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VOLUME I : FINAL REPORT

High Speed Rail Project
Light Freight and Station
Concessions Market Study

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Light Freight and Station Concessions Market Study

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FOREWORD

The Final Report on the Light Freight and Station Concessions Market Study, which was conducted in the context of the High Speed Rail Project in the Québec/Windsor corridor, is presented in two volumes. This document (Volume I) contains an executive summary covering the whole study, followed by separate reports on the two study components as follows:

Part I - Final Report on the Light Freight Market Study.

Part II - Final Report on the Station Concessions Market Study.

Volume II, entitled: "Appendices to the Final Report on the High Speed Rail Project Light Freight Market Study", contains more detailed material (e.g. tables of figures, texts of questionnaires) related to the light freight component of the study. The appendices related the station concessions component are included in the present volume.

EXECUTIVE SUMMARY

The raison d'être and principal source of revenue for a Canadian high-speed rail (HSR) system is the transportation of passengers. However, additional revenues could be derived from light freight operations and station concessions. These are the subject of the present study.

A LIGHT FREIGHT OPERATIONS

Our estimation of the potential net revenues from light freight operations was carried out for two high-speed rail technologies. The first would involve TGV-type rolling stock and would be capable of speeds of over 300 kilometres per hour. The second would involve X-2000 rolling stock and could attain speeds of over 200 kilometres per hour. Two routing options were considered for the first technology, giving rise to three technology/route combinations, i.e.:

- 300 kph technology on existing right-of-way
- 300 kph technology on new right-of-way
- 200 kph technology on existing right-of-way

Three potential sources of light freight traffic were evaluated: courier traffic, less-than-truckload (LTL) traffic and air cargo traffic moving by truck. Two types of operation were considered: specialized light freight cars on mixed trains versus dedicated light freight trainsets running during the day or at night. Similarly, two potential roles were considered for the high-speed rail operator: that of a courier (retailer of transportation service) versus that of a carrier (wholesaler of transportation service).

The overall market potential for the selected traffic types was defined, and the estimated market shares likely to be attracted by an HSR light freight system were estimated. Two scenarios were developed for the market share estimates: a minimal scenario and a most probable scenario. The resulting potential volumes were then projected to the HSR start-up year and for the first 20 years of HSR service. Separate

results were developed by province, and for the implementation of HSR service on two segments of the Québec-Windsor corridor.

1. Sources of HSR Traffic

The starting point of our analysis was a study of three potential sources of light freight traffic. This involved a thorough definition of market volumes by origin-destination pair and by mode. Three techniques were used to define the market: Statistics Canada publications, a survey of the major courier companies in the corridor, and interviews with selected shippers in representative industries involved with light freight operations. In addition to traffic volumes, other important characteristics of the traffic (modes used, imbalances, service characteristics considered important) were identified.

These techniques were used to draw up profiles of the three types of traffic. The resulting profile of air cargo traffic showed that it was not a suitable candidate for diversion to high-speed rail, for two reasons. First, the HSR routing options being considered did not, for the most part, serve the relevant airports. Second, HSR equipment could not accommodate the types of containers used most frequently in air freight operations. Further analysis was, therefore, limited to the other two types of traffic.

2. HSR Service Options

The HSR service options (mixed vs. dedicated trains, retail vs. wholesale orientation) were then assessed. It was found that mixed trains could provide only very limited freight capacity if passenger trip times could not be increased and probably could not be accommodated at Central Station in Montréal or Union Station in Toronto without major modifications to these facilities. Dedicated freight trains running during the day would serve a very small portion of the market. Dedicated night trains could meet the most critical service requirements of the market (i.e. departure as late as possible from the origin city and delivery as early as possible at the destination city), would not interfere with passenger trains and might be able to use the passenger locomotives.

If the HSR operator were to act as a retailer it would have to invest massively in areas outside of its expertise. It would also have to compete with the courier companies in a highly competitive market presently characterized by excess capacity. Air Canada's experience in this market is particularly instructive on this point. On the other hand, the HSR operator could complement the courier industry as an intercity carrier or wholesaler by offering cost-effective transportation, particularly in city pairs with traffic imbalances or small quantities of courier traffic.

On the basis of this assessment, the remainder of the study was conducted for dedicated trains running at night, with the High Speed Rail operator acting as a wholesaler of transportation service.

3. Traffic Projections and Market Shares

Overall traffic levels were projected for the two remaining traffic types (courier and LTL) to the HSR start-up year (2005) and year-by-year for the first twenty years of operation (i.e., to 2024). At the outset of the study it was hoped that the surveys and interviews would provide market trend lines and projections. However, information from this source was limited and self-contradictory. Econometric data provided by Informetrica were therefore used to project total traffic volumes.

Minimal market-share scenarios were developed for all three technology/routing combinations on the assumption that the courier industry would use HSR solely on an overflow basis, i.e., to correct directional imbalances and carry traffic amounting to less than one truckload per day. In these scenarios, LTL traffic is considered primarily as a backhaul to courier traffic. This resulted in market shares of around 20 to 22 percent of courier traffic and 6 percent of LTL traffic.

Most probable market shares were developed by adding traffic to this minimal scenario. This additional volume was estimated at 5 % for shorthaul and 10 % of longhaul courier traffic (applied to the lowest directional volume) and 5 % (with certain exceptions) of LTL traffic. Under these assumptions, HSR's market shares rise to around 24 to 26 percent of courier traffic and 10 percent of LTL traffic.

4. Costs and Revenues

Light freight HSR operations on a scale required to carry the estimated traffic were developed in sufficient detail to estimate capital and operating costs. These were estimated for the three technology/routing combinations and the minimal and most probable traffic levels. In addition, capital costs were estimated both including and excluding locomotives, since night operations may allow for the use of passenger locomotives in freight service. More generally, cost estimates were made on the assumption that the HSR system would be developed to serve passengers. Only the additional costs created by the addition of a freight service were included.

The resulting capital costs range from $ 193 million to $ 303 million for the minimal traffic scenario and from $ 209 million to $ 409 million for the most probable scenario. Operating costs did not very greatly between the technology/routing options. For the start-up year (2005), they were estimated at around $ 21 million annually for the minimal, and $25 million for the most probable, market-share scenarios.

Separate pricing strategies were developed for the courier and LTL markets, taking account of HSR costs and demand factors specific to each market (primarily the costs to potential clients of using other modes). The resulting average prices were applied to the estimated traffic volumes to develop gross revenues. For the minimal market-share scenario these ranged from $ 75 to $ 78 million at start-up, growing to $ 143 to $ 148 million after 20 years of operation. For the most probable market share scenario, the corresponding figures were $ 102 to $106 million at start-up and $ 200 to $ 206 million after 20 years. Courier traffic accounted for more than 55 % of the total revenue under the minimal market-share scenario, falling to around 50 % in the most probable case.

Net operating revenues were developed by subtracting operating costs from the gross revenues. These were on the order of $ 32 to $ 36 million at start-up, growing to $ 61 to $ 65 million after 20 years of operation, under the minimal market-share scenario. Under the most probable market-share scenario, the corresponding figures are $ 47 to $ 49 million at start-up $ 86 to $ 90 million after 20 years of operation. Detailed results by origin-destination pair were used to allocate the net operating revenue between the two provinces.

Capital costs were annualized using a loan payment function and subtracted from net operating revenues to arrive at net revenues. These were on the order of $ 20 to $ 23 million at start-up, growing to $ 40 to $ 46 million after 20 years of operation, under the minimal market-share scenario. Under the most probable market-share scenario, the corresponding figures are $ 31 to $ 36 million at start-up $ 59 to $ 70 million after 20 years of operation.

5. Analysis by Segment

The study also required the evaluation of the Montréal/Ottawa/Toronto segment was as a stand-alone segment, and of the addition of the Montréal/Québec segment resulting in a system running from Toronto to Québec.

The analyses by segment show disproportionate declines in net revenues relative to full corridor operation, due to loss of synergy on the revenue side coupled with the effects of economies of scale on the cost side.

Net operating revenues for the various combinations of market share scenarios and technology/route combinations Montréal-Toronto segment range from 26 to 37 percent of the corresponding figures for corridor-wide operations. When the Québec-Montréal segment is added, net revenues rise to between 64 and 71 percent of their corridor-wide counterparts.

6. Conclusions

The following major conclusions can be drawn from the light freight market study.

- The volumes of courier and LTL traffic moving within the Québec/Windsor corridor are considerable.

- The HSR operator would be more likely to succeed in this market by assuming the role of carrier or wholesaler.

- Any light freight HSR system should operate with dedicated trainsets running at night.

- The net operating revenues generated by all three technology/ROW options are significant.

- Partial implementation of the HSR light freight system would have minor impacts on potential market shares, but losses in economies of scale involved in implementing a smaller system would lead to inferior financial performance. Nevertheless, light freight remains a profitable sideline for HSR in all cases.

B STATION CONCESSIONS

The station concessions component of this study examined the potential revenues available to an HSR Authority from concessions present in stations associated with the HSR system. The objective was to identify the mix of businesses and the total amount of retail space supportable for concession operations, for each station, that would potentially maximize net concession revenues to the HSR Authority over the next 20 years.

Facilities comparable to the proposed HSR stations were interviewed in order to obtain information on the numbers, types and potential revenues associated with concessions, and how this information varies with different levels of passenger traffic passing through these facilities. After constructing an appropriate computer model, passenger ridership forecast information was entered for each station, and the mix and revenue from concessions was calculated.

Two ridership forecast scenarios were provided by the Project Coordinator to use in developing concession revenues. Specifically, these are the "consensus" trip forecasts for:

(1) a 300 kilometer-per-hour train on the composite route via Mirabel; and,

(2) a 200 kilometer-per-hour train on the composite route via Dorval.

We were provided with a forecasts of trips for each scenario, in each of the years 2005 and 2025.

Two revenue forecasts were carried over the course of the assignment; these were:

1) an *unconstrained market potential forecast* showing the amount of concession retail revenues that would be supportable by the market alone, assuming no constraints on the amount of space that would be developed or allocated for concession operations, and assuming that the High Speed Rail Operating Authority has the legal right to claim these operating revenues; and

2) a *supply-driven forecast*, which recognizes that there are important limitations on the amount of space that can be developed or allocated to concession operations because:

- the design of new stations (owned by the High Speed Rail Operating Authority) provides for only certain amounts of concession space, and

- other key stations are not owned by the High Speed Rail Operating Authority, which therefore may have no right of claim over any concession revenues generated.

The unconstrained market potential scenario shows significant potential revenue from station concession operations. Total concession revenues (in thousands of 1993 dollars) under these assumptions are as follows:

300 kph		**200 kph**	
2005	2025	2005	2025
$ 17,558	$27,811	$14,890	$22,828

The estimated revenues are substantially reduced in passing from the unconstrained to the constrained, or supply-driven, approach. Revenues estimated under this approach amount to only $ 1,176 thousand for a 300 kph service and $ 1,169 thousand for a 200 kph service, for the year 2005, i.e., only about seven or eight percent of the unconstrained, or market-driven, revenues. As the revenue potential is constrained by the supply of space to be provided, and as the estimate is made in terms of 1993 constant dollars, the forecast for 2025 is the same as for 2005.

PART I

LIGHT FREIGHT

MARKET STUDY

FINAL REPORT

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1.

INTRODUCTION

1. INTRODUCTION

The light freight component of this study examined the net revenues which could be generated by the transport of freight by a high speed rail (HSR) system. The evaluation of this market took into account the load limits and operating characteristics of two representative technologies: the X-2000 technology and the TGV technology. Three combinations of technology and right-of-way (technology/ROW options), as defined in the terms of reference, were assessed.

The study also addressed the evaluation of various traffic types, i.e. courier traffic, less-than-truckload (LTL) traffic, and air cargo traffic moving by truck. A number of potential HSR service options were analyzed: specialized light freight cars on mixed trains, light freight dedicated trainsets running during the day or at night, the HSR Authority acting as a courier or a retailer of transportation of services, and the HSR Authority acting as a carrier or a wholesaler of transportation services.

The overall market potential for the selected traffic types was defined and the market shares likely to be attracted by an HSR light freight system were estimated. Two scenarios were developed for the market share estimates: a minimal scenario and a most probable scenario. The resulting potential volumes were then projected to the start-up year (2005) and for the first 20 years of HSR service.

Gross revenues, operating costs and investment costs were estimated for each technology/ROW option and for each market share scenario. Estimated net revenues were then derived (by subtracting operating costs and annualized investment costs from gross revenues) for the first 20 years of HSR service in the entire Québec/Windsor corridor. Net revenues were established by province.

The study also required the evaluation of the Montréal/Ottawa/Toronto segment was as a stand-alone segment, and of the addition of the Montréal/Québec segment resulting in a system running from Toronto to Québec.

2.

PROJECT OBJECTIVES AND SCOPE OF WORK

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The objective of the light freight market study was to evaluate the net revenues which could be generated for an HSR authority by the transportation of light freight and small parcels in HSR trainsets.

In the Québec/Windsor corridor, small parcel services are an important source of revenues for courier companies, including Canada Post, as well as for airlines and bus companies. It is anticipated that this market could become an attractive source of revenues for an HSR system.

The evaluation of possible net revenues from such a market was conducted for various scenarios on the basis of the following parameters.

2.1. TECHNOLOGY / RIGHT-OF-WAY OPTIONS

Three technology/Right-of-way (ROW) options were initially identified for assessment in the overall project of which this study is a part. These options were retained for evaluating HSR participation in the light freight market. In addition to differences in operating speed and in the characteristics of the rolling stock, representative route alignments have been identified for the different technologies under consideration. These alignments differ in the city pairs to be served. The effects of all of these differences were taken into account in the present study.

The three technology/ROW options are:

a) 200 + kph on Existing ROW. This option involves X-2000-type technology. It is the only alignment that serves Dorval Airport directly. This would be the only airport directly served by HSR with this option.

b) 300 + kph on Existing ROW. This option involves TGV-type technology, and the alignment mostly serves the same cities as the 200 + kph on existing ROW option. Mirabel Airport could be served by this alignment but, in this case, it would be the only airport directly served by HSR.

c) 300 + kph on New ROW. This option involves TGV-type technology and is the only alignment that serves Kitchener-Waterloo, Pearson Airport, and Mirabel Airport.

2.2. ROLLING STOCK TECHNOLOGIES

The two representative technologies under consideration are X-2000 and TGV. The essential characteristics of the two technologies were determined, with the assistance of the manufacturers. The following characteristics are the most relevant for the transportation of light freight.

2.2.1. The X-2000 technology

Interior dimensions (available space):	79.2 ft long x 8.5 ft wide x 6.27 ft height (24m x 2.566m x 1.9m)
Container dimensions:	7 ft x 8.5 ft x 6.27 ft = 372 cu. ft
Load limit:	Weight per car: 10 to 15 metric tonnes Containers per car: 11

Operating characteristics:

- Train consist: 1 loco-5 cars; cars can be added one at a time, but consists of more than 6 cars could not achieve the maximum speed, so a second locomotive would be required.
- Travel times: As per the Final HSR Trip Times developed by CIGGT in May 1993, i.e.:

	200 + kph Existing ROW
Windsor/London	57 min.
London/Hamilton	40 min.
Hamilton/Toronto	20 min.
Toronto/Kingston	82 min.
Kingston/Ottawa	61 min.
Ottawa/Montréal	58 min.
Montréal/Trois-Rivières	49 min.
Trois-Rivières/Québec	42 min.

2.2.2. TGV technology

Interior dimensions
(available space): 56.1 ft long x 7.75 ft wide x 6.3 ft height
(17m x 2.355m x 1.9m)
Container dimensions: 8 ft x 7.75 ft x 6.3 ft = 392 cu. ft
Load limit: Weight per car: 8 to 10 metric tonnes
Containers per car: 7

Operating characteristics:

- Train consist: 1 loco-8 cars-1 loco; the French "TGV postal" currently operates with half trainsets, i.e., 1 loco-4 cars

- Transit times: As per the final HSR Trip Times developed by CIGGT in May 1993, i.e.:

	300 + kph Existing ROW	300 + kph New ROW
Windsor/London	42 min.	41 min.
London/Kitchener-Waterloo		22 min.
Kitchener-Waterloo/Toronto		22 min.
London/Hamilton	27 min.	
Hamilton/Toronto	17 min.	
Toronto/Kingston	60 min.	61 min.
Kingston/Ottawa	35 min.	34 min.
Ottawa/Montréal	49 min.	51 min.
Montréal/Trois-Rivières	39 min.	38 min.
Trois-Rivières/Québec	29 min.	29 min.

2.3. TYPE OF SERVICE

Two types of basic service were assessed, as required by the terms of reference:

- dedicated cars on passenger trains at any time of the day or of the night.

- dedicated trains travelling at night or during the day

These were assessed on the basis of their operating requirements and market impacts.

2.4. ROLE OF THE HSR AUTHORITY

The terms of reference required that CANARAIL Consultants Canada Inc, (hereinafter "The Consultant") evaluate the possible net revenues if an HSR organization itself offered the service to the shippers (i.e. acts as a retailer) or if it acts solely as a carrier for other small parcel freight operators (i.e. acts as a wholesaler).

These two distinct roles were assessed on the bases of potential market penetration and investment requirements.

2.5. EVALUATION OF POTENTIAL NET REVENUES

For the selected scenarios, the potential net revenues from the small parcels and light freight market were established as follows:

- the gross revenues generated by the services considered in this study LESS:
  - the line-haul costs (i.e. running rights, equipment acquisition and maintenance, dispatching) as evaluated by the technology consultant in the operating plan;
  - all other costs associated with the operation, marketing, and administration of these services.

The evaluation was conducted for two market-share scenarios: minimal and most probable.

3.

APPROACH AND METHODOLOGY

3. APPROACH AND METHODOLOGY

The light freight market study involved a number of tasks, i.e.:

a) estimation of the present market for long distance light freight in the Québec/Windsor corridor;

b) estimation of the present volumes by origin/destination in the Québec/Windsor corridor and the seasonal variations of these volumes;

c) evaluation of modal shares (air, truck, bus) of these volumes by origin/destination;

d) identification of potential trends in this market for the next 13 years (from 1992 to 2005);

e) projection of volumes by origin/destination and by mode for 20 years after the expected start-up of the HSR system, i.e., from 2005 to 2024 (this task was combined with the next one);

f) evaluation of the market share HSR is likely to attract from the various competing modes and translation into volumes by origin/destination in the Québec/Windsor corridor;

g) definition of the operations required to handle this market and evaluation of the resulting equipment requirements based on anticipated volumes, seasonal variations, running times, turnaround times and load factors;

h) establishment of the level of service required to attract these volumes of light freight, given existing and likely trends in the level of service offered by competing modes;

i) evaluation of costs associated specifically with providing this service, given trends in services offered by competitors;

j) definition of a competitive pricing policy and estimation of potential revenues from the light freight market for each of the 20 years following the expected start-up of the HSR system.

The methodologies employed to achieve the above tasks were varied and complementary. The study was conducted in three phases, as follows:

- market definition
- modal shares, trends, forecast and market share
- costs, revenues, and potential net revenues.

A description of the methods used in each phase is provided in the following sections.

3.1. MARKET DEFINITION

The terms of reference required a thorough definition of market volumes by origin/destination and by mode. Three techniques were used to define the market: analysis of Statistics Canada data, a survey of the major courier companies in the corridor, and interviews with selected shippers in representative industries involved with light freight operations.

3.1.1. Statistics Canada Publications

A thorough analysis of various Statistics Canada publications was conducted. The purpose was to identify commodities and overall volumes likely to be attracted to a light freight HSR service. Statistics Canada publications provide data for the entire country and on a province-by-province basis.

As expected, the publications reviewed did not contain the level of detail or accuracy required by the current study in terms of origin/destination volumes by commodity. However, a number of general statistics have been used as indicators and to provide guidelines for assessing the light freight market potential in the Québec/Windsor corridor.

For instance, *Trucking in Canada* (#53-222) provides a distribution of truck traffic by weight group covering the for-hire trucking sector for the year 1990 (latest year available at the time). A summary of the most relevant data is presented in the following table:

WEIGHT GROUP	PERCENTAGE OF TRAFFIC		
	SHIPMENTS	TONNES	REVENUES
Up to 100 kg	33.4 %	0.2 %	5.9 %
100 to 999 kg	31.5 %	1.9 %	15.7 %
1000 to 1999 kg	8.8 %	2.1 %	8.4 %
2000 to 4999 kg	4.0 %	2.3 %	8.8 %
SUMMARY	77.7 %	6.5 %	38.8 %

From this table, it can be observed that the small weight groups represent a very high proportion (77.7%) of the truck shipments and a very low proportion (6.5%) of the total tonnage shipped. It is felt that this type of traffic is susceptible to diversion to an HSR system. The four weight groups described in the above table have been retained for establishing LTL traffic volumes in the Québec/Windsor corridor.

These published data had to be complemented by data from other sources in order to develop traffic volumes by origin/destination. Statistics Canada provided The Consultant with a special printout and a data base which gives results from their truck traffic survey including commodities, shipments, and volumes, for all city pairs within the Québec/Windsor corridor and for two weight groups: shipments up to 100 kg, and shipments from 100 to 1000 kg.

As far as air cargo traffic is concerned, the publication *Air Carrier Traffic at Canadian Airports* (#51-005) provides quarterly passenger and freight traffic at Canadian airports. The level of detail and accuracy of this publication is even less than that of the trucking publication.

However, the following data were useful in assessing the light freight market potential in the Québec/Windsor corridor. A total of 650,000 tonnes of air cargo per year are handled at all Canadian airports. This volume is broken down by market sector as follows:

- Domestic 51.8 %
- Transborder 17.7 %
- Other international 30.6 %

A number of corridor airports are used for freight handling, but only two are involved extensively: Pearson International, with 43.8% of all freight handled at Canadian airports, and Mirabel International, with 12.3%. Dorval International and Ottawa International handle 3.8% and 1.0% respectively of the total freight handled at Canadian airports.

The interview program was extended in order to develop more detailed information on air cargo traffic susceptible to diversion to an HSR system.

3.1.2. Express Courier Survey

The Canadian Courier Association contributed significantly to the study by conducting a survey of its members. A questionnaire was developed and transmitted to eleven major intercity courier companies, including Canada Post. The questionnaire, presented in Appendix 3.1 (Volume II), requested the following data for express courier traffic:

- overall volumes by origin/destination
- seasonality
- service characteristics and their relative importance

Satisfactory results were obtained in these three areas.

The survey questionnaire also addressed the issue of past and future industry trends. However, the results in this area were very limited. Route changes, regulatory changes, and acquisitions are factors that combined to make the assessment of past trends virtually impossible, even for courier industry participants. Estimation of future trends is problematic under the best of conditions, even if a

reliable trend line for the recent past had been made available by the respondents. For this survey, only one respondent provided an estimate of future trends.

3.1.3. Interview Program

The interview program was conducted with selected major light freight shippers, as per the list presented in Appendix 3.2 (Volume II). The program aimed to complete and validate:

- the market data, for both courier traffic and LTL traffic;
- the service characteristics;
- the distribution by mode;
- past industry trends;
- the parameters to be used in forecasting future market trends.

The shippers involved in the interview program were selected from industry sectors that could provide light freight traffic for the HSR system. These industry sectors are:

- retail goods, such as: the clothing industry, the cosmetics industry, the health food industry, etc.;
- just-in-time manufacturing, such as: machinery parts, auto parts, computer parts, aeronautics parts, farm machinery parts, etc;
- medical and bio-technology sectors, such as: pharmaceutical, bio-technology industry, etc;
- service sector, such as: banks, insurance companies, newspapers, magazines, etc;
- international trade sector, such as: freight forwarders, custom brokers, distribution houses, etc;

The criteria for selecting shippers were as follows: **size** (i.e. a range of medium to large size firms); **location** (i.e. firms representing different locations with an attempt to sample across the entire corridor); **willingness to participate** (i.e. individuals are not necessarily willing to devote valuable time for benefits which may be generated 13 years or more from now).

In order to achieve the objectives of the interview program, it was essential to limit the issues addressed to a simplified questionnaire, which is presented in Appendix 3.3 (Volume II). In addition to the objectives pursued, the interview program generated valuable market knowledge, particularly concerning shippers' approaches to rate negotiations and service requirements.

Finally, several other contacts were made in order to validate or complete the information gathered, to confirm certain aspects of a given industry, and to obtain a second or third opinion on specific issues. The interview program was also extended to investigate air cargo traffic moving by truck from and to corridor airports. This market segment was addressed by contacting truck carriers specialized in this trade, air carriers using this service, and airport authorities.

3.2. TRENDS, FORECAST, AND MARKET SHARE

The second phase of the study concentrated on past and future trends, traffic forecasts, and HSR market share.

3.2.1. Trends

It was initially planned to use three approaches to establish the light freight market trends: the courier survey, the interview program, and socio-economic variables.

The courier survey did not produce the anticipated results from the standpoint of identifying specific market trends. As previously mentioned, numerous route changes, regulatory changes, and acquisitions all explain the difficulties experienced by the courier companies in establishing trends. Only one respondent to the courier survey addressed the issue.

The interview program provided a number of results for both past and future trends. However, these range from a 5% annual decrease to a 20% annual increase in the last ten years, and from a 1% annual decrease to a 10% annual increase for the next ten years. The resulting past and future trends by industry sector are presented in Appendix 3.4 (Volume II).

In view of the disappointing results from the first two approaches, socio-economic variables were used to establish future trends for the two types of traffic considered (i.e. courier traffic and LTL traffic). Informetrica provided selected series of economic indicators such as gross output and gross domestic product (GDP) for Canada as a whole, the province of Ontario, and the province of Québec.

General indicators (Miscellaneous Manufacturing, Total Business) as well as industry-specific ones (food processing, textiles, electrical products, printing and publishing, postal services, etc) were obtained and analyzed. Those most applicable to the traffic types under consideration were retained. In the case of courier traffic, a single indicator (Postal Services) was found to provide a good fit. For LTL traffic, it was found necessary to derive a composite LTL indicator from several single industry-specific indicators and the more general total business indicator.

Forecast trends were developed on the basis of derived Gross Output[1]. These are as follows:

FORECAST TRENDS

TRAFFIC TYPE	INDICATOR	FROM 1992 to 2005	FROM 2005 to 2024
Courier Traffic	Postal Services	40.2 %	2.6 % / yr
LTL Traffic	Composite LTL	85.4 %	4.4 % / yr
----	Total business	51.3%	2.7 % / yr

The postal services and composite LTL indicators were used to forecast the growth of courier and LTL traffic from 1992 to 2005 and on a yearly basis from 2005 to 2024.

1 Indicators for Québec and Ontario

3.2.2. Traffic Forecast

The traffic forecast was developed by applying the economic indicators, or forecast trends, for each traffic type to the 1992 estimated volumes for courier traffic and LTL traffic involving shipments of less than 5000 kg.

The forecast was developed in two steps: first, a one-shot projection from 1992 to 2005, the expected start-up year for the HSR system; second, a set of yearly projections from 2005 to 2024. Volumes were projected separately for each traffic type and by origin/destination wherever a minimum volume had been identified during the market definition phase.

Although modal shares were identified by origin/destination for the current courier traffic, the projected volumes were only developed for the total traffic of this type, primarily because of the predominance of the truck mode for the courier industry in the Québec/Windsor corridor. This facilitates the comparison with the LTL traffic projections which, by definition, do not present a distribution by mode.

3.2.3. Market Share Assumptions

Two scenarios have been developed for estimating the potential market share of the HSR light freight system. The first scenario, identified as "**minimal**", is considered conservative on the basis of its assumptions. The second scenario, identified as "**most probable**", is considered as more realistic and more likely to materialize, as HSR's combination of service reliability and cost savings will probably generate traffic over and above that assumed under the minimal scenario.

For the **minimal scenario,** it is considered that the HSR light freight system would offer sufficient advantages to attract the following market segments.

The HSR share of courier traffic would be 100% of the imbalance traffic between each city pair, and 100% of the courier traffic moving in quantities of less than one truckload per day within a city pair. These two situations represent additional costs for the courier industry which could be reduced significantly by the use of HSR.

Within the LTL traffic, the HSR share would be mostly backhaul traffic for HSR containers otherwise returning empty, providing the total LTL traffic moved in the direction opposite to the courier traffic imbalance is at least 2.5 times the volume of the imbalance. In addition, it is assumed the HSR system would attract 10 % of the LTL traffic moving within city pairs separated by more than 500 km.

For the **most probable scenario**, it is considered that both the courier companies and the light freight shippers would take advantage of HSR's service and cost benefits beyond the transportation situations described for the minimal scenario. Consequently, the most probable scenario includes additional volumes assumed to be attracted by the HSR light freight system over and above those identified for the minimal scenario.

For the courier traffic, the following assumptions were used to estimate these additional volumes:

- additional market share would be gained in city pairs where more than one truckload per day, for the entire courier industry, is transported,

- HSR's market share is estimated at 5% for city pairs separated by less than 500 km,

- HSR's market share is estimated at 10% for city pairs separated by 500 or more km,

- the above percentages are applied against the lowest directional volume between each city pair, and the resulting volume is assumed to be handled by HSR in both directions.

For the LTL traffic, the following assumption was used to estimate the additional volumes likely to the diverted to the HSR system:

- HSR's additional market share is estimated at 5% for all city pairs, except where the imbalance is significant.

3.3. COSTS, REVENUES AND POTENTIAL NET REVENUES

The third phase of the study concerns the definition and costing of the operations required to handle the traffic, the pricing strategies likely to be adopted for the HSR system, the resulting gross revenues, the net operating revenues, and, finally, the potential net revenues.

3.3.1. Cost assumptions

The evaluation of net revenues generated by light freight traffic involved a cost assessment of the operational requirements. Two types of cost factors had to be addressed: capital costs and operating costs. The assumptions adopted for each category are described in the following sections.

3.3.1.1. Capital Costs

A high speed rail light freight system would require various categories of equipment and facilities. HSR freight rolling stock, as such, does not presently exist. The French "TGV Postal" uses HSR rail cars originally built to carry passengers and later converted to carry mail traffic.

Preliminary estimates for passenger trainsets were obtained from CIGGT: the X-2000 is estimated at $14 M. U.S. and the TGV is estimated at $25 M. U.S.. For the light freight trainsets, it was determined that significant savings could be made, since sophisticated interior finishing would not be required. The following rolling stock acquisition costs were therefore used: for the X-2000, $15 M Cdn per trainset of 1 locomotive and 5 cars; for the TGV, $25 M Cdn per trainset of 2 locomotives and 8 cars. It should be emphasized that in the development of capital costs, and of the resulting net revenues, it was assumed that the light freight trainsets would have their own locomotives (i.e. no sharing of locomotives with passenger trainsets). The net revenues presented in this study are thus inclusive of locomotive costs and would be subject to improvement, providing the sharing of locomotives was found by the rolling stock manufacturers to be feasible.

The handling efficiency required by the nature of a high speed rail system imposes the use of airline-type containers. An average current price of $3,200 per container (in lots of 100) was obtained from a buyer of airline containers.

The price for handling equipment at the terminal railways was also obtained from a buyer of such equipment for an airline operator. The price for platform loaders was estimated at $35,000 per used unit and at $50,000 per new unit.

An average price was used across the Québec/Windsor corridor for the terminal facilities. A unit cost of $80 per sq. ft. was assumed for the building itself, which is the applicable price for a building of that nature. This price includes the rail siding, indoor trackage and ramps. For the terminal land, the current selling price for industrial land in Laval was used as an average for the corridor at $6.51 per sq. ft. The terminals will require paved areas for truck movement. The materials and installation cost for the paving of such areas has been estimated at $4 per sq. ft., on the basis of recent similar work.

In order to obtain an indication of the annual charges required by these investments, a loan-payment function was applied to depreciable capital costs using a real interest rate of 5%. For the capital costs associated with the land, a straight 5% interest provision has been calculated on the assumption that land will not depreciate over time.

3.3.1.2. Operating Costs - Linehaul and Specific Light Freight Operations

The terms of reference required the operating costs to be estimated for the HSR linehaul costs and for the marginal operations costs attributed specifically to the light freight activities, over and above the railway operation itself.

The **linehaul costs** were estimated by CIGGT, first, in March 1993, on the basis of a preliminary overall operating plan, and, finally, in February 1994, after completion of the final operating plan for the overall project. The differences between the costs provided by CIGGT have had a major impact on the significant difference in the results between the preliminary and the final versions of this study report.

The following definitive HSR linehaul costs for the light freight service were used for this Final Report:

	COST/TRAIN-KM	
COST ITEM	**X-2000**	**TGV**
Crew costs	0.30	0.23
Energy costs[2]	0.29	0.57
Equipment maintenance	1.77	1.96
Infrastructure maintenance	0.35	0.43
Overhaul allowance	1.41	1.57
TOTAL COST/TRAIN-KM	**$4.12**	**$4.76**

The **specific light freight operations costs** include the following elements: terminal handling, container pick-up and delivery, supervision and overall administration and marketing, advertising, and general administration.

The handling operations costs at the terminal are based on average salaries paid by the railway industry. The container pick-up and delivery costs are based on generic courier industry unit costs.

The provisions for supervision and overall administration costs are based on generally applicable percentages, such as:

- supervision 15%
- container maintenance 5%
- maintenance of platform loaders 5%
- building management and maintenance 10%

---

2 Three different sets of energy costs were furnished: one for Windsor/Toronto, one for Toronto/Ottawa/Montréal, and one for Montréal/Québec. As the differences between the three geographic regions' engergy costs were small (X-2000 costs were $0.29, $0.29, and $0.25, and TGV energy costs were $0.60, $0.57, and $0.52 respectively for the three above segments) only the Toronto/Ottawa/Montréal costs were retained.

The provision for marketing, advertising, and general administration is based on a proportion of 2% of the revenue to take into account the relationship between marketing activities and revenue, and a proportion of 10% of all the operating costs, excluding linehaul costs, to account for the general administration component.

3.3.2. Pricing strategies and gross revenues

The pricing strategies have been adapted to the specific competitive situation of each traffic type, i.e., the courier traffic and the LTL traffic.

For the courier traffic, the tariffs of eight major courier companies were analyzed in order to get an indication of the rate variability in the corridor. The interview program and the Canadian Courier Association provided advice on the applicable rates paid by the shippers. These rates were taken to be the competitive situation for ground shipments.

For the HSR system to be competitive, it will have to absorb the additional cost of delivering and picking up the container between the courier's terminal and the railway terminal. It was assumed that the HSR system required a 10% advantage vis-à-vis the estimated current linehaul cost by truck if it is to attract courier traffic. A generic courier industry linehaul cost was used for this estimate.

For LTL traffic, the tariff of one interprovincial carrier was analyzed. An indication of the variations between city pairs and between shipment weights and sizes was obtained. The carrier and the interview program provided advice on the applicable rates paid by the shippers. These rates were taken to be the competitive situation for LTL traffic.

For the HSR system to be competitive, it will have to absorb any additional cost involved in moving the goods between the shipper, the railway terminals and the consignee. For LTL traffic, it was assumed the quality of service of the HSR system would be sufficiently attractive that no further discount would be required.

The estimates for the gross revenues were derived by applying the resulting pricing strategies to the respective potential HSR volumes identified for each traffic type, for each market share scenario, for each technology/ROW option, and for

each of the first 20 years of HSR light freight operations. A similar process was followed for the assessment of a segment-by-segment implementation.

3.3.3. Net Operating Revenues and Net Revenues

Net operating revenues were derived from the gross revenues (operating) by subtracting all the operating costs estimated for HSR linehaul operations and for all the specific light freight operations costs, such as terminal handling, container pick-up and delivery, supervision and administration, and marketing, advertising, etc. The net operating revenues, like the gross revenues, were estimated for all the scenarios and options covered by the study, and for the entire project life under consideration. Similar results were developed for the segment-by-segment implementation scenario.

Net revenues were derived from the net operating revenues by subtracting annualized capital costs. These were developed as follows: total capital costs were estimated as described in Section 3.3.1.1: a loan payment function was applied to these costs, using a five percent real interest rate (i.e., a rate net of any allowance for inflation) and repayment periods equal to the service lives of the different types of assets involved. The treatment of land was a partial exception: in a calculation of this type, repayment of the principal is a substitute for depreciation cost; since land typically does not depreciate in value, the annual charge for land was developed by applying a five percent interest charge to the capital costs.

Net revenues were estimated for all the options and scenarios considered in this study. Finally, all the revenue results were broken down and presented by province, by crediting movements within each province to the province concerned and interprovincial movements to the originating province.

4.

TRAFFIC PROFILES

4. TRAFFIC PROFILES

This chapter describes the main characteristics of the courier industry and traffic, of the less-than-truckload (LTL) industry and traffic, and of the Air Cargo traffic moving by truck.

4.1. COURIER TRAFFIC

Detailed descriptions of the courier industry were obtained from the following recent public documents:

- *Industry Profile - Couriers*, Industry, Science and Technology Canada, September 1992
- *Couriers - Special Report*, The Financial Post, March 13, 1993
- *Couriers in Canada: An Industry Profile*, Surface and Marine Transport, Statistics Canada, Cat. no. 50-002, April 1993

From the above sources, it can be mentioned that the revenues generated by courier traffic in Canada are estimated at $2.1 billion in 1990, postal services excluded. The distribution of revenues is as follows:

Courier companies	$ 1,900 million	89 %
Trucking	149 million	7 %
Bus	89 million	4 %

It can also be estimated that 55% of the revenues are generated by domestic intercity traffic. The courier industry consists of 2433 firms, of which 767 have their headquarters in the province of Ontario, and 421 in the province of Québec. Fewer than 30 large corporations account for more than 67% of the industry revenues and are involved in serving the national and international markets. The numerous small firms operating in the industry are primarily involved in providing services within a given city. Their intercity traffic is handled through agency agreements or through the large corporations, which have extensive installations and networks.

Courier shipments are divided into 25% documents and 75% parcels and are generated by the following customer types:

• service industry (wholesalers, retailers, and financial institutions)	60 %
• manufacturers	20 %
• government institutions	14 %
• agricultural and resource industries	5 %
• general public	1 %

Traffic is mainly provided by large-volume shippers, with 80% of the sales coming from 20% of the clients.

The automobile industry is a major user of courier services. The just-in-time manufacturing and inventory management philosophy requires the high level of reliability provided by the courier companies. The interview program confirmed that the transportation of automobile parts from distribution centers to dealers is performed extensively by courier companies. The low parts inventory at the dealers and the importance of customer service, combined with the small size of the shipments, justify the use of courier companies for deliveries to a multitude of locations by automobile industry distribution centers.

However, the participation of the courier companies in the automobile parts traffic moving from parts manufacturers to assembly plants is virtually nonexistent. This traffic is moved in full carload and full truckload quantities by conventional rail and by truck, in accordance with the just-in-time manufacturing philosophy. The cost efficiencies of the automobile manufacturers impose a door-to-door movement on the carrier, so that an automobile parts manufacturer that is not served directly by a private railway siding will not favour the rail mode. In order for the HSR light freight system to participate in this market, the quantities moved in one shipment would have to fill a full trainload destined to a single assembly plant. This would no longer satisfy the just-in-time manufacturing philosophy of the automobile industry, as a full trainload of a single part would certainly have to be put in storage for more than one day. In addition, the private sidings leading to the parts manufacturers and to the assembly plants would have to be electrified at a very high cost. Moreover, such an operation would no longer be high speed rail due to the shunting involved at origin and destination.

Within the Québec/Windsor corridor, courier traffic is mostly moved by truck (93%). A small share of the traffic is moved by bus (3.8%) and by air (3.3%). The courier companies are using both owner-operators and their own drivers and fleets for their truck movements. The fleets of some courier corporations are larger than those of common carriers. The courier traffic moved by air represents 3% to 5% of the value of air cargo revenues handled by canadian air carriers, and this mode is mostly used for shipments consigned to provinces other than Québec and Ontario.

Courier traffic is highly service sensitive, and the excess capacity in the courier industry imposes increased price competition. The courier companies must aim at cost-effective operations to continue offering superior levels of service. Guaranteed delivery times, sophisticated tracing systems, and customer service telephone lines to confirm delivery are service features offered by the larger courier companies. These companies also have the ability to provide service over a broad geographic area. With their extensive networks and large volumes, the larger corporations are in a better competitive position to offer discount rates and still provide premium and reliable services.

4.2. LTL TRAFFIC

Less-than-truckload traffic involves large volumes, a broad range of shippers, and a large number of truck carriers in the Québec/Windsor corridor. From the special printout produced by Statistics Canada and from the publication *Trucking in Canada*, it is estimated that the 1992 average daily traffic moving LTL in the corridor is 303 trailers of 3000 cu. ft. equivalent. LTL shippers are mostly found in the secondary (manufacturing) sector, whereas firms in the primary and tertiary sectors are small users. Virtually all general freight truck carriers are handling LTL traffic in the corridor.

In recent years, LTL's share of overall truck traffic has increased to the detriment of truckload traffic. The main reasons explaining LTL's growth are:

- the just-in-time manufacturing and inventory management philosophy adopted by a number of large and small manufacturers;

- the fact that many firms ship in smaller quantities in order to be paid faster;

- the development and growth of the small and medium size firms sector;

- the general trend for businesses to become more and more service oriented.

In general, LTL traffic is not time-sensitive, providing a reasonable schedule is offered by the carrier. In the corridor, door-to-door delivery is required by the next day, or by the second day in some cases. The basic service characteristics considered by shippers of LTL traffic are:

- reliability of the carrier

- proper insurance

- destination served

- reasonable delivery schedule.

Once these characteristics are recognized in a number of carriers, the shipper will choose the carrier offering the lowest rate. During an economic recession, like that of the early 1990's, some LTL traffic moves at truckload rates.

It is estimated by Statistics Canada that 17% of all truck shipments in Canada are less than 35 kg and that 70 to 75% of all shipments are moving within the Québec/Windsor corridor. There is a portion of the LTL traffic for which the courier companies are competitive. The courier companies can easily provide all the desired service characteristics, and when they are able to offer a competitive rate they can take the traffic away from the LTL truckers. A number of shippers who participated to the interview program mentioned that the courier companies' share of LTL traffic was increasing significantly in their respective industries, to the detriment of LTL truckers.

4.3. AIR CARGO TRAFFIC

The airline companies serving the international market have rationalized their operations by using a single North American airport terminal for traffic originating

in or destined to large geographic markets. Although the service is offered on an airport-to-airport basis and a single air cargo rate applies to the movement, the first or last leg of the movement may, in fact, be carried out by truck.

Therefore, there are significant volumes of air cargo traffic loaded in airline containers to avoid any additional handling costs and moved by truck between the corridor airports, mainly Pearson, Mirabel and Dorval. This traffic is controlled by the air carriers, who hire specialized trucking companies to provide the ground services with 48 ft. trailers equipped with roller beds.

A number of air carriers, airport authorities, and specialized air cargo truckers were contacted by The Consultant and provided the information presented here concerning this traffic.

Air cargo traffic moves by truck for a number of reasons:

- some airlines select an airport terminal to serve a large geographic area (e.g. an airline selects Chicago airport as a terminal to serve Toronto and Montréal)

- an airline may not have sufficient lifting capacity on a given day for the cargo to be handled.

- the type of aircraft used at a given airport may not have enough lifting capacity for the cargo available (for example, some airlines serve Pearson with 767 aircraft and serve Mirabel with 747 aircraft which can accommodate larger containers).

- airport characteristics such as terminal capacity, cargo handling facilities, curfew, etc. also play a role.

Overall, the road feeder service for airlines contributes to the optimization of aircraft utilization.

This road feeder service is performed between U.S. airports such as John F. Kennedy in New York, Burlington, VT, Buffalo, NY, Detroit, Chicago, and Canadian airports such as Pearson International and Montréal Airports, primarily Mirabel. The estimated daily volumes for this traffic are as follows:

BETWEEN		NUMBER OF 48 FT. TRAILERS/DAY
JFK (New York)	and Pearson	6
JFK (New York)	and Mirabel	6
Burlington Airport	and Mirabel	4
Buffalo Airport	and Pearson	5
Detroit	and Pearson	5
Chicago	and Pearson	7

This traffic is approximately 70% import and 30% export.

Of all the above links, initially only the Detroit/Pearson volumes could constitute a potential for the HSR system, if the Detroit airport was served directly. Eventually, if the HSR system was extended to serve the Chicago airport, the volumes moved between Chicago and Pearson could also constitute potential traffic for the HSR system.

Road feeder services are also performed between Pearson International and Montréal Airports. Public sources (La Presse, May 6, 1993) stated that 86% of the Montréal Airports' air cargo traffic was handled at Mirabel in 1992. The estimated daily volumes for the air cargo traffic moved by truck between corridor airports are as follows:

FROM	TO	NUMBER OF 48 FT. TRAILERS/DAY
Pearson	Mirabel	16
Mirabel	Pearson	13
Pearson	Dorval	2
Dorval	Pearson	2

This international traffic is either originating traffic exported through another airport or import traffic trucked to another airport for distribution to ultimate destination. The traffic volumes moved between corridor airports could constitute a potential for the HSR system, if the airports were served directly by HSR.

The vast majority of air cargo traffic moved by truck is handled in ULD (Unit load device) pallets or containers. This method is selected by all air carriers to reduce damages, handling time and costs. In the course of the interview program, it was stated frequently that air carriers would not accept an additional handling to bring the airline containers or pallets to and from a rail terminal.

The aircraft pallets and containers are designed to use all the cubic capacity available for each aircraft type. Consequently, a wide variety of container shapes and dimensions are involved. For example, one of the air carriers consulted uses 18 different types of pallets and containers to fit its aircraft, whether all-freight or combi.

In order for HSR to succeed in attracting air cargo traffic presently moving by truck, the HSR system would have to serve the airports directly to eliminate any additional handling, and should be able to accommodate the majority of pallet and container types. Based on the car interior dimensions developed with the assistance of ABB and Bombardier for their respective technologies, and based on their specification of a maximum door width of 9 feet, it can be determined that only 33% of the aircraft pallet and container types could be accommodated by HSR trainsets. These containers represent an even smaller share of the volumes handled, due to the limited number of each type loaded in a particular aircraft in comparison with the larger containers.

Consequently, more extensive research by the rolling stock manufacturers would be required to determine whether the HSR cars could be equipped with wider doors (i.e. from 9 ft. to up to 16 ft.). This is an essential condition for considering air cargo traffic moved by truck as a potential traffic for the HSR system.

Since it is currently determined that the HSR equipment could not accommodate the most frequently used aircraft top-deck containers (mainly due to available width), the air cargo traffic moving by truck between airports was not taken into account for estimating the HSR market potential in the current study. Moreover, only the 300 + Kph New ROW Option would serve a minimum of two airports directly.

5.

MODE PROFILES

5. MODE PROFILES

This chapter describes the transportation modes currently competing for light freight traffic in the Québec/Windsor corridor. These are: Courier, LTL trucking, Bus Parcel Express, and Air Cargo. A brief description of these services will be presented along with a thorough analysis of the rate structures for each mode. This information will be used in estimating HSR's market share and in establishing HSR's pricing strategy.

5.1. COURIER SERVICES

5.1.1. Description of services

In the Québec/Windsor corridor, courier services are provided by all the transportation modes, with the exception of the water mode. For services within a city, courier services are performed by bus or metro, automobile, truck, bicycle, and walking persons. For intercity services, the courier companies use their own truck fleet or trucks of independent owner-operators, leased aircraft or their own, commercial airline services, and commercial bus services. Generally, the larger corporations are using a combination of their own fleet of trucks and aircraft and independent operators, whereas the smaller courier companies are mostly using independent carriers such as truck owner-operators, bus companies, and commercial airlines.

The average courier shipment is between 8 and 10 pounds. This weight has declined by about 2 pounds over the last 5 years. This decline is due to an increase in document shipments. There is a trend in the courier industry to concentrate on express mail as a high-priced product. Not only is this a high-revenue product, but all of the major companies have expanded their air handling capacity in the form of leased or purchased aircraft. This expensive equipment needs to be filled to justify its cost. This trend began in the mid-70's.

Some domestic carriers are not active in the air express field but tend to concentrate more on ground modes. Other are in both arenas, with the majority of their shipments moving by ground.

As the Canadian economy turns around one could expect the volume of ground shipments to increase at a higher rate than the air express shipments. The volume of air shipments will increase as wider market areas become a reality.

5.1.2. Rate Structures

The tariffs of eight different courier companies were analyzed. The nature of the firms involved ranged from regional courier operators to national operators and large international corporations. In some cases, the tariffs used were quotations inclusive of volume discounts. On the other hand, other tariffs were published rate guides exclusive of applicable volume discounts.

In general, the tariffs provide the same rates for all the city pairs located in the Québec/Windsor corridor. Only the links with cities outside the corridor or located in remote areas are quoted at increasingly higher rates. In all cases, the courier rates are a function of weight, usually starting with a minimum charge for very low weights (i.e. 0 to 1 lb. or 0 to 2 lbs.) and a charge per additional pound. The tariffs also often include package size and weight restrictions, beyond which a higher rate or a surcharge must be assessed.

Each tariff also contains its own list of service variables and conditions. For example, some conditions are related to insurance, liability, declared value, waiting time, additional stops, number of parcels, dangerous goods, and delivery time. In the courier industry, delivery time has become a major service feature in recent years.

All the major courier companies have their own special delivery schedule which is adapted to each market's requirements. The regular schedules involve next day delivery to the closest destinations and 48 hr. delivery to the most distant destinations and have premium delivery services, along with premium charges, for a guaranteed specific time for next day delivery. This trend started with guaranteed delivery by 12 AM and was later extended to 10 h 30 AM, 9 AM, and, more recently, 8 AM. Under such a guarantee the courier charges do not have to be paid if the delivery is performed later than the specified time. In general, the earliest delivery time guaranteed is the most expensive, as surcharges are applied to each specific time and are cumulative. The time surcharge usually amounts to $5 per shipment or per package.

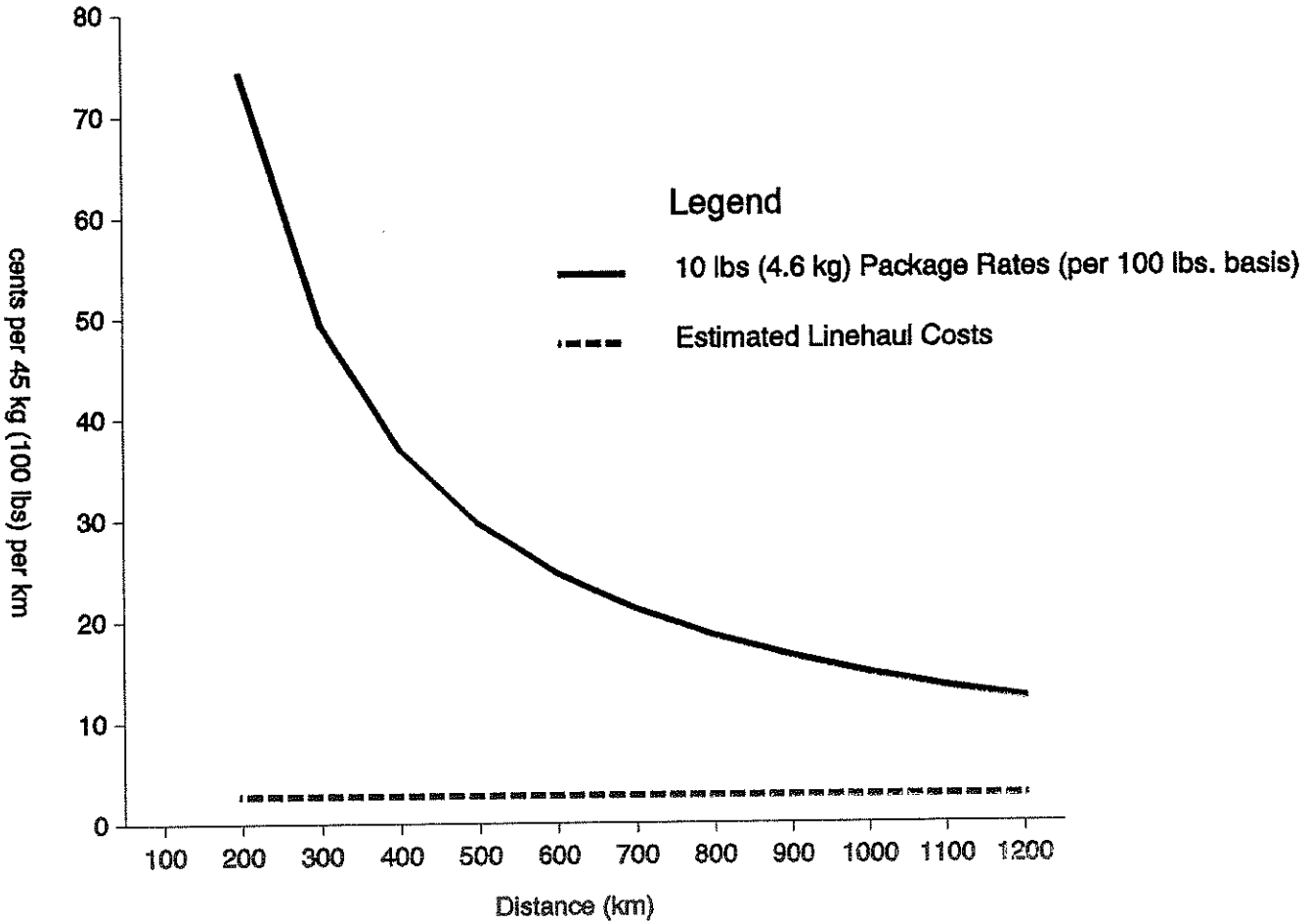
For the current study, the concept of leaving the origin city as late as possible at night and of arriving at the destination city as early as possible was retained. Consequently, the courier rate and surcharge levels selected are based on overnight guaranteed service before 10 h 30 AM. The applicable weight selected is based on 10 lbs per shipment as the courier industry expects the current average of 8 to 10 lbs. to increase with better economic conditions.

An average courier rate for all the corridor city pairs was calculated on the basis of the eight tariffs analyzed and the service and delivery conditions described above. The resulting courier rate retained for this study is $14.84 per 10 lb. shipment for any city pair in the corridor.

The estimated rates for courier traffic and linehaul costs are illustrated by Figure 5.1.2, presented on the following page. The estimated rates and costs have been converted to cents per 100 lbs. per kilometre in order to provide a basis for comparison with the rate structures offered by competing modes. The results were used to establish the HSR pricing strategy for courier traffic.

Figure 5.1.2

Estimated Rates for Courier Traffic (by ground) and Linehaul Costs



5.2. LTL TRUCKING

5.2.1. Description of services

Most trucking companies operating in the Québec/Windsor corridor provide less-than-truckload services and rates. The average Canadian LTL shipment weighs 1515 pounds and travels 358 miles. The LTL traffic complements the full truckload operations of common carriers and owner operators, due to its higher price and lower density.

This fact is illustrated by a comparison developed in the Statistics Canada publication *Trucking in Canada*. In brief, this comparison of LTL traffic and total truck traffic shows that in Québec, LTL traffic accounts for 48.8% of the industry's revenues, but only 12.9% of the tonnes. LTL accounts for 82.5% of total truck shipments in Québec. According to the same source, in Ontario, LTL traffic accounts for 51.6% of the industry's revenues, but only 9.7% of the tonnes. LTL accounts for 79.3% of the total Ontario truck shipments.

The orientation of the trucking industry towards LTL services is expected to be maintained. The high interest rates of the late 1980's and the economic recession have prompted the implementation of "just-in-time" management and inventory, and of smaller quantity shipments by suppliers in order to be paid faster. These trends are favourable to the growth of LTL traffic and services.

5.2.2. Rate Structures

The shippers consulted in the interview program have contributed significantly to determining the applicable LTL rate structures in the Québec/Windsor corridor. There is practically no LTL traffic moving at published rates. To complement the analysis, a sample representative tariff was obtained from a carrier operating across the corridor.

The LTL tariff contains a minimum charge per shipment which represents approximately twice the rate level for each city pair. The published rate for a city pair is generally applicable in both directions. However, the applicable rates vary slightly sometimes on account of shippers' negotiations. Like the courier rates, the LTL rates are a function of weight, but the range and minimum weights are much larger. The

first rate level generally applies to shipments of less than 500 lbs., where a minimum charge also applies. The other rate levels are: from 500 to 999 lbs., from 1,000 to 1,999 lbs., from 2,000 to 4,999 lbs., from 5,000 to 9,999 lbs., and from 10,000 to 20,000 lbs. per shipment.

The LTL tariff also provides a list of service variables and conditions covering, for example, heating or refrigeration, pick-up and delivery, demurrage, additional delivery, waiting time, dangerous goods, declared value, and insurance.

For the current study, the LTL rate retained is that for shipments of less than 500 lbs. The terms of reference of the study address the light freight traffic in the corridor and the use of high speed rail trainsets, which do not offer heavy payload capacities. As previously mentioned, in the interview program, some major LTL shippers have provided indications of the effective rates paid for their LTL traffic between Montréal and Toronto. The specific confidential rates obtained range from as low as 21%to 56% of the LTL published rates that were made available by the truck carrier. Further interviews with other shippers and carriers led to the conclusion that a rate level at 40% of the published rates would currently move a significant share of the LTL traffic.

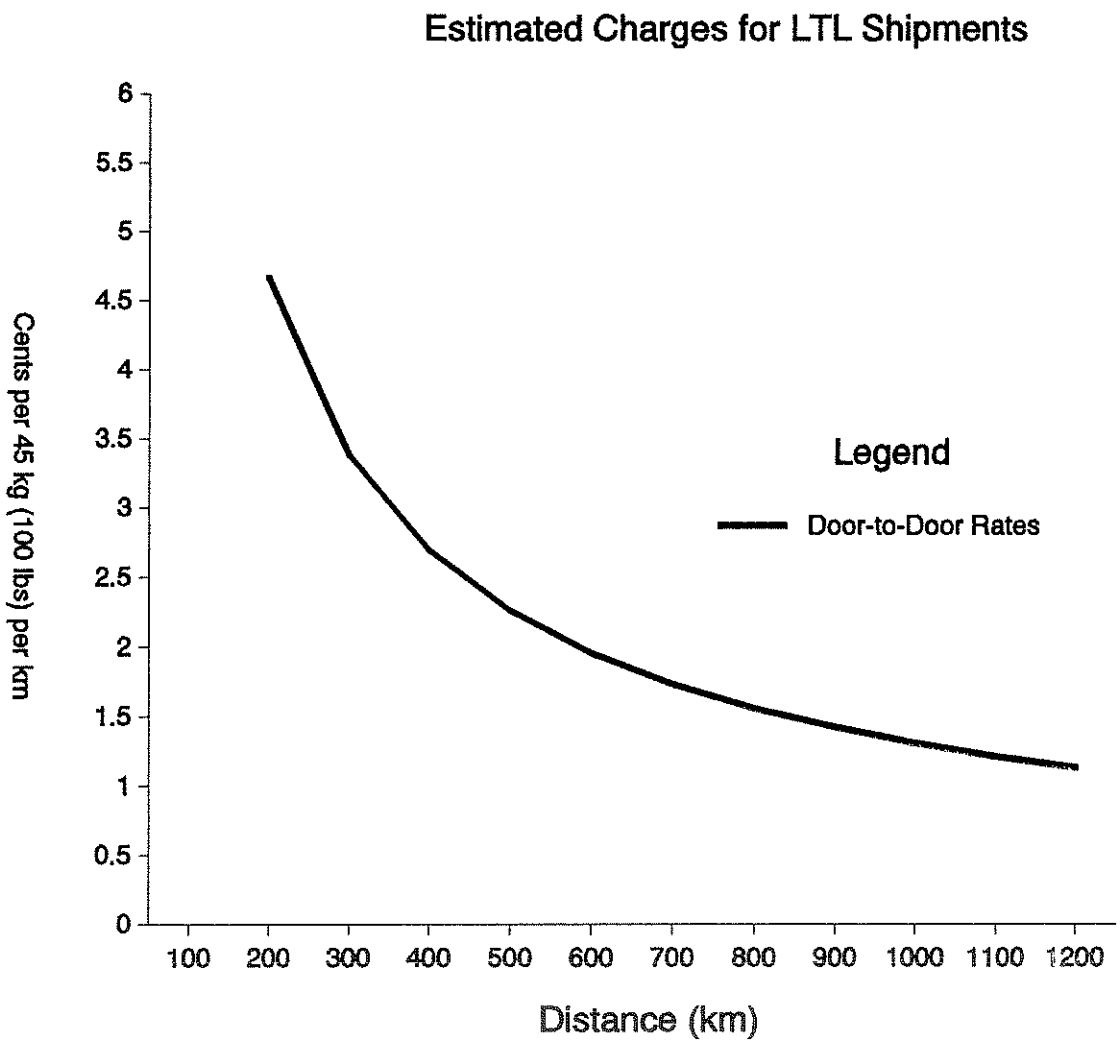
The resulting LTL rates are included in Table 5.2.2, presented at the end of this section. As an example, the effective LTL rate to meet in order to be competitive with trucks is $12.17 per 100 lbs. for the Montréal/Toronto city pair, for a shipment of less than 500 lbs. These rates have been converted to a cents per 100 lbs. per kilometre basis, for the door-to-door rates, and are illustrated in Figure 5.2.2, presented after the rate table. The results were used to establish the HSR pricing strategy for LTL traffic.

For comparison purposes, the full truckload rates currently effective for the Montréal/Toronto city pair are $500 per 45 ft. trailer from Montréal to Toronto, and $600 per 45 ft. trailer in the opposite direction. The rate difference is due to larger volumes moving from Toronto to Montréal. The average weight of general freight is 1,000 lbs. per linear foot of trailer, resulting in a payload of 45,000 lbs. Thus, the truckload rate per 100 lbs. is $1.11 from Montréal to Toronto, and $1.33 in the opposite direction, significantly below the LTL rate of $12.17 per 100 lbs.

Table 5.2.2 **ESTIMATED LTL EFFECTIVE TRUCK RATES (IN $ PER 100 LBS.)**

	Windsor	London	Toronto	Kingston	Ottawa	Montréal	Québec
Windsor		10.60	11.57	13.66	14.64	14.15	16.12
London	10.60		10.60	12.67	13.16	13.16	14.64
Toronto	11.57	10.60		11.57	12.17	12.17	13.66
Kingston	13.66	12.67	11.57		11.57	10.96	12.17
Ottawa	14.64	13.16	12.67	11.57		10.60	11.77
Montréal	14.15	13.16	12.17	10.96	10.60		11.77
Québec	16.12	14.64	13.66	12.17	11.77	11.77	

Figure 5.2.2


Estimated Charges for LTL Shipments
Cents per 45 kg (100 lbs) per km
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Legend
Door-to-Door Rates
100
200
300
400
500
600
700
800
900
1000
1100
1200
Distance (km)

5.3. BUS PARCEL SERVICES

5.3.1. Description of services

Bus parcel services are performed by commercial bus companies across Canada. The volumes handled by this mode are much higher in Western Canada than in the Québec/Windsor corridor; traffic is basically inversely related to the presence of courier companies.

The main characteristics of bus parcel services are:

- The network covers a large territory: in Ontario, more than 500 municipalities are served directly by the carrier consulted, whereas in Québec, more than 900 municipalities are served directly.

- Pick-up and delivery services are available in a total of about one hundred municipalities of Québec and Ontario; for most city pairs, parcel service is performed from terminal to terminal.

- Frequency of service is very high for the major city pairs of the corridor; in some cases, a bus leaves every hour in each direction all day long.

- Loading capacity is limited in terms of size and volume: of the four bins available, two are assigned to parcel traffic, the other two bins being assigned to passenger luggage.

- The operation is efficient: a parcel delivered thirty minutes before a bus departure time will be loaded on that bus; otherwise, any parcel will be loaded on the first bus departing for the parcel's destination.

Bus parcel services are used extensively by individuals and by small firms who want to have control over the departure and arrival times of their shipment. Some of the commodities handled, for example, are prepared foods, magazines and newspapers, audio-visual equipment, used computers for repair, and motorcycle parts. The document and express mail business is also aggressively pursued by the bus companies. A large number of small courier companies use bus parcel

companies for their shipments, primarily to remote areas and intermediate cities within the corridor, but also to the major cities of the corridor.

5.3.2. Rate Structures

The tariff of one representative bus company was analyzed. It sets out specific charges in dollars on the basis of weight categories similar to those in the courier companies' tariffs, i.e. from 0 to 2 lbs., from 2 to 10 lbs., from 10 to 20 lbs., and then every 10 lbs. up to 100 lbs., which is the maximum weight covered by the regular rates. The second basis of charges is distance, and the distance ranges for Québec and Ontario are: from 1 to 50 miles, 51 to 100 miles, 101 to 150 miles, 151 to 200 miles, 210 to 300 miles, and every 200 miles beyond, up to 1,500 miles. Detailed tables provide the rate scale and the distances between each city pair covered by the network.

The published rates cover the intercity transportation from terminal to terminal of shipments not exceeding the dimensions of 2 ft. x 2 ft. x 3 ft. For cities where the pick-up and delivery services are available, the P + D rates are $2.50 per shipment weighing up to 25 lbs.; for each additional 25 lbs. or fraction thereof, the additional cost is $1.00.

The tariff also contains service variables and conditions such as weight, size, package dimensions, types of shipments, special commodity rates, excess value, liability, and prohibited articles. Volume discounts exist but are far from being applied to the same extent as with the courier and LTL trucking companies. It was mentioned that more than $100,000 per year of parcel shipment business is required from a customer to qualify for a volume discount.

The effective rates for regular bus parcel services, including pick-up and delivery charges, for each city pair in the corridor are included in Table 5.3.2 presented at the end of this section. These rates are based on 10-lb. shipments to provide a basis for comparison with the courier rate structures. The rate for regular bus parcel service between Montréal and Toronto, terminal to terminal, is $10.85 per 10-lb. shipment, to which a pick-up and delivery charge of $2.50 at each end is added for a total of $15.85 per 10-lb. shipment. This last rate can be found in Table 5.3.2, as can rates for all the other city pairs that would be served directly by an HSR

system, all of which have pick-up and delivery services available from the bus companies.

The estimated linehaul charges for bus express services presented in the Table have been converted to cents per 100 lbs. per kilometre and are illustrated in Figure 5.3.2, presented after the rate table. The base tariff structure provides for terminal to terminal service, while a separate tariff provides for pick-up and delivery charges. The combined rates are presented in the Figure.

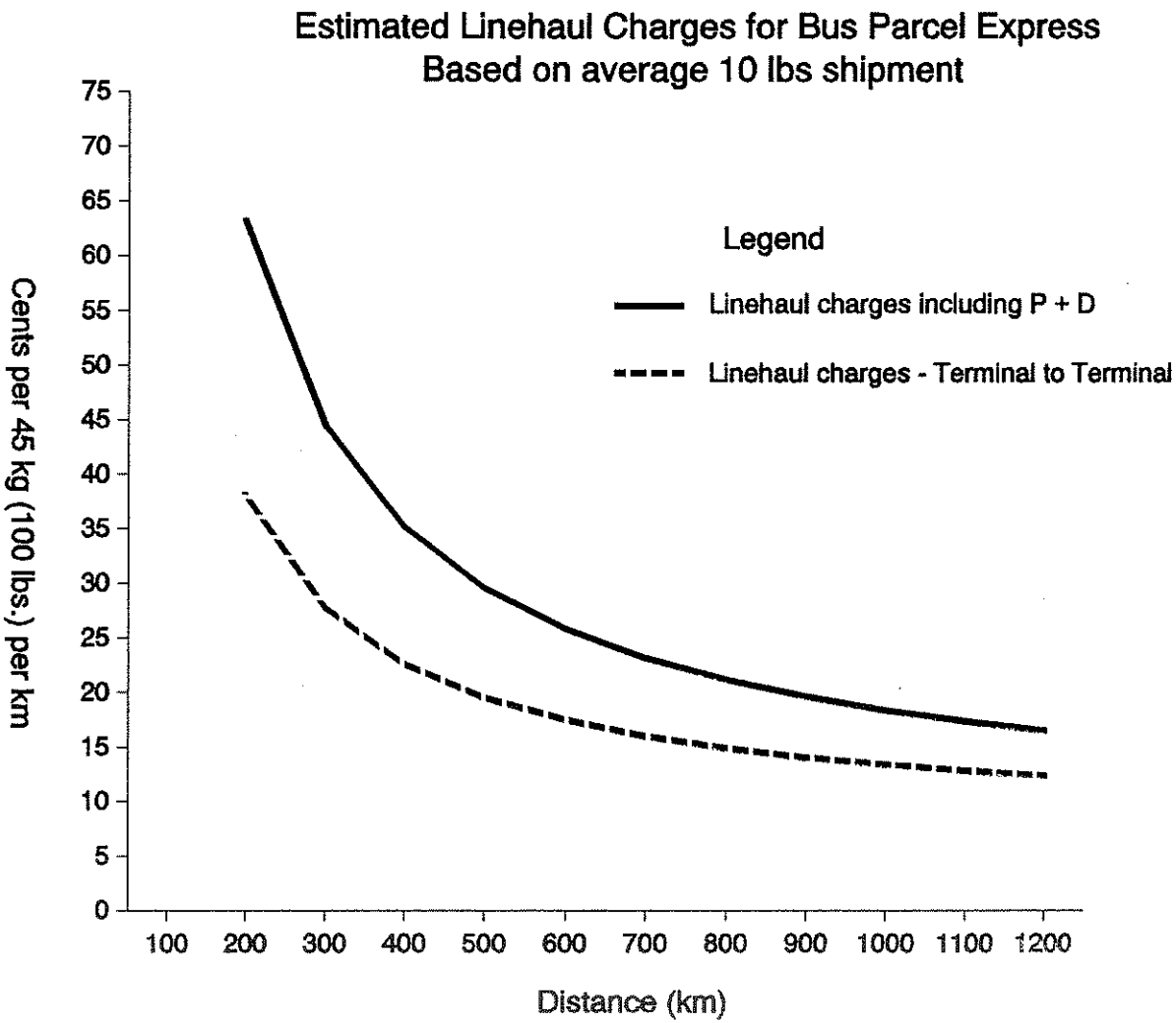
Table 5.3.2

EFFECTIVE BUS PARCEL RATES

Bus parcel rates in dollars for 10 lbs. shipments/
Terminal to terminal rates (right hand triangle) and
rates including pick-up and delivery charges (left hand triangle)

	Windsor	London	Toronto	Kingston	Ottawa	Montréal	Québec
Windsor		7.50 12.50	9.65 14.65	10.85 15.85	10.85 15.85	12.20 17.20	13.55 18.55
London	7.50 12.50		7.50 12.50	9.65 14.65	10.85 15.85	10.85 15.85	12.20 17.20
Toronto	9.65 14.65	7.50 12.50		8.35 13.35	9.65 14.65	10.85 15.85	10.85 15.85
Kingston	10.85 15.85	9.65 14.65	8.35 13.35		7.50 12.50	8.35 13.35	10.85 15.85
Ottawa	10.85 15.85	10.85 15.85	9.65 14.65	7.50 12.50		7.50 12.50	9.65 14.65
Montréal	12.20 17.20	10.85 15.85	10.85 15.85	8.35 13.35	7.50 12.50		8.35 13.35
Québec	13.55 18.55	12.20 17.20	10.85 15.85	10.85 15.85	9.65 14.65	8.35 13.35	

Figure 5.3.2


Estimated Linehaul Charges for Bus Parcel Express
Based on average 10 lbs shipment
Legend
Linehaul charges including P + D
Linehaul charges - Terminal to Terminal
Cents per 45 kg (100 lbs.) per km
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
100
200
300
400
500
600
700
800
900
1000
1100
1200
Distance (km)

5.4. AIR CARGO

5.4.1. Description of services

The commercial airline companies offer fast and frequent services for the transportation of express light freight within the Québec/Windsor corridor for shippers and courier companies. Generally, the airline companies do not provide pick-up and delivery services, except on special request, in which case a contract trucker will be hired. The past experiences of airline companies acting as full-service courier companies have been extremely costly and have led to their current restricted role as an air carrier from one airport terminal to another (i.e. wholesaler of transportation services).

In the role of carrier, the airline companies have succeeded in attracting the biggest share of their express light freight traffic from public and private courier firms, as efficient partners rather than additional competitors. The next category of major customers is composed of major light freight shippers, such as the cosmetics industry. The remainder of the clientele consists of a large number of different firms and industries.

Airline service to airports such as Toronto, Ottawa, Montréal and Québec City can reach a high level of frequency, such as a flight every thirty minutes. Other airports such as London and Windsor offer lower frequencies, whereas cities such as Hamilton, Kingston and Kitchener-Waterloo are served via Pearson Airport, with Trois-Rivières being served via Montréal Airports.

5.4.2. Rate Structures

One airline carrier provided indications on air cargo tariffs for light freight traffic. There would be four major categories of rates for cargo traffic which differ on account of volume, contractual commitment, and delivery time requirements. Three tariff categories apply to courier traffic in the Québec/Windsor corridor; these can basically be summarized in a rate level for same-day delivery and a rate level for overnight delivery. The volume discounts vary by type of shipper and between the individual courier operators within the industry.

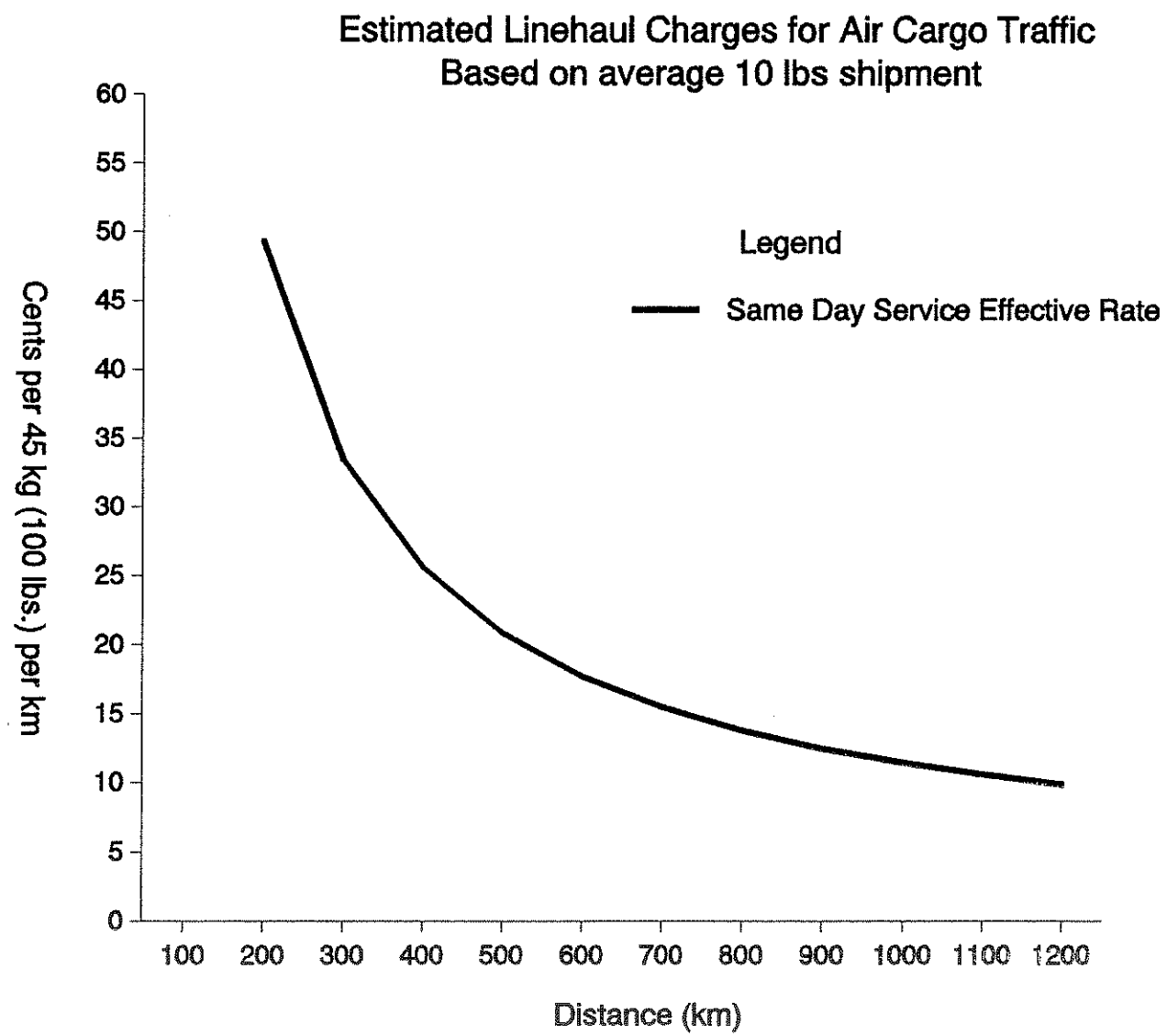
The tariffs contain published rates for documents and mail and for parcels. The same rates apply to most city pairs and are the same for each direction within a city pair. The longer distances travelled such as Québec City/Windsor and Montréal/Windsor are assessed at a higher rate. The current published rates per shipment are as follows:

DELIVERY SERVICE	SAME DAY		OVERNIGHT	
Type of Shipment	Documents	Parcels (up to 30 lbs)	Documents	Parcels (up to 30 lbs)
Québec City/Windsor	$50	$65	$11.50	$10 + $2/add. Kg
Montréal/Windsor	$50	$65	$11.50	$10 + $2/add. Kg
All other City Pairs	$35	$45	$11.50	$20 + $1/add. Kg

The indications received from various sources representing shippers, couriers and carriers lead to an average assessed airline transportation rate of $1 per pound or $2 per kilogram for the main city pairs. For the longer distances, applying the same ratio as the published rates leads to an effective rate of $1.45 per pound.

The estimated linehaul charges for air cargo traffic have been converted to a cents per 100 lbs. per kilometre basis for comparison purposes. The results are illustrated in Figure 5.4.2, presented on the following page. The rate structure presented is applicable to the Same Day delivery service provided by the airlines.

Figure 5.4.2


Estimated Linehaul Charges for Air Cargo Traffic
Based on average 10 lbs shipment
Legend
Same Day Service Effective Rate
Cents per 45 kg (100 lbs.) per km
60
55
50
45
40
35
30
25
20
15
10
5
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
Distance (km)

6.

HSR SERVICE OPTIONS

6. HSR SERVICE OPTIONS

The terms of reference required the evaluation of various service alternatives. The first involved a choice between the movement of light freight in single cars pulled by passenger trains and the movement of light freight in dedicated trainsets. The second service alternative related to the role of the High Speed Rail Authority in the light freight market: the HSR Authority could act as a retailer and compete head-on with the private couriers and Canada Post, alternatively the HSR Authority could act as a wholesaler providing intercity transportation services to the private couriers and Canada Post.

The following sections provide the results of an in-depth analysis for each of these service options, both from a market standpoint and from an operational standpoint.

6.1. LIGHT FREIGHT ON MIXED TRAINS

This service option involves the movement of light freight in single cars pulled by passenger trains according to their schedules. This alternative would provide the high frequency that competing modes such as Bus and Air provide.

6.1.1. Market considerations

The requirement for same-day delivery was addressed by the courier survey and by the interview program. This service characteristic is significant for shipments within a given city. However, for the intercity market, same-day delivery ranked last out of eight service features in the courier survey, while the interview program identified very little intercity traffic, other than daily newspapers and bank clearings, which required same-day delivery.

There is no doubt that some light freight traffic is moving by Bus or by Air on account of a same-day delivery requirement. However, this market segment would offer very limited potential for the HSR light freight service. Indeed, the volumes moved by Bus are estimated at only 3.8% of the Québec/Windsor corridor market, and the light freight volumes moved by Air are estimated at only 3.3% of the courier

traffic in the corridor. Moreover, only a small portion of these volumes require same-day delivery.

6.1.2. Operational Considerations

Two main operational considerations have to be taken into account in considering a potential light freight service on mixed trains: the handling time at stations, and the location of the handling facilities.

The trip times are critical in attracting passengers to the High Speed Rail system. The HSR trip times estimated by CIGGT in May 1993 assume the following station dwell times for embarking and disembarking passengers, applicable for a through train running from Windsor to Québec City:

Station	Time
Windsor	Terminal
London	2 minutes
Hamilton or Kitchener	2 minutes
Toronto	6 minutes
Kingston	2 minutes
Ottawa	5 minutes
Montréal	20 minutes
Trois-Rivières	2 minutes
Québec City	Terminal

Dwell times at terminal stations would generally be considerably longer than at intermediate stations. However, even these would be limited to 30 minutes in "turnaround" situation, i.e., where the same trainset is to be used for the next scheduled train in the opposite direction.

The light freight traffic would have to be handled in containers, and it is estimated that the most efficient handling system could place or remove a loaded or an empty container in an average of two minutes. This requires a wide door

equipped with sophisticated opening and closing devices. Thus, for most intermediate stations, only one operation (place or remove an empty or a loaded container) could be performed within the dwell time allowed for passenger trains. Stations in Toronto, Ottawa, and Montréal would offer more time, and therefore a greater capacity for light freight handling; however, capacity is limited even in these cases (i.e. 3 containers/train in Toronto, 2 containers/train in Ottawa, and 10 containers per train in Montréal).

In summary, dwell-time considerations would reduce the handling capacity at intermediate stations to the point where the operation must be considered almost impossible. Only, the longer dwell times at terminal stations might, however, allow for freight operations at these locations.

The preliminary HSR operating plan, developed by CIGGT (March 1993), and used for the current study provides for 8 departures per day in each direction for the Southwestern Ontario segment, and for 12 departures per day in each direction for the Montréal/Ottawa/Toronto segment and for the Montréal/Québec segment. A more detailed specification of the operating plan would be required to determine which stations will be terminals for which trains. However, it can reasonably be assumed that Montréal and Toronto will be terminal stations in many cases. On the basis of dwell times, then, light freight operations mixed with passenger trains would only be feasible at terminal stations, i.e., at Windsor, Toronto, Montréal and Québec City.

Another operating consideration concerns the location of the light freight handling facility. The small quantities of containers likely to be attracted by the HSR light freight system under the mixed train service option could possibly be handled at the passenger stations. However, major difficulties would be experienced at Montréal Central Station and Toronto Union Station in terms of dock space and truck movement space. Only very limited quantities of containers and trucks can be loaded or unloaded at the same time at these stations.

More significant volumes could not be handled at these stations with their present configuration, and major modifications to accommodate handling, storage and truck operations for such volumes are not feasible economically. As will be demonstrated in the next chapter, the estimated HSR market shares range from 12.1% to 16.7% of the overall market potential in the corridor. These percentages are equivalent to between 467 and 650 HSR containers per day. Such volumes

necessitate dedicated facilities for light freight handling with sufficient space for the handling equipment, the storage of the containers, the truck loading and unloading, and the truck movement from and to the railway terminal.

These requirements preclude the possibility of combining the two service options of mixed and dedicated trains. The mixed trains would have to serve the passenger stations, which do not have sufficient capacity to handle dedicated trains. On the other hand, dedicated light freight terminals would offer sufficient capacity to handle dedicated freight trains but no facilities to handle passengers.

6.2. LIGHT FREIGHT IN DEDICATED TRAINS

This service option involves the movement of light freight in dedicated trains. The terms of reference mention that it should be assumed that the dedicated trains would be travelling at night or during the day, each serving specific market requirements.

6.2.1. Market Considerations

The "same-day delivery" service characteristic has been discussed in section 6.1.1. This market niche represents a small proportion of the overall market. It has been estimated that single cars on mixed trains all-day long would offer sufficient capacity to capture a maximum of 38% of this market segment under the most optimistic assumptions. If the same traffic volumes could be consolidated at a specific time of the day, it would require 1.5 to 2 dedicated trains travelling in each direction to provide the equivalent carrying capacity.

It is anticipated that such a service would only partially meet the market requirements. Indeed, a train scheduled at mid-morning in one city might be too late at another city to provide same day delivery service (within business hours) for the consignees in that city. In addition, the limited frequency offered by such an HSR light freight service would favour the competing modes such as Bus and Air.

The courier survey and the shipper interview program identified very clearly the most important service characteristics necessary to succeed in this market. The reliability of the service is a "sine qua non" condition for all participants. This is

considered as a prerequisite by the shippers. For the intercity market, overnight delivery, complemented by a departure time from the origin city as late as possible combined with a delivery time in the destination city as early as possible, is a very important criterion.

The courier survey addressed eight service requirements. Departure times and arrival times obtained the highest ranking, even above dependability. The interview program addressed a combination of service factors versus cost and other factors: service factors were ranked the most important by 83% of the shippers interviewed for the courier traffic, and by 33% of those interviewed for the LTL traffic.

Consequently, the most important market requirements would best be served by dedicated trains travelling at night. Such a service option would provide late departures (after or at the very end of business hours) and early deliveries (before or at the start of business hours).

6.2.2. Operational Considerations

The introduction of dedicated trains during the day would be feasible within the off-peak periods for passenger service. However, the time required for freight loading or unloading at each station or railway terminal is estimated at between 15 and 30 minutes. This compares with station dwell times ranging from 2 to 20 minutes for passengers. Special attention would have to be given to the train schedule in order to avoid any interference between dedicated light freight trains and passenger trains.

The operation of dedicated freight trains at night presents numerous advantages in addition to fitting almost perfectly the market requirements described previously. The majority of the freight operation would be performed when no passenger service is provided. This eliminates any potential interference between freight trains and passenger trains, leaving only limited interference with maintenance-of-way equipment and crews working at night. It also gives access to low-cost off-peak energy for the traction of the freight trains. And, more importantly, a large proportion of the locomotive fleet required for the passenger trains could also be used for the freight trains, generating significant savings in locomotive investments. However, this possibility would require thorough research by the rolling stock manufacturers, if it became mandatory for the project.

6.3. HSR Authority as a Retailer

This section addresses a specific role of the HSR Authority in the light freight market: retailer. This role of retailer would require the HSR Authority to invest in sorting facilities, pick-up and delivery equipment, and sophisticated shipment tracing systems, in order to serve the shippers directly and to compete head-on with the private courier companies, Canada Post, and the trucking companies offering LTL services.

6.3.1. Market Considerations

The market served by the courier industry has always been highly service-sensitive and has always involved extensive competition between the courier companies. These have continuously improved their service offerings to increase or maintain their respective share of market. The recent economic recession has reinforced the requirement to increase the level of service. It has become common practice for the courier companies to supply a work force at the clients' premises and/or to perform delivery of the product on the shelf or where it will be consumed.

These special services complement other services which are common to the industry: sophisticated hi-tech tracing, billing, and reporting systems for all shipments. Moreover, the corridor market is only a portion of the markets served by the major courier companies, which are involved across Canada, the United States, and on the overseas market.

The recession has also caused downward pressure on the prices that clients are willing to pay for premium services and on rate negotiations. This has contributed to emphasizing the trend to a shipper being served by only one courier company. Shippers feel that the quality of service and of communications is improved by concentrating their shipments with one carrier. Quantity and commitment have contributed to reduced rates.

The courier market in the Québec/Windsor corridor is in a situation of surplus capacity. The difficulties experienced by major courier companies serving this market are an indication of this situation: CanPar has been sold at the beginning of the year, Canada Post made a successful offer to purchase Purolator in June 1993, etc. In addition, Roadway Package System, a successful courier company in the

United States, has expanded its operations in the corridor, starting in August 1992. If the HSR Authority became a retailer, the corridor carrier capacity would be further increased. In this case, the market situation would deteriorate, as would the rate levels.

Other transportation companies have attempted to participate as retailers in the courier market. In general, the trucking companies have succeeded in this field, which is very similar to their normal line of business. Some examples are: CP Transport with CanPar, Day and Ross with Same Day Courier, and Reimer Express with Fast as Flite, etc. On the other hand, the Canadian railway companies were extensively involved in express traffic a long time ago, before the road network was fully developed. Each railway station had its express freight shed. The railways eventually became wholesalers in this market by creating express trucking divisions and by a greater recognition of pool car operators.

The airline companies, such as Air Canada, have experienced major difficulties in the retailer role. The national carrier launched its light freight operation in 1979, as a retailer, and suffered massive operating losses in the first 6 years of service. Since then, Air Canada has assumed primarily the role of a carrier, not that of a courier company.

The bus companies also assume the role of a retailer, by providing the pick-up and delivery services in about one hundred cities in the provinces of Québec and Ontario. This represents only 7% of all the cities served by the bus network. The majority of the light freight traffic is delivered or picked-up directly at the bus terminal by the shippers or consignees. An important number of small courier companies are using the bus companies as a carrier for the intercity transportation of their shipments consigned mostly to out-of-the-way destinations and even to major corridor cities.

The HSR light freight system would not benefit from a "similar line of business", as the trucking companies do, and would not offer an extensive territorial coverage as the bus companies do. It would more closely resemble an airline company, which is restricted to the airport terminals it serves. Air Canada's failure in its attempt to compete as a retailer in the light freight market in the Québec/Windsor corridor is most instructive in this respect.

6.3.2. Operational Considerations

Over and above the market constraints described in the previous section, the role of retailer would require massive investments by the HSR Authority. The items requiring investment would be;

- the pick-up and delivery (P + D) service
- the sorting facility
- the hi-tech tracing system.

The pick-up and delivery investment is a function of the number of packages to be picked-up in one city and delivered in another. The estimated HSR market share, established in the current study, ranges from 166,500 to 230,155 packages per day to be picked-up and delivered, for total P + D activities ranging from 333,000 to 460,310 every day. The courier industry assumes an average of 100 pieces per vehicle per day. Consequently, a total ranging from 3,663 vehicles to 5,063 vehicles would be required, including a 10% provision for spares. Various types of vehicles are used for the P + D activities. A realistic average cost would be $30,000 per vehicle, which would lead to a total investment ranging from $110 million to $152 million for the pick-up and delivery equipment alone.

The pick-up and delivery operation would involve between 3,330 and 4,603 drivers. The average salary of a driver in the courier industry is $20 per hour plus $4 per hour for fringe benefits at 8 hours per day. The labour cost for the P + D operation would, therefore, range from $639,000 per day to $884,000 per day or from $166 million to $230 million per year. This estimate does not include any fuel, supervision, administration, tracing, claims, or insurance costs.

Fuel costs are also direct costs for a P + D operation. If a vehicle averages 150 miles per day and travels an average of 6 miles per gallon, each vehicle would consume 25 gallons per day at a cost of $68 per day. The total fuel cost would range from $226,000 to $313,000 per day, or from $59 million to $81 million per year.

The tremendous number of small shipments moving from a wide range of origins to a wide range of destinations requires sophisticated sorting facilities, particularly in major cities such as Montréal and Toronto, which are used by the courier industry as hub centres. A sorting facility in a major centre would cost in the $25 to $30 million range. The smaller centres would require less sophisticated sorting

facilities that would cost in the $10 to $12 million range. The use of containers for shipments across the corridor would preclude an economical application of the hub concept to the HSR light freight system. The hub concept would involve additional handling in this case.

Consequently, the sorting facilities would require an investment in the range of $120 to $144 million for all the corridor cities served by HSR. In addition, the operation of a sorting facility is highly labour-intensive. This operation is performed at an average estimated cost of $1.50 per delivered piece. Based on an estimated HSR market share ranging from 166,500 to 230,155 packages per day, the sorting operation would cost from $65 to $90 million per year.

Finally, the courier industry has developed hi-technology and computer systems in order to provide high quality services in the areas of tracing, billing, and reporting shipments. The development and implementation of such systems benefits the whole network of the companies involved. An approximation of the cost of a system to provide the HSR light freight operation with a competitive service from that standpoint would be in the $50 million range.

In summary, the retail operation of the HSR light freight system would involve the following investment and operating costs:

COST ITEM	INVESTMENT	OPERATING COST
Pick-up and delivery	$110 to $152 million	$225 to $311 million
Sorting facilities	$120 to $144 million	$65 to $90 million
Tracing system	$ 50 million	not estimated
TOTAL	**$280 to $346 million**	**(Partial) $290 to $401 million**

An investment ranging from $280 to $346 million would be required by the HSR Authority in order to be able to participate as a retailer to the corridor courier market. In view of the market considerations discussed in the previous section, such an investment should be considered as a very high risk. The experience of Air Canada as a retailer has also been mentioned. It resulted in annual deficits in the millions of dollars for its first six years of participation as a retailer in the corridor

courier market. The financial performance of the Air Canada's air cargo operation has been turned around by strictly assuming the role of an air carrier.

6.4. HSR Authority as a Wholesaler

This section addresses specifically the role of the HSR Authority as a wholesaler in the light freight market. This role involves the HSR Authority acting strictly as a carrier providing intercity terminal-to-terminal transportation services to the retailers of the light freight industry, such as private courier companies, LTL truckers, Canada Post, and local truckers.

6.4.1. Market Considerations

The current excess capacity in the courier industry was caused by the slowdown in the economy in the early 1990's. This market situation has generated tremendous downward pressure on rates. In this context, the courier companies are searching for new cost-efficient means of performing their services. Intercity transportation is one important component of these services costs.

The smaller courier companies are mostly using for-hire trucking and contractual owner-operators to perform their intercity transportation operations. The larger courier companies own highway motor fleets that sometimes are larger than those operated by many commercial highway common carriers. These large courier companies also use common carriers and contractual owner-operators. The possibility of choosing between their own fleets and common carriers or independent operators provides these courier companies with more operational flexibility.

The courier survey identified numerous origin/destination segments with important traffic imbalances across the Québec/Windsor corridor. In addition, the survey identified city pairs with total courier traffic volumes of less than one truckload.

These market situations represent significant additional cost to the courier companies that are using their own fleets, since they are carrying a payload in only one direction, the opposite direction being travelled without a revenue load. Common carriers and independent operators are facing a very similar situation, although they have access to other types of traffic to fill trailers otherwise returning empty. Finally,

small quantities are expensive for any type of carrier, as full loads cannot be achieved, even with smaller trucks.

Intercity transportation in the corridor segments presenting the above characteristics constitutes a sector which offers opportunities for cost-efficiency improvements. The HSR light freight system would be in a position to offer a reliable service at very advantageous costs for courier companies and shippers. It should be noted though that market imbalances only exist on some of the train runs and, in some instances, are not in the same direction (i.e. eastbound or westbound).

By restricting its role to a wholesaler or intercity carrier, the HSR Authority would become a supplier to the courier industry rather than a competitor. It could be verified that the courier industry would encourage any partnership which would offer opportunities to improve its cost-efficiencies.

6.4.2. Operational Considerations

The role of the HSR Authority as a wholesaler would involve limiting its participation to the intercity transportation of courier shipments and LTL traffic. While this approach would leave maximum control of their service level to the courier companies and to local carriers, it would save the HSR Authority from investing in areas outside of its expertise, thereby reducing its risk.

The investment for the HSR light freight system would be restricted to dedicated rolling stock, railway terminals, handling equipment and containers. An efficient handling operation is required, from the HSR standpoint, to allow for fast trip times and turnaround times, and, from the courier industry standpoint, to expedite the pick-up and delivery activities, which must be economical and damage-free. HSR-hauled containers would meet these requirements.

6.5. Conclusions

The evaluation of the various service alternatives is conclusive and can be summarized as follows:

- single cars on mixed trains would provide only very limited capacity if passenger trip times could not be increased and, probably could not be accommodated at Central Station in Montréal or Union Station in Toronto without major modifications to these facilities;

- dedicated trains during the day would serve a very small portion of the intercity corridor light freight market;

- dedicated trains during the night would provide the most critical service characteristics of the corridor light freight market (i.e. departure as late as possible from origin city and delivery as early as possible at destination city), would not interfere with passenger trains, and could possibly use the passenger locomotives;

- the HSR Authority would have to invest massively in areas outside of its expertise to assume a retailer role, and would have to compete with the courier companies in a highly competitive market already experiencing excess capacity;

- the HSR Authority would complement advantageously the courier industry, as an intercity carrier or as a wholesaler, by offering improved cost-efficiencies overall, particularly in city pairs with traffic imbalances and small daily quantities.

On the basis of this assessment, the remainder of the study was conducted for dedicated trains running at night and for a High Speed Rail Authority acting as a wholesaler.

7.

VOLUME FORECAST

AND MARKET SHARE

7. VOLUME FORECAST AND MARKET SHARE

This chapter provides estimates of the current overall volumes by origin/destination in the Québec/Windsor corridor, seasonal variations of these volumes, current modal shares, market trends, volume forecasts, and potential HSR market share.

The service options retained for the forecast estimates are based on the HSR Authority acting solely as a carrier (i.e. wholesaler) for the courier companies and the LTL traffic, using dedicated trainsets operating off-peak or at night, and for the two representative technologies (i.e. X-2000 and TGV). The two technologies are taken into account due to different load factors and to different running times.

In addition, the potential HSR market share were estimated on the basis of two different general premises or scenarios:

- The first approach is considered a "**minimal scenario**" and is based on a conservative assessment and assumptions concerning the traffic likely to be attracted by an HSR light freight system.

- The second approach is considered the "**most probable scenario**", as it is based on realistic and reasonable market share assumptions concerning additional traffic likely to be attracted by an HSR light freight system, over and above the potential traffic estimated under the minimal scenario.

7.1. ESTIMATE OF CURRENT OVERALL VOLUMES

7.1.1. Courier Traffic

This section presents the estimated current overall volumes by origin/destination in the Québec/Windsor corridor. As the approach and methodology for defining the market was previously described in Section 3.1, only some key interpretations will be provided before presenting the results.

The courier traffic was estimated on the basis of the survey conducted with the assistance of the Canadian Courier Association. The survey involved a few major corporations representing this industry. Although the industry includes a multitude of small firms, several articles, publications and industry sources have confirmed that the sample of firms which participated in the survey would handle 80 to 90% of the courier traffic within the Québec/Windsor corridor.

The larger corporations control 90% of the traffic for major city pairs where sophisticated tracing systems, sorting facilities, and distribution systems can be justified by the traffic level. For the smaller city pairs, it was assumed the survey participants represent 80% of the traffic, since sophisticated systems are not in place to the same extent, leaving greater access to smaller operators.

For the year 1992, the courier traffic moved within the Québec/Windsor corridor is estimated at a daily average of 203 trailer loads of 3000 cubic feet equivalent. The distribution of this volume by corridor city pair is presented in Table 7.1, on the following page.

Table 7.1

HSR Light Freight Study

Courier Traffic Volumes (1992 Level)

PROV ORIG	ROAD DIST. (km)	ORIGIN	DESTINATION	DIR	'92 Day Vol (3000 cuft) RAW DATA	RAW VS TOTAL MARKET	'92 Day Vol (3000 cuft) TOTAL
ONT	190	Windsor	London	East	1.80	80%	2.25
ONT	190	London	Windsor	West	1.25	80%	1.56
ONT	370	Windsor	Toronto	East	8.40	80%	10.50
ONT	370	Toronto	Windsor	West	5.85	80%	7.31
ONT	185	London	Toronto	East	4.95	90%	5.50
ONT	185	Toronto	London	West	8.00	90%	8.89
ONT	105	Kitchener/Waterloo	Toronto	East	7.70	90%	8.56
ONT	105	Toronto	Kitchener/Waterloo	West	10.50	90%	11.67
ONT	490	Kitchener/Waterloo	Ottawa	East	0.75	80%	0.94
ONT	490	Ottawa	Kitchener/Waterloo	West	0.10	80%	0.13
ONT	285	Windsor	Kitchener/Waterloo	East	0.75	80%	0.94
ONT	285	Kitchener/Waterloo	Windsor	West	0.00	80%	0.00
ONT	70	Hamilton	Toronto	East	8.95	90%	9.94
ONT	70	Toronto	Hamilton	West	10.60	90%	11.78
ONT	610	Hamilton	Montreal	East	1.45	90%	1.61
QUE	610	Montreal	Hamilton	West	1.05	90%	1.17
ONT	260	Toronto	Kingston	East	2.80	90%	3.11
ONT	260	Kingston	Toronto	West	1.50	90%	1.67
ONT	400	Toronto	Ottawa	East	9.60	90%	10.67
ONT	400	Ottawa	Toronto	West	4.95	90%	5.50
ONT	545	Toronto	Montreal	East	15.75	90%	17.50
ONT	545	Montreal	Toronto	West	14.80	90%	16.44
ONT	545	Toronto	Laval	East	2.00	90%	2.22
QUE	545	Laval	Toronto	West	2.00	90%	2.22
ONT	787	Toronto	Trois-Rivieres	East	0.75	80%	0.94
QUE	787	Trois-Rivieres	Toronto	West	0.00	80%	0.00
ONT	802	Toronto	Quebec City	East	3.70	80%	4.63
QUE	802	Quebec City	Toronto	West	1.15	80%	1.44
ONT	355	Windsor	Pearson Airport	East	0.50	80%	0.63
ONT	355	Pearson Airport	Windsor	West	0.00	80%	0.00
ONT	170	London	Pearson Airport	East	0.25	80%	0.31
ONT	170	Pearson Airport	London	West	0.25	80%	0.31
ONT	90	Kichener/Waterloo	Pearson Airport	East	0.25	80%	0.31
ONT	90	Pearson Airport	Kichener/Waterloo	West	0.25	80%	0.31
ONT	415	Pearson Air	Ottawa	East	0.35	80%	0.44
ONT	415	Ottawa	Pearson Air	West	0.10	80%	0.13
ONT	545	Pearson Air	Dorval	East	0.10	80%	0.13
QUE	545	Dorval	Pearson Air	West	0.20	80%	0.25
ONT	585	Pearson Air	Mirabel	East	0.00	80%	0.00
QUE	585	Mirabel	Pearson Air	West	0.00	80%	0.00
ONT	560	Pearson Air	Montréal	East	0.50	80%	0.63
QUE	560	Montréal	Pearson Air	West	0.00	80%	0.00
ONT	175	Kingston	Ottawa	East	0.70	80%	0.88
ONT	175	Ottawa	Kingston	West	0.00	80%	0.00
ONT	290	Kingston	Montreal	East	1.10	80%	1.38
ONT	290	Montreal	Kingston	West	0.50	80%	0.63
ONT	570	London	Ottawa	East	0.05	80%	0.06
ONT	570	Ottawa	London	West	0.00	80%	0.00
ONT	200	Ottawa	Montreal	East	6.15	90%	6.83
QUE	200	Montreal	Ottawa	West	5.30	90%	5.89
ONT	900	Windsor	Montreal	East	0.10	80%	0.13
QUE	900	Montreal	Windsor	West	0.25	80%	0.31
ONT	715	London	Montreal	East	0.35	80%	0.44
QUE	715	Montreal	London	West	0.25	80%	0.31
ONT	635	Kichener/Waterloo	Montreal	East	0.35	80%	0.44
QUE	635	Montreal	Kichener/Waterloo	West	0.25	80%	0.31
QUE	142	Montreal	Trois-Rivieres	East	4.35	80%	5.44
QUE	142	Trois-Rivieres	Montreal	West	1.50	80%	1.88
QUE	111	Montreal	Drummondville	East	1.80	80%	2.25
QUE	111	Drummondville	Montreal	West	0.90	80%	1.13
QUE	253	Montreal	Quebec City	East	13.25	90%	14.72
QUE	253	Quebec City	Montreal	West	4.35	90%	4.83
QUE	130	Trois-Rivieres	Quebec City	East	0.60	80%	0.75
QUE	130	Quebec City	Trois-Rivieres	West	0.85	80%	1.06
QUE	153	Drummondville	Quebec City	East	0.75	80%	0.94
QUE	153	Quebec City	Drummondville	West	0.00	80%	0.00
			Total (in trailers/day)				203.10

7.1.2. LTL Traffic

LTL traffic was estimated on the bases of a Statistics Canada special printout and of "*Trucking in Canada*" (# 53-222). The latter publication provides general data on LTL traffic, distance group shipments, and weight group shipments. These data had to be complemented in order to develop traffic volumes by origin/destination. Statistics Canada provided The Consultant with a special printout and a data base drawn from the general data base that was used to produce the above-referenced publication.

The special printout is derived from the for-hire trucking survey and provides origin/destination survey estimates for the year 1990, and for all the municipalities in the Québec/Windsor corridor, for the two weight groups (i.e. shipments up to 100 kg and shipments from 100 to 1000 kg) most likely to be attracted by the HSR light freight system. It contains data by origin/destination and by commodity, as per the sample presented in Table 7.2, presented at the end of this section.

For the current study, only the data involving cities to be served directly by HSR have been retained and are presented in Table 7.3, at the end of this section. This assumption is considered conservative, since it is more than likely that the HSR system would have access to traffic originating from or terminating in surrounding cities.

Finally, 1992 LTL traffic was estimated by making two extrapolations:

- From Statistics Canada publication # 53-222, it can be determined that the two weight groups for which market intelligence has been gained represent close to 32% of the overall Canadian tonnages of shipments ranging from zero kg to 4,999 kg. It is anticipated that this larger group would constitute the likely target market for the HSR light freight system. Consequently, the origin/destination volumes derived from the special printout were multiplied by three to obtain the estimated LTL traffic volumes for 1990;

- In order to obtain the 1992 LTL volume estimates, a derived gross output indicator was in each year applied to the 1990 volumes.

For the year 1992, the LTL traffic moved within the Québec/Windsor corridor is estimated at a daily average of 302 trailer loads of 3000 cubic feet equivalent, for shipments of less than 5000 kg. The distribution of this volume by city pair is presented in Table 7.4, at the very end of this section.

Table 7.2

STATISTICS CANADA FOR-HIRE TRUCKING SURVEY
ORIGIN AND DESTINATION SURVEY ESTIMATES
AGGLOMERATIONS IN THE QUEBEC CITY - WINDSOR CORRIDOR
FOR COMMODITIES 2 DIGITS
1990

ORIGIN	DESTINATION	COMMODITY	WGHT GRP	ACTUAL SHIPMENT	ESTIM SHIPMENT	ESTIM REVENUE	ESTIM TONNAGE	ESTIM TONNE-KM	ESTIM REVENUE/ SHIPMENT	ESTIM REVENUE/ TONNE	ESTIM REV/ TON-KM	ESTIM WGHT/ SHPMT
MONTREAL	TORONTO	85 KITCHEN UTENSILS, CUTLERY AND TA	2	6	949	40,957	162	90,181	43.180	235.194	0.423	170
	TORONTO	86 OTHER HOUSEHOLD AND PERSONAL EQU	1	3	418	22,489	29	16,752	53.865	1.121.044	1.989	69
	TORONTO	86 OTHER HOUSEHOLD AND PERSONAL EQU	2	84	444	157,751	220	119,507	355.418	660.983	1.211	496
	TORONTO	87 MEDICINAL AND PHARMACEUTICAL PRO	1	25	14,361	192,950	201	114,387	13.435	1,990.604	3.587	14
	TORONTO	87 MEDICINAL AND PHARMACEUTICAL PRO	2	10	1,814	136,241	581	323,214	75.104	249.175	0.448	321
	TORONTO	88 MEDICAL SUPPLIESS, OPTHALMIC GOO	1	7	1,886	31,206	34	19,263	16.543	5,113.417	9.263	18
	TORONTO	88 MEDICAL SUPPLIESS, OPTHALMIC GOO	2	2	463	21,321	96	54,407	46.025	237.307	0.422	207
	TORONTO	89 PRINTED MATTER	1	32	4,754	143,708	202	113,156	30.230	2,071.514	3.751	42
	TORONTO	89 PRINTED MATTER	2	19	1,659	122,235	603	341,584	73.684	227.231	0.398	363
	TORONTO	90 STATIONER'S AND OFFICE SUPPLIES	1	10	2,324	93,486	88	50,749	40.220	1,825.132	3.255	38
	TORONTO	90 STATIONER'S AND OFFICE SUPPLIES	2	15	1,746	84,145	543	304,459	48.192	183.324	0.326	311
	TORONTO	91 PHOTOGRAPHIC GOODS	1	8	1,175	23,187	31	17,242	19.738	1,499.100	2.716	26
	TORONTO	91 PHOTOGRAPHIC GOODS	2	4	433	25,657	151	85,204	59.263	174.856	0.307	348
	TORONTO	92 MUSICAL GOODS	1	1	300	9,914	19	10,149	33.010	515.781	0.977	64
	TORONTO	94 MISCELLANEOUS END-PRODUCTS	1	18	2,713	94,224	88	50,191	34.734	1,381.856	2.399	32
	TORONTO	94 MISCELLANEOUS END-PRODUCTS	2	17	3,042	494,423	1,103	606,312	162.543	414.659	0.761	363
	TORONTO	95 CONTAINERS AND CLOSURES	1	85	6,038	265,093	235	130,022	43.905	2,907.914	5.284	39
	TORONTO	95 CONTAINERS AND CLOSURES	2	66	8,062	682,233	2,865	1,605,773	84.626	320.766	0.576	355
	TORONTO	96 REMAINING END-PRODUCTS CLASSIFIE	1	15	1,342	59,970	75	42,787	44.689	3,206.019	5.858	56
	TORONTO	96 REMAINING END-PRODUCTS CLASSIFIE	2	19	2,458	185,813	817	449,859	75.601	304.354	0.542	332
	TORONTO	99 GENERAL OR UNCLASSIFIED FREIGHT	1	219	42,510	1,043,794	1,165	663,870	24.554	2,325.079	4.164	27
	TORONTO	99 GENERAL OR UNCLASSIFIED FREIGHT	2	200	21,613	1,897,431	7,146	3,995,035	87.792	306.118	0.550	331
	HAMILTON	09 VEGETABLES AND VEGETABLE PREPARA	2	1	94	13,895	93	58,547	147.790	149.283	0.237	990
	HAMILTON	10 SUGAR AND SUGAR PREPARATIONS	2	3	506	36,419	77	48,734	71.928	487.903	0.777	153
	HAMILTON	11 COCOA, COFFEE, TEA AND SPICES	1	1	182	5,058	8	4,987	27.750	616.667	1.014	45
	HAMILTON	11 COCOA, COFFEE, TEA AND SPICES	2	2	92	6,303	32	19,956	68.526	198.038	0.316	346
	HAMILTON	14 OTHER FOODS, FOOD MATERIALS AND	1	3	512	21,708	33	20,650	42.432	661.490	1.057	64
	HAMILTON	14 OTHER FOODS, FOOD MATERIALS AND	2	1	336	14,724	45	34,205	43.840	327.164	0.430	134
	HAMILTON	33 WOOD FABRICATED MATERIALS	1	2	28	563	1	864	20.091	467.693	0.649	45
	HAMILTON	33 WOOD FABRICATED MATERIALS	2	1	230	22,713	46	29,923	98.710	491.095	0.759	201
	HAMILTON	35 PAPER AND PAPERBOARD	1	2	182	7,905	6	3,874	43.531	1,368.951	2.173	34
	HAMILTON	36 TEXTILE FABRICATED MATERIALS	1	1	15	2,112	1	428	136.880	3,041.778	4.938	45
	HAMILTON	37 TEXTILE FABRICATED MATERIALS	1	3	337	8,763	19	11,446	25.982	497.929	0.819	56
	HAMILTON	37 TEXTILE FABRICATED MATERIALS	2	6	957	100,615	304	214,511	105.147	338.516	0.492	317
	HAMILTON	38 TEXTILE FABRICATED MATERIALS	2	1	51	6,831	30	19,179	132.800	225.467	0.356	589
	HAMILTON	40 CHEMICALS AND RELATED PRODUCTS	2	3	59	5,661	14	8,463	96.350	464.666	0.761	230
	HAMILTON	42 CHEMICALS AND RELATED PRODUCTS	1	3	118	6,114	9	5,933	51.872	751.471	1.151	79
	HAMILTON	42 CHEMICALS AND RELATED PRODUCTS	2	9	415	34,795	146	103,021	83.774	252.644	0.388	352
	HAMILTON	43 PETROLEUM AND COAL PRODUCTS	2	1	14	497	3	1,977	35.550	165.349	0.251	215
	HAMILTON	44 IRON, STEEL AND ALLOYS	2	2	140	16,317	45	26,915	116.175	378.400	0.633	323
	HAMILTON	46 METAL FABRICATED BASIC PRODUCTS	1	9	272	11,873	13	8,083	43.700	2,670.090	4.309	48
	HAMILTON	46 METAL FABRICATED BASIC PRODUCTS	2	4	554	41,436	158	99,193	74.840	248.719	0.398	286
	HAMILTON	47 NON-METALLIC MINERAL BASIC PRODU	2	1	336	12,320	65	39,412	36.680	190.052	0.313	193
	HAMILTON	50 MACHINERY NOT ELSEWHERE SPECIFIE	1	2	206	7,949	15	9,074	38.499	534.274	0.877	72
	HAMILTON	50 MACHINERY NOT ELSEWHERE SPECIFIE	2	2	501	31,988	103	63,133	63.849	400.504	0.642	205
	HAMILTON	51 CONVEYING, ELEVATING AND MATERIA	1	2	286	18,524	22	14,275	64.826	857.062	1.332	78
	HAMILTON	52 SPECIAL INDUSTRY MACHINERY	1	1	300	19,656	8	5,306	65.620	2,430.370	3.705	27
	HAMILTON	52 SPECIAL INDUSTRY MACHINERY	2	1	25	1,091	4	2,369	44.440	279.497	0.460	159
	HAMILTON	58 ROAD MOTOR VEHICLES	1	3	137	5,285	11	7,388	38.451	473.027	0.734	83
	HAMILTON	58 ROAD MOTOR VEHICLES	2	3	375	24,170	79	58,845	64.388	303.799	0.414	211
	HAMILTON	63 COMMUNICATION AND RELATED EQUIPM	2	1	117	15,230	15	9,293	130.300	1,042.400	1.639	125
	HAMILTON	65 HEATING, AIR CONDITIONING AND RE	2	1	40	4,461	16	12,349	111.460	274.532	0.361	406
	HAMILTON	68 ELECTRIC LIGHTING, DISTRIBUTION	1	2	166	5,651	4	2,262	34.128	1,809.705	2.803	21
	HAMILTON	68 ELECTRIC LIGHTING, DISTRIBUTION	2	2	538	65,663	210	132,540	121.981	300.679	0.476	391
	HAMILTON	72 SAFETY AND SANITATION EQUIP., AL	1	1	500	16,342	14	11,015	32.700	1,127.586	1.484	29
	HAMILTON	74 FURNITURE AND FIXTURES	1	1	145	7,194	5	2,825	49.550	1,548.437	2.547	32
	HAMILTON	74 FURNITURE AND FIXTURES	2	4	586	58,225	197	122,411	99.324	272.970	0.438	335
	HAMILTON	75 HAND TOOLS AND CUTLERY (EXCEPT T	2	1	13	341	2	1,098	26.250	193.015	0.311	136
	HAMILTON	76 OTHER EQUIPMENT	1	1	22	1,004	2	1,114	44.880	547.317	0.902	82
	HAMILTON	78 APPAREL AND ACCESSORIES	1	10	1,433	36,596	44	26,964	25.532	1,167.124	1.904	31
	HAMILTON	78 APPAREL AND ACCESSORIES	2	2	424	17,677	60	40,096	41.730	323.875	0.459	142

Table 7.3

HSR Light Freight Study
LTL WEIGHT GROUP / COMMODITY COMPARISONS

commodity code	commodity description	GROUP 1 (0 – 100 kg) total estimated tonnage	GROUP 1 (0 – 100 kg) total estimated shipments	GROUP 1 (0 – 100 kg) ave wt. per shipment (kg)	GROUP 2 (100 – 1000 kg) total estimated tonnage	GROUP 2 (100 – 1000 kg) total estimated shipments	GROUP 2 (100 – 1000 kg) ave wt. per shipment (kg)	GROUP 1 Comm. Share of TOTAL (%)	GROUP 2 Comm. Share of TOTAL (%)	% Change In Share GROUP 1 GROUP 2
1	MEAT AND MEAT PREPARATIONS	2513	55230	46	17591	55558	317	3.1%	2.9%	−4%
				n/a			n/a	0.0%	0.0%	N/A
3	FISH	12	400	30	207	448	462	0.0%	0.0%	135%
4	OTHER MARINE PRODUCTS	248	3941	63	2895	8394	345	0.3%	0.5%	59%
5	DAIRY PRODUCTS, EGGS AND HONEY	372	10106	37	1249	4060	308	0.5%	0.2%	−54%
6	CEREAL GRAINS (INC. SEED, FLOUR,	199	3410	58	1908	7042	271	0.2%	0.3%	31%
7	FRUITS AND FRUIT PREPARATIONS	101	1657	61	687	1317	522	0.1%	0.1%	−7%
8	NUTS (EXCEPT OIL NUTS)			n/a	154	200	770	0.0%	0.0%	N/A
9	VEGETABLES AND VEGETABLE PREPARA	117	2734	43	815	1911	426	0.1%	0.1%	−5%
10	SUGAR AND SUGAR PREPARATIONS	738	14713	50	5975	22049	271	0.9%	1.0%	11%
11	COCOA, COFFEE, TEA AND SPICES	293	6276	47	1546	4329	357	0.4%	0.3%	−28%
				n/a			n/a	0.0%	0.0%	N/A
				n/a			n/a	0.0%	0.0%	N/A
14	OTHER FOODS, FOOD MATERIALS AND	3279	85117	39	33540	81647	411	4.0%	5.6%	40%
15	FODDER AND FEED (EXCEPT UNMILLED	24	344	70			n/a	0.0%	0.0%	−100%
				n/a			n/a	0.0%	0.0%	N/A
17	BEVERAGES	59	1282	46	1580	3549	445	0.1%	0.3%	266%
18	TOBACCO	174	3450	50	1422	3893	365	0.2%	0.2%	12%
				n/a			n/a	0.0%	0.0%	N/A
20	CRUDE ANIMAL PRODUCTS, INEDIBLE	14	318	44	77	223	345	0.0%	0.0%	−25%
21	CRUDE VEG. PROD., INEDIBLE (EXC.	147	3870	38	1515	4111	369	0.2%	0.3%	41%
				n/a			n/a	0.0%	0.0%	N/A
23	CRUDE WOOD MATERIALS	28	700	40	72	158	456	0.0%	0.0%	−65%
24	TEXTILE AND RELATED FIBRES (INCL	44	1701	26	854	1587	538	0.1%	0.1%	165%
25	METAL ORES, METAL IN ORES, CONCE	25	383	65	156	256	609	0.0%	0.0%	−15%
26	COAL, CRUDE PETROLEUM AND RELATE			n/a	259	647	400	0.0%	0.0%	N/A
27	CRUDE NON−METALLIC MINERALS (EXC	74	1239	60	314	1302	241	0.1%	0.1%	−42%
				n/a			n/a	0.0%	0.0%	N/A
29				n/a	1193	2403	496	0.0%	0.2%	N/A
30	LEATHER	113	2222	51	1052	2910	362	0.1%	0.2%	27%
31	FURS, DRESSED	20	614	33	85	606	140	0.0%	0.0%	−42%
32	RUBBER AND PLASTIC FABRICATED MA	169	3115	54	1427	4615	309	0.2%	0.2%	15%
33	WOOD FABRICATED MATERIALS	460	11515	40	5591	14114	396	0.6%	0.9%	66%
				n/a			n/a	0.0%	0.0%	N/A
35	PAPER AND PAPERBOARD	791	14200	56	9672	24299	398	1.0%	1.6%	67%
36	TEXTILE FABRICATED MATERIALS	57	1228	46	1462	4596	318	0.1%	0.2%	250%
37	TEXTILE FABRICATED MATERIALS	7361	145178	51	70832	220311	322	9.0%	11.8%	31%
38	TEXTILE FABRICATED MATERIALS	14	226	62	328	1562	210	0.0%	0.1%	220%
39	OILS, FATS, WAXES, EXTRACTS AND			n/a			n/a	0.0%	0.0%	N/A
40	CHEMICALS AND RELATED PRODUCTS	178	5655	31	2256	6688	337	0.2%	0.4%	73%
41	CHEMICALS AND RELATED PRODUCTS	81	2750	29	734	1589	462	0.1%	0.1%	24%
42	CHEMICALS AND RELATED PRODUCTS	2596	65803	39	29964	78905	380	3.2%	5.0%	58%
43	PETROLEUM AND COAL PRODUCTS	140	3059	46	1084	3185	340	0.2%	0.2%	6%
44	IRON, STEEL AND ALLOYS	973	20551	47	12832	35503	361	1.2%	2.1%	80%
45	NON−FERROUS METALS	278	5224	53	2440	6911	353	0.3%	0.4%	20%
46	METAL FABRICATED BASIC PRODUCTS	2576	53315	48	22514	68331	329	3.1%	3.7%	19%
47	NON−METALLIC MINERAL BASIC PRODU	543	10441	52	13627	84120	162	0.7%	2.3%	243%
				n/a			n/a	0.0%	0.0%	N/A
49	MISCELLANEOUS FABRICATED MATERIA	524	12094	43	6174	17530	352	0.6%	1.0%	61%
50	MACHINERY NOT ELSEWHERE SPECIFIE	1540	33191	46	11846	38580	307	1.9%	2.0%	5%

Table 7.3

HSR Light Freight Study
LTL WEIGHT GROUP / COMMODITY COMPARISONS

commodity code	commodity description	GROUP 1 (0 – 100 kg) total estimated tonnage	GROUP 1 (0 – 100 kg) total estimated shipments	GROUP 1 (0 – 100 kg) ave wt. per shipment (kg)	GROUP 2 (100 – 1000 kg) total estimated tonnage	GROUP 2 (100 – 1000 kg) total estimated shipments	GROUP 2 (100 – 1000 kg) ave wt. per shipment (kg)	GROUP 1 Comm. Share of TOTAL (%)	GROUP 2 Comm. Share of TOTAL (%)	% Change In Share GROUP 1 GROUP 2
51	CONVEYING, ELEVATING AND MATERIA	316	5292	60	6464	21284	304	0.4%	1.1%	179%
52	SPECIAL INDUSTRY MACHINERY	670	14176	47	4195	12386	339	0.8%	0.7%	−15%
				n/a			n/a	0.0%	0.0%	N/A
54	AGRICULTURAL MACHINERY AND EQUIP	30	997	30	658	1961	336	0.0%	0.1%	199%
55	TRACTORS	2	19	105	163	741	220	0.0%	0.0%	1012%
				n/a			n/a	0.0%	0.0%	N/A
57	RAILWAY ROLLING STOCK	5	66	76	76	261	291	0.0%	0.0%	107%
58	ROAD MOTOR VEHICLES	3138	73704	43	47010	100520	468	3.8%	7.8%	104%
59	SHIPS AND BOATS	21	569	37	138	545	253	0.0%	0.0%	−10%
60	AIRCRAFT	65	2414	27	263	696	378	0.1%	0.0%	−45%
61	MISCELLANEOUS VEHICLES (INCLUDE	55	1032	53	692	2024	342	0.1%	0.1%	72%
62	RUBBER TIRES AND TUBES	260	5398	48	6365	15822	402	0.3%	1.1%	234%
63	COMMUNICATION AND RELATED EQUIPM	2937	92761	32	10842	38576	281	3.6%	1.8%	−50%
				n/a			n/a	0.0%	0.0%	N/A
65	HEATING, AIR CONDITIONING AND RE	533	9916	54	3641	11764	310	0.6%	0.6%	−7%
66	COOKING EQUIPMENT FOR FOOD	161	3351	48	939	3296	285	0.2%	0.2%	−20%
67	PLUMBING EQP. AND FITTINGS (EXC.	454	9465	48	2469	7725	320	0.6%	0.4%	−26%
68	ELECTRIC LIGHTING, DISTRIBUTION	1908	51100	37	11634	36525	319	2.3%	1.9%	−17%
69	OTHER ELECTRIC EQUIPMENT AND APP	1067	25425	42	10978	30844	356	1.3%	1.8%	40%
70	MEASURE, CONTROL, LAB., MEDICAL	845	26004	32	4202	11942	352	1.0%	0.7%	−32%
				n/a			n/a	0.0%	0.0%	N/A
72	SAFETY AND SANITATION EQUIP., AL	198	5643	35	558	2484	225	0.2%	0.1%	−62%
73	SERVICE INDUSTRY EQUIPMENT (INCL	41	785	52	311	781	398	0.0%	0.1%	4%
74	FURNITURE AND FIXTURES	3275	63868	51	14580	50479	289	4.0%	2.4%	−39%
75	HAND TOOLS AND CUTLERY (EXCEPT T	510	10727	48	3703	11372	326	0.6%	0.6%	−1%
76	OTHER EQUIPMENT	375	7587	49	2522	6568	384	0.5%	0.4%	−8%
77	OFFICE MACHINES AND EQUIPMENT	78	2525	31	110	347	317	0.1%	0.0%	−81%
78	APPAREL AND ACCESSORIES	4427	133051	33	16311	55039	296	5.4%	2.7%	−50%
79	FOOTWEAR	709	17841	40	4755	15627	304	0.9%	0.8%	−8%
80	TOILETRIES, CLEANING PREP. AND C	3618	181034	20	13049	38143	342	4.4%	2.2%	−51%
81	JEWELLERY AND SILVERWARE (EXCEPT	35	1248	28	43	230	187	0.0%	0.0%	−83%
82	WATCHES AND CLOCKS	30	341	88	267	1249	214	0.0%	0.0%	21%
83	OTHER REC.EQUIP.,TOYS,GAMES,SPOR	649	27043	24	4288	14592	294	0.8%	0.7%	−10%
84	HOUSE FURNISHINGS	1448	29422	49	8286	27880	297	1.8%	1.4%	−22%
85	KITCHEN UTENSILS, CUTLERY AND TA	839	17303	48	2138	7170	298	1.0%	0.4%	−65%
86	OTHER HOUSEHOLD AND PERSONAL EQ	524	10572	50	4939	16030	308	0.6%	0.8%	29%
87	MEDICINAL AND PHARMACEUTICAL PRO	3844	253343	15	6629	24582	270	4.7%	1.1%	−76%
88	MEDICAL SUPPLIESS, OPTHALMIC GOO	477	22516	21	3026	9134	331	0.6%	0.5%	−13%
89	PRINTED MATTER	2025	53629	38	11991	37443	320	2.5%	2.0%	−19%
90	STATIONER'S AND OFFICE SUPPLIES	2530	58956	43	7525	29077	259	3.1%	1.3%	−59%
91	PHOTOGRAPHIC GOODS	347	11990	29	1487	5199	286	0.4%	0.2%	−42%
92	MUSICAL GOODS	94	2499	38	362	958	378	0.1%	0.1%	−47%
93	FIREARMS, WEAPONS, AND AMMUNITION			n/a	35	66	530	0.0%	0.0%	N/A
94	MISCELLANEOUS END−PRODUCTS	721	18331	39	4178	14425	290	0.9%	0.7%	−21%
95	CONTAINERS AND CLOSURES	1856	42233	44	18370	58506	314	2.3%	3.1%	35%
96	REMAINING END−PRODUCTS CLASSIFIE	1794	47396	38	18265	54512	335	2.2%	3.0%	39%
				n/a			n/a	0.0%	0.0%	N/A
				n/a			n/a	0.0%	0.0%	N/A
99	GENERAL OR UNCLASSIFIED FREIGHT	12360	419877	29	75406	242353	311	15.0%	12.5%	−17%
		82146			601792			100.0%	100.0%	

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Table 7.4

HSR Light Freight Study

LTL Traffic:1990 Estimated Daily Volumes, with 1992 Projections

(Source: Statistic Canada, 1990 Windsor – Québec Corridor For-Hire Trucking Survey)

PROV ORIG	ROAD DIST. (km)	ORIGIN	DESTINATION	DIR	TOTAL DAILY VOLUMES est. tonnes 1990	(3000 cuft) 1990	(3000 cuft) 1992
ONT	190	Windsor	London	East	18.68	0.93	1.03
ONT	190	London	Windsor	West	21.44	1.07	1.18
ONT	370	Windsor	Toronto	East	86.22	4.31	4.74
ONT	370	Toronto	Windsor	West	235.65	11.78	12.97
ONT	185	London	Toronto	East	94.56	4.73	5.20
ONT	185	Toronto	London	West	354.47	17.72	19.50
ONT	105	Kitchener/Waterloo	Toronto	East	140.54	7.03	7.73
ONT	105	Toronto	Kitchener/Waterloo	West	293.32	14.67	16.14
ONT	490	Kitchener/Waterloo	Ottawa	East	24.53	1.23	1.35
ONT	490	Ottawa	Kitchener/Waterloo	West	2.01	0.10	0.11
ONT	285	Windsor	Kitchener/Waterloo	East	4.07	0.20	0.22
ONT	285	Kitchener/Waterloo	Windsor	West	15.32	0.77	0.84
ONT	70	Hamilton	Toronto	East	141.48	7.07	7.78
ONT	70	Toronto	Hamilton	West	368.26	18.41	20.26
ONT	610	Hamilton	Montreal	East	37.44	1.87	2.06
QUE	610	Montreal	Hamilton	West	41.11	2.06	2.26
ONT	260	Toronto	Kingston	East	119.12	5.96	6.55
ONT	260	Kingston	Toronto	West	18.35	0.92	1.01
ONT	400	Toronto	Ottawa	East	403.71	20.19	22.21
ONT	400	Ottawa	Toronto	West	71.18	3.56	3.92
ONT	545	Toronto	Montreal	East	953.73	47.69	52.47
ONT	545	Montreal	Toronto	West	597.72	29.89	32.89
ONT	545	Toronto	Laval	East	0.00	0.00	0.00
QUE	545	Laval	Toronto	West	0.00	0.00	0.00
ONT	787	Toronto	Trois-Rivieres	East	30.05	1.50	1.65
QUE	787	Trois-Rivieres	Toronto	West	4.51	0.23	0.25
ONT	802	Toronto	Quebec City	East	141.99	7.10	7.81
QUE	802	Quebec City	Toronto	West	17.75	0.89	0.98
ONT	355	Windsor	Pearson Airport	East	0.00	0.00	0.00
ONT	355	Pearson Airport	Windsor	West	0.00	0.00	0.00
ONT	170	London	Pearson Airport	East	0.00	0.00	0.00
ONT	170	Pearson Airport	London	West	0.00	0.00	0.00
ONT	90	Kichener/Waterloo	Pearson Airport	East	0.00	0.00	0.00
ONT	90	Pearson Airport	Kichener/Waterloo	West	0.00	0.00	0.00
ONT	415	Pearson Airport	Ottawa	East	0.00	0.00	0.00
ONT	415	Ottawa	Pearson Airport	West	0.00	0.00	0.00
ONT	545	Pearson Airport	Dorval	East	0.00	0.00	0.00
QUE	545	Dorval	Pearson Airport	West	0.00	0.00	0.00
ONT	585	Pearson Airport	Mirabel	East	0.00	0.00	0.00
QUE	585	Mirabel	Pearson Airport	West	0.00	0.00	0.00
ONT	560	Pearson Airport	Montréal	East	0.00	0.00	0.00
QUE	560	Montréal	Pearson Airport	West	0.00	0.00	0.00
ONT	175	Kingston	Ottawa	East	1.77	0.09	0.10
ONT	175	Ottawa	Kingston	West	15.24	0.76	0.84
ONT	290	Kingston	Montreal	East	4.12	0.21	0.23
ONT	290	Montreal	Kingston	West	24.08	1.20	1.32
ONT	570	London	Ottawa	East	8.69	0.43	0.48
ONT	570	Ottawa	London	West	10.10	0.50	0.56
ONT	200	Ottawa	Montreal	East	49.70	2.48	2.73
QUE	200	Montreal	Ottawa	West	263.61	13.18	14.50
ONT	900	Windsor	Montreal	East	37.02	1.85	2.04
QUE	900	Montreal	Windsor	West	18.77	0.94	1.03
ONT	715	London	Montreal	East	27.01	1.35	1.49
QUE	715	Montreal	London	West	44.19	2.21	2.43
ONT	635	Kichener/Waterloo	Montreal	East	64.55	3.23	3.55
QUE	635	Montreal	Kichener/Waterloo	West	55.70	2.78	3.06
QUE	142	Montreal	Trois-Rivieres	East	112.59	5.63	6.19
QUE	142	Trois-Rivieres	Montreal	West	30.30	1.52	1.67
QUE	111	Montreal	Drummondville	East	0.00	0.00	0.00
QUE	111	Drummondville	Montreal	West	0.00	0.00	0.00
QUE	253	Montreal	Quebec City	East	403.13	20.16	22.18
QUE	253	Quebec City	Montreal	West	78.50	3.92	4.32
QUE	130	Trois-Rivieres	Quebec City	East	0.97	0.05	0.05
QUE	130	Quebec City	Trois-Rivieres	West	7.90	0.40	0.43
QUE	153	Drummondville	Quebec City	East	0.00	0.00	0.00
QUE	153	Quebec City	Drummondville	West	0.00	0.00	0.00
			Total (in trailers / day)		5495.13	274.76	302.34

7.2. SEASONALITY AND VARIATIONS

7.2.1. Courier Traffic

The courier survey provided indications of the daily, weekly, and monthly variations of the courier volumes. The daily volumes are rather consistent as the variation is minimal. Thursday is the peak day of the week, but the volume is only two to three percent greater than the average daily volume.

A similar situation applies to the weekly volumes. In general, the last week of the month is the heaviest, with volumes of only two to three percent more than those of the average week.

The monthly variations are more significant. For instance, in the months of January and July, the volumes could be as low as 20% below the average monthly volumes. For the balance of the year, the variation remains within ten percent of the monthly average, for example, ten percent below in February and ten percent above in November-December.

The daily and weekly peaks being within three percent and the monthly peak being within ten percent, the average daily volumes were used for the forecast and a load factor of 95% was used to determine the container and rolling stock fleet requirements.

7.2.2. LTL Traffic

The seasonality issue was also addressed in the light freight shipper interview program. Generally, the monthly variation is unnoticeable. However, some industries experience peaks during months that are specifically related to their types of business. For example, the banks have greater volumes during spring months due to fiscal year-ends, auto and motorcycle manufacturers have greater volumes during late spring and early summer months due to heavier volumes of motorcycle parts, and the cosmetics industry has greater volumes during late fall and early winter months due to Christmas.

LTL traffic is composed of a very large base of products and industries which have their respective seasonal variations. It was assumed that these would

tend to offset each other and that the overall variation would be slight; consequently, LTL traffic seasonality does not have a significant impact on the forecast, or on the container and rolling stock fleet requirements.

7.3. CURRENT MODAL SHARES

7.3.1. Courier Traffic

The courier traffic shipped within the Québec/Windsor corridor is mostly handled by truck as illustrated by Table 7.5, presented at the end of this section. The share of traffic moved by Air is minimal except for city pairs involving an airport directly. The courier traffic moved by bus is also minimal compared to truck, ranging in most cases from three to five percent of the volume by city pair.

7.3.2. LTL Traffic

LTL traffic is all moved by truck. It is the type of carrier that varies. Some of the truckers that handle LTL traffic also provide courier services. Other truckers specialize in LTL traffic for specific industries. However, it is mostly truckload carriers that handle LTL traffic in the Québec/Windsor corridor.

Table 7.5

HSR Light Freight Study

Courier Traffic Volumes (Distribution by Mode)

PROV ORIG	ROAD DIST. (km)	ORIGIN	DESTINATION	DIR	'92 Day Vol (3000 cuft) TOTAL	Percent Truck	Percent Air	Percent Bus
ONT	190	Windsor	London	East	2.25	95%	1%	4%
ONT	190	London	Windsor	West	1.56	95%	1%	4%
ONT	370	Windsor	Toronto	East	10.50	95%	3%	2%
ONT	370	Toronto	Windsor	West	7.31	95%	3%	2%
ONT	185	London	Toronto	East	5.50	95%	3%	2%
ONT	185	Toronto	London	West	8.89	95%	3%	2%
ONT	105	Kitchener/Waterloo	Toronto	East	8.56	97%	0%	3%
ONT	105	Toronto	Kitchener/Waterloo	West	11.67	97%	0%	3%
ONT	490	Kitchener/Waterloo	Ottawa	East	0.94	97%	1%	2%
ONT	490	Ottawa	Kitchener/Waterloo	West	0.13	97%	1%	2%
ONT	285	Windsor	Kitchener/Waterloo	East	0.94	97%	1%	2%
ONT	285	Kitchener/Waterloo	Windsor	West	0.00			
ONT	70	Hamilton	Toronto	East	9.94	98%	0%	2%
ONT	70	Toronto	Hamilton	West	11.78	98%	0%	2%
ONT	610	Hamilton	Montreal	East	1.61	95%	3%	2%
QUE	610	Montreal	Hamilton	West	1.17	95%	3%	2%
ONT	260	Toronto	Kingston	East	3.11	95%	0%	5%
ONT	260	Kingston	Toronto	West	1.67	95%	0%	5%
ONT	400	Toronto	Ottawa	East	10.67	90%	5%	5%
ONT	400	Ottawa	Toronto	West	5.50	90%	5%	5%
ONT	545	Toronto	Montreal	East	17.50	90%	5%	5%
ONT	545	Montreal	Toronto	West	16.44	90%	5%	5%
ONT	545	Toronto	Laval	East	2.22	90%	5%	5%
QUE	545	Laval	Toronto	West	2.22	90%	5%	5%
ONT	787	Toronto	Trois-Rivieres	East	0.94	95%	0%	5%
QUE	787	Trois-Rivieres	Toronto	West	0.00			
ONT	802	Toronto	Quebec City	East	4.63	85%	10%	5%
QUE	802	Quebec City	Toronto	West	1.44	85%	10%	5%
ONT	355	Windsor	Pearson Airport	East	0.63	50%	50%	0%
ONT	355	Pearson Airport	Windsor	West	0.00	50%	50%	
ONT	170	London	Pearson Airport	East	0.31	60%	40%	
ONT	170	Pearson Airport	London	West	0.31	60%	40%	
ONT	90	Kichener/Waterloo	Pearson Airport	East	0.31	90%	8%	2%
ONT	90	Pearson Airport	Kichener/Waterloo	West	0.31	90%	8%	2%
ONT	415	Pearson Air	Ottawa	East	0.44	55%	40%	5%
ONT	415	Ottawa	Pearson Air	West	0.13	55%	40%	5%
ONT	545	Pearson Air	Dorval	East	0.13	55%	40%	5%
QUE	545	Dorval	Pearson Air	West	0.25	55%	40%	5%
ONT	585	Pearson Air	Mirabel	East	0.00			
QUE	585	Mirabel	Pearson Air	West	0.00			
ONT	560	Pearson Air	Montréal	East	0.63	60%	40%	
QUE	560	Montréal	Pearson Air	West	0.00			
ONT	175	Kingston	Ottawa	East	0.88	92%	0%	8%
ONT	175	Ottawa	Kingston	West	0.00			
ONT	290	Kingston	Montreal	East	1.38	92%	0%	8%
ONT	290	Montreal	Kingston	West	0.63	92%	0%	8%
ONT	570	London	Ottawa	East	0.06	90%	8%	2%
ONT	570	Ottawa	London	West	0.00			
ONT	200	Ottawa	Montreal	East	6.83	90%	2%	8%
QUE	200	Montreal	Ottawa	West	5.89	90%	2%	8%
ONT	900	Windsor	Montreal	East	0.13	80%	15%	5%
QUE	900	Montreal	Windsor	West	0.31	80%	15%	5%
ONT	715	London	Montreal	East	0.44	80%	15%	5%
QUE	715	Montreal	London	West	0.31	80%	15%	5%
ONT	635	Kichener/Waterloo	Montreal	East	0.44	80%	15%	5%
QUE	635	Montreal	Kichener/Waterloo	West	0.31	80%	15%	5%
QUE	142	Montreal	Trois-Rivieres	East	5.44	97%	0%	3%
QUE	142	Trois-Rivieres	Montreal	West	1.88	97%	0%	3%
QUE	111	Montreal	Drummondville	East	2.25	97%	0%	3%
QUE	111	Drummondville	Montreal	West	1.13	97%	0%	3%
QUE	253	Montreal	Quebec City	East	14.72	95%	2%	3%
QUE	253	Quebec City	Montreal	West	4.83	95%	2%	3%
QUE	130	Trois-Rivieres	Quebec City	East	0.75	97%	0%	3%
QUE	130	Quebec City	Trois-Rivieres	West	1.06	97%	0%	3%
QUE	153	Drummondville	Quebec City	East	0.94	97%	0%	3%
QUE	153	Quebec City	Drummondville	West	0.00			
		Total in Trailers / day and Weighted Modal Shares			203.10	93.0%	3.3%	3.8%

7.4. MARKET TRENDS

The market trends issue was addressed in the express courier survey and in the shipper interview program. The intent was to identify specific trends for the last ten years and specific projections for the next ten to twelve years.

Only one respondent addressed the trend issue through the courier survey, while thirteen firms provided some indications on past and future trends. The shippers' trends have been presented before but are repeated in Table 7.6 presented at the end of this section. It illustrates a wide range of trends between firms and between industries.

Considering the limited size of the sample and the large disparity between the data, it was considered more sound to use economic indicators for the future projections of each type of traffic.

Informetrica provided the projections for the indicators selected. The gross output for Québec and Ontario was derived from forecast provincial gross domestic products multiplied by the ratio of the federal gross domestic product to the federal gross output for the same year. This extrapolation was required since gross output data is not available at the provincial level.

The most applicable indicators to the traffic types under consideration were retained. In the case of courier traffic, a single indicator (Postal Services, or CIP) was found to provide a good fit. For LTL traffic, the single indicator (miscellaneous manufacturing, or MOT), used to produce the preliminary report, was reviewed and replaced by a composite LTL indicator, following exchanges with the Technical Committee.

As a result, a number of single industry-specific indicators, representing 50% of the total LTL traffic tonnage, or that portion of the market for which clear Informetrica indicator equivalences could be found to the Statistics Canada Commodity groups, were combined to obtain a tonnage-weighted index. The general Total Business indicator was used to cover the 50% of the LTL market for which no direct corresponding indicator could be found. This composite LTL indicator was subsequently used in all projections.

7.4.1. Courier Traffic

The resulting measures, provided by Informetrica, for postal services and, consequently, for courier traffic are as follows:

	Year-to-Year Change	Interval Change
From 1992 to 2005	2.6 %	40.2 %
From 2005 to 2020	2.6 %	46.1 %
From 2020 to 2024	2.5 %	N/A

For the current study, an annual growth of 2.6% was used for the entire project life from 2005 to 2024.

7.4.2. LTL Traffic

The composite LTL indicator, derived from several Informetrica indicators as described above, yields the following growth rates:

	Year-to-Year Change	Interval Change
From 1992 to 2005	3.6 %	58.9 %
From 2005 to 2020	2.9 %	52.8 %
From 2020 to 2024	N/A	N/A

For the current study, an annual growth of 3.6% was used for projections to 2005, and 2.9%, thereafter, i.e., from 2005 to 2024.

TABLE 7.6

TRENDS NOTED DURING INTERVIEW PROGRAM

INDUSTRY SECTORS	TREND OVER LAST 10 YEARS	TREND FOR NEXT 10 YEARS
COSMETICS / PERFUMES	4.8%	3.5%
AIRCARFT PARTS	4% since 1983, stable since 1991	Stable to 1995, 5% thereafter
BANK	Stable	Stable
AUTOMOBILE	6%	Stable to 1994, in 1995 (-3%), 4% thereafter
HEALTH FOOD	20%	4%
BIOMEDICAL	1%	Stable
BEARINGS	1%	1%
CLOTHING	(-5%)	(-1%)
PHARMACEUTICAL	10%	5%
SEMICONDUCTORS	1%	1%
FARM EQUIPEMENT	Stable	Stable
WAREHOUSING & CUSTOM BROKERS	10 - 15%	Up to 10%

7.5. VOLUME FORECASTS

The market trends described above were applied to the 1992 daily volume estimates, expressed in 3000 cubic foot trailer load equivalents, for each traffic type.

7.5.1. Courier Traffic

The overall courier traffic forecast for all modes within the Québec/Windsor corridor is shown in Table 7.7, presented at the end of this section. The volume forecasts are in truckloads of 3000 cubic feet and represent a daily average, for each city pair.

The 1992 estimated daily volume is 203 truckloads; this increases to 285 truckloads in 2005 and 464 truckloads in 2024, when a 2.6% annual increase is applied to the estimated initial volume estimates.

7.5.2. LTL Traffic

The LTL traffic forecast estimated for light freight shipments of less than 5000 kilograms within the Québec/Windsor corridor is shown in Table 7.8, presented at the end of this section. The volume forecasts are also in truckloads of 3000 cubic feet and represent a daily average, for each city pair.

The 1992 estimated daily volume is 302 truckloads; this increases to 480 truckloads in year 2005 and 827 truckloads in year 2024, when a 2.9% annual increase is applied to the estimated initial volume estimates.

Table 7.7

HSR Light Freight Study

Courier Traffic Volumes – Projections for 2005 – 2024

DAILY VOLUMES – COURIER – ALL MODES (IN TRUCK LOADS – 3,000 cu.ft.)																						
ORIGIN	DESTINATION	DIR	1992	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Windsor	London	East	2.25	3.2	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.8	4.9	5.0	5.1
London	Windsor	West	1.56	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.8	2.8	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.6
Windsor	Toronto	East	10.50	14.7	15.1	15.5	15.9	16.3	16.7	17.2	17.6	18.1	18.5	19.0	19.5	20.0	20.6	21.1	21.6	22.2	22.8	23.4	24.0
Toronto	Windsor	West	7.31	10.3	10.5	10.8	11.1	11.4	11.7	12.0	12.3	12.6	12.9	13.3	13.6	14.0	14.3	14.7	15.1	15.5	15.9	16.3	16.7
London	Toronto	East	5.50	7.7	7.9	8.1	8.3	8.5	8.8	9.0	9.2	9.5	9.7	10.0	10.2	10.5	10.8	11.0	11.3	11.6	11.9	12.2	12.6
Toronto	London	West	8.89	12.5	12.8	13.1	13.5	13.8	14.2	14.5	14.9	15.3	15.7	16.1	16.5	17.0	17.4	17.9	18.3	18.8	19.3	19.8	20.3
Kitchener/Waterloo	Toronto	East	8.56	12.0	12.3	12.6	13.0	13.3	13.6	14.0	14.4	14.7	15.1	15.5	15.9	16.3	16.7	17.2	17.6	18.1	18.6	19.0	19.5
Toronto	Kitchener/Waterloo	West	11.67	16.4	16.8	17.2	17.7	18.1	18.6	19.1	19.6	20.1	20.6	21.1	21.7	22.3	22.8	23.4	24.0	24.7	25.3	26.0	26.6
Kitchener/Waterloo	Ottawa	East	0.94	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1
Ottawa	Kitchener/Waterloo	West	0.13	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Windsor	Kitchener/Waterloo	East	0.94	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1
Kitchener/Waterloo	Windsor	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hamilton	Toronto	East	9.94	13.9	14.3	14.7	15.1	15.4	15.9	16.3	16.7	17.1	17.6	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.6	22.1	22.7
Toronto	Hamilton	West	11.78	16.5	16.9	17.4	17.8	18.3	18.8	19.3	19.8	20.3	20.8	21.3	21.9	22.5	23.1	23.7	24.3	24.9	25.5	26.2	26.9
Hamilton	Montreal	East	1.61	2.3	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.8	2.8	2.9	3.0	3.1	3.2	3.2	3.3	3.4	3.5	3.6	3.7
Montreal	Hamilton	West	1.17	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7
Toronto	Kingston	East	3.11	4.4	4.5	4.6	4.7	4.8	5.0	5.1	5.2	5.4	5.5	5.6	5.8	5.9	6.1	6.2	6.4	6.6	6.7	6.9	7.1
Kingston	Toronto	West	1.67	2.3	2.4	2.5	2.5	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.3	3.4	3.5	3.6	3.7	3.8
Toronto	Ottawa	East	10.67	15.0	15.3	15.7	16.2	16.6	17.0	17.4	17.9	18.4	18.8	19.3	19.8	20.3	20.9	21.4	22.0	22.5	23.1	23.7	24.4
Ottawa	Toronto	West	5.50	7.7	7.9	8.1	8.3	8.5	8.8	9.0	9.2	9.5	9.7	10.0	10.2	10.5	10.8	11.0	11.3	11.6	11.9	12.2	12.6
Toronto	Montreal	East	17.50	24.5	25.2	25.8	26.5	27.2	27.9	28.6	29.4	30.1	30.9	31.7	32.5	33.4	34.3	35.1	36.1	37.0	38.0	38.9	40.0
Montreal	Toronto	West	16.44	23.1	23.7	24.3	24.9	25.5	26.2	26.9	27.6	28.3	29.0	29.8	30.6	31.4	32.2	33.0	33.9	34.8	35.7	36.6	37.5
Toronto	Laval	East	2.22	3.1	3.2	3.3	3.4	3.5	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.5	4.6	4.7	4.8	4.9	5.1
Laval	Toronto	West	2.22	3.1	3.2	3.3	3.4	3.5	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.5	4.6	4.7	4.8	4.9	5.1
Toronto	Trois-Rivieres	East	0.94	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1
Trois-Rivieres	Toronto	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Toronto	Quebec City	East	4.63	6.5	6.7	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.1	9.3	9.5	9.8	10.0	10.3	10.6
Quebec City	Toronto	West	1.44	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.8	2.9	3.0	3.0	3.1	3.2	3.3
Windsor	Pearson Airport	East	0.63	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
Pearson Airport	Windsor	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
London	Pearson Airport	East	0.31	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Pearson Airport	London	West	0.31	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Kichener/Waterloo	Pearson Airport	East	0.31	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Pearson Airport	Kichener/Waterloo	West	0.31	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Pearson Airport	Ottawa	East	0.44	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0
Ottawa	Pearson Airport	West	0.13	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Pearson Airport	Dorval	East	0.13	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Dorval	Pearson Airport	West	0.25	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Pearson Airport	Mirabel	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mirabel	Pearson Airport	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	Montréal	East	0.63	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
Montréal	Pearson Airport	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kingston	Ottawa	East	0.88	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.9	1.9	2.0
Ottawa	Kingston	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kingston	Montreal	East	1.38	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.8	2.8	2.9	3.0	3.1	3.1
Montreal	Kingston	West	0.63	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
London	Ottawa	East	0.06	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ottawa	London	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ottawa	Montreal	East	6.83	9.6	9.8	10.1	10.3	10.6	10.9	11.2	11.5	11.8	12.1	12.4	12.7	13.0	13.4	13.7	14.1	14.4	14.8	15.2	15.6
Montreal	Ottawa	West	5.89	8.3	8.5	8.7	8.9	9.1	9.4	9.6	9.9	10.1	10.4	10.7	10.9	11.2	11.5	11.8	12.1	12.4	12.8	13.1	13.4
Windsor	Montreal	East	0.13	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Montreal	Windsor	West	0.31	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
London	Montreal	East	0.44	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0
Montreal	London	West	0.31	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Kichener/Waterloo	Montreal	East	0.44	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0
Montreal	Kichener/Waterloo	West	0.31	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Montreal	Trois-Rivieres	East	5.44	7.6	7.8	8.0	8.2	8.4	8.7	8.9	9.1	9.4	9.6	9.9	10.1	10.4	10.6	10.9	11.2	11.5	11.8	12.1	12.4
Trois-Rivieres	Montreal	West	1.88	2.6	2.7	2.8	2.8	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3
Montreal	Drummondville	East	2.25	3.2	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.8	4.9	5.0	5.1
Drummondville	Montreal	West	1.13	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.5	2.6
Montreal	Quebec City	East	14.72	20.6	21.2	21.7	22.3	22.9	23.5	24.1	24.7	25.3	26.0	26.7	27.4	28.1	28.8	29.6	30.3	31.1	31.9	32.8	33.6
Quebec City	Montreal	West	4.83	6.8	7.0	7.1	7.3	7.5	7.7	7.9	8.1	8.3	8.5	8.8	9.0	9.2	9.5	9.7	10.0	10.2	10.5	10.8	11.0
Trois-Rivieres	Quebec City	East	0.75	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7
Quebec City	Trois-Rivieres	West	1.06	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.4
Drummondville	Quebec City	East	0.94	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1
Quebec City	Drummondville	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total (in Trailers / day)		203	285	292	300	308	316	324	332	341	350	359	368	378	387	398	408	418	429	441	452	464

Table 7.8

HSR Light Freight Study

LTL Traffic Volumes: Projections for 2005 –2024

DAILY VOLUMES – LTL – ALL MODES (IN TRUCK LOADS – 3,000 cu.ft.)																							
ORIGIN	DESTINATION	DIR	1992	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Windsor	London	East	1.03	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.7	2.7	2.8
London	Windsor	West	1.18	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.8	2.9	3.0	3.0	3.1	3.2
Windsor	Toronto	East	4.74	7.5	7.8	8.0	8.2	8.5	8.7	8.9	9.2	9.5	9.7	10.0	10.3	10.6	10.9	11.2	11.6	11.9	12.3	12.6	13.0
Toronto	Windsor	West	12.97	20.6	21.2	21.8	22.4	23.1	23.8	24.5	25.2	25.9	26.6	27.4	28.2	29.0	29.9	30.7	31.6	32.6	33.5	34.5	35.5
London	Toronto	East	5.20	8.3	8.5	8.8	9.0	9.3	9.5	9.8	10.1	10.4	10.7	11.0	11.3	11.7	12.0	12.3	12.7	13.1	13.4	13.8	14.2
Toronto	London	West	19.50	31.0	31.9	32.8	33.8	34.7	35.8	36.8	37.9	39.0	40.1	41.2	42.4	43.7	44.9	46.2	47.6	49.0	50.4	51.8	53.3
Kitchener/Waterloo	Toronto	East	7.73	12.3	12.6	13.0	13.4	13.8	14.2	14.6	15.0	15.4	15.9	16.4	16.8	17.3	17.8	18.3	18.9	19.4	20.0	20.6	21.2
Toronto	Kitchener/Waterloo	West	16.14	25.6	26.4	27.2	27.9	28.8	29.6	30.4	31.3	32.2	33.2	34.1	35.1	36.1	37.2	38.3	39.4	40.5	41.7	42.9	44.1
Kitchener/Waterloo	Ottawa	East	1.35	2.1	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7
Ottawa	Kitchener/Waterloo	West	0.11	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Windsor	Kitchener/Waterloo	East	0.22	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Kitchener/Waterloo	Windsor	West	0.84	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.3
Hamilton	Toronto	East	7.78	12.4	12.7	13.1	13.5	13.9	14.3	14.7	15.1	15.5	16.0	16.5	16.9	17.4	17.9	18.5	19.0	19.5	20.1	20.7	21.3
Toronto	Hamilton	West	20.26	32.2	33.1	34.1	35.1	36.1	37.1	38.2	39.3	40.5	41.6	42.9	44.1	45.4	46.7	48.0	49.4	50.9	52.3	53.9	55.4
Hamilton	Montreal	East	2.06	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.4	4.5	4.6	4.7	4.9	5.0	5.2	5.3	5.5	5.6
Montreal	Hamilton	West	2.26	3.6	3.7	3.8	3.9	4.0	4.1	4.3	4.4	4.5	4.6	4.8	4.9	5.1	5.2	5.4	5.5	5.7	5.8	6.0	6.2
Toronto	Kingston	East	6.55	10.4	10.7	11.0	11.3	11.7	12.0	12.4	12.7	13.1	13.5	13.9	14.3	14.7	15.1	15.5	16.0	16.5	16.9	17.4	17.9
Kingston	Toronto	West	1.01	1.6	1.7	1.7	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7	2.8
Toronto	Ottawa	East	22.21	35.3	36.3	37.4	38.5	39.6	40.7	41.9	43.1	44.4	45.7	47.0	48.3	49.7	51.2	52.7	54.2	55.8	57.4	59.0	60.8
Ottawa	Toronto	West	3.92	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.3	8.5	8.8	9.0	9.3	9.6	9.8	10.1	10.4	10.7
Toronto	Montreal	East	52.47	83.4	85.8	88.3	90.8	93.5	96.2	99.0	101.9	104.8	107.8	111.0	114.2	117.5	120.9	124.4	128.0	131.7	135.6	139.5	143.5
Montreal	Toronto	West	32.89	52.3	53.8	55.3	56.9	58.6	60.3	62.0	63.8	65.7	67.6	69.5	71.6	73.6	75.8	78.0	80.2	82.6	85.0	87.4	90.0
Toronto	Laval	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Laval	Toronto	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Toronto	Trois–Rivieres	East	1.65	2.6	2.7	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.2	4.3	4.4	4.5
Trois–Rivieres	Toronto	West	0.25	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
Toronto	Quebec City	East	7.81	12.4	12.8	13.1	13.5	13.9	14.3	14.7	15.2	15.6	16.1	16.5	17.0	17.5	18.0	18.5	19.1	19.6	20.2	20.8	21.4
Quebec City	Toronto	West	0.98	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.7
Windsor	Pearson Airport	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	Windsor	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
London	Pearson Airport	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	London	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kichener/Waterloo	Pearson Airport	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	Kichener/Waterloo	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	Ottawa	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ottawa	Pearson Airport	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	Dorval	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dorval	Pearson Airport	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	Mirabel	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mirabel	Pearson Airport	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pearson Airport	Montréal	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Montréal	Pearson Airport	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kingston	Ottawa	East	0.10	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Ottawa	Kingston	West	0.84	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.3
Kingston	Montreal	East	0.23	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Montreal	Kingston	West	1.32	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.8	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.6
London	Ottawa	East	0.48	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
Ottawa	London	West	0.56	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.5
Ottawa	Montreal	East	2.73	4.3	4.5	4.6	4.7	4.9	5.0	5.2	5.3	5.5	5.6	5.8	6.0	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5
Montreal	Ottawa	West	14.50	23.0	23.7	24.4	25.1	25.8	26.6	27.4	28.2	29.0	29.8	30.7	31.6	32.5	33.4	34.4	35.4	36.4	37.5	38.6	39.7
Windsor	Montreal	East	2.04	3.2	3.3	3.4	3.5	3.6	3.7	3.8	4.0	4.1	4.2	4.3	4.4	4.6	4.7	4.8	5.0	5.1	5.3	5.4	5.6
Montreal	Windsor	West	1.03	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.7	2.7	2.8
London	Montreal	East	1.49	2.4	2.4	2.5	2.6	2.6	2.7	2.8	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	4.0	4.1
Montreal	London	West	2.43	3.9	4.0	4.1	4.2	4.3	4.5	4.6	4.7	4.9	5.0	5.1	5.3	5.4	5.6	5.8	5.9	6.1	6.3	6.5	6.7
Kichener/Waterloo	Montreal	East	3.55	5.6	5.8	6.0	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.7	8.0	8.2	8.4	8.7	8.9	9.2	9.4	9.7
Montreal	Kichener/Waterloo	West	3.06	4.9	5.0	5.2	5.3	5.5	5.6	5.8	5.9	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.7	7.9	8.1	8.4
Montreal	Trois–Rivieres	East	6.19	9.8	10.1	10.4	10.7	11.0	11.4	11.7	12.0	12.4	12.7	13.1	13.5	13.9	14.3	14.7	15.1	15.6	16.0	16.5	16.9
Trois–Rivieres	Montreal	West	1.67	2.6	2.7	2.8	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	4.0	4.1	4.2	4.3	4.4	4.6
Montreal	Drummondville	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drummondville	Montreal	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Montreal	Quebec City	East	22.18	35.2	36.3	37.3	38.4	39.5	40.7	41.8	43.1	44.3	45.6	46.9	48.3	49.7	51.1	52.6	54.1	55.7	57.3	59.0	60.7
Quebec City	Montreal	West	4.32	6.9	7.1	7.3	7.5	7.7	7.9	8.1	8.4	8.6	8.9	9.1	9.4	9.7	10.0	10.2	10.5	10.8	11.2	11.5	11.8
Trois–Rivieres	Quebec City	East	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Quebec City	Trois–Rivieres	West	0.43	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2
Drummondville	Quebec City	East	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quebec City	Drummondville	West	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (in trailers / day)			302	480	494	509	523	539	554	570	587	604	621	639	658	677	697	717	738	759	781	804	827

7.6. POTENTIAL HSR MARKET SHARE

Two scenarios have been developed for estimating the market share that an HSR light freight service is likely to attract. The first scenario, identified as "**minimal**" is based on very conservative assumptions for HSR market penetration. The second scenario, identified as "**most probable**", is based on realistic assumptions for HSR market penetration, over and above the traffic volumes identified in the minimal scenario.

7.6.1. Minimal Scenario

Under the minimal scenario, courier traffic constitutes the base traffic and is complemented by low-density LTL traffic.

7.6.1.1. Courier Traffic

The courier traffic volumes, presented previously in Table 7.7, are characterized by significant directional imbalances for most city pairs in the corridor and, in some cases, by less than one truckload between a given city pair for the entire courier industry. These two situations involve a major cost burden to the courier operators, as they have to incur a return-trip cost for generating a one-way revenue trip or else transport their shipments in less-than-truckload quantities.

Consequently, the following assumptions for HSR market penetration are considered conservative:

- the HSR light freight system will attract 100% of the directional traffic imbalances for all the city pairs within the Québec/Windsor corridor;

- the HSR light freight system will attract 100% of the traffic between city pairs for which the total industry daily volume is less than one truckload.

These assumptions resulted in estimated potential volumes for the HSR system of:

- 41.69 trailers/day - for the 200 + kph option and the 300 + kph option Existing ROW;

- 45.28 trailers/day - for the 300 + kph option New ROW

These 1992 volumes are for the entire corridor and their breakdown by city pair are shown in Tables 7.9.1 to 7.9.3, presented at the end of Section 7.6, and cover each technology-ROW option.

7.6.1.2. LTL Traffic

The LTL traffic volumes for shipments within the Québec/Windsor corridor of less than 5000 kg were previously presented in Table 7.8. The main characteristics of this traffic are: the volumes are larger than those of the courier traffic, there are directional imbalances which, sometimes, are in the opposite direction from the courier traffic imbalances, and finally, LTL traffic moves at fairly high rates in comparison with full truckload rates.

Consequently, LTL traffic is mostly considered mostly as potential backhaul traffic for the HSR light freight system and the following conservative assumptions were made:

- the HSR system will attract LTL traffic in HSR containers otherwise returning empty (ORE) where the courier traffic imbalance represents less than 40% of the LTL traffic moving in the opposite direction (i.e. the ORE direction);

- the HSR system will attract a further ten percent of the LTL traffic (for shipments of less than 5000 kg) in city pairs more than 500 km apart.

These assumptions result in estimated potential volumes for the HSR system of:

- 19.36 trailers/day - for the 200 + kph and the 300 + kph Existing ROW options;

- 19.27 trailers/day - for the 300 + kph New ROW option.

These 1992 volumes are for the entire corridor and their breakdown by city pair is provided in Tables 7.10.1 to 7.10.3, presented at the end of this section, for each technology-ROW option.

In order to define and validate the LTL market potential more accurately, the special data base provided by Statistics Canada was used as an independent approach to establish the commodities most susceptible to diversion to an HSR light freight system.

Table 7.11 "Shipment Data Limited to HSR Study O/D Pairs (Year 1990)", presented on the following pages, provides all the commodities and their respective tonnages, shipments, and average weight per shipment, for each of the weight groups covered by the special data base. It also illustrates the proportion that each commodity represents within each weight group, and the variation of that proportion between the two weight groups for each commodity.

The volumes identified are for traffic moving strictly between cities directly served by the HSR system. This is considered very conservative as it is more than likely that the HSR would attract traffic from surrounding cities within the corridor.

Table 7.11

HSR Light Freight Study
LTL WEIGHT GROUP COMMODITY COMPARISONS:
SHIPMENT DATA LIMITED TO HSR STUDY OD PAIRS

commodity code	commodity description (1)	0 – 100 kg (Group 1) estimated tonnage	estimated shipments	estimated wt / shipmt	100 – 1000 kg (Group 2) estimated tonnage	estimated shipments	estimated wt / shipmt	Commodity as % of gr. total (Gr 1)	Commodity as % of gr. total (Gr 2)	% change in comm share Gr1 to Gr2
1	MEAT AND MEAT PREPARATIONS	1423	30943	46	10436	28513	366	2.4%	2.5%	3%
3	FISH				25	48	521	N/A	N/A	N/A
4	OTHER MARINE PRODUCTS	150	2191	68	2759	7893	350	N/A	0.0%	N/A
5	DAIRY PRODUCTS, EGGS AND HONEY	296	6845	43	944	2409	392	0.3%	0.7%	159%
6	CEREAL GRAINS (INC. SEED, FLOUR,	134	2567	52	1358	5522	246	0.5%	0.2%	-55%
7	FRUITS AND FRUIT PREPARATIONS	57	825	69	540	1046	516	0.2%	0.3%	43%
8	NUTS (EXCEPT OIL NUTS)				154	200	770	0.1%	0.1%	34%
9	VEGETABLES AND VEGETABLE PREPARA	57	1064	54	435	1032	422	N/A	0.0%	N/A
10	SUGAR AND SUGAR PREPARATIONS	507	10546	48	4177	15317	273	0.1%	0.1%	8%
11	COCOA, COFFEE, TEA AND SPICES	192	3777	51	1368	3781	362	0.9%	1.0%	16%
								0.3%	0.3%	0%
14	OTHER FOODS, FOOD MATERIALS AND	2261	60316	37	25675	64209	400	N/A	N/A	N/A
								N/A	N/A	N/A
17	BEVERAGES	51	969	53	821	2047	401	3.8%	6.2%	60%
18	TOBACCO	128	2523	51	1024	2430	421	N/A	N/A	N/A
								N/A	N/A	N/A
20	CRUDE ANIMAL PRODUCTS, INEDIBLE	10	168	60	77	223	345	0.1%	0.2%	127%
21	CRUDE VEG. PROD., INEDIBLE (EXC.	126	2546	49	775	2428	319	0.2%	0.2%	13%
								N/A	N/A	N/A
23	CRUDE WOOD MATERIALS	20	559	36	50	112	446	0.0%	0.0%	-65%
24	TEXTILE AND RELATED FIBRES (INCL	42	1625	26	632	1079	586	0.1%	0.2%	112%
25	METAL ORES, METAL IN ORES, CONCE	17	281	60	2	10	200	0.0%	0.0%	-98%
26	COAL, CRUDE PETROLEUM AND RELATE				259	647	400	N/A	0.1%	N/A
27	CRUDE NON-METALLIC MINERALS (EXC	20	498	40	144	687	210	0.0%	0.0%	1%
								N/A	N/A	N/A
29	OTHER WASTE AND SCRAP MATERIALS				562	1385	406	N/A	0.1%	N/A
30	LEATHER	84	1781	47	549	1736	316	0.1%	0.1%	-8%
31	FURS, DRESSED	20	614	33	85	606	140	0.0%	0.0%	-40%
32	RUBBER AND PLASTIC FABRICATED MA	127	2390	53	753	2299	328	0.2%	0.2%	-16%
33	WOOD FABRICATED MATERIALS	268	6783	40	3274	10503	312	0.5%	0.8%	72%
								N/A	N/A	N/A
35	PAPER AND PAPERBOARD	454	8675	52	7365	16600	444	0.8%	1.8%	129%
36	TEXTILE FABRICATED MATERIALS	56	928	60	1027	3271	314	0.1%	0.2%	158%
37	TEXTILE FABRICATED MATERIALS	5802	116585	50	58681	180037	326	9.9%	14.1%	43%
38	TEXTILE FABRICATED MATERIALS	7	126	56	317	1462	217	0.0%	0.1%	538%
								N/A	N/A	N/A
40	CHEMICALS AND RELATED PRODUCTS	133	4180	32	1767	5265	336	0.2%	0.4%	87%
41	CHEMICALS AND RELATED PRODUCTS	36	1539	23	464	965	481	0.1%	0.1%	82%
42	CHEMICALS AND RELATED PRODUCTS	1739	43777	40	20018	54570	367	3.0%	4.8%	62%
43	PETROLEUM AND COAL PRODUCTS	72	1470	49	681	2296	297	0.1%	0.2%	33%
44	IRON, STEEL AND ALLOYS	601	12551	48	7956	22684	351	1.0%	1.9%	87%
45	NON-FERROUS METALS	196	3819	51	1181	3676	321	0.3%	0.3%	-15%
46	METAL FABRICATED BASIC PRODUCTS	1764	36608	48	13742	42746	321	3.0%	3.3%	10%
47	NON-METALLIC MINERAL BASIC PRODU	394	7314	54	11358	77135	147	0.7%	2.7%	306%
								N/A	N/A	N/A
49	MISCELLANEOUS FABRICATED MATERIA	381	8362	46	3991	10056	397	0.6%	1.0%	48%
50	MACHINERY NOT ELSEWHERE SPECIFIE	969	21150	46	7851	27128	289	1.6%	1.9%	14%
51	CONVEYING, ELEVATING AND MATERIA	218	3823	57	4478	15536	288	0.4%	1.1%	189%

Table 7.11 (continued)

HSR Light Freight Study
LTL WEIGHT GROUP COMMODITY COMPARISONS:
SHIPMENT DATA LIMITED TO HSR STUDY OD PAIRS

52 SPECIAL INDUSTRY MACHINERY	482	9560	50	2312	8194	282	0.8%	0.6%	−32%
							N/A	N/A	N/A
54 AGRICULTURAL MACHINERY AND EQUIP	18	778	23	206	559	369	0.0%	0.0%	61%
55 TRACTORS	1	6	167	111	671	165	0.0%	0.0%	1464%
							N/A	N/A	N/A
57 RAILWAY ROLLING STOCK	5	66	76	76	261	291	0.0%	0.0%	114%
58 ROAD MOTOR VEHICLES	1853	44531	42	28489	65557	435	3.2%	6.8%	117%
59 SHIPS AND BOATS	10	307	33	55	241	228	0.0%	0.0%	−22%
60 AIRCRAFT	57	2126	27	263	696	378	0.1%	0.1%	−35%
61 MISCELLANEOUS VEHICLES (INCLUDE	41	641	64	407	1624	251	0.1%	0.1%	40%
62 RUBBER TIRES AND TUBES	171	3030	56	3089	7409	417	0.3%	0.7%	155%
63 COMMUNICATION AND RELATED EQUIPM	2082	58664	35	8019	29214	274	3.5%	1.9%	−46%
							N/A	N/A	N/A
65 HEATING, AIR CONDITIONING AND RE	382	7221	53	2127	6578	323	0.7%	0.5%	−22%
66 COOKING EQUIPMENT FOR FOOD	122	2776	44	548	1770	310	0.2%	0.1%	−37%
67 PLUMBING EQP. AND FITTINGS (EXC.	172	4138	42	1823	6178	295	0.3%	0.4%	49%
68 ELECTRIC LIGHTING, DISTRIBUTION	1221	32283	38	9639	28868	334	2.1%	2.3%	11%
69 OTHER ELECTRIC EQUIPMENT AND APP	779	16328	48	8464	23520	360	1.3%	2.0%	53%
70 MEASURE, CONTROL, LAB., MEDICAL	478	16904	28	3739	9739	384	0.8%	0.9%	10%
							N/A	N/A	N/A
72 SAFETY AND SANITATION EQUIP., AL	128	4087	31	316	1677	188	0.2%	0.1%	−65%
73 SERVICE INDUSTRY EQUIPMENT (INCL	32	597	54	215	538	400	0.1%	0.1%	−5%
74 FURNITURE AND FIXTURES	2362	46840	50	10810	36764	294	4.0%	2.6%	−36%
75 HAND TOOLS AND CUTLERY (EXCEPT T	247	6485	38	1795	6499	276	0.4%	0.4%	2%
76 OTHER EQUIPMENT	199	4438	45	2215	5069	437	0.3%	0.5%	57%
77 OFFICE MACHINES AND EQUIPMENT	63	2357	27	55	142	387	0.1%	0.0%	−88%
78 APPAREL AND ACCESSORIES	3768	112228	34	12549	44079	285	6.4%	3.0%	−53%
79 FOOTWEAR	392	10661	37	3231	9980	324	0.7%	0.8%	16%
80 TOILETRIES, CLEANING PREP. AND C	2942	151192	19	9790	28958	338	5.0%	2.3%	−53%
81 JEWELLERY AND SILVERWARE (EXCEPT	35	1248	28	43	230	187	0.1%	0.0%	−83%
82 WATCHES AND CLOCKS	16	177	90	121	628	193	0.0%	0.0%	7%
83 OTHER REC.EQUIP.,TOYS,GAMES,SPOR	459	21357	21	2999	10272	292	0.8%	0.7%	−8%
84 HOUSE FURNISHINGS	1061	21620	49	6570	21106	311	1.8%	1.6%	−13%
85 KITCHEN UTENSILS, CUTLERY AND TA	597	13260	45	1710	5785	296	1.0%	0.4%	−60%
86 OTHER HOUSEHOLD AND PERSONAL EC	374	7077	53	3442	11004	313	0.6%	0.8%	30%
87 MEDICINAL AND PHARMACEUTICAL PRO	2949	200101	15	4967	17652	281	5.0%	1.2%	−76%
88 MEDICAL SUPPLIESS, OPTHALMIC GOO	309	17773	17	1762	5621	313	0.5%	0.4%	−20%
89 PRINTED MATTER	1680	44022	38	9107	29600	308	2.9%	2.2%	−24%
90 STATIONER'S AND OFFICE SUPPLIES	1763	36603	48	5341	23402	228	3.0%	1.3%	−57%
91 PHOTOGRAPHIC GOODS	224	8256	27	940	3260	288	0.4%	0.2%	−41%
92 MUSICAL GOODS	76	2285	33	360	950	379	0.1%	0.1%	−33%
93 FIREARMS, WEAPONS AND AMMUNITION				15	22	682	N/A	0.0%	N/A
94 MISCELLANEOUS END−PRODUCTS	584	15629	37	3443	11286	305	1.0%	0.8%	−17%
95 CONTAINERS AND CLOSURES	1389	32767	42	13235	42650	310	2.4%	3.2%	34%
96 REMAINING END−PRODUCTS CLASSIFIE	1183	23917	49	12357	35943	344	2.0%	3.0%	47%
							N/A	N/A	N/A
							N/A	N/A	N/A
99 GENERAL OR UNCLASSIFIED FREIGHT	9242	326244	28	42439	134375	316	15.7%	10.2%	−35%

Group Sub−Totals	58,760	416,949
Year 1990 Total for Groups 1 and 2 (All Shipments from 0 − 1000 kg)		475,709
Year 1992 Est. Total for Groups 1 and 2 (All Shipments from 0 − 1000 kg)		523,471

(1) Commodity Descriptions Truncated in Original Statistics Canada Database

The 1992 volume is estimated at 523,471 tonnes, obtained by applying the miscellaneous manufacturing market trend defined previously to the estimated 1990 tonnage of 475,709 tonnes. This last tonnage is broken down as follows: 58,760 tonnes of shipments up to 100 kg, and 416,949 tonnes of shipments between 100 kg and 1000 kg.

From this table, a list of selected target commodities has been developed on the basis of the following criteria:

- does not require specialized equipment, such as refrigeration;
- does not belong to the dangerous goods categories;
- has an average weight per shipment of 300 kg or less;
- has more than 50% of its volume in the less-than-100 kg weight group. Commodities with a greater proportion of shipments of less than 100 kg are more likely to be attracted by an HSR light freight system.

The resulting list of selected target commodities is included in Table 7.12, presented on the following page. This represents a total estimated volume of 100,517 tonnes for the year 1990, broken down into 36,338 tonnes for shipments up to 100 kg and 64,179 tonnes for shipments between 100 kg and 1000 kg. The resulting 1990 estimated average number of trailers per day identified is 19.33. This volume becomes 21.3 trailers per day for the year 1992.

The above traffic volumes are very similar to the potential market share volumes estimated for the HSR system: 19.36 trailers/day for 200 + kph and 300 + kph Existing ROW, and 19.27 trailers/day for 300 + kph New ROW. The two independent approaches have contributed to validating the results, as illustrated by their similarity.

In addition, the second approach illustrates relatively accurately the type of LTL traffic likely to be attracted by an HSR light freight system. The volumes of the selected target commodities represent 21.1% of all the commodities moved within the HSR city pairs, for the two weight groups covered by the special data base. The selected commodities represent only 7% of the total LTL traffic for shipments of less than 5000 kg in the Québec/Windsor corridor.

Table 7.12

HSR Light Freight Study
LTL WEIGHT GROUP COMMODITY COMPARISONS:
YEARLY SHIPMENT ESTIMATES LIMITED TO HSR STUDY OD PAIRS,ONLY TARGET COMMODITIES RETAINED

commodity code	commodity description	0 – 100 kg (Group 1) estimated tonnage	estimated shipments	estimated wt / shipmt	100 – 1000 kg (Group 2) estimated tonnage	estimated shipments	estimated wt / shipmt	Commodity as % of gr. total (Gr 1)	Commodity as % of gr. total (Gr 2)	% change in comm share Gr1 to Gr2
10	SUGAR AND SUGAR PREPARATIONS	507	10546	48	4177	15317	273	1.4%	2.5%	79%
11	COCOA, COFFEE, TEA AND SPICES	192	3777	51	1368	3781	362	0.5%	0.8%	55%
18	TOBACCO	128	2523	51	1024	2430	421	0.4%	0.6%	74%
27	CRUDE NON-METALLIC MINERALS (EXC	20	498	40	144	687	210	0.1%	0.1%	56%
30	LEATHER	84	1781	47	549	1736	316	0.2%	0.3%	42%
31	FURS, DRESSED	20	614	33	85	606	140	0.1%	0.1%	-8%
32	RUBBER AND PLASTIC FABRICATED MA	127	2390	53	753	2299	328	0.3%	0.4%	29%
46	METAL FABRICATED BASIC PRODUCTS	1764	36608	48	13742	42746	321	4.9%	8.2%	69%
50	MACHINERY NOT ELSEWHERE SPECIFIE	969	21150	46	7851	27128	289	2.7%	4.7%	76%
52	SPECIAL INDUSTRY MACHINERY	482	9560	50	2312	8194	282	1.3%	1.4%	4%
63	COMMUNICATION AND RELATED EQUIPM	2082	58664	35	8019	29214	274	5.7%	4.8%	-16%
65	HEATING, AIR CONDITIONING AND RE	382	7221	53	2127	6578	323	1.1%	1.3%	21%
66	COOKING EQUIPMENT FOR FOOD	122	2776	44	548	1770	310	0.3%	0.3%	-3%
68	ELECTRIC LIGHTING, DISTRIBUTION	1221	32283	38	9639	28868	334	3.4%	5.8%	71%
70	MEASURE, CONTROL, LAB., MEDICAL	478	16904	28	3739	9739	384	1.3%	2.2%	70%
72	SAFETY AND SANITATION EQUIP., AL	128	4087	31	316	1677	188	0.4%	0.2%	-46%
74	FURNITURE AND FIXTURES	2362	46840	50	10810	36764	294	6.5%	6.5%	-1%
75	HAND TOOLS AND CUTLERY (EXCEPT T	247	6485	38	1795	6499	276	0.7%	1.1%	58%
77	OFFICE MACHINES AND EQUIPMENT	63	2357	27	55	142	387	0.2%	0.0%	-81%
78	APPAREL AND ACCESSORIES	3768	112228	34	12549	44079	285	10.4%	7.5%	-28%
79	FOOTWEAR	392	10661	37	3231	9980	324	1.1%	1.9%	79%
80	TOILETRIES, CLEANING PREP. AND C	2942	151192	19	9790	28958	338	8.1%	5.8%	-28%
81	JEWELLERY AND SILVERWARE (EXCEPT	35	1248	28	43	230	187	0.1%	0.0%	-73%
82	WATCHES AND CLOCKS	16	177	90	121	628	193	0.0%	0.1%	64%
83	OTHER REC.EQUIP.,TOYS,GAMES,SPOR	459	21357	21	2999	10272	292	1.3%	1.8%	42%
85	KITCHEN UTENSILS, CUTLERY AND TA	597	13260	45	1710	5785	296	1.6%	1.0%	-38%
87	MEDICINAL AND PHARMACEUTICAL PRO	2949	200101	15	4967	17652	281	8.1%	3.0%	-63%
88	MEDICAL SUPPLIESS, OPTHALMIC GOO	309	17773	17	1762	5621	313	0.9%	1.1%	24%
89	PRINTED MATTER	1680	44022	38	9107	29600	308	4.6%	5.4%	18%
90	STATIONER'S AND OFFICE SUPPLIES	1763	36603	48	5341	23402	228	4.9%	3.2%	-34%
91	PHOTOGRAPHIC GOODS	224	8256	27	940	3260	288	0.6%	0.6%	-9%
94	MISCELLANEOUS END-PRODUCTS	584	15629	37	3443	11286	305	1.6%	2.1%	28%
99	GENERAL OR UNCLASSIFIED FREIGHT	9242	326244	28	42439	134375	316	25.4%	25.3%	-0%

TOTAL TARGET COMMODITIES	36338 tonnes/year	64179 tonnes/year (1)	100% 100%
TARGET COMM. AS % OF ALL COMM.	62%	15%	
TOTAL ALL COMMODITIES (HSR OD PAIRS ONLY)	58760 tonnes/year	416949 tonnes/year	

(1) NOTE: For Shaded Commodities, Group 2 Volumes do not enter into total due to average shipment weight in excess of 300 kg

7.6.2. Most Probable Scenario

The most probable scenario is based on the volumes identified for the minimal scenario plus additional volumes assumed to be attracted by the HSR light freight system. These additional volumes are based on realistic assumptions in terms of small percentage traffic shares obtained by HSR from competing modes.

It is anticipated that both the courier companies and the light freight shippers will take advantage of the HSR service and cost benefits beyond the transportation situations described for the minimal scenario (i.e. courier imbalance and less-than-truckload daily courier shipments, and LTL traffic only for containers otherwise returning empty). In the course of the survey and of the interview program, clear indications were received to the effect that HSR would be favoured, providing service reliability is proven and providing costs are competitive and attractive.

7.6.2.1. Courier Traffic

For the most probable scenario, the courier traffic also remains the base traffic. Courier operations are designed mainly to respond to market size; however they are also adapted to the distances to be covered. It is anticipated that an HSR light freight system would be more attractive to the courier companies for the longer distances.

In this context, the following assumptions are considered realistic:

- additional market share would be gained in city pairs generating more than one truckload per day, for the entire courier industry;
- this market share is estimated at five percent for city pairs less than 500 km apart;
- this market share is estimated at ten percent for city pairs over 500 km apart;
- the above percentages are applied against the lowest directional volume within each city pair, with the resulting volume to be handled by HSR in both directions.

These assumptions would generate the additional market share volumes presented in the following table:

Technology/ ROW Options	Minimal Scenario Volumes	Additional Market Share	Total Volumes Most Probable Scenario
- 200 + Kph and 300 + Kph **Existing** ROW options	41.69 trailers/day	7.78 trailers/day	**49.47 trailers/day**
- 300 + Kph **New** ROW option	45.28 trailers/day	7.9 trailers/day	**53.18 trailers/day**

These 1992 volumes are for the entire corridor; their breakdown by city pair is provided in Tables 7.9.1 to 7.9.3, presented at the end of this section, each covering a technology/ROW option.

7.6.2.2. LTL Traffic

In the minimal scenario, LTL traffic was considered as essentially a potential backhaul traffic. For the most probable scenario, it is assumed that LTL traffic in any direction could be attracted to the HSR light freight system on account of service reliability and, primarily, on account of cost savings. This additional traffic would be over and above the ten percent HSR market share of LTL traffic on distances of 500 km and more assumed for the minimal scenario.

The following assumptions are considered realistic:

- the additional market share is estimated at five percent for all city pairs of any distance, except on the lowest volumes within city pairs where the imbalance is significant.

These assumptions would generate the additional market share volumes presented in the following table:

Technology/ ROW Options	Minimal Scenario Volumes	Additional Market Share	Total Volumes Most Probable Scenario
- 200 + Kph and 300 + Kph Existing ROW options	19.36 trailers/day	11.83 trailers/day	**31.19 trailers/day**
- 300+ Kph New ROW option	19.27 trailers/day	11.94 trailers/day	**31.21 trailers/day**

These 1992 volumes are for the entire corridor; and their breakdown by city pair is provided in Tables 7.10.1 to 7.10.3, presented at the end of this section and cover respectively each technology/ROW option.

Table 7.9.1

Québec / Windsor Corridor

Courier Traffic Volumes captured in Minimal and Most Probable Scenarios

200 kph Existing ROW – X2000 Technology							
		ROAD DIST.		'92 Day Vol (3000 cuft)	Market Share Scenario		
					Minimal	Most Probable	
ORIGIN	DESTINATION	(km)	DIR	TOTAL[1]		Additional	Total
Windsor	London	190	East	2.25	0.69	0.08	0.77
London	Windsor	190	West	1.56	0.00	0.08	0.08
Windsor	Toronto	370	East	10.50	3.19	0.37	3.56
Toronto	Windsor	370	West	7.31	0.00	0.37	0.37
London	Toronto	185	East	5.50	0.00	0.28	0.28
Toronto	London	185	West	8.89	3.39	0.28	3.67
Hamilton	Toronto	70	East	9.94	0.00	0.50	0.50
Toronto	Hamilton	70	West	11.78	1.84		1.84
Hamilton	Montreal	610	East	1.61	0.44	0.12	0.56
Montreal	Hamilton	610	West	1.17	0.00	0.12	0.12
Toronto	Kingston	260	East	3.11	1.44	0.08	1.52
Kingston	Toronto	260	West	1.67	0.00	0.08	0.08
Toronto	Ottawa	400	East	10.67	5.17	0.28	5.45
Ottawa	Toronto	400	West	5.50	0.00	0.28	0.28
Toronto	Montreal	545	East	17.50	1.06	1.64	2.70
Montreal	Toronto	545	West	16.44	0.00	1.64	1.64
Toronto	Laval	545	East	2.22	0.00		0.00
Laval	Toronto	545	West	2.22	0.00		0.00
Toronto	Trois – Rivieres	787	East	0.94	0.94		0.94
Trois – Rivieres	Toronto	787	West	0.00	0.00		0.00
Toronto	Quebec City	802	East	4.63	3.19	0.14	3.33
Quebec City	Toronto	802	West	1.44	0.00	0.14	0.14
Kingston	Ottawa	175	East	0.88	0.88		0.88
Ottawa	Kingston	175	West	0.00	0.00		0.00
Kingston	Montreal	290	East	1.38	1.38		1.38
Montreal	Kingston	290	West	0.63	0.63		0.63
London	Ottawa	570	East	0.06	0.06		0.06
Ottawa	London	570	West	0.00	0.00		0.00
Ottawa	Montreal	200	East	6.83	0.94	0.29	1.23
Montreal	Ottawa	200	West	5.89	0.00	0.29	0.29
Windsor	Montreal	900	East	0.13	0.13		0.13
Montreal	Windsor	900	West	0.31	0.31		0.31
London	Montreal	715	East	0.44	0.44		0.44
Montreal	London	715	West	0.31	0.31		0.31
Montreal	Trois – Rivieres	142	East	5.44	3.56	0.09	3.65
Trois – Rivieres	Montreal	142	West	1.88	0.00	0.09	0.09
Montreal	Quebec City	253	East	14.72	9.89	0.24	10.13
Quebec City	Montreal	253	West	4.83	0.00	0.24	0.24
Trois – Rivieres	Quebec City	130	East	0.75	0.75		0.75
Quebec City	Trois – Rivieres	130	West	1.06	1.06		1.06
	Total (in trailers / day)			**172.38**	**41.68**	**7.72**	**49.40**

Note: (1) Only City pairs on the proposed 200 kph Existing ROW Alignment are included in this table.

Table 7.9.2

Québec / Windsor Corridor

Courier Traffic Volumes captured in Minimal and Most Probable Scenarios

300 kph Existing ROW – TGV Technology							
		ROAD DIST.		'92 Day Vol (3000 cuft)	Market Share Scenario		
					Minimal	Most Probable	
ORIGIN	DESTINATION	(km)	DIR	TOTAL[1]		Additional	Total
Windsor	London	190	East	2.25	0.69	0.08	0.77
London	Windsor	190	West	1.56	0.00	0.08	0.08
Windsor	Toronto	370	East	10.50	3.19	0.37	3.56
Toronto	Windsor	370	West	7.31	0.00	0.37	0.37
London	Toronto	185	East	5.50	0.00	0.28	0.28
Toronto	London	185	West	8.89	3.39	0.28	3.67
Hamilton	Toronto	70	East	9.94	0.00	0.50	0.50
Toronto	Hamilton	70	West	11.78	1.84		1.84
Hamilton	Montreal	610	East	1.61	0.44	0.12	0.56
Montreal	Hamilton	610	West	1.17	0.00	0.12	0.12
Toronto	Kingston	260	East	3.11	1.44	0.08	1.52
Kingston	Toronto	260	West	1.67	0.00	0.08	0.08
Toronto	Ottawa	400	East	10.67	5.17	0.28	5.45
Ottawa	Toronto	400	West	5.50	0.00	0.28	0.28
Toronto	Montreal	545	East	17.50	1.06	1.64	2.70
Montreal	Toronto	545	West	16.44	0.00	1.64	1.64
Toronto	Laval	545	East	2.22	0.00		0.00
Laval	Toronto	545	West	2.22	0.00		0.00
Toronto	Trois – Rivieres	787	East	0.94	0.94		0.94
Trois – Rivieres	Toronto	787	West	0.00	0.00		0.00
Toronto	Quebec City	802	East	4.63	3.19	0.14	3.33
Quebec City	Toronto	802	West	1.44	0.00	0.14	0.14
Kingston	Ottawa	175	East	0.88	0.88		0.88
Ottawa	Kingston	175	West	0.00	0.00		0.00
Kingston	Montreal	290	East	1.38	1.38		1.38
Montreal	Kingston	290	West	0.63	0.63		0.63
London	Ottawa	570	East	0.06	0.06		0.06
Ottawa	London	570	West	0.00	0.00		0.00
Ottawa	Montreal	200	East	6.83	0.94	0.29	1.23
Montreal	Ottawa	200	West	5.89	0.00	0.29	0.29
Windsor	Montreal	900	East	0.13	0.13		0.13
Montreal	Windsor	900	West	0.31	0.31		0.31
London	Montreal	715	East	0.44	0.44		0.44
Montreal	London	715	West	0.31	0.31		0.31
Montreal	Trois – Rivieres	142	East	5.44	3.56	0.09	3.65
Trois – Rivieres	Montreal	142	West	1.88	0.00	0.09	0.09
Montreal	Quebec City	253	East	14.72	9.89	0.24	10.13
Quebec City	Montreal	253	West	4.83	0.00	0.24	0.24
Trois – Rivieres	Quebec City	130	East	0.75	0.75		0.75
Quebec City	Trois – Rivieres	130	West	1.06	1.06		1.06
	Total (in trailers / day)			**172.38**	**41.68**	7.72	49.40

Note: (1) Only City pairs on the proposed 300 kph Existing ROW Alignment are included in this table.

Table 7.9.3

Québec / Windsor Corridor

Courier Traffic Volumes captured in Minimal and Most Probable Scenarios

300 kph New ROW – TGV Technology							
		ROAD DIST.		'92 Day Vol (3000 cuft)	Market Share Scenario		
					Minimal	Most Probable	
ORIGIN	DESTINATION	(km)	DIR	TOTAL[1]		Additional	Total
Windsor	London	190	East	2.25	0.69	0.08	0.77
London	Windsor	190	West	1.56	0.00	0.08	0.08
Windsor	Toronto	370	East	10.50	3.19	0.37	3.56
Toronto	Windsor	370	West	7.31	0.00	0.37	0.37
London	Toronto	185	East	5.50	0.00	0.28	0.28
Toronto	London	185	West	8.89	3.39	0.28	3.67
Kitchener/Waterloo	Toronto	105	East	8.56	0.00	0.43	0.43
Toronto	Kitchener/Waterloo	105	West	11.67	3.11	0.43	3.54
Kitchener/Waterloo	Ottawa	490	East	0.94	0.94		0.94
Ottawa	Kitchener/Waterloo	490	West	0.13	0.13		0.13
Windsor	Kitchener/Waterloo	285	East	0.94	0.94		0.94
Kitchener/Waterloo	Windsor	285	West	0.00	0.00		0.00
Toronto	Kingston	260	East	3.11	1.44	0.08	1.52
Kingston	Toronto	260	West	1.67	0.00	0.08	0.08
Toronto	Ottawa	400	East	10.67	5.17	0.28	5.45
Ottawa	Toronto	400	West	5.50	0.00	0.28	0.28
Toronto	Montreal	545	East	17.50	1.06	1.64	2.70
Montreal	Toronto	545	West	16.44	0.00	1.64	1.64
Toronto	Laval	545	East	2.22	0.00		0.00
Laval	Toronto	545	West	2.22	0.00		0.00
Toronto	Trois-Rivieres	787	East	0.94	0.94		0.94
Trois-Rivieres	Toronto	787	West	0.00	0.00		0.00
Toronto	Quebec City	802	East	4.63	3.19	0.14	3.33
Quebec City	Toronto	802	West	1.44	0.00	0.14	0.14
Windsor	Pearson Airport	355	East	0.63	0.63		0.63
Pearson Airport	Windsor	355	West	0.00	0.00		0.00
London	Pearson Airport	170	East	0.31	0.00		0.00
Pearson Airport	London	170	West	0.31	0.00		0.00
Kichener/Waterloo	Pearson Airport	90	East	0.31	0.00		0.00
Pearson Airport	Kichener/Waterloo	90	West	0.31	0.00		0.00
Pearson Air	Ottawa	415	East	0.44	0.00		0.00
Ottawa	Pearson Air	415	West	0.13	0.00		0.00
Pearson Air	Dorval	545	East	0.13	0.00		0.00
Dorval	Pearson Air	545	West	0.25	0.00		0.00
Pearson Air	Mirabel	585	East	0.00	0.00		0.00
Mirabel	Pearson Air	585	West	0.00	0.00		0.00
Pearson Air	Montréal	560	East	0.63	0.00		0.00
Montréal	Pearson Air	560	West	0.00	0.00		0.00
Kingston	Ottawa	175	East	0.88	0.88		0.88
Ottawa	Kingston	175	West	0.00	0.00		0.00
Kingston	Montreal	290	East	1.38	1.38		1.38
Montreal	Kingston	290	West	0.63	0.63		0.63
London	Ottawa	570	East	0.06	0.06		0.06
Ottawa	London	570	West	0.00	0.00		0.00
Ottawa	Montreal	200	East	6.83	0.94	0.29	1.23
Montreal	Ottawa	200	West	5.89	0.00	0.29	0.29
Windsor	Montreal	900	East	0.13	0.13		0.13
Montreal	Windsor	900	West	0.31	0.31		0.31
London	Montreal	715	East	0.44	0.44		0.44
Montreal	London	715	West	0.31	0.31		0.31
Kichener/Waterloo	Montreal	635	East	0.44	0.44		0.44
Montreal	Kichener/Waterloo	635	West	0.31	0.31		0.31
Montreal	Trois-Rivieres	142	East	5.44	3.56	0.09	3.65
Trois-Rivieres	Montreal	142	West	1.88	0.00	0.09	0.09
Montreal	Quebec City	253	East	14.72	9.89	0.24	10.13
Quebec City	Montreal	253	West	4.83	0.00	0.24	0.24
Trois-Rivieres	Quebec City	130	East	0.75	0.75		0.75
Quebec City	Trois-Rivieres	130	West	1.06	1.06		1.06
	Total (in trailers / day)			**174.28**	**45.90**	**7.84**	53.74

Note: (1) Only City pairs on the proposed 300 kph New ROW Alignment are included in this table.

Table 7.10.1

Québec / Windsor Corridor

LTL Traffic Volumes captured in Minimal and Most Probable Scenarios

200 kph Existing ROW – X2000 Technology

ORIGIN	DESTINATION	ROAD DIST. (km)	DIR	'92 Day Vol (3000 cuft) TOTAL[1]	Market Share Scenario		
					Minimal	Most Probable	
						Additional	Total
Windsor	London	190	East	1.03	0.00	0.05	0.05
London	Windsor	190	West	1.18	0.00	0.06	0.06
Windsor	Toronto	370	East	4.74	0.00		0.00
Toronto	Windsor	370	West	12.97	3.24	0.65	3.89
London	Toronto	185	East	5.20	0.00		0.00
Toronto	London	185	West	19.50	0.00	0.98	0.98
Hamilton	Toronto	70	East	7.78	1.57		1.57
Toronto	Hamilton	70	West	20.26	0.00	1.01	1.01
Hamilton	Montreal	610	East	2.06	0.21	0.10	0.31
Montreal	Hamilton	610	West	2.26	0.68	0.11	0.79
Toronto	Kingston	260	East	6.55	0.00	0.33	0.33
Kingston	Toronto	260	West	1.01	0.00		0.00
Toronto	Ottawa	400	East	22.21	0.00	1.11	1.11
Ottawa	Toronto	400	West	3.92	0.00		0.00
Toronto	Montreal	545	East	52.47	5.25	2.62	7.87
Montreal	Toronto	545	West	32.89	4.93	1.04	5.97
Toronto	Laval	545	East	0.00	0.00		0.00
Laval	Toronto	545	West	0.00	0.00		0.00
Toronto	Trois–Rivieres	787	East	1.65	0.17	0.08	0.25
Trois–Rivieres	Toronto	787	West	0.25	0.03	0.01	0.04
Toronto	Quebec City	802	East	7.81	0.78	0.39	1.17
Quebec City	Toronto	802	West	0.98	0.10		0.10
Kingston	Ottawa	175	East	0.10	0.00	0.01	0.01
Ottawa	Kingston	175	West	0.84	0.00	0.04	0.04
Kingston	Montreal	290	East	0.23	0.00	0.01	0.01
Montreal	Kingston	290	West	1.32	0.00	0.07	0.07
London	Ottawa	570	East	0.48	0.05	0.02	0.07
Ottawa	London	570	West	0.56	0.06	0.03	0.09
Ottawa	Montreal	200	East	2.73	0.00		0.00
Montreal	Ottawa	200	West	14.50	1.45	0.73	2.18
Windsor	Montreal	900	East	2.04	0.20	0.10	0.30
Montreal	Windsor	900	West	1.03	0.10	0.05	0.15
London	Montreal	715	East	1.49	0.30	0.07	0.37
Montreal	London	715	West	2.43	0.24	0.12	0.36
Montreal	Trois–Rivieres	142	East	6.19	0.00	0.31	0.31
Trois–Rivieres	Montreal	142	West	1.67	0.00		0.00
Montreal	Quebec City	253	East	22.18	0.00	1.11	1.11
Quebec City	Montreal	253	West	4.32	0.00		0.00
Trois–Rivieres	Quebec City	130	East	0.05	0.00		0.00
Quebec City	Trois–Rivieres	130	West	0.43	0.00	0.02	0.02
	Total (in trailers / day)			**269.33**	**19.36**	**11.23**	**30.59**

Note: (1) Only City pairs on the proposed 200 kph Existing Alignment are included in this table.

Table 7.10.2

Québec / Windsor Corridor

LTL Traffic Volumes captured in Minimal and Most Probable Scenarios

300 kph Existing ROW – TGV Technology

ORIGIN	DESTINATION	ROAD DIST. (km)	DIR	'92 Day Vol (3000 cuft) TOTAL[1]	Market Share Scenario		
					Minimal	Most Probable	
						Additional	Total
Windsor	London	190	East	1.03	0.00	0.05	0.05
London	Windsor	190	West	1.18	0.00	0.06	0.06
Windsor	Toronto	370	East	4.74	0.00		0.00
Toronto	Windsor	370	West	12.97	3.24	0.65	3.89
London	Toronto	185	East	5.20	0.00		0.00
Toronto	London	185	West	19.50	0.00	0.98	0.98
Hamilton	Toronto	70	East	7.78	1.57		1.57
Toronto	Hamilton	70	West	20.26	0.00	1.01	1.01
Hamilton	Montreal	610	East	2.06	0.21	0.10	0.31
Montreal	Hamilton	610	West	2.26	0.68	0.11	0.79
Toronto	Kingston	260	East	6.55	0.00	0.33	0.33
Kingston	Toronto	260	West	1.01	0.00		0.00
Toronto	Ottawa	400	East	22.21	0.00	1.11	1.11
Ottawa	Toronto	400	West	3.92	0.00		0.00
Toronto	Montreal	545	East	52.47	5.25	2.62	7.87
Montreal	Toronto	545	West	32.89	4.93	1.04	5.97
Toronto	Laval	545	East	0.00	0.00		0.00
Laval	Toronto	545	West	0.00	0.00		0.00
Toronto	Trois-Rivieres	787	East	1.65	0.17	0.08	0.25
Trois-Rivieres	Toronto	787	West	0.25	0.03	0.01	0.04
Toronto	Quebec City	802	East	7.81	0.78	0.39	1.17
Quebec City	Toronto	802	West	0.98	0.10		0.10
Kingston	Ottawa	175	East	0.10	0.00	0.01	0.01
Ottawa	Kingston	175	West	0.84	0.00	0.04	0.04
Kingston	Montreal	290	East	0.23	0.00	0.01	0.01
Montreal	Kingston	290	West	1.32	0.00	0.07	0.07
London	Ottawa	570	East	0.48	0.05	0.02	0.07
Ottawa	London	570	West	0.56	0.06	0.03	0.09
Ottawa	Montreal	200	East	2.73	0.00		0.00
Montreal	Ottawa	200	West	14.50	1.45	0.73	2.18
Windsor	Montreal	900	East	2.04	0.20	0.10	0.30
Montreal	Windsor	900	West	1.03	0.10	0.05	0.15
London	Montreal	715	East	1.49	0.30	0.07	0.37
Montreal	London	715	West	2.43	0.24	0.12	0.36
Montreal	Trois-Rivieres	142	East	6.19	0.00	0.31	0.31
Trois-Rivieres	Montreal	142	West	1.67	0.00		0.00
Montreal	Quebec City	253	East	22.18	0.00	1.11	1.11
Quebec City	Montreal	253	West	4.32	0.00		0.00
Trois-Rivieres	Quebec City	130	East	0.05	0.00		0.00
Quebec City	Trois-Rivieres	130	West	0.43	0.00	0.02	0.02
	Total (in trailers / day)			**269.33**	**19.36**	**11.23**	**30.59**

Note: (1) Only City pairs on the proposed 300 kph Existing Alignment are included in this table.

Table 7.10.3

Québec / Windsor Corridor

LTL Traffic Volumes captured in Minimal and Most Probable Scenarios

300 kph New ROW -- TGV Technology

ORIGIN	DESTINATION	ROAD DIST. (km)	DIR	'92 Day Vol (3000 cuft) TOTAL[1]	Market Share Scenario		
					Minimal	Most Probable	
						Additional	Total
Windsor	London	190	East	1.03	0.00	0.05	0.05
London	Windsor	190	West	1.18	0.00	0.06	0.06
Windsor	Toronto	370	East	4.74	0.00		0.00
Toronto	Windsor	370	West	12.97	3.24	0.65	3.89
London	Toronto	185	East	5.20	0.00		0.00
Toronto	London	185	West	19.50	0.00	0.98	0.98
Kitchener/Waterloo	Toronto	105	East	7.73	1.55	0.39	1.94
Toronto	Kitchener/Waterloo	105	West	16.14	0.00	0.81	0.81
Kitchener/Waterloo	Ottawa	490	East	1.35	0.00	0.07	0.07
Ottawa	Kitchener/Waterloo	490	West	0.11	0.00	0.01	0.01
Windsor	Kitchener/Waterloo	285	East	0.22	0.00	0.01	0.01
Kitchener/Waterloo	Windsor	285	West	0.84	0.00	0.04	0.04
Toronto	Kingston	260	East	6.55	0.00	0.33	0.33
Kingston	Toronto	260	West	1.01	0.00		0.00
Toronto	Ottawa	400	East	22.21	0.00	1.11	1.11
Ottawa	Toronto	400	West	3.92	0.00		0.00
Toronto	Montreal	545	East	52.47	5.25	2.62	7.87
Montreal	Toronto	545	West	32.89	4.93	1.04	5.97
Toronto	Laval	545	East	0.00	0.00		0.00
Laval	Toronto	545	West	0.00	0.00		0.00
Toronto	Trois-Rivieres	787	East	1.65	0.17	0.08	0.25
Trois-Rivieres	Toronto	787	West	0.25	0.03	0.01	0.04
Toronto	Quebec City	802	East	7.81	0.78	0.39	1.17
Quebec City	Toronto	802	West	0.98	0.10		0.10
Windsor	Pearson Airport	355	East	0.00	0.00		0.00
Pearson Airport	Windsor	355	West	0.00	0.00		0.00
London	Pearson Airport	170	East	0.00	0.00		0.00
Pearson Airport	London	170	West	0.00	0.00		0.00
Kichener/Waterloo	Pearson Airport	90	East	0.00	0.00		0.00
Pearson Airport	Kichener/Waterloo	90	West	0.00	0.00		0.00
Pearson Air	Ottawa	415	East	0.00	0.00		0.00
Ottawa	Pearson Air	415	West	0.00	0.00		0.00
Pearson Air	Dorval	545	East	0.00	0.00		0.00
Dorval	Pearson Air	545	West	0.00	0.00		0.00
Pearson Air	Mirabel	585	East	0.00	0.00		0.00
Mirabel	Pearson Air	585	West	0.00	0.00		0.00
Pearson Air	Montréal	560	East	0.00	0.00		0.00
Montréal	Pearson Air	560	West	0.00	0.00		0.00
Kingston	Ottawa	175	East	0.10	0.00	0.01	0.01
Ottawa	Kingston	175	West	0.84	0.00	0.04	0.04
Kingston	Montreal	290	East	0.23	0.00	0.01	0.01
Montreal	Kingston	290	West	1.32	0.00	0.07	0.07
London	Ottawa	570	East	0.48	0.05	0.02	0.07
Ottawa	London	570	West	0.56	0.06	0.03	0.09
Ottawa	Montreal	200	East	2.73	0.00		0.00
Montreal	Ottawa	200	West	14.50	1.45	0.73	2.18
Windsor	Montreal	900	East	2.04	0.20	0.10	0.30
Montreal	Windsor	900	West	1.03	0.10	0.05	0.15
London	Montreal	715	East	1.49	0.30	0.07	0.37
Montreal	London	715	West	2.43	0.24	0.12	0.36
Kichener/Waterloo	Montreal	635	East	3.55	0.36		0.36
Montreal	Kichener/Waterloo	635	West	3.06	0.46		0.46
Montreal	Trois-Rivieres	142	East	6.19	0.00	0.31	0.31
Trois-Rivieres	Montreal	142	West	1.67	0.00		0.00
Montreal	Quebec City	253	East	22.18	0.00	1.11	1.11
Quebec City	Montreal	253	West	4.32	0.00		0.00
Trois-Rivieres	Quebec City	130	East	0.05	0.00		0.00
Quebec City	Trois-Rivieres	130	West	0.43	0.00	0.02	0.02
	Total (in trailers / day)			**269.98**	**19.27**	**11.34**	**30.61**

Note: (1) Only City pairs on the proposed 300 kph New Alignment are included in this table.

7.7. SUMMARY OF ESTIMATED HSR MARKET SHARE

In summary, it is interesting to compare the estimated HSR market share potential to the total estimated light freight transportation market, for each forecast scenario, for each traffic type, and for each technology/ROW option. The volumes are in number of trailers/day and the figures in brackets show their relative importance.

Forecast Scenario (year)	Traffic Type	Basis for HSR Market Share Potential and Volumes by Technology/ROW Option			Total Corridor Estimated Current Traffic
		200 + kph	300 + kph (Existing)	300 + kph (New)	
Minimal (1992)	**Courier**	41.69 (20.5%)	41.69 (20.5%)	45.28 (22.3%)	203 (40.2%)
	LTL	19.36 (6.4%)	19.36 (6.4%)	19.27 (6.4%)	302 (59.8%)
	Total	61.05 (**12.1%**)	61.05 (**12.1%**)	64.55 (**12.8%**)	505 (100%)
Most probable (1992)	**Courier**	49.47 (24.4%)	49.47 (24.4%)	53.18 (26.2%)	203 (40.2%)
	LTL	31.19 (10.3%)	31.19 (10.3%)	31.21 (10.3%)	302 (59.8%)
	Total (in trailers/day)	80.66 (**16.0%**)	80.66 (**16.0%**)	84.39 (**16.7%**)	505 (100%)

The 1992 volumes of corridor light freight traffic are estimated at an average of 505 trailer equivalents per day, broken down into 203 trailer equivalents per day of express courier traffic and 302 trailer equivalents per day of LTL traffic involving shipments of less than 5000 kg.

For the **minimal scenario**, the estimated HSR market share represents **12.1%** of the overall light freight transportation market in the corridor for the **200 + kph and 300 + kph Existing ROW options**, and **12.8%** of the same overall market for the **300 + kph New ROW option**.

For the **most probable scenario**, the estimated market share increases to **16.0%** of the overall light freight transportation market in the corridor for the

200 + kph option and the 300 + kph option Existing ROW, and to **16.7%** of the same overall market for the **300 + kph option New ROW**.

The above volumes were retained for developing the HSR traffic forecast, the cost and gross revenue estimates, the net operating revenue estimates, and, finally, the net revenue estimates.

8.

OPERATIONAL REQUIREMENTS AND COST ASSESSMENT

8. OPERATIONAL REQUIREMENTS AND COST ASSESSMENT

This chapter describes the specific operational requirements and assesses the major cost factors for the two HSR market share scenarios: the **minimal** and the **most probable**. For each market share scenario, the capital requirements and operating costs were estimated for the following items: the rolling stock fleet and train operating costs, the container fleet, the handling equipment and handling costs, the terminal facilities, and the marketing, advertising and general administration costs.

8.1. MINIMAL SCENARIO

8.1.1. Rolling stock fleet requirements and linehaul costs

8.1.1.1. Capital Costs

The **first step** in the analysis consisted of considering the potential HSR market share expressed as daily volumes for each technology/ROW option and for each traffic type (i.e. courier and LTL traffic). This information is shown in the six figures identified collectively as Figure 8.1.1 of which one sample is presented at the end of this section. All these figures can be found in Volume II, Section B.

The graphic part of each figure illustrates the corridor by city pair and shows, above the bold line, the 1992 traffic in trailer equivalents for each direction within the city pair; the figures in bold, below the bold line, represent the estimated 1992 HSR market share in trailer equivalents for each direction within the city pair. In addition, each figure provides the following data:

- the directional daily volumes by O/D pair in trailer equivalents for the years 1992 and 2005,

- the directional daily volumes by O/D pair in thousand cubic foot equivalents for the year 2005,

- the directional daily volumes by O/D pair in HSR container equivalents for the year 2005,

- the directional daily volumes by O/D pair in HSR car equivalents for the year 2005.

The above data provided the information required to establish a preliminary light freight operating strategy. It was also used to determine, for the assumed start-up year of 2005, the rolling stock and container fleet requirements.

The **second step** consisted of forecasting the number of trainsets required over the first 20 years of operation of an HSR light freight system (i.e. from 2005 to 2024). This involved a series of operations which started with the extrapolation on a year-by-year basis, over the entire 20 year-period, of both the number of cars (Table 8.1.1.1) and the number of trainsets (Table 8.1.1.2) required to handle the projected traffic volumes. Then, a tentative train schedule was developed for the start-up year 2005 (Table 8.1.1.3) in order to establish representative operating statistics for the period under consideration. Finally, the traffic volumes and capacity requirements, and the light freight operating characteristics were used to determine the rolling stock requirements (Table 8.1.1.4). A rolling stock fleet acquisition schedule was developed on the basis of these requirements and recognized characteristics of railway rolling stock acquisition, mainly in terms of estimated minimum economical ordering quantities.

A sample of the tables described in the above paragraph is presented at the end of this section. All these tables can be found in Section B of Volume II.

Detailed results of this second step are shown by technology/ROW option in Tables 8.1.1.1 to 8.1.1.4, presented in Volume II. In summary, the rolling stock active fleet requirements, in number of trainsets, for the **minimal scenario** are as follows:

Year of acquisition	MINIMAL SCENARIO: ROLLING STOCK REQUIREMENTS BY TECHNOLOGY/ROW OPTION		
	200 + Kph	300 + Kph Existing	300 + Kph NEW
Year 2004	9	7	7
Year 2012			
Year 2014	2	1	1
Year 2020	1	1	1

The acquisition cost for the rolling stock can only be based on a rough estimate at this stage. The French "TGV Postal" has been in operation for a number of years but the trainsets used were converted from the original passenger trainsets. For the moment, it can only be determined that the HSR cars for light freight would not require the sophisticated interior finishing of the passenger cars (i.e. seats, interior panelling, HVOC, windows, toilet, baggage racks, etc.). These items are expensive to purchase and to install. On the other hand, each light freight car would require a sophisticated conveyor system and a wide door in order to ensure the efficient handling of the containers from and into the HSR cars.

In view of these partially offsetting differences, it was assumed the net cost difference would be approximately equivalent to the exchange rate for U.S. dollars. The estimated acquisition costs for passenger HSR car and trainsets provided by CIGGT were modified accordingly and used for estimating the light freight rolling stock costs. These unit costs are as follows:

ROLLING STOCK ESTIMATED ACQUISITION UNIT COSTS (IN 1993 DOLLARS)				
	X-2000 (1 LOCO-5 CARS)		TGV (1 LOCO-8 CARS-1 LOCO)	
	Passengers	Light Freight	Passengers	Light Freight
Trainset	$14 M. U.S.	$15 M. Cdn.	$25 M. U.S.	$25 M. Cdn.
Car	$2 M. U.S.	$2 M. Cdn.	N/A	$1.875 M Cdn.
Loco	$4 M. U.S.	$5 M. Cdn.	N/A	$5 M Cdn.

The possibility of using passenger locos for the light freight trainsets deserves serious consideration and more thorough research. The light freight operation would essentially be carried out at night, when there is no, or very limited, off-peak passenger service. It is anticipated that sufficient motive power would be available for the light freight service. The X-2000 technology would provide a locomotive that could be coupled and uncoupled rapidly. The TGV technology would provide locomotives that are only semi-permanently coupled to the cars. Consequently, the use of passenger locos for light freight service is feasible with both technologies. Rolling stock acquisition costs were, therefore, estimated both including and excluding locomotives. However, in establishing the net revenues presented in chapters 9, 10 and 11 of this report, it has conservatively been assumed that **no locomotive sharing** would occur. The yearly costs of capital used to arrive at net revenues thus **include** the capital costs of a **dedicated fleet of locomotives** sufficient for all of the light freight service's needs.

In summary, total rolling stock acquisition costs would be as follows:

Year of acquisition	MINIMAL SCENARIO: ROLLING STOCK ACQUISITION COSTS BY TECHNOLOGY/ROW OPTION					
	200 + Kph Existing		300 + Kph Existing		300 + Kph NEW	
	Including Locos	Excluding Locos	**Including Locos**	Excluding Locos	**Including Locos**	Excluding Locos
Year 2004	$146 M	$96 M	$186 M	$111 M	$186 M	$111 M
Year 2012	$45 M	$30 M				
Year 2014	$30 M	$20 M	$27 M	$17 M	$27 M	$17 M
Year 2020	$17 M	$12 M	$25 M	$15 M	$25 M	$15 M

Note: The above costs include the extra cars and locomotives required under the assumption of an equipment availability of 95%.

8.1.1.2. Train Operating Costs

As discussed in Section 3.3.1.2, CIGGT provided revised final estimated linehaul costs of $4.12 and $4.76 for the X-2000 and TGV representative technologies respectively. These estimates include crew wages, the cost of energy, maintenance-of-way, and rolling stock maintenance. A further allowance for equipment overhaul was also included. A one-person crew and off-peak energy prices were assumed. These unit costs were applied across the Québec/Windsor corridor for the light freight market study.

As mentioned previously, tentative train schedules were developed for the start-up year on the basis of the projected volumes. The service requirements of the courier traffic, in terms of departure time (as late as possible) and arrival time, were set as primary objectives for the tentative HSR schedules. The results are presented in Tables 8.1.1.3, for each technology/ROW option.

One of the operating statistics derived is the number of train-kilometres on a daily basis. To extrapolate this data to an annual basis, it was assumed the HSR light freight service would only operate on working days. In order to obtain the annual linehaul costs, the daily train-kilometres were multiplied by 260 days per year and by the appropriate technology-specific cost per train-kilometre.

The annual linehaul costs for start-up year 2005, in 1993 dollars, for each technology/ROW option are estimated as follows:

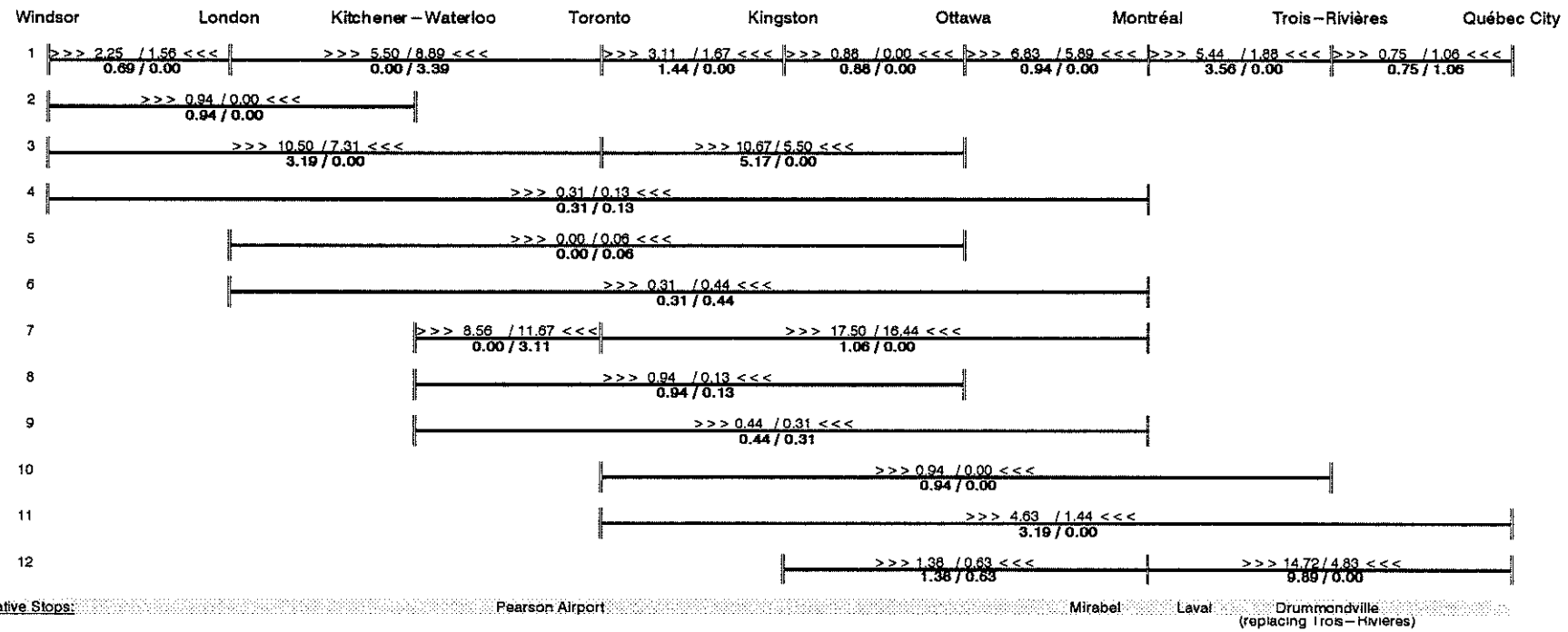
MINIMAL SCENARIO: BY TECHNOLOGY/ROW OPTION			
	200 + Kph Existing	**300 + Kph Existing**	**300 + Kph New**
Linehaul costs	$9,821,000	$10,625,000	$11,556,000

In addition, a lump sum provision of $2 million per year for rolling stock and container fleet management has been included in the overall operating cost estimates.

As mentioned, all the figures and tables introduced in the present section are presented in the Volume II of this report, for each technology/ROW option.

Figure 8.1.1 (300 New – Courier)

Québec – Windsor Corridor : Courier Traffic – Minimal Market Share
300 kph New ROW option – TGV technology



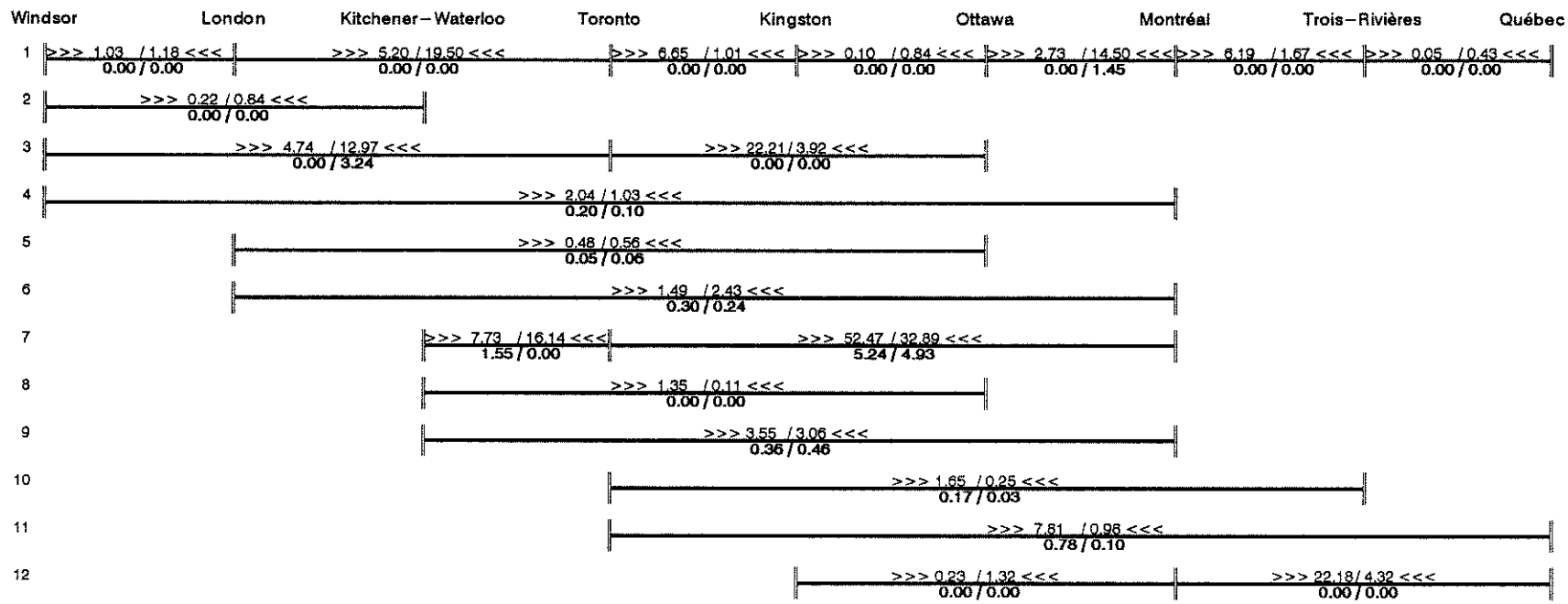
Minimum Load Volumes (Assumptions – 100% of imbalance and 100% of less than one truckload level to be captured)

O/D City	Windsor		London		Hamilton		Toronto		Kingston		Ottawa		Montréal		Trois – Rivières		Québec City
Direction	East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West	
(1992) trailer (1) equivalents	5.13	0.13	4.75	4.02	5.19	7.57	13.8	1.07	14.62	1.7	8.57	1.51	17.58	0	13.83	1.06	
(2005) trailer (1) equivalents	7.2	0.2	6.7	5.6	7.3	10.6	19.3	1.5	20.5	2.4	12.0	2.1	24.6	0.0	19.4	1.5	
(2005) cu. ft. 000's	21.6	0.5	20.0	16.9	21.6	31.6	58.0	4.5	61.5	7.2	36.0	6.4	73.9	0.0	58.2	4.5	
(2005) no. of (2) containers	55.0	1.4	51.0	43.1	55.7	81.2	148.1	11.5	156.9	18.2	92.0	16.2	188.6	0.0	148.4	11.4	
(2005) no. of (3) cars	7.9	0.2	7.3	6.2	8.0	11.6	21.2	1.6	22.4	2.6	13.1	2.3	26.9	0.0	21.2	1.6	

(1) The volumes are in trailer loads of 3000 cu. ft. capacity
(2) Number of containers obtained by assuming 392 cu. ft. per container (8 ft x 7 ft 9 in x 6 ft 3 1/2 in)
(3) Number of cars obtained by assuming a capacity of seven of the above containers, or 2741 cu. ft. per car

Figure 8.1.1 (300 New -- LTL)

Québec – Windsor Corridor : LTL Traffic – Minimal Market Share
300 kph New ROW option – TGV technology



Minimum Load Volumes (Assumptions – 1) LTL Traffic secured in containers otherwise returning empty (ORE) from courrier traffic.
Courrier Traffic imbalance must represent less than 40% of the LTL traffic moved in the opposite direction. 2) In addition,HSR will take 10% of LTL traffic on distances >500km.)

O/D City		Windsor		London		Kitchener–Waterloo		Toronto		Kingston		Ottawa		Montréal		Trois–Rivières		Québec City
Direction		East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West	
(1992)	trailer (1) equivalents	0.2	3.34	0.55	3.64	2.46	4.1	7.1	5.92	7.1	5.92	7.05	7.31	0.95	0.13	0.78	0.1	
(2005)	trailer (1) equivalents	0.3	5.3	0.9	5.8	3.9	6.5	11.3	9.4	11.3	9.4	11.2	11.6	1.5	0.2	1.2	0.2	
(2005)	cu. ft. 000's	1.0	15.9	2.6	17.4	11.7	19.5	33.8	28.2	33.8	28.2	33.6	34.8	4.5	0.6	3.7	0.5	
(2005)	no. of (2) containers	2.4	40.6	6.7	44.3	29.9	49.9	86.3	72.0	86.3	72.0	85.7	88.9	11.6	1.6	9.5	1.2	
(2005)	no. of (3) cars	0.3	5.8	1.0	6.3	4.3	7.1	12.3	10.3	12.3	10.3	12.2	12.7	1.7	0.2	1.4	0.2	

(1) The volumes are in trailer loads of 3000 cu. ft. capacity
(2) Number of containers obtained by assuming 392 cu. ft. per container (8 ft x 7 ft 9 in x 6 ft 3 1/2 in)
(3) Number of cars obtained by assuming a capacity of seven of the above containers, or 2741 cu. ft. per car

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Table 8.1.1.1 (300 New)

Québec – Windsor Corridor
Courier and LTL Traffic – Minimal Market Share
300 kph New ROW Option – TGV Technology

Total traffic volume projections by year, 2005–2024
(volume expressed in number of cars)

O/D City	Windsor		London		Kitchener–Waterloo		Toronto		Kingston		Ottawa		Montréal		Trois–Rivières		Québec City
Direction		East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West
Year																	
2005	8.2	6.0	8.2	12.5	12.2	18.7	33.5	11.9	34.7	12.9	25.4	15.0	28.6	0.2	22.6	1.8	
2006	8.4	6.2	8.5	12.8	12.6	19.2	34.4	12.3	35.7	13.3	26.1	15.4	29.3	0.2	23.1	1.8	
2007	8.6	6.4	8.7	13.2	12.9	19.8	35.3	12.6	36.7	13.6	26.8	15.9	30.1	0.2	23.8	1.9	
2008	8.9	6.5	8.9	13.5	13.2	20.3	36.3	13.0	37.6	14.0	27.5	16.3	30.9	0.2	24.4	1.9	
2009	9.1	6.7	9.1	13.9	13.6	20.8	37.3	13.3	38.7	14.4	28.3	16.8	31.7	0.3	25.0	2.0	
2010	9.3	6.9	9.4	14.3	14.0	21.4	38.3	13.7	39.7	14.8	29.1	17.3	32.5	0.3	25.7	2.0	
2011	9.6	7.1	9.6	14.7	14.4	22.0	39.3	14.1	40.8	15.2	29.9	17.8	33.4	0.3	26.3	2.1	
2012	9.8	7.3	9.9	15.1	14.7	22.6	40.4	14.5	41.9	15.7	30.7	18.3	34.3	0.3	27.0	2.2	
2013	10.1	7.5	10.1	15.5	15.1	23.2	41.5	14.9	43.0	16.1	31.5	18.8	35.2	0.3	27.7	2.2	
2014	10.4	7.8	10.4	15.9	15.6	23.8	42.6	15.4	44.2	16.6	32.4	19.3	36.1	0.3	28.5	2.3	
2015	10.6	8.0	10.7	16.4	16.0	24.5	43.8	15.8	45.4	17.1	33.3	19.9	37.0	0.3	29.2	2.3	
2016	10.9	8.2	11.0	16.8	16.4	25.1	44.9	16.3	46.6	17.5	34.2	20.5	38.0	0.3	30.0	2.4	
2017	11.2	8.4	11.3	17.3	16.8	25.8	46.2	16.7	47.9	18.0	35.1	21.0	39.0	0.3	30.8	2.5	
2018	11.5	8.7	11.6	17.8	17.3	26.5	47.4	17.2	49.2	18.6	36.1	21.6	40.0	0.3	31.6	2.5	
2019	11.8	8.9	11.9	18.3	17.8	27.2	48.7	17.7	50.5	19.1	37.1	22.3	41.1	0.3	32.4	2.6	
2020	12.1	9.2	12.2	18.8	18.3	28.0	50.0	18.2	51.9	19.6	38.1	22.9	42.1	0.3	33.2	2.7	
2021	12.4	9.5	12.5	19.3	18.7	28.7	51.4	18.7	53.3	20.2	39.2	23.6	43.2	0.4	34.1	2.7	
2022	12.7	9.7	12.8	19.8	19.3	29.5	52.8	19.3	54.7	20.8	40.2	24.2	44.4	0.4	35.0	2.8	
2023	13.1	10.0	13.2	20.4	19.8	30.3	54.2	19.8	56.2	21.3	41.3	24.9	45.5	0.4	35.9	2.9	
2024	13.4	10.3	13.5	20.9	20.3	31.2	55.7	20.4	57.7	21.9	42.5	25.6	46.7	0.4	36.9	2.9	

Table 8.1.1.2 (300 New)

Québec – Windsor Corridor
Courier and LTL Traffic – Minimal Market Share
300 kph New ROW Option – TGV Technology

Total traffic volume projections by year, 2005–2024
(volume expressed in number of 8–car trainsets)

O/D City	Windsor		London		Kitchener–Waterloo		Toronto		Kingston		Ottawa		Montréal		Trois–Rivières		Québec City
Direction		East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West
Year																	
	2005	1.0	0.8	1.0	1.6	1.5	2.3	4.2	1.5	4.3	1.6	3.2	1.9	3.6	0.0	2.8	0.2
	2006	1.1	0.8	1.1	1.6	1.6	2.4	4.3	1.5	4.5	1.7	3.3	1.9	3.7	0.0	2.9	0.2
	2007	1.1	0.8	1.1	1.6	1.6	2.5	4.4	1.6	4.6	1.7	3.3	2.0	3.8	0.0	3.0	0.2
	2008	1.1	0.8	1.1	1.7	1.7	2.5	4.5	1.6	4.7	1.8	3.4	2.0	3.9	0.0	3.0	0.2
	2009	1.1	0.8	1.1	1.7	1.7	2.6	4.7	1.7	4.8	1.8	3.5	2.1	4.0	0.0	3.1	0.2
	2010	1.2	0.9	1.2	1.8	1.7	2.7	4.8	1.7	5.0	1.9	3.6	2.2	4.1	0.0	3.2	0.3
	2011	1.2	0.9	1.2	1.8	1.8	2.7	4.9	1.8	5.1	1.9	3.7	2.2	4.2	0.0	3.3	0.3
	2012	1.2	0.9	1.2	1.9	1.8	2.8	5.0	1.8	5.2	2.0	3.8	2.3	4.3	0.0	3.4	0.3
	2013	1.3	0.9	1.3	1.9	1.9	2.9	5.2	1.9	5.4	2.0	3.9	2.4	4.4	0.0	3.5	0.3
	2014	1.3	1.0	1.3	2.0	1.9	3.0	5.3	1.9	5.5	2.1	4.0	2.4	4.5	0.0	3.6	0.3
	2015	1.3	1.0	1.3	2.0	2.0	3.1	5.5	2.0	5.7	2.1	4.2	2.5	4.6	0.0	3.7	0.3
	2016	1.4	1.0	1.4	2.1	2.1	3.1	5.6	2.0	5.8	2.2	4.3	2.6	4.7	0.0	3.7	0.3
	2017	1.4	1.1	1.4	2.2	2.1	3.2	5.8	2.1	6.0	2.3	4.4	2.6	4.9	0.0	3.8	0.3
	2018	1.4	1.1	1.4	2.2	2.2	3.3	5.9	2.2	6.1	2.3	4.5	2.7	5.0	0.0	3.9	0.3
	2019	1.5	1.1	1.5	2.3	2.2	3.4	6.1	2.2	6.3	2.4	4.6	2.8	5.1	0.0	4.0	0.3
	2020	1.5	1.2	1.5	2.3	2.3	3.5	6.3	2.3	6.5	2.5	4.8	2.9	5.3	0.0	4.2	0.3
	2021	1.6	1.2	1.6	2.4	2.3	3.6	6.4	2.3	6.7	2.5	4.9	2.9	5.4	0.0	4.3	0.3
	2022	1.6	1.2	1.6	2.5	2.4	3.7	6.6	2.4	6.8	2.6	5.0	3.0	5.5	0.0	4.4	0.3
	2023	1.6	1.3	1.6	2.5	2.5	3.8	6.8	2.5	7.0	2.7	5.2	3.1	5.7	0.0	4.5	0.4
	2024	1.7	1.3	1.7	2.6	2.5	3.9	7.0	2.5	7.2	2.7	5.3	3.2	5.8	0.0	4.6	0.4

Table 8.1.1.3 (300 New)

Québec – Windsor Corridor
Rolling Stock Requirements – Minimal Market Share Scenario
300 kph New ROW option – TGV technology

Tentative Train Schedule: year 2005

O/D City		Windsor		London		Kitchener–Waterloo		Toronto		Kingston		Ottawa		Montréal		Trois–Rivières		Québec City	
Intercity distance (km)			190		88		97		262		155		194.4		140		133		
handling equip. per station	eastbound	2		1		1		4		1		2		5		1		4	
	westbound	2		2		1		3		1		1		2		1		1	
Travel Time (minutes)	eastbound& westbound		41		22		22		65		34		51		38		29		
Handling time (minutes)	eastbound	29		8		26		26		16		18		27		30		27	
	westbound	22		23		30		18		3		5		11		6		3	
Eastbound Trains / Westbound Trains		Departure / Arrival	Arrival / Departure	Departure / Arrival	Arrival / Departure	Departure / Arrival	Arrival / Departure	Departure / Arrival	Arrival / Departure	Departure / Arrival	Arrival / Departure	Departure / Arrival	Arrival / Departure	Departure / Arrival	Arrival / Departure	Departure / Arrival	Arrival / Departure		
	train / direction																		
	#1 – East	07:30 PM	08:11 PM	08:34 PM	08:56 PM	09:26 PM	09:48 PM	10:14 PM	11:19 PM	11:35 PM	12:09 AM	12:27 AM	01:18 AM						
	#1 – West (return)	07:33 AM	06:52 AM	06:29 AM	06:07 AM	05:37 AM	05:15 AM	04:49 AM	03:44 AM	03:28 AM	02:54 AM	02:36 AM	01:45 AM						
	#2 – West					12:27 AM	12:05 AM	11:39 PM	10:34 PM	10:18 PM	09:44 PM	09:26 PM	08:35 PM	08:08 PM	07:30 PM				
	#2 – East (return)					12:57 AM	01:19 AM	01:45 AM	02:50 AM	03:06 AM	03:40 AM	03:58 AM	04:49 AM	05:16 AM	05:54 AM	06:24 AM	06:53 AM		
	#3 – East							07:00 PM	08:05 PM	08:21 PM	08:55 PM	09:13 PM	10:04 PM	10:31 PM	11:09 PM	11:39 PM	12:08 AM		
	#3 – West							05:46 AM	04:41 AM	04:25 AM	03:51 AM	03:33 AM	02:42 AM	02:15 AM	01:37 AM	01:07 AM	12:36 AM		
	#4 – East	07:00 PM	07:41 PM	08:04 PM	08:26 PM	08:56 PM	09:18 PM	09:44 PM	10:49 PM	11:05 PM	11:39 PM	11:57 PM	12:48 AM	01:15 AM	01:53 AM	02:23 AM	02:52 AM		
	#4 – West (return)													04:29 AM	03:51 AM	03:21 AM	02:52 AM		
	#4 – East (return)													04:59 AM	05:37 AM				
	#5 – West							12:23 AM	11:18 PM	11:02 PM	10:26 PM	10:10 PM	09:19 PM	08:52 PM	08:14 PM	07:44 PM	07:15 PM		
	#5 – East (return)							12:53 AM	01:58 AM	02:14 AM	02:48 AM								
	#5 – West (return)	07:57 AM	07:16 AM	06:53 AM	06:31 AM	06:01 AM	05:39 AM	05:13 AM	04:08 AM	03:52 AM	03:18 AM								
total trains																			
eastward		2	2	2	3	5	5	4	4	3	3								
wesward		2	2	2	3	5	5	4	4	3	3								
O/D City		Windsor		London		Kitchener–Waterloo		Toronto		Kingston		Ottawa		Montréal		Trois–Rivières		Québec City	

beginning of train run

end of train run

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Table 8.1.1.4 (300 New)

Québec – Windsor Corridor
Rolling Stock Requirements and Operating Statistics – Minimal Market Share Scenario
300 kph New ROW Option – TGV Technology

requirement vs availability of cars per station for the year 2005

O/D City		Windsor	London		Kitchener–Waterloo		Toronto		Kingston		Ottawa		Montréal		Trois–Rivières		Québec City
Direction		East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West
Intercity distance (km)		190	190	88	88	97	97	262	262	155	155	194.4	194.4	140	140	133	133	
requirement	2005	8.2	6.0	8.2	12.5	12.2	18.7	33.5	11.9	34.7	12.9	25.4	15.0	28.6	0.2	22.6	1.8	252.5
availability		16	16	16	16	24	24	40	40	40	40	32	32	32	32	24	24	448.0
trains/day/station																		
	2006	2	2	2	2	3	3	5	5	5	5	4	4	4	4	3	3	

Rolling Stock requirements (1)

Average daily train run calculation, year 2005

Train	total dist.	
#1	1972.8	trains/day
#2	1829.8	5
#3	1768.8	
#4	1672.4	Average run
#5	2093.4	1867.4

availability: 0.95 cars, 0.95 locos

operating days / year: 260

avg. weight (tonnes): 50 cars, 75 locos

year of operation	total gross car/km	empty return ratio	adjusted car/km	average cars/train	train–km	average daily train run	**trainsets/ day**	fleet size cars	fleet size locos	operating statistics car–km	operating statistics loco–km	operating statistics gross tonne–km
2005	41,935	0.78	74,698	8	9,337	1867.4	**5**	43	11	19,421,376	4,855,344	1,335,219,600
2006	43,078	0.78	76,734	8	9,592	1867.4	**6**	51	13	19,950,872	4,987,718	1,371,622,420
2007	44,253	0.78	78,826	8	9,853	1867.4	6	51	13	20,494,846	5,123,711	1,409,020,640
2008	45,459	0.78	80,976	8	10,122	1867.4	6	51	13	21,053,695	5,263,424	1,447,441,558
2009	46,699	0.78	83,184	8	10,398	1867.4	6	51	13	21,627,829	5,406,957	1,486,913,226
2010	47,973	0.78	85,453	8	10,682	1867.4	6	51	13	22,217,665	5,554,416	1,527,464,464
2011	49,281	0.78	87,783	8	10,973	1867.4	**6**	51	13	22,823,635	5,705,909	1,569,124,888
2012	50,625	0.78	90,178	8	11,272	1867.4	7	59	15	23,446,181	5,861,545	1,611,924,926
2013	52,006	0.78	92,638	8	11,580	1867.4	7	59	15	24,085,758	6,021,439	1,655,895,847
2014	53,425	0.78	95,165	8	11,896	1867.4	7	59	15	24,742,833	6,185,708	1,701,069,777
2015	54,883	0.78	97,761	8	12,220	1867.4	**7**	59	15	25,417,887	6,354,472	1,747,479,728
2016	56,380	0.78	100,429	8	12,554	1867.4	7	59	15	26,111,413	6,527,853	1,795,159,619
2017	57,919	0.78	103,169	8	12,896	1867.4	7	59	15	26,823,917	6,705,979	1,844,144,305
2018	59,499	0.78	105,984	8	13,248	1867.4	8	68	17	27,555,921	6,888,980	1,894,469,598
2019	61,123	0.78	108,877	8	13,610	1867.4	8	68	17	28,307,961	7,076,990	1,946,172,297
2020	62,791	0.78	111,848	8	13,981	1867.4	8	68	17	29,080,585	7,270,146	1,999,290,215
2021	64,505	0.78	114,901	8	14,363	1867.4	8	68	17	29,874,359	7,468,590	2,053,862,204
2022	66,266	0.78	118,038	8	14,755	1867.4	8	68	17	30,689,865	7,672,466	2,109,928,188
2023	68,075	0.78	121,260	8	15,158	1867.4	9	76	19	31,527,697	7,881,924	2,167,529,189
2024	69,934	0.78	124,571	8	15,571	1867.4	9	76	19	32,388,471	8,097,118	2,226,707,359

(1) Start–up requirements based on characteristics of initial operating scenario for the year 2005. Rolling Stock requirements in subsequent years based on projections of initial year operating scenario and trafic volumes.

8.1.2. Container and handling equipment requirements and costs

8.1.2.1. Capital Costs - Container Fleet

In the previous section, daily traffic volumes were presented in Figure 8.1.1 and expressed in different unit equivalents. These were derived from truck-trailer traffic levels as follows. The average number of trailers per day was first converted to cubic feet. Traffic expressed in cubic feet was then converted to container loads on the basis of container cubic capacities of 372 cu. ft. for the X-2000, and 392 cu. ft. for the TGV. The volumes expressed in container equivalents were then projected for the period extending from the year 2005 to the year 2024. The container volume projections are provided in Tables 8.1.2.1, presented in Volume II - Part I.

Daily traffic levels expressed in container loads would be equal to the container fleet requirements if containers could be ready for re-loading in 24 hours. A 24-hour turnaround is probably not achievable, for a number of reasons. For example, a certain number of containers would have to be repositioned empty to their initial point of origin. In order to take into account a provision for spares and the time required for handling, loading, unloading, empty positioning, and maintenance, a factor of two (2) was applied to the daily number of container loads to determine the total number of containers required.

The acquisition costs of the container fleet are based on a current purchase price for airline containers of a larger cubic capacity (516 cu. ft.). The price obtained was in the range of $3,200 to $3,400 per container purchased in lots of 100. A cost of $3,200, in 1993 dollars, was assumed for both types of containers (X-2000 and TGV) to take into account the smaller size of the containers and the larger purchase quantities. An average useful life of 10 years was assumed for containers.

The resulting container fleet requirements and acquisition costs are presented in Tables 8.1.2.4 presented in Volume II - Part I, and are summarized as follows, for each technology/ROW option:

- For the **200 + Kph existing ROW** option, a total of 4,578 containers will be purchased over the 20 year period with massive acquisitions in year 2005 (1,439 units) and in year 2015 (1,502 units). The total cost of container acquisition for the entire period is estimated at $14,650,000, in 1993 dollars.

- For the **300 + Kph existing ROW** option, a total of 4,344 containers will be purchased over the 20 year period, including 1,365 units in year 2005 and 1,425 units in year 2015. The total cost of container acquisition for the entire period is estimated at $13,900,000, in 1993 dollars.

- For the **300 + Kph New ROW** option, a total of 4,558 containers will be purchased over the 20 year period with major purchases in year 2005 (1,440 units) and in year 2015 (1,502 units). The total cost of container acquisition for the entire period is estimated at $14,580,000, in 1993 dollars.

8.1.2.2. Operating Costs - Container Fleet

This item includes two elements: container fleet management and maintenance of containers. As previously mentioned, a lump sum provision of $2 million per year for rolling stock and container fleet management was included in the overall operating cost estimates.

While a special provision for rolling stock maintenance was not required, since it is already included in the linehaul costs, such a provision had to be made for the maintenance of the container fleet. It is estimated that an amount equivalent to 5% of the value of the fleet is sufficient for this activity. The resulting amounts for each technology/ROW option for the start-up year, in 1993 dollars, are as follows:

CONTAINER MAINTENANCE COSTS (YEAR 2005) BY TECHNOLOGY/ROW OPTION

	200 + Kph Existing	300 + Kph Existing	300 + Kph New
Container maintenance	$230,000	$218,000	$230,000

8.1.2.3. Container Pick-up and Delivery Charges or Provisions

It is assumed that the courier companies would maintain their sorting facilities at their present locations. Regardless of the location selected for the light freight railway terminal in each city, it would not be possible to serve all courier facilities directly with the HSR system. Consequently, container pick-up and delivery costs will have to be incurred by the courier companies or by the truckers, and would be perceived by them as a cost of using the HSR System.

The estimated costs for this activity have been determined as follows, for each technology:

COST ITEM	**UNIT COST FACTOR**	
Labour cost (Driver, fringe benefits, supervision and administration)	$26.40/hour	
Equipment cost at each end (Tractor-trailer, 8 years, 260 days per year, and 8 hours per day, at 5% interest)	$8.18/hour	
Fuel cost (Average consumption: 6 miles per gallon, average round trip for pick-up and delivery: 40 miles total for origin and destination)	$19.08/trailer	
Time required for pick-up and delivery (30 minutes each to load, drive, unload and return for 2 hours at origin and 2 hours at destination).	4 hours	
Number of containers per trailer of 42 ft.	X-2000 6	TGV 5

The total cost for one trailer involved at each end of the pick-up and delivery operation is $190.12. **Consequently, the pick-up and delivery cost per container for each technology is:**

X-2000 - $31.69/container

TGV - $38.02/container

The cost difference is due to the difference in the number of containers per trailer which, in turn, is due to differences in size of the containers for the two technologies.

8.1.2.4. Capital Costs - Handling Equipment Requirements

In order to determine the requirements for handling equipment, it was necessary to identify the total number of containers loaded and unloaded at each terminal. These calculations, for the year 2005, are provided in Tables 8.1.2.4 for each technology/ROW option, presented in Volume II, Section B. It was assumed that the number of containers to be handled at each terminal would be spread evenly among the trains serving that terminal.

The number of platform loaders is based on the number of containers to be handled to and from each train, assuming a handling time of two minutes per container. It was also determined that a train should not be detained at any terminal for more than 30 minutes.

Consequently, the **handling equipment requirements** for the start-up year are estimated as follows, for each technology/ROW option:

	200 + Kph		300 + Kph Existing			300 + Kph NEW	
	Required	Spare	Required	Spare		Required	Spare
Windsor	4	1	4	1		2	1
London	2	1	2	1		2	1
Hamilton	1	1	1	1	Kitchener -Waterloo	1	1
Toronto	4	1	4	1		4	1
Kingston	1	1	1	1		1	1
Ottawa	2	1	2	1		2	1
Montréal	5	1	5	1		5	1
Trois-Rivières	2	1	1	1		1	1
Québec City	3	1	4	1		4	1
SUB-TOTAL	24	9	24	9		22	9
TOTAL NUMBER OF HANDLING UNITS	33		33			31	

The acquisition costs for the handling units are based on an even split of used airline platform loaders, which would be readily available, and new equipment. The average price used is $35,000 per unit. These platform loaders would have a life expectancy of 10 years, at the end of which they would have to be renewed at an estimated cost of $50,000 per unit, in 1993 dollars.

The **acquisition cost of the handling equipment** for start-up year (2005) is therefore estimated, for each technology/ROW option, as follows:

200 + Kph	300 + Kph Existing	300 + Kph New
$1,155,000	$1,155,000	$1,085,000

This estimate includes a spare unit at each terminal, even where traffic volumes are low. This is due to the high sensitivity of the traffic, particularly the courier traffic, to service reliability.

It was determined that no platform loader acquisition would be required other than the initial purchase (year 2005) and the replacement purchase (year 2015). Even if the traffic volumes are expected to grow at each railway terminal over the 20-year period, the number of platform loaders would be sufficient to handle the projected number of containers at each station within the target time of 30 minutes.

This conclusion is the result of a detailed analysis conducted on one technology/ROW option over the 20-year period. The growth in traffic volumes generates more trains at each railway terminal. It was assumed that the traffic at each terminal would be split evenly between the trains. The tentative train schedules provide an average of 60 minutes between each train and for each terminal. Consequently, the same number of platform loaders would gradually handle more containers over the years, as the traffic volumes increase. Over the 20-year period, it was observed that two or three platform loaders could be transferred from one terminal with surplus equipment to another terminal experiencing a minor shortage.

8.1.2.5. Handling Costs - Railway Terminal

The personnel and operating costs for handling the containers at the railway terminals have been estimated. It was assumed a three-men crew would be required for each platform loader in operation: one operator and two helpers.

The **terminal handling costs** for start-up year (2005) for each technology/ROW option, are as follows:

Cost element	TECHNOLOGY/ROW OPTION		
	200 + Kph	300 + Kph Existing	300 + Kph NEW
Loader Operators - Number - Cost (at $45,000/year)	(24) $1,080,000	(24) $1,080,000	(22) $990,000
Helpers - Number - Cost (at $35,000/year)	(48) $1,680,000	(48) $1,680,000	(44) $1,540,000
Additional Staff Allocation (15% for vacation, overtime, etc.)	$414,000	$414,000	$379,500
Supervisory Cost (15%)	$476,100	$476,100	$436,425
Operating costs of platform loaders ($30/day/loader required)	(24) $187,200	(24) $187,200	(22) $171,600
Maintenance of platform loaders (5% of value at $35,000)	(33) $57,750	(33) $57,750	(31) $54,250
TOTAL	$3,895,050	$3,895,050	$3,571,775

8.1.3. Facility requirements

8.1.3.1. Capital Costs

Light freight terminal facilities would be required in each city served by HSR. The passenger stations could not be used for this purpose, primarily on account of the high freight volumes and the related truck traffic generated by the pick-up and delivery operations.

The terminal facility requirements have been estimated to accommodate the volumes identified and it has been assumed that the container handling from and to the train would be performed indoors. The size of the building has been established at 60,000 sq. ft. (500 ft. x 120 ft.) for the Montréal and Toronto terminals, and at 30,000 sq. ft. (500 ft. x 60 ft.) for all the other cities. The unit cost for the

buildings has been assumed to be $80 per sq. ft. This includes the cost of the related rail sidings.

The **land requirements** for the terminal buildings have been estimated at three times the size of the buildings, and the land acquisition cost was assumed to be $6.51 per sq. ft., as an average price for the entire corridor. The terminals will require **paved areas** for truck movement, and it has been assumed that an area 1.5 times the size of the building would be paved at an average cost of $4 per sq. ft..

In summary, for start-up year 2005, the estimated acquisition costs for land and buildings are estimated as follows and are expected to be the same for the three technology/ROW options:

TERMINAL	LAND	PAVED AREAS	BUILDING
Windsor	$585,900	$180,000	$2,400,000
London	$585,900	$180,000	$2,400,000
Hamilton or Kitchener-Waterloo	$585,900	$180,000	$2,400,000
Toronto	$1,171,800	$360,000	$4,800,000
Kingston	$585,900	$180,000	$2,400,000
Ottawa	$585,900	$180,000	$2,400,000
Montréal	$1,171,800	$360,000	$4,800,000
Trois-Rivières	$585,900	$180,000	$2,400,000
Québec	$585,900	$180,000	$2,400,000
TOTAL	$6,444,900	$1,980,000	$26,400,000

8.1.3.2. Operating Costs

An annual provision for building management and maintenance has been established at $2,640,000 per year, which represents 10% of the buildings' total value.

The amount applies to each technology/ROW option since the facility requirements are similar for all options.

8.1.4. Marketing, advertising, and general administration costs

Marketing, advertising and general administration costs were estimated on the basis of a percentage of all other personnel and management costs. In order to work with the courier industry, the HSR light freight system will have to be in a position to complement most aspects of the courier services. While the marketing and advertising activities will not require the level of effort and money spent by the courier companies, other functions will have to be integrated with the courier systems. This will be the case for communications and telecommunications, information systems and shipment tracing, insurance and claims, and accounting. These functions are accounted for under the heading "**general administration costs**".

It was assumed that the service capabilities of the courier industry would necessitate an important contribution from the HSR light freight system. It was estimated that 10% of the following personnel and management cost items would be sufficient to provide administrative services complementary to those of the courier industry.

The cost items used as a basis are:

- rolling stock and container fleet management
- container maintenance
- terminal handling personnel and supervision
- other terminal handling costs
- maintenance of platform loaders
- building management and maintenance

In addition, it was estimated that an amount equal to 2% of the revenues should be provided for marketing, sales and advertising costs.

The resulting provision for this cost item for start-up year 2005, in 1993 dollars, for each technology/ROW option is as follows:

TECHNOLOGY/ROW OPTION			
Marketing, Advertising and general administration	**200 + Kph Existing**	**300 + Kph Existing**	**300 + Kph New**
	$2,364,000	$2,362,000	$2,418,000

8.1.5. Summary of estimated costs for the Minimal Scenario

8.1.5.1. Capital Costs

This section provides a summary of the estimated acquisition costs over the 20-year period under study. The resulting amounts are obtained from the tables presented in this section for the rolling stock acquisition costs and for the land and building acquisition costs. The container fleet and handling equipment acquisition costs can be found in Table 8.1.2.4, presented in Volume II, Section B. The results are summarized here by cost element for each technology/ROW option.

Cost element	MINIMAL SCENARIO: CONTAINER FLEET AND HANDLING EQUIPMENT ACQUISITION COSTS BY TECHNOLOGY/ROW OPTION		
	200 + Kph	300 + Kph Existing	300 + Kph NEW
Rolling Stock **- Including Locos** - Excluding Locos	**$193 M** $128 M	**$237.5 M** $142.5 M	**$237.5 M** $142.5 M
Land and Building	$34.8 M	$34.8 M	$34.8 M
Container Fleet	$14.6 M	$13.9 M	$14.6M
Handling Equipment	$2.8 M	$2.9 M	$2.7 M
TOTAL			
INCLUDING LOCOS	**$245.2 M**	**$289.1 M**	**$289.6 M**
EXCLUDING LOCOS	$180.2 M	$194.1 M	$194.6 M

These estimated capital costs are for the entire project life and are in 1993 dollars.

8.1.5.2. Operating Costs

This section summarizes the estimated annual operating costs for start-up year 2005 for the **minimal scenario**. The resulting amounts are provided in Table 8.1.5.2 presented at the end of this section, for each technology/ROW option.

It can be observed that the differences between the estimates for the three technology/ROW options are marginal. This is due to the similarity in the traffic volumes estimated for the three options.

Table 8.1.5.2

SUMMARY OF ESTIMATED OPERATING COSTS – MINIMAL SCENARIO

OPERATING COSTS			
	200+KPH	**300+KPH EXISTING**	**300+KPH NEW**
Linehaul costs	$9,821,000	$10,625,000	$11,556,000
Rolling stock and container fleet management and maintenance	$2,230,000	$2,218,000	$2,230,000
Handling costs railway terminal	$3,895,000	$3,895,000	$3,572,000
Building management and maintenance	$2,640,000	$2,640,000	$2,640,000
Marketing, Advertising and general administration costs	$2,364,000	$2,362,000	$2,418,000

TOTAL	**$20,950,000**	**$21,740,000**	**$22,416,000**

8.2. MOST PROBABLE SCENARIO

Since the most probable scenario has been defined as an extension of the minimal scenario traffic basis, many common operational requirements and cost elements are shared by the two scenarios. **The emphasis here will be on describing points of difference between the two scenarios**, rather than on providing a complete description of the most probable scenario.

8.2.1. Rolling Stock Fleet Requirements and Linehaul Costs

Figure 8.2.1, presented in Volume II, Section B, shows the estimated daily traffic volumes for each technology/ROW option and for each traffic type (courier, LTL). As with Figure 8.1.1, this is subdivided into six more detailed figures (three technology/ROW options and two traffic types). The explanations of the figures given in Section 8.1.1.1 would apply here as well.

The requirement for trainsets was estimated through the process described in Section 8.1.1.1 for the **minimal scenario** and illustrated in Tables 8.2.1.2 through 8.2.1.4. (There are three versions of each of these tables, one for each technology/ROW option.) **The resulting equipment requirements for the most probable scenario are as follows, in number of trainsets:**

Year of acquisition	MOST PROBABLE SCENARIO: NUMBER OF TRAINSETS REQUIRED BY TECHNOLOGY/ROW OPTION		
	200 + Kph	300 + Kph Existing	300 + Kph NEW
Year 2004	9	9	9
Year 2009	2		
Year 2012			
Year 2013		2	2
Year 2017	2		
Year 2020			
Year 2021	1	1	1

The differences between the minimal and the most probable scenarios in the number of trainsets required (and the resulting differences in acquisition costs) are roughly proportional to the differences in forecast traffic level. In addition, the acquisition schedule would be accelerated for the most probable scenario.

Rolling stock unit costs were presented in Section 8.1.1.1, as was the possibility of saving locomotive costs by using passenger locomotives for freight operations at night. Under these assumptions, along with a presumed equipment availability of 95%, rolling stock acquisition costs under the most probable scenario would be as follows:

Year of acquisition	MOST PROBABLE SCENARIO: ROLLING STOCK ACQUISITION COSTS BY TECHNOLOGY/ROW OPTION					
	200 + Kph		300 + Kph Existing		300 + Kph NEW	
	Including Locos	Excluding Locos	**Including Locos**	Excluding Locos	**Including Locos**	Excluding Locos
Year 2004	**$146 M**	$96 M	**$213 M**	$128 M	**$213 M**	$128 M
Year 2009	**$15 M**	$10 M	**$25 M**	$15 M	**$25 M**	$15 M
Year 2012						
Year 2013	**$32 M**	$22 M	**$32 M**	$17 M	**$32 M**	$17 M
Year 2017			**$25 M**	$15 M	**$25 M**	$15 M
Year 2020						
Year 2021	**$30 M**	$20 M	**$27 M**	$17 M	**$27 M**	$17 M

Tentative train schedules, based on estimated traffic and the service requirements of the courier traffic, are presented in Table 8.2.1.3. Table 8.2.1.4 presents the various operating statistics resulting from these schedules. (As noted above, there are separate versions of these two tables for the three technology/ROW options.) Technology-specific linehaul costs per train-kilometre, derived as explained in Section 8.1.1.2, were applied to the train-kilometres shown in Table 8.2.1.4 to estimate the linehaul costs of light freight service. This resulted in the following linehaul costs, for the start-up year (2005), expressed in 1993 dollars:

MOST PROBABLE SCENARIO: LINEHAUL COSTS BY TECHNOLOGY/ROW OPTION			
	200 + Kph Existing	300 + Kph Existing	300 + Kph New
Linehaul costs	$11,537,000	$13,649,000	$15,235,000

As with the rolling stock acquisition costs, differences between the minimal and the most probable scenario linehaul costs are a function of the differences in forecast traffic levels.

An additional lump sum provision of $2 million per year for rolling stock and container fleet management was included in the overall operating cost estimates.

8.2.2. Container and Handling Equipment Requirements and Costs

The development of acquisition costs for containers and handling equipment, and of operating costs for the handling operation, under the **most probable scenario**, followed the same logic and used many of the same factors outlined for the minimal scenario in Sections 8.1.2.1 through 8.1.2.5.

Traffic volumes, expressed in number of containers, were estimated as described in Section 8.1.2.1, but using the more optimistic assumptions as to market share which characterize the most probable scenario. The results are shown in Table 8.1.2.1, presented in Volume II, Section B. (There are three versions of this table, one for each technology/ROW option.) Container requirements were derived from these figures by applying a factor of two (2) to allow for spares and handling, loading, empty positioning and maintenance time. A unit cost of $3,200 per container was applied.

The resulting **container fleet requirements and acquisition costs** are provided in detail in Table 8.2.2.4, presented in Volume II, Section B. They can be summarized as follows:

- For the **200 + Kph Existing ROW** option, a total of 6,141 containers will be purchased over the 20-year period of operations, with massive acquisitions in years 2005 (1,896 units) and 2015 (1,984 units). The total cost of container acquisition for the entire period is estimated at **$19,650,000**, in 1993 dollars.

- For the **300 + Kph existing ROW** option, a total of 5,827 containers will be purchased over the 20-year period, including 1,799 units in 2005 and 1,882 units in 2015. The total cost of container acquisition for the entire period is estimated at **$18,650,000**, in 1993 dollars.

- For the **300 + Kph New ROW** option, a total of 6,077 containers will be purchased over the 20-year period, including 1,884 units in 2005 and 1,970 units in 2015. The total cost of container acquisition for the entire period is estimated at **$19,450,000**, in 1993 dollars.

Differences in container related costs between the minimal and the most probable options are a function of the differences in forecast traffic levels. In contrast to the rolling stock costs, there is no marked difference between the three technology/ROW options in this respect. This suggests that the differences between the three, observed in the case of rolling stock, is essentially due to indivisibilities. Since containers can be purchased in smaller units and quantities than trainsets, the container fleet size can be more closely matched to the traffic levels.

Annual maintenance costs were assumed to be equal to five percent of the value of the fleet. For the start-up year (2005), these would be as follows:

MOST PROBABLE SCENARIO: CONTAINER MAINTENANCE COSTS BY TECHNOLOGY/ROW OPTION			
	200 + Kph Existing	**300 + Kph Existing**	**300 + Kph New**
Container maintenance	$304,000	$288,000	$301,000

As noted above, a lump sum of $2 million per year was provided for administration of the rolling stock and container fleets. As outlined in Section

8.1.2.3, pick-up and delivery costs were estimated at $31.69 and $ 38.02 per container for the 200 Kph and 300 Kph technologies, respectively.

The need for container-handling equipment at rail terminals was estimated by applying the assumptions and factors outlined in Section 8.1.2.4 to the traffic levels projected for the most probable scenario. This resulted in the following **requirements for handling units for the most probable scenario**:

	200 + Kph		300 + Kph Existing			300 + Kph NEW	
	Required	Spare	Required	Spare		Required	Spare
Windsor	2	1	2	1		3	1
London	3	1	2	1		2	1
Hamilton	2	1	1	1	**Kitchener -Waterloo**	1	1
Toronto	5	1	4	1		4	1
Kingston	1	1	1	1		1	1
Ottawa	2	1	2	1		2	1
Montréal	5	1	5	1		5	1
Trois-Rivières	2	1	1	1		1	1
Québec City	4	1	4	1		4	1
SUB-TOTAL	26	9	22	9		23	9
TOTAL NUMBER OF HANDLING UNITS	**35**		**33**			**32**	

Assuming an average price of $ 35,000 per unit, **acquisition costs for container-handling equipment** in start-up year 2005, for the most probable scenario, would be as follows:

200 + Kph	300 + Existing	300 + New
$1,225,000	$1,155,000	$1,120,000

As for the minimal scenario, it was determined that the platform loaders installed at the outset of high-speed rail operations would suffice to handle the increasing traffic levels over the 20-year period of operation. Other than replacement of the initial equipment in 2015, no additional investments would be required.

Container-handling equipment costs are largely a function of the need to provide a minimal capacity (including spares) and are, therefore, relatively insensitive to traffic level. **For this reason, cost differences between the minimal and most probable scenarios are minimal.**

Wages and other operating costs related to the handling operation in the rail terminals were developed on the same basis as for the minimal scenario, i.e., on the assumption of a three-person crew (one operator, two helpers) assigned to each platform loader. **Operating costs of container handling** in terminals would be as follows for start-up year 2005:

Cost element	MOST PROBABLE SCENARIO: CONTAINER HANDLING OPERATING COSTS TECHNOLOGY/ROW OPTION		
	200 + Kph	300 + Kph Existing	300 + Kph NEW
Loader Operators - Number - Cost (at $45,000/year)	(26) $1,170,000	(22) $990,000	(23) $1,035,000
Helpers - Number - Cost (at $35,000/year)	(52) $1,820,000	(44) 1,540,000	(46) $1,610,000
Additional Staff Allocation (15% for vacation, overtime, etc.)	$448,500	$379,500	$396,750
Supervisory Cost (15%)	$515,780	$436,430	$456,260
Operating costs of platform loaders ($30/day/loader required)	$202,800	$171,600	$179,400
Maintenance of platform loaders (5% of value at $35,000)	$61,250	$54,250	$56,000
TOTAL	$4,218,330	$3,571,780	$3,733,410

8.2.3. Facility Requirements

The capital and operating costs of land and buildings needed for light freight HSR operations are identical to those incurred under the minimal scenario.

8.2.4. Marketing, Advertising and General Administration costs

As with the minimal scenario, a markup of 10% was applied to the personnel and management costs of the HSR light freight operation to account for general administration costs. An additional provision equal to 2% of the revenues was made for the marketing, sales and advertising activities. The results of these calculations are shown below, for each technology/ROW option.

	TECHNOLOGY/ROW OPTION		
	200 + Kph Existing	**300 + Kph Existing**	**300 + Kph New**
Marketing, Advertising and general administration	$2,951,000	$2,836,000	$2,927,000

8.2.5. Summary of Estimated Costs for the Most Probable Scenario

8.2.5.1. Capital Costs

The resulting **capital costs** for the **most probable scenario** are summarized by cost element for each technology/ROW option in the following table:

Cost element	TECHNOLOGY/ROW OPTION		
	200 + Kph	300 + Kph Existing	300 + Kph NEW
Rolling Stock **- Including Locos** - Excluding Locos	**$223 M** $148 M	**$321 M** $191 M	**$321 M** $191 M
Land and Building	$34.8 M	$34.8 M	$34.8 M
Container Fleet	$19.7 M	$18.6 M	$19.4 M
Handling Equipment	$3.0 M	$2.8 M	$2.7 M
TOTAL			
INCLUDING LOCOS	**$280.5 M**	**$377.5 M**	**$378.2 M**
EXCLUDING LOCOS	$205.5 M	$247.5 M	$248.2 M

8.2.5.2. Operating Costs

The estimated operating costs of the HSR system for the most probable scenario are summarized in Table 8.2.5.2, presented on the following page.

Table 8.2.5.2

SUMMARY OF ESTIMATED OPERATING COSTS – MOST PROBABLE SCENARIO

OPERATING COSTS			
	200+KPH	**300+KPH EXISTING**	**300+KPH NEW**
Linehaul costs	$11,537,000	$13,649,000	$15,235,000
Rolling stock and container fleet management and maintenance	$2,304,000	$2,288,000	$2,301,000
Handling costs railway terminal	$4,218,000	$3,572,000	$3,733,000
Building management and maintenance	$2,640,000	$2,640,000	$2,640,000
Marketing, Advertising and general administration costs	$2,951,000	$2,836,000	$2,927,000
TOTAL	**$23,650,000**	**$24,985,000**	**$26,836,000**

9.

PRICING STRATEGY, GROSS AND NET REVENUE ESTIMATES

9. PRICING STRATEGY, GROSS AND NET REVENUE ESTIMATES

In this chapter, a pricing strategy is elaborated, gross operating revenues are presented for the first 20 years of an HSR light freight system, and net operating revenues are derived from the projected annual operating costs and the estimated gross operating revenues for the period under study. Finally, annualized capital costs are subtracted from the net operating revenues to obtain the estimated net revenues.

9.1. PRICING STRATEGY

Differences between the respective natures of the courier and LTL traffic, considered as potential for the HSR light freight system, necessitated a specific pricing strategy for each traffic type.

In both cases, the elements taken into account are:

- the HSR light freight system estimated operating costs; and
- the estimated current costs incurred by the courier companies or LTL shippers:

These elements were largely developed in Chapter 5, in which mode profiles including rate structures were presented, and in Chapter 8, where light freight operating and capital costs were established.

The HSR Authority would also have to earn sufficient revenue to provide for depreciation and a return on the capital invested. To provide an indication of the ability of a light freight service to produce a net profit, tentative costs of capital have been developed. A 5% cost of capital (in constant dollars) was used for this purpose. The yearly costs of capital thus obtained have been subtracted from the net operating revenues in order to arrive at indicative net revenues. Capital outlays are presented separately as well in order to allow for more thorough

financial analyses, which are to be conducted by the consultants responsible for the financial and cost-benefit analyses.

9.1.1. Courier Traffic

For this study, the courier traffic has been identified as the base cargo, on account of its nature as express light freight. For the three technology/ROW options and for the two market share scenarios, it was estimated that the HSR light freight market would be generated primarily from courier traffic imbalances, which involve higher linehaul costs to the courier companies.

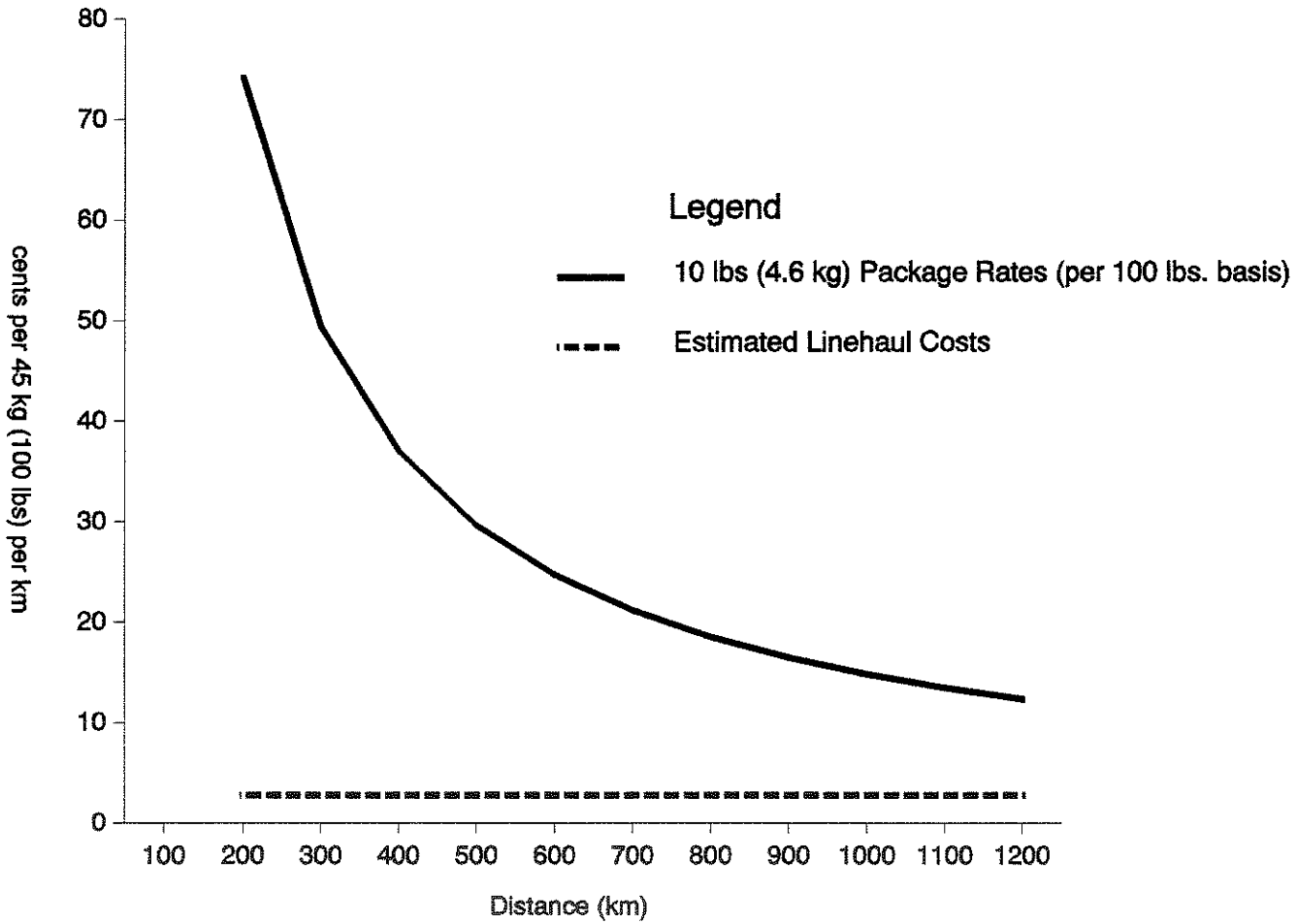
The HSR light freight system operating costs were developed mostly on the basis of specific annual unit costs, with the exception of linehaul costs, for which a unit cost per train-kilometre basis was used. For the pricing strategy, the total annual operating cost was divided by the total annual car-kilometres, for each technology/ROW option, to obtain an overall system operating cost per car-kilometre. This unit cost was then converted into a cost per container per kilometre.

The current linehaul costs incurred by the courier companies were derived from a breakdown of generic courier costs for the shipment of an average weight package in the Québec/Windsor corridor. The resulting average cost was 0.92$ per 10 lb-shipment for a 500 km distance. In the market segment identified as likely potential for an HSR system, a higher trucking cost of $1.53 per 10 lb-shipment of 500 km is required to reflect the 100% empty return for most of the potential courier traffic. The results are illustrated in Figure 9.1.1 presented on the following page. For the pricing strategy, the competitive cost estimates were also converted to a cost per container per km comparative basis.

In order to assess the available margin, approximations of the annual charges for capital expenditures were developed. The resulting amounts are presented in Table 9.1.1.1, for the **minimal scenario**, and Table 9.1.1.2, for the **most probable scenario**, both presented at the end of Section 9.1.

Figure 9.1.1

Estimated Rates for Courier Traffic (by ground) and Linehaul Costs



Finally, a competitive pricing strategy had to be determined in order to attract the estimated share of traffic for the HSR light freight system.

Preliminary indications were obtained from the courier industry regarding pricing requirements. The competitive situation of the industry and the current market conditions necessitate a high level of reliability. Providing such service reliability was offered by the HSR light freight system, the estimated courier traffic likely to be attracted could possibly be obtained at the same linehaul cost level. However, a 10% cost reduction would constitute a major incentive for the courier companies to convert from their linehaul truck operations to using the HSR light freight system.

All the revenue estimates generated by the courier traffic have therefore been developed on the basis of a 10% price incentive vis-à-vis the estimated current truck linehaul costs to the courier companies. Consequently, a unit price of $1.38 per 10 lb-shipment of 500 km was used for calculating the estimated gross revenues generated by courier traffic.

9.1.2. LTL Traffic

In general, the LTL traffic has been considered as backhaul traffic for the containers otherwise returning empty. This approach has been followed for the three technology/ROW options and for the two market share scenarios. In the most probable scenario, more LTL traffic has been assumed to constitute forehaul traffic for the HSR light freight system.

The same HSR operating costs were used for courier traffic and LTL traffic, and, consequently, the same cost per container per kilometre constituted one of the bases for the pricing strategy for LTL traffic.

LTL costs currently incurred by shippers were derived from a published tariff and from shippers involved in the interview program. As described in Section 5.2.2, the applicable LTL rates represent approximately 40% of the published rates. In order to obtain a comparative basis, from the standpoint of the shippers who are paying the freight bill, the equivalent of $600 per trailer has been deducted from the rates to take into account the pick-up and delivery portion of a

conventional LTL shipment. The remaining portion was allocated to the linehaul operation, container pick-up and delivery, consolidation and presort.

Linehaul charges for LTL shipments have been estimated for a number of city pairs in the corridor. The interpolated results are illustrated in Figure 9.1.2 presented at the end of Section 9.1.2. For the pricing strategy, the competitive cost estimates, shown in cents per 100 lbs per km, were converted to a cost per container per km comparative basis.

As for the annual charges for capital expenditures, the approximations used for the courier traffic were also taken into account for the LTL traffic.

The competitive pricing strategy in this case is designed from the shipper's standpoint rather than from the LTL carrier's standpoint. The linehaul charges were estimated by reducing the applicable LTL rates by $600 per trailer (or $1.33 per 100 lbs.) for pick-up and delivery. Moreover, two separate provisions for container pick-up and delivery were made using the unit cost derived for courier traffic, as it is expected LTL shipments will involve two movements at each end (i.e. the pick-up of an empty container and the return to the loading point, and the delivery of the loaded container to the railway terminal and the return to the loading point, and a similar quadruple operation at destination). An additional provision was made for the consolidation of LTL shipments and the presort operation required for distribution at destination. The amount of $100 per container was used in the calculations.

It is expected the resulting net linehaul charge would provide sufficient incentive for LTL truckers to use the HSR light freight system without further price reduction. In addition, a great number of LTL shippers are being assessed much higher rates than the competitive level retained for the study. The concept of reduced directional pricing has been considered for the LTL traffic moving in containers otherwise returning empty. It is anticipated such a concept would not be required for the HSR light freight system to attract the estimated LTL volumes.

Consequently, the pricing strategy for the LTL traffic is based on the assumption that no further incentive beyond the specific cost provisions identified would be required in order for the HSR light freight system to attract the estimated market share.

All the revenue estimates generated by the LTL traffic have been developed on the basis of the estimated linehaul portion of the effective LTL rates in the Québec/Windsor corridor.

The following sections present the HSR revenues resulting from the above pricing strategies.

Table 9.1.1.1

Québec – Windsor Corridor – Minimal Market Share Scenario

HSR Light Freight: Start–up (year 2005) Annual Charges for Capital Expenditures

	200 kph Option – X2000 technology		TGV technology 300 kph Existing ROW Option		300 kph New ROW Option	
	total capital cost	equivalent annual capital cost[2]	total capital cost	equivalent annual capital cost (1)	total capital cost	equivalent annual capital cost (1)
Rolling Stock [1,3]						
(including Locos)	$146,000,000	$10,359,059	$185,625,000	$13,170,550	$185,625,000	$13,170,550
(excluding Locos)	$96,000,000	$6,811,436	$110,625,000	$7,849,116	$110,625,000	$7,849,116
Buildings[4]	$26,400,000	$1,446,106	$26,400,000	$1,446,106	$26,400,000	$1,446,106
Handling						
Containers[5]	$4,604,800	$596,343	$4,368,000	$565,676	$4,608,000	$596,757
Other Equip.[6]	$1,155,000	$149,578	$1,155,000	$149,578	$1,085,000	$140,512
Total (including Locos)	$178,159,800	**$12,551,085**	$217,548,000	**$15,331,909**	$217,718,000	**$15,353,925**
Total (excluding Locos)	$128,159,800	**$9,003,462**	$142,548,000	**$10,010,475**	$142,718,000	**$10,032,491**

Notes:

(1) cost for rolling stock required according to preliminary operating scenarios
(2) real interest rate (net of inflation) of 5% per annum
(3) Assumed useful life of rolling stock : 25 years
(3) Assumed useful life of buildings : 50 years
(4) Assumed useful life of containers : 10 years
(5) Assumed useful life of handling equip. : 10 years

Table 9.1.1.2

Québec – Windsor Corridor – Most Probable Market Share Scenario

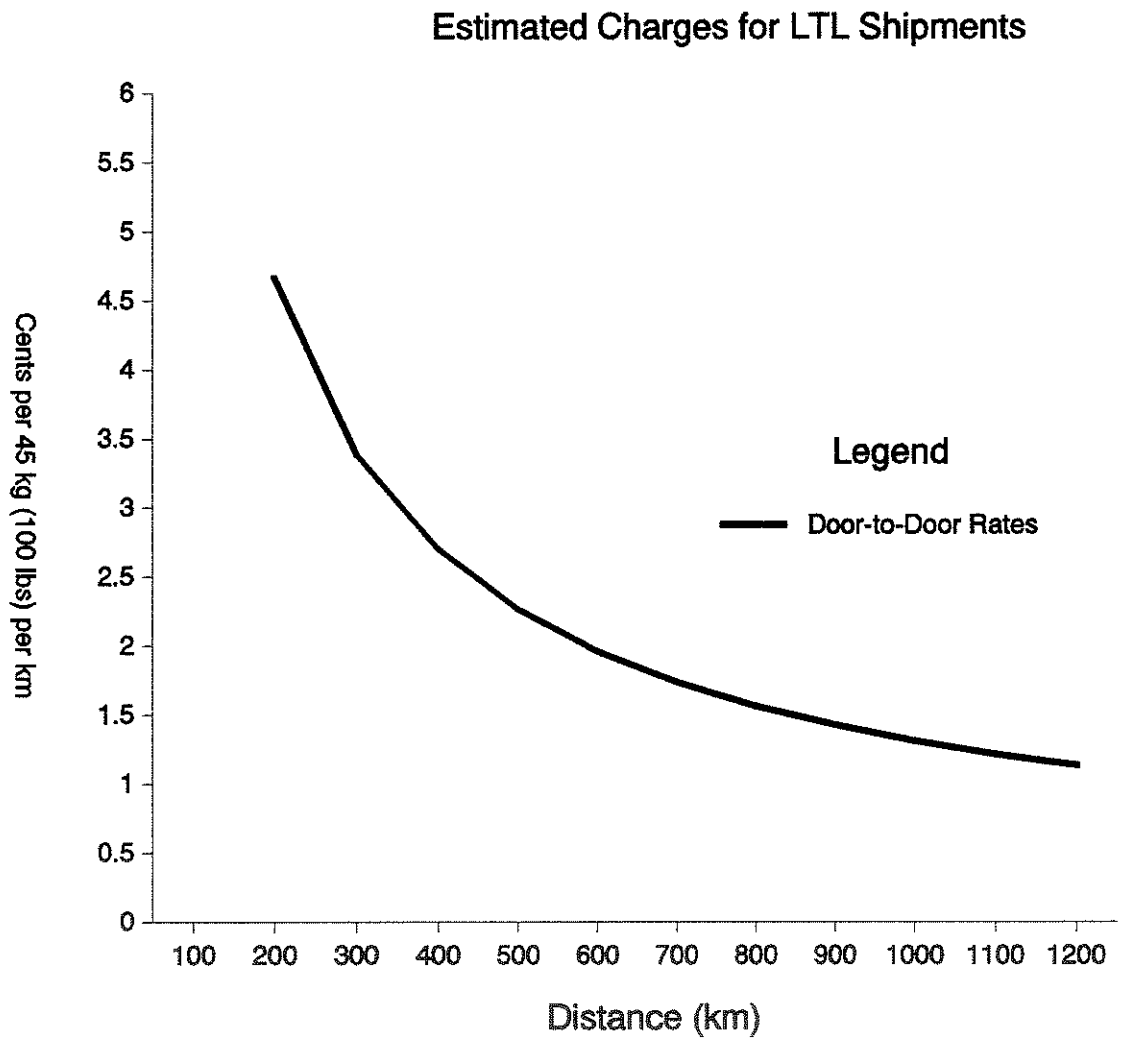
HSR Light Freight: Start–up (year 2005) Annual Charges for Capital Expenditures

	200 kph Option – X2000 technology		TGV technology 300 kph Existing ROW Option		300 kph New ROW Option	
	total capital cost	equivalent annual capital cost[2]	total capital cost	equivalent annual capital cost (1)	total capital cost	equivalent annual capital cost (1)
Rolling Stock [1,3]						
(including Locos)	$146,000,000	$10,359,059	$185,625,000	$13,170,550	$185,625,000	$13,170,550
(excluding Locos)	$96,000,000	$6,811,436	$110,625,000	$7,849,116	$110,625,000	$7,849,116
Buildings[4]	$26,400,000	$1,446,106	$26,400,000	$1,446,106	$26,400,000	$1,446,106
Handling						
Containers[5]	$6,067,200	$785,730	$5,756,800	$745,532	$6,028,800	$780,757
Other Equip.[6]	$1,225,000	$158,643	$1,155,000	$149,578	$1,120,000	$145,045
Total (including Locos)	$179,692,200	**$12,749,538**	$218,936,800	**$15,511,765**	$219,173,800	**$15,542,458**
Total (excluding Locos)	$129,692,200	**$9,201,915**	$143,936,800	**$10,190,331**	$144,173,800	**$10,221,024**

Notes:

(1) cost for rolling stock required according to preliminary operating scenarios
(2) real interest rate (net of inflation) of 5% per annum
(3) Assumed useful life of rolling stock : 25 years
(3) Assumed useful life of buildings : 50 years
(4) Assumed useful life of containers : 10 years
(5) Assumed useful life of handling equip. : 10 years

Figure 9.1.2


Estimated Charges for LTL Shipments
Cents per 45 kg (100 lbs) per km
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Legend
Door-to-Door Rates
100
200
300
400
500
600
700
800
900
1000
1100
1200
Distance (km)

9.2. GROSS REVENUE ESTIMATES

The gross revenue estimates were calculated by applying the established pricing strategies, expressed in revenue per container per kilometre, to the market share volumes identified by city pair. This was done for each technology/ROW option, and for each market share scenario.

The presentation of the results by province necessitated the evaluation of the gross revenues on a city pair basis. Evidently, the revenues generated by a movement occurring within a province have been allocated to that province. For the interprovincial movements, the approach retained has been to allocate the revenues generated to the province of origin.

Extrapolations have been conducted to forecast the revenues for the 20-year period under study on the basis of the volume forecasts developed in Chapter 7 of this report. The results of the gross revenue projections are summarized and presented in Section 9.2.1, for the **minimal scenario**, and in Section 9.2.2, for the **most probable scenario**. The detailed results are presented in Volume II, Section C.

The following sections provide a brief summary of the gross revenue projections by market share scenario, by technology/ROW option, and for each traffic type.

9.2.1. Minimal Scenario

This section provides the range of total annual gross revenues estimated for the 20-year period, broken down by courier traffic and LTL traffic, for each technology/ROW option. All the revenues are estimated in 1993 dollars.

For the **200 + Kph Existing** option, the total annual gross revenues are estimated at **$70,132,000 for start-up year 2005** and at **$116,863,000 for year 2024**. The revenues generated from courier traffic are estimated at $41,613,000 for start-up year 2005 and represent 59.3% of the total gross revenues. The remaining revenues are generated from LTL traffic and are estimated at $28,519,000 for start-up year 2005.

For the **300 + Kph existing ROW** option, the total annual gross revenues are estimated at **$70,129,000 for start-up year 2005** and at **$116,857,000 for year 2024**. The revenues generated from courier traffic are estimated at $41,611,000 for start-up year 2005 and represent 59.3% of the total gross revenues. The remaining revenues are generated from LTL traffic and are estimated at $28,518,000 for the start-up year.

For the **300 + Kph New ROW** option, the total annual gross revenues are estimated at **$73,665,000 for start-up year 2005** and at **$122,608,000 for year 2024**. The revenues generated from courier traffic are estimated at $45,226,000 for start-up year 2005 and represent 61.3% of the total gross revenues. The remaining revenues are generated from LTL traffic and are estimated at $28,439,000 for start-up year 2005.

The results show only slight differences between the three technology/ROW options. The use of common traffic volumes and pricing strategies leads to similar results from the gross revenue standpoint. More significant differences will appear when operating and capital costs are taken into account.

9.2.2. Most Probable Scenario

For the most probable scenario, the summary contains the same results as in the previous section. It also provides a comparison with the overall results of the minimal scenario.

For the **200 + Kph Existing ROW** option, the annual gross revenues are estimated at **$95,087,000 for start-up year 2005** and at **$158,943,000 for year 2024**. The revenues generated from courier traffic amount to $51,059,000 or 53.7% of the total gross revenues for start-up year 2005. The remaining revenues are generated from LTL traffic and amount to $44,028,000 for year 2005. **For the most probable scenario, the total gross revenues are 36% higher than for the minimal scenario.**

For the **300 + Kph existing ROW** option, the annual gross revenues are estimated at **$95,067,000 for start-up year 2005** and at **$158,910,000 for year 2024**. The revenues generated from courier traffic amount to **$51,057,000** or

53.7% of the total gross revenues for start-up year 2005. The remaining revenues are generated from LTL traffic and amount to $44,010,000 for year 2005. **For the most probable scenario, the total gross revenues are 35.5% higher than for the minimal scenario.**

For the **300 + Kph New ROW** option, the annual gross revenues are estimated at **$98,766,000 for start-up year 2005** and at **$164,966,000 for year 2024**. The revenues generated from courier traffic amount to **$54,397,000** or **55.1%** of the total gross revenues for start-up year 2005. The remaining revenues are generated from LTL traffic and amount to $44,369,000 for year 2005. For the most probable scenario, the total gross revenues are 29.1% higher than for the minimal scenario.

9.3. NET OPERATING REVENUES

The net operating revenues take into account the gross revenues as defined in the previous section. They also take into account the light freight operating costs to be incurred by the HSR system, and the provisions made for the additional activities required to offer a competitive service to the customers, i.e. the courier companies or the LTL shippers.

The operating costs, in 1993 dollars, were extrapolated for the 20-year period. The cost parameters were described in detail in Chapter 8. Some cost elements have been established on a lump sum basis or as a percentage of an investment value. In these cases, the variation of the cost estimates will be nonexistent or minor over the 20-year period. Other cost elements have been established as a proportion of the traffic handled or as a percentage of the revenue generated. Consequently, the annual variation of these cost estimates over the 20-year period will be more significant, as traffic and revenue are expected to increase.

The provisions for additional activities required to make the HSR system competitive have also been extrapolated for the 20-year period. These provisions are restricted to the container pick-up and delivery for courier traffic, but also include consolidation and presort, and an additional container pick-up and delivery for LTL traffic. These additional activities will have to be performed to provide the LTL shippers with a competitive service. All the above provisions are directly

related to traffic volumes, which are reflected in the annual variations of the estimates for the 20-year period.

The detailed results are included in Tables 9.3.1 for the **minimal scenario**, and in Tables 9.3.2 for the **most probable scenario**, presented in Volume II, Section C. A brief summary of the gross revenue projections by market share scenario and by technology/ROW option, and for each province, is provided in the following sections.

9.3.1. Minimal Scenario

This section provides the range of total annual net operating revenues estimated for the 20-year period and for each technology/ROW option under the minimal scenario. A revenue breakdown by province is also presented. The net operating revenues are estimated in 1993 dollars.

For the **200 Kph Existing ROW** option, the net operating revenue ranges from **$33,921,000 (year 2005)** to **$63,678,000 (year 2024)** for the entire HSR system. The definition used for revenue distribution between provinces produces the following breakdown: **Québec $9,631,000** and **Ontario $24,291,000** for the start-up year.

For the **300 Kph existing ROW** option, the net operating revenue ranges from **$32,351,000 (year 2005)** to **$61,067,000 (year 2024)** for the entire system. The revenue breakdown by province is as follow: **Québec, $9,067,000** and **Ontario, $23,284,000** for the start-up year.

For the **300 Kph New ROW** option, the net operating revenue ranges from **$35,720,000 (year 2005)** to **$64,786,000 (year (2024)**. The revenue allocation by province is as follows: **Québec, $9,285,000** and **Ontario, $25,435,000** for the start-up year.

More details are presented in Table 9.3.1 in Volume II, Section C. This consists of a series of tables, identified by option and providing total, Québec, and Ontario results. Each table also includes a capital cost schedule.

9.3.2. Most Probable Scenario

For the most probable scenario, the summary results are presented in the same format as in the previous section. The detailed results are included in Table 9.3.2 presented in Volume II, Section C.

For the **200 Kph Existing ROW** option, the net operating revenue ranges from **$48,953,000 (year 2005)** to **$89,975,000 (year 2024)** for the entire HSR system. Based on the study definition of revenue distribution, the breakdown of net operating revenue by province is: **Québec, $14,757,000** and **Ontario, $34,196,000** for the start-up year.

For the **300 Kph Existing ROW** option, the net operating revenue ranges from **$47,084,000 (year 2005)** to **$85,918,000 (year 2024)** for the entire system. The revenue breakdown by province is: **Québec, $14,202,000** and **Ontario $32,882,000** for the start-up year.

For the **300 Kph New ROW** option, the net operating revenue ranges form **$48,413,000 (year 2005)** to **$88,167,000 (year 2024)** for the entire system. The distribution by province results in: **Québec, $14,041,000** and **Ontario, $26,311,000** for the start-up year.

The detailed tables making up Table 9.3.2 are presented in the same sequence as for the minimal scenario, and can be found in Volume II, Section C.

9.4. NET REVENUES

The net annual revenues were derived from the net operating revenues by subtracting further allowances for the costs of capital associated with the purchase of rolling stock, freight terminals, land, buildings, containers, and handling equipment.

The detailed results are also included in Table 9.3.1 for the **minimal scenario**, and in Table 9.3.2 for the **most probable scenario**, presented in Volume II, Section C. A brief summary of the net revenue projections by market share scenario and by technology/ROW option, and for each province, is provided in the following sections.

9.4.1. Minimal Scenario

This section provides the range of total annual net revenues estimated for the 20-year period and for each technology/ROW option under the minimal scenario. A revenue breakdown by province is also presented. The net revenues are estimated in 1993 dollars.

For the **200 Kph Existing ROW** option, the net revenue ranges from **$22,751,000 (year 2005)** to **$45,984,000 (year 2024)** for the entire HSR system. The definition used for revenue distribution between provinces produces the following breakdown: **Québec $5,893,000** and **Ontario $16,858,000** for the start-up year.

For the **300 Kph existing ROW** option, the net revenue ranges from **$19,677,000 (year 2005)** to **$40,282,000 (year 2024)** for the entire system. The revenue breakdown by province is as follow: **Québec, $4,839,000** and **Ontario, $14,838,000** for the start-up year.

For the **300 Kph New ROW** option, the net revenue ranges from **$22,020,000 (year 2005)** to **$43,954,000 (year (2024)**. The revenue allocation by province is as follows: **Québec, $5,171,000** and **Ontario, $16,848,000** for the start-up year.

The tables making up detailed Table 9.3.1 are presented in Volume II, Section C. The tables are identified by option and provide total, Québec, and Ontario results. Each table also includes a capital cost schedule.

9.4.2. Most Probable Scenario

For the most probable scenario, the summary results are presented in the same format as in the previous section. The detailed results are included in Table 9.3.2 presented in Volume II, Section C.

For the **200 Kph Existing ROW** option, the net revenue ranges from **$36,364,000 (year 2005)** to **$69,639,000 (year 2024)** for the entire HSR system. Based on the study definition of revenue distribution, the breakdown of net

revenue by province is: **Québec, $10,499,000** and **Ontario, $25,865,000** for the start-up year.

For the **300 Kph Existing ROW** option, the net revenue ranges from **$30,692,000 (year 2005)** to **$58,779,000 (year 2024)** for the entire system. The revenue breakdown by province is: **Québec, $8,688,000** and **Ontario $22,004,000** for the start-up year.

For the **300 Kph New ROW** option, the net revenue ranges from **$31,981,000 (year 2005)** to **$60,948,000 (year 2024)** for the entire system. The distribution by province results in: **Québec, $8,680,000** and **Ontario, $23,301,000** for the start-up year.

The detailed tables that make up Table 9.3.2 are presented Volume II, Section C in the same sequence as for the minimal scenario. Three of these tables are shown on the following pages. These give results for each of the three technology/ROW conbinates for the corridor as a whole.

Table 9.3.2 (200 Total)

NET OPERATING REVENUES

Quebec – Windsor Corridor

MOST PROBABLE MARKET SHARE SCENARIO

200 kph Existing R/W Option (X–2000 Technology)

QUÉBEC AND ONTARIO COMBINED (IN THOUSANDS OF 1993 DOLLARS)

YEAR	REVENUES			OPERATING COSTS					PROV. FOR EXTRA CUST. COSTS			Total Costs and Provisions	NET OPERATING REVENUE	NET REVENUE[1]
	Courier	LTL	Total	Line Haul	Fleet Mgmnt.	Terminal & Handling	Marketing & Admin.	Sub–total	Pick–up & Delivery	LTL Consolida. and Presort	LTL Additional P & D			
2005	51,059	44,028	95,087	11,537	2,303	8,192	2,951	24,983	7,813	10,129	3,210	46,134	48,953	36,364
2006	52,387	45,304	97,691	11,850	2,314	8,192	3,004	25,360	8,025	10,392	3,293	47,070	50,621	36,941
2007	53,749	46,618	100,367	12,172	2,324	8,192	3,059	25,747	8,244	10,662	3,379	48,032	52,335	38,629
2008	55,146	47,970	103,116	12,503	2,335	8,192	3,115	26,144	8,469	10,939	3,467	49,019	54,097	40,363
2009	56,580	49,361	105,941	12,843	2,346	8,192	3,173	26,553	8,699	11,224	3,557	50,033	55,908	42,145
2010	58,051	50,793	108,844	13,192	2,358	8,192	3,232	26,973	8,936	11,516	3,649	51,074	57,770	43,976
2011	59,560	52,266	111,826	13,550	2,370	8,192	3,293	27,404	9,180	11,815	3,744	52,143	59,683	44,793
2012	61,109	53,782	114,891	13,918	2,382	8,192	3,355	27,848	9,430	12,122	3,842	53,241	61,649	46,727
2013	62,698	55,341	118,039	14,297	2,395	8,192	3,419	28,303	9,687	12,437	3,941	54,369	63,670	48,715
2014	64,328	56,946	121,274	14,685	2,409	8,192	3,486	28,771	9,951	12,761	4,044	55,527	65,748	50,757
2015	66,001	58,598	124,598	15,084	2,423	8,192	3,553	29,252	10,222	13,093	4,149	56,716	67,882	51,545
2016	67,717	60,297	128,013	15,494	2,437	8,192	3,623	29,747	10,500	13,433	4,257	57,937	70,077	53,676
2017	69,477	62,045	131,523	15,916	2,452	8,192	3,695	30,254	10,787	13,782	4,368	59,191	72,332	55,865
2018	71,284	63,845	135,128	16,348	2,468	8,192	3,769	30,776	11,081	14,141	4,481	60,479	74,650	56,909
2019	73,137	65,696	138,833	16,793	2,484	8,192	3,844	31,313	11,383	14,508	4,598	61,801	77,032	59,220
2020	75,038	67,601	142,640	17,250	2,501	8,192	3,922	31,864	11,693	14,885	4,717	63,159	79,481	61,595
2021	76,989	69,562	146,551	17,719	2,518	8,192	4,002	32,430	12,012	15,272	4,840	64,554	81,997	62,971
2022	78,991	71,579	150,570	18,201	2,536	8,192	4,084	33,012	12,339	15,669	4,966	65,987	84,584	65,479
2023	81,045	73,655	154,700	18,696	2,554	8,192	4,169	33,610	12,676	16,077	5,095	67,458	87,242	68,056
2024	83,152	75,791	158,943	19,204	2,574	8,192	4,255	34,225	13,022	16,495	5,227	68,969	89,975	69,639

1. Net Revenue = Net Operating Revenue less Yearly Cost of Capital

YEAR	CAPITAL COSTS			TOTAL CAPITAL COST	YEARLY COST OF CAPITAL
	Rolling Stock	Containers	Terminals & Handling		
2005	131,000	6,069	36,155	173,223	12,589
2006	15,000	203	0	15,203	13,679
2007	0	210	0	210	13,707
2008	0	217	0	217	13,735
2009	0	225	0	225	13,764
2010	0	233	0	233	13,794
2011	15,000	242	0	15,242	14,890
2012	0	250	0	250	14,922
2013	0	260	0	260	14,956
2014	0	269	0	269	14,991
2015	15,000	6,347	1,900	23,247	16,337
2016	0	492	0	492	16,401
2017	0	509	0	509	16,467
2018	17,000	528	0	17,528	17,741
2019	0	547	0	547	17,812
2020	0	567	0	567	17,885
2021	15,000	588	0	15,588	19,026
2022	0	609	0	609	19,105
2023	0	631	0	631	19,186
2024	15,000	655	0	15,655	20,336

Table 9.3.2 (300 Existing Total)

NET OPERATING REVENUES

Quebec – Windsor Corridor

MOST PROBABLE MARKET SHARE SCENARIO

300 kph Existing R/W Option (TGV Technology)

QUÉBEC AND ONTARIO COMBINED (IN THOUSANDS OF 1993 DOLLARS)

YEAR	REVENUES			OPERATING COSTS					PROV. FOR EXTRA CUST. COSTS			Total Costs and Provisions	NET OPERATING REVENUE	NET REVENUE[1]
	Courier	LTL	Total	Line Haul	Fleet Mgmnt.	Terminal & Handling	Marketing & Admin.	Sub–total	Pick–up & Delivery	LTL Consolida. and Presort	LTL Additional P & D			
2005	51,057	44,010	95,067	13,649	2,288	7,055	2,836	25,827	8,894	9,609	3,653	47,983	47,084	30,692
2006	52,384	45,287	97,671	14,023	2,298	7,055	2,889	26,264	9,136	9,858	3,748	49,007	48,664	30,340
2007	53,746	46,600	100,346	14,406	2,307	7,055	2,943	26,713	9,385	10,115	3,846	50,059	50,288	31,937
2008	55,144	47,951	103,095	14,803	2,318	7,055	2,999	27,175	9,640	10,378	3,946	51,139	51,956	33,579
2009	56,577	49,342	105,919	15,209	2,328	7,055	3,057	27,649	9,903	10,648	4,048	52,248	53,671	35,266
2010	58,048	50,773	108,821	15,627	2,340	7,055	3,116	28,137	10,173	10,924	4,153	53,388	55,434	37,000
2011	59,558	52,245	111,803	16,055	2,351	7,055	3,177	28,638	10,450	11,208	4,261	54,558	57,245	37,008
2012	61,106	53,760	114,867	16,496	2,363	7,055	3,239	29,153	10,735	11,500	4,372	55,760	59,107	38,839
2013	62,695	55,319	118,014	16,949	2,375	7,055	3,303	29,682	11,027	11,799	4,486	56,994	61,020	40,721
2014	64,325	56,924	121,249	17,414	2,388	7,055	3,369	30,226	11,328	12,106	4,603	58,262	62,986	42,654
2015	65,997	58,575	124,572	17,892	2,401	7,055	3,437	30,785	11,636	12,420	4,722	59,564	65,007	42,178
2016	67,713	60,273	127,987	18,383	2,415	7,055	3,507	31,360	11,953	12,743	4,845	60,902	67,085	44,195
2017	69,474	62,021	131,495	18,888	2,429	7,055	3,578	31,951	12,279	13,075	4,971	62,276	69,219	46,267
2018	71,280	63,820	135,100	19,407	2,444	7,055	3,652	32,558	12,614	13,415	5,100	63,686	71,414	48,397
2019	73,133	65,671	138,804	19,940	2,459	7,055	3,727	33,181	12,958	13,763	5,233	65,136	73,669	48,811
2020	75,035	67,575	142,610	20,487	2,475	7,055	3,805	33,823	13,311	14,121	5,369	66,624	75,986	51,059
2021	76,986	69,535	146,521	21,050	2,491	7,055	3,885	34,482	13,674	14,488	5,508	68,152	78,368	53,368
2022	78,988	71,551	150,539	21,628	2,508	7,055	3,967	35,159	14,047	14,865	5,652	69,723	80,816	55,741
2023	81,041	73,626	154,667	22,222	2,526	7,055	4,051	35,855	14,430	15,252	5,799	71,335	83,332	56,273
2024	83,148	75,761	158,910	22,833	2,544	7,055	4,138	36,570	14,823	15,648	5,949	72,991	85,918	58,779

1. Net Revenue = Net Operating Revenue less Yearly Cost of Capital

YEAR	CAPITAL COSTS			TOTAL CAPITAL COST	YEARLY COST OF CAPITAL
	Rolling Stock	Containers	Terminals & Handling		
2005	185,625	5,758	35,910	227,293	16,393
2006	26,875	192	0	27,067	18,324
2007	0	199	0	199	18,350
2008	0	206	0	206	18,377
2009	0	214	0	214	18,405
2010	0	221	0	221	18,433
2011	25,000	229	0	25,229	20,237
2012	0	238	0	238	20,268
2013	0	246	0	246	20,299
2014	0	255	0	255	20,332
2015	31,875	6,023	1,550	39,448	22,829
2016	0	466	0	466	22,889
2017	0	483	0	483	22,952
2018	0	501	0	501	23,017
2019	25,000	519	0	25,519	24,858
2020	0	538	0	538	24,928
2021	0	558	0	558	25,000
2022	0	578	0	578	25,075
2023	26,875	599	0	27,474	27,059
2024	0	621	0	621	27,140

Table 9.3.2 (300 New Total)
NET OPERATING REVENUES
Quebec – Windsor Corridor
MOST PROBABLE MARKET SHARE SCENARIO
300 kph New R/W Option (TGV Technology)
QUÉBEC AND ONTARIO COMBINED (IN THOUSANDS OF 1993 DOLLARS)

YEAR	REVENUES			OPERATING COSTS					PROV. FOR EXTRA CUST. COSTS			Total Costs and Provisions	NET OPERATING REVENUE	NET REVENUE[1]
	Courier	LTL	Total	Line Haul	Fleet Mgmnt.	Terminal & Handling	Marketing & Admin.	Sub–total	Pick–up & Delivery	LTL Consolida. and Presort	LTL Additional P & D			
2005	54,397	44,369	98,766	15,235	2,302	7,217	2,927	27,681	9,314	9,678	3,680	50,353	48,413	31,981
2006	55,811	45,656	101,467	15,652	2,311	7,217	2,982	28,163	9,567	9,930	3,775	51,436	50,031	33,573
2007	57,262	46,980	104,242	16,081	2,322	7,217	3,039	28,659	9,827	10,188	3,873	52,548	51,694	33,302
2008	58,751	48,342	107,093	16,522	2,333	7,217	3,097	29,169	10,094	10,453	3,974	53,690	53,403	34,983
2009	60,278	49,744	110,022	16,975	2,344	7,217	3,157	29,693	10,369	10,725	4,078	54,864	55,159	36,711
2010	61,846	51,187	113,032	17,440	2,355	7,217	3,218	30,231	10,651	11,004	4,184	56,068	56,964	38,486
2011	63,454	52,671	116,125	17,918	2,367	7,217	3,281	30,784	10,940	11,290	4,292	57,306	58,819	40,310
2012	65,103	54,199	119,302	18,410	2,379	7,217	3,346	31,352	11,238	11,583	4,404	58,577	60,725	40,410
2013	66,796	55,770	122,566	18,914	2,392	7,217	3,412	31,936	11,544	11,884	4,518	59,883	62,684	42,336
2014	68,533	57,388	125,920	19,433	2,405	7,217	3,481	32,536	11,858	12,193	4,636	61,223	64,697	44,315
2015	70,315	59,052	129,366	19,966	2,419	7,217	3,551	33,153	12,180	12,510	4,756	62,600	66,766	46,142
2016	72,143	60,764	132,907	20,514	2,433	7,217	3,623	33,787	12,512	12,836	4,880	64,015	68,892	45,944
2017	74,018	62,527	136,545	21,076	2,448	7,217	3,697	34,439	12,852	13,169	5,007	65,467	71,078	48,064
2018	75,943	64,340	140,283	21,654	2,463	7,217	3,774	35,109	13,202	13,512	5,137	66,959	73,324	50,243
2019	77,917	66,206	144,123	22,248	2,479	7,217	3,852	35,797	13,561	13,863	5,271	68,492	75,632	52,481
2020	79,943	68,126	148,069	22,859	2,495	7,217	3,933	36,504	13,930	14,223	5,408	70,065	78,004	53,007
2021	82,022	70,101	152,123	23,486	2,512	7,217	4,015	37,231	14,309	14,593	5,548	71,682	80,441	55,370
2022	84,154	72,134	156,289	24,130	2,530	7,217	4,100	37,978	14,699	14,973	5,693	73,342	82,947	57,798
2023	86,342	74,226	160,569	24,793	2,548	7,217	4,188	38,746	15,099	15,362	5,841	75,047	85,521	58,385
2024	88,587	76,379	164,966	25,473	2,567	7,217	4,278	39,535	15,510	15,761	5,992	76,799	88,167	60,948

1. Net Revenue = Net Operating Revenue less Yearly Cost of Capital

YEAR	CAPITAL COSTS			TOTAL CAPITAL COST	YEARLY COST OF CAPITAL
	Rolling Stock	Containers	Terminals & Handling		
2005	185,625	6,030	35,945	227,600	16,432
2006	0	200	0	200	16,458
2007	26,875	207	0	27,082	18,392
2008	0	214	0	214	18,420
2009	0	222	0	222	18,448
2010	0	230	0	230	18,478
2011	0	238	0	238	18,509
2012	25,000	246	0	25,246	20,315
2013	0	255	0	255	20,348
2014	0	264	0	264	20,382
2015	0	6,304	1,600	7,904	20,625
2016	31,875	483	0	32,358	22,949
2017	0	501	0	501	23,014
2018	0	519	0	519	23,081
2019	0	538	0	538	23,150
2020	25,000	557	0	25,557	24,996
2021	0	577	0	577	25,071
2022	0	598	0	598	25,149
2023	26,875	620	0	27,495	27,136
2024	0	642	0	642	27,219

10.

EVALUATION BY SEGMENT:

MONTRÉAL/OTTAWA/TORONTO

STAND ALONE

10. EVALUATION BY SEGMENT: MONTRÉAL/OTTAWA/TORONTO STAND ALONE

This chapter presents the evaluation of an HSR light freight system which would be limited to the Montréal/Ottawa/Toronto segment of the Québec/Windsor corridor. The overall market definition developed for the study of the entire Québec/Windsor corridor has served as a basis for the present analysis. The four major aspects for which impacts have been assessed are: market share volumes, operational requirements, net operating revenues, and net revenues. The analysis will be presented, for each element, by market share scenario and by technology/ROW option.

10.1. MARKET SHARE VOLUMES

An HSR light freight system which was limited to the Montréal/Ottawa/Toronto segment would involve a shorter network. Consequently, a smaller number of origins and destinations would be served by the system. It is expected that the volumes originating or destined outside the Montréal/Ottawa/Toronto segment would not be handled by the HSR system. The additional handling required for such traffic would cause major inefficiencies from cost, damage, and delivery schedule standpoints.

Moreover, the traffic volume identified for the movement within the Montréal/Ottawa/Toronto segment would also be affected by a reduced network. A number of courier companies would not modify their linehaul operation if only a portion of their market were accessible by the HSR light freight system. Likewise, a number of LTL truckers would not favour a line-haul carrier that did not provide service to a majority of their markets.

The indications provided by the courier industry and the interview program with the shippers lead towards an overall reduction in market share of 10%. Such a reduction would be experienced on the traffic volumes moving within the Montréal/Ottawa/Toronto segment.

On this basis, the traffic volumes identified for the Québec/Windsor corridor have been analyzed for all the city pairs located within the Montréal/Ottawa/Toronto segment, for each market share scenario, for each technology/ROW option, and for each of courier and LTL traffic. The results of this analysis are summarized in the following sections.

10.1.1. Minimal Scenario

The three technology/ROW options would generate the same traffic volumes within the Montréal/Ottawa/Toronto segment. The differences between the routes affect primarily the cities served in the Windsor/Toronto segment and would not have an impact on the Montréal/Ottawa/Toronto segment.

For courier traffic, it is expected the reduction would be experienced in city pairs where the proportion of traffic imbalance is very low. This is the case with the Montréal/Ottawa and Toronto/Montréal city pairs.

For the LTL traffic, which still constitutes potential for containers otherwise returning empty, the reduction would be experienced in the Montréal/Ottawa city pair.

Overall, a reduction of 2.94 trailers per day has been assumed, leaving a total of 20.18 trailers per day based on 1992 HSR traffic volumes. This represents a decrease of 12.7% from the market share estimate for traffic moving within the Montréal/Ottawa/Toronto segment under the entire Québec/Windsor corridor assessment.

10.1.2. Most Probable Scenario

A similar approach was used for the most probable scenario. For courier traffic, the market share volumes of the Montréal/Ottawa and Toronto/Montréal city pairs have been reduced. For LTL traffic, the market share volumes have also been reduced for both city pairs.

Overall, a reduction of 4.38 trailers per day has been assumed, leaving a total of 29.29 trailers per day based on 1992 HSR traffic volumes. This represents a decrease of 13% from the market share estimate for traffic moving within the Montréal/Ottawa/Toronto segment under the entire Québec/Windsor corridor assessment.

10.2. OPERATIONAL REQUIREMENTS

As mentioned previously, traffic levels for the Montréal/Ottawa/Toronto segment option are 12% lower than the traffic between these same city pairs when the entire Québec/Windsor corridor is served. In addition, there is no longer a requirement to carry the traffic originating or destined outside of the Montréal/Ottawa/Toronto segment. These conditions have major impacts on the operating plan and on equipment acquisition.

10.2.1. Minimal Scenario

10.2.1.1. 200 Kph Existing ROW option

In view of the conditions mentioned above, the operating plan for this option requires 3 and 2 trains per day between Toronto and Ottawa, and Ottawa and Montréal respectively. This compares to 5 and 4 trains respectively under the "full corridor" option.

Due to the shorter overall length of this corridor, it is possible to have all trainsets perform two runs per evening, i.e. - one westbound and one eastbound. Consequently, it is possible to cover the entire schedule with 3 trainsets. (By contrast, seven trainsets would be required for initial operations under the "full corridor" option). These trains generally finish working in the middle of the night. They would be able to continue longer; however, there is not enough time available for them to complete another full run, and the result is that their average utilization of 1114 km/day is lower than the 1310 km/day obtained under the "full corridor" option.

10.2.1.2. 300 Kph Existing ROW Option

The reduced traffic conditions discussed above would also apply to this option. As a result, the operating plan requires 3 and 2 trains per day between Toronto and Ottawa, and Ottawa and Montréal respectively, as was the case for the 200 kph option. This compares to 5 and 4 trains respectively under the "full corridor" option.

Due to the shorter overall length of this corridor and higher speed of the TGV trains, it is possible to have all trainsets perform three full runs in each direction per evening. This compares to 2 runs for the X-2000 equipment. Consequently, it is possible to cover the entire schedule with 2 trainsets. (By contrast, five trainsets would be required for initial operations under the "full corridor" option). However, even with these very good turnarounds, the average utilization of 1578 km/day is still less than the 1717 km/day obtained for the "full corridor" TGV operation.

Five trainsets would be required for initial operations under the "full corridor" option.

10.2.1.3. 300 Kph New ROW Option

Operating conditions for this option are effectively identical to those for the 300 kph Existing ROW Option. All trains originate and terminate at the same stations. Running times are slightly longer and utilization is slightly higher due to the slightly longer distances between station pairs.

10.2.2. Most Probable Scenario

10.2.2.1. 200 Kph Existing ROW Option

The operating plan for this traffic requires 4 trains per day between Toronto and Kingston, 5 trains/day between Kingston and Ottawa, and 3 trains/day between Ottawa and Montréal. This compares to 6 trains/day between Toronto and Ottawa, and 5 trains/day between Ottawa and Montréal, under the "full corridor" option.

Again, as for the Minimal Scenario, it is possible to have all trainsets perform two runs per evening, i.e. - one westbound and one eastbound. In addition, by having two of the trainsets travel more than two complete runs by adding an Ottawa-Kingston segment, it is possible to cover the entire schedule with 4 trainsets. (By contrast, eight trainsets would be required for initial operations under the "full corridor" option). The extra Ottawa-Kingston segment helps to improve utilization compared to the Minimal Scenario traffic level. However, the average utilization of 1236 km/day is still lower than the 1376 km/day obtained for the "full corridor".

10.2.2.2. 300 Kph Existing ROW Option

The operating plan for this traffic requires 4 trains per day between Toronto and Ottawa, and 3 trains/day between Ottawa and Montréal respectively. This compares to 6 trains/day between Toronto and Ottawa, and 5 trains/day between Ottawa and Montréal, under the "full corridor" option.

Compared to the Minimal Scenario conditions, this operating plan requires only one extra train each way between Toronto and Montréal. Therefore, it is possible to cover the entire schedule with 3 trainsets. (By contrast, seven trainsets would be required for initial operations under the "full corridor" option). The result is that there is a lower utilization for the fleet at this traffic level compared to the Minimal Scenario. The average utilization is 1463 km/day which compares to 1603 km/day obtained for the "full corridor".

10.2.2.3. 300 Kph New ROW Option

Operating conditions for this option are effectively identical to those for the 300 kph Existing ROW Option. All trains originate and terminate at the same stations. Running times are slightly longer and utilization is slightly higher due to the slightly longer distances between station pairs.

10.2.3. Overview

The total courier and LTL traffic being transported by the high speed railway, under this segment-by-segment scenario, is approximately 35% of the traffic levels anticipated under a "full corridor" operation. However, as seen in the discussion above, the fleet size required to carry this traffic varies from 40 - 50% of the "full corridor" fleet. In general, this fleet is 30% greater than would be expected if the Montréal/Ottawa/Toronto stand alone segment could be operated at the same efficiency as the overall corridor, and suggests a more profitable operation under "full corridor" conditions. This is a result of the greater opportunity to optimize the train operations and schedule which comes with more trains and longer runs.

10.3. NET OPERATING REVENUES

The annual net operating revenues for the Montréal/Ottawa/Toronto segment have been derived from the gross revenues estimated for this segment, the operating costs and the applicable additional provisions made for a competitive HSR service. All these elements have been established on the same basis used for the entire Québec/Windsor corridor assessment.

The detailed results are presented, in Volume II, Section D, in Tables 10.3.1, for the **minimal scenario**, and Tables 10.3.2, for the **most probable scenario**. Each market share scenario contains nine tables, including three for each technology/ROW option, which provide the total results and the results broken down by province.

The estimated net operating revenues for the Montréal/Ottawa/Toronto segment are summarized in the following sections for each market share scenario. The results are compared with the assessments of the entire Windsor/Québec corridor.

10.3.1. Minimal Scenario

For the **200 Kph Existing ROW** option, the net operating revenues range from **$8,766,000 (year 2005)** to **$19,204,000 (year 2024)** for the

Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, $1,651,000** and **Ontario $7,115,000**.

The estimated net operating revenues for the Montréal/Ottawa/Toronto segment represent 26% of the equivalent figures for the entire Québec/Windsor corridor.

For the **300 Kph Existing ROW** option, the net operating revenues range from **$8,191,000 (year 2005)** to **$18,232,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, $1,467,000** and **Ontario, $6,723,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 25.3%.

For the **300 Kph New ROW** option, the net operating revenues range from **$8,217,000 (year 2005)** to **$18,152,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, $1,421,000** and **Ontario, $6,796,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 23.7%.

Detailed results are shown in Table 10.3.1, which is presented in Volume II, Section D.

10.3.2. Most Probable Scenario

For the **200 Kph Existing ROW** option, the net operating revenues range from **$16,913,000 (year 2005)** to **$32,870,000 (year 2024)** for the Montréal/Toronto segment. The breakdown by province in the start-up year is: **Québec, $4,263,000** and **Ontario, $12,651,000**.

In comparison with the estimated net operating revenues for the entire Québec/Windsor corridor assessment, this represents a proportion of 34.5%.

For the **300 Kph Existing ROW** option, the net operating revenues range from **$16,485,000 (year 2005)** to **$32,149,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, $4,130,000** and **Ontario, $12,354,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 35.0%

For the **300 Kph New ROW** option, the net operating revenues range from **$16,267,000 (year 2005)** to **$31,782,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, $4,057,000** and **Ontario, $12,210,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 33.6%.

Detailed results are provided in Table 10.3.2, which is presented in Volume II, Section D.

10.4. NET REVENUES

The net annual revenues for the Montréal/Ottawa/Toronto segment have been derived from the net operating revenues estimated for this segment by subtracting further allowances for the costs of capital associated with the purchase of rolling stock, freight terminal land and buildings, containers, and handling equipment.

The detailed results are presented in Volume II, Section D, in Table 10.3.1, for the **minimal scenario**, and Table 10.3.2, for the **most probable scenario**. Each market share scenario contains nine tables, including three for each technology/ROW option, which provide the total results and the results broken down by province.

The estimated net revenues for the Montréal/Ottawa/Toronto segment are summarized in the following sections for each market share scenario. The results are compared with the assessments of the entire Windsor/Québec corridor.

10.4.1. Minimal Scenario

For the **200 Kph Existing ROW** option, the net revenues range from **$3,536,000 (year 2005)** to **$10,272,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, ($533,000)** and **Ontario $4,070,000**.

Negative net revenues for the province of Québec occur in all of the technology/right-of-way options for the minimal market share scenario. These results reflect two assumptions made for this study:

1- Revenues are attributed to the province where a shipment originates (in the case of the Montréal/Ottawa/Toronto segment, more shipments originate in Ontario);

2- However, handling costs are attributed to the station where they occur (interprovincial shipments originating in Ontario will also create a handling expense in Québec, though no revenue).

If these assumptions were changed, it would result in different revenue splits between the two provinces, consequently improving the net results that could be expected for the province of Québec.

The estimated net revenues for the Montréal/Ottawa/Toronto segment represent 16% of the equivalent figures for the entire Québec/Windsor corridor.

For the **300 Kph Existing ROW** option, the net revenues range from **$2,656,000 (year 2005)** to **$8,633,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, ($830,000)** and **Ontario, $3,456,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 13.3%.

For the **300 Kph New ROW** option, the net revenues range from **$2,656,000 (year 2005)** to **$8,564,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, ($877,000)** and **Ontario, $3,533,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 12%.

Detailed results are shown in Table 10.3.1, which is presented in Volume II, Section D.

10.4.2. Most Probable Scenario

For the **200 Kph Existing ROW** option, the net revenues range from **$10,383,000 (year 2005)** to **$22,658,000 (year 2024)** for the Montréal/Toronto segment. The breakdown by province in the start-up year is: **Québec, $1,650,000** and **Ontario, $8,732,000**.

In comparison with the estimated net revenues for the entire Québec/Windsor corridor assessment, this represents a proportion of 29%.

For the **300 Kph Existing ROW** option, the net revenues range from **$8,923,000 (year 2005)** to **20,438,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, $1,171,000** and **Ontario, $7,751,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 29%.

For the **300 Kph New ROW** option, the net revenues range from **$6,931,000 (year 2005)** to **$18,297,000 (year 2024)** for the Montréal/Ottawa/Toronto segment. The breakdown by province in the start-up year is: **Québec, $502,000** and **Ontario, $6,429,000**.

In comparison with the results for the entire Québec/Windsor corridor assessment, this represents a proportion of 22%.

Detailed results are provided in Table 10.3.2, which is presented in Volume II, Section D.

11.

EVALUATION BY SEGMENT: TORONTO/MONTRÉAL/QUÉBEC SEGMENTS

11. EVALUATION BY SEGMENT: TORONTO/MONTRÉAL/QUÉBEC SEGMENTS

This chapter addresses the addition of the Montréal/Québec segment to the truncated system discussed in the preceding chapter, resulting in a service between Toronto and Québec City. For the Montréal/Québec City segment, only one common route is considered for the three technology/ROW options.

The four major aspects for which impacts have been assessed are: market share volumes, operational requirements, net operating revenues, and net revenues. The results of the analysis are presented in the following sections, for each of the four elements, by market share scenario and by technology/ROW option.

11.1. Market Share Volumes

The expansion of the HSR light freight system beyond the Montréal/Ottawa/Toronto segment would increase the volumes moving by HSR within the segment itself. The larger available network would provide more incentive for courier companies to modify their linehaul operation. Likewise, the larger number of origins and destinations accessed by the HSR system would be more attractive to LTL shippers, as a greater portion of their markets would be accessible by an extended HSR network.

In comparison with the traffic volumes estimated for the entire Québec/Windsor corridor, the volumes of the Toronto/Montréal/Québec segments would be slightly lower. The indications provided by the courier industry and the interview program with the shippers lead towards an overall reduction in market share of 5%. Such a reduction would be experienced on the traffic volumes moving within the Montréal/Ottawa/Toronto segment.

For the Montréal/Québec segment, the volumes identified for the "entire corridor" option would not be decreased, either for traffic moving within the Montréal/Québec segment or for traffic originating or destined to the Montréal/Ottawa/Toronto segment. This situation applies since this study has not

identified any significant volumes of courier and LTL traffic moving between the Montréal/Québec segment and the Windsor/Toronto segment.

The traffic volumes identified for the entire Québec/Windsor corridor were analyzed for all the city pairs located within the Toronto/Montréal/Québec segments, for each market share scenario, and technology/ROW option, and for courier and LTL traffic. The results of this analysis are summarized in the following sections.

11.1.1. Minimal Scenario

The three technology/ROW options would generate the same traffic volumes within the Toronto/Montréal/Québec segments. For the corridor as a whole, the traffic variations are caused by differences in routes and cities served by the three technology/ROW options within the Windsor/Toronto segment; options excluding that segment do not, therefore, give rise to any such variation.

For courier traffic, the estimated overall traffic variations have been allocated to Montréal/Ottawa and Montréal/Toronto city pairs due to the very low proportion of imbalance traffic within these city pairs.

For LTL traffic, the traffic differences with the entire Québec/Windsor corridor assessment were allocated to the Montréal/Ottawa city pair.

Overall, a reduction of 2 trailers per day has been assumed, leaving a total of 41.59 trailers per day based on 1992 HSR traffic volumes. This represents a decrease of 4.6% from the market share estimate for the traffic moving within the Toronto/Montréal/Québec segments under the entire Québec/Windsor corridor assessment.

11.1.2. Most Probable Scenario

Under the most probable scenario, similar traffic impacts would be experienced. For courier and LTL traffic, the market share volumes would be higher than the levels estimated for the Montréal/Ottawa/Toronto stand-alone segment but slightly lower than for the entire Québec/Windsor corridor

assessment. These traffic differences would be primarily experienced in the Montréal/Ottawa and Toronto/Montréal city pairs.

An overall reduction of 3.29 trailers per day has been assumed, leaving a total of 53.71 trailers per day based on 1992 HSR traffic volumes. This represents a decrease of 5.8% from the market share estimate for the traffic moving within the Toronto/Montréal/Québec segments under the entire Québec/Windsor corridor assessment.

11.2. OPERATIONAL REQUIREMENTS

As mentioned previously, traffic levels for the Toronto/Montréal/Québec segments are 5% lower than the traffic between these same city pairs when the entire Québec/Windsor corridor is served. In addition, there is no longer a requirement to carry the traffic originating or destined outside of the Toronto/Québec segments. These conditions have a considerable impact on the operating plan and on equipment acquisition.

11.2.1. Minimal Market Share

11.2.1.1. 200 Kph Existing ROW Option

The operating plan for this option calls for 4 trains each way per day throughout the length of the line, except between Kingston and Ottawa, where 5 trains are required. The "full corridor" option has an almost identical operating plan, except that 5 trains per day are required between Toronto and Ottawa.

The X-2000 trains operating this corridor are unable to complete 2 full runs from one end of the corridor to the other in a night. Consequently, 5 trainsets are required to cover the entire schedule. (By contrast, seven trainsets would be required for initial operations under the "full corridor" option.) However, by originating and terminating at intermediate stations, it is possible to obtain an average utilization of 1460 km/day, which is greater than the 1310 km/day obtained for the "full corridor".

11.2.1.2. 300 Kph Existing ROW Option

The conditions for reduced traffic discussed above continue to apply for this option. The resulting operating plan requires 4 and 3 trains per day between Toronto and Trois-Rivières, and Trois-Rivières and Québec respectively.This compares to 5 trains per day between Toronto and Ottawa, 4 trains/day between Ottawa and Trois-Rivières, and 3 trains/day between Trois-Rivières and Québec.

Due to the higher speed of the TGV equipment, it is possible to have all trainsets complete two full runs (one in each direction) per night. Consequently, it is possible to cover the entire schedule with 4 train sets. (By contrast, five trainsets would be required for initial operations under the "full corridor" option.) However, even with these good turnarounds, the average utilization of 1647 km/day is still less than the 1717 km/day obtained for the "full corridor" TGV operation.

11.2.1.3. 300 Kph New ROW Option

Operating conditions for this option are effectively identical to those for the 300 Kph Existing ROW Option. All trains originate and terminate at the same stations. Running times are slightly longer and utilization is slightly higher due to the slightly longer distances between station pairs.

11.2.2. Most Probable Scenario

11.2.2.1. 200 Kph Existing ROW Option

The operating plan for this traffic requires 6 trains per day between Toronto and Ottawa, 5 trains/day between Ottawa and Montréal, and 4 trains/day between Montréal and Québec. This is identical to the "full corridor" option.

Again, as for the Minimal Scenario, it is not possible for any trainset to complete two runs per evening; however, all are able to return over a portion of the line. As a result, it is necessary to have 7 trainsets to cover the operating plan. (By contrast, eight trainsets would be required for initial operations under the "full corridor" option.) The resulting average utilization drops considerably from the

Minimal Scenario; however, at 1357 km/day, it is only slightly lower than the 1376 km/day obtained for the "full corridor".

11.2.2.2. 300 Kph Existing ROW Option

The operating plan for this traffic generally requires 5 trains per day throughout the corridor, with a sixth between Kingston and Ottawa, and only 4 trains/day between Trois-Rivières and Québec. This is almost identical to the "full corridor" option, the only difference being one additional train each way between Toronto and Kingston.

Review of this operating plan shows that 5 trainsets are required to cover the schedule. (By contrast, seven trainsets would be required for initial operations under the "full corridor" option.) This produces a relatively good utilization of 1721 km/day, which compares to only 1603 km/day achieved under the "full corridor implementation" scenario.

11.2.2.3. 300 Kph New ROW Option

Operating conditions for this option are effectively identical to those for the 300 Kph Existing ROW Option. All trains originate and terminate at the same stations. Running times are slightly longer and utilization is slightly higher due to the slightly longer distances between station pairs.

11.2.3. Overview

The total courier and LTL traffic being transported by the high speed rail system, under this shortened corridor would generate approximately 66% of the traffic levels anticipated under a "full corridor" operation. However, as seen in the discussion above, the fleet size required to carry this traffic varies from 71 to 87% of the "full corridor" fleet. In general, this is 18% higher than would be expected based on "full corridor" operational efficiencies. However, it represents an improvement on the Montréal/Ottawa/Toronto stand alone segment and confirms the improvement in efficiency of operation that is available with more trains and longer runs.

11.3. NET OPERATING REVENUES

The annual net operating revenues for the Toronto/Montréal/Québec segments have been derived from the gross revenues estimated for these segments, the operating costs and the applicable additional provisions made for a competitive HSR service. All these elements have been established on the same basis as that used for the entire Québec/Windsor corridor assessment.

The detailed results are provided in Table 11.3.1, for the **minimal scenario**, and Table 11.3.2, for the **most probable scenario**, and are presented in Volume II, Section E. Each market share scenario contains nine tables, including three for each technology/ROW option, which provide the total results and the results broken down by province.

The estimated net operating revenues for the Toronto/Montréal/Québec segments are summarized in the following sections for each market share scenario. These results are compared with the corresponding results for the Montréal/Ottawa/Toronto segment, and for the entire Québec/Windsor corridor.

11.3.1. Minimal Scenario

For the **200 Kph Existing ROW** option, the net operating revenues range from **$21,615,000 (year 2005)** to **$41,186,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $6,872,000** and **Ontario, $14,743,000**.

In comparison with the estimated net operating revenues for the Montréal/Ottawa/Toronto segment, this represents an increase of 147%. It also represents a proportion of 64% of net operating revenues estimated for the entire Québec/Windsor corridor assessment.

For the **300 Kph Existing ROW** option, the net operating revenues range from **$20,591,000 (year 2005)** to **$39,604,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $6,462,000** and **Ontario, $14,129,000**.

In comparison with the results for the Montréal/Toronto segment, this represents an increase of 151%. It also represents a proportion of 64% of the net operating revenues estimated for the entire Québec/Windsor corridor.

For the **300 Kph New ROW** option, the net operating revenues range from **$20,318,000 (year 2005)** to **$39,146,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $6,354,000** and **Ontario, $13,964,000**.

In comparison with the results for the Montréal/Toronto segment, this represents an increase of 147%. It also represents a proportion of 59% of the net operating revenues estimated for the entire Québec/Windsor corridor.

Detailed results are provided in Table 11.3.1, which is presented in Volume II, Section E.

11.3.2. Most Probable Scenario

For the **200 Kph ROW** option, the net operating revenues range from **$32,236,000 (year 2005)** to **$59,462,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: Québec, $10,777,000 and Ontario, $21,459,000.

In comparison with the estimated net operating revenues for the Montréal/Ottawa/Toronto segment, this represents an increase of 91%. It also represents a proportion of 66% of net operating revenues estimated for the entire Québec/Windsor corridor.

For the **300 Kph Existing ROW** option, the net operating revenues range from **$31,145,000 (year 2005)** to **$57,409,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $10,469,000** and **Ontario, $20,677,000**.

In comparison with the results for the Montréal/Ottawa/Toronto segment, this represents an increase of 89%. It also represents a proportion of 66% of the net operating revenues estimated for the entire Québec/Windsor corridor.

For the **300 Kph New ROW** option, the net operating revenues range from **$30,797,000 (year 2005)** to **$56,823,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $10,330,000** and **Ontario, $20,466,000.**

In comparison with the results for the Montréal/Ottawa/Toronto segment, this represents an increase of 89%. It also represents a proportion of 64% of the net operating revenues estimated for the entire Québec/Windsor corridor.

The detailed results are provided in Table 11.3.2, which is presented in Volume II, Section E.

11.4. NET REVENUES

The net annual revenues for the Montréal/Ottawa/Toronto segment have been derived from the net operating revenues estimated for this segment by subtracting further allowances for the costs of capital associated with the purchase of rolling stock, freight terminal land and buildings, containers, and handling equipment.

The detailed results are provided in Table 11.3.1, for the **minimal scenario**, and Table 11.3.2, for the **most probable scenario**, and are presented in Volume II, Section E. Each market share scenario contains nine tables, including three for each technology/ROW option, which provide the total results and the results broken down by province.

The estimated net revenues for the Toronto/Montréal/Québec segments are summarized in the following sections for each market share scenario. These results are compared with the corresponding results for the Montréal/Ottawa/Toronto segment, and for the entire Québec/Windsor corridor.

11.4.1. Minimal Scenario

For the **200 Kph Existing ROW** option, the net revenues range from **$13,465,000 (year 2005)** to **$28,043,000 (year 2024)** for the

Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $3,454,000** and **Ontario, $10,011,000.**

In comparison with the estimated net revenues for the Montréal/Ottawa/Toronto segment, this represents an increase of 281%. It also represents a proportion of 59% of the net operating revenues estimated for the entire Québec/Windsor corridor assessment.

For the **300 Kph Existing ROW** option, the net revenues range from **$10,701,000 (year 2005)** to **$23,683,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $2,357,000** and **Ontario, $8,343,000.**

In comparison with the results for the Montréal/Toronto segment, this represents an increase of 308%. It also represents a proportion of 54% of the net revenues estimated for the entire Québec/Windsor corridor.

For the **300 Kph New ROW** option, the net revenues range from **10,428,000 (year 2005)** to **$23,224,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $2,250,000** and **Ontario, $8,179,000.**

In comparison with the results for the Montréal/Toronto segment, this represents an increase of 293%. It also represents a proportion of 47% of the net revenues estimated for the entire Québec/Windsor corridor.

The detailed results are provided in Table 11.3.1, which is presented in Volume II, Section E.

11.4.2. Most Probable Scenario

For the **200 Kph ROW** option, the net revenues range from **$21,813,000 (year 2005)** to **$42,647,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: Québec, $6,445,000 and Ontario, $15,369,000.

In comparison with the estimated net revenues for the Montréal/Ottawa/Toronto segment, this represents an increase of 110%. It also represents a proportion of 60% of net revenues estimated for the entire Québec/Windsor corridor.

For the **300 Kph Existing ROW** option, the net revenues range from **$19,225,000 (year 2005)** to **$37,518,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $5,547,000** and **Ontario, $13,678,000**.

In comparison with the results for the Montréal/Ottawa/Toronto segment, this represents an increase of 115%. It also represents a proportion of 63% of the net revenues estimated for the entire Québec/Windsor corridor.

For the **300 Kph New ROW** option, the net revenues range from **$17,102,000 (year 2005)** to **$36,932,000 (year 2024)** for the Toronto/Montréal/Québec segments. The breakdown by province in the start-up year is: **Québec, $4,705,000** and **Ontario, $12,397,000**.

In comparison with the results for the Montréal/Ottawa/Toronto segment, this represents an increase of 147%. It also represents a proportion of 53% of the net revenues estimated for the entire Québec/Windsor corridor.

The detailed results are provided in Table 11.3.2, which is presented in Volume II, Section E.

12.

SUMMARY AND CONCLUSIONS

12. SUMMARY AND CONCLUSIONS

The following major observations and conclusions have been drawn from the **light freight market study**:

- The current (1993) estimated volumes of courier and LTL traffic, moving strictly between the Québec/Windsor corridor cities directly served by the proposed HSR system, would be considerable.

- It would seem the HSR Authority would be more likely to succeed in this light freight transportation market by assuming a role of **wholesaler**, or a carrier only, rather than attempting to compete head-to-head with the retailing expertise of the well-established courier and LTL trucking companies currently serving the corridor.

- Any light freight HSR service should be operated on the basis of **dedicated trainsets running at night**. The service option involving mixed trains has been evaluated in this study, but would not be adequate to satisfy the specific market requirements and service characteristics. A nocturnal service is dictated by the time-sensitive intercity courier market, which requires overnight shipping and sorting, and early morning delivery.

- The estimated **net operating revenues** likely to be generated for all three technology/ROW options **would be significant**, and would definitely have a positive effect on the overall project viability.

- A partial implementation of the HSR light freight system on only the Toronto-Montréal or Toronto-Québec segments of the corridor would have minor impacts on the estimated potential market shares. However, due to the losses in economies of scale of a smaller system, it would lead to an inferior financial performance. Nevertheless, **regardless of the HSR light freight system implementation scenario, the estimated revenues generated by light freight traffic would definitely result in a positive contribution to the HSR project's overall viability.**

PART II

STATION CONCESSIONS

MARKET STUDY

FINAL REPORT

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1.

INTRODUCTION AND METHODOLOGY

1. INTRODUCTION AND METHODOLOGY

1.1 PURPOSE AND SCOPE OF THE WORK

The station concessions component of this study examined the potential revenues available to an HSR Authority from concessions present in stations associated with the HSR system. These concessions could be potentially located at all proposed station stops, dependent upon their ability to generate a positive income for the Authority.

The objective of this study segment was to identify the mix of businesses and the total amount of retail space supportable for concession operations, for each station, that would potentially maximize net concession revenues to the HSR Authority. This mix was determined on the basis of two traffic forecast time periods, one for 2005 and one for 2025.

Revenue forecasts were developed in two distinct steps. These were:

1) Development of an *unconstrained market potential forecast* showing the amount of concession retail revenues that would be supportable by the market alone, assuming no constraints on the amount of space that would be developed or allocated for concession operations, and assuming that the High Speed Rail Operating Authority has the legal right to claim these operating revenues; and

2) Development of a *supply-driven forecast*, which recognizes that there are important limitations on the amount of space that can be developed or allocated to concession operations because:

- the design of new stations (owned by the High Speed Rail Operating Authority) provides for only certain amounts of concession space, and

- other key stations are not owned by the High Speed Rail Operating Authority, which therefore may have no right of claim over any concession revenues generated.

This report presents the financial model used to estimate concession revenues and the results for each station on each of two proposed routings, for each of the two time periods for both the "unconstrained market potential" and the "supply-driven" scenarios.

1.2 OVERVIEW OF METHODOLOGY

The core of our approach to this assignment involved interviewing facilities comparable to the proposed HSR stations in order to obtain concession-related information (interview guide included as Appendix A), building a computer financial model, and having our relevant industry experts review the output and test for reasonableness. In total, more than 20 in-depth interviews were carried out (Appendix B) and information was obtained from 12 different organizations, pertaining to 160 concession operations in total (Appendix C). Appropriate data was also obtained from sources such as Statistics Canada and the Retail Council in order to develop a solid base of data for the revenue forecast.

The process through which the concession mix and rental revenues was estimated for each station under each scenario, is illustrated in the accompanying diagram, and is described as follows:

A) Traffic Forecast Conversion into In-Station Passenger Estimates

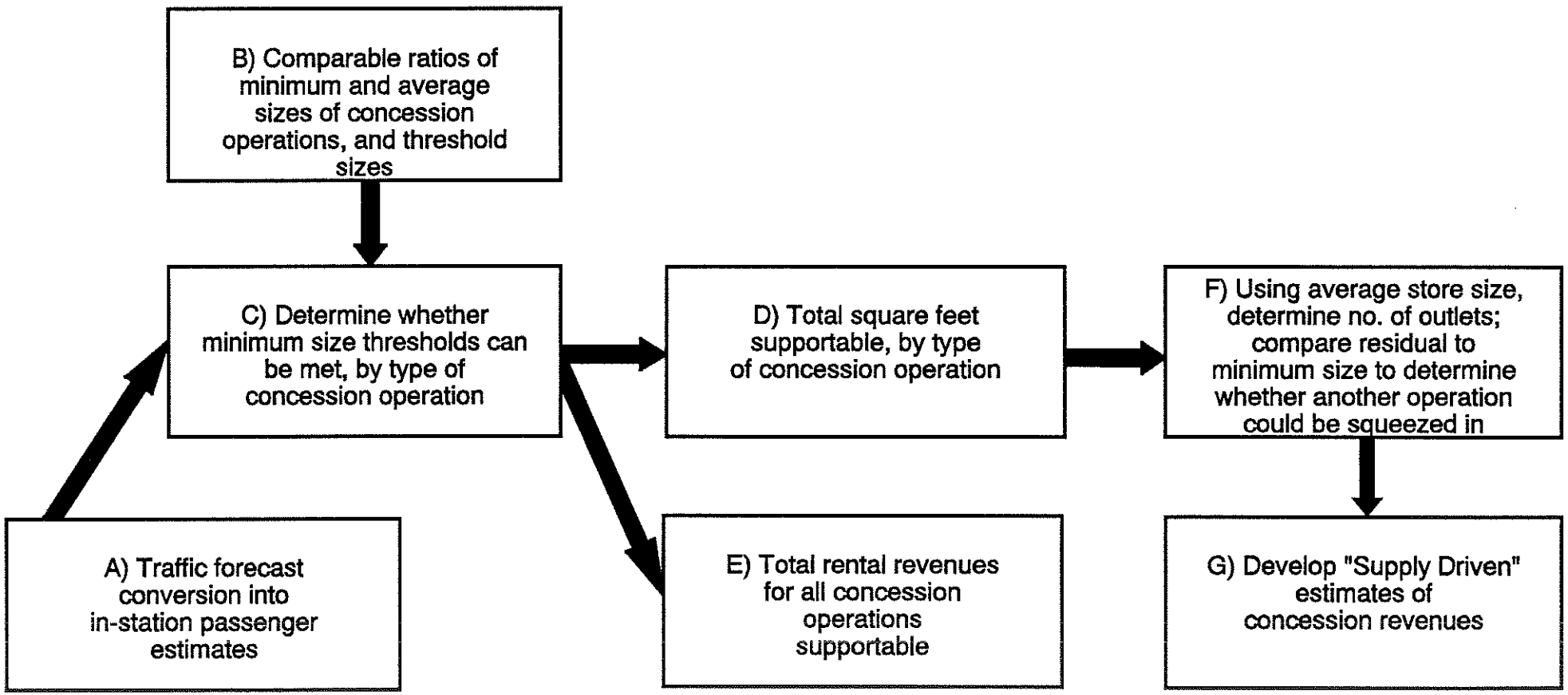
First, the "consensus" trip forecasts provided by the Project Coordinator were converted into estimates of passenger traffic in each market area. (Note that in cities where there were suburban stations planned in addition to a downtown station, the forecasts, and thus our estimates of market potential revenues, did not distinguish between individual stations within the market area)[1]. This was done according to the following logic:

---

1 The specific forecasts provided to us were Revision 2 of the CRA/Sofrerail Based Composite Forecast (March 9, 1994) for the years 2005 and 2025, for:

a) the 200 kph route Québec — Windsor (via Dorval); and
b) the 300 kph route Québec — Windsor (via Mirabel).

PROCESS USED TO ESTIMATE STATION CONCESSION REVENUES



- One passenger trip from an originating point in Station A to a destination point in Station C was considered to be a passenger in both Stations A and C (where the passenger could be a customer at various concession operations); for example, 10,000 passengers travelling the link from A to C would result in-station traffic of 10,000 in station A, as well as 10,000 in station C.

- Pass-through trips (e.g.. where a passenger goes through Station B from an originating point in Station A to a destination point in Station C) were not considered to result in-station passenger traffic in the passing-through station (i.e.. Station B in the example above); in other words, we assumed that pass-through passengers did not disembark into the station.

Using the above approach, the "consensus" trip forecasts were thus converted into in-station estimates of passenger traffic.

This method of converting the "consensus" forecasts into estimates of passenger traffic in each station was discussed with the Project Coordinator, who agreed that it was the proper and appropriate way to do this.

B) *Comparable Ratios of Minimum and Average Sizes of Concession Operations, and Threshold Sizes*

From the data collected on other concession operations (in train stations, and other transportation terminals such as bus stations and airports), we have identified average and minimum sizes (in square feet) of concession operations, as well as the levels of in-station passenger traffic required to support these facilities. These data are contained in Chart 2.1 (see Chapter 2).

C) *Determine Total Square Feet Supportable By Type of Concession Operation*

We next calculated the total amount of square footage supportable. This was done using the ratios of average square footage per thousand passengers (as

discussed in B, above), by concession type, to the estimated in-station passenger traffic (as calculated in A above).

To illustrate, we might have calculated in Station X that there would be annual traffic of 2,260,000. Taking as an example "newsstand/smoke shop" concessions, the information contained in Chart 2.1 tells us that every 1,000 annual in-station passengers can support 1.13 sq.ft. of "newsstand/smoke shop" space. Accordingly, this level of in-station traffic would be sufficient to support 2000 sq.ft. (2,260 ÷ 1.13) of "newsstand/smoke shop" space.

D) *Total "Market Potential" Rental Revenues by Type of Concession Operation*

To estimate the **rental revenues** (note: not concession sales) accruing to station management, we applied the ratios of average rental revenue per thousand passengers, by concession type (as calculated in B, above), to the estimated in-station passenger traffic for each scenario (as calculated in A, above). Note that these revenue estimates represent the potential that could be delivered by the market, not necessarily the actual rental revenues likely realized (see F, below).

E) *Concession Mix*

Next, we estimated the number of concession operations in each station, by concession type, according to the following methodology:

- The total square footage by concession type (as calculated in C, above) was divided by the average size per operation (as evidenced by our comparison data which are shown in Chart 2.1) to determine a base number of outlets.

- Any surplus or residual square footage in that concession type category was then compared to the minimum size of concession operation to determine whether any additional operations could be "squeezed in". If so, additional operations (as many as could be accommodated by the residual) were added to the total.

For example, if in "Station X" we found that the annual traffic in the station would support 2000 sq. ft. of "newsstand/smoke shop" space, the calculation would be as follows:

- 847 sq. ft. is the average size of a "newsstand/smoke shop" operation (see Chart 2.1)

- 140 sq. ft. is the minimum size of a "newsstand/smoke shop" operation (also see Chart 2.1)

- Accordingly, the market demand could support 2 average sized operations (2000 ÷ 847)

- The residual from the above is 306 sq. ft., which is not large enough to support an average sized operation, but is large enough to support two minimum sized operations, each of 140 sq. ft.

- Accordingly the maximum number of "newsstand/smoke shop" operations in Station X is 4 (two average sized operations, and two of minimum size).

This process generated an estimate of the total number of concession operations, by type, for each station. Clearly, this procedure will lead to a maximum estimate of the number of individual concession operations of a certain type supportable by the retail traffic in a given station.

F) *Development of "Supply-Driven" Estimates of Concessions Revenues*

Finally, recognizing that there were limitations on the amount of concessions space that was to be allowed in each station, and taking into account the fact that the High Speed Rail Operating Authority would not own each of the stations (and thus be able to claim all or any of the concession revenues generated in that station), we developed "supply-driven" estimates of concession revenues (see section 4.2 of this Report).

We also interviewed various owners and managers of rail stations (e.g., SNCF, which operates a high speed rail service of the type being contemplated in

Canada) in order to determine ways and means of managing concession operations in stations that were not to be owned by the High Speed Rail Operating Authority.

1.3 SCENARIOS EXAMINED

Two forecast scenarios have been provided to us. These are the "consensus" trip forecasts prepared by CRA/Sofrerail, for the 300 kph and 200 kph composite routes. Specifically, these are:

(1) a 300 kilometer-per-hour train via Mirabel; and,

(2) a 200 kilometer-per-hour train via Dorval.

We were provided with a forecasts of trips for each scenario, in each of the years 2005 and 2025.

2.

DATA COLLECTION AND ANALYSIS

2. DATA COLLECTION AND ANALYSIS

2.1 DESCRIPTION OF APPROACH

The base information for this model was collected by means of a series of interviews with managers of retail leasing operations in train stations and other transportation-related terminals (e.g.. airports, bus terminals). Appendix A contains the interview guide used; Appendix B lists those individuals interviewed and their affiliations. We collected information from facilities in both the U.S. and Canada; the data was then standardized to ensure comparability.

2.2 BASE DATA USED

Chart 2.1, overleaf, shows the results of the analysis of this base data, in 1993 constant dollars, by type of retail category (Section 3.2 of this Report contains the descriptions of the retail categories used). The data collected from actual concession operations was in terms of $1991 dollars; these figures were then adjusted upwards by the actual inflation factors over the 1991 to 1993 period (which amounted to 3.33%).

This data was then input into a computer model, as the key parameters in the generation of estimates of space requirements and station-by-station rental revenues.

Chart 2.1

SUMMARY OF DATA COLLECTED ON CONCESSION OPERATIONS

Retail Type	No. of Cases	Minimum (Threshold) Size of Operation (sq. ft.)	Average Size of Operation	Sq. Ft. Required Per 1000 In-Station Passengers *	$ Rental Revenues Generated Per 1000 In-Station Passengers	Implied Rental Revenues Per Sq. Ft.
Restaurants	21	242	2,202	2.52	$131.66	$52
Fast Food	18	120	1,531	2.34	$148.11	$63
Coffee Shops	2	400	618	.67	$20.60	$31
Newstand /Smoke Shop	26	140	847	1.13	$106.74	$94
Video Games/Arcade	5	75	498	.34	$26.25	$78
Vehicle Rentals	28	70	199	.43	$144.90	$342
Consumer Services	15	58	614	.75	$39.17	$52
Specialty Stores	24	80	1,641	2.93	$60.03	$20
Bank Machines	6	54	61	.07	$3.39	$49
Miscellaneous	15	N/A	0	N/A	$35.60	N/A

* weighted average of all sample data.
Source: Ernst & Young Interviews

3.

CONCESSION MIX AND REVENUE ESTIMATION MODEL

3. CONCESSION MIX AND REVENUE ESTIMATION MODEL

3.1 COST ASSUMPTIONS

For the purpose of the computer model, it is assumed that incremental facility operating costs (i.e. the additional costs borne by the facility due to the presence of a particular concession) are zero. This is consistent with discussions held with various facility managers, property managers, and the like. Through these discussions, it was determined that additional facility operating costs are, for the most part, negligible. The majority of the interviewees stated that basic operating costs (electricity, heating, exterior cleaning, etc.) are covered either explicitly by the tenant (through metering of electricity, heating, etc.) or implicitly by the tenant (the lease arrangement allows for full cost recovery by the facility).

3.2 TURNOVER RATES

Turnover costs incurred by the facility (implicit or explicit) are assumed to be negligible for three reasons. First, the turnover rates in the facilities interviewed are very low. There were only a couple of incidents where the tenant either went bankrupt or made an arrangement with another concession in order to alleviate the rental pressures being experienced.

Second, in instances where a tenant does leave the facility, there are usually a number of concessions willing to tender a bid for the space vacated. Therefore, the implicit cost of lost rental revenue is limited to the number of months necessary to complete the tendering process and the number of weeks required to renovate the existing space. Except in cases where the facility must provide the new tenant with a structural "shell," (approximately $2,000-$3,000 for a 500 sq. ft. space) all explicit renovation costs are usually borne by the new tenant.

Third, we assume pro-active and aggressive management of the concession space in each of the high-speed rail stations so that, when space does become available, it is re-occupied with a minimum of lost time and revenue.

This general situation seems to be consistent with experience elsewhere. For example the experience of the SNCF in France is that turnover rates in station concession operations are low, with the overall mix of retail activities being quite stable, and operations rarely going bankrupt or out of business.

However, since there will be some fluctuation in the business cycle over the 20 years between 2005 and 2025, at times the general state of the economy may dictate higher turnover rates than at other times. For example, Central Station in Montréal currently suffers from an estimated 35% vacancy rate (conversely, Union Station in Toronto is fully leased, with a very low turnover rate). Accordingly, we suggest that the forecast revenues shown here be considered as maximum estimates, which is a preferable approach to arbitrarily picking an average turnover rate for the period.

3.3 RETAIL CATEGORY DESCRIPTIONS

There are certain retail categories which are self-explanatory (Video Games/Arcade, Vehicle Rentals, and Bank Machines), while other categories contain a broader range of concessions.

The "*Restaurants*" retail category consists of restaurants, bars, or any combination of the two.

The "*Fast Food*" retail category consists of concessions serving pizza, burgers & fries, deli foods, chicken, and sandwiches. Examples of such concessions are Pizza Pizza, McDonald's, Swiss Chalet, and Blimpie's. The "Fast Food" category also contains juice bars and ice cream shops.

The "*Coffee Shops*" retail category includes concessions serving coffee, doughnuts, muffins, and cakes. Examples of such concessions are MMMuffins, Second Cup, Tim Horton's, and a cappuccino bar.

The "*Newsstand/Smoke Shop*" retail category consists of concessions selling a mix of newspapers and magazines, and/or variety goods such as gum, chips, and chocolate bars, and/or souvenirs and gifts. Examples of such concessions include United Cigar Stores, Cara Smoke Shops, and souvenir shops.

The "*Consumer Services*" retail category includes concessions such as dry cleaners, shoe repair shops, clothing alteration shops, barber shops, hair dressers, beauty clinics, banks, travel insurance stands, foreign exchange shops, photo development stores, and lottery kiosks.

The "*Specialty Stores*" retail category includes concessions such as florists, liquor stores, shoe stores, clothing stores, drug stores, book stores, jewelry stores, candy stores, and duty free shops.

The "*Miscellaneous*" retail category consists of odds and ends, such as courier drop boxes, information panels, private mail boxes, Ticketmaster outlets, lockers, pay phones, photo machines and taxi stands. The majority of these concessions do not require any leasable square footage.

3.4 THE STATION CONCESSION NEGOTIATION PROCESS

In cases where a high speed rail right-of-way utilizes an existing station, with its own pre-existing retail space configuration, any new retail operation required in order to meet increased demand should "fit" within the existing space. (In such situations, the additional space demanded should be estimated as the residual resulting from subtracting the existing retail space provision from the estimates presented in this report.)

The activity mix required in these situations, where a high speed rail station is "grafted onto" an existing rail station, may require both new space for new retail operation, and/or an adjustment of the retail mix to accommodate new operations in existing space. For each of these situations, we suggest the following principles be followed in the negotiations process:

	Situation	Principles
1.	New space created for new operations	- same lease arrangements (in terms of leasehold improvements, base rental rates, percentage rents, etc.) as any other operation.
2.	New operations in an existing space	- notify those retail activities which are no longer required (as soon as high speed rail operation is announced) - where possible, do not renew leases of non-suitable or surplus retail operations - move as quickly as possible to ensure appropriate retail mix in place when high-speed rail comes on-stream.

These principles will ensure that the retail mix established in a given station will be one that optimally responds to consumer (passenger traffic) demand.

Our information implies that the High Speed Rail Operating Authority will likely have no right to charge concession operations rental or lease fees, in stations owned by others (eg. Union Station in Toronto and Central Station in Montréal). However, in other situations (such as the Gare du Palais in Québec and the VIA Station in Ottawa), the High Speed Rail Operating Authority will be taking over existing stations, and thus this negotiation process could apply.

4.

RESULTS AND CONCLUSIONS

4. RESULTS AND CONCLUSIONS

4.1 UNCONSTRAINED MARKET POTENTIAL ESTIMATES

Total concession revenues (in thousands of 1993 dollars) under the unconstrained market potential assumptions are as follows:

300 kph		200 kph	
2005	2025	2005	2025
$ 17,558	$27,811	$14,890	$22,828

Charts 4.1 through 4.4, overleaf, present the results of this analysis in more detail. The results for the year 2005 are presented first, followed by the year 2025. Appendix E contains the detailed forecasts of "unconstrained market potential" revenues for each station and for each concession type, for the two forecast years, 2005 and 2025.

4.2 SUPPLY-DRIVEN ESTIMATES

The estimates of revenues accruing to the high speed rail facility presented in the preceding section represent the unconstrained market potential for revenues. In other words, they are estimates of what the market would bear (in terms of total revenues and floorspace), given the passenger traffic delivered into each station by the high speed rail network.

In reality, the amount of space to be provided in each station constrains the total revenue potential, as the space allowed for concession operations appears to be considerably less than that which the traffic would support. We have therefore developed a "supply driven" estimating methodology, to account for the fact that the natural market demand will be constrained by the amount of space allowed.

Chart 4.1

SUMMARY MODEL RESULTS FOR 300 K.P.H. (VIA MIRABEL) HIGH SPEED RAIL LINE – UNCONSTRAINED MARKET POTENTIAL SCENARIO

STATION	ANNUAL IN-STATION PASSENGER TRAFFIC (000)		TOTAL CONCESSION SPACE SUPPORTABLE (000 SQ. FT.)		NO. OF CONCESSION OPERATIONS*		ANNUAL RENTAL REVENUES GENERATED** ($000)	
YEAR	2005	2025	2005	2025	2005	2025	2005	2025
WINDSOR	1,293	2,043	14	23	15	23	$957	$1,512
LONDON	2,052	3,135	23	35	23	34	$1,519	$2,321
KITCHENER	727	1,234	8	14	9	14	$536	$914
TORONTO	6,972	11,141	78	124	76	121	$5161	$8,248
KINGSTON	1,467	2,189	16	24	16	24	$1,086	$1,621
OTTAWA-HULL	3,905	6,290	44	70	43	71	$2,891	$4,657
MONTREAL	4,976	7,876	56	88	54	86	$3,684	$5,831
TROIS-RIVIERES	453	688	5	8	7	9	$324	$507
QUEBEC	1,891	2,974	21	33	21	33	$1,400	$2,202
TOTAL	23,736	37,570	265	419	264	415	$17,558	$27,811

* Excluding ABM Installations
** Reported in $1993 constant dollars

Chart 4.2

SUMMARY MODEL RESULTS FOR 200 K.P.H. (VIA DORVAL) ROUTE
HIGH SPEED RAIL LINE – SPEED = 200 KM/H
UNCONSTRAINED MARKET POTENTIAL SCENARIO

STATION	ANNUAL IN-STATION PASSENGER TRAFFIC (000)		TOTAL CONCESSION SPACE SUPPORTABLE (000 SQ. FT.)		NO. OF CONCESSION OPERATIONS *		ANNUAL RENTAL REVENUES GENERATED** ($000)	
YEAR	2005	2025	2005	2025	2005	2025	2005	2025
WINDSOR	1,085	1,654	12	18	12	18	$803	$1,224
LONDON	1,732	2,579	19	29	19	28	$1,282	$1,909
KITCHENER	727	835	8	9	9	10	$453	$618
TORONTO	5,610	8,736	63	98	61	95	$4,153	$6,467
KINGSTON	1,274	1,787	14	20	14	19	$943	$1,323
OTTAWA-HULL	3,398	5,307	38	59	37	58	$2,516	$3,929
MONTREAL	4,382	6,794	49	76	47	74	$3,244	$5,030
TROIS-RIVIERES	426	632	4	7	7	8	$305	$466
QUEBEC	1,608	2,514	18	28	17	27	$1,190	$1,861
TOTAL	20,242	30,838	225	344	223	337	$14,890	$22,828

* Excluding ABM Installations
** Reported in $1993 Constant Dollars

Chart 4.3

CONCESSIONS MIX FOR ALL SCENARIOS - 2005

SCENARIO 1: 300 KPH, NEW RIGHT OF WAY (Via Mirabel)

Station	Revenue (000'S)	Sq. Ft.	Number of Concessions By Type									
			Rest	Fast Food	Cof. Shop	News Stand	Video Game	Car Rntl	Cons Serv.	Spec. Store	ABM's	Misc
1)Detroit/Windsor	$957	14,000	1	2	1	2	1	3	2	2	1	N/A
2) London/St. Thomas	$1,519	23,000	2	3	2	3	1	4	3	4	2	N/A
3)Kitch/Watr/Cambr.	$536	8,000	1	1	1	1	1	2	1	1	0	N/A
5) Greater Toronto	$5,161	78,000	8	11	8	9	5	15	8	12	8	N/A
8) Kingston	$1,086	16,000	2	2	2	2	1	3	2	3	2	N/A
9) Ottawa-Hull	$2,891	44,000	4	6	4	5	3	8	5	7	4	N/A
12) Montreal Urban	$3,684	56,000	6	8	5	7	3	11	6	9	6	N/A
14) Trois Rivieres	$324	5,000	1	1	0	1	1	1	1	1	0	N/A
16) Quebec	$1,400	21,000	2	3	2	3	1	4	2	3	2	N/A
	$17,558	265,000										

SCENARIO 2: 200 KPH, VIA DORVAL

Station	Revenue (000'S)	Sq. Ft.	Number of Concessions By Type									
			Rest	Fast Food	Cof. Shop	News Stand	Video Game	Car Rntl	Cons Serv.	Spec. Store	ABM's	Misc
1)Detroit/Windsor	$803	12,000	1	2	1	1	1	2	1	2	1	N/A
2) London/St. Thomas	$1,282	19,000	2	3	2	2	1	4	2	3	2	N/A
3)Kitch/Watr/Cambr.	$453	7,000	1	1	1	1	1	1	7	1	0	N/A
5) Greater Toronto	$4,153	63,000	6	9	6	7	4	12	7	10	6	N/A
8) Kingston	$943	14,000	1	2	1	2	1	3	2	2	1	N/A
9) Ottawa-Hull	$2,516	38,000	4	5	4	5	2	7	4	6	4	N/A
12) Montreal Urban	$3,244	49,000	5	7	5	6	3	9	5	8	5	N/A
14) Trois Rivieres	$305	4,000	1	1	0	1	1	1	1	1	0	N/A
16) Quebec	$1,190	18,000	2	2	2	2	1	3	2	3	2	N/A
	$14,890	224,000										

Chart 4.4

CONCESSIONS MIX FOR ALL SCENARIOS - 2025

SCENARIO 1: 300 KPH, NEW RIGHT OF WAY (Via Mirabel)

Station	Revenue ('000'S)	Sq. Ft.	Number of Concessions By Type									
			Rest	Fast Food	Cof. Shop	News Stand	Video Game	Car Rntl	Cons Serv.	Spec. Store	ABM's	Misc
1) Detroit/Windsor	$1,512	23,000	2	3	2	3	1	4	2	4	2	N/A
2) London/St. Thomas	$2,321	35,000	4	5	3	4	2	7	4	6	4	N/A
3) Kitch/Watr/Cambr.	$914	14,000	1	2	1	2	1	3	2	2	1	N/A
5) Greater Toronto	$8,248	124,000	13	17	12	15	8	24	14	20	13	N/A
8) Kingston	$1,621	24,000	3	3	2	3	1	5	3	4	2	N/A
9) Ottawa-Hull	$4,657	70,000	7	10	7	8	4	13	8	11	7	N/A
12) Montreal Urban	$5,831	88,000	9	12	9	11	5	17	10	14	9	N/A
14) Trois Rivieres	$507	8,000	1	1	1	1	1	1	1	1	0	N/A
16) Quebec	$2,202	33,000	3	5	3	4	2	6	4	5	3	N/A
	$27,811	419,000										

SCENARIO 2: 200 KPH, VIA DORVAL

Station	Revenue ('000'S)	Sq. Ft.	Number of Concessions By Type									
			Rest	Fast Food	Cof. Shop	News Stand	Video Game	Car Rntl	Cons Serv.	Spec. Store	ABM's	Misc
1) Detroit/Windsor	$1,224	18,000	2	3	2	2	1	4	2	3	2	N/A
2) London/St. Thomas	$1,909	29,000	3	4	3	3	2	5	3	5	3	N/A
3) Kitch/Watr/Cambr.	$618	9,000	1	1	1	1	1	2	11	1	1	N/A
5) Greater Toronto	$6,467	98,000	10	13	9	12	6	19	11	16	10	N/A
8) Kingston	$1,323	20,000	2	3	2	2	1	4	2	3	2	N/A
9) Ottawa-Hull	$3,929	59,000	6	8	6	7	4	11	6	9	6	N/A
12) Montreal Urban	$5,030	76,000	8	10	7	9	5	14	8	12	8	N/A
14) Trois Rivieres	$466	7,000	1	1	1	1	1	1	1	1	0	N/A
16) Quebec	$1,861	28,000	3	4	3	3	2	5	3	4	3	N/A
	$22,828	344,000										

Chart 4.5, overleaf, indicates the amount of new concession space to be built at each of the stations, for both scenarios.

At all locations other than downtown Toronto, downtown Montréal and Dorval, the stations will be newly constructed with a given amount of space devoted to concession operations, or (in the case of VIA's Ottawa and Gare du Palais stations) are assumed to be turned over to the High Speed Rail Operating Authority. The High Speed Rail Operating Authority will manage the concession space outright, and will collect rental revenues directly from the concession operators.

We have developed a pro-rata method of estimating concession revenues in these stations according to a "supply-driven" approach. The method follows these steps:

1) calculate the ratio of the total amount of space that would have been supported under the "market potential" approach, to the amount of space that is to be allowed under the "supply driven" approach in a given City (including any suburban stations), for the year 2005;

2) apply this ratio to the estimate of the concession revenues generated under the "market potential" scenario, for the year 2005;

3) in cases where the 200 kph scenario estimate is greater than the 300 kph estimate (which can occur if the ratio of "supply-allowed" to "market supported" space – which will be larger for the 200 kph stations, as the denominator is smaller – when applied to the estimate of market supported concession revenues yields a larger absolute number), revert to the 300 kph estimate.

It is worth noting that these estimates are likely to be conservative. This is because, even if space is constrained, if demand is overwhelmingly high (as it will be in some cases), some potential patrons could be expected to wait in line until they were served. However, there is no good way of measuring this, and, in our opinion the pro-rata approach leads to defensible and reasonable estimates.

Chart 4.5

CONFIGURATION OF CONCESSIONS SPACE AT STATIONS, BOTH SCENARIOS

	SCENARIO	
STATION	**200 KPH SCENARIO**	**300 KPH SCENARIO**
Windsor	New Station: 1350 sq. ft.	New Station: 1350 sq. ft.
London	New Station: 1350 sq. ft.	New Station: 1350 sq. ft.
Kitchener	New Station: 1075 sq. ft.	New Station: 1075 sq. ft.
Toronto - Pearson	New Station: 1075 sq. ft.	New Station: 1075 sq. ft.
Toronto - Union Station	Use existing Union Station - No new concession space	Use existing Union Station - No new concession space
East Toronto	New Station: 1075 sq. ft.	New Station: 1075 sq. ft.
Kingston	New Station: 1075 sq. ft.	New Station: 1075 sq. ft.
Ottawa - Hull	3770 sq. ft. of new concession space at existing station site	3770 sq. ft. of new concession space at new station in Hull
Montréal - Airport	Dorval No new concession space	Mirabel No new concession space
Montréal - Central Station	Use Existing Central Station - No new concession space	Use Existing Central Station - No new concession space
Montréal - Laval	New Station: 1075 sq. ft.	New Station: 1075 sq. ft.
Trois-Rivières	New Station: 1075 sq. ft.	New Station: 1075 sq. ft.
Québec - Suburban (Ancienne Lorette)	New Station: 1075 sq. ft.	New Station: 1075 sq. ft.
Québec - Gare du Palais	3770 sq. ft. of new concession space at existing station site	3770 sq. ft. of new concession space at existing station site

Downtown Montréal and Toronto present special and difficult cases in this analysis. Because of the configuration of the High Speed Rail line, and the fact that there are existing stations in downtown Montréal (Central Station) and downtown Toronto (Union Station) that will not be owned by the High Speed Rail Authority, it is more difficult to estimate what concession revenues (if any) will accrue to the Authority. (We assume in this analysis that the VIA stations in Ottawa and Québec would be acquired and operated by the High Speed Rail Operating Authority, an assumption that has been discussed with and approved by the Project Coordinator).

The relevant factors in determining the total amount of revenue (if any) accruing to the High Speed Rail Operating Authority in Union and Central Stations are as follows:

- Both stations are owned by other organizations who in turn will rent out the concession space themselves, and have indicated that they will retain the revenues.

- Both stations are used by other organizations (e.g. Union Station is used by VIA and GO Transit; Central Station is used by VIA and the Deux-Montagnes commuter trains), in no case do these user organizations get any share of the concession revenues generated in the station in recognition of the fact that they "deliver a market" into the station.

- Through our discussions with representatives of the owners of both stations, we conclude that it is unlikely in the extreme that the owners would offer any "kickback" to the High Speed Rail Operating Authority as compensation for the market that it delivers. The reasons cited are:

  - there is no known precedent for this type of arrangement in transportation terminals elsewhere; and

  - if the station owners were to establish this type of precedent with the High Speed Rail Operating Authority, they would shortly find that similar arrangements were being demanded by their other users.

A more likely accommodation that would be made would be that the users would be provided with space for their on-going operations at relatively low rates. (The likely fee basis charged to the High Speed Rail Operating Authority for the use of existing facilities would be a "train mile charge", i.e. a charge for every mile the train travels on the owner's rails, plus a grossed-up per mile charge to account for depreciation. The user would not receive a discount resulting from increased traffic brought into the stations to concession operations.) As this relates to the operating budget for the High Speed Rail Operating Authority, and not to concession revenues directly realized, it is not dealt with here.

Accordingly, we conclude that under the "supply-driven" approach, concession revenues at both Central and Union stations will be zero. A similar approach was applied to Dorval station, where we assumed continuing CN ownership.

Chart 4.6, overleaf, contains the estimates of concession revenues generated in the year 2005 for each of the scenarios. As the revenue potential is constrained by the supply of space to be provided, and as the estimate is made in terms of 1993 constant dollars, the forecast for 2025 is the same as for 2005. As shown there, this results in total revenues of $ 1,176,000 for the 300 kph scenario and $ 1,169,000 for the 200 kph scenario.

It should be noted that these estimates of "supply-driven" rental revenues are incremental, in the sense that they accrue directly to the High Speed Rail Operating Authority (which is not at present collecting rental revenues in any of the stations). Further, as most of the stations at which the Operating Authority will collect revenues do not presently exist, any rental revenues generated at those locations will be incremental.

At Union Station in Toronto, and at Central Station in Montréal, the picture is clouded because the high speed rail passengers will replace some of the existing passengers using the stations. Therefore, the incremental rental revenues attributed to the High Speed Rail would need to be discounted to account for present usage. However, as this is a matter of concern for the owners of those stations and not the High Speed Rail Operating Authority, we do not attempt to estimate these revenues here.

Chart 4.6

SUPPLY DRIVEN CONCESSION RENTAL REVENUE ESTIMATES, YEARS 2005 AND 2025, IN $1993

	SCENARIO	
STATION	**200 KPH SCENARIO ($000)**	**300 KPH SCENARIO ($000)**
Windsor	$92	$90
London	$89	$89
Kitchener	$72	$70
Toronto	$142	$142
Kingston	$69	$69
Ottawa - Hull	$248	$248
Montréal	$71	$71
Trois-Rivières	$70	$70
Québec	$323	$320
TOTAL	**$1,176**	**$1,169**

4.3 PARTIAL IMPLEMENTATION

Ridership forecasts were supplied by the Project Manager for two partial implementation scenarios, i.e.:

- Toronto-Montréal;
- Toronto-Québec.

These show a more than proportional decline in ridership relative to a full (Québec-Windsor) implementation, due to a loss of synergy in the system. However, under the supply-driven approach outlined above, demand for concessions would probably continue to outstrip supply in the remaining stations. Revenues from station concessions can, therefore, be estimated for these two scenarios by simply subtracting the stations not included in each from the base case estimates outlined in the preceding section. This results in the following estimated revenues (in thousands of 1993 dollars) :

	300 kph	**200 kph**
Toronto-Montréal	$ 530	$ 530
Toronto-Québec	$ 923	$ 920

4.4 CONCLUSIONS

The unconstrained market potential scenario shows significant potential revenue from station concession operations. As noted above, for the year 2005 we estimate revenues of about $ 18 million for a 300 kph service and $ 14 million for a 200 kph service.

The estimated revenues are substantially reduced in passing from the unconstrained to the constrained, or supply-driven, approach. As noted above, revenues estimated under this approach amounted to only $ 1,176 thousand for a 300 kph service and $ 1,169 thousand for a 200 kph service, i.e., only about seven or eight percent of the unconstrained, or market-driven, revenues.

The supply-driven approach incorporates two types of constraints:

- the fact that certain stations (notably Union in Toronto and Central in Montreal) would not belong to the HSR Authority;

- space constraints at the other stations.

For the year 2005, the amount of revenue loss caused by each constraint is as follows:

	300 kph		200 kph	
	$ 000	% of Unconstrained Revenue	$ 000	% of Unconstrained Revenue
Station Ownership	8,632	49	7,184	48
Space Constraint	7,750	44	6,537	44
Total	16,382	93	13,721	92

Thus, although more than half of the revenue loss is attributable to the fact that certain stations would not belong to the HSR Authority, substantial revenues would be lost simply because of a lack of space in the other stations. We suggest that in future projects of this type consideration be given to the amount of concession space that the market will support when designing the stations.

STATION CONCESSIONS

APPENDICES

APPENDIX A.

INTERVIEW GUIDE

HIGH SPEED RAIL -

CONCESSION NET REVENUE

Appendix A

INTERVIEW GUIDE
HIGH SPEED RAIL - CONCESSION NET REVENUE

The terms of reference of the High Speed Rail Project Study for the Québec/Windsor corridor require The Consultant to identify the potential costs and revenues from concessions which would operate in each of the proposed stations along the High Speed Rail route. We would appreciate it if you would take the time to answer a few questions with respect to your facility to help us develop these cost and revenue estimates.
Our questions are in four general areas, as follows:

1) Facility Data - specific information about your facility, including:

- passenger traffic levels
  - by type (business travellers, commuter, non-business travellers)
  - by time (as much detail as possible - i.e. hours, days, months)
- facility size (sq. ft.)
  - total
  - leasable area
- number and types of concessions
- size (sq. ft.) of each type of concession

2) Leasing Cost Data - what **each type of concession** tenant creates in terms of annual operating costs for your facility (preferably by major category of cost types)?

3) Leasing Revenue Data - what is the average annual leasing revenue accruing to your facility from **each type of concession**?

- revenue type? (i.e., commission vs. fixed rent)
- how would your revenues vary if passenger traffic levels increased by 10%?
- terms and conditions of lease?
- concession average annual sales levels, by type? Per capita expenditure info?

4) Other Leasing Data:

- average turnover rates for each concession type
- average setup costs for each concession type (determine average size)

- other leasing arrangements

Finally, we would like to ask your opinion about the following:

- are there any "rules of thumb" which suggest potential revenues by traffic levels
- the minimum traffic levels required to make the first concession of each type a viable business proposition
- the incremental traffic levels required to make a second concession of the same type a viable business proposition (for each concession type).

APPENDIX B.

LIST OF PARTICIPANTS

TO INTERVIEW PROGRAM

Appendix B

LIST OF PARTICIPANTS IN INTERVIEW PROGRAM

ORGANIZATION	INTERVIEWEE
Go Transit	Lou Iacovino
Montréal Transit (STCUM)	Hélène Proteau
Toronto Transit Commission	Mike Roche
Toronto Terminals Railway Company	Jim Cook
VIA Rail (Ontario)	Ken Rose
VIA Rail (Western Canada)	Mariel Decelles-Brentnall
VIA Rail (Eastern Canada)	Manon Chartrand
Ottawa Airport	Laura Lee Downey
Windsor Airport	Diane Ondejko
Kingston Airport	Sandra Bash
Dorval Airport	Yvan Sénécal
Mirabel Airport	Luc Charbonneau
Transport Canada	Beverly Oram
Transport Canada	Bill Johnston
P.A. Management Services, Inc.	Al Rubbert
French National Railway (SNCF)	Richard Niere

APPENDIX C.

ORGANIZATIONS PROVIDING BACKGROUND DATA

Appendix C

ORGANIZATIONS PROVIDING BACKGROUND DATA

ORGANIZATION	FACILITY
Go Transit	Union Station Pickering Station Cooksville Station Erindale Station Meadowvale Station
Montréal Transit	Berri-UQAM Station
Toronto Terminals Railway Company	Union Station
VIA Rail (Ontario)	Brockville Station Cornwall Station Kingston Station Windsor Station
VIA Rail (Western Canada)	Vancouver Station
VIA Rail (Eastern Canada)	Ottawa Station Québec Station
Ottawa Airport	Ottawa Airport
Kingston Airport	Kingston Airport
Dorval Airport	Dorval Airport
Mirabel Airport	Mirabel Airport
Transport Canada	Windsor Airport London Airport Halifax Airport Dorval Airport Mirabel Airport Ottawa Airport Toronto Airport Winnipeg Airport Calgary Airport Edmonton Airport Vancouver Airport Moncton Airport St. John's Airport Regina Airport Saskatoon Airport Thunder Bay Airport Victoria Airport
P.A. Management Services, Inc.	Newark Penn Station

APPENDIX D.

LEASE TERMS AND CONDITIONS

Appendix D

LEASE TERMS AND CONDITIONS

Concession Type	Type of Rent	%	Term
Restaurants	> of % of Gross Rev. or Min. Rent	10%	5-10 years
Fast Food	> of % of Gross Rev. or Min. Rent	10%	5-10 years
Coffee Shops	Fixed		10 years
Newsstand/Smoke Shops	> of % of Gross Rev. or Min. Rent	10%	5-10 years
Video Games/Arcades	% of Gross Rev.	50%	5 years
Vehicle Rentals	> of % of Gross Rev. or Min. Rent	10%	5 years
Consumer Services	Fixed		5 years
Specialty Stores	> of % of Gross Rev. of Min. Rent	4-15%	5 years
Bank Machines	Fixed		1-5 years
Miscellaneous	Fixed		3-5 years

The information presented in this table is not "hard" data. In other words, not all of the concessions in the facilities interviewed have rental agreements as listed above. Rather, the table lists the prevalent leasing arrangement for each type of concession as determined by the results of the facility interviews conducted.

For each of the retail categories listing, the greater of a percentage of gross revenue or a minimum guaranteed rent as the most common type of rent, there were examples of leasing arrangements which called for a fixed rent only.

Likewise, although the "Coffee Shops" and "Consumer Services" retail categories list a form of fixed rent as the most common type of rent, there were specific examples of concessions in each of these categories which paid the greater of a percentage of gross revenue or a minimum guaranteed rent.

In general, the percentage of gross revenue called for in the leasing arrangements ranged from 4-18% (with the exception of the "Video Games/Arcade" retail category), with the majority falling in the 10-15% range. Also, the term "fixed rent" encompasses any rent determined on a per square foot basis, an annual flat rate basis, or a monthly flat rate basis.

The terms of the rental agreements for concessions in most retail categories ranged from 1-15 years, with the majority falling in the 5-10 year range. Concessions in the "Bank Machine" and "Miscellaneous" retail categories consistently had shorter terms (1-5 years). Quite often, the length of the term is dependent upon the size of the tenant's capital investment in the concession. Also, there were many examples of leasing arrangements which included an option to renew the lease at the end of the term.

APPENDIX E.

"UNCONSTRAINED MARKET POTENTIAL"

ESTIMATES FOR 2005 AND 2025

Ridership Forecast = 2005 Revenue Forecast = $1993

1) Detroit/Windsor

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**1,293,000**			**1,085,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$175,905	3,264	1	$147,608	2,739	1
Fast Food	$197,877	3,021	2	$166,045	2,535	2
Coffee Shops	$27,527	864	1	$23,099	725	1
Newsstand/Smoke Shops	$142,614	1,464	2	$119,673	1,228	1
Video Games/Arcades	$35,070	437	1	$29,428	367	1
Vehicle Rentals	$193,597	548	3	$162,454	460	2
Consumer Services	$52,339	968	2	$43,919	812	1
Specialty Stores	$80,205	3,792	2	$67,303	3,182	2
Bank Machines	$4,527	89	1	$3,799	75	1
Miscellaneous (1)	$47,561	N/A	0	$39,910	N/A	0
	$957,223	14,445	16	$803,238	12,122	13

2) London/St. Thomas

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**2,052,000**			**1,732,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$279,163	5,179	2	$235,628	4,372	2
Fast Food	$314,032	4,794	3	$265,060	4,047	3
Coffee Shops	$43,685	1,371	2	$36,873	1,158	2
Newsstand/Smoke Shops	$226,330	2,323	3	$191,035	1,961	2
Video Games/Arcades	$55,656	693	1	$46,977	585	1
Vehicle Rentals	$307,240	869	4	$259,327	734	4
Consumer Services	$83,062	1,536	3	$70,109	1,296	2
Specialty Stores	$127,286	6,017	4	$107,437	5,079	3
Bank Machines	$7,184	141	2	$6,064	119	2
Miscellaneous (1)	$75,479	N/A	0	$63,709	N/A	0
	$1,519,119	22,925	25	$1,282,219	19,350	21

Ridership Forecast = 2005 Revenue Forecast = $1993

3) Kitch/Watr/Cambr.

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**727,000**			**615,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$98,904	1,835	1	$83,667	1,552	1
Fast Food	$111,258	1,699	1	$94,118	1,437	1
Coffee Shops	$15,477	486	1	$13,093	411	1
Newsstand/Smoke Shops	$80,186	823	1	$67,833	696	1
Video Games/Arcades	$19,718	246	1	$16,681	208	1
Vehicle Rentals	$108,852	308	2	$92,082	260	1
Consumer Services	$29,428	544	1	$24,894	460	1
Specialty Stores	$45,096	2,132	1	$38,149	1,803	1
Bank Machines	N/A	N/A	0	N/A	N/A	0
Miscellaneous (1)	$26,741	N/A	0	$22,622	N/A	0
	$535,661	8,072	9	$453,138	6,828	8

Ridership Forecast = 2005 Revenue Forecast = $1993

5) Greater Toronto

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**6,972,000**			**5,610,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$948,500	17,598	8	$763,207	14,160	6
Fast Food	$1,066,975	16,290	11	$858,538	13,108	9
Coffee Shops	$148,428	4,660	8	$119,432	3,749	6
Newsstand/Smoke Shops	$768,992	7,893	9	$618,768	6,351	7
Video Games/Arcades	$189,102	2,356	5	$152,160	1,896	4
Vehicle Rentals	$1,043,898	2,953	15	$839,969	2,376	12
Consumer Services	$282,217	5,218	8	$227,085	4,199	7
Specialty Stores	$432,476	20,444	12	$347,991	16,450	10
Bank Machines	$24,410	479	8	$19,642	385	6
Miscellaneous (1)	$256,453	N/A	0	$206,354	N/A	0
	$5,161,452	77,891	84	$4,153,147	62,675	67

8) Kingston

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**1,467,000**			**1,274,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$199,577	3,703	2	$173,320	3,216	1
Fast Food	$224,505	3,428	2	$194,969	2,977	2
Coffee Shops	$31,231	980	2	$27,122	851	1
Newsstand/Smoke Shops	$161,806	1,661	2	$140,519	1,442	2
Video Games/Arcades	$39,789	496	1	$34,555	431	1
Vehicle Rentals	$219,650	621	3	$190,752	540	3
Consumer Services	$59,382	1,098	2	$51,570	954	2
Specialty Stores	$90,999	4,302	3	$79,027	3,736	2
Bank Machines	$5,136	101	2	$4,461	88	1
Miscellaneous (1)	$53,961	N/A	0	$46,862	N/A	0
	$1,086,037	16,389	18	$943,157	14,233	15

Ridership Forecast = 2005 Revenue Forecast = $1993

9) Ottawa-Hull

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**3,905,000**			**3,398,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$531,252	9,856	4	$462,278	8,577	4
Fast Food	$597,610	9,124	6	$520,020	7,939	5
Coffee Shops	$83,134	2,610	4	$72,341	2,271	4
Newsstand/Smoke Shops	$430,711	4,421	5	$374,790	3,847	5
Video Games/Arcades	$105,915	1,320	3	$92,164	1,148	2
Vehicle Rentals	$584,685	1,654	8	$508,773	1,439	7
Consumer Services	$158,069	2,923	5	$137,547	2,543	4
Specialty Stores	$242,229	11,451	7	$210,779	9,964	6
Bank Machines	$13,672	268	4	$11,897	233	4
Miscellaneous (1)	$143,639	N/A	0	$124,990	N/A	0
	$2,890,916	43,626	47	$2,515,578	37,962	41

12) Montreal Urban

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**4,976,000**			**4,382,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$676,955	12,560	6	$596,145	11,060	5
Fast Food	$761,513	11,626	8	$670,609	10,238	7
Coffee Shops	$105,935	3,326	5	$93,289	2,929	5
Newsstand/Smoke Shops	$548,839	5,633	7	$483,323	4,961	6
Video Games/Arcades	$134,964	1,681	3	$118,853	1,481	3
Vehicle Rentals	$745,042	2,107	11	$656,104	1,856	9
Consumer Services	$201,422	3,724	6	$177,378	3,280	5
Specialty Stores	$308,663	14,591	9	$271,817	12,850	8
Bank Machines	$17,422	342	6	$15,342	301	5
Miscellaneous (1)	$183,034	N/A	0	$161,184	N/A	0
	$3,683,790	55,592	60	$3,244,045	48,956	53

Ridership Forecast = 2005 Revenue Forecast = $1993

14) Trois Rivieres

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**453,000**			**426,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$61,628	1,143	1	$57,955	1,075	1
Fast Food	$69,326	1,058	1	$65,194	995	1
Coffee Shops	N/A	N/A	0	N/A	N/A	0
Newsstand/Smoke Shops	$49,965	513	1	$46,987	482	1
Video Games/Arcades	$12,287	153	1	$11,554	144	1
Vehicle Rentals	$67,826	192	1	$63,784	180	1
Consumer Services	$18,337	339	1	$17,244	319	1
Specialty Stores	$28,100	1,328	1	$26,425	1,249	1
Bank Machines	N/A	N/A	0	N/A	N/A	0
Miscellaneous (1)	$16,663	N/A	0	$15,670	N/A	0
	$324,131	4,727	7	$304,812	4,445	7

16) Quebec

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**1,891,000**			**1,608,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$257,259	4,773	2	$218,759	4,059	2
Fast Food	$289,393	4,418	3	$246,084	3,757	2
Coffee Shops	$40,258	1,264	2	$34,233	1,075	2
Newsstand/Smoke Shops	$208,572	2,141	3	$177,358	1,820	2
Video Games/Arcades	$51,290	639	1	$43,614	543	1
Vehicle Rentals	$283,134	801	4	$240,761	681	3
Consumer Services	$76,545	1,415	2	$65,090	1,204	2
Specialty Stores	$117,299	5,545	3	$99,745	4,715	3
Bank Machines	$6,621	130	2	$5,630	110	2
Miscellaneous (1)	$69,557	N/A	0	$59,148	N/A	0
	$1,399,929	21,126	23	$1,190,421	17,965	19

Ridership Forecast = 2025 Revenue Forecast = $1993

1) Detroit/Windsor

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**2,043,000**			**1,654,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$277,938	5,157	2	$225,017	4,175	2
Fast Food	$312,655	4,773	3	$253,123	3,865	3
Coffee Shops	$43,494	1,365	2	$35,212	1,105	2
Newsstand/Smoke Shops	$225,337	2,313	3	$182,432	1,873	2
Video Games/Arcades	$55,412	690	1	$44,861	559	1
Vehicle Rentals	$305,893	865	4	$247,649	701	4
Consumer Services	$82,698	1,529	2	$66,952	1,238	2
Specialty Stores	$126,728	5,991	4	$102,598	4,850	3
Bank Machines	$7,153	140	2	$5,791	114	2
Miscellaneous (1)	$75,148	N/A	0	$60,840	N/A	0
	$1,512,456	22,824	25	$1,224,475	18,478	20

2) London/St. Thomas

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**3,135,000**			**2,579,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$426,498	7,913	4	$350,858	6,510	3
Fast Food	$479,771	7,325	5	$394,683	6,026	4
Coffee Shops	$66,742	2,095	3	$54,905	1,724	3
Newsstand/Smoke Shops	$345,782	3,549	4	$284,457	2,920	3
Video Games/Arcades	$85,031	1,059	2	$69,950	871	2
Vehicle Rentals	$469,395	1,328	7	$386,146	1,092	5
Consumer Services	$126,901	2,347	4	$104,395	1,930	3
Specialty Stores	$194,465	9,193	6	$159,976	7,563	5
Bank Machines	$10,976	215	4	$9,030	177	3
Miscellaneous (1)	$115,316	N/A	0	$94,864	N/A	0
	$2,320,876	35,024	38	$1,909,263	28,812	31

Ridership Forecast = 2025 Revenue Forecast = $1993

3) Kitch/Watr/Cambr.

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**1,234,000**			**835,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$167,878	3,115	1	$113,597	2,108	1
Fast Food	$188,848	2,883	2	$127,786	1,951	1
Coffee Shops	$26,271	825	1	$17,776	558	1
Newsstand/Smoke Shops	$136,107	1,397	2	$92,098	945	1
Video Games/Arcades	$33,470	417	1	$22,648	282	1
Vehicle Rentals	$184,763	523	3	$125,022	354	2
Consumer Services	$49,951	924	2	$33,800	625	1
Specialty Stores	$76,546	3,619	2	$51,795	2,449	1
Bank Machines	$4,320	85	1	$2,923	57	1
Miscellaneous (1)	$45,391	N/A	0	$30,714	N/A	0
	$913,544	13,786	15	$618,160	9,329	11

Ridership Forecast = 2025 Revenue Forecast = $1993

5) Greater Toronto

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**11,141,000**			**8,736,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$1,515,667	28,121	13	$1,188,481	22,050	10
Fast Food	$1,704,987	26,031	17	$1,336,932	20,411	13
Coffee Shops	$237,183	7,446	12	$185,983	5,838	9
Newsstand/Smoke Shops	$1,228,822	12,613	15	$963,557	9,890	12
Video Games/Arcades	$302,178	3,765	8	$236,947	2,952	6
Vehicle Rentals	$1,668,110	4,719	24	$1,308,016	3,700	19
Consumer Services	$450,973	8,339	14	$353,622	6,539	11
Specialty Stores	$691,081	32,669	20	$541,898	25,617	16
Bank Machines	$39,007	765	13	$30,586	600	10
Miscellaneous (1)	$409,803	N/A	0	$321,339	N/A	0
	$8,247,810	124,467	134	$6,467,361	97,598	105

8) Kingston

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**2,189,000**			**1,787,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$297,801	5,525	3	$243,111	4,511	2
Fast Food	$334,998	5,115	3	$273,477	4,175	3
Coffee Shops	$46,602	1,463	2	$38,044	1,194	2
Newsstand/Smoke Shops	$241,441	2,478	3	$197,101	2,023	2
Video Games/Arcades	$59,372	740	1	$48,469	604	1
Vehicle Rentals	$327,753	927	5	$267,562	757	4
Consumer Services	$88,608	1,638	3	$72,335	1,338	2
Specialty Stores	$135,785	6,419	4	$110,848	5,240	3
Bank Machines	$7,664	150	2	$6,257	123	2
Miscellaneous (1)	$80,519	N/A	0	$65,732	N/A	0
	$1,620,542	24,455	26	$1,322,937	19,964	21

Ridership Forecast = 2025 Revenue Forecast = $1993

9) Ottawa-Hull

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**6,290,000**			**5,307,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$855,717	15,876	7	$721,986	13,395	6
Fast Food	$962,604	14,696	10	$812,168	12,400	8
Coffee Shops	$133,909	4,204	7	$112,982	3,547	6
Newsstand/Smoke Shops	$693,770	7,121	8	$585,347	6,008	7
Video Games/Arcades	$170,604	2,125	4	$143,942	1,793	4
Vehicle Rentals	$941,784	2,664	13	$794,602	2,248	11
Consumer Services	$254,611	4,708	8	$214,820	3,972	6
Specialty Stores	$390,171	18,444	11	$329,195	15,562	9
Bank Machines	$22,022	432	7	$18,581	365	6
Miscellaneous (1)	$231,367	N/A	0	$195,209	N/A	0
	$4,656,559	70,272	76	$3,928,833	59,290	64

12) Montreal Urban

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**7,876,000**			**6,794,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$1,071,483	19,880	9	$924,284	17,149	8
Fast Food	$1,205,321	18,402	12	$1,039,734	15,874	10
Coffee Shops	$167,674	5,264	9	$144,639	4,541	7
Newsstand/Smoke Shops	$868,701	8,917	11	$749,359	7,692	9
Video Games/Arcades	$213,621	2,661	5	$184,274	2,296	5
Vehicle Rentals	$1,179,251	3,336	17	$1,017,246	2,877	14
Consumer Services	$318,810	5,895	10	$275,012	5,085	8
Specialty Stores	$488,551	23,095	14	$421,435	19,922	12
Bank Machines	$27,575	541	9	$23,787	467	8
Miscellaneous (1)	$289,705	N/A	0	$249,906	N/A	0
	$5,830,693	87,990	95	$5,029,676	75,902	82

Ridership Forecast = 2025 Revenue Forecast = $1993

14) Trois Rivieres

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**688,000**			**632,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$93,598	1,737	1	$85,980	1,595	1
Fast Food	$105,290	1,607	1	$96,719	1,477	1
Coffee Shops	$14,647	460	1	$13,455	422	1
Newsstand/Smoke Shops	$75,885	779	1	$69,708	716	1
Video Games/Arcades	$18,661	232	1	$17,142	214	1
Vehicle Rentals	$103,012	291	1	$94,628	268	1
Consumer Services	$27,849	515	1	$25,583	473	1
Specialty Stores	$42,677	2,017	1	$39,203	1,853	1
Bank Machines	N/A	N/A	0	N/A	N/A	0
Miscellaneous (1)	$25,307	N/A	0	$23,247	N/A	0
	$506,925	7,639	9	$465,664	7,017	8

16) Quebec

	Scenario: 300 kph - New ROW			Scenario: 200 kph - (Via Dorval)		
Traffic Forecast =	**2,974,000**			**2,514,000**		
	Revenue	Sq. Feet	#	Revenue	Sq. Feet	#
Restaurants	$404,595	7,507	3	$342,015	6,346	3
Fast Food	$455,132	6,949	5	$384,735	5,874	4
Coffee Shops	$63,314	1,988	3	$53,521	1,680	3
Newsstand/Smoke Shops	$328,024	3,367	4	$277,287	2,846	3
Video Games/Arcades	$80,664	1,005	2	$68,187	850	2
Vehicle Rentals	$445,289	1,260	6	$376,414	1,065	5
Consumer Services	$120,384	2,226	4	$101,763	1,882	3
Specialty Stores	$184,478	8,721	5	$155,944	7,372	4
Bank Machines	$10,413	204	3	$8,802	173	3
Miscellaneous (1)	$109,394	N/A	0	$92,473	N/A	0
	$2,201,686	33,225	36	$1,861,143	28,086	30