Canada

U.S. Department of Transportation
Federal Highway Administration

Ontario

MDOT
Michigan Department of Transportation

Canada-US-Ontario-Michigan Border Transportation Partnership

URS

CORRADINO

IBI GROUP

HLB Decision Economics Inc.

Planning/Need and Feasibility Study Report

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1. Introduction

1.1. Overview

This Planning/Needs and Feasibility (P/NF) Study identifies a long-term strategy for the transportation network in Southeastern Michigan-Southwestern Ontario. This study was conducted by the governments of Canada, United States, Ontario and Michigan, which have formed a partnership with the purpose of improving the movement of people and goods across the Canadian/U.S. border.

The P/NF Study was initiated in March 2002. Several technical working papers and reports were developed over the course of the P/NF Study; through the consultation activities held during the P/NF Study, these documents were made available for comment to government ministries/ agencies/departments, as well as municipalities and other public and private stakeholders, interested parties and the general public. The key findings of these documents, revised to incorporate comments as appropriate, comprise this P/NF Study Report.

The elements of the recommended strategy identified by the Consultant Team are presented as advice to the Partnership. These elements include major infrastructure projects to address border crossing deficiencies. The Partnership has taken the results of this study to initiate formal environmental studies to meet the requirements of the U.S. National Environmental Policy Act (NEPA), Canadian Environmental Assessment Act (CEAA) and Ontario Environmental Assessment Act (OEAA). Other recommendations considered to be minor infrastructure or operational improvements may be implemented more directly, in accordance with the appropriate legislation.

1.2. The Border Transportation Partnership

The Canada-U.S.-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.

The purpose of the Partnership is to improve the movement of people and goods across the United States and Canadian border within the region of Southeast Michigan and Southwest Ontario. The overall objectives of the Partnership in support of this purpose

are the following:

a) To improve the movement of people, goods and services in a safe and efficient manner across the U.S./Canadian border at the Detroit and St. Clair Rivers to connect with existing national, provincial and regional transportation systems, such as I-75 and Highway 401;

b) To enhance the regional economic vitality and Canadian/U.S. trade;

c) To meet the long term needs of the U.S. and Canadian border inspection agencies;

d) To expedite the planning and environmental study process to ensure that future travel demands in this corridor can be accommodated in a timely manner;

e) To ensure that all modes of surface transportation including road, rail and marine will be considered;

f) To use a single integrated planning and environmental study process, resulting in a single product, which will meet the requirements of all members of the Partnership;

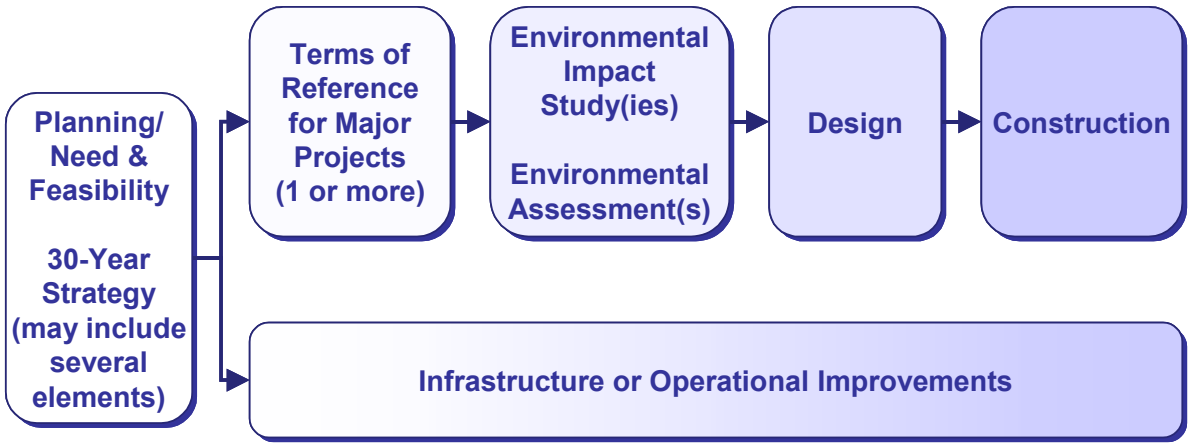
g) To ensure that any solutions which are developed as a result of the above integrated planning and environmental study process comply with all relevant and applicable federal, provincial, state and/or municipal laws, regulations, bylaws, ordinances or other binding enactments validly created by bodies with legislative or rule-making authority;

h) To ensure that the process is conducted in a financially responsible and prudent manner; and

i) To ensure that intelligent transportation systems/state-of-the-art facilities be provided to enhance border crossing efficiency.

In light of these overall objectives, the Partnership initiated the P/NF Study. The P/NF Study is considered the first step in identifying and implementing effective solutions to current and future cross border transportation problems and opportunities (refer to Exhibit 1.1).

EXHIBIT 1.1: BI-NATIONAL PLANNING & ENVIRONMENTAL PROCESS



1.3. Objectives of the Planning/Needs and Feasibility Study

The objectives of the P/NF Study established by the Partnership included the following:

a) 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.

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

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

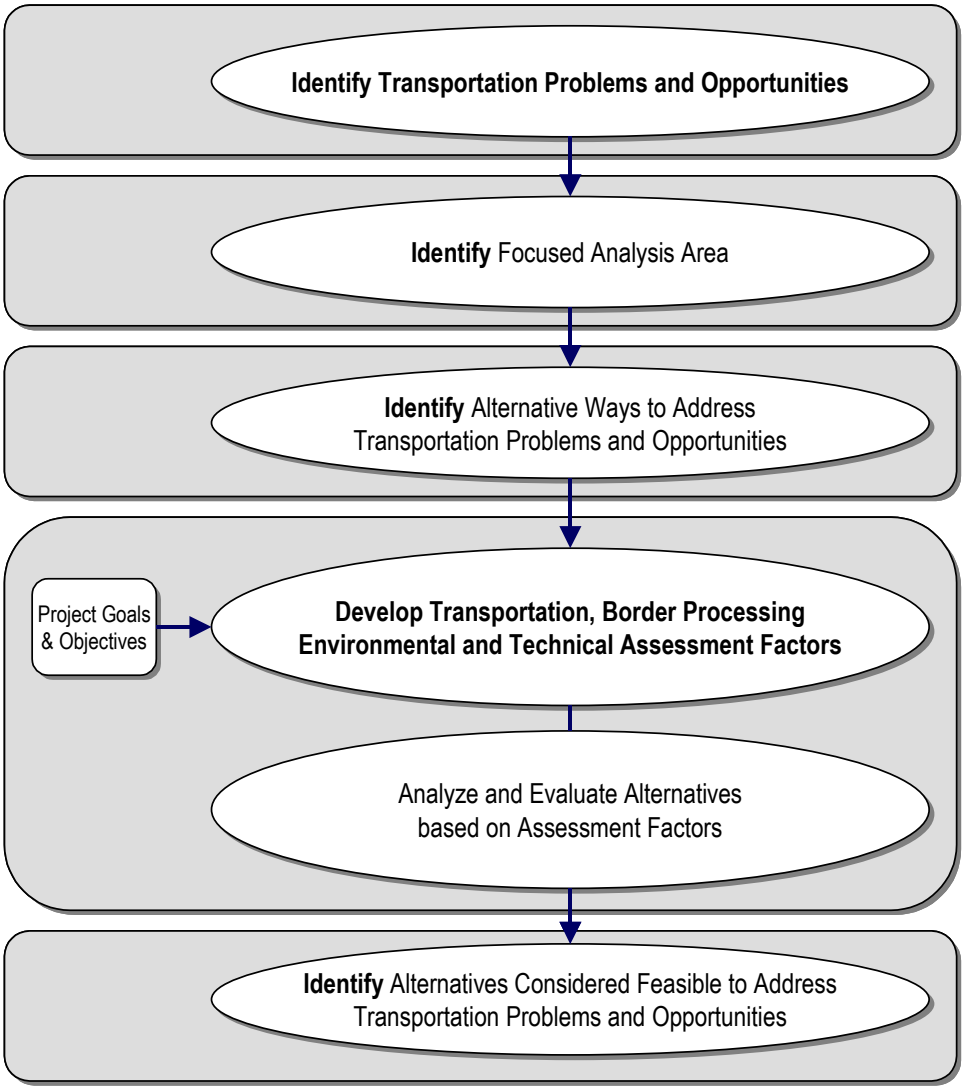
This P/NF Study Report documents findings relative to these objectives. Based on the work completed on this P/NF Study, the potential elements of a strategy for managing the border crossing needs in the Detroit/Wayne County – Windsor/Essex County area were identified by the Consultant Team.

2. Study Process

2.1. Overview

The Planning/Needs and Feasibility (P/NF) Study was carried out to assess the nature and extent of existing and future transportation problems and opportunities in Southeastern Michigan-Southwestern Ontario. The study process for the P/NF Study reflected the Partnership's objectives for the study (refer to Exhibit 2.1).

EXHIBIT 2.1: PLANNING/NEED AND FEASIBILITY STUDY PROCESS



Initially, the Partnership established a broad geographic area within which trade and travel characteristics were to be assessed. All surface transportation modes were considered, as were the requirements of border processing agencies. Consultation with public and private sector stakeholders, as well as the general public, was a key aspect of the process.

2.2. Partnership Organization

The Canada-U.S.-Ontario-Michigan Border Transportation Partnership was directed by a Steering Committee, comprised of senior staff at Transport Canada, U.S. Federal Highways Administration, Ontario Ministry of Transportation and Michigan Department of Transportation. The Steering Committee provided overall guidance and direction to a Working Group. The Working Group oversaw the day-to-day implementation of the study process and administered the activities of the Consultant Team. The Partnership Working Group, together with the Consultant Team, formed the Project Team for the P/NF Study.

2.3. Consultant Team

The Partnership also retained a Consultant Team to implement the Study Process for the P/NF Study. The bi-national Consultant Team included expertise and experience in transportation planning, engineering, economics and consultation based on projects completed in Ontario as well as Michigan.

Led by URS Canada, the Consultant Team included the following members:

- URS Great Lakes
- The Corradino Group
- IBI Group
- HLB Decision Economics

Other specialists and subconsultants were also on the team to provide the necessary inputs to the study.

2.4. Consultation

Consultation was undertaken throughout the P/NF Study. Formal consultation activities were incorporated at key steps in the study process and additional meetings were held throughout the study, upon the request of study participants. Means of providing input to the Project Team at any time in the study were also made available.

Consultation activities involved public and private sector consultation groups established for this study, as well as the general public. Public sector stakeholders included regional and local municipalities in both the U.S. and Canada. The following public organizations were invited to participate in this study:

- Aamjiwnaang First Nation
- American Indian Leadership Council
- American Indian Services
- Canada Customs & Revenue Agency
- Canada Political/Economic Relations and Public Affairs
- Canadian Coast Guard
- Canadian Council on International Law
- Canadian Environmental Assessment Agency
- Canadian Food Inspection Agency
- Canadian Heritage
- Canadian Transportation Agency
- Canadian/American Border Trade Alliance
- Chamber of Maritime Commerce
- Chippewas of Kettle and Stony Point First Nation
- Citizenship & Immigration Canada
- City of Detroit
- City of Port Huron
- City of Riverview
- City of Sarnia
- City of Windsor
- City of Wyandotte
- County of Essex
- County of Lambton
- Detroit Regional Chamber
- Detroit/Wayne County Port Authority
- Environment Canada - Ontario Region
- Essex Region Conservation Authority
- Fisheries & Oceans Canada
- Health Canada
- Indian and Northern Affairs Canada
- International Human Rights Law Group
- International Joint Commission
- Michigan Commission on Indian Affairs
- Michigan Historical Center, State Historic Preservation Office
- Moravian of the Thames
- Munsee-Delaware Nation
- North American Indian Association
- Office of the Minister for International Cooperation
- Office of the Minister for International Trade
- Office of the Ministry of Foreign Affairs
- Oneida Nation of the Thames
- Ontario Ministry of the Environment
- Ontario Ministry of Enterprise, Opportunity & Innovation
- Ontario Ministry of Finance
- Ontario Ministry of Intergovernmental Affairs
- Ontario Ministry of Natural Resources
- Ontario Ministry of the Environment
- Ontario Ministry of Tourism, Culture & Recreation
- Sarnia-Lambton Chamber of Commerce
- Serco Aviation Services Inc.
- Southeast Michigan Council of Governments (SEMCOG)
- St. Clair County Road Commission
- Town of Amherstburg
- Town of LaSalle
- Town of Tecumseh
- Transport 2000/Ontario
- U.S. Department of Transportation
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Customs Service
- U.S. Environmental Protection Agency
- U.S. General Services Administration
- U.S. Immigration & Naturalization Service
- U.S. International Boundary Commission
- U.S. State Department
- Village of Point Edward
- Walpole Island
- Wayne County
- Wayne County Family Independence Agency
- Windsor & District Chamber of Commerce
- Windsor Port Authority
- Windsor-Essex County Development Commission

The Private Sector Consultation Group was comprised of selected private sector businesses with an immediate stake or interest in the functioning of the border crossings, including border crossing owners/operators, proponents of new border crossing proposals, automotive and trucking industry representatives. The following organizations were invited to participate in this study:

- Alliance of Automobile Manufacturers
- Ambassador Bridge / Canadian Transit Company / Detroit International Bridge Co.
- Association of International Automobile Manufacturers (U.S. & Canada)
- Automotive Parts Manufacturer's Association
- Bison Transport Inc.
- Blue Water Bridge Authority
- Bridge Project Association
- Canadian National Railroad
- Canadian Pacific Railway
- Canadian Trucking Alliance
- Canadian Vehicle Manufacturers' Association
- Chrysler Logistics
- Concord Transportation Inc.
- Coyle Group Inc.
- CSX Railroad
- Daimler Chrysler
- Detroit -Windsor Tunnel Corporation
- Detroit-Windsor Truck Ferry
- Detroit River Tunnel Partnership
- F.B. Bowen Enterprises Inc.
- Ford Motor Company
- General Motors
- International Business Consultants of Canada
- J.B. Hunt
- Johnson Controls
- Kimley-Horn of Michigan, Inc.
- Lear Corporation World Headquarters
- Magna Transportation Inc.
- Maritime Systems Inc.
- Mich-Can International Bridge Company
- Michigan Trucking Association
- Michigan Vegetable Council
- Motor and Equipment Manufacturers Assoc'n
- Norfolk Southern Railway
- Ontario Fruit & Vegetable Growers' Assoc'n
- Ontario Trucking Association
- Penske Logistics 4098
- Rush Trucking
- Ryder Logistics
- Schneider National Inc.
- Skylink International (Aerial Gondola Crossing the Detroit River)
- SLH Transport Inc.
- Sysco Food Services
- UPS Supply Chain Solutions
- Visteon Corporation
- Walmart Transportation

Opportunities for public involvement in the study process were also provided through two rounds of public information open houses and additional meetings held throughout the study.

The first round of Public Information Open Houses (PIOH) were held November 12th to 14th, 2002, in Windsor, Ontario, Detroit, Michigan and Sarnia, Ontario. The purpose of these meetings were to introduce the Partnership and the P/NF Study to the public, as well as to exchange information on transportation problems and opportunities in Southeastern Michigan-Southwestern Ontario. The PIOH featured the findings of the following draft interim study documents:

- Strategic and Geographic Area Overview Working Paper;
- Travel Demand Analysis Process Working Paper;
- Existing And Future Travel Demand Working Paper; and
- Transportation Problems and Opportunities Report.

Participants were asked to provide comments on these findings, as well as any other issues pertaining to the study, to the Project Team. A summary of the major issues raised by attendees is provided in Table 2.1.

The second round of Public Information Open Houses were held June 16th to 18th, 2003, in Windsor, Ontario, and in Detroit, Michigan and Wyandotte, Michigan. The Project Team also attended a public meeting on the P/NF Study in LaSalle, Ontario on October 8th, 2003. The purpose of these meetings were to discuss the findings of the draft Feasible Transportation Alternatives Working Paper, which included the potential elements of a strategy to meet the long term (30 year) needs of the transportation network in Southeastern Michigan – Southwestern Ontario. A summary of the major issues raised by attendees is provided in Table 2.2.

In addition to these formal consultation activities, other methods of exchanging information about the study included a project website and a project hotline, available anytime.

TABLE 2.1: SUMMARY OF COMMENTS RAISED AT PIOH 1

COMMENT	RESPONSE
What is the Planning/Need and Feasibility Study?	All of the partnership representatives - the governments of Canada, the United States, Michigan and Ontario - recognize the need to address the traffic flow at the Southeast Michigan-Southwest Ontario border, one of the world's busiest international crossings. The study will examine all potential solutions for meeting the projected growth in future trade and traffic between the two countries and offer recommendations for both the medium and long term.
What is the purpose of the Planning/Need and Feasibility Study?	The purpose of the study is to find workable solutions for addressing traffic flow across the border. 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 Michigan-Ontario gateway. 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 gateway between Canada and the United States.
Why is the study necessary?	The current Southeast Michigan and Southwest Ontario border crossings are among the busiest international crossings in North America and represent nearly 50 per cent of the traffic volume crossing the U.S./Canada border. Currently, more than 75,000 vehicles use the crossings each day. According to the Ontario Ministry of Transportation's Southwest Ontario Frontier International Gateway Study (1998), daily traffic at these crossings will grow to 104,000 vehicles by 2021. The study also provides the following example: Traffic at one of the busiest Michigan-Ontario crossings, the Ambassador Bridge/Huron Church Road/Highway 3 corridor, is expected to reach capacity around 2010.
Who is conducting the study?	The study is being conducted by the Canada-U.S.-Ontario-Michigan Border Transportation Partnership. This bi-national partnership includes representatives from Transport Canada, the United States Federal Highway Administration, the Ontario Ministry of Transportation and the Michigan Department of Transportation Key stakeholders from the public and private sectors will be invited to provide input through consultation groups and public information open houses. The Partnership 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 gateway between Canada and the United States.

TABLE 2.1: SUMMARY OF COMMENTS RAISED AT PIOH 1 CONTINUED

COMMENT	RESPONSE
What is the geographic area involved in the study?	The study will examine existing and future cross-border transportation problems at the border crossings at Windsor/Detroit and Sarnia/Port Huron. The geographic area to be studied within the area of Southwest Ontario extends east to London, while the area of Southeast Michigan extends west to the Battle Creek area. It will also examine the larger transportation network connected by border crossings, including Interstate Freeways and Provincial 400-series Highways, rail corridors and marine crossings. The study will consider trade areas linked with or affected by the international crossings, such as the Greater Toronto Area and the Ohio region.
How will the public be involved in the study?	All of the partnership representatives - the governments of Canada, the United States, Michigan and Ontario - represent the interest of the people they serve, and encourage feedback from any member of the public. A Web site has been set up to provide the public with access to information and a forum for feedback throughout the project - the address is www.PartnershipBorderStudy.com. Also, the Partnership has planned a series of formal public information open houses to provide information to and solicit feedback from the public - information on the open houses will be posted on the Web site and advertised in local newspapers. Throughout the course of the study, both a Public and Private Sector Consultation Group will be provided with opportunities to review the study's progress and raise their concerns/comments. Invited participants of the Public Sector Consultation Group include: U.S. Customs U.S. State Department U.S. Immigration and Naturalization Services U.S. Environmental Protection Agency Southeast Michigan Council of Governments Ontario Ministry of Economic Development and Trade Canadian Food Inspection Agency Canadian Environmental Assessment Agency Ontario Ministry of the Environment Canada Customs and Revenue Agency Citizenship and Immigration Canada City of Detroit Essex County City of Windsor City of Sarnia … As well as many others Invited participants of the Private Sector Consultation Group includes privately owned bridge/tunnel operators, railway companies, freight barge operators, transport carriers, trucking associations, customs brokers and other interested organizations.
When will the study be completed?	The comprehensive Planning/Need and Feasibility Study will take approximately two years to complete. The results will be used to begin work on an integrated environmental process that will examine the environmental impacts and mitigation of alternative designs as well as constructability issues. Depending on the findings of the Planning/Need and Feasibility Study, components for Environmental Assessments/Environmental Impact Statements may be initiated in 2004 following completion of the Study and may be expected to take approximately three to five years to complete.

TABLE 2.1: SUMMARY OF COMMENTS RAISED AT PIOH 1 CONTINUED

COMMENT	RESPONSE
Why is the study taking so long to complete?	Unlike some of the private sector proposals presented, the Partnership is focused on "bigger picture" solutions. The study will investigate not only the border crossing but also how each crossing interacts with the rest of the transportation network on both sides of the border. This will ensure a more complete overview of solutions that serves the region's need over the long term.
How much will the study cost?	The cost estimated to undertake the Planning/Need and Feasibility Study is $4.5 million (CDN).
How much will it cost to provide a new or improved crossing?	Until the study process is completed and recommendations have been made and approved, it is not possible to determine what the total cost will be.
Who is paying for the study?	The cost will be shared equally among the four members of the bi-national Partnership. Funding for this project will come from the participating state, provincial and federal transportation agencies.
What happens after the Planning/Need and Feasibility Study has been completed?	The results of the study will be used to initiate the components for extensive Environmental Assessments/Environmental Impact Statements of the recommended projects. The results of these studies will hopefully provide an environmentally acceptable transportation alternative that the Partnership can take forward into the final design and construction phases of the project.
Will the study consider border security issues?	The study will assess the benefits and impacts of a wide range of socio-economic considerations. Certainly, current global events have made border management issues even more important to the four transportation agencies in the bi-national Partnership. All partners are working together to accelerate the planning process as much as possible and are looking at ways to make all crossings safe and more efficient for all its users.
Is a new bridge or an addition to the Ambassador Bridge going to be constructed?	The study will research the possibility of building a new bridge, as well as the possibility of making improvements to the Ambassador Bridge and other existing crossings. The purpose of the study is to examine all potential solutions for meeting the projected growth in future trade and traffic between the two countries.

TABLE 2.1: SUMMARY OF COMMENTS RAISED AT PIOH 1 CONTINUED

COMMENT	RESPONSE
Will there be a new border crossing? Where?	The study will research the possibility of creating a new crossing, as well as the possibility of making improvements to existing crossings. The purpose of the study is to examine all potential alternatives to meet the projected growth in future trade and traffic between the two countries. The study will examine various locations for a potential new crossing based on economic, environmental, social, geographic and transportation factors.
When will the construction of a new crossing or bridge begin?	It is not yet known if a new crossing will be the preferred alternative, or if improvements to the existing crossings will be the preferred alternative. Until the Planning/Need and Feasibility Study is completed, no decision on potential construction or its time frame can be determined. However, any such recommendations will be included in the Final Planning/Need and Feasibility Study.
What are the potential environmental implications of building a new crossing or bridge?	The Planning/Need and Feasibility Study will identify and assess all impacts and benefits of new border crossings including possible environmental impacts. The study will be conducted in line with the requirements of the National Environmental Policy Act (NEPA) of the United States, the Canadian Environmental Assessment Act (CEAA) and the Ontario Environmental Assessment Act (OEAA). The assessments along with the recommended alternatives will be the subject of public consultation during the environmental study. In addition, formal Environmental Assessments/Environmental Impact Statements would be conducted once the Planning/Need and Feasibility Study is completed.
Will there be a financial benefit to the people and businesses in the surrounding areas?	One of the objectives of the Planning/Need and Feasibility Study will be to examine the economic benefits of various alternatives to the surrounding area. Both countries, and in particular the border cities in the broad study area, rely on the efficient movement of goods and people across the border. The ability to provide this efficient movement, while addressing security concerns, affects the livelihood of the region's businesses and residences. The study will ensure that future transportation demands can be accommodated to allow Southeast Michigan and Southwest Ontario to experience continued economic growth and increased employment through trade growth as projected for the area.
Consider impacts to health in terms of air quality, vehicle emissions, noise and personal safety.	Potential noise, air quality, aesthetic and mitigation measures will be identified and assessed in upcoming stages of the project. The assessment of potential impacts on the quality of life, including safety and health impacts, will be conducted in the next phases as this study moves forward. The impacts generated by each identified alternative will be compared to the potential benefits to the transportation network, as well as the impacts and benefits of the other alternatives, in determining which will be carried forward for further consideration.

TABLE 2.2: SUMMARY OF COMMENTS RAISED AT PIOH 2

COMMENT	RESPONSE
Consider impacts to existing communities in terms of residences/ property acquisition, area businesses, tourism and the economy.	In developing the Road-Based Opportunity Corridors, the Project Team has attempted to avoid the densely populated urban areas and maximize the use of existing infrastructure. Typically, impacts to a community are assessed considering measures such as potential impacts to residential, commercial, industrial and recreational land uses, noise and aesthetic impacts, as well as impacts to emergency services access, out-of-way travel and impacts to pedestrian access. The need to consider such impacts to the local communities and businesses in the generation and assessment of alternatives is recognized. Potential property impacts will be identified in later phases of the project as route/crossing alignments are developed. Negotiations for property acquisition generally are not initiated until the project has received environmental approval, which is not anticipated for 3 to 4 years. As well, economic impacts will be factored into any long-term solution to the border crossing traffic problem.
Consider impacts to the natural environment.	Potential impacts to natural environment features will be assessed in the next phases of the project. Working with government agencies and local naturalist groups, the Project Team will identify impacts to features and mitigation measures. The objective of this study is to identify the crossing alternatives that result in the least overall impacts. In determining the recommended location for the new crossing/road connections, the Project Team will identify and compare all potential impacts and benefits to identify the alternative which results in the lowest overall impacts.
Consider other corridor alternatives, as some corridors are not reasonable or viable.	The alternative corridors were developed in our effort to reduce the overall impacts to the focused analysis area. Specifically, these corridors were developed to be sufficiently wide to accommodate various route alignments for road connections. The assessment of the Opportunity Corridors was based on 'representative alignments' for road connections and border crossing within the corridors. These representative alignments were developed for feasibility assessment purposes only. The Project Team will consider other corridor alternatives that are consistent with the generation criteria. A long-term transportation strategy has not yet been identified and each of the proposals identified to date will receive careful consideration.
Consider alternative modes of transportation, such as rail and water transport.	Non-roadway modes have been examined in our assessment of feasible transportation alternatives. Encouraging greater use of the ferry and rail services and improvements to marine vessel services and rail corridors are included as elements of the proposed 30-year strategy for improving the transportation network. While this may improve utilization of the transportation network as a whole, which includes roads, rail lines and ferries, it will not reduce the need for a new or expanded road-based crossing in the Detroit River area, which is required to meet the current and future needs of the network.

TABLE 2.2: SUMMARY OF COMMENTS RAISED AT PIOH 2 CONTINUED

COMMENT	RESPONSE
Concerned about border safety & security, border processing, and Customs (i.e. processing rates, technology, Homeland/ national Security, the post-9/11 situation)	Improving the flow of traffic through border processing is a priority of the highest order among our recommendations. Certainly, current global events have made border management issues even more important to the four transportation agencies in the Bi-National Partnership. All partners are working together to look at ways to make all crossings safe and more efficient for all its users. The Project Team has been consulting with border processing agencies in both Canada and the U.S., as well as with major border 'users' throughout this study, and will continue to do so as the project moves forward.
Get the truck traffic off our streets.	Concerns with truck traffic in urban areas and their effects on the neighbourhood, along with other issues related to the natural, cultural and economic features, as well as transportation benefits and costs, will be considered as we move forward in this study. Representatives of the trucking industry have been, and will continue to be, invited to participate in consultation activities on the project.
The Study process is too slow; speed up the study process - we need a quicker solution.	The Bi-National Study is looking at the medium- to long-term needs of the border transportation network. The request for a quick solution to the study and the border crossing traffic problems is understandable. The Partnership will accelerate the study as rapidly as laws and regulations permit while ensuring adequate opportunities to provide and incorporate input to the project are available to all stakeholders. Short-term measures to address more immediate needs include additional staff at the border, promoting NEXUS and FAST, plaza improvements at the Ambassador Bridge and the Windsor Gateway Action Plan.
The Public is being left out of the Study process; the public needs to be more informed.	A web site has been set up to provide the public with access to information and a forum for feedback throughout the project - the address is www.PartnershipBorderStudy.com. The Study Team will continue to invite key stakeholders and the public to provide input and advice and solicit feedback through consultation groups and public information open houses. Comments regarding the choice of meeting site as a possible hindrance to public participation reflects a concern that is shared by the Study Team. We welcome any suggestions of a site that could accommodate the displays that should be available for public scrutiny; the crowd that is hoped would appear and, ideally, is accessible by public transportation. Comments regarding more community involvement are welcome and important - we can be reached through our 24-hour toll-free hotline at 1-800-900-2649. Any advice you may have to help increase public awareness as we prepare for the third round of public information open houses is appreciated. The Study Team is always available to speak with any group that issues an invitation.
Opposition to private ownership of existing or new crossings.	The responsibility and cost of constructing and operating a new or expanded crossing, whether public, private or some combination, is an issue that is currently under study by the four governments sponsoring the study.

3. Geographic Overview

At the outset of the Planning/Needs and Feasibility Study, an overview of transportation issues and assets was developed for a broad geographic area in Southeastern Michigan – Southwestern Ontario (refer to Exhibit 3.1). This overview was compiled from past and on-going studies and other secondary sources related to cross-border transportation in Ontario and Michigan, as well as input from study participants received during the P/NF Study. Details of the Geographic Overview are provided in the *Strategic and Geographic Overview Working Paper*, available under separate cover.

3.1. Border Crossing Movements

3.1.1. 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 3.1), 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 3.2.

In year 2000, total U.S. trade with Ontario was U.S.$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

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

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Broad Geographic Area

EXHIBIT 3.1

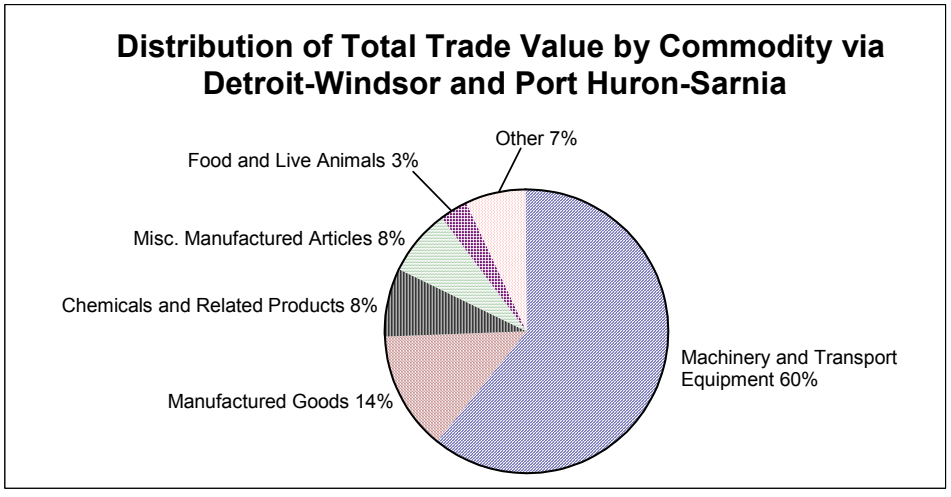
propelled Canada into an ongoing trade surplus situation with the United States. Exports to the United States were negligible prior to the pact but now cars and trucks are Canada's largest items of export. With the "Big Three" original automakers located across the river in Detroit, Ontario has become 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.

TABLE 3.1: VALUE OF SURFACE TRADE THROUGH WINDSOR/DETROIT AND SARNIA/ PORT HURON, BILLIONS OF $U.S.[$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 U.S.	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: U.S.DOT Bureau of Transportation Statistics

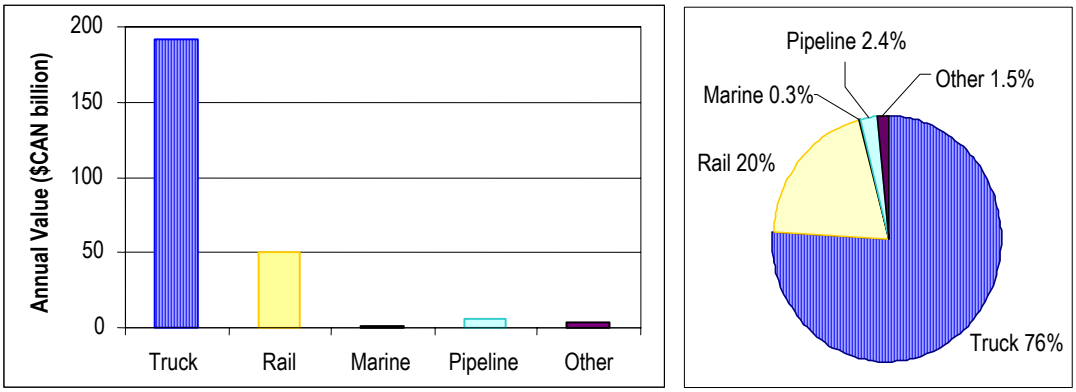
EXHIBIT 3.2: DISTRIBUTION OF TOTAL TRADE VALUE BY COMMODITY VIA DETROIT-WINDSOR AND PORT HURON-SARNIA



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 3.3). 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 3.3: 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 3.2 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 3.2: 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.

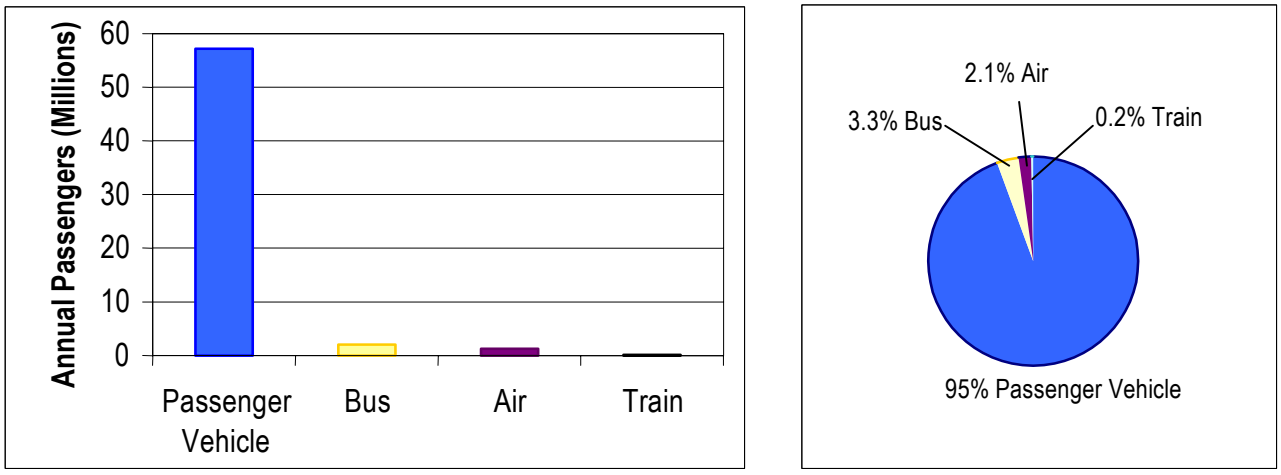
The Detroit River frontier represents the busiest corridor for trade between Canada and the United States. The benefits of such trade to the local, regional and national economies is represented in the prosperity, opportunities and high standards of living each country enjoys, and the prospect of continued 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.

3.1.2. 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 3.4). While bus, air and ferry services are available and operating in the Broad Geographic Area, the information on trip purpose and trends in people movement available for the Broad Geographic Area 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 3.4: 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 U.S., 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 3.3 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 3.3: 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%

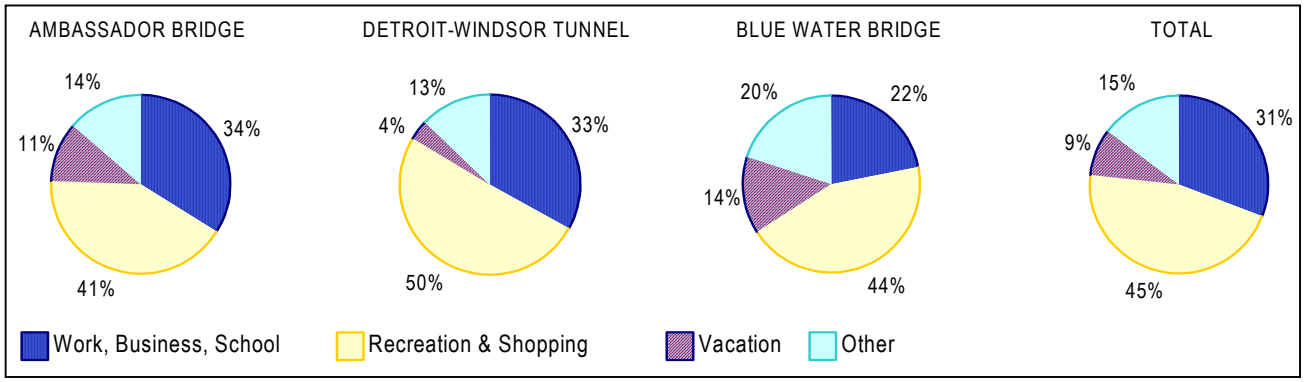
Source: BTOA

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 3.5. 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 3.5: CROSS-BORDER PASSENGER CAR TRIPS BY TRIP PURPOSE, 2000 WEEKDAY



3.2. Transportation Network

3.2.1. Roadway Network

The highway network serving the border crossings is presented in Exhibit 3.6, 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 U.S., 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.

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

Roadway Network

EXHIBIT 3.6

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

TABLE 3.4: 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.

3.2.2. Railway Network

There are four major freight railway companies active in the study area (reference Exhibit 3.7):

- 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 | 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

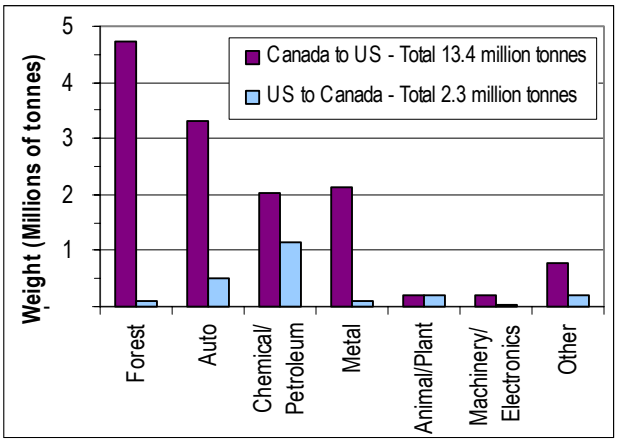
Study Area Rail Lines

EXHIBIT 3.7

Exhibit 3.8 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 U.S. Meanwhile, the value of goods shipped to Canada from the U.S. by rail has declined slightly over this gateway in recent years.

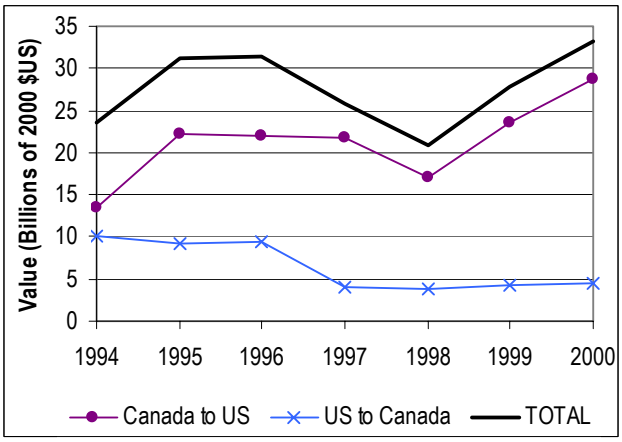
EXHIBIT 3.8: WEIGHT AND VALUE OF RAIL FREIGHT TRAFFIC ACROSS SOUTHEAST MICHIGAN – SOUTHWEST ONTARIO

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 3.5. 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 3.5: 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]

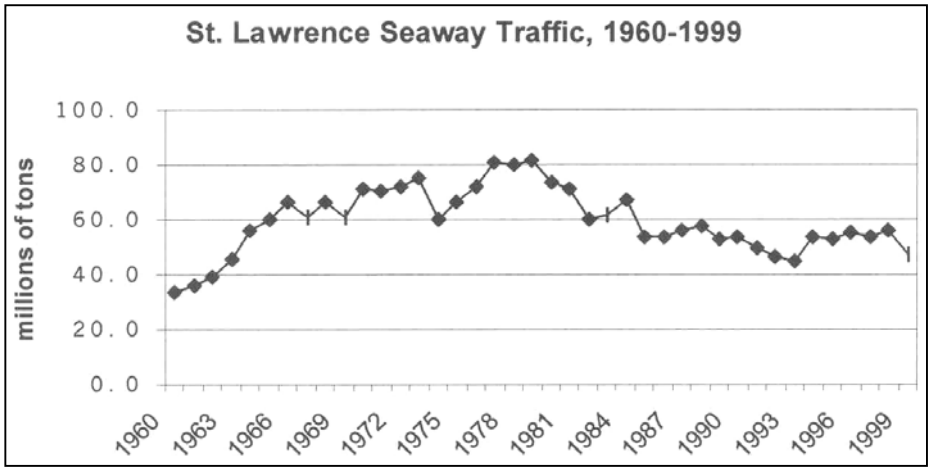
Source: U.S.D.O.T., Bureau of Transportation Statistics
[1] Via the Windsor-Detroit rail tunnel
[2] Via the Sarnia-Port Huron rail tunnel

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.

3.2.3. Marine

Marine shipments on the Great Lakes – St. Lawrence Seaway System have generally been declining since the early 1980's (reference Exhibit 3.9). 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 U.S. Canadian and U.S. federal agencies are considering improving the Great Lakes – St. Lawrence Seaway System to further increase capacity for commercial shipping.

EXHIBIT 3.9: ST. LAWRENCE SEAWAY TRAFFIC – HISTORICAL DATA

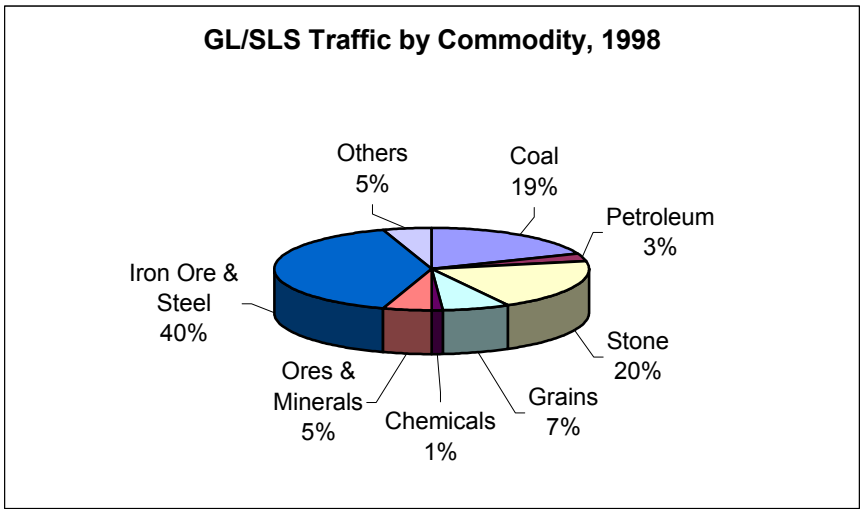


Source: USACE

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 3.10 identifies the major commodities handled on the Great Lakes/St. Lawrence Seaway System (GL/SLS).

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.

EXHIBIT 3.10: MAJOR COMMODITIES TRANSPORTED VIA MARINE



Source: USACE

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 Broad Geographic Area, 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 Broad Geographic Area, additional cross-border ferry services (both passenger and commercial vehicle) are being proposed (reference Exhibit 3.11).

3.3. 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 3.6 and 3.7. 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 3.6: 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 3.7: 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

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

Existing and Proposed Ferry Service

EXHIBIT 3.11

4. Travel Demand

4.1. 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, U.S.-Canada currency exchange rate and price variables. Factors affecting demand for goods movement considered in this study include U.S.-Canada currency exchange rate, economic production and commodity trade.

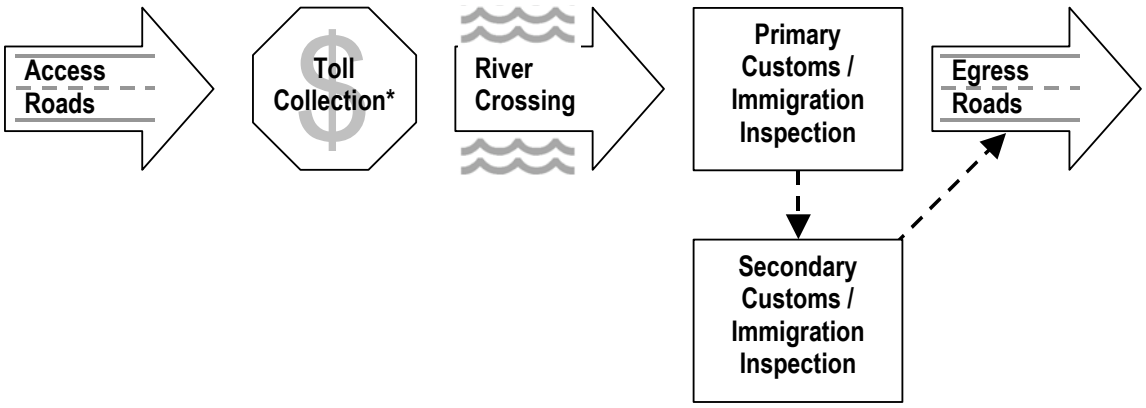
The travel demand analyses carried out for the Planning/Need and Feasibility Study involved the development of a comprehensive process to estimate future demand on the existing and currently committed future transportation network. The process included the development of a regional travel demand forecasting 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.

4.2. 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 4.1, 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 4.1: 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 U.S./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 U.S., the need for border processing resources to meet the anticipated transportation needs will be identified.

4.3. Existing Travel Demand

4.3.1. 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 U.S.-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, addresses 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 U.S.-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 U.S.-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 4.1 provides tabulated results of the trip type analysis for both passenger cars at the Windsor-Detroit border crossings.

TABLE 4.1: 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 4.1, 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 4.2 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 4.2: 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 4.2 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.

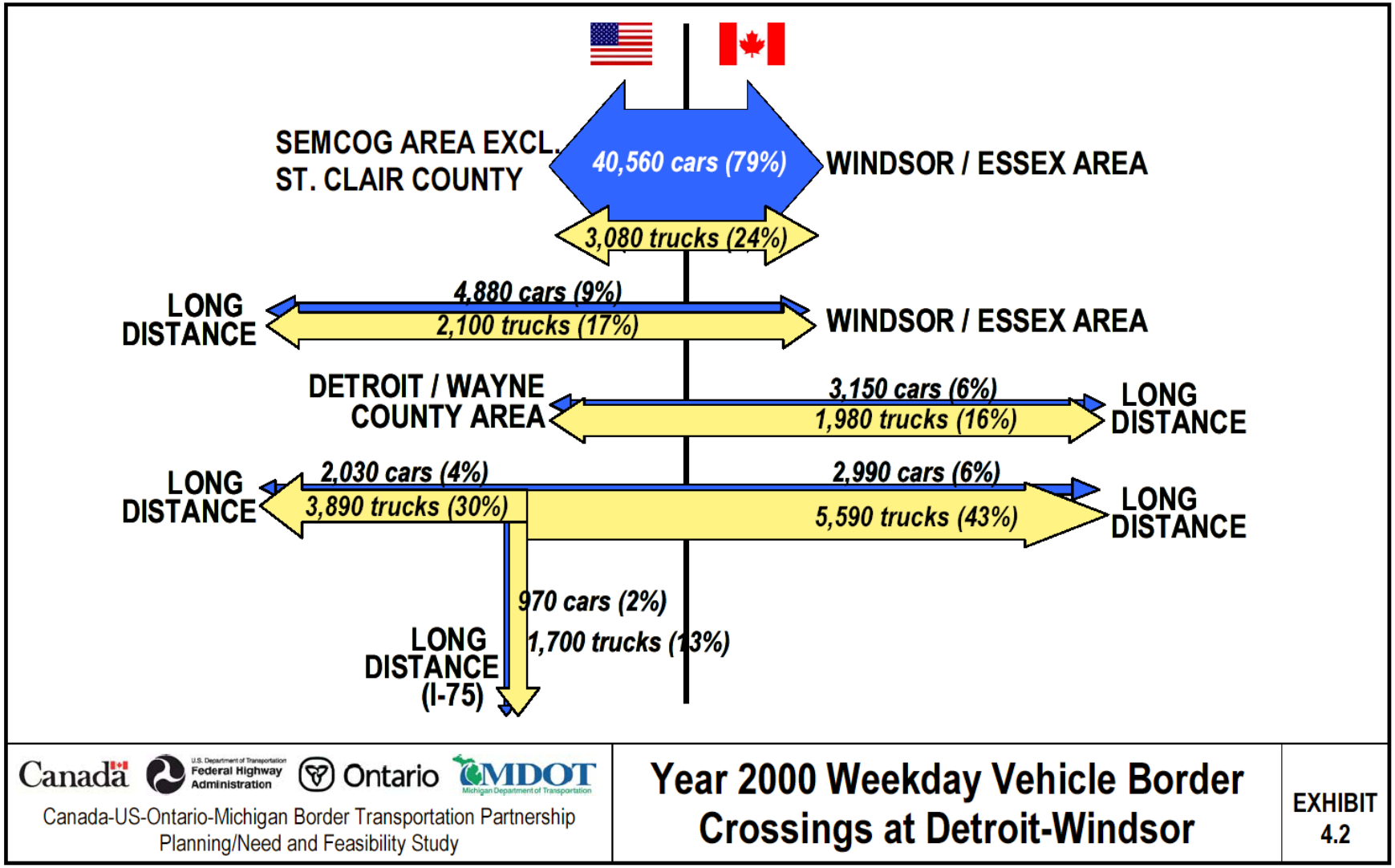

SEMCOG AREA EXCL. ST. CLAIR COUNTY
40,560 cars (79%)
3,080 trucks (24%)
WINDSOR / ESSEX AREA
LONG DISTANCE
4,880 cars (9%)
2,100 trucks (17%)
WINDSOR / ESSEX AREA
DETROIT / WAYNE COUNTY AREA
3,150 cars (6%)
1,980 trucks (16%)
LONG DISTANCE
LONG DISTANCE
2,030 cars (4%)
3,890 trucks (30%)
2,990 cars (6%)
5,590 trucks (43%)
LONG DISTANCE
970 cars (2%)
1,700 trucks (13%)
LONG DISTANCE (I-75)
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
Year 2000 Weekday Vehicle Border Crossings at Detroit-Windsor
EXHIBIT 4.2

Table 4.3 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 4.3: 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.

4.3.2. 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.

4.4. Future Travel Demand

Based on the outlook for increased economic activity within and between Canada and the U.S., 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 4.4: 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 & 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%

4.4.1. 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 U.S. 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 4.3 and discussed in the remainder of this section.

EXHIBIT 4.3: EXISTING AND FUTURE BASE CASE VOLUME/CAPACITY (PEAK DIRECTION)

Component	Ambassador Bridge	Detroit-Windsor Tunnel	Blue Water Bridge
Existing (2000)			
Access Road			
U.S.	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			
U.S.	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 U.S. 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.

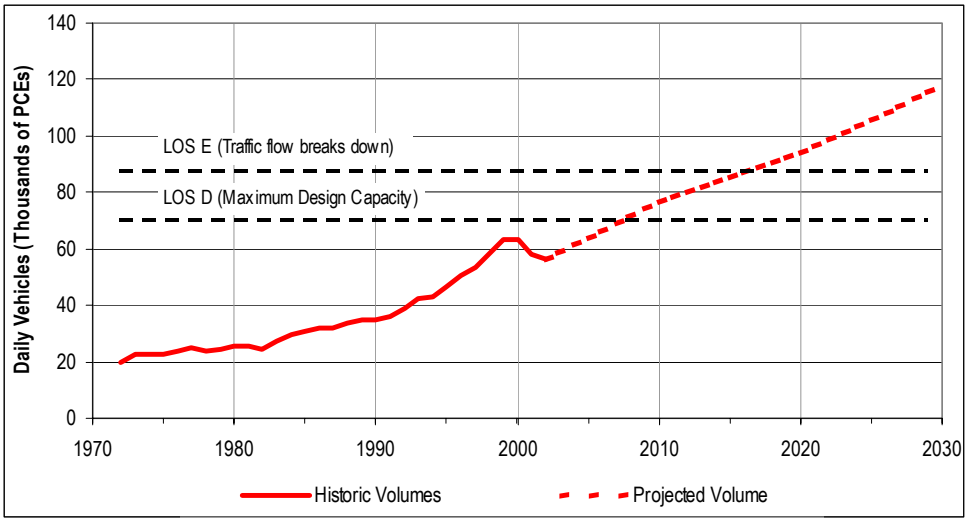
Travel demand at border processing facilities on both the American and Canadian sides of the bridge is anticipated to reach available capacity within five years. It is recognized that border crossing programs, such as NEXUS and FAST, may be somewhat successful in deferring the need for additional border 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 4.4). At that point, the bridge will be physically constrained from addressing increases in travel demand.

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.

EXHIBIT 4.4: FUTURE DAILY VOLUME AND CAPACITY – AMBASSADOR BRIDGE



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*

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.

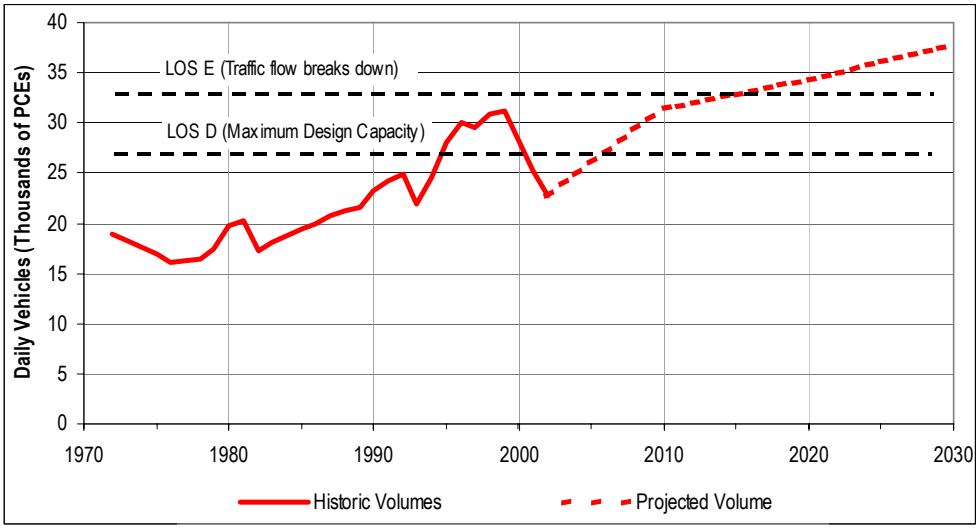
As noted earlier, the tunnel currently faces capacity constraints at this crossing at the border processing components. As travel demand continues to increase, these capacity constraints will increase delay at the crossing, leading to extensive queuing on the adjacent downtown road network of both Windsor 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 4.5). After that point, the tunnel will be physically constrained from addressing increases in travel demand.

Similar to the issues noted for the Ambassador Bridge, the impacts to the local and regional economies will 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.

EXHIBIT 4.5: 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*

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.

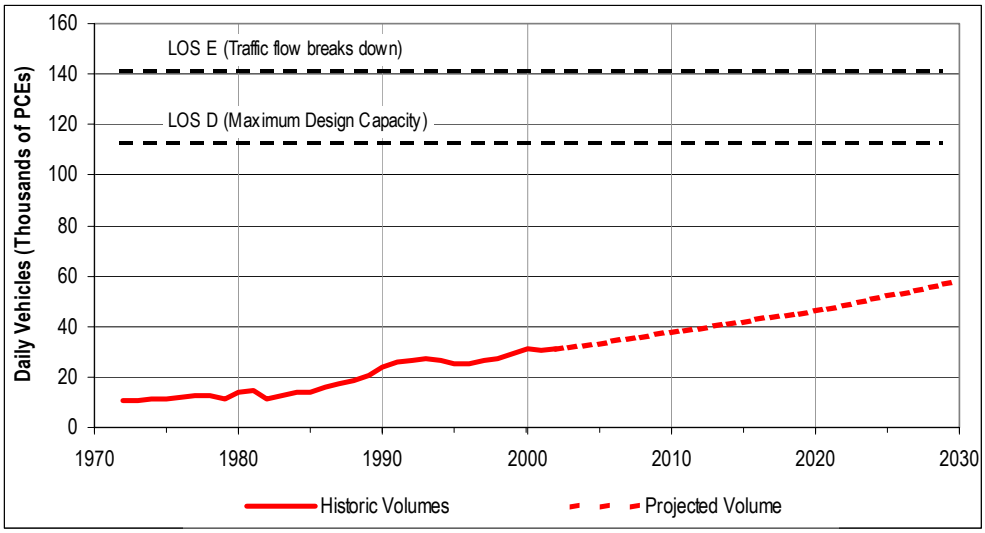
As noted previously, although there is often congestion on Highway 402, this crossing generally has sufficient infrastructure capacity and is expected to operate below capacity beyond the 30-year timeframe for this study (see Exhibit 4.6). In coming to this conclusion, it is assumed that the recommended 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.

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.

EXHIBIT 4.6: FUTURE DAILY VOLUME AND CAPACITY – BLUE WATER BRIDGE



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*

4.4.2. 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.

5. Transportation Problems and Opportunities

5.1. 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 5.1.

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 U.S. 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 5.1: 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.

5.2. 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.

6. Analysis Area

On the basis of the transportation problems identified with the Ambassador Bridge and Detroit-Windsor Tunnel, a Focused Analysis Area (FAA) was established in the Windsor-Detroit portion of the Broad Geographic Area. In establishing the Analysis Area, the need to provide for a range of feasible transportation alternatives was considered. Exhibit 6.1 identifies the Analysis Area proposed for this study. The rationale for the general limits of the Analysis Area are provided below:

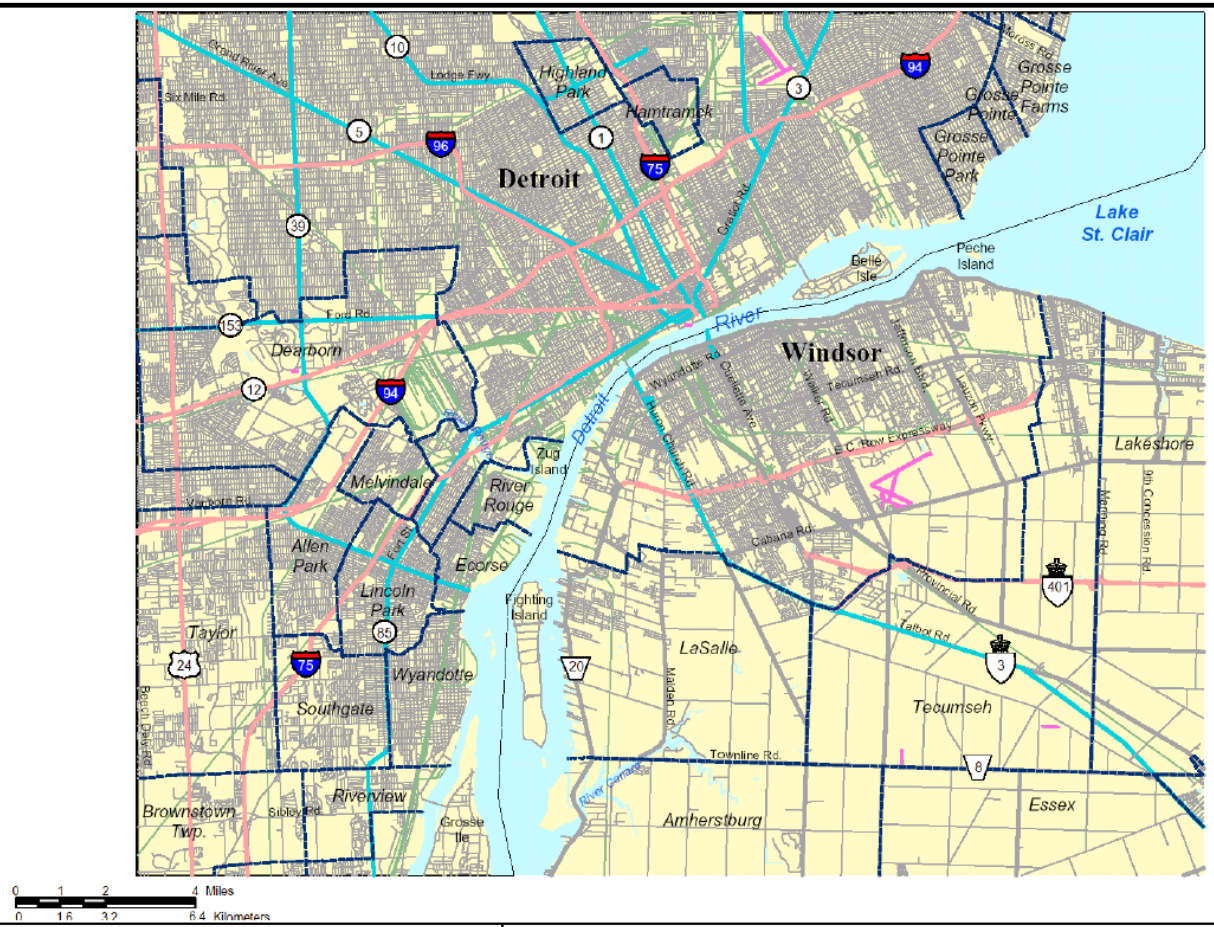
- North and West Limits: These limits are defined to allow for connections between the existing Provincial Highway and Interstate Freeway System for road-based alternatives. These limits are established to generally include the I-94 and I-75 corridors to ensure that the road-based alternatives considered 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 U.S. beyond the proposed east limit generally precludes any reasonable fixed link 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.

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.

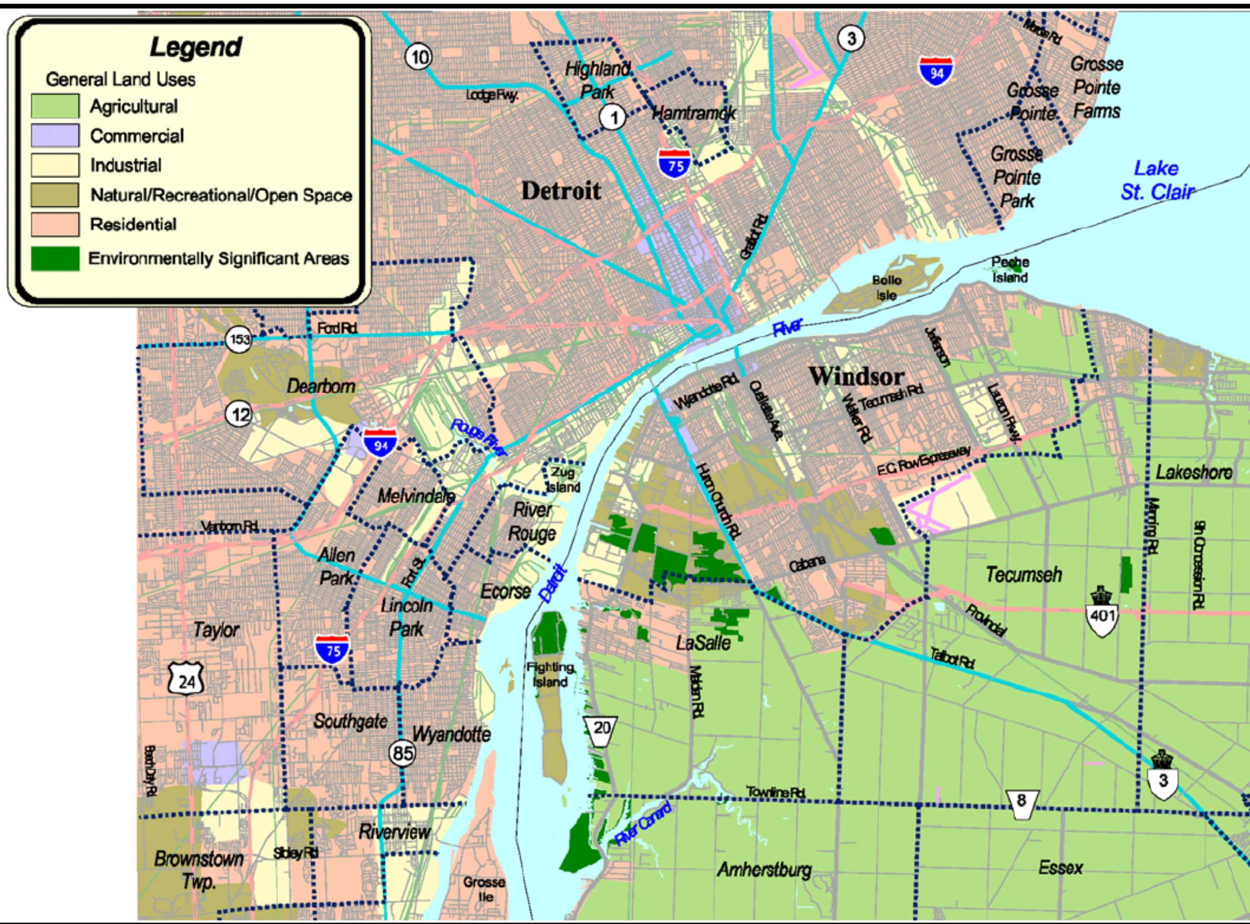
The major features and general land uses in the Analysis Area are shown in Exhibit 6.2.



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

Proposed Analysis Area

EXHIBIT 6.1



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

General Land Uses

EXHIBIT 6.2

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 U.S. share many of the same environmental concerns and goals. For example, at the national level, both national governments have 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.

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 over the 1990-2000 period by 7.5% to approximately one million. 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 U.S. 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 U.S. 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.

7. Transportation Alternatives

7.1. Description of the Alternatives Considered

The Focused Analysis Area identified in the previous chapter provided the area in which alternatives would be developed to address transportation problems and opportunities. Consistent with environmental approval processes in both Canada and the U.S., the transportation alternatives considered included roadway and non-roadway based options. The transportation alternatives considered are defined as follows:

The "Do-Nothing" Alternative

This alternative was defined as taking no significant action to expand infrastructure, manage demand or improve operations. It includes transportation improvements already contained in the existing plans and programs for geographical areas encompassed by the Southeast Michigan Council of Governments (SEMCOG) and the Windsor-Essex area. It does not include improvements to existing border processing capacity.

Improvements to Border Processing

Border processing is a key component in the transportation network in that it can restrict the capacity of the transportation network. Alternatives that improve border processing rates to a level equal to or greater than the flow rate of traffic across the border will to some degree address the transportation problems on the network.

Transportation Demand Management

Travel demand management focuses on the optimal use of existing and/or future infrastructure. This alternative includes measures such as Intelligent Transportation Systems (ITS) technologies and transportation/land use policies with incentives to reduce, shift or divert transportation demand, thereby deferring the need for expansion of the transportation network.

New and/or Improved Rail Alternatives With New or Expanded International Crossing

Rail currently plays a role in the movement of international and inter-regional goods in the FAA. Improvements to the rail network and/or expansion of existing crossings may address transportation problems by diverting sufficient truck traffic from the road network to impact the need or timing of roadway-based improvements.

New and/or Improved Transit and Marine Services

Capacity and/or service improvements/expansions to transit and marine services may reduce, shift or divert road-based passenger and freight travel demand.

New and/or Improved Road Alternatives With New or Expanded International Crossing

Federal/state/provincial roads are general freeways and highways designed to accommodate high volumes of international and/or inter-regional long distance, traffic. Connections between Highway 401 in Windsor/Essex County and the interstate freeway system in Detroit/Wayne County are required with this alternative to maintain continuity of the freeway/highway network. The highway connections would be designed to federal, provincial and/or state standards.

The river crossing could be either a new crossing (bridge or tunnel) or an expanded existing crossing. For the purposes of this study, a second span at the Ambassador Bridge crossing is considered to be an expansion of the existing crossing. Converting a rail tunnel to accommodate vehicular traffic is considered to provide a new crossing for road-based traffic.

Operational or structural changes of the existing crossings, such as modifications to plaza layouts or lane configurations are considered as expansion to existing crossings.

Although municipal roads do not typically serve international and/or inter-regional long distance travel, such facilities may address transportation problems by diverting local traffic from other facilities or serving as a connector between national, state and provincial facilities and international crossings.

Combinations of the above

Several of the above alternatives may be consolidated and put forward as a transportation network improvement strategy to both expand the transportation network and reduce, shift or divert various aspects of travel demand.

7.2. Evaluation of Transportation Alternatives

The transportation alternatives were assessed and evaluated using broad factors to determine which alternatives were practical and feasible from a transportation, environmental and border processing perspective.

The evaluation factors were established to achieve the objectives of the Planning/Need and Feasibility Study and are consistent with environmental approval processes in both Canada and the U.S. The factors developed for evaluating the practicality and feasibility of transportation alternatives are as follows:

- Transportation Network Improvement;
- Transportation Opportunities;
- Governmental Land Use, Transportation Planning and Tourism Objectives;
- Border Processing;

- Environmental Feasibility; and;
- Technical Feasibility.

The rationale and method of assessment used in the evaluation are listed in Table 7.1.

TABLE 7.1: EVALUATION FACTORS

Factor	Rationale	Method of Assessment
Transportation Network Improvement	Alternative would be considered feasible only if it enhances the performance of the transportation system with respect to the quality of travel as defined by travel time, travel speed, delay and reliability during the planning horizon of this study (to 2030).	Assessment of ability of the alternative to address congestion on the transportation network by improving travel time and reliability for international passenger and freight movement
Transportation Opportunities	Improvements to transportation efficiency may be gained by improving the utility of inefficient or underutilized transportation corridors as well as making use of planned network improvements	Assessment of the ability of the alternative to optimize use of existing transportation corridors or planned network improvements
Governmental Land Use, Transportation Planning and Tourism Objectives	Recognizing the importance and impacts of accommodating the free flow of international passengers and goods, consideration must be given to the degree to which alternatives support local, regional, provincial, state and national planning and tourism objectives.	Assessment of the degree to which the alternative is consistent with governmental land use, transportation planning and tourism objectives.
Border Processing	Alternatives would be considered feasible only if the long-term needs of the U.S. and Canadian border processing agencies can be met.	Assessment of the ability of the alternative to meet long-term needs of border processing agencies.
Environmental Feasibility	Consideration of potential impacts to environmental constraints (including natural, social and cultural features) is required under the environmental approval processes in both Canada and the U.S.	Assessment as to whether environmental constraints in the FAA (including natural, social and cultural features) preclude the alternative.
Technical Feasibility	Alternatives requiring new or expanded facilities would be considered feasible only if technical requirements related to alignment (both horizontal and vertical) and cross-section can be achieved at a reasonable cost.	Assessment of the ability of alternative requiring new or expanded facilities to achieve minimum technical requirements at a reasonable construction/implementation cost.

Do Nothing

One objective of the Planning/Need and Feasibility Study is to identify feasible alternatives to address the transportation problems and opportunities of the international road network in the FAA. Delays and queuing are already frequent occurrences at the Ambassador Bridge and the Detroit-Windsor Tunnel. Doing nothing will not reduce the likelihood of disruption to the transportation network on this strategic trade corridor, nor will it address the lack of sufficient roadway capacity to meet existing and future travel demand at the Detroit-Windsor crossings.

Doing nothing will result in a deficiency of capacity and increased travel delays. Extended delays at border crossings and queuing on approach roadways will negatively impact the local communities. The effects of congested border crossings in Windsor-Detroit will extend beyond the border communities to other regions in both countries. The Do-nothing alternative will not be carried forward as a possible solution. However, the Do Nothing or "Base Case" alternative will be carried forward as a benchmark from which to compare and assess other alternatives.

Improvements to Border Processing

Many of the delays and queuing currently experienced on the approaches to the border crossings are related to border processing deficiencies and border security concerns. The issues of border security will be on-going and will require additional efforts among border processing agencies, transportation agencies and local community agencies to accommodate security procedures implemented during periods of high level risk.

Under typical operating conditions, the deficiencies in border processing relate to improper or inaccurate documentation by drivers, passengers, or shippers, a lack of available border processing staff and facilities to accommodate border processing requirements, limited use of Intelligent Transportation Systems (ITS) and a low participation rate in border processing programs. These elements combined result in delays and queuing at the border crossings.

The U.S. government has recently approved the provision of additional staffing at the Detroit border crossings and the recent launch of the NEXUS and FAST programs are expected to address to some degree the issues of identifying high and low risk border users and proper documentation. In addition, commercial vehicle pre-processing centres are being brought into use in Ontario to ensure documentation of commercial border users is properly and accurately completed. The Canadian Transit Company, owner of the Ambassador Bridge, has opened such a centre along the Highway 401 Corridor west of London. The facility serves commercial vehicles destined to either the Ambassador Bridge or Blue Water Bridge. The purpose of these facilities are to reduce processing times at the border crossings.

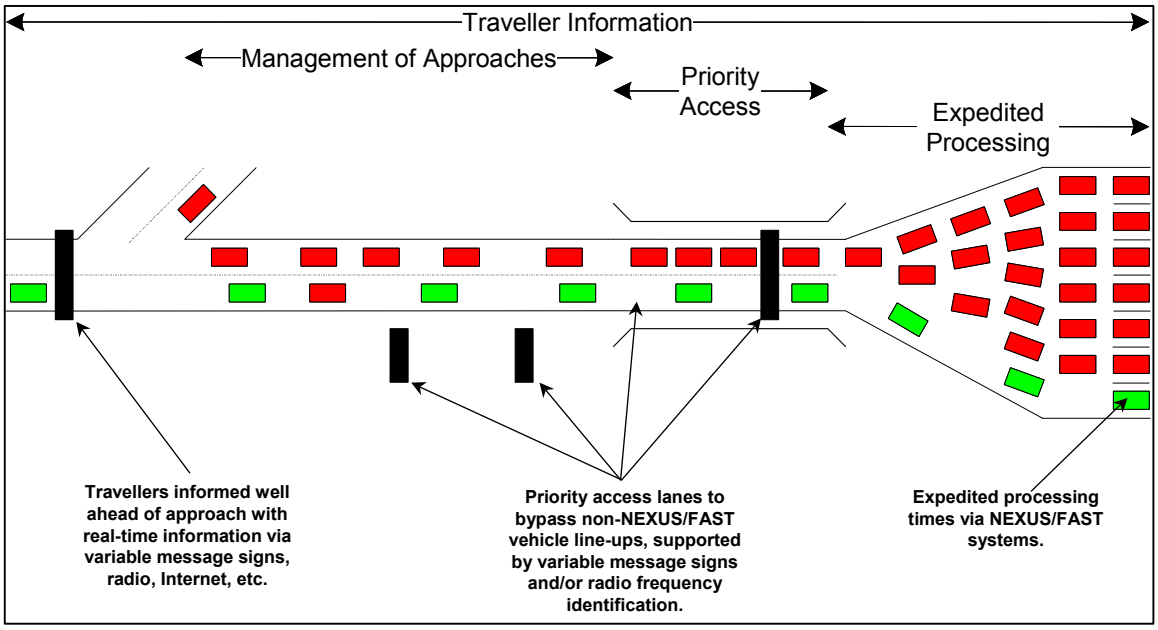
Operators at the existing border crossings have identified additional staffing as being the most important issue facing the border over the short term. Governments have responded and are adding more staff at the border crossings. In the longer term, greater use of NEXUS and FAST are seen as being the more cost-effective method of addressing the projected increases in travel demand at the border crossings.

International border crossings present unique opportunities for the implementation of Intelligent Transportation System technologies and systems, particularly in terms of improving the security, safety and efficiency of passenger and commercial vehicle processing. In particular, ITS could provide expedited processing, priority access, approach management and traveller information in support of the NEXUS and FAST systems at the Detroit-Windsor crossings.

The NEXUS and FAST systems are designed to expedite inspection/processing times for passengers and commercial vehicles and their drivers. Ensuring effective use of these programs and higher participation rates will require that users experience travel time and/or convenience benefits. This may require infrastructure improvements such as providing priority access lanes for NEXUS and FAST users to get around other vehicles queuing for inspection. ITS applications that can support these lanes include variable message signs (i.e. signs that can be automatically altered) to indicate priority lanes or radio frequency identification (RFID) to enforce their use by NEXUS/FAST participants only (refer to illustration in Exhibit 7.1).

The efficient use of a system of several border crossings can be managed well ahead of arrival through the implementation of traveler information systems. Real-time (i.e. up-to-the-minute) knowledge of the conditions at each crossing would allow more effective management of the border crossing system as a whole and provide useful guidance and information to cross-border travelers in determining the time and route of travel. Real-time information can be used to distribute resources and manage/control traffic at crossings and assist in the staffing/allocation of inspection resources. The media that could be used to disseminate this information could include dynamic signs at strategic road junctions, local low power radio (highway advisory radio), Internet information channels (which could be used for example, by truck dispatchers) and closed-circuit television. Such information dissemination would not only use these diversion strategies but also might influence the timing of arrival at the border.

EXHIBIT 7.1: POSSIBLE APPLICATIONS FOR ITS AT BORDER CROSSINGS



In the U.S., MDOT and FHWA are finalizing plans for improvements to connections between the interstate freeway system and the Ambassador Bridge plaza. These

improvements will provide for some expansion of secondary inspection facilities, a frequent cause of delays for U.S.-bound commercial traffic.

While these measures will assist border processing agencies improve processing rates and reduce the likelihood of extensive queuing and delays, these improvements alone are not sufficient to address the need for reasonable options for maintaining the movement of people and goods and the need for additional network capacity to accommodate future travel demand. It can be expected that, as international traffic volumes continue to grow, additional staffing and facilities improvements will be required in this region.

Improvements to border processing can maximize the use of existing transportation corridors and would be consistent with government planning and tourism objectives in that they lead to improved flow across the border. Less congestion and delay may encourage cross-border travel, which in turn helps the regional tourism industry.

Improvements to border processing facilities may result in impacts to FAA features. However, the impacts can be avoided, minimized or mitigated through proper development and application of border processing technologies.

'Improvements to Border Processing' is a component of any solution to the transportation problems in the FAA, although not the only component. This alternative will be carried forward for further study.

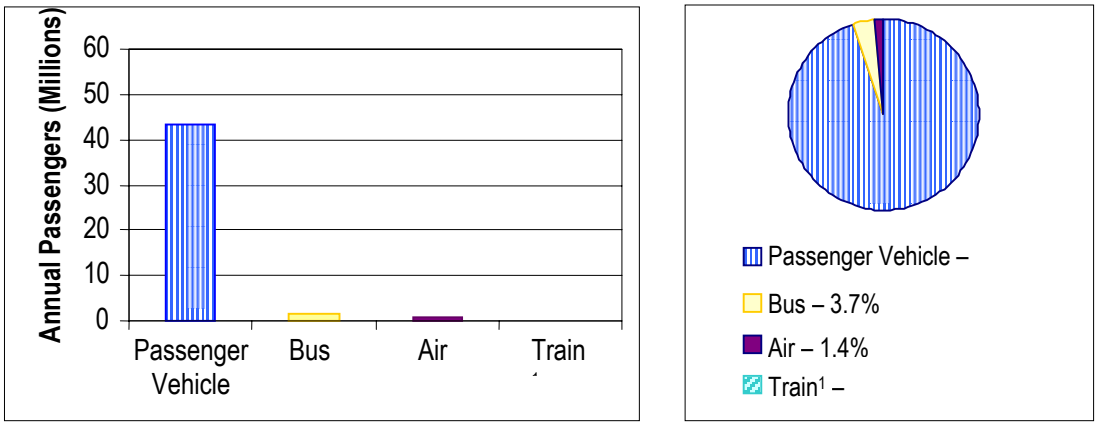
Transportation Demand Management

Transportation Demand Management (TDM) is the application of technologies, policies or other methods to reduce, shift or divert transportation demand.

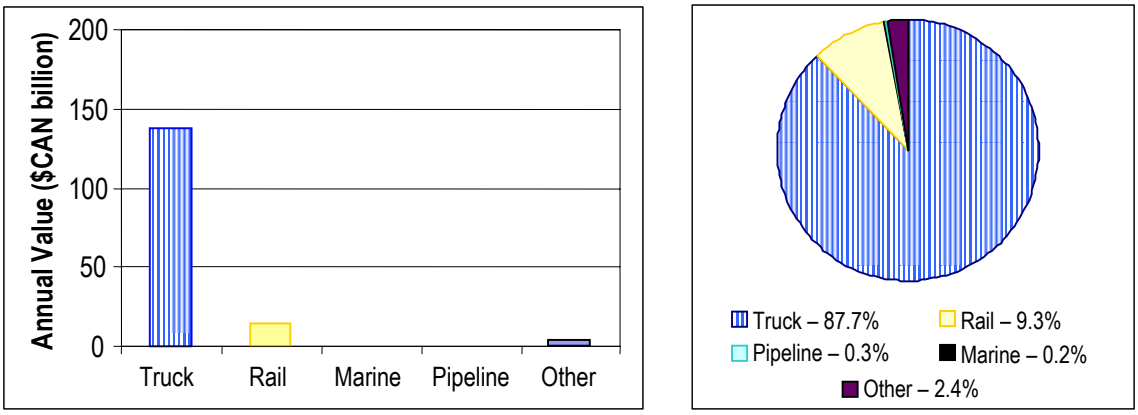
As represented in Exhibit 7.2, the vast majority of international trips in the FAA are road-based. The modal shares depicted in this exhibit are expected to remain relatively constant over the long term, with the exception of a slight shift from truck to inter-modal rail, which will be discussed in a subsequent section of this chapter.

EXHIBIT 7.2: CROSS-BORDER TRIPS BY MODE (2000)

Cross-Border Person Trips by Mode[1] (Annual 2000)



Cross-Border Value of Goods Transported by Mode (Annual 2000)



Note 1: There is no through passenger rail service provided between Windsor and Detroit. Train trips reported here are deemed to have used the rail service operating between Sarnia-Port Huron.

The most common trip purposes (refer to Exhibit 7.3) are recreational/shopping and work/business/school. Data provided in the *Existing and Future Travel Demand Working Paper, November 2002* identified that peak travel periods for work/business/school trips do not coincide with peak recreational/shopping trips. Recreational/shopping trips are generally at lower levels during the morning and afternoon peak periods and higher in mid-day, evening and weekend periods.

EXHIBIT 7.3: CROSS-BORDER PASSENGER CAR TRIPS BY TRIP PURPOSE, 2000 WEEKDAY

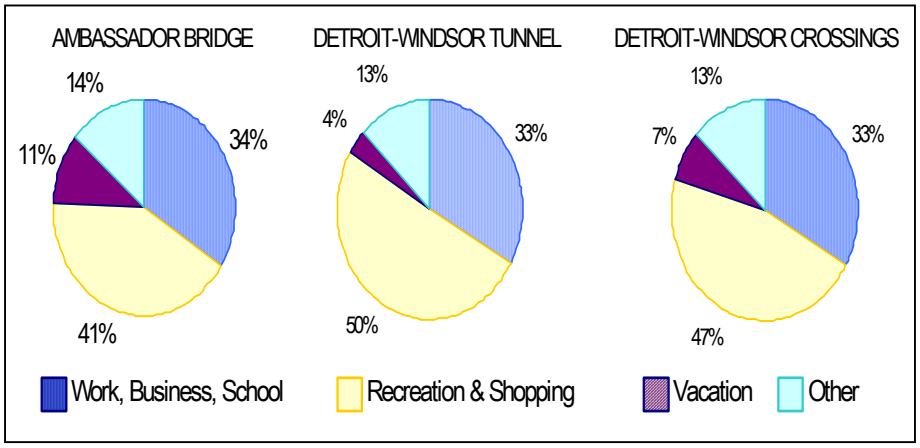


Table 7.2 provides additional information as to the vehicle and trip type (by origin-destination) of these road-based trips. The vast majority of passenger trips are local, defined as beginning and ending in the Windsor/Essex County-Detroit/Wayne County area. A sizable amount of commercial trips are passing entirely through the Windsor/Essex County-Detroit/Wayne County area.

TABLE 7.2: 2000 DAILY INTERNATIONAL TRAFFIC CROSSING AT WINDSOR-DETROIT BY VEHICLE AND TRIP TYPE

Type of Traffic	Passenger	%	Commercial	%
International Local to Local	40,561	79%	3,083	24%
Local (U.S. side) to Long Distance (Canadian Side)	3,145	6%	1,983	16%
Local (Canadian side) to Long Distance (U.S. Side)	4,882	9%	2,113	16%
International Long Distance to Long Distance	3,003	6%	5,589	44%
Total	51,591	100%	12,769	100%

This information, together with other data presented in the *Existing and Future Travel Demand Working Paper, November 2002*, was used to evaluate the feasibility and practicality of TDM as a transportation alternative.

Demand Reduction Measures

Demand reduction measures for passenger trips in the FAA, such as ride sharing and use of transit would have little effect on the operations of the transportation network. The average auto occupancy for cross-border trips at the Ambassador Bridge is 1.85 and at the Detroit-Windsor Tunnel is 1.75, which suggests that ride-sharing is already being practiced by cross-border travelers (typical occupancy rates for metropolitan areas are around 1.1 persons per vehicle). Further promotion of ride sharing can be expected to yield only marginal reductions in demand on the network.

Demand reduction measures for freight traffic in the FAA include use of rail and marine. These alternatives are discussed separately in this section.

Challenges and possible benefits of improving transit ridership are discussed under New and/or Improved Transit and Marine Services.

Measures to Shift Demand

Shifting travel demand to less busy days of the week or off-peak periods of the day or other international crossings was also considered. Based on the findings of the *Existing and Future Travel Demand Working Paper – November* 2002, the transportation network exhibits evidence of attempts by users to manage demand during peak travel periods throughout the week. For example:

- the number of passenger cars crossing the Ambassador Bridge and Detroit-Windsor Tunnel is greatest on the weekend and Fridays when commercial vehicle traffic is lowest, suggesting drivers are deferring leisure trips to non-workdays;
- weekday cross-border passenger car travel is characterized by morning and afternoon peaks; weekday cross-border commercial vehicle traffic is highest during

mid-day periods, suggesting truckers attempt to avoid peak periods for passenger car travel;

- weekday to weekend traffic volume comparisons suggest passenger car traffic diverts to the Detroit-Windsor tunnel during the week to avoid high truck traffic levels on the Ambassador Bridge.

Given the degree of demand management already practiced by network users, encouragement of any such measures would be expected to yield only marginal improvements to network operations.

Measures to Divert Demand

One measure to reduce demand on the traffic network in the FAA is to divert travel demand to other international crossings outside of the FAA. Shifting passenger and commercial traffic to border crossings in the Sarnia-Port Huron area, for example, would preserve capacity on the Detroit-Windsor crossings.

Work completed as part of the *Existing and Future Travel Demand Working Paper – November 2002*, identified that approximately 7% of passenger car traffic and 30% of commercial vehicle traffic currently using the Ambassador Bridge on a weekday could also use the Blue Water Bridge without significant travel time increases.

The Working Paper identified a number of reasons why the Detroit-Windsor crossings are preferred by such trip-makers, including:

- operators may be more familiar with the routing and comfortable with customs brokers at the Ambassador Bridge, resulting in the formation of travel habits;
- the Blue Water Bridge has only had increased capacity for a relatively short period of time, not long enough for the increased attractiveness of this crossing to break travel habits;
- it is easier (or habitual) for the administrative departments of operators to deal with one bridge for matters such as pre-clearance papers. Once pre-cleared for a particular crossing, a driver cannot change crossings to avoid delays;
- aggressive voucher redemption program and marketing by the Ambassador Bridge;
- convenient rest stop en route to the Ambassador Bridge;
- there is better access to I-75 south of Detroit via Windsor, as travelling down I-94 via Sarnia-Port Huron requires going through the core of Detroit; and,
- there is a perception of a shorter trip distance via the Ambassador Bridge for more of the total trips between Ontario and Michigan.

Changes to border processing procedures under the FAST program to allow for the use of any border crossing in southwest Ontario-southeastern Michigan, and increased education/awareness programs may encourage long-distance travelers to divert from the Windsor-Detroit border crossings. Achieving a high degree of diversion from these

candidate trips would defer, but not eliminate the need for improvements to the transportation network in the FAA.

Other measures to divert demand include:

- incentives to encourage reduction of trips (e.g. promoting telecommuting); and
- land use and transportation planning policies and other policies and procedures that result in less single occupancy vehicle use, less commuting, higher transit use, and more efficient use of the transportation network.

The development of effective measures to divert demand in the FAA is made complicated by the bi-national nature of the transportation network. Implementation of such measures would require international agreement by various levels of governments in both countries, each with their own legislation/policies to address issues that are unique to them. As noted previously, travel demand in the FAA relies heavily on road-based transportation for the movement of people and goods. Nevertheless, measures to reduce or change this aspect of travel demand may be effective in achieving a marginal reduction in travel demand across the transportation network.

Transportation Systems Management

Transportation Systems Management (TSM) relates to a wide range of systems and technology to improve the efficiency and safety of existing and future highways. Driver messaging/directional signing, traffic metering, incident monitoring can improve traffic flow during high congestion periods, bad winter weather, traffic accident, special events, etc. Operations on the transportation network are carefully monitored by a number of sources, including local media, border agencies, border crossing operators and the trucking community. These various information sources provide updates of border crossing conditions, allowing motorists, and trucking dispatchers, to make informed choices about whether and where to travel. Improving communications and the increased use of technologies to better inform drivers may provide some benefit to network operations, but would not eliminate the need for other improvements.

Localized improvements, such as improved signal timing and improvements to intersections may better utilize existing facilities and roads by increasing their efficiency, but would similarly yield only marginal improvements to network operations.

Conclusions

The nature of international travel demand on the FAA transportation network means that implementing TDM measures alone will not eliminate the need for other network improvements to accommodate the 2030 travel demand. In addition, TDM does not address the need for reasonable options for maintaining the movement of people and goods on the transportation network. However, implementing TDM measures can provide some benefit to network operations, and they support other government and tourism objectives. In addition, TDM could be implemented in conjunction with border processing requirements with minor impacts to environmental features. TDM, therefore, will also be

considered as part of the strategy for improvements to the transportation network.

New and/or Improved Rail Alternatives

The capacity of the existing rail network has been determined to be sufficient to meet the long-term needs of rail transport. The rail network in the FAA is capable of accommodating projected 2030 demand, assuming main line capacity on links outside the FAA also keep pace with the growth through investment in additions and renewals. Rail alternatives considered in this study are therefore of two types: 1) alternatives that provide new rail service and facilities where not currently provided in the FAA, and 2) alternatives that increase the use of rail.

As noted earlier in this chapter, there is no international passenger rail service provided in the FAA, and rail presently carries approximately 20% of the value of international freight shipped in the FAA. Measures could be introduced to encourage the use of railway passenger services across the border. At present, there are no known plans for the introduction of passenger rail services in the FAA. It is unlikely that such a service could achieve appropriate ridership to sufficiently address network operational needs.

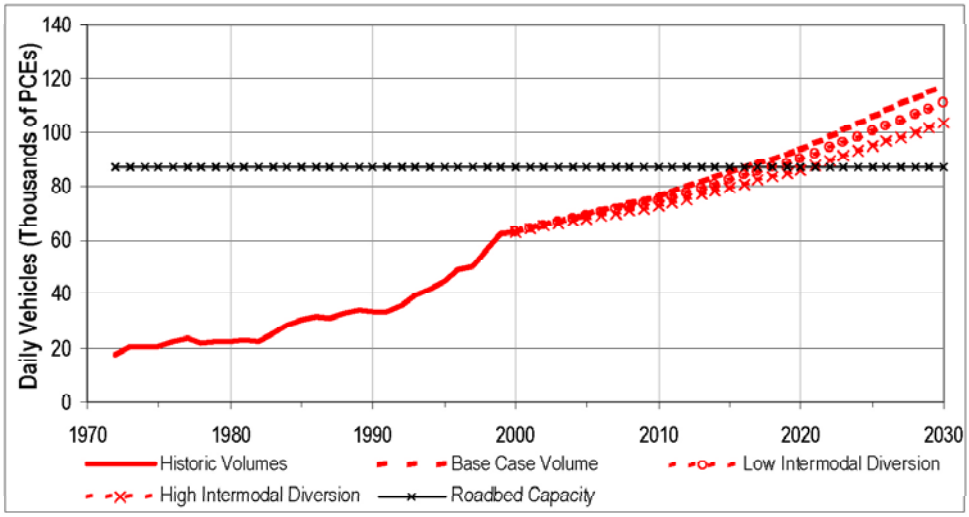
Both CN and CPR have introduced short distance (1,000 km or less) intermodal rail services in the corridor (currently between Montreal/Toronto and Detroit/Chicago). The Detroit Intermodal Freight Terminal project is examining ways to rationalize and improve the capacity and utilization of freight terminals within the Detroit area.

These measures will help to increase the competitiveness and market share of the rail mode. The Base Case scenario for future travel demand used to identify future needs of the network includes an aggressive, but realistic, increase in intermodal rail traffic of 10% by 2010, increasing to 15% in 2020, and 20% by 2030. It should be noted that an increase in intermodal rail traffic of 10% would correspond to a 4.4% decrease in truck traffic on the Ambassador Bridge. A 20% increase in intermodal rail traffic by 2030 would correspond to an 8.9% reduction in truck traffic at the bridge.

To determine the effectiveness of new and/or improved rail alternatives, a scenario was developed which assumed twice the projected increase in the shift to rail, that is 20% diversion of commercial vehicles to intermodal rail by 2010, increasing to 30% in 2020, and 40% in 2030. Similar to the Base Case scenario, the reduction in truck traffic at the Ambassador Bridge would be approximately 8.8% by 2010, increasing to almost 18% by 2030. This scenario is considered very optimistic and an upper threshold on what is possible to achieve under current market conditions. For this level of diversion to occur, significant investment in infrastructure and technology (such as a high clearance rail tunnel and upgrades to rail corridors and intermodal terminals within and outside of the FAA) would be required, along with a change in the current goods movement trends and patterns of which shippers are accustomed. As previously indicated, this investment and change in shipping patterns is already underway to a certain extent, but there is large uncertainty as to the degree of penetration into the commercial vehicle market that can be achieved.

As shown in Exhibit 7.4, even under such an optimistic diversion scenario, rail improvements would defer, but not eliminate the need for improvements to the transportation network. This alternative would therefore only marginally improve congestion on the road-based transportation network.

EXHIBIT 7.4: BENEFITS OF RAIL/INTERMODAL DIVERSION FOR THE AMBASSADOR BRIDGE



From a technical perspective, rail corridors and tunnels are technically feasible to construct and implementing rail improvements would allow for the use of existing transportation corridors. In addition, a new or expanded international rail crossing, would provide an option for maintaining the movement of people and goods in cases of disruption to any of the existing border crossings on the transportation network. However, improvements to rail and more diversion to rail will not significantly reduce the road-based demand on the network. As a result, delays and queuing on the road network would continue to occur and gradually worsen as traffic volumes increased. Such delays and queuing on the road-based network of this international trade corridor is not consistent with governmental planning objectives or tourism objectives. Similarly, improvements to rail would only partially address border processing needs; improvements to rail may assist in the processing of freight traffic, but would have little benefit to truck and passenger vehicle inspection processes on the road network. Rail improvements would likely also result in impacts to environmental features within or adjacent to existing or proposed rail corridors, but these impacts could be avoided or mitigated to the extent possible as with the road alternatives.

New and/or Improved Transit and Marine Services

Presently, transit and marine services in the FAA serve minor roles in the transportation network. As noted previously in this section, transit served approximately 2% of the annual passenger cross-border trips in the FAA in 2000, while marine served less than 1% of the value of international freight shipments in the same year.

Transit

Currently, the only public transit available between Windsor and Detroit is the Tunnel Bus operated by Transit Windsor. In developing the travel demand projections, increased frequencies of existing services were assumed at levels to support a continuation of current market shares, but no new local or intercity services were included.

However, a number of alternatives for improving transit services can be implemented to provide choices for cross-border travelers. These alternatives include:

- Increase tunnel bus services - Current levels of service are rather low and increased services might encourage greater utilization.
- Extend tunnel bus or introduce new commuter express services to major destinations - For example, many Windsor residents work at the hospital complex in downtown Detroit. A direct bus to the hospital complex could encourage transfers. Similarly the other origins and destinations in Detroit/Windsor might be linked with a better bus service.
- Introduction of Ambassador Bridge bus service - Similar to the bus through the tunnel, a bus crossing Ambassador Bridge could provide connections between areas in Windsor and Detroit for local commuters and visitors.
- Alternative public transit systems - These could include new systems such as the proposed gondola system across the river, the introduction of a passenger ferry service (possibly similar to the Seabus service in Vancouver), development of a shuttle rail service through the existing rail tunnel, extension of planned commuter rail services in the Detroit region to Windsor and other measures.

Improvements to transit services are not likely to adequately reduce travel demand on the road network sufficiently to overcome the need for road improvements. Transit improvements could make use of use of existing transportation corridors and can be implemented, in most cases, at a reasonable cost and in a relatively short time frame (as compared to major infrastructure improvements).

However, delays and queuing on the road-based network would result even with the transit service improvements. This result is not consistent with governmental planning objectives or tourism objectives. Similarly, improvements to transit services would only partially address border processing needs (for example, transit improvements would only address passenger travel). Transit improvements would likely also result in impacts to environmental features within or adjacent to existing or proposed new transit corridors, but these impacts could be avoided, minimized or mitigated to the extent possible as with other infrastructure improvement alternatives.

Marine

Marine services can be considered as being of two types – long-distance and local. Long-distance marine services are comparable to rail in that such services can reduce travel demand in the FAA. Local ferry services are comparable to the tunnel bus service for

passengers and an alternative road-based crossing for trucks and cars (the ferry terminals are accessed via the road network in the FAA).

Long-distance shipping on the Great Lakes primarily serves bulk goods transport (e.g. ore, stone, salt). In the past, package freighters have operated on the Great Lakes. However, given the just-in-time inventory processes now practiced by many North American industries and the time sensitivities to many goods presently being transported by truck, the potential market for long-distance shipping is only a fraction of that which crosses the Detroit-Windsor border today. A feasibility study is expected to be initiated shortly to investigate opportunities for improving navigability on the Great Lakes- St. Lawrence Seaway (GL-STS) System. Issues related to ground-side access to marine ports have also been identified as constraints to increasing the role of Great Lakes shipping. However, the major impediment to the increased use of marine services is the seasonality of this service. Navigation on the GL-STS System is suspended from the end of December to generally April the following year. Even with improved use of marine services, there will still be a need to provide for ground shipments during the winter months. These issues make it highly unlikely that marine services would be able to provide the necessary transportation network improvements in the FAA.

The Detroit-Windsor Truck Ferry provides local ferry services in the FAA. Currently, the truck ferry has a relatively small but vital role in the FAA. The service is relied upon to ferry oversize shipments and hazardous goods across the Detroit River, but in no way restricts its use to these two markets. There are possibilities to increase the use of the service to divert passengers and other freight services from the bridge and tunnel. The ferry is currently operating at about 25% of capacity. The operation also has the capability of adding barges and tugs to increase its daily operating capacity. Others have expressed an interest in launching new truck and passenger ferry services on the Detroit River.

It is possible that these services could be increased to the point that several hundred trucks per day could be transported across the border. This would be an important contribution to the overall capacity of the border crossing system. However, the traffic demands analysis projects an increase of several thousand trucks per day. At full capacity and with additional barges, ferry services alone cannot provide sufficient transportation network improvements to meet the long-term needs of the region. Adding or improving these marine services is technically feasible, can make use of use of existing transportation corridors along the riverfront and can be implemented, in most cases, at a reasonable cost and in a relatively short time frame (as compared to major infrastructure improvements).

However, delays and queuing on the road-based network would result even with the marine service improvements. This result is not consistent with governmental planning objectives or tourism objectives. Similarly, improvements to marine services would only partially address border processing needs (for example, new ferry services could increase border processing staffing requirements at the border). Marine services would likely also result in impacts to environmental features within or adjacent to existing or proposed marine terminals and facilities, but these impacts could be avoided, minimized or mitigated to the extent possible, as with other alternatives.

New and/or Improved Road Alternatives With New or Expanded International Crossing

Expanding the road network will provide an option for maintaining the movement of people and goods and alleviating congestion. As noted earlier in this chapter, the majority of cross-border trips on the network (97% of passenger trips and 75% of the value of freight shipments) currently use road-based transportation modes. This trend is likely to continue over the planning horizon of this study. Providing additional road-based capacity directly addresses the needs of the network. Through proper planning, such expansion can maximize use of existing corridors and be implemented in a manner consistent with planning and tourism objectives.

New or expanded border crossings must be designed to meet the long-term needs of border processing agencies. These needs include: size/flexibility of plaza area to accommodate border processing requirements, the ability to identify and separate low and high-risk traffic and security of the primary and secondary inspection areas. These improvements can be incorporated into existing border crossings or a new crossing.

Improvements to the existing crossings can provide some relief but would not fully address the need for reasonable options for maintaining the movement of people and goods in cases of disruption at any of the existing border crossings and additional road capacity. However, improvements to the existing crossings can increase utilization of existing infrastructure and improve operations on the network.

New road alternatives, whether federal, provincial, state and/or municipally governed, can be designed to comply with design standards. Given the nature and extent of development and other land uses in the FAA, expansion of the road network will generate impacts to natural, social and/or cultural features. The four transportation agencies that comprise the Partnership, in consultation with agencies, other government offices and departments, stakeholder groups and the public, will develop and apply methodologies to avoid, minimize or mitigate impacts to the extent possible, as appropriate.

'New or improved road alternatives with new or improved international crossing' is a feasible alternative and will be carried forward for further study.

Combinations of the Alternatives

In order to satisfy the study goals and objectives, including basic transportation demand (the movement of people and goods), it was apparent from the traffic analysis, that several of the planning alternatives, implemented in concert will be required to address future transportation needs within the FAA. Border processing improvements are required immediately. The implementation of these improvements is not under the direct control of the Partnership. The Partnership, however, is continuing to work with border processing agencies to encourage and support initiatives that improve border processing at the Windsor-Detroit crossings. However, it is also clear that, the only planning alternative that can practically accommodate a significant amount of increased demand for travel and effectively provide reasonable options for maintaining the movement of people and goods in cases of disruptions at any of the existing border crossings is the 'new and/or improved roads with new or improved international crossing' alternative. The road improvements

alternative has been identified as the most effective at addressing the transportation network requirements, border processing requirements, and provides the highest overall level of "support" to government planning and tourism objectives. This alternative has a comparable degree of environmental and technical feasibility as the other alternatives on the basis that impacts could be avoided, reduced or mitigated to the extent possible as with other infrastructure improvement alternatives.

In terms of addressing transportation network requirements for people and goods movement, a multi-modal approach provides choice for travelers and offers viable mechanisms to reduce auto use. However, alternatives for travel demand management, rail, transit, ferries, etc. cannot independently address the diverse user needs, sufficiently alleviate traffic congestion on the transportation network nor effectively provide reasonable options for maintaining the movement of people and goods in cases of disruptions at any of the existing border crossings.

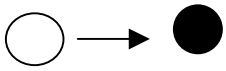
7.3. Conclusions

The evaluation of transportation alternatives is summarized in graphic form in Exhibit 7.5.

EXHIBIT 7.5: SUMMARY OF EVALUATION OF TRANSPORTATION ALTERNATIVES

Factor	Do Nothing	Border Processing	TDM	Rail Improvements	Transit Improvements	Marine Improvements	New and/or Expanded Roadways
Transportation Network Improvement	○	◑	◑	◔	◔	◔	●
Transportation Opportunities	○	◑	●	●	●	●	●
Governmental Land Use, Transportation Planning and Tourism Objectives	○	●	◑	◑	◔	◔	●
Border Processing	○	●	◑	◑	◔	◔	●
Environmental Feasibility	◑	◑	◑	◑	◔	◔	◑
Technical Feasibility	N/A	●	●	●	●	●	●

Shading represents the degree to which the alternative addresses each factor, relative to the other alternatives



Low High

The assessment of transportation alternatives indicates that border processing improvements and roadway additions/improvements with new or improved border crossing must be a part of the network improvements to accommodate the long-term transportation needs in the FAA. However, the analysis also supports the inclusion of

travel demand management measures as well as rail, transit and ferry service improvements as part a multi-modal strategy for the medium and long-term needs of the transportation network in the FAA.

Subsequent chapters of this document will discuss the generation and assessment of new and/or improved roadway alternatives with new or improved border crossing. The multi-modal strategy addressing other aspects of improvements to the transportation network is discussed in Chapter 10.

8. Development of Alternative Roadway Corridors

8.1. Alternatives Generation Process

The process used to generate new and/or improved road alternatives and new or expanded international crossings is consistent with environmental approval processes in both the U.S. and Canada. The process consisted of the following steps:

Step 1 – Identify Design Requirements for New/Improved Road Connections and New or Expanded International Crossing

Step 2 - Identify Constraint Areas in the Focused Analysis Area

Step 3 – Develop Opportunity Corridors for New/Improved Road Connections and New or Expanded International Crossing

Step 4 – Assess the Feasibility of the Alternative Opportunity Corridors

8.2. Description of the Roadway Alternatives and New International Crossing

Descriptions of the road connections and international crossing required to meet the needs of the transportation network were developed to provide a basis for assessing the network performance, as well as the technical and environmental feasibility, of alternative alignments.

New or improved road connections between the provincial highway system in Windsor/Essex County and the interstate freeway system in Detroit/Wayne County will be required to provide sufficient capacity to meet the long-term needs of the network. An assessment of future (2030) lane requirements across the Detroit River identified that five traffic lanes per direction are needed. Together, the Ambassador Bridge and Detroit-Windsor Tunnel provide three lanes per direction across the river. Therefore, two additional traffic lanes per direction are required on a new or expanded crossing to meet the needs of cross-border capacity in 2030. In their effort to plan for an international crossing, the governments must seek opportunities, whenever possible, to reflect the fact that such infrastructure, once constructed, will last beyond 30 years. In addition, the governments need to consider the benefits to provide sufficient flexibility at a new crossing to implement various operational improvements (e.g. traffic streaming) and to accommodate maintenance operations. On this basis, a six-lane crossing is being proposed for a new crossing, while a four-lane second span is assumed for the expansion of the Ambassador Bridge. The minimum vertical clearance required for new bridge alternatives over the Detroit River is 46 m (150 ft). It is recognized that the new crossing may also be a tunnel. It is assumed that such a tunnel would be bored under the Detroit River riverbed.

The minimum vertical clearance required for new bridge alternatives over the Detroit River is 46 m (150 ft). It is recognized that the new crossing may also be a tunnel. It is assumed that such a tunnel would be bored under the Detroit River riverbed.

Consistent with the function and projected traffic characteristics of the new road connections leading to a new/expanded border crossing, the new roadway connections will be multi-lane freeways with access provided at interchanges only. Such road facilities typically have the following design characteristics:

- Minimum right-of-way width = 100 m (300 ft)
- Design speed = 120 km/h (75 mph)
- Maximum mainline grade = 3%
- Minimum horizontal curve radius = 650 m (2,130 ft)

As the project proceeds to the preliminary design stage, the design characteristics of the roadway alternatives and new border crossing may be modified to reflect issues specific to the location of the alternative and to reduce impacts.

To meet the needs of the transportation network, the new road connections must connect to the provincial highway system in the Windsor/Essex County area and the interstate freeway system in the Detroit/Wayne County area. Highway 401 is generally an east-west facility terminating at the south end of the City of Windsor. The I-75, which parallels the Detroit River between the Ambassador Bridge and the south limit of the FAA, provides the first opportunity for an interstate connection in the southern portion of the FAA, while I-94 provides such an opportunity in the northern portion.

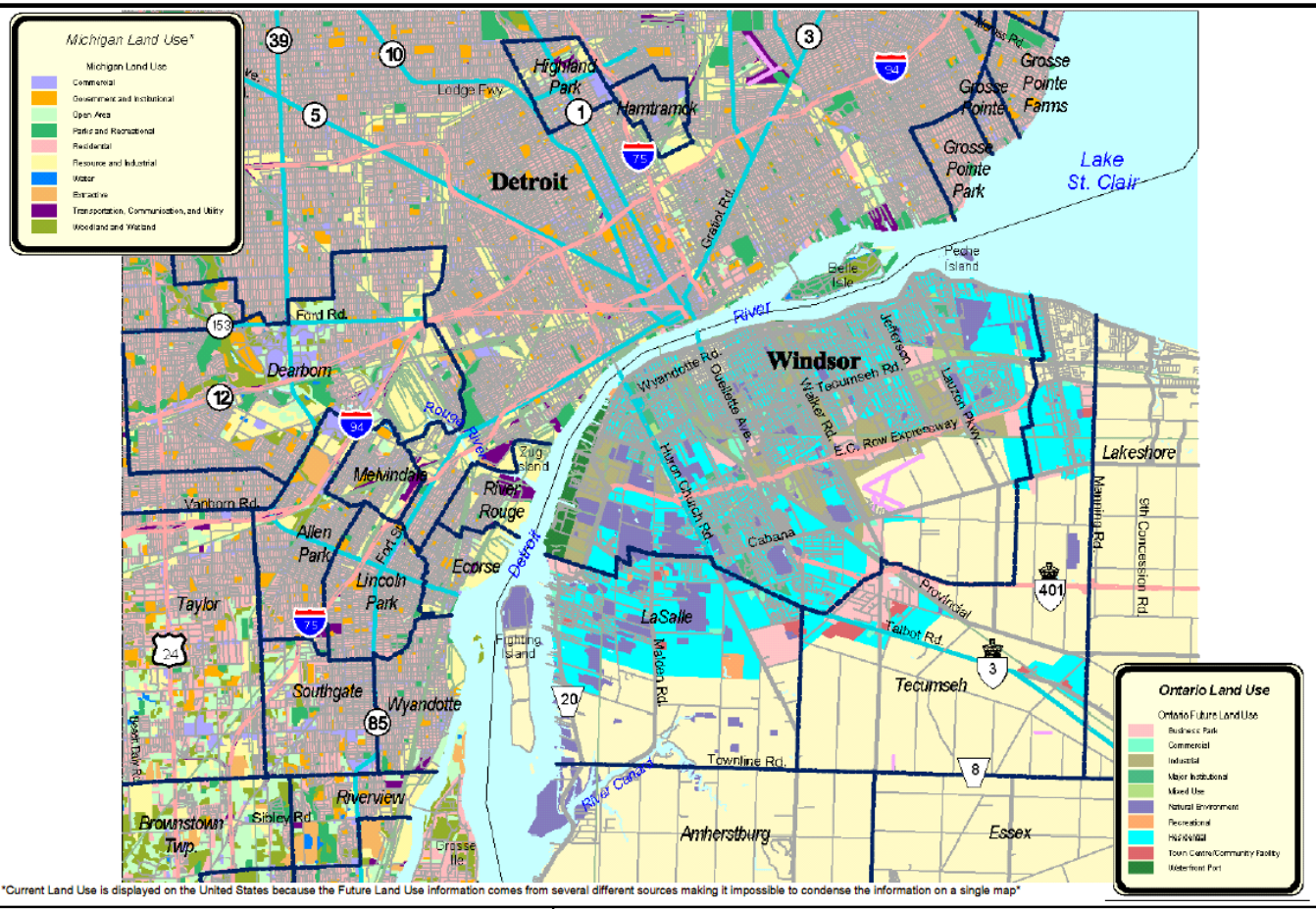
8.3. Identification of Constraint Areas

An environmental overview of the FAA, identifying the general characteristics and significant environmental features of the FAA, was completed based on secondary source information (i.e. publicly available documents). The existing and future mix of land uses on both sides of the Detroit River includes natural areas and agricultural lands, single and multiple family residential neighbourhoods, intensely developed core urban areas and heavily industrialized areas (refer to Exhibit 8.1).

To assist the generation of alternatives that would reduce the overall impacts to the FAA, constraint areas were identified. The constraint areas include residential and commercial areas and significant natural features. Direct impacts to such areas are to be avoided as much as possible.

The constraint areas are shown in Exhibit 8.2. From this Exhibit, it is evident that there are no opportunities to locate new/improved roadways or new/expanded river crossings alternatives within the FAA where all constraint areas can be avoided.

As the project proceeds through the environmental studies, constraint areas may be modified to reflect updated conditions and more detailed data obtained for the FAA.



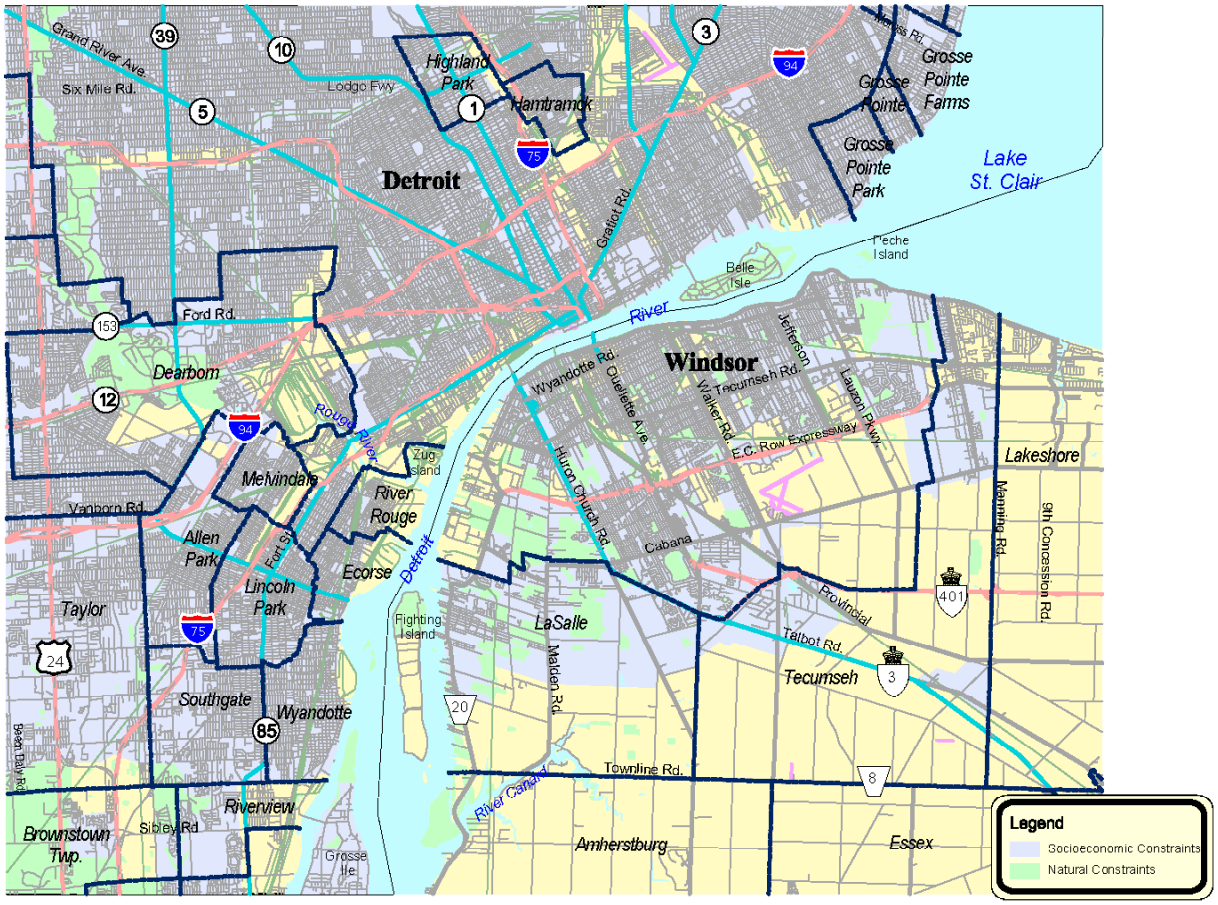
Current Land Use is displayed on the United States because the Future Land Use information comes from several different sources making it impossible to condense the information on a single map

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

Future Land Use

EXHIBIT 8.1



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

Constraint Features

EXHIBIT 8.2

8.4. Generation of Alternative Opportunity Corridors

Once the constraint areas were identified, a set of guiding principles was used in developing corridors that minimize impacts to the constraint areas as much as possible. These corridors were referred to as opportunity corridors.

The guiding principles reflect the objectives of the Partnership to address transportation needs and take advantage of transportation opportunities in the FAA, and avoid as much as possible, generating unacceptable impacts related to a new international transportation corridor.

The guiding principles established for the generation of the opportunity corridors were as follows:

- **Utilize existing infrastructure to the maximum extent** - Taking advantage of existing transportation and other linear corridors may improve usage of the transportation network and/or reduce impacts to other land uses.
- **Seek areas or land uses that are compatible, or areas in transition to compatible land uses, with transportation corridors** - Compatible areas are those that are less impacted by new transportation corridors than other land uses; areas in transition allow the opportunity to incorporate new transportation corridors in the area planning.
- **Minimize impacts to significant natural features** - Such features are usually regionally unique, protected by legislation/designations and may preclude a transportation facility.
- **Minimize impacts to city centres** - Such areas generally provide a focus for cultural, social and economic activities.

The opportunity corridors were of sufficient width to allow for flexibility in routing of road alignments to avoid or reduce impacts to significant environmental features which may be identified in later planning stages. Five opportunity corridors were developed based on the guiding principles and a review of current proposals by other proponents (refer to Exhibit 8.3):

- South Crossing
- Central Crossing;
- Twin Ambassador Bridge;
- Rail Corridor[2]; and,
- East Crossing.

The following sections provide a brief description of each the alternative Opportunity Corridors.

[2] The Rail Corridor may be referred to as “Truck Tunnel” in some supporting documents.

* Connections between corridors will also be considered in environmental planning stages

1. South Crossing Corridor
2. Central Crossing Corridor
3. Twinned Ambassador Bridge Corridor
4. Rail Corridor
5. East Crossing Corridor

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

Road-Based Opportunity Corridors

EXHIBIT 8.3

8.4.1. South Crossing

The South Crossing Corridor was generated in an attempt to minimize as much as possible, impacts to the urban areas of metropolitan Detroit and metropolitan Windsor (refer to Exhibit 8.4-A). On the Canadian side, the corridor generally avoids existing built-up areas of Windsor and LaSalle, and includes the lands between LaSalle's urban area boundary and River Canard. The mouth of this river is a designated environmentally significant area. The predominant land use on the Canadian side is agricultural. The distance from the Detroit River to Highway 401 is approximately 12 km (7.5 mi).

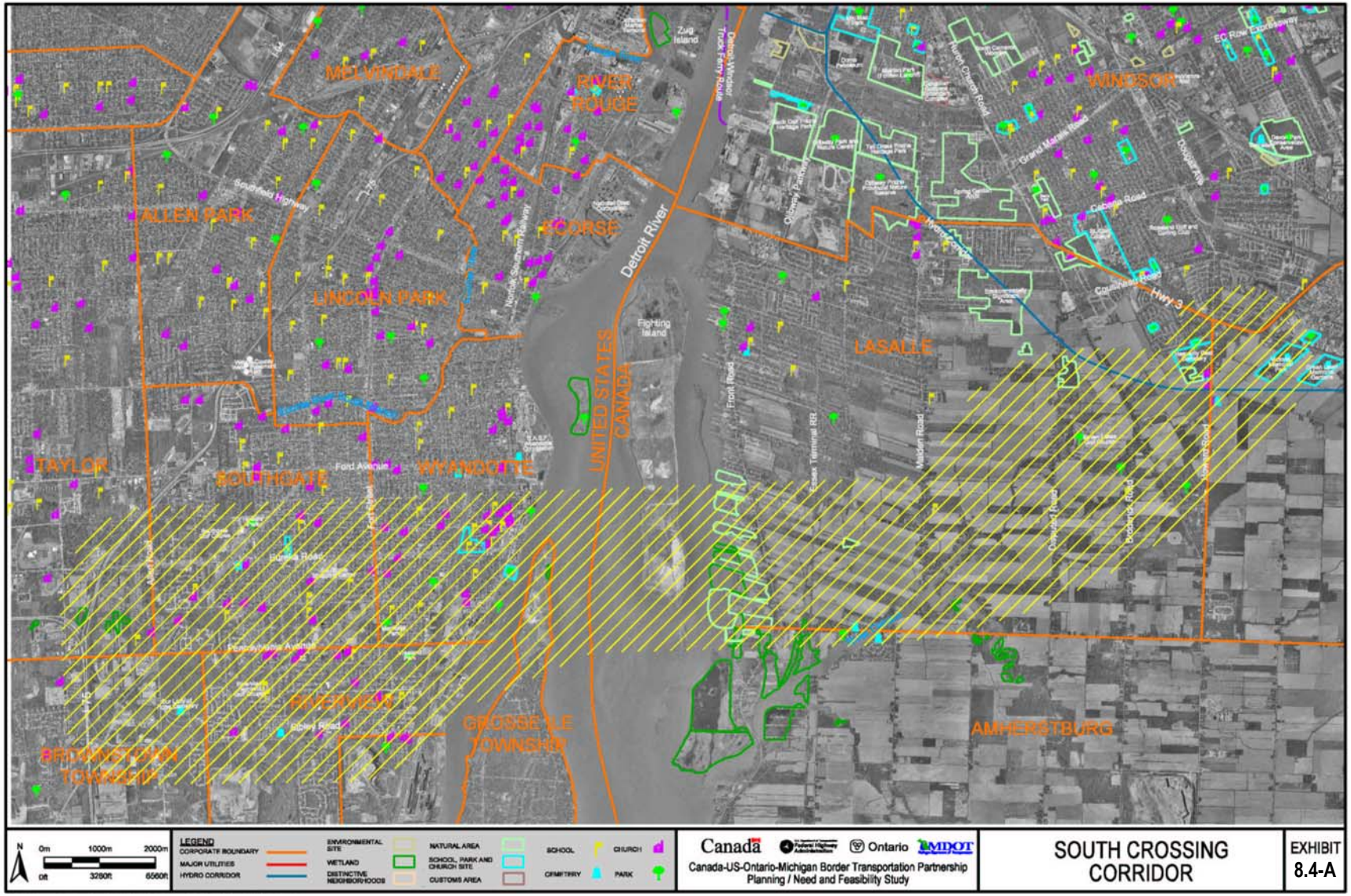
On the U.S. side, the corridor attempts to minimize impacts to metropolitan Detroit, but does include portions of the Cities of Wyandotte, Riverview and Southgate, the Townships of Brownstown and Grosse Ile, the majority of which are densely developed urban areas. The width of the corridor on the U.S. side is generally restricted to the north by dense urban development, and to the south by the south limit of the FAA, which was established as the reasonable limit for generating alternatives that would address the problems on the transportation network. The distance from the Detroit River to I-75 is approximately 8 km (5 mi).

The width of the Detroit River in this corridor varies between 3.5 and 4.5 km (2.2 to 2.8 mi.) and includes the southern portion of Fighting Island and the northern section of Grosse Ile. For a bridge alternative, this will likely require in-water work and possible piers in the River, both of which are a concern from a natural environment and marine navigation perspective. The portion of the river in this corridor is designated as an International Wildlife Refuge, and the Canadian shoreline includes several designated environmentally significant marsh areas.

The total length of the corridor is approximately 24 km (15 mi.).

8.4.2. Central Crossing

North of the Grosse Ile and Fighting Island area of the Detroit River, the river narrows and is less environmentally sensitive on both sides. The I-75 freeway is closer to the river in this area, so the impact to the urban area on the U.S. side may be reduced when compared with the South Crossing. Some land uses along the river are compatible with transportation corridors. On this basis, a Central Crossing corridor was developed (refer to Exhibit 8.4-B).


MELVINDALE
RIVER ROUGE
WINDSOR
ALLEN PARK
ECORSE
LINCOLN PARK
Detroit River
LASALLE
UNITED STATES
CANADA
TAYLOR
SOUTHGATE
WYANDOTTE
RIVER VIEW
GROSSE ILE TOWNSHIP
BRIGHTSTON TOWNSHIP
AMHERSTBURG
Fighting Island
Zug Island
Hwy 3
LEGEND
CORPORATE BOUNDARY
MAJOR UTILITIES
HYDRO CORRIDOR
ENVIRONMENTAL SITE
WETLAND
DISTINCTIVE NEIGHBORHOODS
NATURAL AREA
SCHOOL, PARK AND CHURCH SITE
CUSTOMS AREA
SCHOOL
CHURCH
CEMETERY
PARK
Canada
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning / Need and Feasibility Study
SOUTH CROSSING CORRIDOR
EXHIBIT 8.4-A


DETROIT
DEARBORN
WINDSOR
MELVINDALE
RIVER ROUGE
ECORSE
LINCOLN PARK
WYANDOTTE
LASALLE
TECUMSEH
Detroit River
UNITED STATES
CANADA
Fighting Island
Zug Island
Michigan Avenue
Norfolk Southern Railway
Southfield Highway
Ecorse Creek
Hwy 401
EC Row Expressway
Grand Marais Road
Front Road
Malden Road
Dalhousie Road
Brockelbank Road
LEGEND
CORPORATE BOUNDARY
MAJOR UTILITIES
HYDRO CORRIDOR
ENVIRONMENTAL SITE
WETLAND
DISTINCTIVE NEIGHBORHOODS
NATURAL AREA
SCHOOL, PARK AND CHURCH SITE
CUSTOMS AREA
SCHOOL
CEMETERY
CHURCH
PARK
0m 1000m 2000m
0ft 3280ft 6560ft
Canada
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning / Need and Feasibility Study
CENTRAL CROSSING CORRIDOR
EXHIBIT 8.4-B

The width of the Detroit River in this corridor varies between 0.6 and 0.75 km (0.4 to 0.5 mi.). For a bridge alternative, this creates an opportunity to avoid in-water structures by spanning the entire river. On the U.S. side, the corridor includes a portion of southwest Detroit and a portion of the City of River Rouge. This area of Metropolitan Detroit includes heavy industrialized areas such as Zug Island and the former Solvay lands, but also includes some residential areas. In southwest Detroit, the *Detroit Master Plan* has identified that some of the residential areas will be transitioned to commercial and industrial uses. The distance from the Detroit River to I-75 is approximately 2 to 3 km (1.3 to 1.9 mi).

On the Canadian side, the corridor passes between the core areas of Windsor and LaSalle, but impacts the outer areas of both communities. From Highway 401, access to this portion of the Detroit River can be gained via a number of new and or improved roadway alignments.

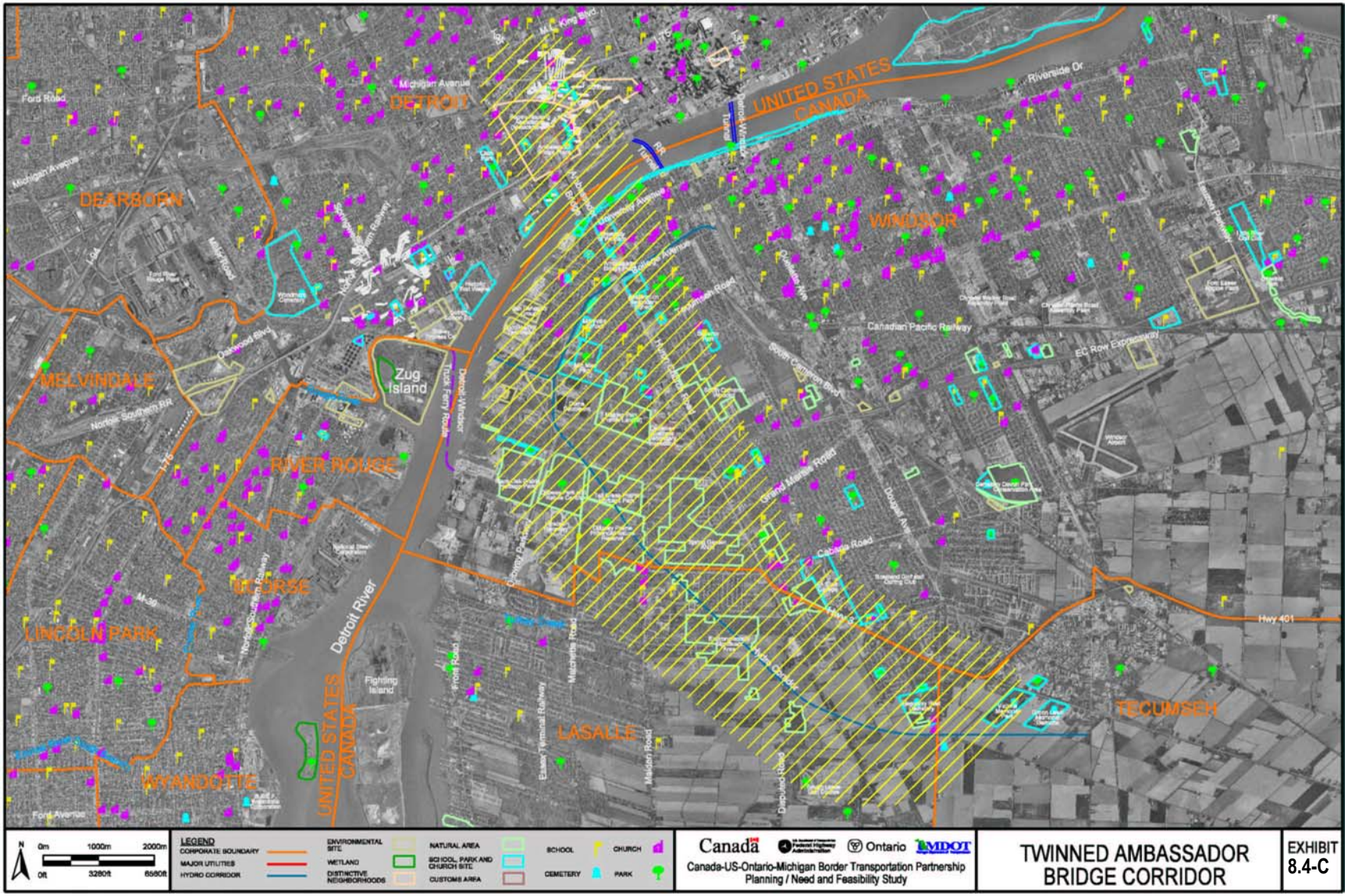
The E.C. Row Expressway is an east-west controlled access facility originally constructed as a partnership between the City of Windsor and the Ontario Ministry of Transportation (MTO). MTO transferred ownership of the Expressway to the City of Windsor in 1997. The Windsor Gateway Action Plan as announced on May 27, 2003, was developed by the governments of Canada and Ontario and proposes to transfer ownership of the Expressway back to MTO, upon successful completion of various environmental assessments. In addition, the Action Plan includes an extension of the Lauzon Parkway between EC Row and Highway 401. If implemented, these two improvements could provide an alternate connecting route from Highway 401 to Huron Church Road. For transportation planning purposes, alternatives to new or improved road connections for the Central Crossing corridor therefore include combinations of east-west and north-south routings from Highway 401 to the Huron Church Road/E.C. Row area along the Huron Church and EC Row corridors.

The land uses in the Central Crossing corridor include residential areas, protected natural areas and industrial areas. The distance from the Detroit River to Highway 401 is approximately 12 km (7.5 mi). The total length of the corridor is approximately 15 km (9.5 mi).

8.4.3. Twinned Ambassador Bridge

The Ambassador Bridge is considered an opportunity corridor because it currently serves as a crossing corridor (refer to Exhibit 8.4-C). The corridor has roadway connections in place leading to a river crossing, although the road connections and the crossing would require improvements to accommodate future travel demand.

The width of the river in this location is approximately 0.6 km (0.4 mi.). Advances in engineering design and materials could enable a second span to be constructed without permanent in-water structures, unlike the existing bridge. A second span would also require improvements and expansions to the bridge plazas to meet the long-term needs of border processing agencies and increased international traffic.


UNITED STATES
CANADA
DETROIT
WINDSOR
DEARBORN
MELVINDALE
RIVER ROUGE
ECORSE
LINCOLN PARK
WYANDOTTE
LASALLE
TECUMSEH
Zug Island
Fighting Island
Detroit River
Ford Road
Michigan Avenue
Riverside Dr
Canadian Pacific Railway
Grand Marais Road
Malden Road
Dougall Ave
Hwy 401
Canada
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning / Need and Feasibility Study
TWINNED AMBASSADOR BRIDGE CORRIDOR
EXHIBIT 8.4-C

On the U.S. side, the plans for improvements to the connection between the Ambassador Bridge plaza and the interstate freeway system are being finalized under a separate initiative between Michigan Department of Transportation, Federal Highways Administration and the Ambassador Bridge. This initiative, known as the Ambassador Bridge Gateway Project, provides for improvements to the freeway connections and could accommodate a second span. The twin structures, therefore, would be directly connected to the interstate freeway system at the bridge plaza; there would be little or no additional impacts to land uses in the vicinity of the Ambassador Bridge plaza.

On the Canadian side, the corridor includes portions of the City of Windsor, the Towns of LaSalle and the Town of Tecumseh. Highway 401 is generally an east-west facility terminating at the south end of the City of Windsor. The primary road corridor currently connecting Highway 401 to the Ambassador Bridge is Huron Church Road/Talbot Road, which runs generally north-south. It has been noted previously that this facility in its present form is unsuitable for accommodating increased volumes of international traffic. New and/or improved roads connecting Highway 401 to the Ambassador Bridge would be required.

As with the Central Crossing corridor, various connections between Highway 401 and E.C. Row, along with the Expressway could serve as alternate connecting routes to Huron Church south of Ambassador Bridge. For transportation planning purposes, alternatives to new or improved road connections to the Ambassador Bridge therefore include combinations of east-west and north-south routings along the Huron Church and EC Row corridors from Highway 401 to the Ambassador Bridge.

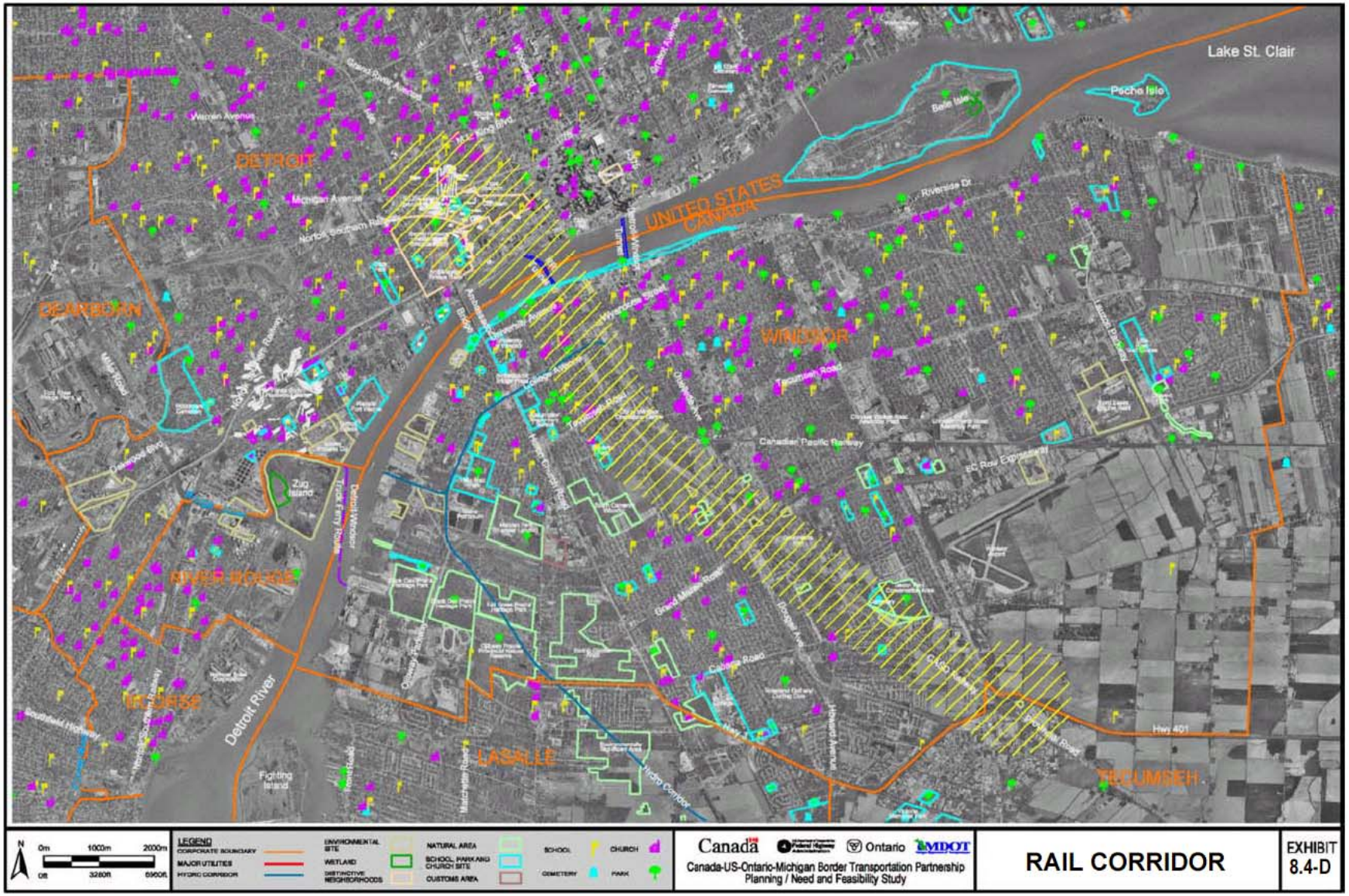
Land uses in the Twinned Ambassador Bridge corridor include residential areas, commercial areas, protected natural areas and industrial areas. The distance from the Detroit River to Highway 401 is approximately 14 km (8.8 mi.).

The total length of the corridor is approximately 15 km (9.5 mi.).

8.4.4. Rail Corridor

This corridor is the focus of a proposal developed by the Detroit River Tunnel Partnership (DRTP). DRTP is a partnership between two major private enterprises, Canadian Pacific Railway and Borealis Transportation Infrastructure Trust. In September 2002, DRTP filed a Notice of Intent to make application to the Canadian Transportation Agency for approval to construct the Canadian portion of the project. DRTP is preparing an environmental assessment in accordance with the Canadian Environmental Assessment Act. This proposal makes use of the existing twin-tube rail tunnel situated between the Ambassador Bridge and Detroit-Windsor Tunnel (refer to Exhibit 8.4-D). The rail corridor leading to the tunnel on the Canadian side extends southerly to Highway 401 and beyond. On the U.S. side, the rail corridor crosses I-75 in the area of the I-75/I-96/I-94 exchange just north of the Ambassador Bridge plaza connection.

Their proposal includes converting the rail tunnels for use by trucks and paving the railroad right-of-way to provide a controlled access roadway between the U.S. and Canada. Border processing facilities would be incorporated in the project on lands owned


Lake St. Clair
Pelee Isle
Belle Isle
DETROIT
UNITED STATES
CANADA
DEARBORN
WINDSOR
RIVER ROUGE
ECORSE
LASALLE
TECUMSEH
Detroit River
Fighting Island
Zug Island
Canadian Pacific Railway
Hwy 401
Canada
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning / Need and Feasibility Study
RAIL CORRIDOR
EXHIBIT
8.4-D

or acquired by the DRTP. One DRTP proposal features a joint customs facility, providing for both Canadian and American border inspection agencies, in Windsor. However, there is presently no legislation to allow for such a border inspection regime.

DRTP is also developing a proposal which provides customs facilities (primary and secondary inspections) on both sides of the border to reflect current border inspection processes.

The Rail Corridor alternative considered in this study, therefore, is based upon a conventional border inspection regime, with inspection facilities provided on both sides of the border. The DRTP proposal also includes construction of a new high-clearance rail tunnel below the Detroit River to maintain a single track within the international rail corridor.

The DRTP proposal provides a single lane per direction for international trucks only, which is insufficient for the long-term needs of the transportation network. However, the proposal provides additional border crossing capacity to the network and provides an alternative crossing for maintaining goods movement across the border. On this basis, the rail corridor was included in the assessment of feasible transportation alternatives.

The corridor for this alternative generally coincides with the existing rail corridor in Windsor and Detroit. Some widening of the corridor and/or easements may be required to accommodate an alternative. Lands adjacent to the rail corridor on the Canadian side include residential, commercial and industrial uses.

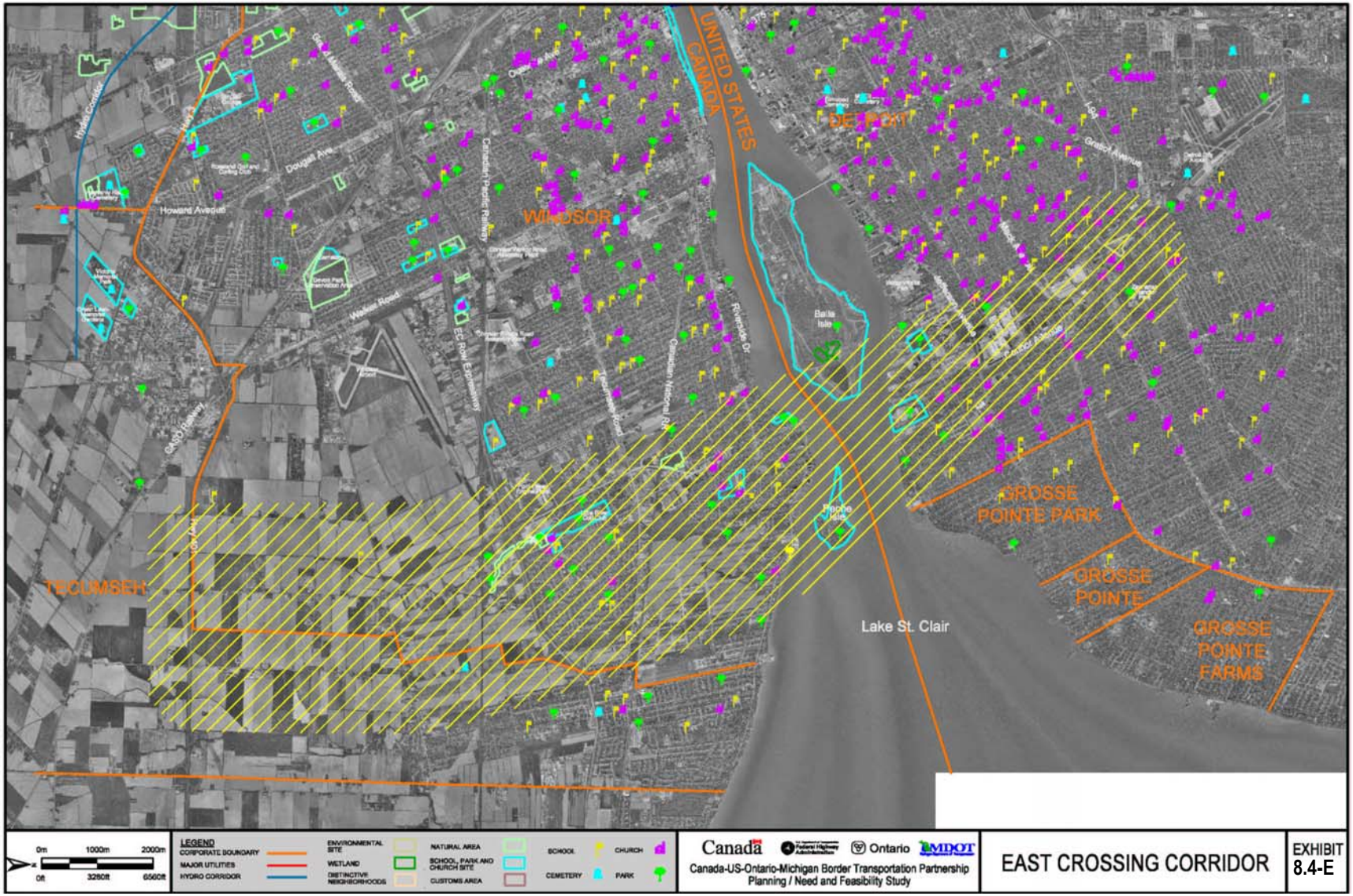
On the U.S. side, the rail corridor is located in southwest Detroit, west of the Central Business District. Land uses adjacent to the corridor are generally light industrial and mixed residential/commercial uses.

The total length of the corridor is approximately 15 km (9.5 mi.).

8.4.5. East Crossing

The East Crossing Corridor represents an opportunity to avoid the city centres of Windsor and Detroit by providing a crossing and road connections east of these areas (refer to Exhibit 8.4-E). This corridor connecting Highway 401 to I-94 is generally centered on Lauzon Parkway/Lauzon Road in Windsor and Conner Avenue in Detroit. This corridor includes, or is in proximity to, a number of automotive manufacturing facilities (potentially major generators of international truck traffic), as well as Windsor Airport and Detroit City Airport. The city centres of Windsor and Detroit bound the width of this corridor to the west. The straits where Lake St. Clair flows into the Detroit River were considered the east limits of the corridor.

On the U.S. side, the corridor includes a portion of the City of Detroit, and includes a mix of heavy industrial use, urban residential subdivisions, and inactive industrial sites. The distance from the river to I-94 is approximately 5.5 km (3.5 mi.).


UNITED STATES
CANADA
DETROIT
WINDSOR
TECUMSEH
Lake St. Clair
GROSSE POINTE PARK
GROSSE POINTE
GROSSE POINTE FARMS
Howard Avenue
Dougall Ave.
Walker Road
Riverside Dr.
Canadian Pacific Railway
CASO Railway
Belle Isle
Peche Island
0m 1000m 2000m
0ft 3280ft 6560ft
LEGEND
CORPORATE BOUNDARY
MAJOR UTILITIES
HYDRO CORRIDOR
ENVIRONMENTAL SITE
WETLAND
DISTINCTIVE NEIGHBORHOODS
NATURAL AREA
SCHOOL, PARK AND CHURCH SITE
CUSTOMS AREA
SCHOOL
CHURCH
CEMETERY
PARK
Canada
Ontario
MDOT
Canada-US-Ontario-Michigan Border Transportation Partnership
Planning / Need and Feasibility Study
EAST CROSSING CORRIDOR
EXHIBIT
8.4-E

The river crossing portion of the corridor includes the east end of Belle Isle, a large urban park which is also a National Historic Site, and the west end of Peche Isle, a provincially designated natural area. The width of the river varies from 1.5 to 2.0 km (0.9 to 1.3 mi.), which could necessitate in-water structures for a new bridge crossing.

On the Canadian side, the corridor covers portions of the City of Windsor and the Town of Tecumseh. The portion of the corridor north of E.C. Row Expressway is primarily residential, business park and industrial uses. South of E.C. Row to Highway 401, land use is almost exclusively tilled agricultural fields. The distance from Highway 401 to the Detroit River is approximately 13 km (8 mi.).

The total length of the corridor is approximately 20 km (12.5 mi.).

8.4.6. Other Proposals and Corridors

In addition to the DRTP proposed Rail Corridor, other corporate and private interests have publicly identified a number of specific border crossing proposals. These proposals generally represent planning and engineering efforts undertaken to provide for new or expanded crossings and/or connecting roadway improvements, when needed. These proposals include:

- International Union Bridge – new bridge crossing in the vicinity of the north end of Grosse Ile; this proposal would connect the new crossing to the local road system and does not provide for any direct roadway connections to the interstate freeway; this proposal is located within the South Crossing corridor.
- Mich-Can - proposal for a new bridge crossing downriver of the Ambassador Bridge in the vicinity of the junction of the E.C. Row Expressway and the Ojibway Parkway/Zug Island; this proposal connects the I-75 in Detroit and E.C. Row Expressway in Windsor; this proposal is located within the Central Crossing corridor.
- Ambassador Bridge Parkway Proposal – separate controlled access road connection along Essex Terminal Railway right-of-way between Ambassador Bridge and a new border processing area at E.C. Row Expressway/Huron Church Road; this proposal also includes improvements to the Huron Church/Highway 3 corridor from E.C. Row Expressway to Highway 401; this proposal is located within the Twinned Ambassador Bridge corridor.

It must be noted that the proposals identified by the private and corporate interests are specific route alignments, not broad opportunity corridors.

In addition, the City of Windsor has identified proposed long-term corridor protection areas for future transportation planning flexibility in the Windsor area. These corridors, as identified in the Windsor Area Long Range Transportation Study (WALTS) are:

- Highway 401 East – protects for a future connection between Highway 401 and E.C. Row Expressway east of Windsor Airport; this area generally coincides with a portion of the East Crossing Corridor;

- Highway 401 West – protects for a future connection between Highway 401 and the Ambassador Bridge or a new crossing in west Windsor; this area generally coincides with the Central and Twinned Ambassador Bridge Corridors; and,
- Southwest Corridor – protects for upgrading and extension of east-west arterial routes between Highway 401 and Ojibway Parkway/Essex Road 20; this area overlaps with the Central Corridor.

The City has noted that consideration of any details on these corridors and any specific roadway alignments will require planning and feasibility studies, route planning studies and environmental assessments.

In that the locations of these other proposals and protection areas coincide to some degree with the opportunity corridors identified by the Project Team, it suggests that the guiding principles used to establish these other proposals are similar to those developed by the Project Team.

8.5. Assess the Feasibility of Alternative Opportunity Corridors

The assessment of opportunity corridors was based on a set of factors developed consistent with the environmental approval processes in the U.S. and Canada. The factors reflect the objectives of the Partnership to address transportation and border processing needs and take advantage of transportation opportunities in the FAA, and avoid as much as possible, generating unacceptable impacts related to a new international transportation corridor.

The assessment is intended to confirm the feasibility of the various opportunity corridors. During the environmental study processes, a more detailed analysis and evaluation of opportunity corridors and route alignment alternatives will be undertaken.

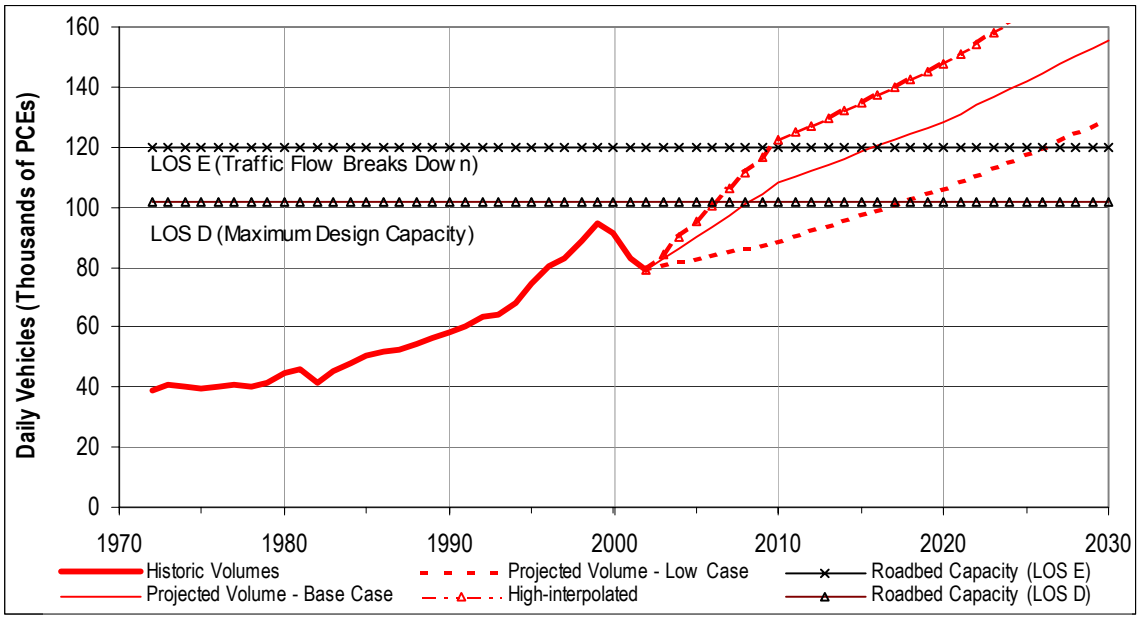
The assessment of corridors was carried out using primarily secondary source information on analysis area features, consultation with public and private sector stakeholders and travel demand modelling work. The corridor maps identify the various types of land uses and features potentially affected. The feasibility assessment of opportunity corridors, based on transportation policy objectives, environmental border processing and technical factors, is presented in Chapter 9 of this report. A discussion of the travel demand modelling work used to assess transportation network performance with each of the corridors is provided in the following section.

8.5.1. Assessment of Transportation Network Improvements

The assessment of Transportation Network Improvement was based on projected information. This was based on transportation model runs performed for the Base Case and five crossing alternatives for the 2010, 2020 and 2030 horizon years and consider queuing delays at the bridge/customs plaza and congestion impacts on the road network given growth in cross-border and local background traffic.

The transportation model runs performed for each alternative are based on work documented in the Travel Demand Analysis Working Paper and the Existing and Future Travel Demand Working Paper. Future travel demand estimates have been prepared for High, Low and Base Case scenarios, as shown in Exhibit 8.5, to reflect future uncertainties in traffic growth rates. The traffic forecasts and assessments are presented for the Base Case, which falls in the middle of the range of the future projections and reflects the most probable or likely scenario for planning purposes.

EXHIBIT 8.5: HISTORIC AND PROJECTED WINDSOR-DETROIT CROSS-BORDER TRAFFIC



The following provides a summary of key transportation model run findings and an assessment of the alternatives. A more complete description of the model run assumptions and findings is presented in the *Feasible Transportation Alternatives Working Paper*.

Assessment of Alternatives

Over the 30-year horizon for this study, the cross-border traffic forecasts prepared for this study project an approximate 40% increase in car and 120% increase in truck traffic at the Windsor-Detroit Gateway. This corresponds to an increase in daily cross-border car trips from 52,000 to 70,000 trips and an increase in daily truck trips from 13,000 to 28,000 trips. A summary of the transportation model results is presented in Exhibits 3.6 through 3.12.

In reviewing the assessment of transportation network benefits, it is important to note that, for all alternatives, it has been assumed that border processing staffing and facilities will be available to meet the projected travel demand. The additional requirements for border processing facilities assumed to be in place are identified in Appendix A. It is also important to note that the toll rates were assumed to be the same for all new/expanded crossings. Therefore, no allowances were made for toll rates to influence trip routing decisions.

Exhibit 8.6 presents the projected volume/capacity (V/C) ratio for each crossing for each horizon year. The capacity is based on the bridge/tunnel roadbed capacity. The bridge crossings are assumed to be four-lane cross-sections as suggested by the projected 2030 cross-border demand, while the tunnel crossing is assumed to be a two-lane cross-section as defined in the DRTP proposal. For planning purposes, a V/C ratio for the bridge/tunnel roadbed based on Level-of-Service D (LOS D) is assumed, with the need for a new crossing indicated when the V/C exceeds 0.83. LOS D has been determined by the Partnership as the appropriate basis for determining future infrastructure requirements, given the importance, lead-time and level of investment associated with a major international crossing. LOS E reflects conditions when traffic flow breaks down.

Exhibit 8.6 graphically presents the travel flows for traffic crossing the border at Windsor-Detroit and the extent of diversion of traffic between crossings. The travel flows are shown from Canada to the U.S., with the reverse move from the U.S. to Canada similar to those shown. Each exhibit displays car and truck flows in the year 2030 through the use of desire lines, which show travel orientations and patterns associated with each alternative where the thickness of the line is proportional to the traffic flow. From a roadbed capacity perspective, one truck is assumed to be equivalent to three passenger cars.

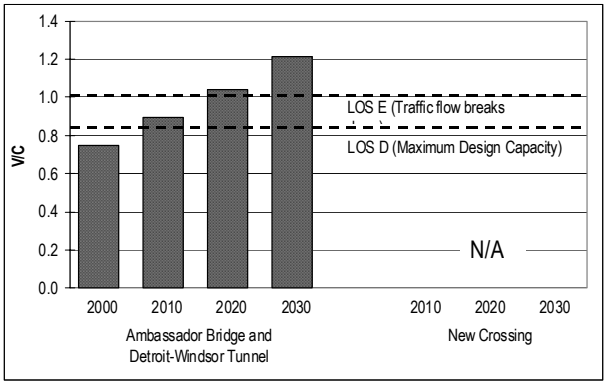
Base Case (No Improvement)

Under the Base Case, with no major network improvements, future cross-border traffic is projected to significantly exceed the existing roadbed capacity of the Ambassador Bridge and Windsor-Detroit Tunnel with a V/C ratio of 1.21 in 2030, establishing a capacity need for a new crossing in the future. Based on LOS D, the need for a new crossing may be justified by the year 2010, when the projected V/C ratios for the Existing Crossings and Huron-Church Road are projected to be 0.89 and 1.00, respectively.

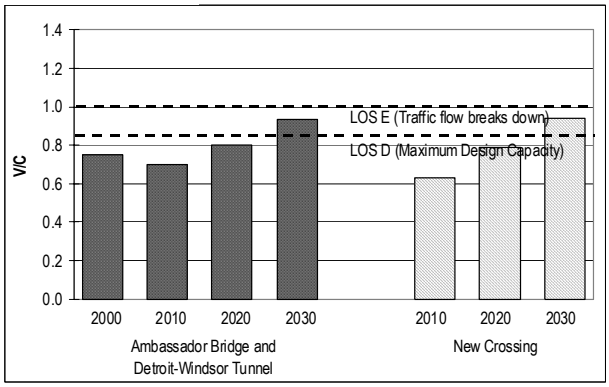
Exhibit 8.7 presents the travel flows under the Base Case Alternative, with the existing Ambassador Bridge and Detroit Windsor Tunnel to accommodate cross border traffic demands. In 2030, 70,200 daily car and 27,800 daily truck trips are projected at the Existing Crossings. The travel flows shown for the Base Case reflect the significant differences in the truck and car markets. The truck movements reflect longer distance travel with the predominant flows between Highway 401 and I-75/I-94. Approximately 75-80% of Ontario based truck traffic is from Highway 401, with the remaining 20-25% from the immediate Windsor area. Among cross-border truck traffic to the U.S., approximately 50% is destined to I-75 (South to Toledo and beyond), 20% to I-94 (West to Chicago and beyond), 25% to northerly directions via I-75, I-96 and M-10. Car traffic is much more local in nature with the predominant flows between Detroit and Windsor, as reflected in the car desire line flows. Approximately 20% of the Ontario based traffic is from Highway 401 with most of the remaining 80% from the immediate Windsor area. In Michigan, 12% of car traffic is oriented to /from I-75 and 8% to I-94, with most of the remaining 80% to the more centrally located road facilities that better accommodate shorter and more local cross-border trips.

EXHIBIT 8.6: EXISTING AND PROJECTED ROADBED LEVEL-OF-SERVICE AT INTERNATIONAL CROSSINGS

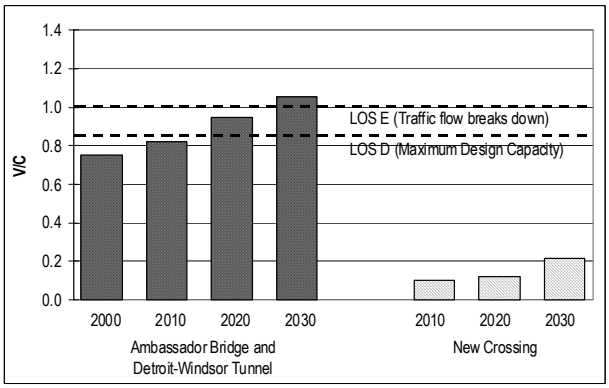
Base Case



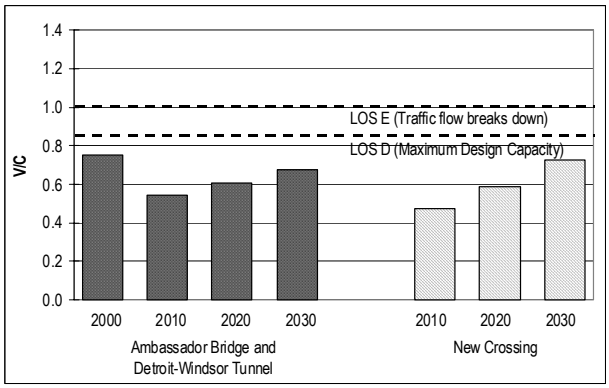
Rail Corridor



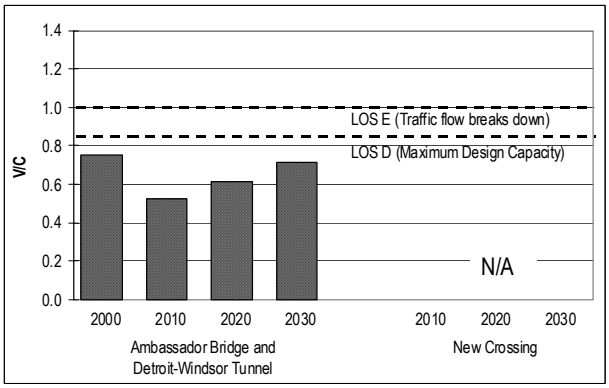
East Crossing



Central Crossing



Twinned Ambassador Bridge



South Crossing

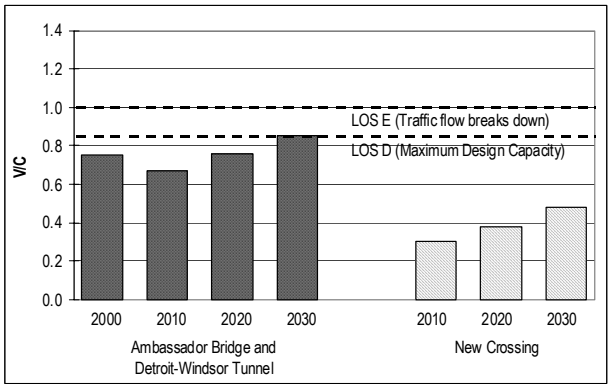
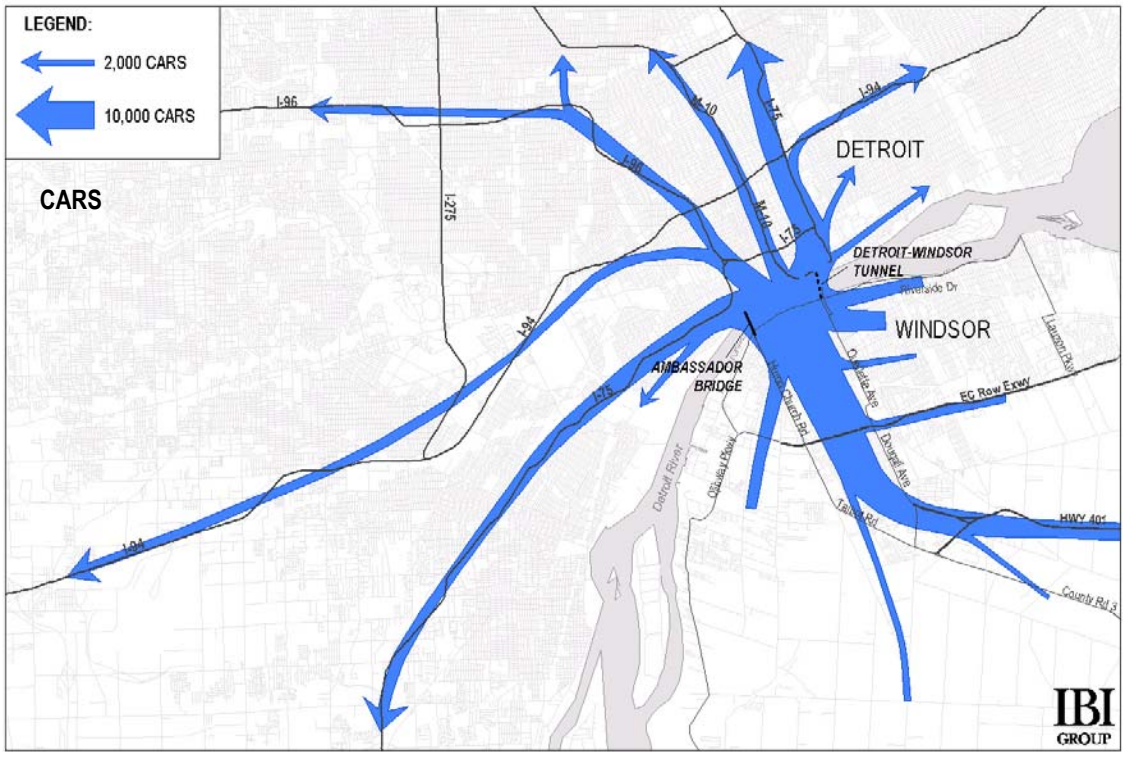
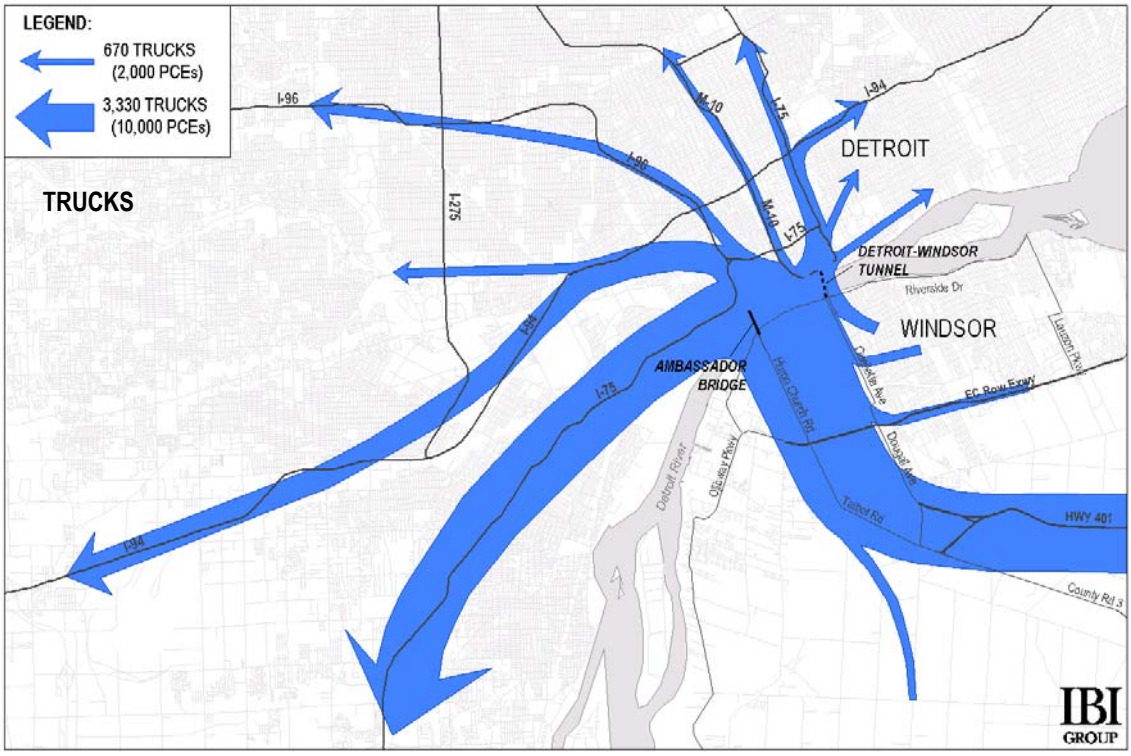


EXHIBIT 8.7: BASE CASE, 2030 DAILY FLOWS





Note: 1 truck is assumed to be 3 passenger car equivalents.

South Crossing Alternative

The South Crossing Alternative, due to a more southerly alignment and a direct connection to I-75, is able to attract significant truck traffic, but much less car traffic from the existing crossings. The estimated travel distance savings for a trip from Highway to I-75 (South to Toledo) is 10.6 kilometres (6.6 miles), providing significant savings for long distance travel, but little benefit for local Windsor-Detroit travel. In 2030, approximately 7,300 daily cars and 18,200 daily trucks are projected for the South.

Crossing, with the V/C ratio estimated to be 0.48 for this new crossing. However, the projected 2030 V/C ratio for the Existing Crossings is estimated at 0.86 and just slightly above the level considered acceptable based on LOS D. The V/C ratio for Huron-Church Road is projected at 0.79.

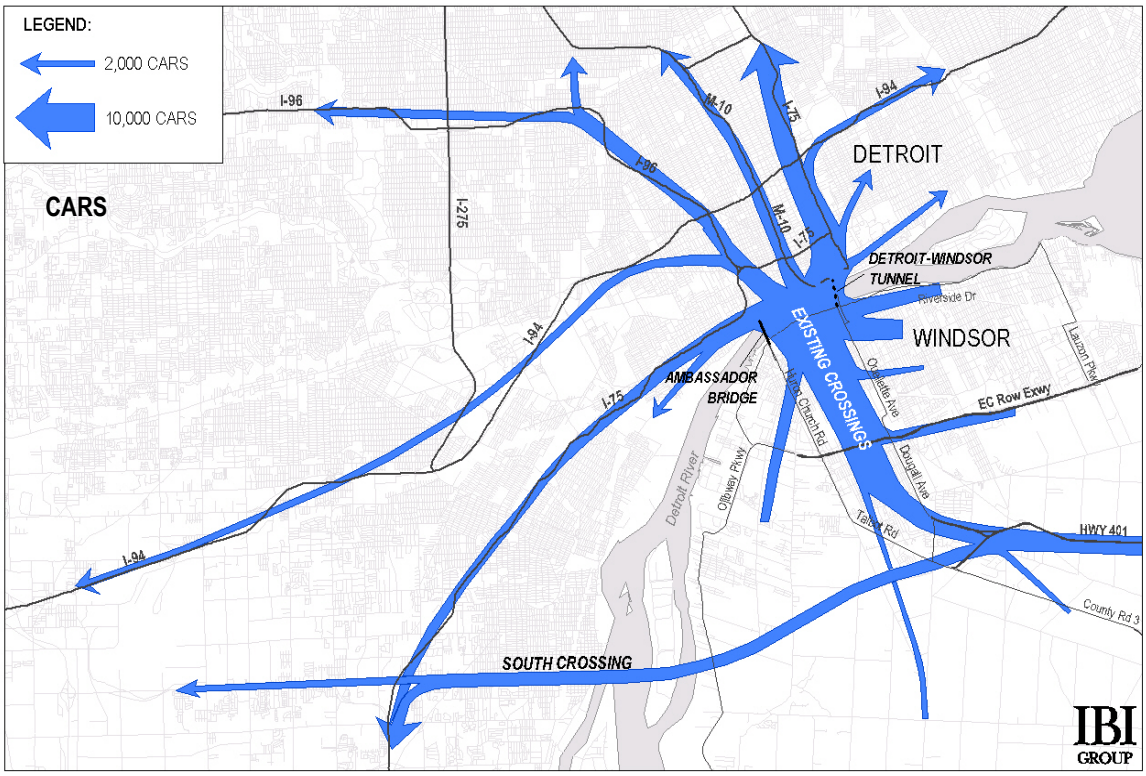
The projected car and truck travel flows associated with the South Crossing Alternative are shown in Exhibit 8.8. This alternative would attract approximately 65% of the truck traffic crossing at Windsor-Detroit. This truck traffic corresponds to approximately 12,500 daily trips to/from I-75 (South to Toledo) and approximately 5,500 daily trips to/from I-94 (West to Chicago). The movement from the South Crossing to I-94 was assumed to be made via an I-75/Eureka Road/I-275 routing, which would involve heavy truck movements on a local arterial road. Improvements/upgrading of local roads and/or designations of truck routes to higher-order facilities connecting to I-94 will therefore need to be considered with this alternative. The car volumes projected to use the South Crossing Alternative are projected to be low, reflecting approximately 10% of the cross-border car market in 2030. The car flows reflect largely long distance travel, similar to truck market for this crossing, travelling to/from I-75 (South to Toledo) and I-94 (West to Chicago).

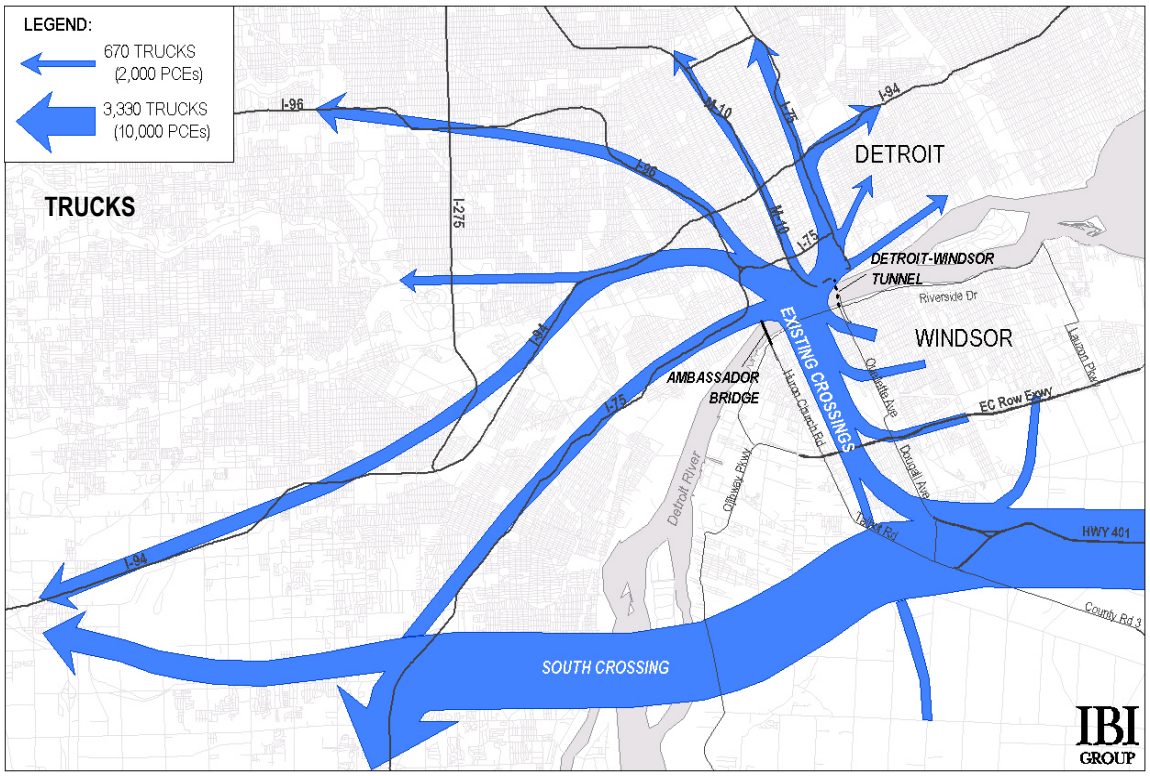
Central Crossing Alternative

The Central Crossing is projected to have the highest traffic volumes among the alternatives, with an estimated 2030 daily traffic of 16,600 cars and 22,800 trucks. This translates to a 2030 V/C ratio of 0.73 and reduces the V/C ratio for the Existing Crossings to 0.67. The V/C ratio for Huron-Church Road is projected to be 0.49.

Exhibit 8.9 presents the travel flows associated with a Central Crossing Alternative located in the vicinity of E.C. Row/Ojibway Parkway in Windsor and Zug Island in Detroit. The location of the Central Crossing provides a balance between the westward pull of major truck movements to/from on I-75 (South to Toledo) and west on I-94 (West to Chicago) and the more central Windsor/central Detroit travel orientations associated with the major car movements. For travel between Highway 401 and I-75 (South to Toledo), the Central Crossing Alternative reduces the travel distance by approximately 3.1 kilometres (1.9 miles). For travel between Highway 401 and I-94 (West to Chicago), the distance savings is approximately 5 kilometres (3.1 miles). The ability of the Central Crossing Alternative to serve both car/truck and local/long distance trips results in a significant attraction of traffic while adequately meeting capacity requirements and level-of-service criteria. The Central Crossing Alternative serves approximately 80% of the truck traffic crossing at Windsor-Detroit, effectively serving almost all cross-border truck traffic to/from

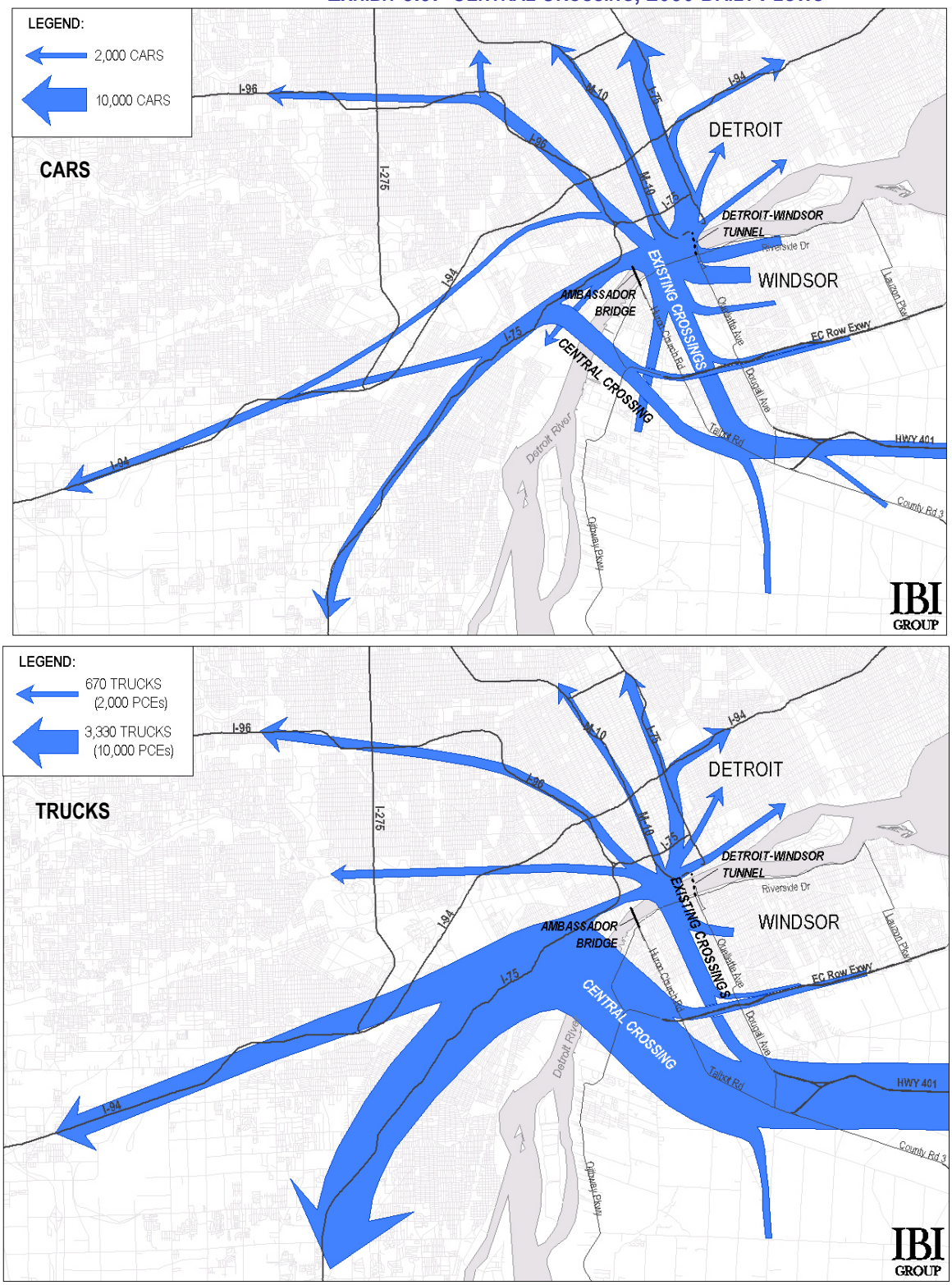
EXHIBIT 8.8: SOUTH CROSSING, 2030 DAILY FLOWS





Note: 1 truck is assumed to be 3 passenger car equivalents.

EXHIBIT 8.9: CENTRAL CROSSING, 2030 DAILY FLOWS



Note: 1 truck is assumed to be 3 passenger car equivalents.

I-75 (South to Toledo) and I-94 (West to Chicago). The remaining 20% of the truck traffic using predominantly the Ambassador Bridge is destined to and from northerly locations. In terms of cross-border car traffic, the Central Crossing is able to serve approximately 25% of these trips, comprised largely the long distance car travel component and some local car travel.

Twinned Ambassador Bridge

The Twinned Ambassador Bridge Alternative provides a second span adjacent to the existing bridge, with a controlled access road from Highway 401. While the new roadway does not increase the travel distance for trips between Highway 401 and the crossing, it does increase the length of trips accessing the bridge from Windsor due to the limited number of freeway access points. In 2030, this alternative is projected to have a V/C ratio of 0.67, indicating good utilization with adequate capacity to accommodate future growth and demand needs.

Exhibit 8.10 presents the travel flows under the Twinned Ambassador Bridge Alternative. Given the identical crossing location and similar access/egress road routings relative to the Base Case, the travel flows are similar to those described for the Base Case, as noted above. However, the additional capacity provided by the second span together with the assumed upgrades/improvements to Huron Church Road to address the identified capacity deficiencies would satisfy the long term needs for Windsor-Detroit cross-border traffic.

Rail Corridor Alternative

The Rail Corridor Alternative provides one-truck lane of traffic in each direction and is projected to accommodate approximately 19,200 daily trucks in 2030. This provides much needed truck capacity, but is inadequate to provide the total capacity needed to accommodate the growth in demand to 2030, as reflected by a projected 2030 V/C ratio of 0.93 for the Existing Crossings, 0.94 for the Rail Corridor and 0.93 for Huron-Church Road.

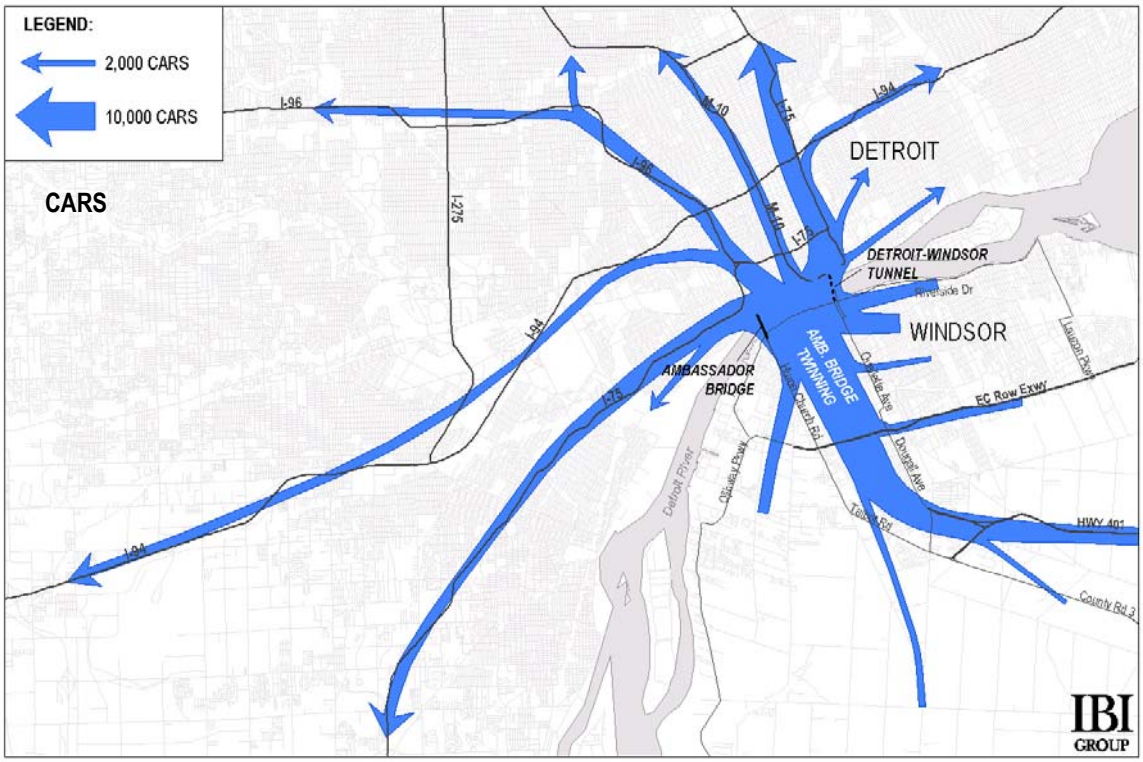
Exhibit 8.11 displays the travel flows that are projected with the Rail Corridor Alternative that uses the existing CASO rail right-of-way and rail tunnel conversion. Given the higher speeds and controlled access to the Rail Corridor provided to/from Highway 401 and I-75, significant volume of trucks are projected to use this alternative, with approximately 70% of daily cross-border truck traffic using the Rail Corridor. This alternative exclusively serves truck traffic.

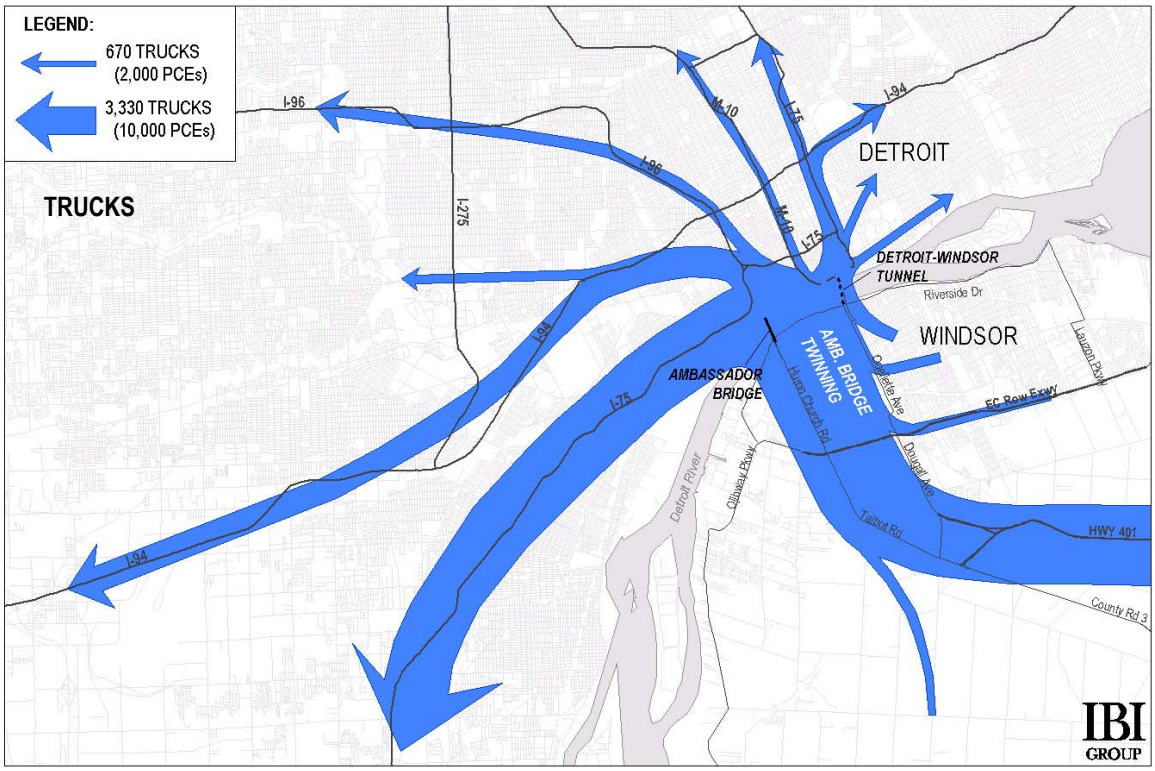
East Crossing Alternative

The projected traffic on the East Crossing Alternative is the lowest among the alternatives, with a projected daily demand of 8,500 daily cars and 1,800 trucks in 2030, with a V/C ratio of only 0.22. Given this low volume, the V/C ratio for the Existing Crossings is projected to be 1.06 and 1.16 for Huron-Church Road.

The car and truck travel flows associated with the East Crossing Alternative are shown in Exhibit 8.12. The truck traffic volumes are quite low compared to the other alternatives, reflecting the relatively low truck travel demand between the manufacturing facilities in

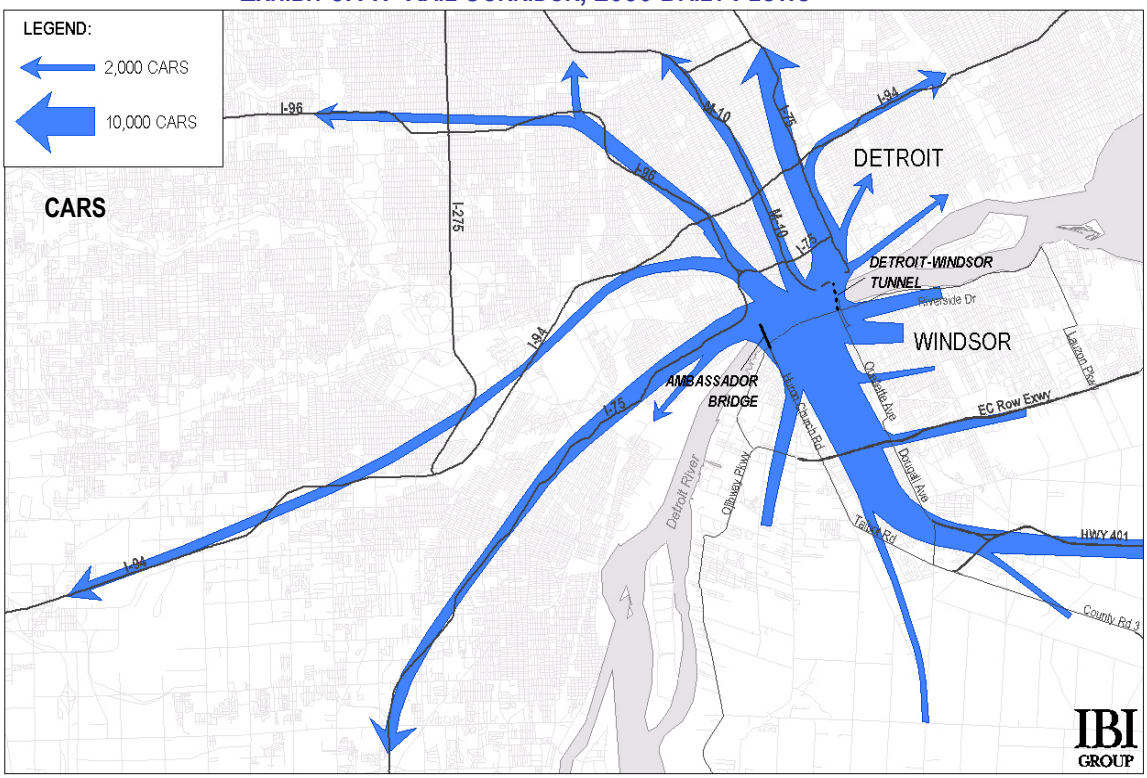
EXHIBIT 8.10: TWINNED AMBASSADOR BRIDGE, 2030 DAILY FLOWS

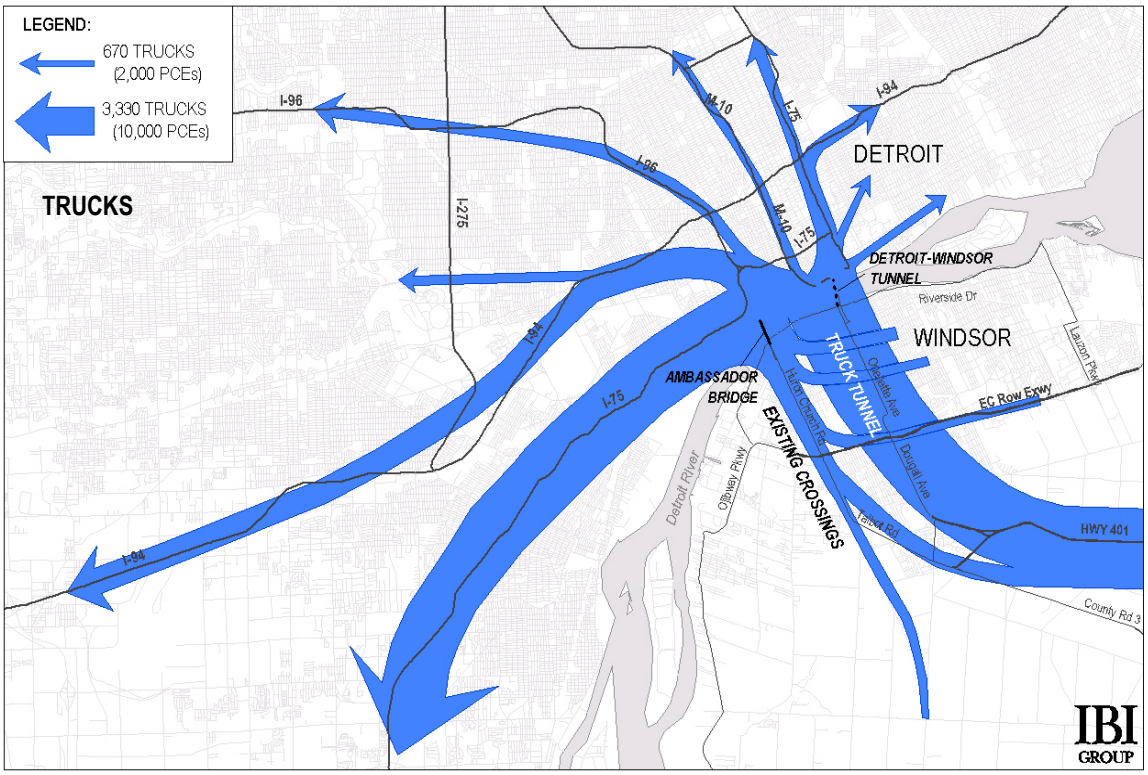




Note: 1 truck is assumed to be 3 passenger car equivalents.

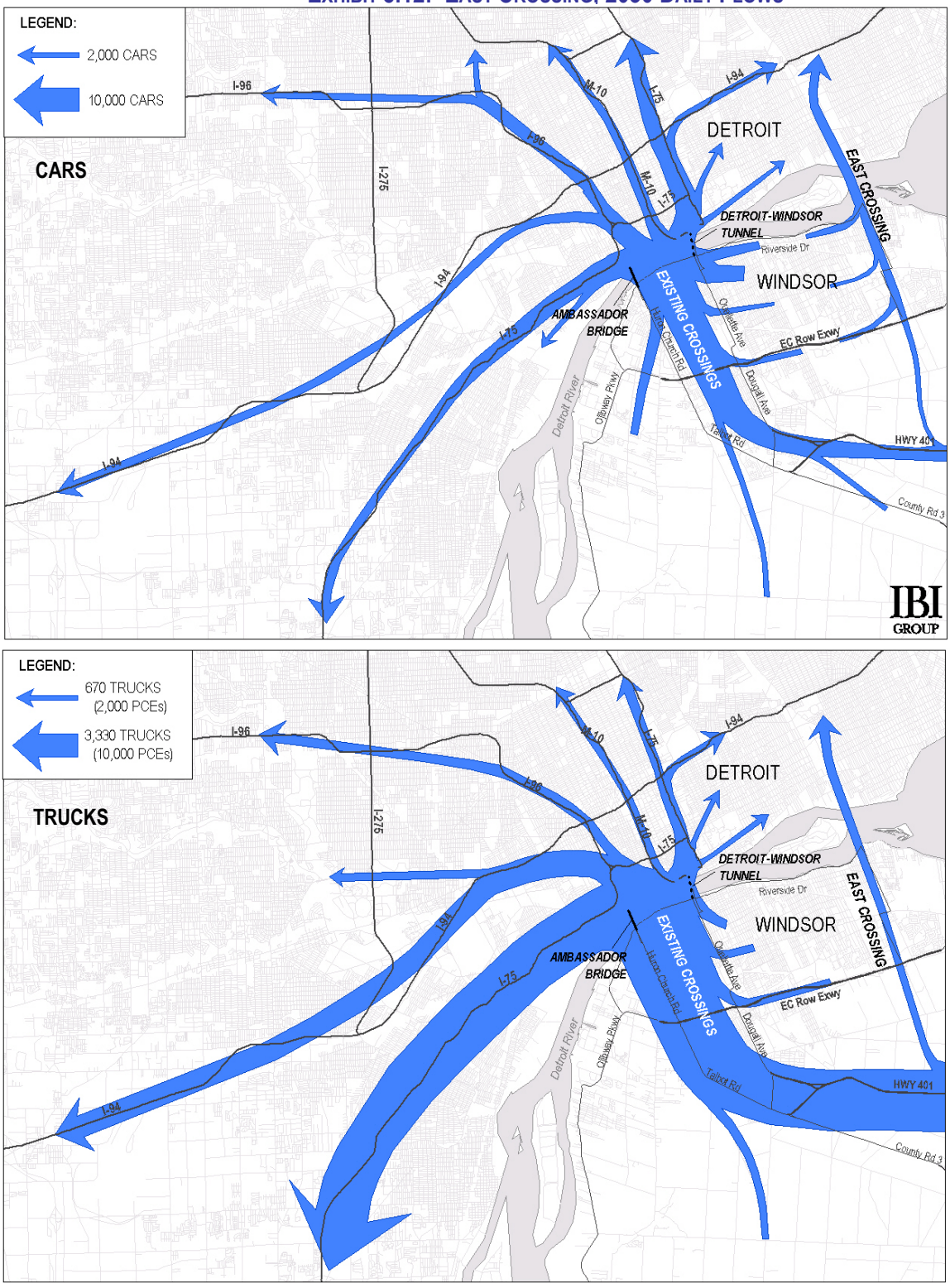
EXHIBIT 8.11: RAIL CORRIDOR, 2030 DAILY FLOWS





Note: 1 truck is assumed to be 3 passenger car equivalents.

EXHIBIT 8.12: EAST CROSSING, 2030 DAILY FLOWS



Note: 1 truck is assumed to be 3 passenger car equivalents.

east Windsor and east Detroit, compared to the large, more westerly oriented flows between Highway 401 and I-75 (South to Toledo) and I-94 (West to Chicago). In 2030, the East Crossing Alternative is projected to only capture approximately 12% and 6% of the car and truck market, respectively. The longer travel distance of 14 kilometres (8.7 miles) for this movement compared to an Ambassador Bridge routing and the congestion on I-75 for east to west travel through central Detroit needed to reach I-75 and I-94 are the main reasons for the low truck attraction with the East Crossing. Also, truck trip destinations to the northeast that may be more conveniently accessed by an East Crossing may also reached via the Blue Water Bridge, which reduces the potential market for this crossing.

Summary

The transportation comparison of alternatives provides an indication of the relative strengths and weaknesses of each alternative based on the transportation measures presented. There is no clear overall best alternative, although the Central Crossing, South Crossing and Twinned Ambassador Bridge Alternatives provide greater benefits to the network than the East Crossing and Rail Corridor Alternatives when assessed on an individual basis. The major findings of the transportation analysis include the following:

- The Twinned Ambassador Bridge and Central Crossing Alternatives best address the future network requirements projected for the Windsor-Detroit border crossings and satisfy future demand based on LOS D.
- The Central Crossing Alternative provides better travel time savings and has a projected higher demand compared to the Twinned Ambassador Bridge Alternative. This is due to its more westerly location, which provides a shorter travel distance for the truck travel flow between Highway 401 in Canada and I-75 Corridor and I-94 Corridor in the U.S., which is a significant portion of international long-distance truck traffic.
- The South Crossing Alternative diverts a significant proportion of truck traffic from the existing crossings and provides the greatest travel time savings among the alternatives. In terms of car traffic, the southerly alignment does not serve local Windsor to Detroit travel well and therefore the South Crossing is projected to attract very low volumes of local traffic. The overall traffic diversion from Existing Crossings is lower than the Central and Twinned Ambassador Bridge alternatives, but under certain low trade growth scenarios is sufficient to satisfy future network requirements for the next 20 to 25 years based on LOS D.
- The Rail Corridor provides significant travel time benefits to cross-border truck traffic and is projected to attract significant truck volumes. However, the additional two-lanes of capacity provided by the tunnel does not meet future network requirements and the 30-year demand need. It will need to be implemented in conjunction with a second new/expanded crossing if the Rail Corridor is to be part of a 30-year strategy for the border crossing.
- The East Crossing is projected to attract low cross border car and truck traffic over the study horizon and is not able to meet future network requirements.

The assessment factors, the results of the assessment and conclusions are provided in the following chapter.

9. Feasibility Assessment of Opportunity Corridors

As discussed in Chapter 3, the generation of opportunity corridors was a four-step process. The fourth and final step was the feasibility assessment. The purpose of the feasibility assessment was to test the technical feasibility of the five opportunity corridors to ensure that each alternative:

- reasonably addressed the transportation and border processing problems and opportunities identified; and,
- was not likely to generate any unacceptable impacts associated with a new international transportation corridor.

In conducting the assessment, a set of factors and measures were developed to identify the transportation benefits and potential impacts of each alternative. Each alternative was assessed and conclusions were documented based on the assessment.

9.1. Assessment Factors and Measures

A preliminary set of factors was presented for comment at the first round of Public Consultation in November 2002. Measures for the factors were developed consistent with the level of detail employed for a feasibility study. The rationale and measures used for transportation network improvement, government/land use/transportation planning/tourism objectives, border processing and technical feasibility factors are shown in Tables 9.1-A to 9.1-D. In addition, the corridors were assessed based on the degree to which each alternative optimized the use of existing infrastructure. As noted in Section 8.4, taking advantage of existing transportation and other linear corridors may improve usage of the transportation network and/or reduce impacts to other land uses.

As well, the opportunity corridors were assessed on environmental factors. The Partnership's objective is to generate alternatives that reduce the overall impacts to natural, cultural and socio-economic features in the FAA.

As the project proceeds through the environmental approvals processes, factors and measures will be modified as appropriate to reflect the level of information used in decision-making.

9.2. Assessment of Opportunity Corridors

The Opportunity Corridors were developed to be sufficiently wide to accommodate various route alignments for road connections. The assessment of the Opportunity Corridors was based on 'representative alignments' for road connections and border crossings within the corridors. These representative alignments were developed for feasibility assessment purposes only.

As the project proceeds through the environmental approvals process, roadway alignments and new/expanded border crossing locations will be developed based on study area conditions identified at a higher level of detail than that available for this feasibility study. The results of the feasibility assessment of each opportunity corridor are provided in Tables 9.2-A to 9.2-G.

TABLE 9.1-A: TRANSPORTATION NETWORK IMPROVEMENT FACTORS

Factors	Rationale for Assessment	Measures Considered and Rationale
Support local international traffic	• Presently, the majority of international trips (93% of passenger car and 56% of commercial vehicle trips) have at least one trip end (i.e. origin or destination) in the Detroit/Wayne County-Windsor/Essex County region. These crossings represent a significant amount of trade and other economic activity for the local economies. Support of these movements is assessed on the ability of the alternative to meet the long-term travel demand of these movements.	• ***Travel time on the network aggregated to total vehicle-hrs during the peak hr**: Travel time is a measure of network efficiency; travel time was assessed relative to the base case (do nothing) scenario; the lower the total travel time the less congestion and delay assumed on the network* • ***Travel distance on the network aggregated to total vehicle-km during the peak hr** Travel distance is a measure of network efficiency; travel distance was assessed relative to the base case (do nothing) scenario; the shorter the total travel distance, the more efficient the network*
Support long distance freight travel	• Approximately 44% of truck trips crossing the border are passing through the FAA. These movements represent a substantial amount of annual trade between the two nations. Support of these movements is assessed on the ability of the alternative to meet the long-term travel demand of these movements.	
Support long distance passenger travel	• Existing border crossings are an important link between the two countries for passenger travel. Such activity contributes to the local, regional and national economies and enables important social interaction.	
Impacts to access and mobility on local road networks	• Although of major importance, border crossings represent a portion of the economic and social activities in the study area; in developing solutions to border crossing issues, local community access and mobility must be maintained, enhanced and improved wherever possible.	• *Assessment based on assumed road connections, crossings and closures developed for a representative alignment within each corridor*

TABLE 9.1-B: GOVERNMENT, LAND USE, TRANSPORTATION PLANNING AND TOURISM OBJECTIVES FACTORS

Factors	Rationale for Assessment	Measures Considered and Rationale
Support existing land use and future plans	• Once implemented, the improvements to the border crossing(s) could have a long-term effect on the local communities; compatibility with existing land use and future federal, provincial/state and municipal plans can reduce the overall effect on the character, growth and development of the community.	• *Subjective assessment of compatibility with existing land use and public planning documents*
Support the transportation system	• Federal, provincial/state and municipal governments share responsibilities for providing safe, efficient and reliable transportation; improving the transportation system to meet the travel needs of the region is vital to the national, regional and local economies, as well as providing a reasonable degree of access and mobility.	• *Subjective assessment of compatibility with existing road network and public transportation plans and systems*
Maintain security and protect against system vulnerability	• Safe and reliable transportation is vital to the national, regional and local economies, as well as providing a reasonable degree of access and mobility. The additional need to assess and reduce risks and potential weaknesses in the transportation system, given the strategic importance of this international trade corridor, is an important responsibility of all levels of government.	• *Subjective assessment of road network risks/weaknesses*

TABLE 9.1-C: BORDER PROCESSING FACTORS

Factors	Rationale for Assessment	Measures Considered and Rationale
Meet the long term needs for commercial processing and passenger crossings	• Based on discussions with border processing agencies, their long term needs at the border crossings are: • Size/flexibility of plaza area to complete border processing requirements; • Ability to identify and separate high risk traffic from low risk traffic; • Security of primary and secondary commercial inspection areas and associated parking; • Communications with other border crossings; and • Monitoring of border crossing conditions.	• *Subjective assessment of possible border processing issues and constraints associated with each alternative*

TABLE 9.1-D: TECHNICAL FEASIBILITY FACTORS

Factors	Rationale for Assessment	Measures Considered and Rationale
Technical Considerations	• While all alternatives will be constructed to comply with government design standards and requirements in meeting the needs of the project, each alternative will have unique, as well as common characteristics that are worth considering in an assessment of differences and similarities among the alternatives	• *Length of Corridor* • *Length of river crossing* • *Maximum road grade* • *Structure types*
Capital Construction Cost Estimate	• While it is acknowledged that the border crossings in the study area are among the busiest and most strategic for both countries, it is recognized that resources available to address the needs of the network are finite. Minimizing costs in achieving the project objectives is an important consideration	• *$ (2004 base year) Estimated cost to construct a new or expanded international crossing and roadway connections in the Windsor/Essex County and Detroit/Wayne County area*
Constructability and Related Impacts	• Consideration of constructability and related impacts is an essential part of assessing feasibility of any proposed solution. It must be verified that the impacts of implementing a solution do not outweigh the benefits.	• *Subjective assessment*

TABLE 9.2-A: ASSESSMENT OF TRANSPORTATION NETWORK IMPROVEMENT FACTORS

ASSESSMENT OF TRANSPORTATION NETWORK IMPROVEMENT FACTORS							
Factors	**Measures**	**Base Case (No Action)**	**South Crossing**	**Central Crossing**	**Twinned Ambassador Bridge**	**Rail Corridor**	**East Crossing**
Support local international traffic Support long distance international freight travel Support long distance international passenger travel	• ***Travel time on the network aggregated to total vehicle-hrs during the peak hr****: Travel time is a measure of network efficiency; travel time was assessed relative to the base case (do nothing) scenario; the lower the total travel time the less congestion and delay assumed on the network* • ***Travel distance on the network aggregated to total vehicle-km during the peak hr*** *Travel distance is a measure of network congestion; Travel time is a measure of network efficiency; travel distance was assessed relative to the base case (do nothing) scenario; the lower the total travel distance, the less congestion and delay assumed on the network*	• Alternative will not support international traffic • Without additional capacity, worsening congestion levels at existing crossings lead to increased delays	• Alternative provides limited support to local international traffic; does support long distance travel to I-75 and possibly I-94 • Can provide sufficient additional capacity to meet long-term travel needs of the region • Alternative does not divert sufficient passenger car traffic to relieve congestion at existing border crossings	• Alternative supports local and long distance international traffic • Can provide sufficient additional capacity to meet long-term travel needs of the region • Diverts sufficient traffic to relieve congestion on local road network in vicinity of existing crossings	• Alternative supports local and long distance international traffic • Can provide sufficient additional capacity to meet long-term travel needs of the region • Does not require diversion of international traffic, but requires modifications to local road network to provide additional capacity	• Alternative provides limited support to international truck traffic • Provides additional capacity for network, but capacity provided is insufficient to meet long-term travel needs of the region • Provides capacity and options for maintaining movement of goods as an alternate river crossing for trucks which can indirectly benefit passenger car traffic	• Alternative provides limited support to international traffic • Can provide sufficient additional capacity to meet long-term travel needs of the region • Alternative does not divert sufficient traffic to relieve congestion at existing border crossings
Access and mobility on local road networks	• *Assessment based on assumed road connections, crossings and closures developed for a representative alignment within each corridor*	• Without improvements, congestion and delays at border crossings and connecting roadways will reduce local mobility and access	• Alternative does not attract sufficient international passenger car traffic to relieve congestion at existing border crossings; this could affect local mobility and access • May require modifications to local road network which could affect local mobility and access	• Attracts sufficient international traffic to relieve congestion on local road network in vicinity of existing crossings • May require modifications to local road network	• Maintains existing travel patterns for international traffic • Requires modifications to local road network which could affect local mobility and access	• Capacity provided is insufficient to meet long-term travel needs of the region; as a result congestion on local road network in vicinity of river crossings could affect local access and mobility • May require modifications to local road network	• Alternative does not attract sufficient international traffic to relieve congestion at existing border crossings; • May require modifications to local road network

TABLE 9.2-B: ASSESSMENT OF GOVERNMENT, LAND USE, TRANSPORTATION PLANNING, AND TOURISM OBJECTIVES

ASSESSMENT OF GOVERNMENT, LAND USE, TRANSPORTATION PLANNING, AND TOURISM OBJECTIVES							
Factors	**Measures**	**Base Case (No Action)**	**South Crossing**	**Central Crossing**	**Twinned Ambassador Bridge**	**Rail Corridor**	**East Crossing**
Support existing and future plans	• *Subjective assessment of compatibility with public planning documents*	• Not compatible with Windsor Area Long Term Transportation Study (WALTS) recommendations, which identifies need for network improvements related to increased cross-border development	• Compatible with existing and future plans in the Canadian portion of the corridor; avoids majority of proposed urban expansion area of LaSalle • Corridor in Wyandotte area includes a heavily developed mix of land uses which are not all compatible with highway uses	• Portion of corridor south of EC Row Expressway in Windsor/LaSalle consistent with WALTS recommendations • Corridor includes a mix of land uses which are not all compatible with highway uses	• Portion of corridor south of EC Row Expressway in Windsor/Lasalle consistent with WALTS recommendations • Corridor includes a mix of land uses which are not all compatible with highway uses	• Compatible with existing and future plans in that it improves use of existing transportation corridor, but adjacent land uses are not all compatible with highway uses • Introduces international truck traffic into areas of Windsor/Detroit currently lesser exposed to such traffic	• Portion of corridor south of EC Row Expressway in Windsor/Tecumseh consistent with WALTS recommendations • Corridor includes a mix of land uses which are not all compatible with highway uses
Support the transportation system	• *Subjective assessment of compatibility with public transportation plans and systems*	• Does not support the transportation system; significant portions of the network will fail by year 2030	• Increases capacity of the existing system but, due to lack of travel demand in this corridor, alternative provides lesser improvements to network operations than other alternatives	• Increases capacity of the existing system and provides greater improvement to network operations than other alternatives	• Increases capacity of the border crossing and provides improvement to network operations in Windsor	• Increases capacity of the border crossing, but does not provide sufficient capacity to meet long-term traffic needs; as a result, alternative provides lesser improvements to network operations than other alternatives	• Increases capacity of the existing system but alternative provides lesser improvements to network operations than other alternatives
Maintain security and protect against system vulnerability	• *Subjective assessment of road network risks/weaknesses*	• No reduction of potential risks/ weaknesses in border crossing network	• Options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings	• Options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings	• Options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings	• Options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings	• Options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings

TABLE 9.2-C: ASSESSMENT OF BORDER PROCESSING FACTORS

ASSESSMENT OF BORDER PROCESSING FACTORS							
Factors	**Measures**	**Base Case (No Action)**	**South Crossing**	**Central Crossing**	**Twinned Ambassador Bridge**	**Rail Corridor**	**East Crossing**
Meet the long term needs for commercial processing and passenger crossings	• *Subjective assessment of possible border processing issues and constraints associated with each alternative*	• Low-risk traffic mixing with high-risk traffic limits effectiveness/ ability of initiatives to reduce processing times • At Ambassador Bridge, secondary inspection of Canada-bound trucks occurs off-site; at Detroit-Windsor Tunnel, secondary inspection of all trucks occurs off-site; unsecured connections between primary and secondary inspection areas not consistent with long-term needs of border processing agencies	• Existing development in corridor may limit size/flexibility of plaza area to complete border processing requirements	• Existing development in corridor may limit size/flexibility of plaza area to complete border processing requirements	• Existing development in corridor may limit size/flexibility of plaza area to complete border processing requirements	• Existing development around rail tunnel U.S. portal may limit size/flexibility of plaza area to complete border processing requirements • Proposal would provide direct improvements for commercial vehicle processing only; no change from base case for passenger car crossings	• Existing development in corridor may limit size/flexibility of plaza area to complete border processing requirements

TABLE 9.2-D: ASSESSMENT OF TECHNICAL FEASIBILITY

ASSESSMENT OF TECHNICAL FEASIBILITY							
Factors	**Measures**	**Base Case (No Action)**	**South Crossing**	**Central Crossing**	**Twinned Ambassador Bridge**	**Rail Corridor**	**East Crossing**
Technical Considerations	• *Length of Corridor* • *Length of river crossing* • *Maximum road grade·* • *Structure types*	• N/A	• Total length of corridor (approx.) = 24 km (15 mi) • Length of River Crossing = 3.5 to 4.5 km (2.2 to 2.8 mi) which could necessitate in-water work and structures • (Assumed) max. grade of 3% consistent with highway design standards	• Total length of corridor (approx.) = 15 km (9.5 mi) • Width of Detroit River at crossing (approx.) = 0.6 to 0.75km (0.4 to 0.5 mi) • (Assumed) max. grade of 3% consistent with highway design standards	• Total length of corridor (approx.) = 15 km (9.5 mi) • Width of Detroit River at crossing (approx.) = 0.6 km (0.4 mi) • Max. Grade of 5% on river crossing structure is not consistent with highway design standards but satisfies arterial road design standards	• Total length of corridor (approx.) = 15 km (9.5 mi) • Width of Detroit River at crossing (approx.) = 0.6 km (0.4 mi) • (Assumed) max. grade of 3% consistent with highway design standards; facility would operate at posted speeds more consistent with arterial road in tunnel • Not a direct freeway connection on U.S. side, but this should not limit operations; direct connection is being planned • Emergency services operations/ equipment are limited with tunnel facility	• Total length of corridor (approx.) = 20 km (12.5 mi) • Width of Detroit River at crossing (approx.) = 1.5 to 2 km (0.9 to 1.3 mi) which could necessitate in-water work and structures • (Assumed) max. grade of 3% consistent with highway design standards • Constraints may preclude a direct freeway connection on U.S. side
Capital Construction Cost Estimate	• *$ (2003 base year) Estimated cost to construct new crossing and roadway connection between Highway 401 in Windsor/Essex County and Interstate Freeway System in Detroit/Wayne County*	• N/A	• TBD	• TBD	• TBD	• TBD	• TBD
Constructability and Related Impacts	• *Subjective assessment*	• N/A	• Significant disruptions to vehicular traffic during construction on U.S. side; • Some disruption to marine traffic during construction of river crossing • Minor disruptions to vehicular traffic during construction on Canadian side • Possibility of permanent structures in river which would affect marine navigation in river	• Significant disruptions to vehicular traffic during construction • Some disruption to marine traffic during construction of river crossing • Minor disruptions to vehicular traffic during construction on Canadian side	• Significant disruptions to vehicular traffic during construction in Windsor • Some disruption to vehicular traffic during construction in Detroit • Some disruption to marine traffic during construction of river crossing	• Some minor disruptions to vehicular traffic during construction and conversion of twin rail tunnels	• Significant disruptions to vehicular traffic during construction on U.S. side; • Some disruption to marine traffic during construction of river crossing • Minor disruptions to vehicular traffic during construction on Canadian side • Possibility of permanent structures in river which would affect marine navigation in river

TABLE 9.2-E: ASSESSMENT OF TRANSPORTATION OPPORTUNITY FACTORS

ASSESSMENT OF TRANSPORTATION OPPORTUNITY FACTORS						
Factors	**Base Case (No Action)**	**South Crossing**	**Central Crossing**	**Twinned Ambassador Bridge**	**Rail Corridor**	**East Crossing**
Optimize use of the existing infrastructure (transportation corridors and facilities)	• No optimized use of infrastructure; with no increases in road capacity, increasing traffic volumes will result in increased congestion, bottlenecks and inefficient use of infrastructure	• Some degree of optimization of existing infrastructure is possible by making use of existing major road and/or rail corridors; • Direct access to I-75; 9 km (5.5 mi) to I-94 (via Telegraph Road), 20 km (12 mi) to I-96 (via I-75)	• Some degree of optimization of existing infrastructure is possible by making use of existing major road and/or rail corridors; • Direct access to I-75; 8 km (5 mi) to I-94 (via Southfield Hwy), 8 km (5 mi) to I-96 (via I-75) • Truck ferry facilities are situated within this corridor; improvements to road network in this corridor may also improve connectivity to ferry	• Some degree of optimization of existing infrastructure is possible by making use of existing major road and/or rail corridors; • Direct access to I-75/I-94/I-96 • Can take better advantage of the U.S. Gateway Project which expands U.S. plaza and improves connections to freeway system • Improvements to road network in this corridor may also improve connectivity to truck ferry.	• Alternative offers some degree of optimization of existing infrastructure by making use of existing rail corridor and tunnel to provide additional capacity and a new crossing for international truck traffic; • Indirect connection to U.S. interstate highway system (I-75); direct connection is being planned • Alternative incorporates a new, larger rail tunnel, which would improve rail facilities at this crossing	• Some degree of optimization of existing infrastructure is possible by making use of existing major road and/or rail corridors; • Direct access to I-94; 6 km (4 mi) to I-75 (via I–94), 11 km (7 mi) to I-96 (via I-94)

TABLE 9.2-F: ASSESSMENT OF ENVIRONMENTAL FACTORS

ASSESSMENT OF ENVIRONMENTAL FACTORS						
Factors	**Base Case (No Action)**	**South Crossing**	**Central Crossing**	**Twinned Ambassador Bridge**	**Rail Corridor**	**East Crossing**
Natural Features						
Air Quality	• Meets Regional AQ standards	• All new crossings would result in similar Regional Air Quality Impacts				
Ground Water	• No impact	• No significant impact	• No significant impact	• No significant impact	• No significant impact	• No significant impact
Surface Water	• No impact	• New crossings at Detroit River, Canard River tributaries, West Branch Cahill Drain, and Lepain Drain requiring permits	• New crossings at Detroit River, Turkey Creek, Lennon Drain, Cahill Drain, and Lepain Drain requiring permits	• New crossing at Detroit River requiring permits • Crossing at Grand Marais/Turkey Creek requiring permits	• Temporary construction impacts requiring permits	• New crossing at Detroit River requiring permits
Agricultural Lands	• No impact	• Potential to impact agricultural areas	• Potential to impact agricultural areas	• Potential to impact agricultural areas	• No agricultural lands impacted	• Potential to impact agricultural areas
Wetlands	• No impact	• Potential to impact the Detroit River Marsh Wetland Complex Provincially Significant Wetland	• Potential to impact wetland areas	• Potential to impact wetland areas	• No wetlands impacted	• Potential to impact wetland areas
Environmentally Sensitive Areas	• No impact	• Requires a new crossing of Detroit River, which is a designated Heritage River in both U.S. and Canada • Impact upon Detroit River Floodprone Area requiring permits • Potential impacts to Grosse Ile as well as a portion of the Detroit River which are both designated as International Wildlife Refuge	• Requires a new crossing of Detroit River, which is a designated Heritage River in both U.S. and Canada • Potential to impact Ojibway Park and Prairie Reserve area, one of the largest protected prairie and oak savannah habitats in Canada. • Potential to impact Candidate Natural Heritage sites in Windsor	• Requires a new crossing of Detroit River, which is a designated Heritage River in both U.S. and Canada • Potential to impact Ojibway Park and Prairie Reserve area, one of the largest protected prairie and oak savannah habitats in Canada • Potential to impact Candidate Natural Heritage sites in Windsor	• Potential to impact Candidate Natural Heritage site in Windsor	• Requires a new crossing of Detroit River, which is a designated Heritage River in both U.S. and Canada • Potential to impact portion of Detroit River, islands, and adjacent shorelands that are all designated as International Wildlife Refuge • Potential to impact wildlife habitat (Blue Herron lagoon on Belle Isle) • Potential to impact Candidate Natural Heritage sites in Windsor

TABLE 9.2-F: ASSESSMENT OF ENVIRONMENTAL FACTORS CONTINUED

ASSESSMENT OF ENVIRONMENTAL FACTORS						
Factors	**Base Case (No Action)**	**South Crossing**	**Central Crossing**	**Twinned Ambassador Bridge**	**Rail Corridor**	**East Crossing**
Endangered Species	• No known impacts	• No known impacts – this will be investigated further in next stage of project	• No known impacts – this will be investigated further in next stage of project	• No known impacts – this will be investigated further in next stage of project	• No known impacts – this will be investigated further during next stage of project	• No known impacts – this will be investigated further in next stage of project
Cultural Features						
Historic/Archaeological Sites	• No impact	• Potential to impact historical/ archaeological sites	• Potential to impact historical/ archaeological sites	• Potential impact to Ambassador Bridge	• Potential impact to historical/ archaeological sites within/adjacent to rail corridor	• Potential to impact Belle Isle (Natural Historic Landmark)
National, State, and Local Parks/ Recreation Sites	• No impact.	• Potential impacts to municipal parks and recreation areas	• Potential impacts to recreation areas and local parks	• Potential impacts to municipal parks	• Potential impacts to municipal parks adjacent to rail corridor	• Potential to impact Belle Isle, a Natural Historic Landmark and the largest municipal park in the U.S. • Potential impacts to municipal parks
Socioeconomic Features						
Residential Areas	• Potential impacts to residential areas in communities adjacent to existing crossings and connecting roadways	• Potential impacts to residential areas	• Potential impacts to residential areas	• Potential impacts to residential areas	• Potential impacts to residential areas adjacent to rail corridor	• Potential impacts to residential areas
Commercial/Industrial Areas	• Potential impacts to commercial and industrial areas in communities adjacent to existing crossings and connecting roadways	• Potential impacts to commercial and industrial areas	• Potential impacts to commercial and industrial areas	• Potential impacts to commercial and industrial areas	• Potential impacts to commercial and industrial areas adjacent to rail corridor	• Potential impacts to commercial and industrial areas
Cemeteries, Schools, Places of Worship	• Potential impacts to cemeteries, schools, places of worship in communities adjacent to existing crossings and connecting roadways	• Potential impacts to cemeteries, schools, places of worship adjacent to rail corridor	• Potential impacts to cemeteries, schools, places of worship	• Potential impacts to cemeteries, schools, places of worship	• Potential impacts to cemeteries, schools, places of worship	• Potential impacts to cemeteries, schools, places of worship
Environmental Justice	• No impact	• Corridor includes areas where environmental justice must be considered	• Corridor includes areas where environmental justice must be considered	• Corridor includes areas where environmental justice must be considered	• Corridor does not include areas where environmental justice must be considered	• Corridor does not include areas where environmental justice must be considered
Landfills / Hazardous Waste Sites	• No impact	• Potential impact on gas, oil, and disposal wells • Potential impacts to contaminated sites	• Potential impact upon Malden Park (former landfill) • Potential impacts to oil, gas, or disposal wells • Potential impacts to contaminated sites	• Potential impact upon Malden Park (former landfill) • Potential impacts to contaminated sites	• Potential impacts to active landfill areas • Potential impacts to contaminated sites	• Potential impacts to contaminated sites

9.3. Conclusions of the Feasibility Assessment

The conclusions of the Feasibility Assessment can be summarized as follows:

- Each corridor permits at least one constructible road/river crossing alignment.
- All corridors contain alternatives that satisfy the need for added road capacity and options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings.
- The location of a route and connections to the freeway system determines the degree of benefits to the transportation network.
- All corridors include significant environmental constraints.
- The development and evaluation of specific alignments within the corridors is more appropriately conducted under the formal environmental study processes of Canada and the U.S.

All corridors will be brought forward into the Canadian and U.S. environmental approval processes. The rationale for this action is provided below.

This assessment has identified a number of benefits and impacts for each of the alternative corridors. Technically, it is feasible to construct a new crossing in each of the corridors identified, although the costs and effectiveness of each alternative does vary. Fundamentally, each alternative corridor provides for additional road capacity and provides options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings.

From a transportation benefit perspective, each corridor provides some benefits to the network by increasing capacity. However, each corridor benefits the network to differing degrees. The farther away a corridor is located from the existing crossings, the less local traffic it will attract because of increased travel time. An assessment of travel time, as well as the volume-to-capacity ratio under future traffic conditions was used to assess the degree of network improvement each corridor would provide.

A new crossing located in the South Crossing corridor would attract sufficient tra.ffic from the Ambassador Bridge and Detroit-Windsor Tunnel to alleviate congestion at these two crossings until approximately 2030. After that time, the two existing crossings would experience congestion during peak periods, and additional improvements to the network would be required.

The Rail Corridor directly serves only international truck traffic and can provide one lane per direction across the river. This alternative in itself does not provide sufficient relief to the network to meet long-term travel demand. However, combined with other corridor options, this alternative may provide sufficient relief to the network to meet the travel demand needs to 2030 and beyond.

The East Crossing corridor does not attract sufficient traffic away from the existing crossings to alleviate congestion at these crossings. This would result in continued poor traffic operations at the existing crossings, while the East Crossing would be relatively under utilized. Combining this alternative with other corridor options, however, may provide a solution that meets the requirements of the network.

No corridor completely avoids the constraint areas identified by the Project Team. Specifically, all corridors result in some impacts to residential, commercial, and natural areas in the FAA.

The nature and extent of the impacts associated with each corridor varies, however impacts to social, cultural and natural features within each corridor can be avoided, minimized or mitigated to the extent possible. Selecting which alternatives are to be carried forward for further study based on the impacts of a new crossing within each corridor will require value judgements as to what features or degree of impacts are considered more important. These value judgements require input from the communities involved, as well as consideration of government legislation and policies as well as technical/environmental expertise.

It is recognized that, in deciding upon which alternatives are to be set aside and those that are to be brought forward for further study, the Partnership will be narrowing the range of alternatives to be considered under the environmental processes of both countries.

The significance of this decision is not to be understated; while necessary to provide for the free flow of people enjoying the social, cultural and commercial benefits of a cross-border region and to provide for the movement of goods on a strategic trade corridor, a new international transportation corridor will have long-lasting benefits and impacts to the Windsor/Essex County-Detroit/Wayne County area.

One objective of the P/NF Study was to identify the alternative(s) to be carried forward for study under the environmental approval processes. To achieve this objective, analysis and evaluation of the corridors would be required in accordance with environmental approval processes in both countries. Undertaking this work as part of the P/NF Study would require repeating a large part of this analysis and evaluation work once the formal environmental approvals processes were initiated.

Given the level of detail employed to date in identifying the range of corridors and the significance of any recommendations coming from the feasibility assessment, the most prudent way to give all feasible alternatives due consideration is to initiate the Canadian and U.S. environmental approval processes, which include formal opportunities for public participation and agency concurrence, and formalize the decision-making processes. This will accelerate the planning process for the implementation of a new crossing by avoiding the need to repeat the analysis and evaluation of alternative corridors. The corridors identified in the P/NF Study will be brought forward into the Canadian and U.S. environmental approval processes.

In the environmental study process, more information will be collected to assist in the generation and assessment of alternatives. The work included in this P/NF Study can serve as the basis for developing route alignments within and connecting between the Opportunity Corridors.

10. Potential Elements of the Recommended Strategy

The two Detroit-Windsor Crossings, namely the Ambassador Bridge and the Detroit-Windsor Tunnel, experience congestion today. This congestion can generally be attributed to inadequate resources (staffing and facilities) at border processing on one side of the border or the other and heightened security procedures, not a lack of roadway capacity on the bridge and tunnel. Additional resources are being implemented at the border crossings, however such improvements will not address the medium to long-term needs of the transportation network in the Detroit/Wayne County-Windsor/Essex County area. Specifically, such resources will not address the need to maintain the free flow of people and goods in this strategic trade corridor between Canada and the United States. Nor will such resources provide for sufficient roadway capacity to serve projected travel demand. Analysis of future travel demand identified a need for additional roadway capacity approaching the existing crossings within 5 years and a need for an additional river crossing in 10-15 years.

Travel demand management measures and encouragement of the use of other modes may marginally defer the need for a new crossing, but to provide options for maintaining the movement of people and goods in cases of disruptions to any of the existing border crossings in the transportation network and serve future travel demand, a new river crossing is required.

Based on the work completed on this P/NF Study, the potential elements of a strategy for managing the border crossing needs in the Detroit/Wayne County-Windsor/Essex County area were identified by the Consultant Team. This strategy, presented as advice to the Partnership, includes the following:

1. **Ensure sufficient border processing resources to serve travel demand at the crossings** – this element is required in all cases to ensure the border crossings are functioning efficiently; it includes ensuring staffing and facilities are adequate to serve travel demand, greater use of programs (such as NEXUS and FAST) and technologies, and other measures to reduce demands on border processing resources.

2. **Construct a new or expanded international crossing or crossings connecting the interstate freeway system in Michigan to the provincial highway system in Ontario** – a new crossing is required to add options for maintaining movement of goods to the network as well as provide the necessary capacity to meet future travel needs. Implementing a new crossing can take 8 to 10 years, including the time required for successful completion of environmental processes in Canada and the United States, as well as time to design and construct the new crossing. This element will also consider whether more than one crossing is to be pursued.

3. **Optimize the use of existing network in the short to medium-term** – Implementing a new crossing can require 8 to 10 years; in the meantime, implementing improvements and measures to optimize use of the existing network is required to reduce congestion and related impacts.

4. **Implement travel demand measures and encourage use of other modes to reduce travel demand on the transportation network** – on-going efforts to reduce road-based travel demand during peak travel periods will allow the transportation network to function more efficiently.

The following sections include discussion of potential improvements to address the short, medium and long-term needs of the transportation network.

10.1. Improvements to Border Processing

Border Processing Staffing (on-going)

Presently, the most limiting factor to increased throughput at the border has been identified as the staffing by the border inspection services (U.S. and Canadian Customs and Immigration). Demand has been shown to be predictable and if sufficient resources are available, the inspection services can be prepared for the peak demand periods. While adequate staffing levels will be an on-going need for border crossings, this need is particularly heightened in the short-term. Governments are taking steps to address this need. In the mid to long term, as new technologies are implemented and participation in NEXUS and FAST increases, the demand for additional staff may be more manageable.

- **Partnership agencies (TC, FHWA, MTO and MDOT) to liaise with border processing agencies to identify required staffing and implement technologies/ programs to achieve and maintain a reasonable processing rate under typical operating conditions to avoid queuing on the approach roadways as much as possible.**

Border Processing Facilities (0 – 5 years)

Inspection services require the physical facilities to process cross-border demands, with sufficient number of inspection lanes and booths and office/administrative space. In some cases, this will involve expansion of the queuing areas and plazas on either side of the border to ensure that sufficient capacity can be made available for inspection services and for access to and from the bridge plaza. Such plaza studies are underway at the Blue Water Bridge, Ambassador Bridge (U.S. plaza) and Detroit-Windsor Tunnel.

- **Continue to participate with current plaza studies at the Blue Water Bridge, Ambassador Bridge (U.S. plaza) and Detroit-Windsor Tunnel in partnership with the crossing operators and related government agencies to plan for future land and physical needs related to primary and secondary inspection and access to and egress from the plaza areas.**

- **Participate in similar planning study of Ambassador Bridge (Canadian plaza) with the bridge operator and border processing agencies to identify future access and border processing needs.**

Implement and encourage greater use of NEXUS / FAST and employ new systems to minimize processing time (0 – 5 years)

The NEXUS and FAST programs are designed to reduce processing times by border inspection services for passengers and trucks, respectively. Ensuring effective use of these programs and higher participation rates will require that users experience travel time and/or convenience benefits. This will require actions such as the provision of exclusive lanes for NEXUS and FAST users to bypass other vehicles queuing for inspection, provisions of sufficient capacity at the NEXUS/FAST booths so that delays are reduced to a minimum, and other measures. Another strategy to encourage greater use of the programs may include providing reduced tolls for NEXUS/FAST users.

- **In coordination with the plaza studies noted above, examine strategies to increase NEXUS/FAST penetration among users, including strategies and infrastructure approaches to provide priority treatment to NEXUS/FAST users at the border. (For example, providing dedicated NEXUS/FAST lanes on Huron Church Road close to the bridge plaza for traffic streaming purposes.)**

Commercial Vehicle Processing Centre (0 – 5 years)

At present, 20 to 25% of trucks to the U.S. do not have complete documentation upon reaching the border, resulting in lengthy processing time for trucks and inefficiencies at both primary and secondary inspection areas. A Commercial Vehicle Processing Centre (CVPC) could improve truck flow into the United States by providing an off-site location for driver or brokers to enter and electronically transmit necessary shipping information in advance of the border. This would ensure that all documentation is complete upon arriving at primary inspection.

A CVPC could possibly serve as a staging point for trucks approaching the border; all international trucks could be held at the CVPC and released only as capacity becomes available. Efforts should build on CVPC experience at the Peace Bridge and the CVPC near London, operated by the Ambassador Bridge.

- **Undertake efforts in partnership with border processing agencies and crossing operators to assess the feasibility of processing centres to reduce processing times at the border;**
- **If the feasibility of processing centres is confirmed, proceed with studies to locate and implement a CVPC in the Windsor/Essex County area and in the Sarnia/Lambton County area.**

Partnership of Municipalities, Transportation and Border Processing Agencies (on-going)

It is recognized that transportation agencies, border processing agencies and border communities must continue to work closely together on transportation issues related to the

border, including border processing facility and infrastructure needs and the implementation of programs/technologies (e.g. NEXUS/FAST, ITS) to ensure the efficient and secure movement of cross-border traffic. For example, the existing Windsor-Detroit Border Working Group could be broadened to include the city.

- **A bi-national border crossing committee consisting of municipalities, transportation, border processing and security agencies be established to liaise and coordinate the development and implementation of border crossing protocols and procedures which balance the need to maintain the flow of people and goods, with the need for appropriate security.**

10.2. New/Expanded International Crossing

Initiate Formal Environmental Processes for a New/Expanded Crossing (0 to 4 years)

A new or expanded river crossing and new or improved road connections between the interstate freeway system in Michigan and the provincial highway system in Ontario are the key elements of a long-term strategy for improvements to the transportation network. Implementing a new crossing is a lengthy process consisting of identifying and obtaining environmental approvals, as well as design and construction of the new crossing.

Therefore, the Partnership recommends moving forward with initiation of the formal environmental approval processes on both sides of the border, namely, the U.S. National Environmental Policy Act (NEPA), the Canadian Environmental Assessment Act (CEAA) and the Ontario Environmental Assessment Act (OEAA). Moving forward in this way will allow for the decision-making on the five alternative corridors to be conducted under a full and open public process.

The next steps in the process will be carried out in consultation with stakeholders and community groups. These steps include:

- Satisfying environmental assessment requirements of all four partners;
- Developing the framework for conducting the next stage in the NEPA/CEAA/OEAA process.
- Prepare a Terms of Reference for an Individual Environmental Assessment in accordance with OEAA.

The Partnership will continue looking for ways to accelerate the planning activities, without compromising opportunities for consultation or the environmental approval processes in the United States or Canada.

- **Continue planning for a new crossing in the Detroit-Windsor area including undertaking environmental studies. This process will identify the preferred location and type of new crossing. Once the environmental studies are completed and approved, the land may be reserved for the new crossing and its approaches and design and construction may proceed to meet needs for the medium and long term.**

10.3. Optimize Use of Existing Network

As the planning for a new crossing proceeds, improvements to the existing network will address the short- to medium-term need for improvements to the network to reduce congestion on this strategic trade corridor. On the U.S. side, proposed improvements to the plaza at the Ambassador Bridge will improve the connections with the interstate freeway system. On the Canadian side, the Governments of Canada and Ontario are considering short and medium-term solutions to improve the transportation network.

- **On the Canadian side, proceed with activities that will improve the capacity and operations of the existing network such as the proposals outlined in the Windsor Gateway Action Plan.**
- **On the U.S. side, proceed with activities leading to the implementation of the Ambassador Bridge Gateway Project as finalized by the U.S. federal and Michigan state governments.**

10.4. Travel Demand Management

Effective implementation of the following travel demand management measures will contribute to improved operations on the transportation network. However, these measures will not eliminate the need for a new crossing or short-term improvements. These elements represent sound transportation practices designed to ensure the road, rail, transit and marine facilities serving the travel demand in the FAA are utilized as efficiently as possible.

10.4.1. Road-based Travel Demand

Develop and Implement an intelligent transportation systems (ITS) strategy and Electronic Data Interchange (EDI) to improve traffic operations (0 – 5 years)

At present, the Detroit-Windsor Tunnel, the Ambassador Bridge and the Blue Water Bridge operate independently. Real-time knowledge of the conditions at each crossing would allow more effective management of the border crossing system as a whole and provide useful guidance and information to cross-border travelers in determining the time and route of travel. Real time regional traffic information can be used to distribute resources and manage/control traffic at crossings and assist in the staffing/allocation of inspection resources.

The media that could be used to disseminate this information could include dynamic signs at strategic road junctions, local low power radio (highway advisory radio), Internet information channels (which could be used for example, by truck dispatchers), and other measures. Such information dissemination would not only use these diversion strategies but also might influence the timing of arrival at the border. Users could be alerted in advance of a substantial queue at one crossing, allowing diversion to another.

EDI systems would need to be upgraded to ensure users could take advantage of this information. For example, shipping documentation for a truck is sent in advance to a specific inspection facility to accelerate customs clearance, but this information presently cannot be transferred to another crossing facility if delays suggest use of another crossing.

- **Develop an ITS cross-border strategy and real-time information system, in collaboration with border processing agencies. This will include strategies to increase the efficiency and throughput at border crossings and development of a coordinating mechanism for the collection and dissemination of information among affected federal, state/provincial, and city agencies.**

Encourage use of Blue Water Bridge (on-going)

The Blue Water Bridge has reserve crossing capacity, but border processing capacity, particularly for U.S.-bound trucks, is severely constrained. Once additional border processing capacity is added, additional international traffic, particularly truck traffic, could divert from the Detroit-Windsor crossings. MDOT and MTO are participating with operating agencies of the Blue Water Bridge in planning and implementing plaza and roadway improvements at this border crossing. These efforts must continue with the objective of implementing the improvements to the U.S. side as quickly as possible, and implementing the improvements on the Canadian side to meet traffic demand.

An ITS system capable of reporting on all the border crossings in Southeastern Michigan-Southwestern Ontario can assist in achieving effective diversion. Such a system will need to be integrated with the border processing clearance systems to enable routing of traffic to any crossing in the region.

- **Continue to support the planning efforts currently underway for improvements to plaza facilities at the Blue Water Bridge**
- **Incorporate the Blue Water area in the development of a regional ITS system.**

Education and information dissemination (on-going)

Many drivers arrive at the border without having knowledge of the documentation required to cross the border or of alternative routes and less congested times that might be available. Public information programs which could include improved signage, advertising, internet pages and other measures could provide this information to users.

- **Encourage and support appropriate agencies to develop a comprehensive education and public information program, building on current initiatives available by state, provincial, federal and bridge/tunnel operating authorities.**
- **Explore improvements to border crossing trail-blazing signage on both sides of the border to facilitate the movement of vehicles and increase driver awareness.**

10.4.2. Improvements To Rail Network

Encourage greater use of intermodal rail (5 – 10 years)

Both CN and CPR have introduced short distance (1,000 km or less) intermodal rail services in the corridor (currently between Montreal/Toronto and Detroit/Chicago). A number of measures could be employed to encourage the use of these services to divert freight traffic to the rail mode. Federal and provincial support for infrastructure road-based improvements could be used to encourage expansion of rail terminals, track capacity and/or rolling stock acquisition. An alternative approach could involve rebates on current railway fuel taxes (federal or provincial in Canada) either to the railway or to the shippers when intermodal services are used. For example, a rebate might be provided for every kilometer of truck travel diverted from highways to rail.

- **The federal, state and provincial governments, in partnership with rail operators, shippers and representatives of exporting industries, develop an intermodal rail strategy for Southwestern Ontario and Michigan, respectively, to assess its future role and identify strategies and initiatives to promote greater use.**

Review and provide support to improvements of rail terminals (5 – 10 years)

The Detroit Intermodal Freight Terminal (DIFT) project is examining methods to improve the capacity and utilization of freight terminals within the Detroit area. This project could encourage the use of intermodal services across the border. Consideration should be given to studying the need for a new intermodal terminal(s) in Southwest Ontario for freight moving into the United States. Alternatively, improvements to terminals in Central Ontario might be considered.

- **The Canadian federal and provincial governments, in partnership with rail operators, shippers and representatives of exporting industries, pursue the potential need for a new intermodal terminal in Southwest Ontario and initiate study, as appropriate. This initiative can be a part of the intermodal rail strategy for southwestern Ontario identified above.**
- **The U.S. federal and state governments will continue to support the planning efforts of the DIFT project, to identify the appropriate intermodal strategy for the Detroit area as soon as possible.**

Encourage and support improvements to Inter-City Passenger Rail (0 – 10 years)

A substantial portion (approximately 80%) of passenger vehicles using the crossing in Windsor-Detroit involves local traffic between Windsor and Detroit, but there are also 20% longer distance passengers. Measures could be introduced to encourage the use of railway passenger services across the border, as currently there is no through passenger train service across the Detroit River and only one train per day across the St. Clair River. VIA Rail and Amtrak could be encouraged to develop new services to provide through cross-border services, diverting some passengers from automobile to inter-city train. Such an initiative could be part of the Mid-West Rail initiative, which is examining improvements

in the Chicago-Detroit Corridor.

- **Encourage VIA Rail and Amtrak to pursue the development of new cross-border services through Windsor-Detroit.**
- **Encourage government agencies to consider funding to support infrastructure improvements to facilitate such services.**

10.4.3. Improvements To Transit Network

Encourage New/Improved Transit Services (on-going)

Currently, the only public transit available between Windsor and Detroit is the Tunnel Bus operated by Transit Windsor. A number of measures might encourage a shift to greater public transit use. Current levels of service for the tunnel bus are rather low and increased services might encourage more utilization. For example, many Windsor residents work at the hospital complex in downtown Detroit. A direct bus to the hospital complex could encourage greater public transit use for these commuters. Similarly other major origins and destinations in Detroit/Windsor might be linked with a better bus service.

Similar to the tunnel bus, a bus crossing Ambassador Bridge could provide connections between areas in Windsor and Detroit for local commuters and visitors. Alternative public transit services could also include new privately operated systems, such as the proposed gondola system across the Detroit River, the introduction of a passenger ferry service (possibly similar to the Seabus service in Vancouver), development of a shuttle rail service through the existing rail tunnel, extension of planned commuter rail services in the Detroit region to Windsor or other measures.

- **Encourage and support D-DOT and Transit Windsor in the examination of possible enhancements to the existing tunnel bus service and the provision of new routes and services to serve other major destinations.**
- **Encourage private sector initiatives to provide alternative public transit services, with discussions and study, as appropriate, to determine feasibility.**

10.4.4. Improvements To Marine Services

Encourage Greater Use of Ferry services (0 – 5 years)

Currently, marine service has a relatively small role in the transportation network this area. There are possibilities to increase this role and divert passengers and commercial vehicles from the bridge and tunnel. Encouraging use of the ferry service and utilizing existing/excess capacity can provide immediate benefits to the transportation network.

- **Encourage ferry service operators to work directly with shippers (i.e. through reservations systems) to enhance ferry services.**
- **Encourage ferry service operators to work with local municipalities, province/states to improve access to the ferry terminals.**

- **Encourage private sector initiatives to develop/enhance ferry services to provide alternatives to road-based border crossings.**

Improvements to marine vessel services (5 – 10 years)

Governments should continue efforts to explore possible opportunities to promote short sea shipping as a means of helping alleviate highway congestion, facilitate trade and to improve utilization of waterway capacity. A review of the groundside accessibility to marine ports should be undertaken to identify necessary improvements.

- **Continue to pursue marine opportunities that cost-effectively reduce road-based cross-border demand, as appropriate (e.g. short sea shipping and roll-on/roll-off ferry services.**
- **Undertake a strategic review of groundside access to major ports to identify any required improvements to accessibility and identify other potential sites that may fit accessibility criteria.**

10.5. Summary / Next Steps

The following table (see Table 10.1) summarizes the potential elements for a 30-year strategy to address the medium and long-term needs of the transportation network in southeastern Michigan – southwestern Ontario. These elements were presented for comment at the second round of public consultation in June 2003. Comments received have been considered and incorporated where appropriate in the Planning/Need and Feasibility Study.

The government partners should each consider the potential elements of the recommended strategy and initiate the appropriate programs/funding reviews necessary to implement these elements. Where appropriate, cooperation among the Partners shall be formalized in an effort to continue a comprehensive and consistent approach to cross-border transportation issues and solutions along the U.S./Canadian border.

TABLE 10.1: POTENTIAL ELEMENTS OF A 30-YEAR STRATEGY FOR IMPROVEMENTS TO THE TRANSPORTATION NETWORK IN SOUTHEASTERN MICHIGAN-SOUTHWESTERN ONTARIO

Element	Timeframe	Issues/Challenges
IMPROVEMENTS TO BORDER PROCESSING		
Border Processing Staffing	On-going	Improvements to border processing are not in the direct control of the Partnership; the involvement of the Partnership on border processing improvements is limited to participation and liaison with border processing initiatives. Nevertheless, improvements to border processing are a key element of the 30-year strategy for improvements to the transportation network and must be pursued.
Border Processing Facilities	0 – 5 years	
Implement and encourage greater use of NEXUS / FAST and employ new systems to minimize processing time	0 – 5 years	
Commercial Vehicle Processing Centre	0 – 5 years	
Partnership of Municipalities, Transportation and Border Processing Agencies	on-going	
NEW/EXPANDED INTERNATIONAL CROSSING		
Initiate Formal Environmental Processes for a New or Expanded International Crossing	0 to 4 years	The selection of a preferred location for a new or expanded international crossing will follow environmental processes in both Canada and the U.S. These processes will require up to 4 years to complete. Once completed, design and construction of the new or expanded international crossing can proceed. In September 2002, DRTP filed a Notice of Intent to make application to the Canadian Transportation Agency for approval to construct the Canadian portion of the project. DRTP is preparing an environmental assessment in accordance with the Canadian Environmental Assessment Act.
OPTIMIZE USE OF EXISTING NETWORK		
On the Canadian side, proceed with activities that will improve the capacity and operations of the existing network, e.g. Windsor Gateway Action Plan.	0-5 years	Short-term improvements should not preclude the consideration of alternatives for the long-term needs of the network. Implementing the short-term improvements may require environmental approvals prior to their implementation. Any such approvals processes should be initiated as soon as possible to enable timely implementation of any solutions.
On the U.S. side, implement the Ambassador Bridge Gateway Project as finalized by the U.S. federal and Michigan state governments (construction has been initiated on this project).	0-5 years	

TABLE 10.1: POTENTIAL ELEMENTS OF A 30-YEAR STRATEGY FOR IMPROVEMENTS TO THE TRANSPORTATION NETWORK IN SOUTHEASTERN MICHIGAN-SOUTHWESTERN ONTARIO CONTINUED

Element	Timeframe	Issues/Challenges
TRAVEL DEMAND MANAGEMENT		
Develop and Implement an intelligent transportation systems (ITS) strategy and Electronic Data Interchange (EDI) to improve traffic operations	0 – 5 years	This improvement can benefit both the road network and border processing. Implementation of ITS and EDI should proceed as quickly as possible. Consistency between Canadian and U.S. systems is required.
Encourage use of Blue Water Bridge	on-going	Planning is underway for improvements to the bridge plazas in both Canada and the U.S. These improvements, once implemented, will increase the effectiveness of this crossing; in the meantime, encouraging use of this crossing will also depend on the flexibility of border processes to enable truckers to choose which crossing (Ambassador Bridge or Blue Water Bridge) to use; presently, this choice is restricted by the border processing systems now in use.
Education and information dissemination	on-going	An on-going, dependable and widely available means of providing information on the border crossing conditions may help distribute peak traffic flows more evenly among the crossings; Consistency in the collection and dissemination of the data in Canada and the U.S. is preferred.
Encourage greater use of intermodal rail	5 – 10 years	Improvements to rail services and facilities may improve utilization of the transportation network but will not reduce the need for a new crossing and other road-based improvements.
Encourage and provide support to improvements of rail terminals	5 – 10 years	
Encourage and support improvements to Inter-City Passenger Rail	0 – 10 years	
Encourage new/improved Transit Services	on-going	New/improved transit services and facilities may improve utilization of the transportation network but will not reduce the need for a new crossing and other road-based improvements.
Encourage greater use of Ferry services	0 – 5 years	New/improved marine services and facilities may improve utilization of the transportation network but will not reduce the need for a new crossing and other road-based improvements.
Encourage improvements to marine vessel services	5 – 10 years	