Partnership of

Canada

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Washington, D.C. 20590

Ontario

MDOT
MICHIGAN DEPARTMENT OF TRANSPORTATION

Canada–US–Ontario–Michigan
Border Transportation Partnership

Canada-United States-Ontario-Michigan Border Transportation Partnership Planning/Need and Feasibility Study

Transportation Problems and Opportunities Report

January 2004

URS

Preface

The Canadian, U.S., Ontario and Michigan governments are conducting a Planning/Needs and Feasibility Study to provide a long-term strategy that will ensure the safe and efficient movement of people, goods and services between Southeast Michigan and Southwest Ontario. The study will assess the existing transportation network, including border crossings, and will identify medium- and long-term transportation needs, alternatives and potential new crossings between Southeast Michigan and Southwest Ontario.

The objectives of the Planning/Needs and Feasibility Study are as follows:

a) Identify a focused analysis area within which transportation alternatives will be studied.

b) Identify existing and future transportation problems and opportunities with respect to capacity of border crossings, and the linkage to, and capacity of, existing and planned future national, provincial and municipal transportation systems.

c) Identify and analyze surface transportation alternatives (highway, arterial road, rail and marine) that are practical and feasible from a transportation, environmental, border processing and financial perspective.

d) Recommend feasible international crossing alternatives that address the identified transportation problems and opportunities.

e) For the recommended international crossing alternatives, determine user and collateral economic benefits, and the potential to generate revenue to fund implementation.

f) Develop an overall 30-year transportation strategy, which includes implementation strategies for any international crossing alternatives.

The results of the Planning/Needs and Feasibility Study may be used to initiate the scoping and terms of reference for an environmental study to meet the requirements of the National Environmental Policy Act (NEPA), Canadian Environmental Assessment Act (CEAA) and Ontario Environmental Assessment Act (OEAA).

The Planning/Needs and Feasibility Study will incorporate consultation with public and private sector stakeholders and the general public. Additional project information is available through the project website: www.partnershipborderstudy.com

Transportation Problems and Opportunities Report

List of Exhibits

Related Planning/Need and Feasibility Study Documents

Specific information that guided the study process and/or served as inputs to decision-making will be documented over the course of the Planning/Need and Feasibility Study. Information presented in this Transportation Problems and Opportunities Report has been compiled from the following related study documents:

Strategic and Geographic Area Overview Working Paper (available at www.PartnershipBorderStudy.com)

Travel Demand Analysis Process Working Paper (available at www.PartnershipBorderStudy.com)

Existing and Future Travel Demand Working Paper (available at www.PartnershipBorderStudy.com)

Environmental Overview (available at www.PartnershipBorderStudy.com)

1. Introduction

The Transportation Problems and Opportunities Report provides an overview of the nature and extent of transportation issues to be addressed by the Planning/Need and Feasibility Study. The Transportation Problems and Opportunities Report includes an introduction of the four government partners sponsoring the Planning/Need and Feasibility Study and the objectives of the study. An overview of transportation and socioeconomic characteristics of the general study area is also provided. In addition, this document summarizes the findings of work completed to date on travel demand and the rationale used to establish a focused analysis area.

The objective of the Transportation Problems and Opportunities Report is to describe the transportation problems and opportunities that will be addressed in the recommended 30-year transportation strategy for Southeast Michigan – Southwest Ontario border crossings. This report will serve as the basis for the identification, development and assessment of transportation alternatives.

1.1. Strategic Overview

The Canada-US-Ontario-Michigan Border Transportation Partnership includes the transportation authorities from two federal governments and two provincial/state governments. The Federal Highway Administration (FHWA) is an arm of the U.S. Department of Transportation and Transport Canada (TC) is the corresponding federal level agency in Canada. The Ontario Ministry of Transportation (MTO) and the Michigan Department of Transportation (MDOT) are the provincial and state agencies that have roadway jurisdiction on each side of the border between Ontario and Michigan.

Each of the four partners sponsoring this project has among their mandates, statements of mission, purpose, or vision, an expression of the importance of the border crossings that are the focus of this study.

1.1.1. Transport Canada (TC)

The Canada Transportation Act – 1966 – c.10 – strives to ensure that "each carrier or mode of transportation, as far as is practicable, carries traffic to or from any point in Canada under fares, rates and conditions that do not constitute…(iv) an unreasonable discouragement to the development of primary or secondary industries, to export trade in or from any region of Canada or to the movement of commodities through Canadian ports."

TC's 2001-2004 Business Plan states that, "to effectively plan for continual increases in international traffic, the federal government will participate in several border crossing studies/projects to identify future demand."

1.1.2. Ontario Ministry of Transportation (MTO)

The primary goal of the MTO's "Strategic Transportation Directions" process is to develop a fiscally and environmentally sustainable transportation system that will foster economic development while addressing the needs of the transportation users, industry and the public. In Southwest Ontario that is expressed in an objective that proposes to support the efficient operation of international and interprovincial trade corridors and gateways.

The Toll Bridges Act – R.S.O. 1990, c T-11, section 5 states that the Minister of Transportation "may on behalf of Her majesty in right of Ontario enter into agreements with any Canadian or foreign authority for the joint financing, construction or operation of any international bridge or tunnel and for any matter incidental thereto."

1.1.3. U.S. Federal Highway Administration (FHWA)

The general responsibilities of the Secretary of the U.S. Department of Transportation, the Cabinet officer under whom the FHWA functions, listed in 49 CFR 1.1.4 (a)(1) includes "Leadership in formulating and executing well-balanced national and international transportation objectives, policies, and programs."

The FHWA responsibilities include in 49 CFR 1.4 (d)(2) "Providing for improving, in cooperation with the States, roads on the Federal-aid primary, secondary, and interstate highway systems and urban extensions thereof."

The vision of the Federal Highway Administration is to improve transportation for a strong America. The mission of the Federal Highway Administration is to enhance mobility through innovative leadership and public service.

1.1.4. Michigan Department of Transportation (MDOT)

Public Act 51 of 1951 states that the state shall "provide for the continuing review of transportation needs within the state;"

and

Public Act 286 of 1964 Section 247.806a, paragraph (d) describes the powers of the Secretary of the Michigan Department of Transportation and states that the Secretary may "establish a program of current and long-range planning for the transportation systems under the department's jurisdiction."

In its application MDOT's mission is to provide "the highest quality transportation for economic benefit and improved quality of life."

It is only natural that these organizations have formed a partnership to examine future prospects for the maintenance of people and freight movement between Ontario and Michigan.

1.2. Purpose and Objectives of the Planning/Need and Feasibility Study

The purpose of the Planning/Need and Feasibility Study is to find workable solutions for addressing traffic flow across the border in Southeast Michigan – Southwest Ontario. The Broad Geographic Area (BGA) considered for this study is shown in Exhibit 1.1. The study will assess the existing transportation network and will identify medium- and long-term needs, alternatives and potential solutions for the region.

The bi-national government partnership aims to use this study to narrow the possible solutions to reach the best overall answer that will ensure the safe and efficient flow of people, goods and services across the Southeast Michigan – Southwest Ontario frontier.

The study will provide a comprehensive 30-year strategy to address both medium and long-term solutions for ensuring the Southeast Michigan – Southwest Ontario border remains a key access between Canada and the United States.

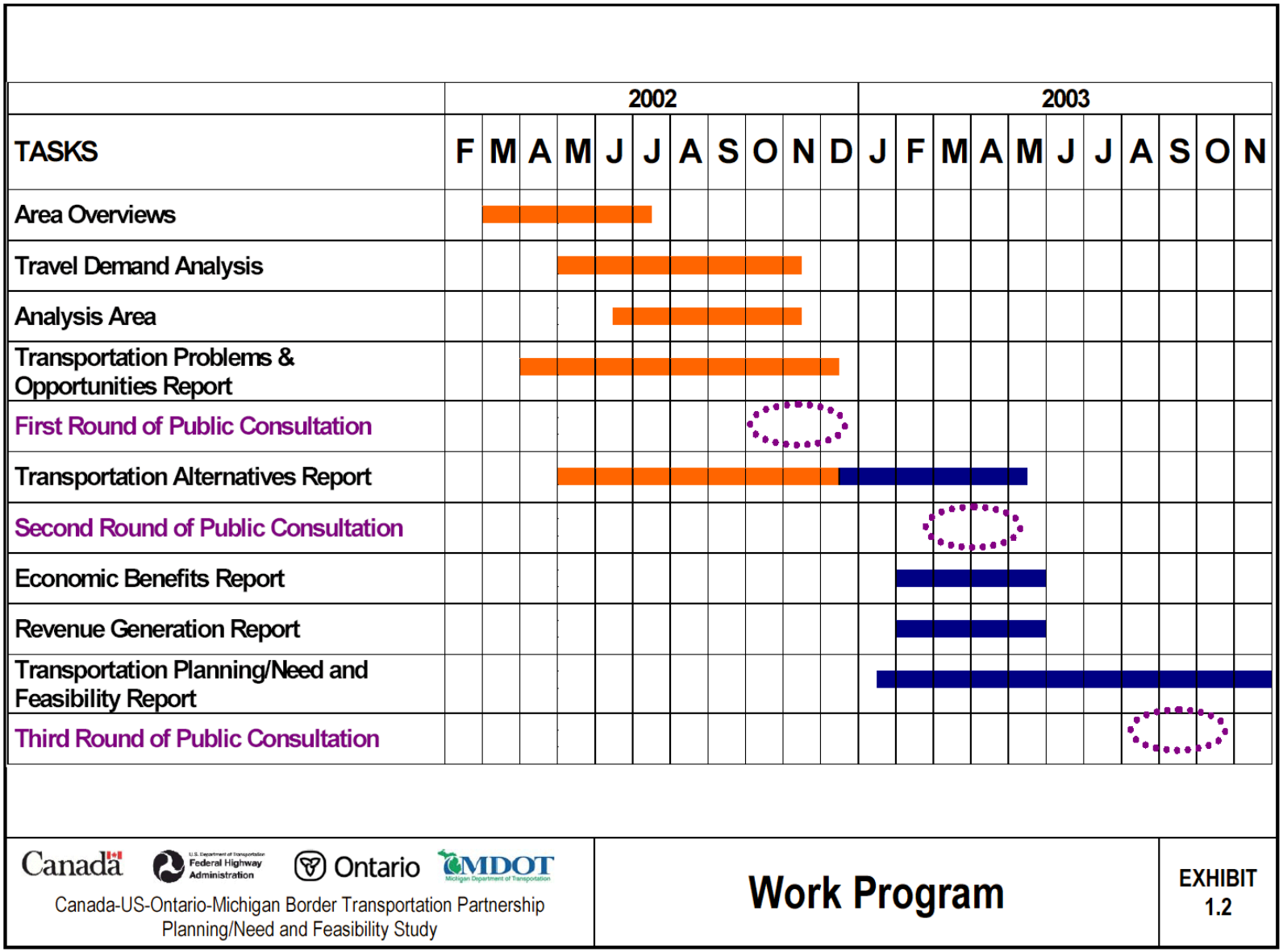
The Work Program proposed for the Planning/Need and Feasibility Study is shown in Exhibit 1.2. As can be seen from this exhibit, the major work steps proposed for this study, once completed, generally will be documented in working papers or reports. In addition, three formal rounds of public consultation are proposed for the study. The Planning/Need and Feasibility Study is proposed to be completed by November 2003.

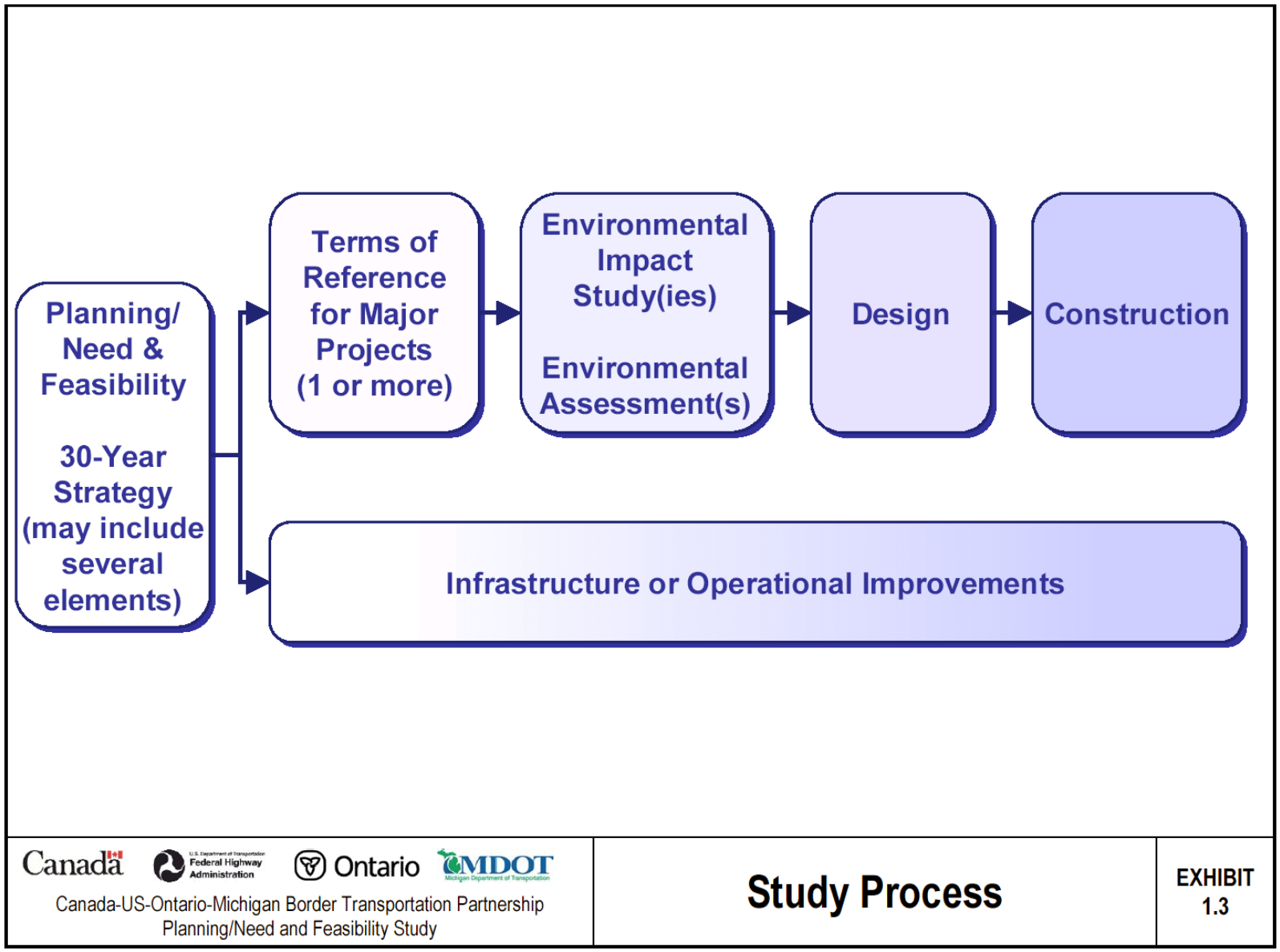
The process relating this Planning/Need and Feasibility Study to implementation of border crossing improvements is illustrated schematically in Exhibit 1.3. Should the recommendations of this study identify major infrastructure projects to address border crossing deficiencies, the results of this study may be used to initiate the scoping and terms of reference for an environmental study to meet the requirements of the US National Environmental Policy Act (NEPA), Canadian Environmental Assessment Act (CEAA) and Ontario Environmental Assessment Act (OEAA). This step would be followed by completion of the appropriate environmental impact/assessment studies, design of the approved improvements and ultimately, construction. Recommendations considered to be minor infrastructure or operational improvements could be implemented more directly, in accordance with the appropriate legislation. It is important to note that the Partnership is committed to implementing effective consultation programs throughout the study process.

Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study

Broad Geographic Area

EXHIBIT 1.1


2002
2003
TASKS
F M A M J J A S O N D J F M A M J J A S O N
Area Overviews
Travel Demand Analysis
Analysis Area
Transportation Problems & Opportunities Report
First Round of Public Consultation
Transportation Alternatives Report
Second Round of Public Consultation
Economic Benefits Report
Revenue Generation Report
Transportation Planning/Need and Feasibility Report
Third Round of Public Consultation
Canada
U.S. Department of Transportation Federal Highway Administration
Ontario
MDOT Michigan Department of Transportation
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study
Work Program
EXHIBIT 1.2


Planning/ Need & Feasibility
30-Year Strategy (may include several elements)
Terms of Reference for Major Projects (1 or more)
Environmental Impact Study(ies)
Environmental Assessment(s)
Design
Construction
Infrastructure or Operational Improvements
Canada
Federal Highway Administration
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study
Study Process
EXHIBIT 1.3

1.3. Other Government Transportation Initiatives

Together with the Partnership's Planning/Need and Feasibility Study, a number of initiatives are currently in progress that address various issues related to international traffic in the Broad Geographic Area. A listing of the current initiatives is provided in Exhibit 1.4.

It should also be noted that border crossing rights of First Nations people residing in Canada and the US will be considered at existing as well as any new border crossings.

EXHIBIT 1.4: OTHER GOVERNMENT INITIATIVES TO ADDRESS BORDER TRANSPORTATION ISSUES

Participating Agencies	Initiative	Purpose/Objective
Federal Government of Canada / Province of Ontario	Joint Management Committee	Identify a 5-year Action Plan to address short and medium-term improvements at the Windsor border crossings
FHWA / MDOT	Gateway Study	Development and approval of improvements to connections between Ambassador Bridge plaza and interstate system
TC/ FHWA/ MTO/ MDOT together with Canadian and US Customs and Immigration Agencies	Detroit-Windsor Border Working Group	On-going co-ordination of transportation and border processing improvements at Detroit-Windsor border crossings
MDOT / BWBA	Blue Water Bridge Plazas Improvements	Separate planning studies leading to infrastructure and border processing improvements at CA and US plazas
Federal Governments of Canada and US	Canada-US Smart Border Declaration (Manley-Ridge)	Establishment of programs and projects consistent with Four Pillars of border security (Secure flow of people, secure flow of goods, secure infrastructure, and information sharing)
TC/ MTO/ City of Windsor	Operational Improvements on Huron Church	Immediate improvements to address current operational issues
US Army Corps of Engineers/TC	Feasibility Study (to be initiated in 2003)	Review feasibility of improving commercial navigation on Great Lakes/ St. Lawrence Seaway System

1.4. Past Studies

A number of studies have projected a need for additional capacity at the border crossings that are being studied in this project. The details differ but the conclusions are similar and they are summarized below.

The *Southwestern Ontario Frontier International Gateway Study Technical Report* – produced by the Ministry of Transportation of Ontario (MTO) in December 1998 – arrived at the following conclusions:

- International trade carried by trucks is projected to increase at an average annual rate of four to five percent.
- Trade and truck traffic will double by 2021, which will increase delays.
- Blue Water Bridge will provide adequate capacity; however, truck processing on the Michigan side needs to be improved.
- Detroit-Windsor Tunnel is close to capacity.
- Ambassador Bridge will reach the capacity of a four-lane bridge between 2011 and 2021.
- Future traffic deficiencies on Huron Church Road/Highway 3 and the Ambassador Bridge represent a major source of delay for trade and traffic across the Detroit River. Improvements to the connection from Highway 401 to I-75 across the Detroit River will require a bi-national study of corridor options to evaluate the long-term need and feasibility for a new or improved international highway crossing.

The Eastern Border Transportation Coalition produced the *Trade and Traffic Flows Across the Eastern US-Canada Border* in May, 1997 and reported:

- Projected continued growth would likely result in major operational deficiencies in the transportation network in the near-term as auto volumes return to earlier rates of increase (decreases occurred 1992-94 due to the recession, changes in tariffs, reduced value of the Canadian dollar, reduced cross border shopping, etc.), with a potential economic crisis over the next 20 years due to the potential for very major delays to truck traffic.
- The Southeast Michigan – Southwest Ontario trade corridors were noted as being areas where improvements to the transportation network are needed to address future demand.

The *Ontario-Michigan Border Crossing Traffic Study* produced by MTO, Transport Canada, MDOT, and FHWA in August 2001 found that:

- Nearly 90 percent of weekday tunnel traffic is local.
- Ambassador Bridge traffic is 70 percent local.
- At Ambassador Bridge, 72 percent of all trips into Canada, 68 percent of all trips into the U.S. started and ended within the Southeast Michigan Council of Governments (SEMCOG)/Essex area.

- At the tunnel, 90 percent of all trips into Canada and 86 percent of all trips into the U.S. started and ended within the SEMCOG/Essex area.
- At the Blue Water Bridge, 44 percent of all trips into Canada, 49 percent of all trips into the U.S. started and ended within the SEMCOG/Lambton County area.

The Windsor Area Long Range Transportation Plan (WALTS), August 1999 indicated that:

- Over 90 percent of cross-border trips either originate or terminate in the SEMCOG/ WALTS area.
- 76 percent of cross-border trips have both ends in the local area.
- Border crossing facilities at Windsor will reach capacity within 20 years, and as early as 2014; further, associated connecting corridors (Huron Church Road and Highway 3) will reach capacity by 2016.
- Issues related to cross-border traffic will require involvement of provincial and federal governments, as international transportation infrastructure requires federal approval and the implementation of such infrastructure will be partly influenced by provincial initiatives.

1.5. Consultation Incorporated in the Transportation Problems and Opportunities Report

The Planning/Need and Feasibility Study includes a consultation program designed to obtain input and share information with public sector and private sector stakeholders, as well as the general public. The consultation activities reflected in this Summary Report include meetings with the following:

- Public Sector Consultation Group, consisting of various affected government departments, ministries, agencies, municipalities and First Nations in the Broad Geographic Area.
- Private Sector Consultation Group, consisting of owners/operators of current border crossings and proponents of new border crossing proposals in the Broad Geographic Area, as well as representatives of border crossing users, including local industry, tourism and trucking operations.
- Border Crossing Agencies, including representatives from customs and immigration agencies in both Canada and US, as well as US Government Services Agency.

The release of this document coincides with the first round of formal public consultation. Input from the general public, as well as the other consultation groups, on the work completed to date as discussed in this report is encouraged. The comments received from the first round of consultation will be taken under advisement for future work of the study.

2. Geographic Overview

2.1. Border Crossing Movements

2.1.1. Trade

Canada and the United States are the largest bilateral trade partners in the world. The North American Free Trade Agreement (NAFTA) has had significant impact on trade between the two nations, solidifying/reinforcing access to bilateral trade for both markets. In 2001, 87 percent of the value of Canadian exports was destined for the United States. Approximately 40 percent of these exports entered the United States via either the Detroit-Windsor or Port Huron-Sarnia corridors (reference Table 2.1), signifying the importance of these border crossings to the national economies of both the United States and Canada.

Canada is the largest importer of U.S. products, with 22 percent of total United States exports destined for Canada and more than two-thirds of these exports headed for Ontario. The nature of commodity trade via Detroit-Windsor and Port Huron-Sarnia is illustrated in Exhibit 2.1.

In year 2000, total U.S. trade with Ontario was US$243 billion (CAN$365 billion[1]), which is larger than total U.S. trade with Japan. Recent statistics from U.S. International Trade Administration identify that Canada is the largest export market for a number of U.S. states, including Michigan, Ohio, Indiana and Illinois.

In terms of value of shipments, Detroit was the largest point of entry for Canadian exports to the U.S. and Port Huron was the second largest, indicating the significance of these trade corridors not just to the local economies or provincial/state economies, but also to Canada and the United States in general. Approximately one-fifth of the value of total Canadian exports to the U.S. passes through each of these ports annually.

The most significant component of this bilateral trade is related to the automotive industry. The Autopact, the 1965 agreement between Canada and the U.S. that opened the way for Canadian auto plants to produce automobiles for sale in the U.S., followed by NAFTA, has propelled Canada into an ongoing trade surplus situation with the United States. Exports to the United States were negligible prior to the pact but now cars and trucks are Canada's largest items of export. With the "Big Three" original automakers located across the river in Detroit, Ontario has become a leader in automotive manufacturing exports to the United States. Similarly, Michigan has become a major importer of Canadian products. In fact, 16 percent of all Canadian worldwide exports are destined for Michigan.

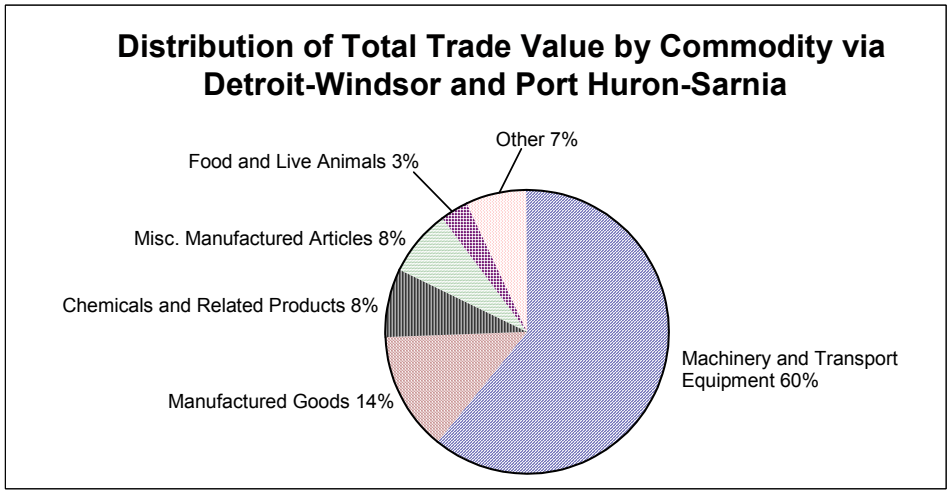
[1] Unless otherwise indicated, a currency conversion rate of 1.6:1 Canadian to U.S. is used throughout this document.

TABLE 2.1: VALUE OF SURFACE TRADE THROUGH WINDSOR/DETROIT AND SARNIA/ PORT HURON, BILLIONS OF $US[$CDN]

	1995	2001	Annual Growth
Total Bi-National Surface Trade			
Canada to U.S.	143.7 [197.1]	200.9 [311.1]	6%
U.S. to Canada	129.9 [178.2]	145.7 [225.6]	2%
Total	**273.6 [375.3]**	**346.6 [536.7]**	**4%**
Surface Trade Through Windsor/Detroit and Sarnia/Port Huron			
Canada to US	58.5 [80.3]	81.0 [125.4]	6%
U.S. to Canada	52.3 [71.7]	66.5 [103.3]	4%
Total	**110.8 [152.0]**	**147.5 [228.7]**	**5%**
% of Total Bi-National Surface Trade Through Windsor/Detroit & Sarnia/ Port Huron	**40%**	**42%**	**N/A**

Source: USDOT Bureau of Transportation Statistics

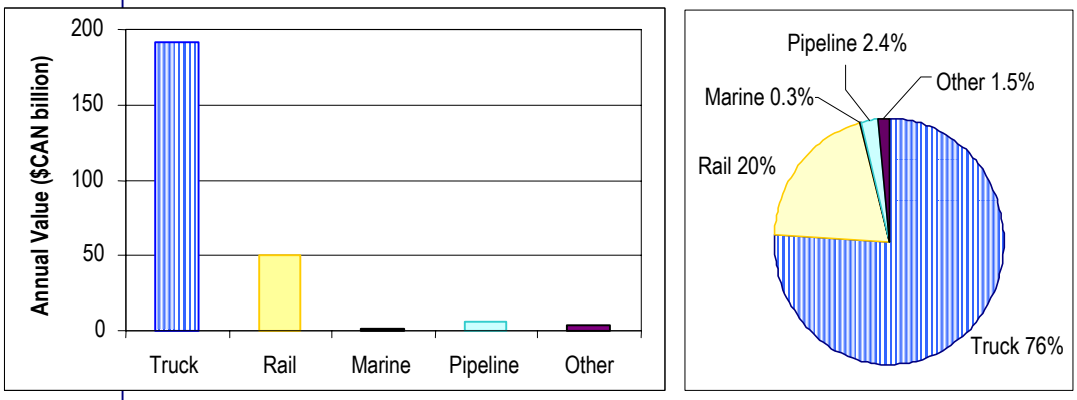
EXHIBIT 2.1: DISTRIBUTION OF TOTAL TRADE VALUE BY COMMODITY VIA DETROIT-WINDSOR AND PORT HURON-SARNIA



Source: U.S. Census Bureau – 2000 Data

Approximately 76% of the value of goods transported between Southeast Michigan – Southwest Ontario is carried on trucks (reference Exhibit 2.2). Rail carries approximately 20% of the goods by value, while marine, pipeline, air and other modes account for approximately 4% of the total goods transported.

EXHIBIT 2.2: CROSS-BORDER VALUE OF GOODS TRANSPORTED BY MODE IN DETROIT-WINDSOR AND PORT HURON-SARNIA (ANNUAL 2000)



Note: Other may include mail and/or air
Data Source: Canada Customs and Revenue Agency

The increased trade flows have resulted in a robust increase in truck and railcar crossings at Detroit-Windsor and Port Huron-Sarnia. In terms of the division of this trade by crossing location, the data presented in Table 2.2 identifies that between 1998 and 2001, the Detroit River crossings consistently carried over 70% of the total value of cross-border trade in the Southeast Michigan – Southwest Ontario frontier.

Since 1995, the values of freight crossing by truck and by railcar have grown at average annual rates of 5.2 percent and 6.6 percent, respectively. Trucks now represent one-fifth of all vehicle crossings at Detroit-Windsor and Port Huron-Sarnia. Cross-border truck traffic has steadily increased at all three road-based border crossings, reflecting the propensity of just-in-time delivery practices adopted by the major manufacturing plants in the area.

Two-way trade between the U.S. and Canada through the Windsor/Detroit and Sarnia/Port Huron corridors continues to increase. Over the long term, the prospects for continued bilateral trade growth between Canada and the U.S. remain strong. As evident over the past thirty years, bilateral trade in goods and services has grown faster than GDP, increasing at an annual rate of approximately 11 percent. Moreover, in recent years, trade between Border States and provinces has grown significantly faster than national bilateral trade.

TABLE 2.2: DIVISION OF VALUE OF GOODS CROSSING BORDERS ($U.S. [$CDN] BILLION)

	1998	1999	2000	2001
St. Clair River[1] Value of Goods from Canada to U.S.	14.6 [23.36]	15.1 [24.16]	16.60 [25.56]	15.40 [24.64]
St. Clair River[1] Value of Goods from U.S. to Canada	12.3 [19.68]	15.1 [24.16]	16.1 [25.76]	14.5 [23.20]
Total at St. Clair River Crossings	26.9 [43.04]	30.2 [48.32]	32.7 [52.32]	29.9 [47.84]
Detroit River[2] Value of Goods from Canada to U.S.	41.8 [66.88]	46.6 [74.56]	47.4 [75.84]	44.8 [71.68]
Detroit River[2] Value of Goods from U.S. to Canada	34 [54.4]	37.2 [59.52]	38 [60.8]	34.9 [55.84]
Total at Detroit River Crossings	75.8 [121.28]	83.8 [134.08]	85.4 [136.64]	79.7 [127.52]
Total at Both Crossings	102.7 [164.32]	114 [182.4]	118.1 [188.96]	109.6 [175.36]

Source: U.S.D.O.T., Bureau of Transportation Statistics

[1] St. Clair River refers to border crossings between the Cities of Port Huron, Michigan and Sarnia, Ontario, including the Blue Water Bridge and the Sarnia-Port Huron rail tunnel.

[2] Detroit River refers to border crossings between the Cities of Detroit, Michigan and Windsor, Ontario, including the Ambassador Bridge, the Detroit-Windsor Tunnel (auto and truck), the Windsor-Detroit rail tunnel, and a truck ferry service.

The conclusion of a report commissioned by Industry Canada on North American Integration[1] is that over the next 25 years, the economic integration between Canada and the U.S. will advance markedly, two-way trade flows will continue to expand sharply and that trade will play an even greater role in both economies. This report cites that free trade forces will bring about a further increase in Canada-U.S. trade, which by 2005 or 2010 could be 20 to 30 percent above what it would have been in the absence of the recent trade agreements.

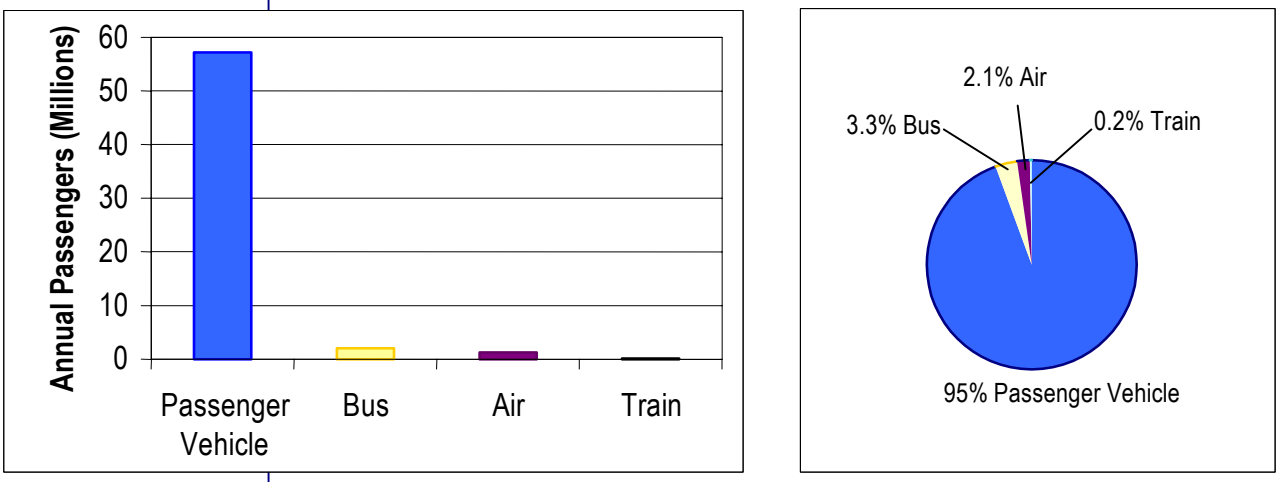
The Detroit River frontier represents the busiest corridor for trade between Canada and the United States. The benefits of such trade to the local, regional and national economies is represented in the prosperity, opportunities and high standards of living each country enjoys, and the prospect of continued increased trade passing through this corridor must be encouraged as well as protected. The governments of Canada, United States, Ontario and Michigan each have a duty and responsibility to provide for and reduce the likelihood of disruption to the safe, continuous transport of people and goods across the Detroit River frontier.

[1] *North American Integration: 25 Years Backward and Forward*, by Gary C. Hufbauer and Jeffrey J. Schott, Institute for International Economics, 1998.

2.1.2. People Movement

In discussing the volumes and trends in cross-border people movement in the Broad Geographic Area, it is important to recognize that the vast majority of such trips are accomplished via passenger cars (reference Exhibit 2.3). While bus, air and ferry services are available and operating in the BGA, the information on trip purpose and trends in people movement available for the BGA is generally gathered and expressed in terms of passenger vehicle data. In identifying an overall 30-year transportation strategy, this Planning/Need and Feasibility Study will consider all modes of people movement.

EXHIBIT 2.3: MODAL SHARE OF CROSS-BORDER PERSON TRIPS FOR SOUTHEAST MICHIGAN – SOUTHWEST ONTARIO BORDER CROSSINGS (ANNUAL 2000)



Data Source: Passenger Car, Bus Passenger, Train Passenger: U.S. DOT, BTS, based on data from U.S. Customs Service, Mission Support Services, Office of Field Operations, Operations Management Database – based on passengers incoming to US, multiplied by 2. Air: U.S. DOT, based on flights between London/Toronto and Detroit/Lansing/Grand Rapids/Chicago.

Ontario-Michigan passenger car border crossing volumes have been rising fairly steadily, almost doubling from 11.6 million in total in 1972 to 21.5 million in total for 2000. From 1995 to 2000, overall passenger vehicle growth averaged 2.0 percent per annum. This trend runs counter to the trends in all other ports of entry where passenger vehicle crossings decreased by 2.2 percent annually. However, the initial change in cross-border travel post-September 11, 2001 contributed to an overall decrease in cross-border vehicle movement of approximately 10 percent. As a result, total passenger vehicle crossings at Detroit-Windsor and Port Huron-Sarnia for the period 1995 to 2001 remained virtually unchanged. Table 2.3 provides the number of total border crossings by passenger vehicles. As shown in this table, the annual volume of passenger vehicles crossing the Blue Water Bridge is approximately one-quarter of that crossing the Ambassador Bridge and the Detroit-Windsor Tunnel combined.

TABLE 2.3: TOTAL PASSENGER VEHICLE CROSSINGS (THOUSANDS)

	Ambassador Bridge	Blue Water Bridge	Detroit Windsor Tunnel	Total
1995	7,498	3,797	8,148	19,442
1996	7,824	3,850	8,754	20,429
1997	8,123	3,875	8,660	20,658
1998	8,609	3,840	9,136	21,585
1999	8,925	4,043	9,337	22,304
2000	8,734	4,390	8,368	21,491
2001	7,813	4,122	7,512	19,447
Annual Growth				
1995-2000	3.1%	2.9%	0.5%	2.0%
1995-2001	0.7%	1.4%	-1.3%	0.0%

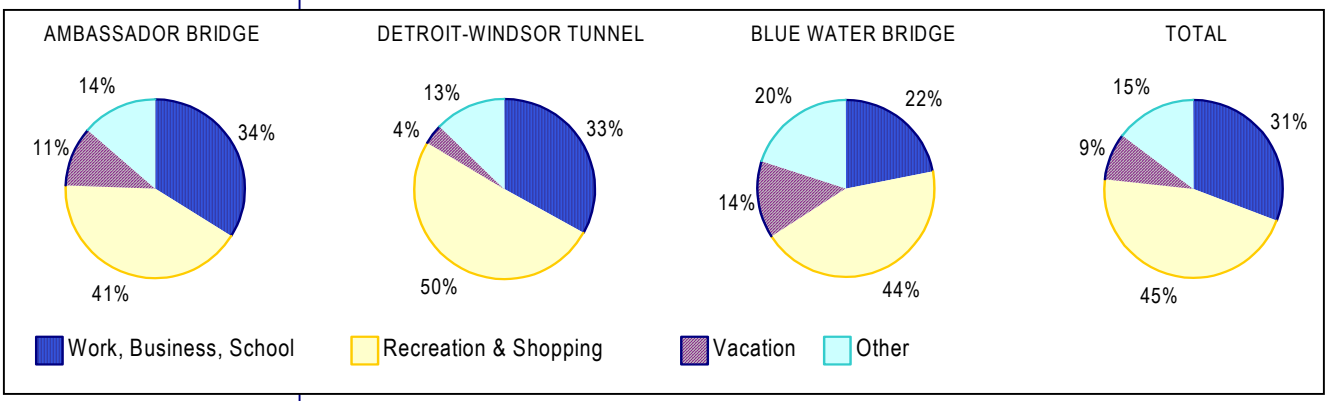
Source: BTOA

According to data collected across all Canada-U.S. border crossings from 1992 to 1999, U.S. person trips to Canada increased by 38 percent over this time frame while trips by Canadian residents to the U.S. have declined by 45 percent in total, due mostly to the reduction in same-day trips. This decline in travel to the U.S. by Canadian residents is due, in part, to the decline in the value of the Canadian dollar against the U.S. dollar. The 27 percent depreciation in the dollar from 1991 to 2001 made shopping and travel in the U.S. less attractive for Canadians. Combined, total cross-border trips fell by approximately 3 percent.

The same data also identified that the primary purpose of overnight trips by Canadian residents to the U.S. was vacation, although its share dropped from 68 percent in 1997 to 52 percent in 1999. The main purpose of overnight trips by U.S. residents to Canada was also vacation and its share increased from 47 percent in 1997 to 57 percent in 1999. This is consistent with the effect of the depreciation in value of the Canadian dollar.

A breakdown of cross-border passenger car trips by trip purpose by crossing is shown in Exhibit 2.4. The Ambassador Bridge and the Detroit Windsor Tunnel are similar in that they carry a higher proportion of commuting travel (work, business, school), but less recreation and shopping travel, compared to the Blue Water Bridge. Vacation travel is highly oriented to the Blue Water and Ambassador Bridges, with a small proportion of trips using the Detroit-Windsor Tunnel for this trip purpose.

EXHIBIT 2.4: CROSS-BORDER PASSENGER CAR TRIPS BY TRIP PURPOSE, 2000 WEEKDAY



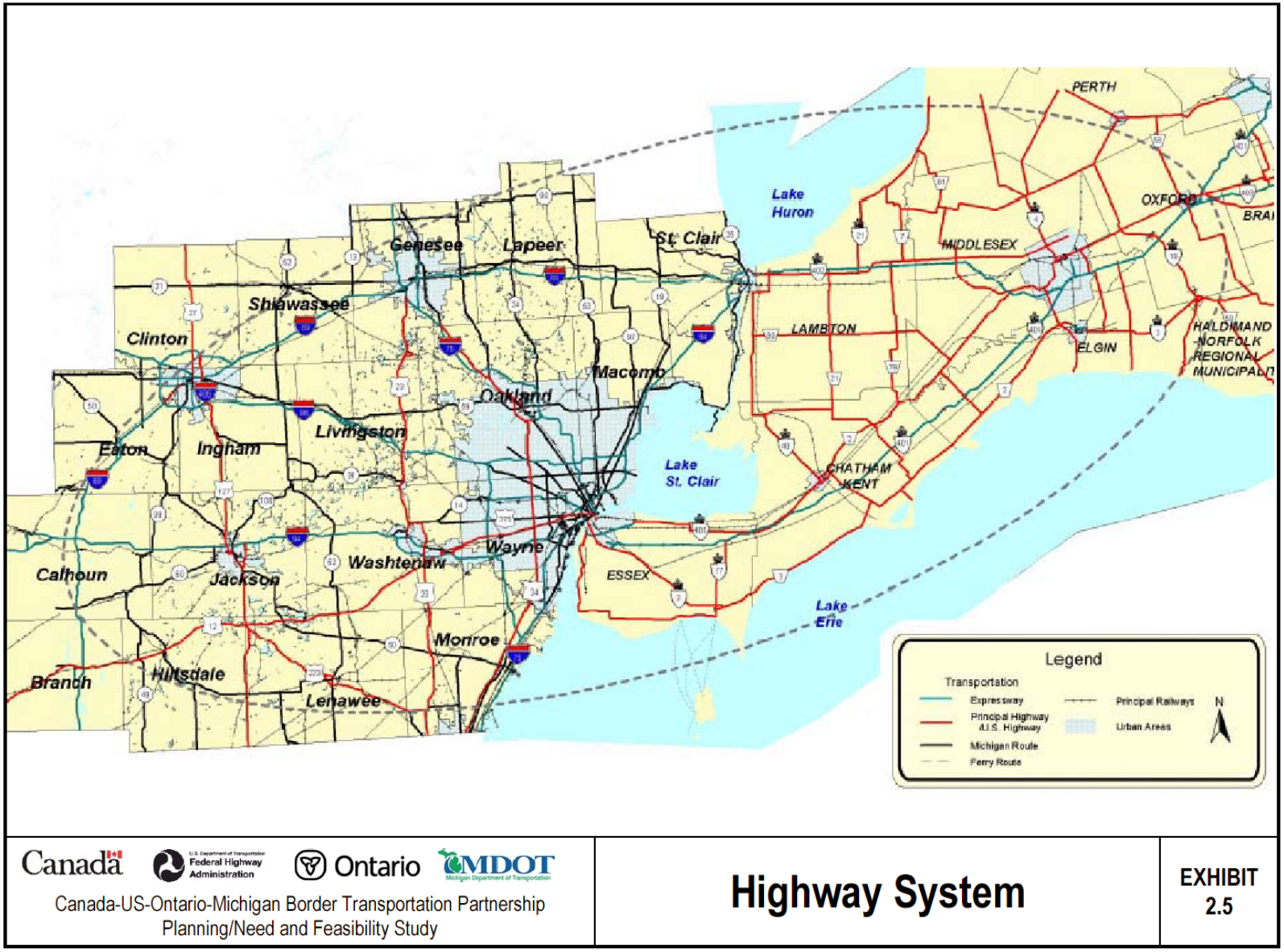
2.2. Transportation Network

2.2.1. Roadway Network

The highway network serving the border crossings is presented in Exhibit 2.5, which shows provincial and state highways under jurisdiction of the MTO and MDOT, respectively, and the local and regional road network under jurisdiction of the local municipality or county. On the Canadian side, Highway 401 is the primary provincial highway leading to/from the Broad Geographic Area. At London, Ontario, Highway 402 connects to Highway 401. Highway 401 serves southwest Ontario to Windsor-Detroit and Highway 402 provides access to areas west of London to Sarnia. Highway 401 is the predominant highway facility and trade corridor in Ontario, spanning the entire southern portion of the province, linking major urban/manufacturing centres in London, Waterloo Region, the Greater Toronto Area (GTA), and eastward to Quebec.

On the U.S. side, the interstate freeways leading to/from the Broad Geographic Area include I-75, I-94, I-69 and I-96. Each of these interstate freeways serve the urban/manufacturing areas of Southeast Michigan, and provide connections to other major urban areas throughout the rest of Michigan, the mid-western U.S. and beyond to the rest of the continental US, western Canada and Mexico.

The three fixed links in the Broad Geographic Area connecting the roadway system in Canada to that of the U.S. are the Ambassador Bridge, the Detroit-Windsor Tunnel and the Blue Water Bridge.


Lake Huron
PERTH
OXFORD
BRANT
MIDDLESEX
LAMBTON
ELGIN
HALDIMAND NORFOLK REGIONAL MUNICIPALITY
CHATHAM KENT
ESSEX
Lake St. Clair
Lake Erie
St. Clair
Lapeer
Genesee
Shiawassee
Clinton
Macomb
Oakland
Livingston
Eaton
Ingham
Wayne
Washtenaw
Jackson
Calhoun
Monroe
Hillsdale
Branch
Lenawee
Legend
Transportation
Expressway
Principal Highway U.S. Highway
Michigan Route
Ferry Route
Principal Railways
Urban Areas
N
Canada
Federal Highway Administration
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study
Highway System
EXHIBIT 2.5

The Ambassador Bridge, opened in 1929, is the world's longest international suspension bridge. With a total length of 2.8 km (9200 ft) and spanning some 560 m (1850 ft) across the Detroit River, this structure connects the local road network in west Windsor to the interstate freeway system in southwest Detroit. The structure features four lanes on a 17 m (55 ft) wide deck at a maximum grade of 5%. The maximum height of the bridge over the Detroit River is 45 m (152 ft). Both U.S. and Canadian plazas conduct a variety of border crossing functions, including toll collection, border processing, duty free shopping and currency exchange. In terms of total vehicle crossings, the Ambassador Bridge is the busiest border crossing in North America.

The Detroit-Windsor Tunnel, opened in 1930, connects the downtown areas of Windsor and Detroit. The Tunnel is 1,573 m (5,160 ft) long with a height clearance of 4 m (13 ft 2 inches). The roadway is 6.7 m (22 ft) wide and allows for two lanes of traffic in opposite directions. The maximum grade of the Canadian approach is 5% and 5.1% for the U.S. approach. The maximum depth from the roadbed to the river surface is 22.8 m (75 ft). The plazas at either end of the tunnel provide for a variety of border crossing functions, including toll collection, border processing, duty free shopping and currency exchange. The Detroit - Windsor Tunnel is the only vehicular international subaqueous border crossing in the world and is among the busiest border crossings in North America.

The Blue Water Bridge is actually a twin span; the original span was opened in 1938, and a twin span was opened in 1997. The original span has a deck width of 11.6 m (38 ft) and the twin span is 15.5 m (51ft). Together, the two spans provide six lanes over the St. Clair River connecting the terminus of Highway 402 in Point Edward to I-94 in Port Huron. The spans are approximately 1.9 km (6100 ft) long, with main spans of 266 m (871 ft) and 281 m (922 ft). Minimum clearance over the St. Clair River is 45 m (152 ft). The maximum grade of the Canadian approach is 4.25% and 4.31% for the U.S. approach. The plazas at either end of the bridge provide for a variety of border crossing functions, including toll collection, border processing, duty free shopping and currency exchange.

Table 2.4 lists the border processing facilities currently in place at each of the three fixed border crossings.

TABLE 2.4: ROADWAY BORDER PROCESSING FACILITIES

Crossing	Traffic Lanes (to U.S. / to CAN)	Toll Booths (to U.S. / to CAN)	Inspection Lanes for Trucks (to U.S. / to CAN)	Inspection Lanes for Autos (to U.S. / to CAN)
Ambassador Bridge	2 / 2	13 / 18	9 / 10	12 / 10
Detroit-Windsor Tunnel	1 / 1	6 / 6	1 / 3	10 / 9
Blue Water Bridge	3 / 3	6 / 5	5 / 7	8 / 12

Source: Southeast Michigan-Southwest Ontario Bi-National Transportation Planning Project, November 2001. Updated to reflect recent improvements.

2.2.2. Railway Network

There are four major freight railway companies active in the study area (reference Exhibit 2.6):

- Canadian National (CN);
- Canadian Pacific Railway (CPR);
- CSX Transportation (CSX);
- Norfolk Southern Corporation (NS).

All four railways operate on both sides of the international border, although the first two are Canadian headquartered and the last two are U.S. headquartered.

Existing rail freight traffic through Southeast Michigan – Southwest Ontario is in the order of 40 trains per day (20 trains each way), moving through two tunnels that cross the gateway at Detroit-Windsor and one at Port Huron-Sarnia (although one of the two at Detroit-Windsor is rarely used).

The original Sarnia – Port Huron tunnel, opened in 1890, was abandoned once the new St. Clair rail tunnel was completed in 1995. The St. Clair tunnel is a single track and can accommodate railway cars and loads of essentially all sizes, including double-stack container trains.

The Detroit-Windsor tunnel has twin tubes with each tube accommodating a single track. One of these was subsequently enlarged to take larger size equipment, while the other one is still in its original size. The larger one still cannot handle full double-stack dimension cars, however.

The dominant direction of rail traffic is from Canada to the U.S. (85% by weight). Primarily the auto, chemical and petroleum, forest products, and metal commodity sectors use the rail mode. The automotive sector includes finished goods (autos and trucks in purpose-built multi-level cars) and considerable traffic in auto parts, which is a growth area for intermodal services. The chemical and petroleum sector includes dry and liquid bulk chemicals and fertilizers that move in heavy shipments (often multiple carloads), and often need special handling as dangerous commodities. The forest products sector is a traditional export sector and covers wood pulp, pulp and paper, and lumber.

Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study

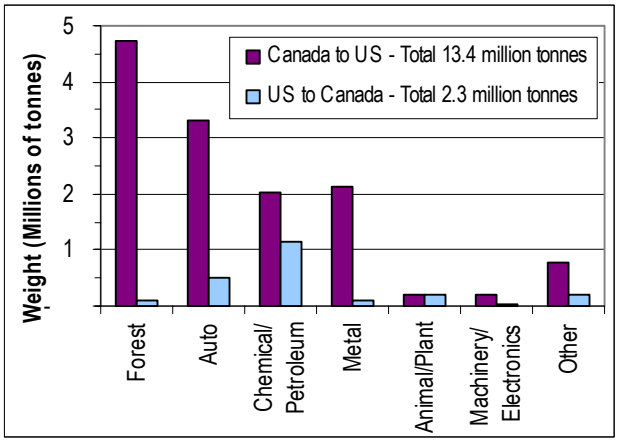
Study Area Rail Lines

EXHIBIT 2.6

Exhibit 2.7 shows the weight by commodity of rail-transported goods moving across Southeast Michigan – Southwest Ontario in 2000, and the value by commodity from 1994 to 2000. The total value of goods moving across the border by rail has increased over time, driven by growth in Canadian exports to the US. Meanwhile, the value of goods shipped to Canada from the U.S. by rail has declined slightly over this gateway in recent years.

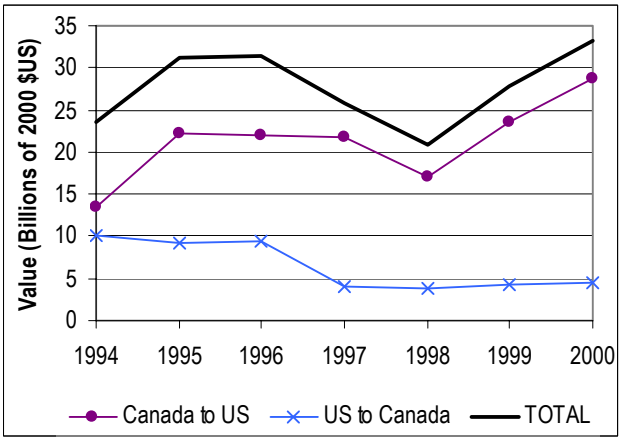
EXHIBIT 2.7: WEIGHT AND VALUE OF RAIL FREIGHT TRAFFIC ACROSS SOUTHEAST MICHIGAN – SOUTHWEST ONTARIO

WEIGHT, 2000[1]



[1] Does not include in-transit shipments.
Source: CCRA

VALUE, 1994-2000[2]



[2] Values after 1996 do not include in-transit shipments.
Source: BTS

The former ConRail lines in the Detroit area are now part of the "ConRail Shared Assets Organization", which is jointly owned by CSX and Norfolk Southern. These lines are shown as ConRail (CR) on the exhibit. In Canada, CSX owns a line between Sarnia and Blenheim, which intersects with both CN and CP. For the remainder of its Canadian operations, CSX operates with trackage rights over CN rail lines. NS also uses trackage rights rather than its own lines in Canada.

CN and CPR have recently entered into an agreement whereby they each can access both tunnels, although currently CN does not make extensive use of the Detroit-Windsor tunnel.

Although all four railways offer an intensive service of freight trains, CN and CPR operate most of the through trains crossing the border, including the RoadRailer and Expressway intermodal services.

The division of value of goods (in $U.S. billion) carried by rail across the two sections of the frontier (Detroit River and the St. Clair River) is described in Table 2.5. As shown in this table, the Sarnia/Port Huron rail tunnel conveys two to three times the annual value of cross-border goods as the Windsor-Detroit rail tunnel.

TABLE 2.5: DIVISION OF GOODS CROSSING BORDER BY RAIL ($U.S. [$CDN] BILLION)

	1998	1999	2000	2001
St. Clair River[2] Value of Goods from U.S. to Canada	10.9 [17.4]	16.4 [26.2]	22.2 [35.5]	20.2 [32.3]
St. Clair River[2] Value of Goods from Canada to U.S.	1.9 [3.0]	2.2 [3.5]	2.5 [4.0]	2.7 [4.3]
Total Crossing at St. Clair River	12.8 [20.4]	18.6 [29.7]	24.7 [39.5]	22.9 [36.7]
Detroit River[1] Value of Goods from U.S. to Canada	5.3 [8.5]	6.5 [10.4]	6.5 [10.4]	7.7 [12.3]
Detroit River[1] Value of Goods from Canada to U.S.	1.6 [2.6]	1.9 [3.0]	2.1 [3.4]	4.2 [6.7]
Total Crossing at Detroit River	6.9 [11.1]	8.4 [13.4]	8.6 [13.8]	11.9 [19.0]
Total Crossing Border	19.7 [31.5]	27.0 [43.1]	33.3 [53.3]	34.8 [55.7]

Source: U.S.D.O.T., Bureau of Transportation Statistics

[1] Via the Windsor-Detroit rail tunnel

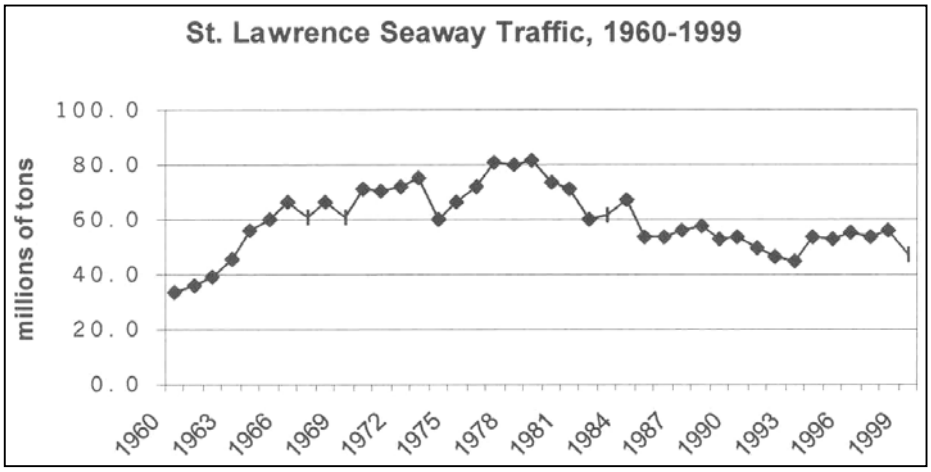
[2] Via the Sarnia-Port Huron rail tunnel

At present, there is one cross-border passenger train service operating between Toronto and Chicago, which utilizes the Sarnia-Port Huron crossing. The service is a joint VIA/Amtrak routing with service frequencies of 1 train per day in each direction, seven days a week. It is estimated that travel by passenger rail accounts for approximately 0.2% of the passenger traffic crossing between Southeast Michigan – Southwest Ontario. Trends in rail passenger traffic entering the U.S. in Michigan indicate that rail passenger volumes have been increasing fairly steadily, with 2000 volumes 42% higher than in 1994.

2.2.3. Marine

Marine shipments on the Great Lakes – St. Lawrence Seaway System have generally been declining since the early 1980's (reference Exhibit 2.8). Bulk goods (i.e. iron ore, coal) are well served by the seaway system. Some Michigan ports have handled increased volumes since the 1980's, primarily from increased shipments on the Upper Great Lakes. However, for other types of goods moving through southeastern Michigan – southwestern Ontario, the marine mode does not meet the needs of many industries/manufacturers. Some of the challenges facing the competitiveness of commercial shipping on the Seaway are the speed of marine in comparison to other modes, the seasonality of the System (the seaway is closed between Lake Erie and east coast ports between late December and mid-April) and the size of the locks on the seaway system, which restrict the size of vessels. This restriction results in goods/products that may be suitable for shipping, being trucked or shipped by rail around these locks and to/from the deep-water ports on the eastern coast of Canada and the US. Canadian and U.S. federal agencies are considering improving the Great Lakes – St. Lawrence Seaway System to further increase capacity for commercial shipping.

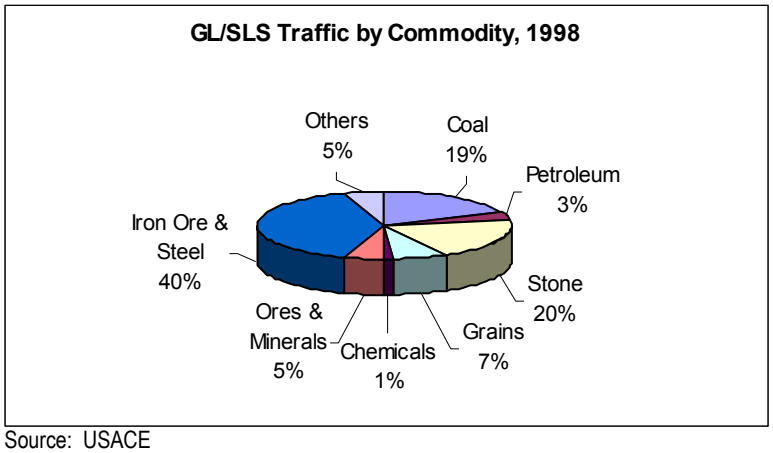
EXHIBIT 2.8: ST. LAWRENCE SEAWAY TRAFFIC – HISTORICAL DATA



Source: USACE

Active ports in this study area include Windsor, Detroit, Sarnia, Port Huron, St. Clair, Marysville and Marine City. Detroit and Windsor have organized port commissions, i.e. Detroit/Wayne County Port Authority and the Windsor Port Authority. In the most recent year for which statistics are available, Detroit handled 15.7 million metric tonnes (year 2000) and Windsor 5.8 million tonnes (1998). In both cases, almost all the cargo is North American, moving between these ports and other Great Lakes harbours. Exhibit 2.9 identifies the major commodities handled on the Great Lakes/St. Lawrence Seaway System (GL/SLS).

EXHIBIT 2.9: MAJOR COMMODITIES TRANSPORTED VIA MARINE



Source: USACE

The largest (by volume) commodity handled through the Port of Detroit is iron ore, followed by stone/aggregates, coal and cement. The major commodities handled in Windsor are stone, salt, grain and general cargo.

There are currently four cross-border ferry services operating in the study area. The Walpole Island Ferry, Marine City Ferry and Detroit-Windsor Truck Ferry are privately owned, while the Pelee Island Ferry is owned by the province of Ontario. Each provides a relatively limited service (in terms of total vehicle capacity); however the last does service

a specialized market in the Detroit-Windsor area that is not catered to by either of the crossings there. A description of each follows.

The Walpole Island Ferry provides year-round transport between Algonac, Michigan and Wallaceburg, Ontario at the northern end of Lake St. Clair using two boats. Each is capable of carrying up to 20 passenger cars and/or small commercial vehicles. There is a 20-minute headway and a 6-minute travel time at a cost of $4 U.S.

The Marine City Ferry operates year-round between Marine City, Michigan and Sombra, Ontario, also using two boats when busy. The ferries can transport 12 passenger vehicles each, but will also take large trucks. The service runs every 20 to 30 minutes and charges $5 U.S. per car. Travel time is 7 minutes.

The Pelee Island Ferry, operated by the Pelee Island Transportation Company, operates from March to December. There are two vehicular/passenger ferries between Pelee Island and the Ontario mainland (Leamington or Kingsville) or Sandusky, Ohio. The service runs an average of two to three times per day depending on the season and costs vary depending on passenger age, vehicle/trailer type, and departure port. Travel time between the mainland ports and Pelee Island is approximately one and a half hours. Travel time between Sandusky and Pelee Island is approximately one hour and 45 minutes.

The Detroit-Windsor Truck Ferry was started in 1990 for the purpose of handling trucks carrying dangerous goods (Classes 1, 3, 7 and 8), which are banned from the Ambassador Bridge and tunnel crossings in accordance with Michigan State law. The ferry also handles over-sized loads that cannot use the bridge or tunnel, but in no way restricts its use to these two markets.

The ferry operates with one-hour headways for 10-hour days and can shuttle 8 trucks per crossing. As the ferry currently handles about 40 trucks per day on average, it is operating at about 25% of capacity. The cost of a one-way crossing is $75 to $100 (CAN) in comparison to a $15 to $20 dollar toll fee for the bridge or tunnel (dependent on truck gross weight). Travel time is about 30 minutes and is currently unaffected by congestion delay. Thus, the ferry is a slower traverse (about 2 to 3 times longer) but is more reliable given the variation in wait times possible at the road-based crossings.

The ferry can provide a significant distance savings to trucks carrying dangerous goods or heavy loads by allowing them to cross at Windsor-Detroit as opposed to having to travel to alternate crossings that support this market. The alternative for vehicles with dangerous goods within the study area is Port Huron-Sarnia; very heavy vehicles must cross much further away by land between Minnesota and Ontario. It is estimated that more than 50% of the ferry crossing trips are from London (i.e. the point at which travel distances across the corridor via Port Huron-Sarnia and Detroit-Windsor are similar) inward, with a similar market range on the Michigan side.

Two other privately-owned ferry services operate in the BGA, although these are not cross-border services (Algonac–Harsen's Island and Algonac–Russell Island). In addition to the current ferry services operating in the BGA, additional cross-border ferry services (both passenger and commercial vehicle) are being proposed (reference Exhibit 2.10).

Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study

Existing and Proposed Ferry Service

EXHIBIT 2.10

2.3 Socioeconomic Overview

The Broad Geographic Area has a population of approximately 5.9 million people (Year 2000 data). Over eighty percent of the population of the region resides in the United States with Detroit being the largest city with a population of approximately one million. The Census metropolitan areas of London, with a population of 432,000 and Windsor, with a population of 307,000, are the largest centres on the Canadian side and represent approximately 68 percent of the total region's Canadian population.

A breakdown of population by county, along with historical growth data, is provided in Tables 2.6 and 2.7. As noted in these tables, the population on both sides of the border is increasing, with the rate of growth from 1990 to 2000 in Canada (8.0%) exceeding that in the U.S. (5.3%). The overall rate of population growth in the entire Broad Geographic Area over the same time period is approximately 5.8%.

The service industry (39%) and manufacturing (18%), led by the automotive sector are the primary sources of employment in the region representing almost 60% of total employment. The employment base on both sides of the border is increasing, with the rate of growth from 1990 to 1996 in the U.S. (8.2%) exceeding that in Canada (1.3%). The overall rate of employment growth in the entire Broad Geographic Area over the same time period is approximately 7.0%.

TABLE 2.6: HISTORICAL POPULATION BY ONTARIO COUNTY (THOUSANDS)

	Essex	Lambton	Chatham-Kent	Middlesex	Elgin	Total	10 Year Growth
2000	370	127	108	400	81	1,086	8.0%
1990	323	129	110	369	75	1,006	9.0%
1980	309	123	107	314	69	923	N/A

Source: Statistics Canada, HLB

TABLE 2.7: HISTORIC POPULATION BY MICHIGAN COUNTY (THOUSANDS)

	Wayne	St. Clair	Livingston	Macomb	Monroe	Oakland	Washtenaw	Total	10 Year Growth
2000	2,061	164	157	788	146	1,194	323	4,834	5.3%
1990	2,112	146	116	717	134	1,084	283	4,590	-2.0%
1980	2,338	139	100	695	135	1,012	265	4,683	N/A

Source: SEMCOG

3. Travel Demand

3.1. Travel Demand Analysis Process

Details of the Travel Demand Analysis Process employed for the Planning/Need and Feasibility Study are provided in the *Travel Demand Analysis Process Working Paper,* available under separate cover. The following provides a brief overview of the role of travel demand forecasting and the process used to determine and assess existing and future travel demand for this study.

Travel demand analysis is that part of transportation planning that attempts to understand characteristics, decisions and trends of travel. Travel demand is more than just reviewing the number of trips made on a network. It's an attempt to understand how travel time and economic factors will influence the decisions travelers make in selecting the mode, routes, time of day and frequency of trips between origins and destinations. Understanding these factors and their effect on the current and future behavioural patterns is an essential part of transportation planning.

Factors affecting passenger demand considered in this study include economic output, population, employment, casinos/recreation/shopping, US-Canada currency exchange rate and price variables. Factors affecting demand for goods movement considered in this study include US-Canada currency exchange rate, economic production and commodity trade.

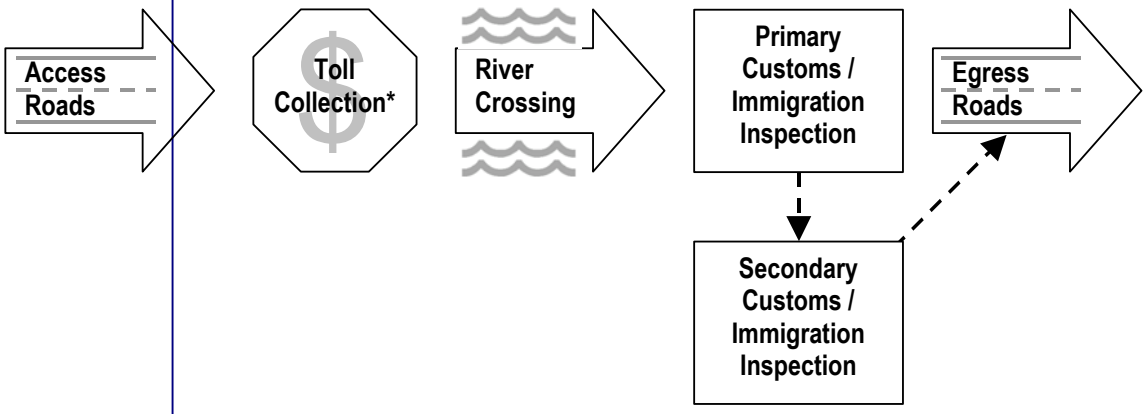
The travel demand analyses carried out for the Planning/Need and Feasibility Study involved the development of a comprehensive process to estimate future demand on the existing and currently committed future transportation network. The process included the development of a regional travel demand forecasting model. The regional model developed for this study built on extensive work already carried out by Southeastern Michigan Council of Governments (SEMCOG), MDOT, MTO and the City of Windsor. All of the models developed by these agencies were developed primarily for purposes other than examining cross-border movements. Recent economic, statistical and transport data and trends were incorporated into the regional model. Transportation planning representatives from SEMCOG, MDOT, MTO and the City of Windsor were involved in the development of the demand analysis process and calibration of the regional model.

Details of the assessments of the existing and future travel demand are provided in the *Existing and Future Travel Demand Working Paper*, available under separate cover.

3.2. Border Crossing System

International border crossings must be considered as a system made up of individual components. The movement of vehicles across the Canada-U.S. border involves a series of sequential activities. As illustrated in Exhibit 3.1, the border crossing system includes access roads leading to the border crossing, toll collection, the bridge span or road bed itself, customs inspection (primary and secondary), and egress roads. Border capacity is governed by all of these components with the component with the lowest capacity governing the overall effective capacity of the crossing. Consequently, the ultimate capacity of a bridge or tunnel will not be realized if the customs capacity or road access capacity is the limitation or bottleneck in the system.

EXHIBIT 3.1: TYPICAL BORDER CROSSING SYSTEM



*Note: Toll collection may occur at or subsequent to clearing inspection.

As part of the data collection and travel demand analysis processes conducted for this study, consultation with Canadian and American border processing agencies was used to develop an understanding of current policy, operational and security issues and obtain input on assumptions of future conditions. This information was reflected in the travel demand forecasting model, as appropriate.

Earlier sections in this document establish the border crossings in the Broad Geographic Area as part of a major international trade route. As such they serve a diverse mix of vehicles, drivers, passengers and cargoes. One of the key challenges facing border processing agencies, particularly on the U.S. side of the border, is having sufficient staffing available to meet the fluctuating traffic demand at border crossings. It is generally recognized that, while programs such as FAST and NEXUS may provide some improvement in border processing capacity, additional staffing is required to address the increasing volumes of cross-border traffic and address the need for heightened awareness of security concerns.

In February 2002, an announcement was made that the U.S. Customs service would hire 285 additional officers for five Northern state border crossings. It is estimated that 78 of these new officers are being deployed to Detroit and 16 to Port Huron. This could ameliorate what some believe to be the most significant problem in improving traffic flow across the US/Canada border.

In addition, the U.S. Immigration and Naturalization Service is in the process of hiring 6,000 new officers including border patrol agents and immigration inspectors. The specific assignment of these new officers has not been announced, although it is expected that some of these resources will be directed to the Michigan border crossings to further improve staffing levels.

On this basis, assumptions regarding the capacities of border crossings have been analysed assuming that staffing at border crossings will be available to meet the long-term needs of the region. Through on-going consultation with border processing agencies in Canada and the US, the need for border processing resources to meet the anticipated transportation needs will be identified.

3.3. Existing Travel Demand

3.3.1. Roadway Based Travel Demand

Ambassador Bridge Border Crossing

The Ambassador Bridge border crossing is considered to consist of the Highway 401 connection to Highway 3, the arterial road designated as Highway 3, Talbot Road and Huron Church Road connecting Highway 401 to the Ambassador Bridge Canadian plaza (this arterial road is herein referred to as Huron Church Road), the Ambassador Bridge and related Canada/U.S. border processing facilities, and the U.S. plaza connections to I-75/I-96.

Although there are presently periods when travel demand exceeds border crossing capacity at this crossing, in general this crossing has sufficient infrastructure capacity to process existing auto and truck demands. It is acknowledged that queues for border crossing facilities frequently extend well back onto the access roads and significant delays are experienced by cross-border travelers. However, many of the existing queues and delays are related to various border processing issues (e.g. staffing, facilities and processing), and in the last year, border security issues have resulted in increased vehicle inspection times.

The areas operating at or near capacity during peak periods at this crossing are the connections between the interstate freeway system and the U.S. plaza, primary inspection of Canada–bound automobile traffic and secondary inspection of US-bound trucks.

At present, most of the signalized intersections along Huron Church Road are approaching capacity with several movements at critical levels. Under these conditions and with the large percentage of commercial vehicles using this facility, traffic flow can be unstable, with periods of congestion occurring unpredictably along the corridor.

Operational deficiencies at the Ambassador Bridge connections to the U.S. Interstate system are being addressed through large scale improvements being implemented over the next several years. The Ambassador Bridge Gateway Project, currently under construction and scheduled for completion in 2006, will address the current deficiencies in this component of the border crossing.

Detroit-Windsor Tunnel Crossing

The Detroit-Windsor Tunnel Crossing is considered to include the tunnel and related border processing facilities as well as the connections from the plaza to the downtown road networks in Windsor and Detroit.

The current limiting capacity constraint at this crossing is at the border processing components. The critical area operating at or near capacity during peak periods at this crossing is primary inspection of Canada-bound automobile and bus traffic and primary inspection of U.S.-bound autos. As with the Ambassador Bridge crossing, it is recognized that frequently, queues at the border crossing extend onto the downtown road network. Many of these queues and delays result from a lack of available staffing and border security issues, which increase vehicle inspection times.

The tunnel operator has identified initiatives for plaza improvements on both sides of the border. These improvements address current operating deficiencies and the need for additional/improved border processing facilities at this crossing.

Blue Water Bridge Crossing

The Blue Water Bridge Crossing is considered to include the connection of Highway 402 to the Blue Water Bridge Canadian plaza, the Blue Water Bridge and related border processing facilities and the connection of I-94 to the U.S. bridge plaza.

This crossing generally operates well below the capacity of the crossing. It is recognized that queues of US-bound trucks periodically extend back onto Highway 402. These queues and delays can be attributed to the lack of available staff at border processing as well as a lack of secondary inspection parking for US-bound trucks. The configuration of the U.S. plaza is currently being addressed in a planning study being undertaken by MDOT.

In addition, the Blue Water Bridge Authority is developing a Master Plan to address operational improvements, security and border processing issues on the Canadian plaza. The BWBA Master Plan, together with the MDOT planning study, will address the operational issues currently affecting traffic at this crossing.

Travel Patterns

In addition to traffic volumes, the travel demand analysis allows for an assessment of current travel patterns in the Broad Geographic Area. Understanding the origins and destinations of the daily trips that occur in the BGA helps to identify causes of problems in the transportation network and travel trends that need to be considered with future growth.

Details of the travel patterns in Windsor/Essex-Detroit/Wayne as well as Sarnia/Lambton-Port Huron/St. Clair are provided in the Existing and Future Travel Demand Working Paper. The discussion presented in this document summarizes the key travel pattern findings.

The origins and destinations of current trips at the border crossings were classified as two types – local and long distance. Table 3.1 provides tabulated results of the trip type analysis for both passenger cars at the Windsor-Detroit border crossings.

TABLE 3.1: WEEKDAY PASSENGER VEHICLE CROSS-BORDER TRIPS BY LOCAL/LONG-DISTANCE TRIP TYPE IN WINDSOR/ESSEX-DETROIT/WAYNE AREA, 2000 DATA

	PASSENGER CAR TRIPS					
	Ambassador Bridge		Detroit-Windsor Tunnel		Total	
DAILY TRIP TYPE	Volume	%	Volume	%	Volume	%
Local[1] to Local	18,360	70	21,980	87	40,340	78
Local (Detroit /Wayne Area) to/from Long-Distance	2,160	8	970	4	3,130	6
Local (Windsor/Essex Area) to/from Long-Distance	2,920	11	1,930	8	4,850	9
Long-Distance to Long-Distance	2,750	10	240	0.9	2,990	6
Other[2]	170	0.6	120	0.5	290	1
TOTAL TRIPS	26,350	100	25,240	100	51,590	100

Notes:
[1] For Ambassador Bridge and the Detroit-Windsor Tunnel, a "local" trip end refers to Essex and Chatham-Kent in Ontario, and the SEMCOG area in Michigan, excluding St. Clair County in Michigan.
[2] Includes unexpected or atypical trips; e.g. shortest trip not taken, unexpected long-distance diversion (e.g. Chatham-Kent to Detroit via Blue Water Bridge), etc.

As indicated in Table 3.1, the significant majority (almost 80%) of passenger car trips using the Windsor-Detroit border crossings are local trips with a trip origin and destination in either Windsor/Essex or Detroit/Wayne. This is consistent with the high degree of trips taken for work/business/school and recreation/shopping purposes documented at these crossings. Conversely, approximately 6% of the passenger traffic using the Windsor-Detroit border crossings has neither a trip origin nor trip end in the local area. Addressing delays at the Windsor-Detroit border crossings is necessary, therefore, to address the daily needs of local passenger movement.

Table 3.2 reflects a different profile of commercial vehicle border crossing trips than that identified for passenger cars. While the border crossings serve a significant volume of local-to-local trips, long-distance to long-distance trips account for over 40% of the commercial vehicle crossings. This is significant in that such trips may be candidates for diverting away from the Windsor-Detroit crossings to other road-based crossings, such as the Blue Water Bridge, or to other modes of transport, such as rail or marine.

TABLE 3.2: WEEKDAY COMMERCIAL VEHICLE CROSS-BORDER TRIPS BY LOCAL/LONG-DISTANCE TRIP TYPE IN WINDSOR/ESSEX-DETROIT/WAYNE AREA, 2000 DATA

	COMMERCIAL VEHICLE TRIPS					
	Ambassador Bridge		Detroit-Windsor Tunnel		Total	
DAILY TRIP TYPE	Volume	%	Volume	%	Volume	%
Local[1] to Local	2,550	21	490	68	3,040	24
Local (Detroit /Wayne Area) to/from Long-Distance	1,850	15	110	15	1,960	15
Local (Windsor/Essex Area) to/from Long-Distance	2,000	17	90	12	2,090	16
Long-Distance to Long-Distance	5,480	46	30	4	5,510	43
Other[2]	170	1.4	10	1.1	180	1
TOTAL TRIPS	12,040	100	720	100	12,760	100

[1] For Ambassador Bridge and the Detroit-Windsor Tunnel, a "local" trip end refers to Essex and Kent County in Ontario, and the SEMCOG area in Michigan, excluding St. Clair County in Michigan.

[2] Includes unexpected or atypical trips; e.g. shortest trip not taken, unexpected long-distance diversion (e.g. Chatham-Kent to Detroit via Blue Water Bridge), etc.

Exhibit 3.2 graphically illustrates the origin-destination travel pattern information for border crossing trips in the Windsor/Essex-Detroit/Wayne area. The majority of the truck movements in the Detroit-Windsor area are focused on the I-94 and I-75 corridors, which extend west and south from the Ambassador Bridge and Detroit-Windsor Tunnel. Additional information on the origins and destinations of the long distance commercial vehicle trips identified that approximately 13% (1,700 trucks) of the long distance trips utilize the I-75 corridor south of Detroit on the trip. The dominance of the auto manufacturing sector in Southeast Michigan and Ohio is the primary reason for these movements. Such trips may not be suitable candidates for diversion to the Blue Water Bridge, as this would result in significant out-of-way travel.

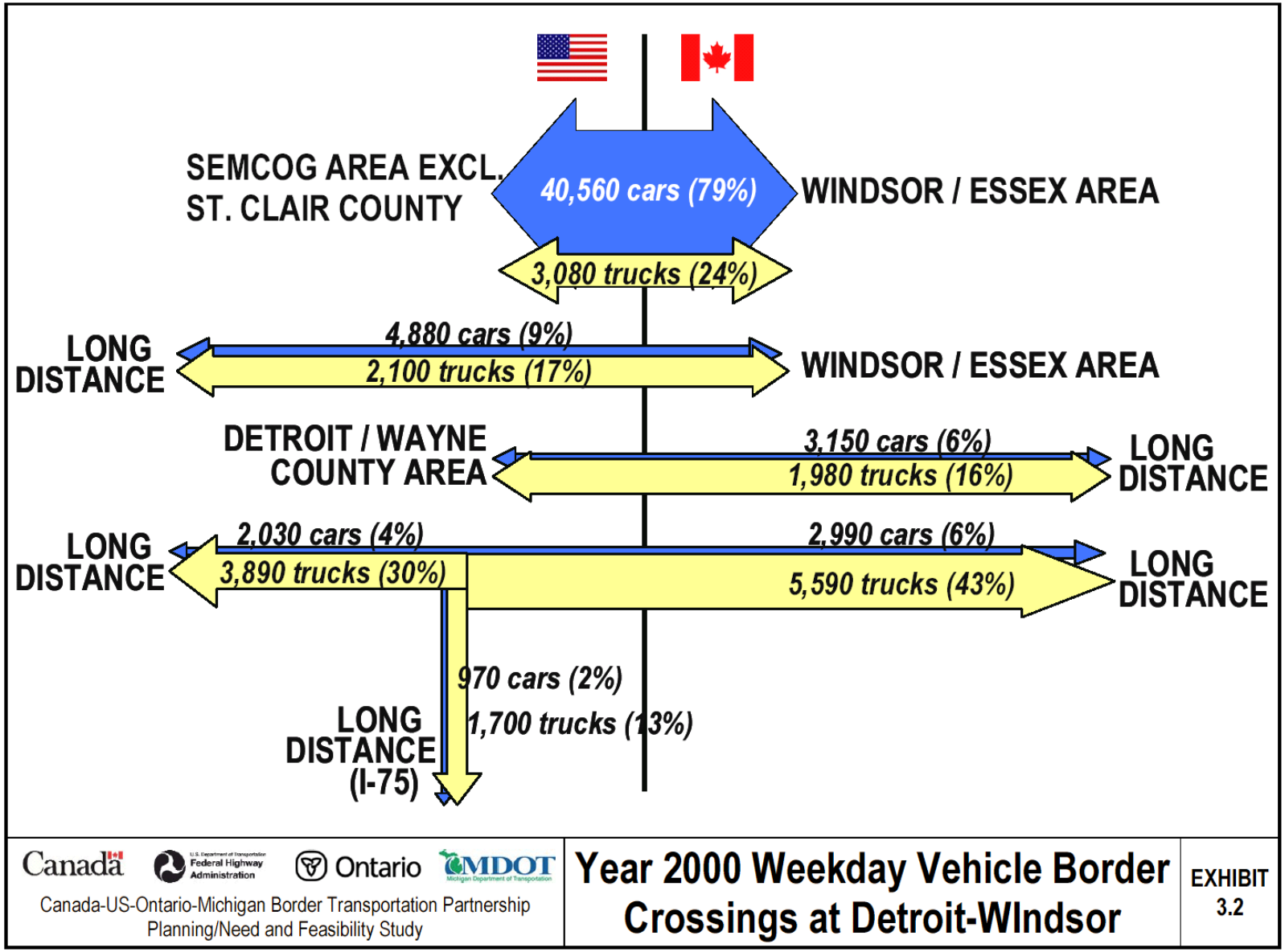

SEMCOG AREA EXCL. ST. CLAIR COUNTY
40,560 cars (79%)
WINDSOR / ESSEX AREA
3,080 trucks (24%)
LONG DISTANCE
4,880 cars (9%)
2,100 trucks (17%)
WINDSOR / ESSEX AREA
DETROIT / WAYNE COUNTY AREA
3,150 cars (6%)
1,980 trucks (16%)
LONG DISTANCE
LONG DISTANCE
2,030 cars (4%)
3,890 trucks (30%)
2,990 cars (6%)
5,590 trucks (43%)
LONG DISTANCE
970 cars (2%)
LONG DISTANCE (I-75)
1,700 trucks (13%)
Canada
Federal Highway Administration
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study
Year 2000 Weekday Vehicle Border Crossings at Detroit-Windsor
EXHIBIT 3.2

Table 3.3 provides the trip types for passenger and commercial vehicles at the Blue Water Bridge. The trip type characteristics are similar to those observed at the Windsor-Detroit border crossings in that the majority of passenger vehicle trips are local in nature and long-distance trips are a significant component of the commercial vehicle traffic.

TABLE 3.3: WEEKDAY CROSS-BORDER TRIPS BY LOCAL/LONG-DISTANCE TRIP TYPE IN SARNIA/LAMBTON-PORT HURON/ST. CLAIR AREA, 2000 DATA

	BLUE WATER BRIDGE			
	Passenger Vehicles		Commercial Vehicles	
DAILY TRIP TYPE	Volume	%	Volume	%
Local[1] to Local	6,010	43	40	0.8
Local (Port Huron/St. Clair Area) to/from Long-Distance	2,680	19	1,200	21
Local (Sarnia/Lambton Area) to/from Long-Distance	1,790	13	210	4
Long-Distance to Long-Distance	2,790	20	3,580	62
Other[2]	830	6	720	14
TOTAL TRIPS	14,100	100	5,740	100

[1] A "local" trip end refers to Lambton County in Ontario, and St. Clair, Macomb and Livingston Counties in Michigan.

[2] Includes unexpected or atypical trips; e.g. shortest trip not taken, unexpected long-distance diversion (e.g. Chatham-Kent to Detroit via Blue Water Bridge), etc.

Taken together, the information provided in the trip type tables also identify that the Windsor-Detroit crossings carry over four times the passenger vehicles and more than double the commercial vehicles at the Sarnia-Port Huron crossing.

3.3.2. Non-Roadway Travel Demand

Rail

As the freight rail systems in the Broad Geographic Area are all privately held companies, specific information on rail traffic and system capacities are not readily available from public sources. The assessment of current rail traffic demand in relation to the capacity of the rail crossings is based on the information available on current rail traffic levels and an understanding of rail operations. Considering the existing demand and the estimated capacity of the gateway rail facilities, the volume-to-capacity ratio on the rail network is about 33%, well below maximum potential.

Similarly, with one passenger train per day currently operating between Sarnia-Port Huron, additional capacity is available to increase passenger rail service, if warranted. However, the CPR line is close to full capacity.

Marine

In general, port facilities in the region have the capacity to accommodate increased traffic demand without significant infrastructure improvements. In addition, as noted earlier, Canadian and U.S. federal agencies are considering improving the Great Lakes – St. Lawrence Seaway to further increase capacity and create additional opportunities for commercial shipping. The improvements being considered may impact on the long-distance truck and rail travel demand, by enabling larger ships to serve areas further inland than is currently available.

As noted previously in this document, the current passenger and freight ferry systems operating in the Broad Geographic Area are operating below capacity. The three existing operators have indicated an ability to add vessels/increase frequency of service as required to respond to any increases in demand. In addition, there are proposals for adding passenger and truck ferry services in the Broad Geographic Area.

3.4. Future Travel Demand

Based on the outlook for increased economic activity within and between Canada and the US, as well as projected increases in the economic sectors found within the Broad Geographic Area, forecasts of travel demand were developed to the year 2030.

Travel demand is commonly derived from the projected behaviour of social (or demographic) measures of the study area such as population and employment. As the impact of travel resulting from commercial goods movement/trade is also of critical importance to this study, the behaviour of economic performance measures such as economic production and the rate of currency exchange must also be considered.

The forecasts considered three growth scenarios: High Growth, Low Growth and Base Case. As their names suggest, the High and Low Growth scenarios were based on the most optimistic and pessimistic (respectively) projections for international trade and travel demand, based on historic performance and available data from industry. The Base Case scenario assumes what is the most likely to occur, given projection in demand by the various commodity producers and manufacturers and the trade relationship between Canada and the U.S. For the purposes of analyzing future demand, this study adapted the Base Case scenario.

A summary of the forecasts by mode are provided in Table 4.4. The effects of this growth on the transportation network and travel patterns are described below. Details on the future travel demand projections are provided in the *Travel Demand Analysis Process Working Paper* and *Existing and Future Travel Demand Working Paper*.

TABLE 3.4: SUMMARY OF BASE CASE ANNUAL VOLUME FORECASTS (THOUSANDS)

Crossing	Vehicle Type	2000	2010	2020	2030	Overall Growth (2000-2030)	Avg. Ann. Growth (2000-2030)
Ambassador Bridge	Passenger Cars	8,734	10,313	11,598	12,525	43.4%	1.21%
	Commercial vehicles	3,486	4,300	5,592	7,593	117.8%	2.63%
	Buses	81	96	108	117	43.4%	1.21%
	Total	12,301	14,708	17,297	20,235	64.5%	1.67%
D-W Tunnel	Passenger Cars	8,368	9,322	10,007	10,749	28.4%	0.84%
	Commercial vehicles	182	227	295	394	116.6%	2.61%
	Buses	70	78	83	90	28.5%	0.84%
	Total	8,620	9,627	10,385	11,233	30.3%	0.89%
Ambassador Bridge and D-W Tunnel	Passenger Cars	17,102	19,635	21,605	23,274	36.1%	1.03%
	Commercial vehicles	3,668	4,526	5,887	7,987	117.8%	2.63%
	Buses	151	174	191	206	36.5%	1.04%
	Total	20,921	24,335	27,683	31,467	50.4%	1.37%
Blue Water Bridge	Passenger Cars	4,390	5,095	5,689	6,130	39.6%	1.12%
	Commercial vehicles	1,577	1,941	2,546	3,496	121.7%	2.69%
	Buses	10	11	13	14	39.6%	1.12%
	Total	5,977	7,048	8,247	9,640	61.3%	1.61%
SE-MI/ SW-ON Border	Passenger Cars	21,492	24,730	27,293	29,403	36.8%	1.05%
	Commercial vehicles	5,245	6,468	8,433	11,484	118.9%	2.65%
	Buses	161	185	204	220	36.7%	1.05%
	Total	26,898	31,383	35,930	41,107	52.8%	1.42%
	Rail Weight (tonnes)	19,296	23,828	30,516	40,790	111.4%	2.53%
	Rail Passengers	105	121	133	144	36.8%	1.05%

3.4.1. Roadway Based Travel Demand

Between 1972 and 2000, passenger vehicle volumes increased by 126% for the Ambassador Bridge, 52% for the Detroit-Windsor Tunnel and 88% for the Blue Water Bridge. Although passenger traffic growth has slowed down in recent years, starting even prior to September 11, 2002, expectations are that passenger traffic will continue to grow substantially over the next 30 years. The base case forecasts developed for this study project increases of 43%, 28% and 40% for passenger car traffic on the Ambassador Bridge, Detroit-Windsor Tunnel and Blue Water Bridge respectively between 2000 and 2030. The growth forecasts reflect the fact that much of the growth in traffic in the late 1990s, particularly for the Detroit-Windsor Tunnel, was fuelled by visits to Windsor Casino, whereas this traffic now appears to have stabilized. Additionally, modest population and employment growth in the Windsor-Essex and SEMCOG areas will likely result in a slowing of commuter related trips.

In the last 30 years, freight movements across the Ontario-Michigan border, in particular trucking movements, have increased at a very substantial rate. Between 1972 and 2000, the Ambassador Bridge experienced a five-fold increase in truck trips while Blue Water Bridge truck volumes increased by over six times. Trucking movements for the Detroit-Windsor Tunnel remained relatively stable; however, trucks represent a very small portion of the demand for this facility. In annual percentage terms, between 1972 and 2000, truck traffic has increased by 5.7% per year on the Ambassador Bridge and 6.8% on the Blue Water Bridge. The base case forecasts developed for this study estimate future annual growth rates of 2.63%, 2.60% and 2.69% for the Ambassador Bridge, Detroit-Windsor Tunnel and Blue Water Bridge, respectively. These growth rates are based on economic projections by goods movement category and reflect a slight reduction in the growth of international trade between Canada and the US. This outlook is due to the fact that the effects of free-trade agreements have now largely been absorbed by both nations' economies. Additionally, a slowing of the growth in auto manufacturing, one of the key markets for the Ontario-Michigan border crossings, is expected to occur over the next decade.

In terms of the patterns of travel demand, this study has confirmed that the majority of passenger movements (approximately 40,500 trips) across the Ontario-Michigan border are same-day trips starting and ending in the Detroit and Windsor areas. Same-day or local trips are more highly represented in the peak hours for border crossing demand. These same-day trips are generally not divertible by time of day or by location. Future travel patterns for passenger vehicles are therefore assumed to remain largely unchanged from current observations.

For truck movements, a large portion of the trips are longer-distance trips, although there are also a substantial amount of shorter-distance truck movements between Windsor/Essex and Detroit/Wayne County due to the high integration of the auto manufacturing sectors in these areas. As noted earlier, the majority of the truck movements in the Detroit-Windsor area are focused on the I-94 and I-75 corridors, which extend west and south from the Ambassador Bridge and Detroit-Windsor Tunnel. The dominance of the auto manufacturing sector in Southeast Michigan and Ohio is the primary reason for these movements. Some changes to travel patterns for commercial vehicles have been incorporated in the assessment of future travel demand. These changes reflect assumptions relating to future economic, transportation and commodity-based forecasts.

The future daily volume and capacity for each of the road-based border crossings are summarized in Exhibit 3.3 and discussed in the remainder of this section.

EXHIBIT 3.3: EXISTING AND FUTURE BASE CASE VOLUME/CAPACITY (PEAK DIRECTION)

Component	Ambassador Bridge	Detroit-Windsor Tunnel	Blue Water Bridge
Existing (2000)			
Access Road			
US	Near Capacity	Near Capacity	Adequate
Canada	Near Capacity	Near Capacity	Adequate
Toll Collection			
Autos	69%	54%	26%
Commercial Vehicles	101%	39%	100%
Roadbed			
Truck Lane	71%	-	-
Cars and Trucks (PCE)	73%	84%	22%
Border Processing			
Passenger Cars	112%	95%	64%
Commercial Vehicles	132%*	46%	86%
Projected (2030)			
Access Road			
US	Adequate**	Over Capacity	Adequate
Canada	Over Capacity	Over Capacity	Adequate
Toll Collection			
Passenger Cars	Adequate	Adequate	Adequate
Commercial Vehicles	Adequate	Adequate	Adequate
Roadbed			
Truck Lane	153%	-	-
Cars & Trucks (PCE)	135%	115%	41%
Border Processing			
Passenger Cars	193%	146%	89%
Commercial Vehicles	148%	79%	159%

Note: Component with highest volume-to-capacity ratio governs capacity for downstream components.
* Reflects 6 US truck inspection booths in 2000, which was increased to 9 in September 2002.
** Assumes Ambassador Bridge Gateway Project is completed.

Ambassador Bridge Border Crossing

As noted previously, congestion commonly occurs along Huron Church Road during peak travel periods today and several intersections are operating at near critical levels. Anticipated increases in border crossing traffic, combined with modest growth in background traffic, will mean that Huron Church Road will likely exceed capacity within 5 years. By 2010 at least seven intersections between Cabana Road and Ambassador Bridge will be operating at level of service F.

An assessment of future traffic operations identifies a number of problems at this crossing. Travel demand at almost all the various components of this crossing is expected to exceed the practical capacities, resulting in severe traffic congestion and extensive delays.

MTO has planned provisions for improvements to the section of Highway 401 east of Windsor from Highway 3 easterly to Tilbury. Therefore, this component of the corridor is expected to have sufficient capacity beyond the 30 year planning horizon.

As the traffic volumes approach the capacity of the facility, congestion, queuing and infiltration of traffic onto other parallel roads will become more frequent. (City of Windsor Traffic Engineering is already observing such conditions during periods of excessive delay at the border.) The effects of this problem can extend beyond the traffic and direct economic impacts associated with delays to the movement of people and goods. The local communities around the border crossings have expressed concerns with disruption to local access and impacts to air quality and noise levels during periods of congestion on the border crossing approach roadways.

No significant problems are anticipated in the future due to constraints at toll collection at the Ambassador Bridge. For U.S.-bound passenger vehicle traffic, toll collection currently occurs after vehicles have cleared U.S. Customs/Immigration inspection. The use of improved toll collection technology and frequent user programs are expected to help this component keep pace with increasing traffic demand.

Travel demand at border processing facilities on both the American and Canadian sides of the bridge is anticipated to reach available capacity within five years. It is recognized that border crossing programs, such as NEXUS and FAST, may be somewhat successful in deferring the need for additional border processing resources. However, additional staffing and facilities will be required to meet travel demand. Border processing agencies in both countries are working to address this need.

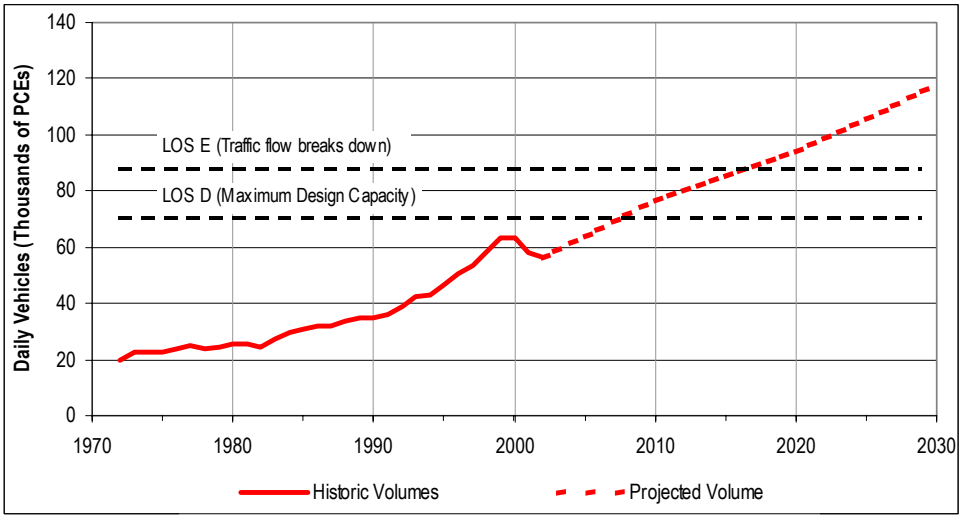
As noted earlier, operational deficiencies at the Ambassador Bridge connections to the U.S. Interstate system are being addressed through large scale improvements being implemented over the next several years. The Ambassador Bridge Gateway Project will address the current deficiencies relating to the connections between the bridge plaza and the freeway system. In addition this project involves improvements to secondary inspection of commercial vehicles for U.S. Customs. These improvements will address a major cause of delays currently experienced by U.S.-bound trucks at the bridge, which often results in impacts to operations on the access roads for this crossing. Once in place, it is anticipated that these improvements will provide sufficient facilities to address access to the bridge plaza/freeway system and U.S. border processing requirements over the long term.

Based on the assumed roadway capacity of the Ambassador Bridge, travel demand is expected to reach capacity within 10 to 15 years (refer to Exhibit 3.4). At that point, the bridge will be physically constrained from addressing increases in travel demand.

Ambassador Bridge capacity is projected to be reached within the following time frames:

Access Roads < 5 yrs
Roadbed 10-15 yrs
Border Processing < 5 yrs

EXHIBIT 3.4: FUTURE DAILY VOLUME AND CAPACITY – AMBASSADOR BRIDGE



It should also be noted that maintenance operations on the Ambassador Bridge structure generally require the partial closure of at least one lane. These ongoing periodic maintenance operations reduce the capacity of the facility and generate queues and delays. As with the effects of delays on Huron Church, the effects of delays due to capacity constraints on the Ambassador Bridge reach beyond the limits of the bridge and its plazas. As the busiest border crossing in North America, the impacts to the local, regional and national economies would be significant. It can be anticipated that the road network leading to the structure on both sides of the border will experience similar delay, access and traffic infiltration problems as noted previously, as border crossing volumes continue to increase.

Detroit-Windsor Tunnel Crossing

The Detroit-Windsor Tunnel Crossing is considered to include the tunnel and related border processing facilities as well as the connections from the plaza to the downtown road networks in Windsor and Detroit.

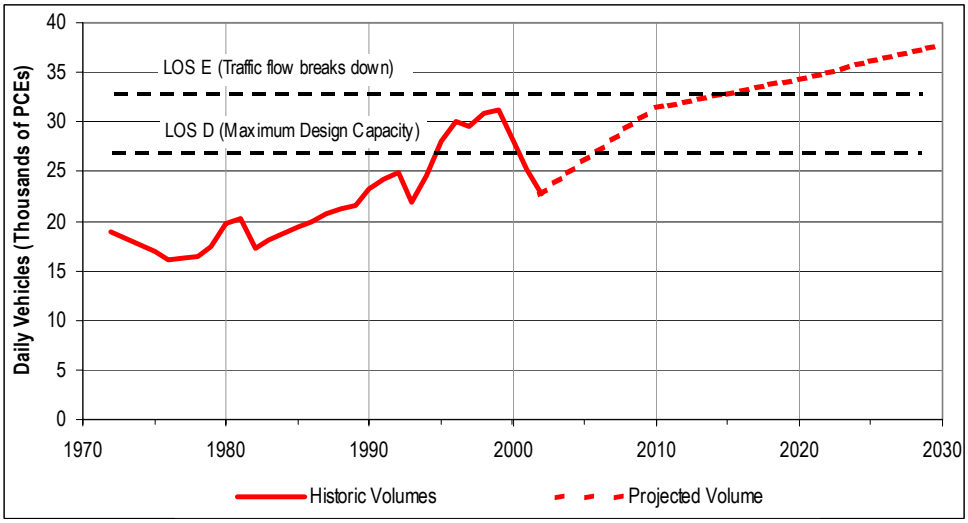
As noted earlier, the tunnel currently faces capacity constraints at this crossing at the border processing components. As travel demand continues to increase, these capacity constraints will increase delay at the crossing, leading to extensive queuing on the adjacent downtown road network of both Windsor and Detroit. The Detroit & Canada Tunnel Corporation is proposing significant changes on the U.S. plaza to address these issues and improve operations.

The Canadian plaza is constrained by adjacent development and road network. Short-term measures are being implemented to reduce the congestion effects on the Windsor road network caused by extensive queuing. In addition, plans are proposed for further operational improvements and improvements to border processing facilities.

The tunnel itself has sufficient capacity to meet the travel demands over the next 10 to 15 years (see Exhibit 3.5). At that point, the tunnel will be physically constrained from

addressing increases in travel demand.

EXHIBIT 3.5: FUTURE DAILY VOLUME AND CAPACITY – DETROIT-WINDSOR TUNNEL



Detroit-Windsor Tunnel capacity is projected to be reached within the following time frames:

Access Roads	*< 5 yrs*
Roadbed	*10-15 yrs*
Border Processing	*< 5 yrs*

Similar to the issues noted for the Ambassador Bridge, the impacts to the local and regional economies of disruptions or temporary closures due to maintenance, security, etc. at the tunnel would be significant. It can be anticipated that the downtown road networks leading to the tunnel on both sides of the border will experience similar delay, access and traffic infiltration problems as noted previously with the Ambassador Bridge.

Blue Water Bridge

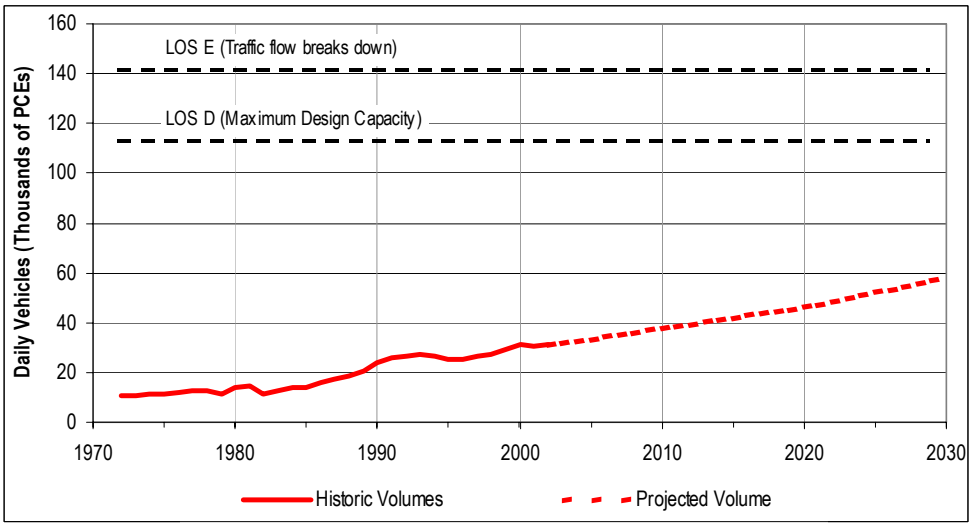
The Blue Water Bridge Crossing is considered to include the connection of Highway 402 to the Blue Water Bridge Canadian plaza, the Blue Water Bridge and related border processing facilities and the connection of I-94 to the U.S. bridge plaza.

As noted previously, although there is often congestion on Highway 402, this crossing generally has sufficient infrastructure capacity and is expected to operate below capacity beyond the 30-year timeframe for this study (see Exhibit 3.6). In coming to this conclusion, it is assumed that the recommended improvements to the configuration of the U.S. plaza currently being studied by MDOT will be implemented in a timely way to reduce cross-border delays at this crossing.

Blue Water Bridge capacity is projected to be reached within the following time frames:

Access Roads	*>30 yrs*
Roadbed	*>30 yrs*
Border Processing	*5-10 yrs*

EXHIBIT 3.6: FUTURE DAILY VOLUME AND CAPACITY – BLUE WATER BRIDGE



Similarly, it is assumed that operational improvements, security and border processing issues on the Canadian plaza identified in the Blue Water Bridge Authority Master Plan will be addressed through plaza reconfiguration. It is recognized that obtaining and maintaining adequate staffing at border processing facilities at both sides of the border will continue to be a challenge. Blue Water Bridge is presently the second-busiest Canada/U.S. border crossing in terms of commercial traffic volumes. A substantial portion of this traffic is long distance serving the areas well beyond the border crossing itself. Extensive delays at this crossing would have significant impacts to the local, regional and national economies of both countries.

The road connections to the bridge plaza on both sides of the border are not expected to reach capacity within the 30-year timeframe. MTO has provisions for widening Highway 402 from 4 lanes to 6 in the future as warranted to meet future travel demand. Similarly, planned widening of I-94 in the vicinity of the bridge plaza will ensure adequate capacity is available in the future.

3.4.2. Non-Roadway Travel Demand

Rail

The rail network is assumed to be operating currently at about one-third of its capacity. Future growth scenarios assuming increased diversion from truck transport to rail/intermodal were assessed to determine the likely future effects on rail operations. These scenarios acknowledge that rail has been successful at capturing a greater share of track traffic for longer distance shipments (i.e. greater than 400 km (250 mi)). Upon consideration of a range of growth scenarios, the capacity of the rail network was determined to be sufficient to meet the long-term needs of rail transport.

Marine

As noted previously in this document, the current passenger and freight ferry systems operating in the Broad Geographic Area are operating below capacity. It was assumed that travel demand for long-distance bulk shipping will remain relatively constant over the 30-year planning horizon for this study. All operators have indicated an ability to add vessels/increase frequency of service as required to respond to any increases in demand.

As discussed in the Roadway Network Travel Demand, future travel demand of vehicles is expected to exceed the capacity of the existing road network. This will create more opportunity for other modes and other crossings to serve the excess demand. Currently, the Detroit River truck ferry operates with one-hour headways for 10-hour days and can shuttle 8 trucks per crossing. As the ferry currently handles about 40 trucks per day on average, it is operating at about 25% of capacity. It is understood that the ferry service could operate two barges, providing a daily capacity of 320 trucks and that there are proposals for additional truck ferry services on the Detroit River. Given that the current commercial vehicle travel demand at the Ambassador Bridge is approximately 12,800 trucks per day and growing, it would appear that there is sufficient market to enable marine services to continue to play a role in serving travel demand at the border, but will have little effect in managing the excess demand.

4. Transportation Problems and Opportunities

4.1. Transportation Problems

The previous chapter outlined the current and future deficiencies in the roadway network serving the international border crossings in the Broad Geographic Area that are anticipated within the 30-year time frame for this Planning/Need and Feasibility Study. The problems to be addressed by this study are as follows:

- The lack of reasonable options for maintaining the movement of people and goods in cases of major incidents, maintenance operations, congestion or other disruptions at any of the existing border crossings;
- Lack of sufficient roadway capacity to meet the future travel demand at the Windsor-Detroit border crossings; and
- Lack of border processing capacity to meet the existing and future travel demand at the Windsor-Detroit border crossings.

These deficiencies are summarized in Exhibit 4.1.

Delays at border processing and lack of roadway capacity along Huron Church Road result in congestion and delays at the Ambassador Bridge border crossing. Similarly, delays at border processing and lack of capacity at the connections to the plazas at the Detroit-Windsor tunnel results in congestion and delays at the Detroit Windsor Tunnel. The Ambassador Bridge and Detroit-Windsor Tunnel represent two of the busiest border crossings in North America. They carry over 16 million passenger vehicles and 3.7 million commercial vehicles annually and handle 23% of the total surface trade between Canada and the US. The delays and resultant queuing at these crossings have several negative effects associated with poor transportation network operations, including the following:

- Increased highway safety concerns, including higher potential for collisions at intersections, entrances and queue ends;
- Lost economic opportunity costs;
- Increased air pollution;
- Impacts to access and adjacent land uses in the vicinity of the border crossings;
- Infiltration of cross-border traffic onto local roads;
- Impacts to incident/emergency response;
- Increased vehicle operating costs and fuel consumption; and
- Increased driver frustration.

Given the importance of this trade corridor and the substantial number of people dependent upon safe, reliable access across the Detroit River on a daily basis, governments must take all reasonable steps to reduce the likelihood of disruption to this corridor; i.e., sufficient alternative crossings to meet existing and projected capacity needs, even if some of its components fail or are impaired, are required if the trade link between Canada and the United States is to be sustained.

EXHIBIT 4.1: TIMEFRAMES BY WHICH TRAVEL DEMAND IS ANTICIPATED TO MEET CAPACITY

Blue Water Bridge Corridor				
U.S. Interstate 1-69	U.S. Border Processing	Blue Water Bridge	Canadian Border Processing	Highway 402
At or near capacity beyond 30 years	At or near capacity within 5 – 10 years	At or near capacity beyond 30 years	At or near capacity within 15 – 20 years	At or near capacity beyond 30 years

Detroit – Windsor Tunnel Corridor				
Downtown Detroit Road Connections to Tunnel Plaza	U.S. Border Processing	Detroit-Windsor Tunnel	Canadian Border Processing	Downtown Windsor Road Connections to Tunnel Plaza
At or near capacity within 5 years	At or near capacity within 5 years	At or near capacity within 10 - 15 years	At or near capacity within 15 – 20 years	At or near capacity within 5 years

Ambassador Bridge Corridor					
U.S. Interstate Connections (with gateway)	U.S. Border Processing	Ambassador Bridge	Canadian Border Processing	Huron Church Road	Highway 401 (6 lanes)
At or near capacity beyond 30 years	At or near capacity within 5 years	At or near capacity within 10 – 15 years	At or near capacity within 5 years	At or near capacity within 5 years	At or near capacity beyond 30 years

Further, as travel demand continues to increase, the effects of increased congestion and delays will continue to worsen.

The roadway network components of the Blue Water Bridge crossing generally operate well below capacity and are projected to continue to operate below capacity over the 30-year planning horizon for this study. Deficiencies at this crossing pertain to the lack of staffing and facilities required for border processing. Border processing agencies, transportation authorities and the bridge operators are working to address these issues.

The U.S. government has recently approved additional staffing and it is anticipated that the staffing issues will be addressed. It is recognized that staffing of border processing

facilities in the Broad Geographic Area will continue to require on-going coordination and liaison between transportation authorities and border processing agencies on both sides of the border.

MDOT and the Blue Water Bridge Authority are currently planning plaza improvements on both sides of the border to address border processing facility requirements based on future travel demand. Given that the deficiencies identified at this crossing fall under current planning studies being undertaken by the agencies in control of their respective plazas, the Planning/Need and Feasibility Study will rely on these efforts to develop the appropriate strategies for addressing future travel demand at this crossing.

4.2. Transportation Opportunities

In addressing the stated Transportation Problems, this Planning/Need and Feasibility Study will consider opportunities to reduce impacts and enhance benefits to the border region. As such, the transportation opportunities to be considered in this study include the following:

- Development of a multi-modal strategy for a balanced transportation system that provides more transportation choices;
- Protection of future required right-of-way;
- Optimization of existing infrastructure;
- Facility rehabilitation to avoid or delay replacement;
- Partnerships with other proponents to co-operatively address common problems and/or shared objectives;
- Revenue generation and/or cost reduction; and
- Support for provincial, state and national economic and planning objectives.

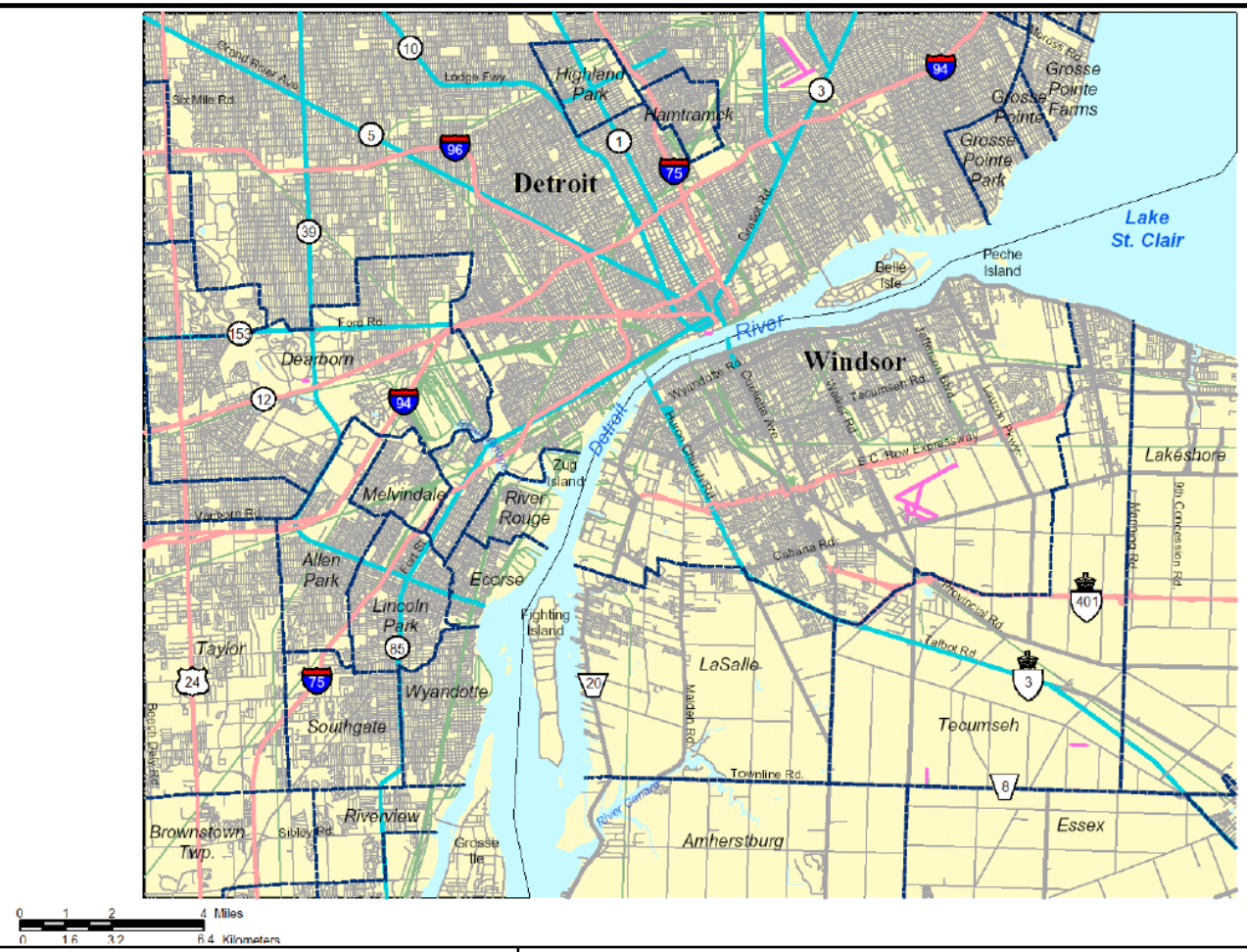
Consideration of these transportation opportunities will not be restricted to roadway improvements. The assessment of travel demand identified a number of aspects of the transportation system that are currently operating well below capacity, and will likely continue to operate below capacity in the future under the current travel patterns. Such aspects include the roadway network at the Blue Water Bridge crossing and the rail and marine systems. As part of the generation and assessment of transportation alternatives, the opportunity to divert excess demand to under-utilized crossings or modes will be considered.

5. Analysis Area

On the basis of the transportation problems identified with the Ambassador Bridge and Detroit-Windsor Tunnel, a focussed Analysis Area was established in the Windsor-Detroit portion of the Broad Geographic Area. In establishing the Analysis Area, the need to provide or a range of feasible transportation alternatives was considered. Exhibit 5.1 identifies the Analysis Area proposed for this study. The rationale for the general limits of the Analysis Area are provided below:

- North and West Limits: These limits are defined to allow for connections between the existing Provincial Highway and Interstate Freeway System for road-based alternatives. These limits are established to generally include the I-94 and I-75 corridors to ensure that the road-based alternatives considered can access the high-order road facilities in both Michigan and Ontario. Such access is highly desirable given the nature of international traffic using the existing border crossings.
- East Limit: This limit was generally defined by the technical and environmental constraints associated with Lake St. Clair. The Detroit River widens at the base of the lake. The width of the water body between Canada and the US beyond the proposed east limit generally precludes any reasonable fixed link road-based alternatives.
- South Limit: This limit was generally defined by the limit of the existing urban areas of Windsor/LaSalle and Greater Detroit. To be effective in serving the existing and future travel demand, transportation corridors must be suitably located in proximity to the population/employment areas to attract sufficient traffic away from the existing crossings to alleviate traffic congestion. In addition, the transportation corridors should integrate with the existing transportation network. To effectively address the need for additional road-based capacity, corridors must attract at least 20% of the cross-border traffic. Corridors south of the proposed south limit would not divert sufficient traffic to address the problem.

The proposed limits can be refined to accommodate any reasonable alternatives that may be developed.



Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study

Proposed Analysis Area

EXHIBIT 5.1

6. Environmental Overview

This section provides a general description of the major environmental features and constraints within the Analysis Area. A more detailed description of the Analysis Area is provided in the Environmental Overview document available under separate cover.

The Canadian side of the Analysis Area consists primarily of the urban area of the City of Windsor and the neighbouring Towns of LaSalle and Tecumseh. Beyond this urban area, the land use is typically rural. The area is characterized by both heavily urbanized and intensively agricultural land uses that are interspersed with a patchwork of remnant natural heritage features, including wetlands, prairies and woodlots.

On the American side, the Analysis Area is an intensely developed urban area consisting of intermixed residential, commercial and industrial areas. Other notable land uses in the area include recreation areas, utilities and military properties.

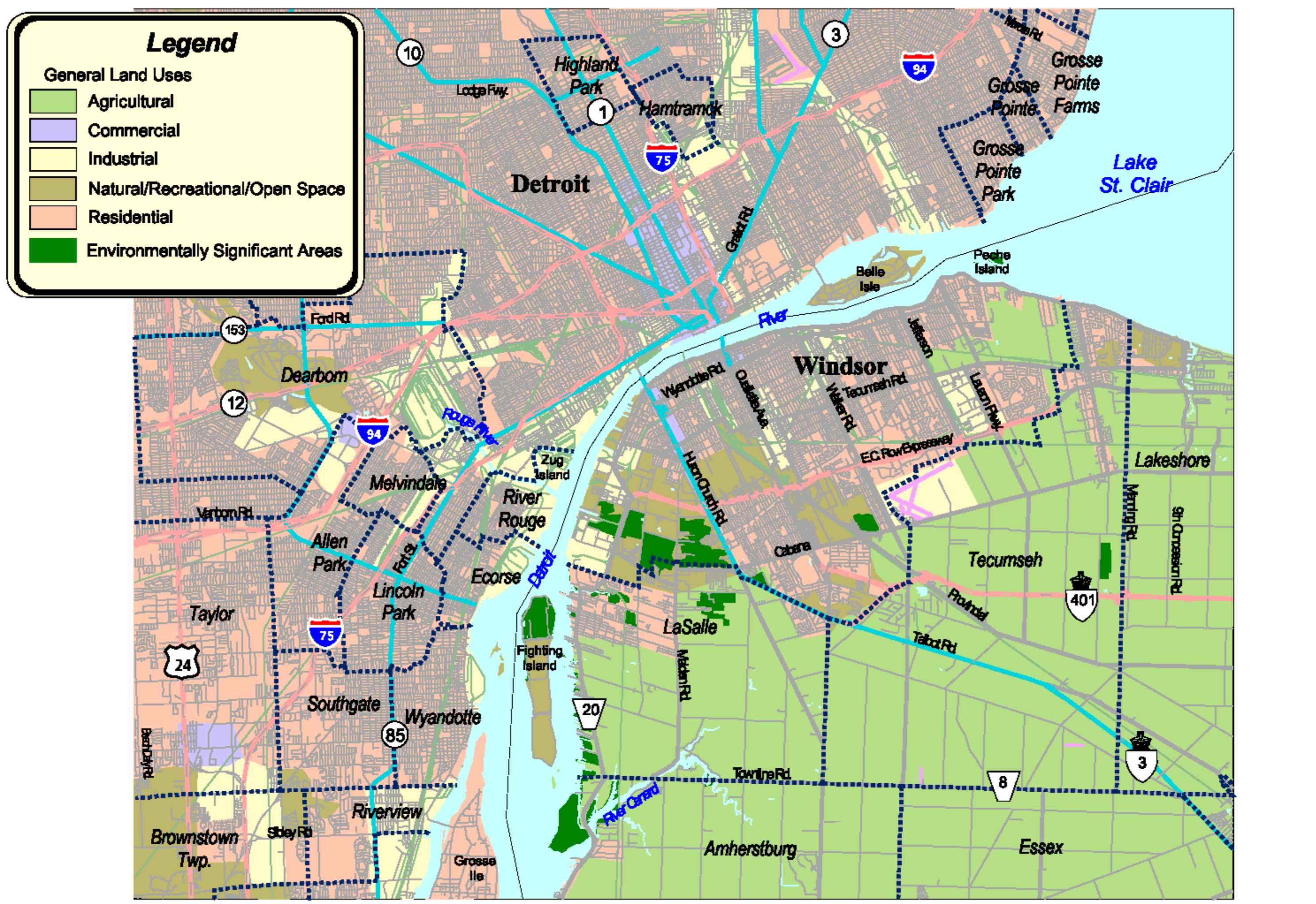
The major features and general land uses in the Analysis Area are shown in Exhibit 6.1.

Descriptions of the features and constraints in the Analysis Area are based on a variety of readily available sources. In addition to the current statutes governing the protection of natural resources and features, data from a number of agencies, municipalities, universities, organizations, books and publications were collected and compiled.

The citizens and governments of Canada and the US share many of the same environmental concerns and goals. For example, at the national level, they have both designated the Detroit River as a significant natural resource deserving of the attention and protection of both countries. The objectives of many of their environmental regulatory programs are the same or quite similar in many cases, although the approach and emphasis may be different in some aspects.

The Analysis Area on the Canadian side incorporates the western portion of Essex County as well as the City of Windsor. The populations of Windsor, LaSalle and Tecumseh are approximately 208,000, 20,500 and 25,000, respectively. Between 1991 and 2001, the populations in Windsor, LaSalle and Tecumseh have increased by 9%, 24% and 139%, respectively. Both LaSalle and Tecumseh have benefited greatly from a population growth spilling out of the established urban area of Windsor. The total population of the Essex/Windsor area has increased from 323,000 in 1991 to 370,000 in 2001, an increase of 14.6%. The population of this area is projected to continue to increase steadily over the next 30 years.

The trend in population on the Canadian side is also indicative of the trends in employment. Manufacturing related to automobiles is the major employment sector in Windsor/Essex (37,000 jobs) while agriculture is another primary economic sector. Employment projections are not available by Canadian county.



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Transport Canada / Transports Canada
Ontario
MDOT

Canada-US-Ontario-Michigan Border Transportation Partnership
Planning/Need and Feasibility Study

General Land Uses

EXHIBIT 6.1

On the American side, the Analysis Area is contained within Wayne County and includes a large portion of the City of Detroit. The population of Detroit is approximately 950,000 and, similar to the rest of Wayne County, has been declining for several decades. The core urban areas of Detroit have been losing population to its suburbs for many years. The population of Detroit has declined by 7.5% from just over 1 million in 1990 to approximately one million in 2000. The population of Detroit is projected to decline by a further 9% to 850,000 by 2030.

The services sector is the major employment sector in the City of Detroit, accounting for 47% of all jobs in the City. Manufacturing accounts for 14% of all jobs and is the second highest employment sector. Overall employment levels are projected to decline by 12% over the next 30 years in Detroit, due to a general shortage of available workers.

On the American side, Title IV of the Civil Rights Act and Environmental Justice issues will need to be addressed in developing and assessing alternative locations for transportation corridors. These provisions protect minority and low income population groups from being excluded from participating in, being denied the benefits of, or being subjected to discrimination under any program or activities receiving U.S. federal funding.

Colonization along the banks of the Detroit River began in the 1700's. Prior to that, there is a strong likelihood of prehistoric activities in the area, due to its location along a river between two Great Lakes. As a result, there are a number of historical and archaeological sites on both sides of the border, and there is the potential for encountering more sites of archaeological significance. However, the constant development and redevelopment of the area over three centuries has probably destroyed many, if not most, of those sites.

The major natural features that could preclude or constrain new transportation corridors in the Analysis Area are shown in Exhibit 6.1. Features of note include:

- The Detroit River is designated as a bi-national Heritage River; the governments of Canada and the US are actively cooperating to develop management plans to preserve and enhance the remaining natural features of the entire river.
- Ojibway Black Oak Woods, Ojibway Prairie Complex and Spring Garden Road Prairie, which as designated Environmentally Sensitive Areas, represent a virtually continuous protected area from the riverfront to Huron Church Road south of the EC Row Expressway.
- Canard River Marsh and Detroit River Marshes, which are designated Environmentally Sensitive Areas at the south end of the Analysis Area.
- Belle Isle and Peche Isle are designated sites in the Detroit River; Belle Isle is the largest island urban park in the US and Peche Isle is designated as an Environmentally Sensitive Area.

The Analysis Area is intensely developed and industrialized, and the area contains hundreds of areas of known or high potential for contamination. An assessment of the nature and extent of possible/known contamination will need to be considered in evaluating alternative transportation corridors. Contaminated sites are not considered to preclude new transportation corridors, and in some instances may present opportunities for re-use of abandoned lands.