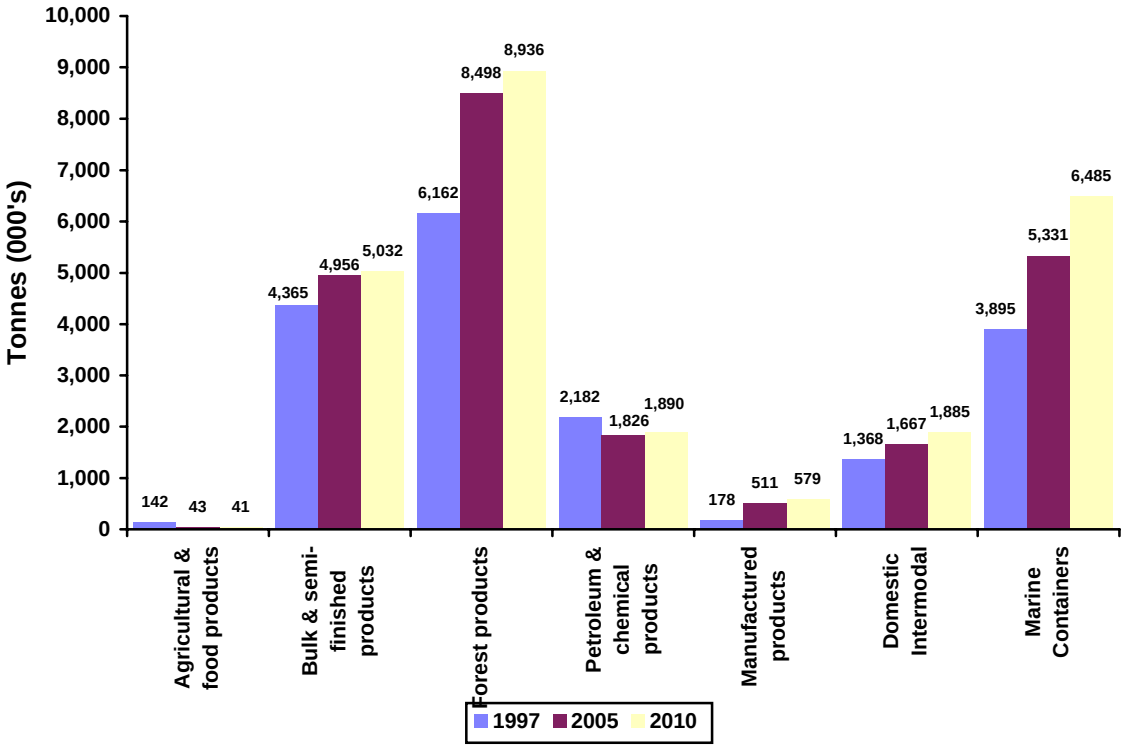
- Québec outbound traffic
- Québec inbound traffic
- Québec intraprovincial traffic
- Québec in-transit traffic.

1. Québec outbound rail traffic

Québec outbound rail traffic forecasts by commodity category for 2005 and 2010 are provided in Figure VI-4. Annual growth rates for each commodity category are shown in Appendix D. This type of traffic will grow at an annual rate of 2.4% from 1997 to 2010, compared to 5.6% between 1992 and 1997. As a matter of interest, rail traffic will increase faster than truck traffic (1.6%) between 1997 and 2010.

1 The base year for Transport Canada rail traffic forecasts is 1994.

Figure VI-4
Québec outbound rail traffic forecasts by commodity category



Sources: Transport Canada, CN and Port of Montréal.

Annual rates of growth for each commodity category of goods between 1997 and 2010 are as follows:

- Agricultural and food products — (9.1)%
- Bulk and semi-finished products — 1.1%
- Forest products — 2.9%
- Petroleum and chemical products — 1.1%
- Manufactured products — 9.5%

- Domestic intermodal — 2.5%[1]
- Marine containers — 4.0%[1]

Table VI-4 presents the forecasts by major destination.

Table VI-4
Québec outbound rail traffic forecasts by major destination (000's of tonnes)

Destination	1997	2005	2010	Annual growth rates 1997–2010
Ontario	2,855	3,813	4,299	3.2
Maritimes	1,456	2,329	2,559	4.4
West	2,081	2,991	3,454	4.0
Sub-total Canada	**6,392**	**9,133**	**10,312**	**3.7**
United States	**11,901**	**13,699**	**14,536**	**1.6**
Total	**18,293**	**22,832**	**24,848**	**2.4**

Source: Transport Canada.

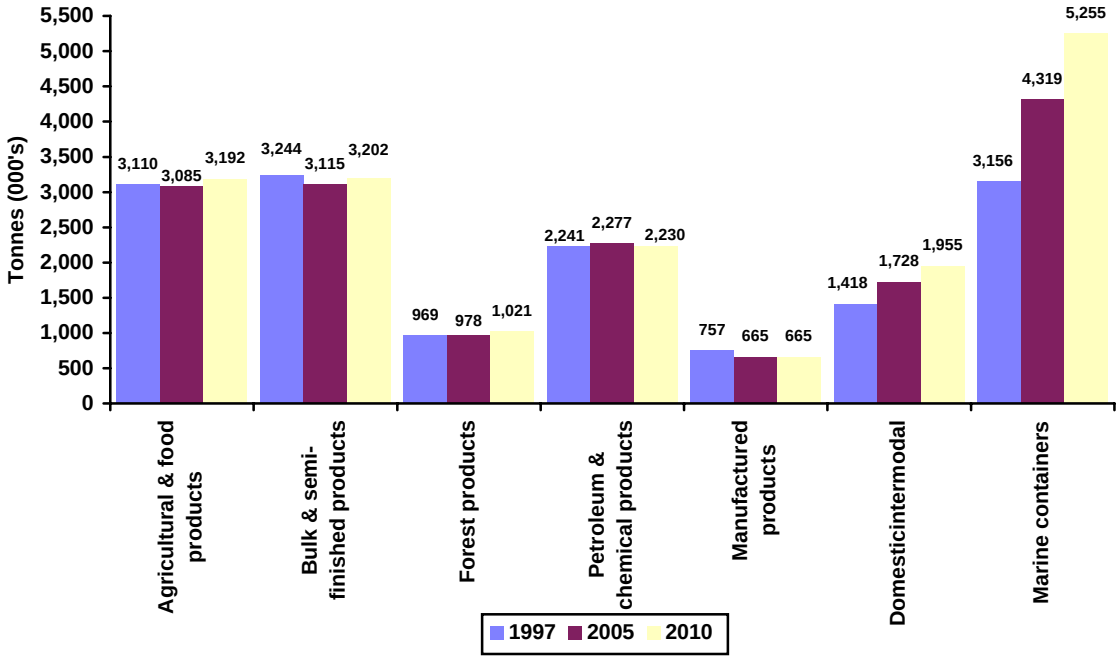
It is worth mentioning that Canadian traffic will grow at a higher rate than traffic to the United States. This trend is a reversal of patterns observed between 1992 and 1997.

2. Québec inbound rail traffic

Québec inbound rail traffic forecasts by commodity category for 2005 and 2010 are presented in Figure VI-5. Annual growth rates for each class are given in Appendix D. This type of traffic will grow annually at a rate of 2% between 1997 and 2010, whereas it increased by 3.4% between 1992 and 1997. Thus, the growth in inbound rail traffic will continue to lag behind that of outbound rail traffic.

[1] As estimated by KPMG.

Figure VI-5
Québec inbound rail traffic forecasts by commodity category



Sources: Transport Canada, CN and Port of Montréal.

Forecasted annual growth rates of each commodity category of goods from 1997 to 2010 are listed below:

- Agricultural and food products — 0.2%
- Bulk and semi-finished products — (0.1)%
- Forest products — 0.4%
- Petroleum and chemical products — 0.2%
- Manufactured products — (1.0)%
- Domestic intermodal — 2.5%[1]
- Marine containers — 4.0%[1]

[1] As estimated by KPMG.

Forecasts by major origin are shown in Table VI-5.

Table VI-5
Québec inbound rail traffic forecasts by major origin (000's of tonnes)

Destination	1997	2005	2010	Annual growth rate 1997–2010
Ontario	4,983	4,834	5,081	0.2
Maritimes	1,250	1,213	1,261	(0.1)
West	3,413	3,880	4,257	1.7
Sub-total Canada	**9,646**	**9,927**	**10,599**	**0.7**
United States	**5,250**	**6,240**	**6,920**	**2.2**
Total	**14,896**	**16,167**	**17,519**	**1.3**

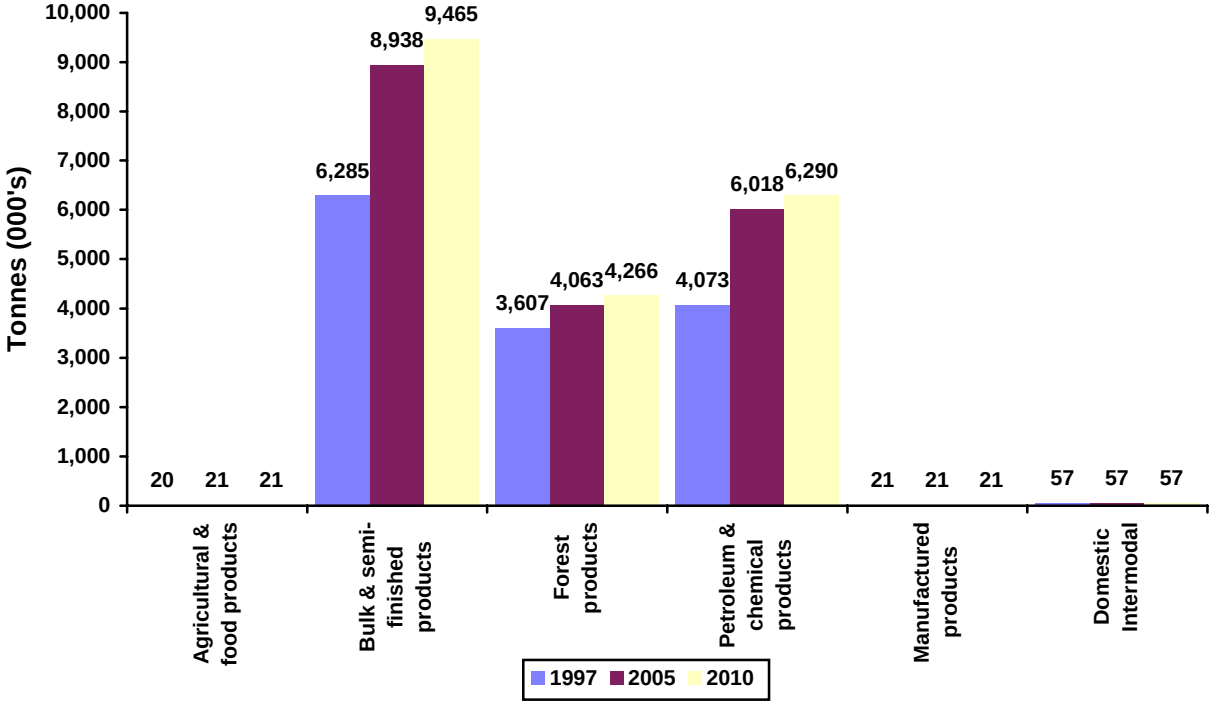
Source: Transport Canada.

As a matter of note, traffic from the United States will continue to grow faster than traffic from other points in Canada. This is contrary to the pattern observed for the outbound rail traffic forecast.

3. Québec intraprovincial rail traffic

Québec intraprovincial rail traffic will grow at a rate of 2.7% from 1997 to 2010. The results by commodity category are shown in Figure VI-6.

Figure VI-6
Québec intraprovincial rail traffic by commodity category



Sources: Transport Canada, CN et CP.

Annual growth rates for each commodity category are forecasted at the following levels between 1997 and 2010:

- Agricultural and food products — 0.4%
- Bulk and semi-finished products — 3.2%
- Forest products — 1.3%
- Petroleum and chemical products — 3.4%
- Manufactured goods — 0.0%
- Domestic intermodal — 0.0%
- Marine containers — 0.0%

4. Québec in-transit rail traffic forecasts

Table VI-6 presents the Québec in-transit rail traffic forecasts. The rate of growth is predicted to be 3.5%. In-transit rail traffic represents the sharpest growth as is the case with truck traffic.

Table VI-6
Québec in-transit rail traffic forecasts (000's of tonnes)

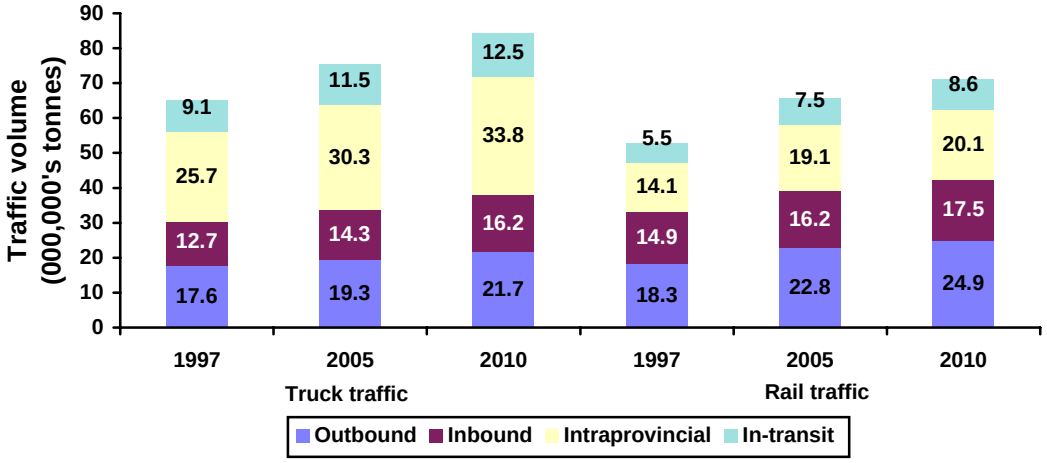
Origin	Destination	1997	2005	2010	Annual growth rate 1997–2010
Ontario	Maritimes	1,534	1,898	2,142	2.6
Maritimes	Ontario	1,678	2,736	3,164	5.0
United States	Maritimes	757	880	967	1.9
Maritimes	United States	1,545	2,019	2,298	3.1
Total		**5,514**	**7,533**	**8,571**	**3.5**

Sources: Transport Canada, CN.

D. Summary

Québec truck and rail transport forecasts are summarized in Figure VI-7.

Figure VI-7
Québec rail and truck traffic forecasts



Source: Transport Canada.

Certain observations may be made based on the forecasts:

- As stated early in this chapter, growth rates will taper off from 1997 to 2010, compared to the 1992-1997 period, considering that the economy was in recession in 1992.

- Rail transport growth (2.3%) will be slightly higher than that of truck transport (2%) over the period 1997-2010. This is caused by the expected strong continued growth of intermodal transport (both domestically and internationally).

- Truck transport will grow more rapidly than rail transport for only Québec inbound traffic.

- Historical trends whereby rail freight transport's market share decreased relative to that of truck transport, will no longer prevail; rail transport will slightly increase its market share in the future.

E. Areas of congestion

1. Truck transport

According to the forecasts, an increase in freight flow by commodity category of up to 4.4% per year may be expected. According to the type of traffic involved, average annual increases will be the following:

- Québec outbound traffic: 1.6%
- Québec inbound traffic: 1.9%
- Québec intraprovincial traffic: 2.0%
- Québec in-transit traffic: 2.5%

Assuming that the average weight per truckload remains essentially unchanged (in fact, they may increase slightly due to improved productivity), traffic may be expected to grow proportionately.

Indeed, these percentage increases are close to those that are expected to occur in the provincial highway system generally. In this respect, truck traffic does not differ markedly from other types of traffic. As a general rule, therefore, trucking cannot be deemed to be solely responsible for road congestion problems that may occur or intensify in the future.

The Montréal area expressway system is at full capacity in peak hours and the same may be said quite often of Autoroute Métropolitaine and Autoroute Décarie at other

times. Given that trucks sometimes account for up to 15% of total traffic, they can have a major impact on general traffic conditions. Although the share of trucks on the road is less significant (6% to 8% on Autoroute Métropolitaine) at peak hours, any reduction in truck traffic will produce significant capacity gains.

Conversely, traffic congestion forces trucks to travel at low speeds and to make frequent stops. In such circumstances, heavy vehicle movements are made more difficult than automobile movements and result in longer delays for trucks and other road users.

The main causes of existing road congestion in the Montréal area are:

- the missing segments of the expressway system (for example, the segment that would link Autoroute 30 to Autoroute 20, enabling trucks to bypass the heart of the Montréal area);

- insufficient capacity of certain highway segments such as Autoroute Métropolitaine between Autoroute Décarie and Autoroute des Laurentides;

- lack of integration of municipal arterial roads into the expressway system.

It is of paramount importance that these critical components of the Montréal area highway system be completed in order to ensure reliable operation of the system.

2. Rail transport

According to rail transport forecasts, an increase in freight flow per corridor of up to 4.5% per year may be expected. Annual increases by traffic type will be as follows:

- Québec outbound traffic: 2.4%
- Québec inbound traffic: 1.3%
- Québec intraprovincial traffic: 2.7%
- Québec in-transit traffic: 3.3%

In Chapter V, we concluded that the Québec rail system was underutilized and rarely congested at present. Interviews with railway officials indicated that the CN line between Montréal and Québec City is the only section of the Québec rail system operating at near capacity levels. This line is traveled daily by several freight and passenger (VIA Rail) trains. Freight includes all types of goods traveling from and to various Québec regions (for example, Montréal, Chaudière-Appalaches, Lower St. Lawrence and the Gaspé), as well as intermodal traffic between the Maritimes and Québec, Ontario and the American markets. CN is already planning to increase capacity on this important and strategic line.

With the exception of the CN line between Montréal and Québec City, traffic forecasts show that no rail system congestion is to be expected in Québec. Therefore, abundant capacity is available to recover part of the market share lost to truckers and alleviate highway system congestion problems.

VII

Future Plans

This chapter sets out future plans for the Québec highway system, that of neighbouring provinces and American states, as well as for the Québec rail system.

A. Highway system

1. MTQ direction

The MTQ has determined the direction it will be taking with respect to highway infrastructure under its jurisdiction. The Ministry intends to take the following action in the coming years, based on an ever-increasing, five-year budget:

- ensure road condition consistency across the province;
- take action with respect to concrete road surfaces;
- continue the limited capacity bridge reinforcement program initiated in the early nineties, placing emphasis on the most heavily used load axes;
- conduct a regular maintenance program aimed at ensuring structure functionality and safety and increasing operational life;
- improve structural quality by reinforcing infrastructures;
- increase road linkage functionality through improved alignment;
- increase road system safety through action at locations with a high incidence of accidents and a high share of truck traffic; and
- further develop the system by giving priority to initiatives that improve safety, reduce congestion and improve access to specific areas, especially outlying areas.

Appendix E provides the reader with a text prepared by the MTQ describing more in detail its direction over the next five years.

2. The upper tier Québec highway system

The following projects are included among those that the MTQ will carry out on the highway system under study:

- Route 185, between Dégelis and Saint-Patrick-de-la-Rivière-du-Loup in the Lower St. Lawrence region. This highway links the Maritimes to the other Canadian provinces. Construction work is intended to improve safety on this route, which includes numerous intersections, and to increase user maneuverability (to improve passing opportunities). Work will be completed in 1999.

- Route 138 (St. Anne Boulevard) between the municipalities of Boischatel and Sainte-Anne-de-Beaupré. This section of highway is one of the most dangerous in the Province. Construction work is mostly intended to improve safety and will be phased over four years from 1998 to 2001.

- Route 138 (15 km) between Tadoussac and Grandes-Bergeronnes, where work was begun in 1997 and chiefly involves road resurfacing and reinforcement. The project is slated for completion in 2001.

- Highways 175 and 169 in the Saguenay–Lac-St-Jean region, from Stoneham to Laterrière and Hébertville. Work will be conducted over five years from 1998 to 2003 and includes adjusting curve alignment, building slow-moving traffic and passing lanes as well as auxiliary lanes, adjusting road grades and redesigning intersections.

- Route 155 in the Mauricie region. The plan includes three phases: rebuilding Route 155 South between Grand-Mère and La Tuque, bypassing the city of La Tuque and rebuilding Route 155 North between La Tuque and the Lac-Saint-Jean region. Work begun in 1996, will continue into 2004 and is intended to make this main highway safer and more rideable.

3. The Montréal area highway system

In a speech delivered recently to the Chamber of Commerce of Metropolitan Montréal (March 26, 1999), the Québec Minister of Transport announced that the government would invest over $500 million over the next five years (2000-2005) in highways and public transit in the Greater Montréal area.

Over $280 million will be spent to improve the area's highway infrastructure quality. This amount includes $201 million to preserve, improve and develop the system as well as implement measures to solve the problem of traffic congestion.

Projects proposed by the Ministry include the following:

- work aimed at reducing local traffic and increasing traffic flow on Autoroute Métropolitaine. Only 10% of traffic on this expressway travels across the city, whereas the remaining vehicles use it to travel short distances. The MTQ therefore wishes to make the Métropolitaine a transit route;

- due to saturation levels on Autoroute Métropolitaine, a second east-west expressway is being considered. Related work could involve extending Autoroute 30 between Chateauguay and Vaudreuil (35 km) and between Candiac and Sainte-Catherine (7 km). In this respect, the MTQ is now awaiting a work authorization certificate for a 35 km segment. It is currently responding to questions from the Bureau d'évaluation environnementale regarding the section linking Candiac and Sainte-Catherine;

- redevelopment of the Dorval and Côte-de-Liesse interchanges on Autoroute 520;

- redevelopment of the l'Acadie traffic circle on Autoroute 40;

- improvements are also being considered on routes 720, 40, 25, 15 and 10. This project will be submitted to the Council of Ministers for approval. Redevelopment of Autoroute 40 access ramps at Ville d'Anjou is also planned;

- improvements to the traffic circle near the Mercier Bridge as well as other highway infrastructure redevelopment projects on Mohawk land;

- consideration is being given to improving traffic capacity on Notre Dame Street, between Autoroute Ville-Marie and the new Autoroute 25 access lane, in order to improve service to the Port of Montréal and the industrial area in the eastern part of the city; and

- construction of new access ramps at the Salaberry interchange on Autoroute 15 in Montréal, as well as at the autoroutes 13 and 440 interchange at Laval, in order to improve traffic flow.

More than $85 million will be expended to preserve structures and road surfaces. This amount will fund projects including major resurfacing of Autoroute Ville-Marie (A-720), between the Ville Marie Tunnel and the Turcot interchange; improvements to the Mercier Bridge (Route 138) and the Lepage Bridge (A-25) linking Laval and Terrebonne.

4. Provincial projects

Contacts were made with the transport ministries of Ontario and New Brunswick as well as the departments of transport of neighbouring American states (Maine, Vermont, New Hampshire and New York) to obtain information on future projects that will perhaps affect the effectiveness of freight transport between Québec and these jurisdictions. The contacts identified those projects which could alter, over the longer term, the profile of commercial vehicle movements to or from Québec.

a) Ontario

According to information provided:

- a major contract valued at over $10 million has been awarded to upgrade to four lanes a heavily traveled 9.1 km segment of Highway 417, west of Ottawa. This project should be completed by the end of October 1999.

- the Ontario government plans to considerably increase spending in support of system preservation, improvement and development, compared to amounts expended for this purpose over the past decade.

b) New Brunswick

Major freight transport projects that New Brunswick intends to undertake in the medium-term concern linkages with states in the U.S. North-East.

5. Projects in the northeastern United States

The main project planned in the northeastern states involves improving routes 9 and 2 across Maine, New Hampshire and Vermont in order to develop an east-west expressway at the St. Stephen's border crossing into New Brunswick (Calais in Maine) to Interstate 89 in the State of Vermont. The expressway will extend to the Philipsburg border crossing in Québec. In fact, the American Secretary of Transportation has given the go-ahead (May 28, 1999) and awarded initial funding of $1,500,000 for construction of a new border crossing at Calais as part of the east-west expressway project.

Should the federal government approve the proposed investments, the development of a corridor in the northeastern United States will have a strong economic impact on New Brunswick, the Canadian trading partner generating the highest number of truck trips to the State of Maine. New Brunswick has committed to improving infrastructures under its jurisdiction that are adjacent to the corridor. The corridor will also facilitate trade between the three American states and Québec. It provides the shortest route between Halifax (Nova Scotia) and Montréal as well as the western provinces.

This project has already been approved by all Atlantic Provinces as well as by the Atlantic Provinces Transportation Commission and the Eastern Border Transportation Coalition (EBTC), of which the Québec and Ontario transport ministers are members.

In addition to developing the commercial vehicle corridor described above, Maine, New Hampshire and Vermont intend to amend their regulations, make greater use of Intelligent Transport Systems and improve highway infrastructures.

a) Maine

- According to the integrated freight transport plan of the State of Maine, border crossing operational effectiveness is critical to improving trade with Canada as well as to its own role as a new important link in international trade with Canada. Indeed, Maine shares twenty-two border crossings with Canada—seventeen with New Brunswick and five with Québec—and operational effectiveness could be improved at these locations by the introduction of Intelligent Transport Systems which would support exchange of information on the carrier and the vehicle at crossings and major highway links, without vehicles being required to stop. Implementing such systems is difficult however given the large number of public and private sector stakeholders involved in highway freight transport.

- Negotiations undertaken by the U.S. and Canada under NAFTA on potential harmonization of commercial vehicle weight and dimension restrictions will have an impact on related policies of the northeastern states. Generally speaking, federal and American state standards are more stringent than those adopted by Canadian provinces.

- In terms of infrastructure, Maine has published a document setting out priority projects on a six-year planning horizon. Funding required to improve the system is mainly provided by the federal government which is added to special highway funding contributed by the State. Under the *Transportation Equity Act for the 21st Century* (TEA-21) adopted by Congress and authorizing highway, safety and public transit programs as well as those involving other modes of surface transportation over the next six years, Maine will receive approximately $126 million annually to be applied to highway and bridge improvement over the period.

- Maine recognized the need to rebuild or improve approximately 20% of the public highway system (6,760 km) to meet modern safety standards and provide adequate structural capacity.

b) New Hampshire

- With the exception of improvements to Route 2 under the east-west expressway project across the northeastern states, New Hampshire is not planning any new investments prior to 2005 in the northern part of the State.

c) New York

- The New York Department of Transport has given priority to implementing Intelligent Transport Systems for commercial vehicles. The I-95 project is an accurate reflection of this priority. The program is based on the development of strategic plans for each region of the state, both urban and rural. The State is now establishing a regional transport management board to coordinate efforts aimed at streamlining operations at border crossings shared with Canada.

- New York will invest $12.6 billion in highway and bridge improvement initiatives from 2000 to 2005.

- The Department of Transport recently completed an assessment of border crossings, including the one located between Interstate 87 (State of New York) and Autoroute 15 (Québec) at Lacolle. A number of operational and infrastructure needs have been identified which will facilitate freight transport once they are met. Safety is also a major concern for the state. In the interest of safety, the Department wishes to set up a commercial vehicle inspection site (equipped with Intelligent Transport Systems, in-motion weighing facilities, commercial data exchange resources, etc.) immediately to the South of the crossing.

d) Vermont

- Reconstruction of Route 78, which is linked to Interstate 89, as well as the Missisquoi Bridge is planned.

B. Rail system

Considering that the rail system is underutilized, there are few infrastructure projects that are planned. Most initiatives involve improving existing services, especially in the area of intermodal rail transport.

1. Canadian National

As stated in Chapter IV, Ecorail, a CN wholly-owned subsidiary, operated until recently the 3R system linking Drummondville, Québec, and Mississauga (Malport), Ontario. However, for technical reasons, the 3R system was withdrawn from service and will be replaced by RoadRailer technology in 1999. A new terminal will be built at the Taschereau marshalling yard to replace the Drummondville terminal. The Malport terminal at Mississauga will continue to serve Toronto. CN will initially run two 60-trailer trains daily in either direction.

Regarding the Québec infrastructure, CN stated its intention to increase line capacity between Montréal and Québec City, given that traffic is practically at the capacity level.

2. St. Lawrence & Hudson

St. Lawrence & Hudson (SL&H) has been operating "Iron Highway" or "Expressway" technology for over a year between Montréal and Toronto. At present, two 20-platform trains run per day in either direction between Montréal and Toronto. However, significant expansion is planned for 1999 with the aim of tripling service levels and extending operations to Detroit. Train capacity will be increased from 20 to 60 platforms per train. Platforms are able to accommodate any combination of conventional (non-reinforced) semitrailers. Expressway clients are trucking firms and the service provided will therefore be a cooperative arrangement between the rail and trucking industries.

Three new terminals are slated to be built at Montréal's Côte-Saint-Luc marshalling yard, as well as at Milton, Ontario, and Detroit, Michigan. SL&H is committing over $80 million over the next two years to the purchase of new equipment, the construction of the three terminals and the development of supporting information systems.

The company will also increase the capacity of its Lachine intermodal yard from 120,000 to 180,000 containers/trailers per year, or 50%. Expansion will be completed by 2000.

Finally, the Côte-Saint-Luc repair and maintenance workshop is beginning to maintain car and vehicle fleets belonging to other organizations such as the Agence métropolitaine de transport. This year, a new partner, Progress Rail, will take over part of the workshop in order to service other clients such as short line railways.

3. Short line railways

A few short line railway projects were also identified, including the following:

- establishment of new distribution centres in Québec City (Henri IV Yard) by QGRY for handling lumber and automobiles; and
- construction of a new yard at Magog by the QSR to replace the Farnham yard, as well as a new intermodal terminal at the same location.

VIII

Observations And Recommendations

In order to remain competitive, shippers are paying greater attention to logistics in the marketing of their products and are evaluating their supply and distribution methods. Transport is an essential component of the logistics system and hence of the economic competitiveness of a company, a region or a territory.

Generally speaking, changes in freight transport demand characteristics over the past two decades (just-in-time, door-to-door, increased frequency, improved reliability and shorter transit time as well as greater flexibility) and market internationalization have favoured trucking in the Québec and Canadian freight transport markets, as well as across the continent.

Trucking will therefore play an increasingly important role in the transport of freight and the significance of this mode of transport must be recognized. To this end, a safe and sound highway system must be maintained, as well as one that offers sufficient capacity, for the transport of passengers and goods.

However, rail transport is also forecasted to expand, at a more rapid pace even than that of the trucking industry. The revitalization of rail transport in Québec is mainly due to intermodal transport. It is therefore necessary to protect the rail system and promote intermodality as well as the integration of various modes of transportation in order to achieve optimum use of surface systems.

In view of information compiled on the current situation and future plans in the surface transport sector, and taking into account forecasts by mode, one may identify those elements that are essential to improving the effectiveness of surface freight transport and to improving linkages with marine and air transportation.

A. Reliable and effective highway infrastructure

Following two decades of intensive development in the sixties and seventies, the Québec highway system underwent few further developments. According to the Ministère des Transports du Québec, considerable investments will have to be made over the next few years to adequately maintain and develop the highway system.

Generally speaking, the highway system is well developed outside metropolitan areas. However, the Montréal Metropolitan area, which serves as a freight transport mode, is incomplete. Indeed, it is currently impossible for a truck to travel East or West without using the Montréal Island highway system. This is in spite of the fact that the majority of bridges and arterial highways on the island are at capacity levels in peak periods. As well, peak periods are growing progressively longer. Thus, one can conclude that road congestion in the heart of the Montréal area and the lack of alternative routes are ever-growing impediments to regional economic development.

Road damage caused by trucking is also a major problem. This is due to the fact that, for the most part, the Québec highway system was not originally designed for the current levels of truck traffic and the present authorized load limits. Furthermore, highways are aging and are thus vulnerable to deterioration.

The Ministère des Transports du Québec (MTQ) is seeking to manage road infrastructure ever more effectively. In order to manage heavy vehicle movements, the MTQ has taken specific measures including the implementation of a trucking road network, the adoption of a policy governing heavy vehicle travel through municipal road networks, and the establishment of regulations for the purpose of limiting and controlling commercial vehicle loads and dimensions at all times and especially during thaw periods. In and around Montréal, the MTQ has implemented a traffic management system on major expressways in order to alleviate congestion and increase travel reliability.

Furthermore, in view of the lack of a body responsible for government-wide integration of highway safety directions and standards, the MTQ established the Table de concertation Industrie/Gouvernement sur la sécurité des véhicules lourds in 1998. Under its mandate, the roundtable is tasked with implementing a safety action plan. Its areas of responsibility are threefold: legislation and compliance; training; and road user awareness.

Traffic forecast analysis shows a growth rate over the next several years which is in keeping with general traffic growth forecasts for Québec as a whole. In general terms, therefore, no specific measures are being considered to accommodate increasing traffic caused by freight transport.

The MTQ’s future plans are similar to those of neighbouring provinces and states in that they provide for technical solutions in response to demand. However, funding of related projects is far from certain and, in this respect, Québec is not alone. All other jurisdictions are facing similar problems and many have turned to the private sector to meet their financial requirements.

Therefore, in order to conserve and improve the highway system and ensure its reliability, we recommend:

- that, given the important role of highway transport in economic development, the various levels of government give priority to funding projects which preserve and develop the system and consider partnerships with the private sector for this purpose;

- that ways be examined to complete the Montréal area highway system to solve the problem of system discontinuity and to improve reliability;

- that sections of travel corridors located in Québec have all the necessary features to encourage external trade in order to ensure effective transport of freight with interprovincial and international markets. As an example, it should be mentioned that the second most important corridor in terms of Québec/United States trade is the Philipsburg border crossing, where a national highway (Route 133) joins up with Interstate 89 in Vermont. This international corridor could become considerably more important if the project involving development of an east-west expressway across the northeastern states is carried out;

- that highways be designed to support truck traffic levels sufficient to ensure effective freight transport in the intraprovincial market, as well as effective and reliable transport of primary products from source regions; and

- that initiatives are undertaken with respect to system deterioration caused by heavy vehicles through adequate regulation and control of loads and reinforcement of highway infrastructure when road improvement work is performed. As mentioned, the MTQ has already determined that routes 117 in the Abitibi, 138 on the north shore and 155 in the Haute-Mauricie do not meet current requirements for highway freight transport.

B. Using new technologies

Generally, studies conducted both in Canada and the United States have tended to show that the benefits of ITS outweigh their costs, sometimes quite significantly. Though results are not as conclusive regarding freight transport, they nonetheless demonstrate that wise use of ITS in this area can result in benefits that are far from negligible. There is every indication that this holds true for Québec as well.

Deregulation and free trade agreements encourage freight traffic between countries (Canada and the United States), as well as among the regions of a country (provinces and states), thereby prompting stakeholders to simplify control procedures, thus facilitating automated system implementation.

Technically speaking, vehicle identification systems mostly rely on electronic label technology (transponders) coupled with dedicated short range communications.

With respect to government initiatives, auditing and validation projects in major corridors are the most advanced and such projects unquestionably demonstrate that there are benefits to be achieved both by government agencies and by motor carriers. For example, reference is made to Revenue Canada (Customs) participation in the North American Commercial Trade Automation Prototype project (NACTAP) which enables data element, format, code and electronic data interchange systems standardization.

Québec's ITS needs are essentially the same as those of its neighbours to the south. There is no doubt that ITS application to Québec freight transport holds significant potential.

Therefore, in order to assess ITS feasibility in Québec, we recommend:

- that Québec give priority to developing an action plan for applying ITS to the transport of goods within the province to meet industry needs, which are essentially identical to those of its neighbours to the South. In the short run, the action plan should initially emphasize electronic audit and validation systems;

- that the above-mentioned plan be undertaken in conjunction with that put forward by the federal government (ITS Plan) to promote Intelligent Transport Systems development and deployment. The ITS Plan has five elements: partnership with all stakeholders, development of a Canadian ITS architecture, a multimodal research and development plan, ITS deployment and integration and strengthening of the Canadian ITS industry;

- that active participation in Intelligent Transport Systems demonstration projects being conducted by Québec's partners be carried out in order to derive maximum benefit from these efforts. In this respect, particular attention should be given to the AVION project (Automated Vehicle Identification Ontario, which is essentially an Ontario extension of the American Advantage I-75 project);

- that the action plan be jointly validated by stakeholders and that the exchange of views for this purpose be supported by specialized associations (such as the Association québécoise du transport et des routes—AQTR) to achieve the widest possible consensus.

C. Harmonized regulations

The *Act respecting Owners And Operators Of Heavy Vehicles*, enacted by the MTQ in 1998, established a new framework for heavy vehicle users. The act is essentially aimed at protecting highway users and highway system assets.

Québec weight and dimension standards have evolved considerably over the past few years. In October 1998, the Province adopted a new regulation amending the *Règlement sur les normes de charges et de dimensions applicables aux véhicules routiers et aux ensembles de véhicules routiers* was adopted. The regulation is a result of discussions conducted with neighbouring provinces to achieve a common standard for most commonly used heavy vehicles. However, Ontario did not ratify the agreement achieved as a result of the discussions.

To this day, individual states and provinces are free to establish weight and dimension standards to be applied within their jurisdiction.

Canadian, American and Mexican standards and policy harmonization is one of the elements contemplated by NAFTA. Terms of the agreement deal with harmonizing, within three to six years, vehicle operation and safety standards, including those related to driving permits, equipment, transport of dangerous goods, as well as cross-border operations with respect to bills of lading, vehicle weight and dimensions, customs procedures, etc. Important harmonization issues are the eventual development of a standard North American bill of lading (transport contract) and cabotage regulations.

In Canada, the AIT outlines arrangements related to the harmonization of the following subjects: the adoption of uniform rules concerning vehicle weights and dimensions, the elimination of licences for extraprovincial truckers, complete implementation of the Canadian Highway Safety Code, the establishment of a national bill of lading, and the preparation of a work plan to determine the administrative arrangements to harmonize areas such as fuel tax collection and licencing.

Therefore, in order to ensure effective transport of freight in interprovincial and international markets, priority must continue to be accorded to harmonizing standards as specified in the AIT and NAFTA respectively.

D. Preservation and operation of the rail system

The MTQ is concerned with the preservation of the Québec rail system. It is recognized that rail transport is essential for certain Québec regions, and an assistance program is now being developed in this area. The program will enable the MTQ, in cooperation with other government and private sector partners, to assist short line railways in maintaining an essential railway system.

Although no problems were raised in terms of the effective operation of trains between Québec and the United States with respect to Québec border crossings, it must be recognized that Québec rail traffic transits through border crossings outside the Province (for example, at Windsor/Detroit, where problems have occurred in the past with marine containers). This demonstrates the need for cooperation among provinces, and the governments of Canada and the United States to ensure that customs clearance procedures and mechanisms are in effect to support the effective operation of trains and expeditious carriage of freight along the entire border.

E. Intermodality and modal integration

To ensure that optimum use is made of surface transport systems, it is necessary to promote intermodality and modal integration.

Although rail/highway integration is expanding, it has yet to occur in most Québec regions. New technologies such as “Expressway” offer promising means of providing service to remote regions as well as reducing the requirement for highway system maintenance. It should be noted that the MTQ has set up a working group of shippers and carriers regarding truck and rail modal integration. The group’s mandate has two components. The first is short-term in nature and is aimed at seeking measures to be implemented quickly in order to encourage modal integration. The second is a medium-term effort for the purpose of defining action to be taken by the MTQ with a view to meeting the needs of shippers.

Integrating marine and highway transport is particularly relevant in the St. Lawrence River basin, and its port infrastructures and marine services (ferries and coastal shipping).

At present, there is insufficient use of marine transport for intraprovincial movements mainly due to trucking industry competitiveness and the sparse population of certain regional markets (such as the north shore).

In order to increase modal integration which can permit a better utilization of infrastructure for the transport of freight in Québec, it is necessary to promote the collaboration of all stakeholders in the transport chain and put in place information mecanisms which present to shippers, the available transportation options. In addition, it would be advantageous to closely examine methods to favour transport chains which include an efficient marine segment.

F. Competitive position of the St. Lawrence River and its ports

Efforts must be made to ensure that the St. Lawrence River and its ports maintain their competitive position in international markets for the transport of containerized and non-containerized goods (for example, bulk goods such as grain, coal and iron ore). Governments must recognize the importance of the St. Lawrence River for the economies of Canada and Québec and the pivotal role played by the Port of Montréal within the river system. In light of this, governments must support efforts to reduce shipping costs on the river and consider the competitive position of the river within the framework of all policies having an impact on this position.

The Port of Montréal must maintain its competitive position in international markets for the transport of containers if the Montréal area is to remain a freight traffic node. Land transport, and especially the rail system, is of paramount importance in this respect. The Port of Montréal is now near capacity levels for the handling of containers on the Island of Montréal and it may be required to extend its container handling facilities to other locations within five years (for example, Contrecoeur). In order to maintain the port's competitive edge, development of an effective land transport system (both highway and rail) to service the new terminal will be essential.

G. Availability of freight transport data

In conducting this study, the consultant was required to cope with the absence or lack of relevant or reliable data regarding freight transportation on several occasions. The following are examples of areas in which data are lacking:

- origins and destinations of freight movements by Québec regions and mode of transport;
- origins and destinations of freight movements by province and border crossing;
- value of freight trade between Québec and other Canadian provinces (such information is only available between Québec and American states);
- details of railway line operations in Québec of the transcontinental railway companies, which are unavailable for reasons of confidentiality; and
- details on traffic volumes transported by private trucking.

It should be noted, however, that the 1999 National Roadside Survey conducted under the guidance of the Canadian Council of Motor Transport Administrators (CCMTA) should bring a significant improvement in data concerning truck transport.

Discontinuity of certain data (for example, changes made in 1996 and 1997 to the Statistics Canada's origin/destination survey methods for common carriers) also put in doubt the general trends of the trucking industry described in this report.

It is recommended, therefore, that all levels of government take action to improve the availability and reliability of data for all transport modes in order to enhance their planning initiatives in support of an effective an efficient transport system for Québec and for Canada.

Appendix A

Bibliography

Association des constructeurs de routes et grands travaux du Québec, *Les infrastructures routières du Québec : propositions de financement*, juillet 1996.

B.B.L. Inc., *Étude relative au transport intégré des marchandises dans la région de Montréal, volet routier*, janvier 1996.

Beauchemin-Beaton-Lapointe Inc., *Étude relative au transport intégré des marchandises dans la région de Montréal, volet routier*, janvier 1996.

Canadian Council of Motor Transport Administrators, *National Roadside Survey, Project Report*, September 1997.

Canadian Council of Motor Transport Administrators, *National Roadside Survey Basic Data Set File Manual*, June 1997.

Canadian Council of Motor Transport Administrators, *National Roadside Survey Data Analysis Manual*, avril 1997.

Canarail, *Étude relative au transport intégré des marchandises et des matières dangereuses-volet ferroviaire*, janvier 1994.

CFORT, *Étude de préfaisabilité sur la création d'un service maritime routier sur le Saint-Laurent*, avril 1995.

Chambre de commerce du Montréal Métropolitain, de Laval et de la Rive-Sud, *Les infrastructures routières : une urgence pour le transport des marchandises*, rédigé pour présentation devant la Table métropolitaine des transports, février 1996.

Chartered Institute of Transport, *Proceedings-Freight Transportation Services Situation and Outlook Conference*, November, 1997.

Conseil des Infrastructures du Québec, *Programme national de réfection des infrastructures routières et urbaines, un projet de société—pour approbation*, février 1999.

Eastern Border Transportation Coalition, *Trade and Traffic across the Eastern US-Canada Border, An Assessment prepared for the EBTC and Member Agencies, Volume 2 : Statistical Review of Border Crossing Trade and Traffic Data*, March 1998.

Eastern Border Transportation Coalition, *Trade and Traffic Across the Eastern US-Canada Border, An Assessment prepared for the EBTC and Member Agencies*, May 1997.

Eastern Border Transportation Coalition, *Trade and Traffic across Eastern US-Canada Border, Volume 2 : Statistical Review of Border Crossing Trade and Traffic Data*, March 1998.

Institut maritime du Québec, *Étude des flux du Bas-Saint-Laurent*, mars, 1998.

KPMG, *Étude sur le transport ferroviaire des marchandises*, avril 1991.

KPMG, *Nature, ampleur et évolution de la conteneurisation au Québec*, juin 1997.

Ministère des Transports du Québec, Commission des Transports, Société de l'assurance automobile du Québec, *Feu vert ou feu rouge, Utilisateurs de véhicules lourds à vous de choisir, Obligations des utilisateurs de véhicules lourds*, novembre 1998.

Ministère des Transports du Québec, *Diagramme d'écoulement de la circulation 1992 (Carte).*

Ministère des Transports du Québec, Direction de l'Ile de Montréal, *Enquête Origine-Destination des camions du Port de Montréal*, juillet 1987.

Ministère des Transports du Québec, Direction de l'Ile de Montréal, *Enquête Origine—Destination des camions du Port de Montréal*, juillet 1987.

Ministère des Transports du Québec, *Données sur la circulation par numéro de route, de tronçon et de section, Recueil 1996.*

Ministère des Transports du Québec, *Enquête du CCATM au bord des routes sur le camionnage 1995, Résultats détaillés pour le Québec*, Services des politiques en transport multimodal, décembre 1997.

Ministère des Transports du Québec, *Étude de cas d'infractions relatives à la masse autorisée pour les véhicules lourds au Québec*, préparé par Gilles Gonthier, services des normes en transport routier des marchandises, Bulletin économique du transport au Québec.

Ministère des Transports du Québec, *Guide des normes de charges et de dimensions des véhicules*, Direction de la sécurité en transport, version préliminaire, novembre 1998.

Ministère des Transports du Québec, *Guide du Règlement sur le permis spécial de circulation*, décembre 1993.

Ministère des Transports du Québec, *Investissements du ministère des Transports 1998-1999, Ensemble du Québec*, avril 1998.

Ministère des Transports du Québec, *L'évolution du transport des marchandises au Québec de 1984 à 1995 : Le transport ferroviaire*, Bulletin économique du transport au Québec.

Ministère des Transports Du Québec, *Le transport des marchandises au Québec—Problématique et enjeux*—avril 1999.

Ministère des Transports du Québec, *Les États du nord-est des États-Unis : Portrait socio-économique et liens de transport avec le Québec*, Direction de la planification des transports, janvier 1997.

Ministère des Transports du Québec, *Métadonnées relatives aux routes, aux localités, à l'hydrographie, aux voies ferrées, aux aéroports et aux limites administratives*, Service de la géométrique et de la cartographie, décembre 1998.

Ministère des Transports du Québec, *Plan de transport de l'agglomération de Québec. Le transport multimodal, document de travail*, janvier 1996.

Ministère des Transports du Québec, *Plan de transport de l'Outaouais-Problématique, Orientations et Objectifs*, février 1994.

Ministère des Transports du Québec, *Portrait du réseau ferroviaire québécois*, Bulletin économique du transport au Québec.

Ministère des Transports du Québec, *Recensement de la circulation sur les routes du Québec, Rapport annuel* 1996.

Ministère des Transports du Québec, *Réseau de camionnage (carte)*, Édition préliminaire pour consultation.

Ministère des Transports du Québec, *Réseau routier, exploitation et camionnage, Plan de transport de la région de l'Abitibi-Témiscamingue*, février 1998.

Ministère des Transports du Québec, *Vers un plan de transport pour la Région de Montréal-Phase I : Choisir, Diagnostic et Orientations*, mars 1995.

Ministère des Transports du Québec, *Vision des transports pour la Côte-Nord (document pour consultation), avril 1998.*

Ministry of Transportation Ontario, Province of Ontario, 1995 *Commercial Vehicle Survey, Station Summary Report*, December 1997.

Montréal International, Le transport, *Un secteur stratégique pour la région de Montréal, préparé par Albert Juneau*, février 1998.

Ports Canada, *Tours d'horizon et répertoire.*

Raymond, Chabot MuniConsult, *Étude de l'impact de l'augmentation de charge de 59 000 KG à 62 500 KG du Train Double de Type B sur le Chemin de fer d'intérêt local du nord du Québec*, janvier 1998.

Research and Traffic Group, *Service intermodal de surface pour le transport domestique des marchandises dans le corridor Québec-Ontario*, réalisé pour le Ministères des Transports du Québec et de l'Ontario et pour l'Association des chemins de fer du Canada, novembre 1996.

Research and Traffic Group, *Service intermodal de surface pour le transport domestique des marchandises dans le corridor Québec–Ontario (sommaire exécutif)*, novembre 1996.

Société de l'assurance automobile du Québec, *Obligations des transporteurs et conducteurs de véhicules lourds*, avril 1997.

Société de l'assurance automobile du Québec, *Rapport d'activité 1997*, Deuxième trimestre 1998.

TAF Consultants, *Freight Transport Trends & Forecasts to 2010*, Rapport préparé pour "The Economic Analysis Directorate (ACA) Transport Canada," avril 1998.

Transport Canada, *Transportation and North American Trade (Draft)*, November 1998.

Transports Canada, *Canada–U.S. International Border Crossing infrastructure Inventories*, préparé par Regent Dickey, avril 1998.

Tsai, Joe, *Intelligent Transportation Border Crossing Systems*, Ministry of Transportation of Ontario, prepared for presentation at the Intelligent Transportation Systems (ITS) Session.

Appendix B

Conversion Tables

Conversion Table
Commodity categories—Truck transport

Transport Canada	Freight Transportation Study
1. Grain 2. Agricultural and food products	1. Agricultural and food products
3. Non-ferrous metals 4. Alumina and Bauxite 5. Coal 6. Fertilizer 7. Construction materials 8. Salt 9. Steel 10. Other bulk materials	2. Bulk and semi-finished products
10. Woodpulp 11. Newsprint 12. Logs and bolts 13. Pulpwood and chips 14. Lumber 15. Other forest products	3. Forest products
16. Petroleum 17. Chemical products	4. Petroleum and chemical products
18. Manufactured products 19. Other manufactured products 20. Other fabricated products	5. Manufactured products

Conversion Table
Commodity categories—Rail transport

Transports Canada	Freight Transportation Study
1. Grain	1. Agricultural and food products
2. Agricultural and food products	
3. Non-ferrous metals	2. Bulk and semi-finished products
4. Alumina and Bauxite	
5. Coal	
6. Fertilizer	
7. Construction materials	
8. Salt	
9. Steel	
10. Woodpulp	3. Forest products
11. Newsprint	
12. Logs and bolts	
13. Pulpwood and chips	
14. Lumber	
15. Other forest products	
16. Petroleum	4. Petroleum and chemical products
17. Chemical products	
18. Manufactured products	5. Manufactured products
19. Containerized freight	6. Domestic intermodal (piggyback and containers)
20. TOFC	7. Marine containers
21. Other	

Appendix C

Zones Of The United States

Table C-1
Zones of the United States

North-East	North-Centre	South	West
Connecticut	North Dakota	Alabama	Alaska
Maine	South Dakota	Arkansas	Arizona
Massachusetts	Illinois	North Carolina	California
New Hampshire	Indiana	South Carolina	Colorado
New Jersey	Iowa	Delaware	Idaho
New York	Kansas	District of Columbia	Montana
Pennsylvania	Michigan	Florida	Nexada
Rhode Island	Minnesota	Georgia	New Mexico
Vermont	Missouri	Kentucky	Oregon
	Nebraska	Louisiana	Utah
	Ohio	Maryland	Washington
	Wisconsin	Mississippi	Wyoming
		Oklahoma	
		Tennessee	
		Texas	
		Virginia	
		West Virginia	

Appendix D

Growth Rates

TRUCK TRAFFIC ORIGINATING IN QUÉBEC

	ANNUAL GROWTH RATE (%)			
Commodity categories	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Agricultural and food products	8.9	3.5	2.2	3.0
Bulk and semi-finished products	15.0	0.2	1.8	0.8
Forest products	18.6	(0.8)	2.9	0.6
Petroleum and chemical products	6.1	5.1	3.2	4.3
Manufactured products	12.9	1.6	2.0	1.8
Total	**13.8**	**1.2**	**2.4**	**1.6**
Major destinations				
Ontario	8.5	1.5	2.4	1.9
Maritimes	9.8	(0.5)	1.1	0.1
West	11.3	(1.3)	1.0	(0.4)
Sub-total Canada	**10.9**	**1.1**	**2.1**	**1.5**
North	23.7	2.0	4.6	3.0
North-East	15.7	1.6	1.9	1.8
West	17.2	(1.0)	1.4	(0.1)
South	21.8	(1.2)	1.8	(0.1)
Sub-total United States	**18.4**	**1.2**	**2.6**	**1.8**
Total	**13.8**	**1.2**	**2.4**	**1.6**

TRUCK TRAFFIC DESTINED TO QUÉBEC

	ANNUAL GROWTH RATE (%)			
Commodity categories	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Agricultural and food products	6.6	0.7	2.3	1.3
Bulk and semi-finished products	8.5	(1.4)	1.4	(0.4)
Forest products	7.4	1.3	2.1	1.6
Petroleum and chemical products	0.5	4.0	2.1	3.2
Manufactured products	17.7	4.3	3.7	4.0
Total	**9.3**	**1.5**	**2.5**	**1.9**
Major destinations				
Ontario	5.7	1.9	2.3	2.1
Maritimes	4.3	1.6	1.5	1.6
West	9.0	(1.3)	1.2	(0.3)
Sub-total Canada	**6.6**	**1.8**	**2.2**	**1.9**
North	26.8	(0.5)	2.2	0.5
North-East	14.8	2.5	3.2	2.7
West	27.8	(4.6)	0.9	(2.5)
South	21.8	(0.3)	4.3	1.8
Sub-total United States	**21.8**	**1.1**	**3.2**	**1.9**
Total	**9.3**	**1.5**	**2.5**	**1.9**

INTRAPROVINCIAL TRUCK TRAFFIC

	ANNUAL GROWTH RATE (%)			
Commodity categories	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Agricultural and food products	9.4	3.5	1.8	2.9
Bulk and semi-finished products	7.2	3.6	3.2	3.4
Forest products	15.2	1.0	1.3	1.1
Petroleum and chemical products	2.5	3.3	3.2	3.2
Manufactured products	1.8	1.2	1.2	1.2
Total	**8.1**	**2.1**	**1.9**	**2.0**

QUÉBEC IN-TRANSIT TRUCK TRAFFIC

		ANNUAL GROWTH RATE (%)			
Origines	**Destinations**	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Ontario	Maritimes	8.4	2.0	1.5	1.8
Maritimes	Ontario	12.3	(1.2)	1.0	(0.4)
North-East (U.S.)	Ontario	14.2	3.9	1.9	3.1
Ontario	North-East (U.S.)	8.5	3.2	1.8	2.7
Total		**10.7**	**3.0**	**1.7**	**2.5**

RAIL TRAFFIC ORIGINATING IN QUÉBEC

	ANNUAL GROWTH RATE (%)			
Commodity categories	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Agricultural and food products	(1.5)	(13.9)	0.5	(9.1)
Bulk and semi-finished products	11.1	1.6	0.2	1.1
Forest products	3.3	4.1	0.7	2.9
Petroleum and chemical products	(3.2)	(2.2)	1.1	(1.1)
Manufactured products	(2.6)	14.1	1.8	9.5
Intermodal domestic	6.5	2.5	2.5	2.5
Marine containers	11.9	4.0	4.0	4.0
Total	**5.6**	**2.8**	**1.7**	**2.4**
Major destinations				
Ontario	2.7	3.7	2.4	3.2
Maritimes	1.7	6.1	1.9	4.4
West	6.8	4.6	2.9	4.0
Sub-total Canada	**3.7**	**4.6**	**2.5**	**3.8**
Sub-total United States	**6.7**	**1.8**	**1.2**	**1.6**
Total	**5.6**	**2.8**	**1.7**	**2.4**

RAIL TRAFFIC DESTINED TO QUÉBEC

	ANNUAL GROWTH RATE (%)			
Commodity categories	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Agricultural and food products	9.6	(0.1)	0.7	0.2
Bulk and semi-finished products	(2.1)	(0.5)	0.7	(0.1)
Forest products	(3.0)	0.1	1.1	0.4
Petroleum and chemical products	(0.4)	0.2	0.2	0.2
Manufactured products	0.1	(1.6)	0.0	(1.0)
Intermodal domestic	9.7	2.5	2.5	2.5
Marine containers	9.7	4.0	4.0	4.0
Total	**3.4**	**1.0**	**1.6**	**1.3**
Major destinations				
Ontario	(1.5)	(0.4)	1.0	0.2
Maritimes	5.6	(0.4)	0.8	(0.1)
West	4.4	1.6	1.9	1.7
Sub-total Canada	**1.2**	**0.4**	**1.3**	**0.7**
Sub-total United States	**8.1**	**2.2**	**2.1**	**2.2**
Total	**3.4**	**1.0**	**1.6**	**1.3**

INTRAPROVINCIAL RAIL TRAFFIC

	ANNUAL GROWTH RATE (%)			
Commodity categories	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Agricultural and food products	17.3	0.6	0.0	0.4
Bulk and semi-finished products	0.7	4.5	0.9	3.2
Forest products	10.3	1.5	1.1	1.3
Petroleum and chemical products	23.5	5.0	0.7	3.4
Manufactured products	83.8	0.0	0.0	0.0
Domestic intermodal	(14.0)	0.0	0.0	0.0
Total	**7.6**	**3.9**	**0.9**	**2.7**

QUÉBEC IN-TRANSIT RAIL TRAFFIC

		ANNUAL GROWTH RATE (%)			
Origines	**Destinations**	**1992-1997**	**1997-2005**	**2005-2010**	**1997-2010**
Ontario	Maritimes	2.7	2.0	1.5	1.8
Maritimes	Ontario	13.6	(1.2)	1.0	(0.4)
United States	Martimes	14.5	3.9	1.9	3.1
Maritimes	United States	15.5	3.2	1.8	2.7
Total		**10.4**	**3.0**	**1.7**	**2.5**

Appendix E

MTQ Policy Concerning Interventions On Road Infrastructures Under Its Responsibility

MTQ Policy Concerning Interventions On Road Infrastructures Under Its Responsibility

In recent years, given the need to contribute to the effort to reduce the government deficit, the MTQ granted priority to the preservation of the road network, ensuring the quality of the roadways and strengthening limited-capacity bridges. It also maintained its objective of a reduction in road accidents, focusing on the most urgent interventions. Since these two objectives took the lion's share of the available budget, priority, in the area of road network development, was given to the optimization of the existing network.

In the next few years, given a growing five-year budget, it will be appropriate to pursue efforts to repair, maintain and improve road infrastructures in order to meet the most urgent needs and effectively support the growth of Québec's economy.

In the area of roadway preservation, given the current condition of the network and the needs of rehabilitation of cement concrete roadways, the proposed five-year strategy seeks to achieve uniform road conditions of high quality throughout the province, above all on the highways and on cement concrete roadways and, in decreasing order of priority, on roads of national, regional and collector networks.

Regarding the preservation of structures, it is proposed that we pursue the program to reinforce limited-capacity bridges begun in the early 90s, giving priority to the most heavily used corridors. This specifically targeted program applies in addition to the regular maintenance program, whose goal is to keep structures operational and safe, and ensure they have the longest possible service life.

In the area of road network improvement, the increased budget has made it possible to go beyond the fundamental objective of reducing road accidents and to seek improved structural quality by reinforcing infrastructures and improving their functional condition through geometric correction. Priority should be given to sensitive accident areas and to the sectors most heavily used by the trucking industry.

With respect to road network development, priority still needs to be given to interventions to improve safety, reduce congestion, and open up or improve service to the regions. Over the last few years, a special budget has been used to alleviate chronic congestion in the Montréal region.