

**Detroit River**  
INTERNATIONAL CROSSING  
S T U D Y

# Generation and Assessment of Illustrative Alternatives Report

**DRAFT November 2005**

DRAFT

This working paper/report is an interim study document.

As such, the findings are not necessarily final and are subject to change as a result of stakeholder input and/or additional analysis.

## Preface

The Border Transportation Partnership representing the governments of Canada, the United States, Ontario and Michigan is conducting route planning and environmental studies for a new or expanded crossing of the Detroit River, with connections to freeways in Ontario and Michigan.

The Border Transportation Partnership is coordinating the studies in Ontario and Michigan to develop an end-to-end solution that represents the best balance between environmental impacts and transportation benefits. In Canada, the Detroit River International Crossing (DRIC) Study is being conducted in accordance with the Ontario Environmental Assessment Act (OEAA). The Terms of Reference (TOR) document that provides the framework for this study was approved by the Ontario Minister of the Environment in September 2004. The work will also be coordinated with the requirements of the Canadian Environmental Assessment Act (CEAA). An OEAA Environmental Assessment Report and CEAA Screening Report will be prepared for public review and comment at the completion of this study.

The Canadian studies are being coordinated with similar studies in the United States. The U.S. studies are being led by the Michigan Department of Transportation in conjunction with the U.S. Federal Highway Administration. The U.S. studies are being conducted in accordance with the requirements of the U.S. National Environmental Policy Act (NEPA).

In preparing the environmental studies in accordance with requirements of both countries, a series of supporting documents will be prepared for review and public comment throughout the DRIC Study. In Canada, these supporting documents include:

- Transportation Planning/Need Report
- Study Area Existing Conditions Report
- CEAA Project Description
- Illustrative Alternatives Generation and Assessment Report
- Practical Alternatives Generation and Assessment Report
- CEAA Scoping Report
- Concept Design Alternatives Generation and Assessment Report
- Selection of Technically and Environmentally Preferred Alternative Report

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These supporting documents will be compiled into the final documents to be submitted under the OEA and CEAA processes.

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## List of Supporting Documents

New CBSA Plaza Approximate Size and Specifications – Memo by B. Holthoff, Stantec – August 2005  
 Alternatives Analysis – Canadian Side – November 2005  
 Evaluation of Illustrative Alternative Plazas on U.S. Side of Border – October 2005

# 1. Illustrative Alternatives Generation

## 1.1. Introduction

The Ontario Ministry of Transportation, together with its partners Transport Canada, Michigan Department of Transportation and U.S. Federal Highways Administration, are committed to planning, designing and implementing a transportation solution for the Detroit River International Crossing Project in an environmentally sensitive manner. As such, an integrated study process has been developed to aid in developing alternatives that minimize adverse environmental impacts, and address the identified transportation problems.

The purpose of this undertaking is to provide for the safe, efficient, and secure movement of people and goods across the Canadian-U.S. border in the Detroit River area to support the economies of Ontario, Michigan, Canada and the U.S.

In order to meet the purpose, this study must address the following regional transportation and mobility needs:

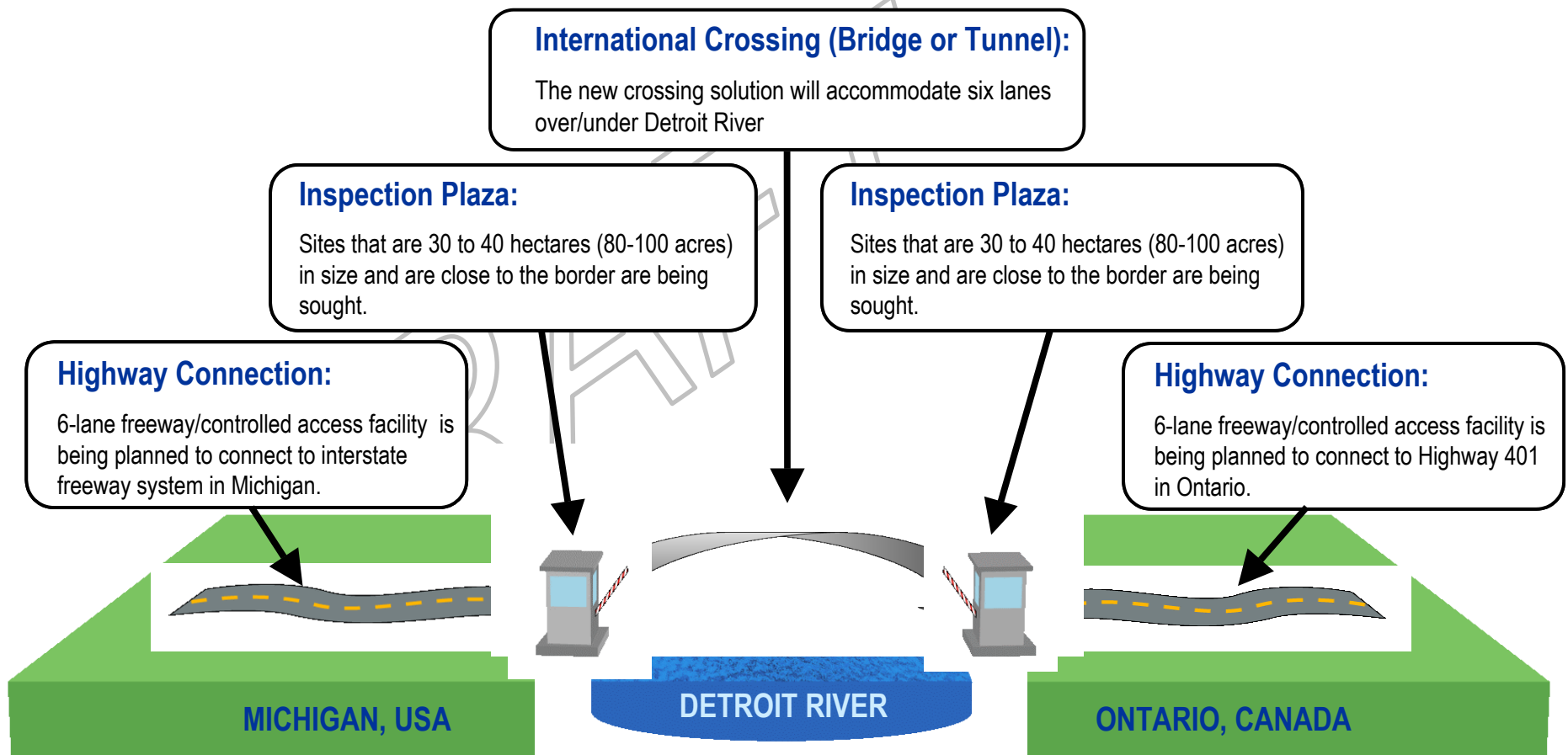
- Provide new border crossing capacity to meet increased long-term travel demand
- Improve system connectivity to enhance the continuous flow of people and goods;
- Improve operations and processing capabilities at the border; and,
- Provide reasonable and secure crossing options (i.e. network redundancy).

Given this purpose and these needs in the Detroit River area, the Partnership has developed a number of alternatives for a new or expanded crossing at the Detroit River that connect the Highway 401 in the Windsor/Essex County area to the interstate freeway system in the Detroit/Wayne County area. The alternatives to be considered for a new or expanded border crossing include the following components (refer to Exhibit 1.1):

- A new or expanded crossing of the Detroit River (tunnel or bridge)
- Plazas connected to the crossing (either directly or through a secure connection) for border agencies to inspect inbound and outbound drivers, passengers, vehicles and freight (these inspection plazas may also include other functions, such as toll collection and crossing maintenance facilities, and other border related services such as duty free shopping, brokerage offices, and other agency offices); and
- Controlled access roadways connecting the crossing plazas to the provincial or interstate freeway system.

This chapter documents the process used to generate illustrative crossing, inspection plaza and route alternative as well as descriptions of the specific alternatives considered.

**EXHIBIT 1.1: COMPONENTS OF NEW OR EXPANDED INTERNATIONAL CROSSING**



## 1.2. Generation of Alternatives

The underlying principle guiding the alternatives generation process was to start with a broad perspective and narrow to the more focused as the study progresses. The identification of illustrative alternatives began with consideration of information available through secondary sources and consultation concerning existing environmental features.

The process for identifying a technically and environmentally preferred alternative for a new or expanded crossing with connections to the provincial highway network and interstate freeway system will include the development of illustrative and practical alternatives. Illustrative alternatives<sup>1</sup> were assessed to determine practical alternatives<sup>2</sup>; based on additional study, consultation, further refinement of the practical alternatives, and a further evaluation process, a 'technically and environmentally preferred' alternative will be selected. The 'technically and environmentally preferred' alternative is the alternative that provides the best overall balance of transportation objectives and environmental impacts, including its ability to satisfy the regional transportation and mobility needs identified previously in this document.

As illustrative and practical alternatives are developed, information on area features is supplemented with field investigations and additional research as required. When a preferred alternative is selected, concept design proceeds with even more focused data that will include detailed field surveys. This process continues on into later design stages and processes. The process of collecting additional environmental data as the project becomes more focused ensures that current information is sought and used throughout planning and design.

The concept of focusing the range of alternatives and increasing the level of environmental and technical investigations as the project progresses is schematically illustrated on Exhibit 1.2.

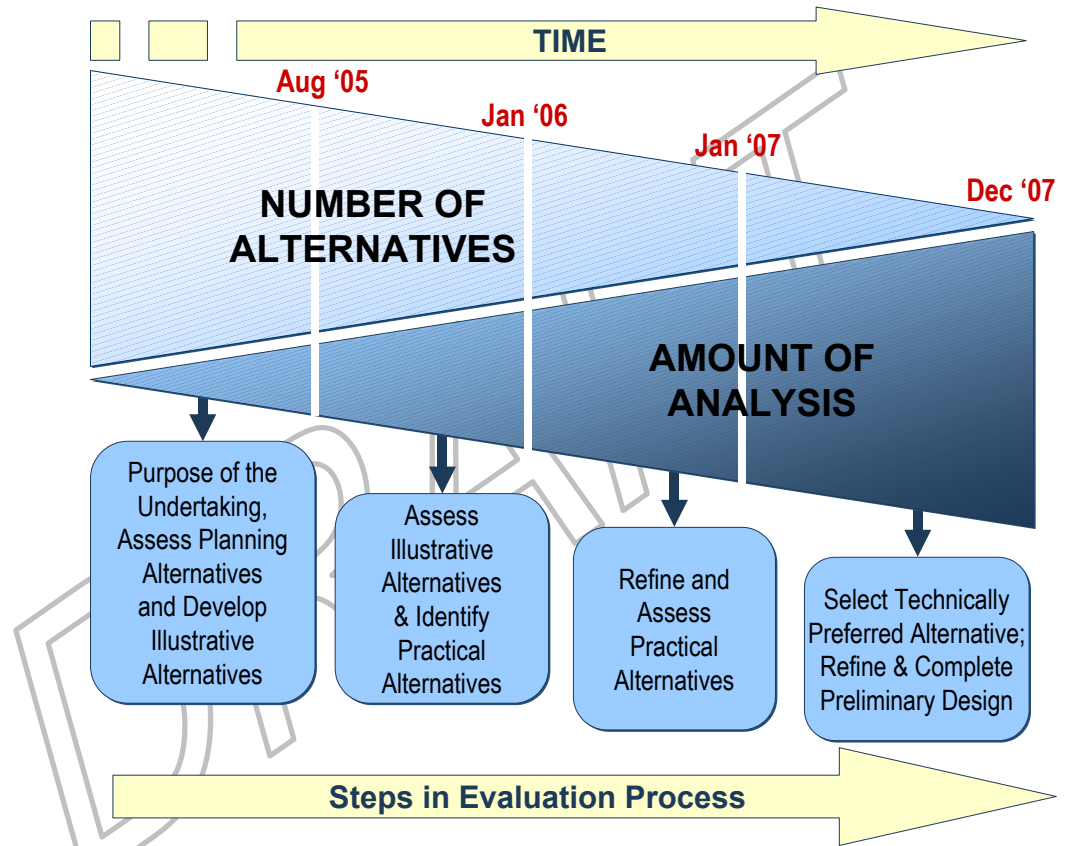
This approach is based on MTO's existing policies and protocols and has been used on many similar EA studies in Ontario, and is also consistent with FHWA and MDOT practices under NEPA. Work plans have been developed to scope the specific environmental inputs, investigations and methods of data collection and impact assessment at the respective study stages.

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<sup>1</sup> Illustrative alternatives represent the full set of alternative crossing locations/inspection plaza sites/connecting roadway alignments to be considered.

<sup>2</sup> Practical alternatives represent the set of illustrative alternatives that, upon an evaluation of impacts and benefits, are carried forward for further consideration.

**EXHIBIT 1.2: EVALUATION PROCESS**

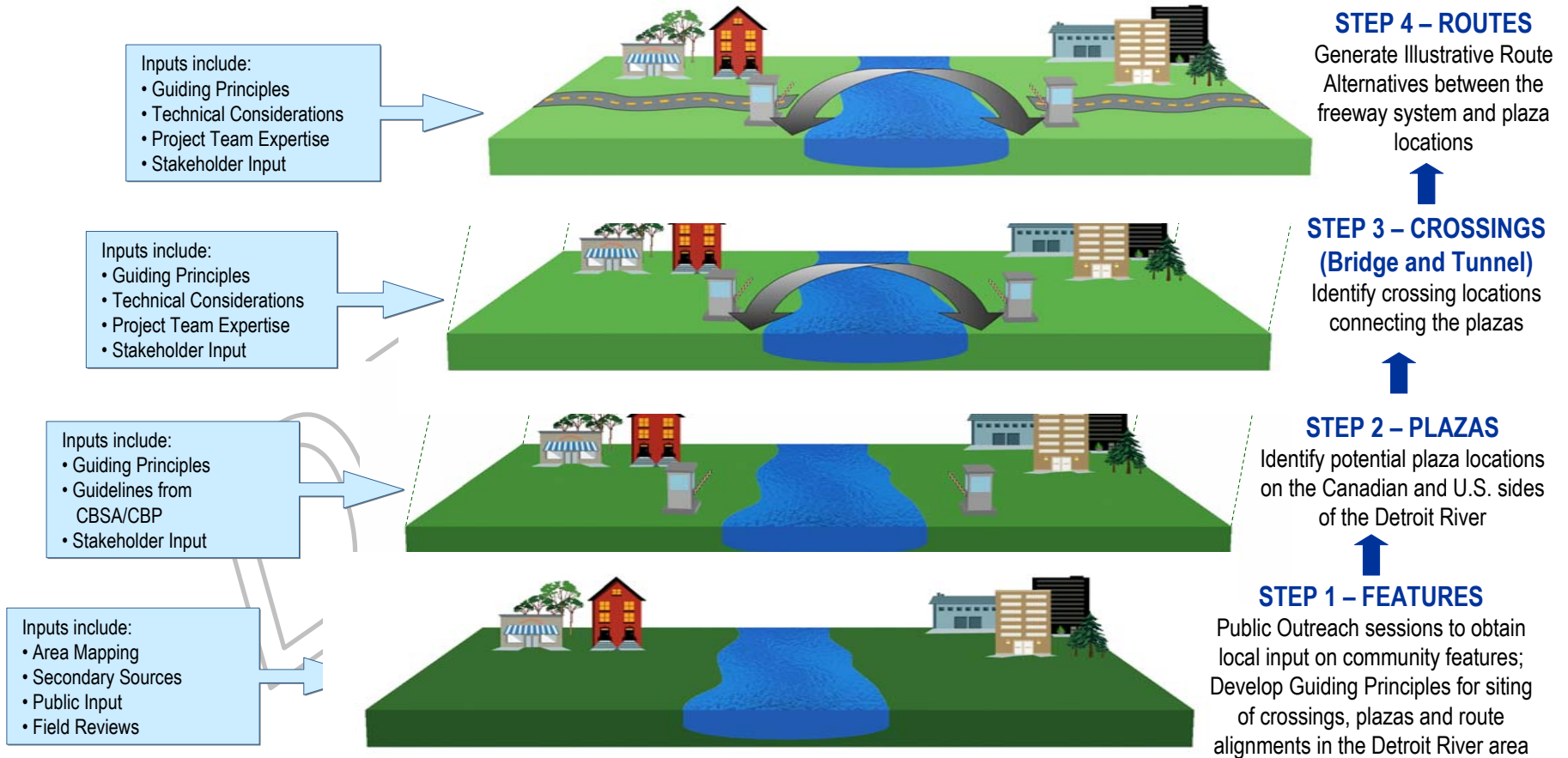


The following steps were undertaken in the generation of illustrative alternatives (refer to Exhibit 1.3):

- Data collection of features in the Detroit River area; this step included Initial Public Outreach sessions to obtain local input on community features;
- Develop guiding principles for siting of river crossings, inspection plazas and route alignments in the Detroit River area;
- Identify potential inspection plaza locations on the Canadian and U.S. sides of the Detroit River;
- Identify crossing locations connecting these plazas; and
- Generate illustrative route alternatives between the freeway system and inspection plaza locations.

This document provides additional information on how each of these steps was followed in developing illustrative crossing locations, inspection plaza sites and route alignments for the Canadian side of the Detroit River. Additional information regarding the development of illustrative alternatives on the U.S. side of the Detroit River is available under separate cover (“Illustrative Alternatives on U.S. Side of Border”, August 2005).

**EXHIBIT 1.3: DEVELOPMENT OF ILLUSTRATIVE ALTERNATIVES**





### 1.2.1. Data Collection / Key Features

Secondary source data including aerial photography and GIS Information obtained from external agencies and municipal Official Plans was used to identify area features along the Detroit River area. This information was augmented during the early months of 2005 through field investigations, updated aerial photography and interpretation, meetings with interested groups and individuals, and discussions with ministries, agencies and the public, including Initial Public Outreach meetings held on April 5 and 6, 2005 in Windsor and LaSalle, respectively.

This information was reviewed by the Project Team specialists and incorporated in the documentation of area features and the analysis of impacts. The following provides a summary of key features on the Canadian Side. Details of the data collection and area features and characteristics are available in the *Environmental Overview Report*, June 2005.

Key area features on the Canadian side of the Detroit River are identified in Exhibits 1.4-A and 1.4-B. Features in the Canadian portion of the study area include the urban area of the City of Windsor, the neighbouring Towns of LaSalle, Tecumseh and Amherstburg and a surrounding fringe of rural land uses. The area has a combined population of over 300,000, including more rural parts of adjoining Essex County. It is characterized by both heavily urbanized and intensive agricultural land uses that are interspersed with a patchwork of remnant natural heritage features, including wetlands, prairies, and woodlots.

The City of Windsor has a census population of 208,402 and is the largest population center in the Canadian portion of the study area. The primary land use in the City of Windsor is residential, with major employers clustered in manufacturing and commercial nodes across the city. Approximately 27 percent of employment in Windsor is related to automotive manufacturing and the machine, tool, die, and mold industry. Employment in manufacturing also dominates the different employment sectors in the area surrounding the City of Windsor. The presence of skilled labour in the Town of Tecumseh, the Town of LaSalle and the Town of Amherstburg keeps the area's industrial sector globally competitive, and supports a diverse employment base. In addition to these industrial pursuits, agriculture will remain one of the area's primary economic sectors.

Located within the City of Windsor and the Town of LaSalle is the Ojibway Prairie Provincial Prairie Reserve, which was regulated under the Provincial Parks Act in 1977 (OMNR 2002). Recently the Ojibway Prairie Park Management Plan was published, which sets out the park management directives for the next twenty years.

As outlined in the Official Plans for the City of Windsor and the Town of LaSalle, there are also numerous parks and Open Space Features that provide recreational opportunities for the public. Municipal parks of note include the Ojibway Park, located immediately adjacent to the Ojibway Prairie Park, and the Black Oak Heritage Park. These parks are associated with lands described as Environmentally Sensitive Areas (ESAs) or Areas of Natural or Scientific Interest (ANSIs).



EXHIBIT 1.4-A: CURRENT LAND USE (CANADIAN SIDE)



EXHIBIT 1.4-B: KEY AREA FEATURES (CANADIAN SIDE)



The City of Windsor and Town of LaSalle have undertaken biological inventories of the remnant forest and prairie habitat features to determine their local significance (ERCA/Windsor 1992; Silani & Waldron 1996). The areas under review were known as Candidate Natural Heritage Sites (CNHS). Thirty-eight (38) CNHS were inventoried in the City of Windsor; and 27 CNHS were inventoried in the Town of LaSalle.

The Detroit River has been designated a Canadian Heritage River. As such, the preservation and enhancement of its natural features, as well as its cultural and recreational values, is considered to be of both federal and provincial importance. The Detroit River is the first river to be designated a bi-national Heritage River. Canada and the U.S. have also initiated the establishment of the Detroit River International Wildlife Refuge. When fully established, the Refuge will include the marshes, coastal wetlands, islands, shoals, and riverfront lands from Mud Island on its north extent to the southern border of Sterling State Park in Monroe County, Michigan at its southern extent.

Underlying both the Canadian and U.S. sides of the Detroit River at a depth of approximately 350 meters (1200 feet) are extensive geological deposits of pure salt. These deposits were mined on the U.S. side from the 1890s to the 1980s. Mining of salt on the Canadian side also began in the 1890s and continues to the present day. In addition to the larger room and pillar mines, solution or brine wells were used to extract salt. These brine wells have left large cavities in the bedrock which can influence the location of bridge pier footings or tunnel locations. The brine well activity is generally limited to the Ojibway and River Canard areas on the Canadian side. Oil and gas wells are also found in the Detroit River area.

Additional information on key features in the Detroit River area is provided in the *Existing Conditions Report*.

## 1.2.2. Guiding Principles

Due to the nature and extent of development in the Detroit River area, it is recognized that there are no opportunities to develop a new or expanded crossing with connections to the provincial and interstate freeway system without impacting some level of environmental and community features. The following guiding principles were developed to assist in the identification of illustrative crossing, inspection plaza and road alignment alternatives, guiding principles were developed.

The overall guiding principles used to generate the illustrative alternatives were as follows:

- 1) **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;
- 2) **Seek areas or land uses that are compatible with transportation corridors and facilities, or areas in transition to compatible land uses** - Compatible areas are those that are considered to be less impacted by new crossing, inspection plaza and route alignments than other land uses (e.g. industrial areas may be considered to be less impacted by a new inspection plaza than residential areas); areas in transition allow the opportunity to incorporate new route alignments in the area planning;

- 3) **Minimize impacts to significant natural features** - such features are usually regionally unique, protected by legislation/designations and may preclude a transportation facility; and
- 4) **Minimize impacts to city centres** - such areas generally provide a focus for cultural, social and economic activities.

The guiding principles reflect the objectives of the Partnership to address transportation needs and take advantage of transportation opportunities, and to avoid generating unacceptable impacts as much as possible.

### 1.2.3. Plaza Locations

On the basis that inspection plazas have a relatively large property requirement and have specific siting requirements unique to their purpose, identifying possible sites for inspection plazas was the initial step in the development of illustrative alternatives. The location of the inspection plazas will influence the development of crossing alternatives as well as the development of the route alternatives.

In addition to the overall guiding principles for generating illustrative alternatives, specific siting considerations were developed for generating alternative plaza sites through discussions with the Canadian Border Service Agency and the U.S. Department of Homeland Security Customs Border Protection Branch.

The following key considerations for locating plazas were developed based on these discussions, together with Project Team experience on other border crossing projects:

- **Proximity to Border:** CBSA and CBP require that the plazas are to be located as close to the border as possible, to reduce security / monitoring requirements for border agencies. Where plazas cannot be directly connected to the bridge or tunnel, secure connections would be required to prevent goods and travellers from avoiding inspection. In Canada, a secure roadway of 1500m (0.9 mi) was considered the maximum reasonable distance, subject to consideration of land use and line of sight concerns. (In the U.S., connecting the plaza to the crossing is the only acceptable alternative.)
- **Site Area:** The potential site must provide adequate space to accommodate projected traffic demand, as well as turn-around drives and installation of equipment systems prior to and after inspection points, some storage of traffic queues on the plaza, and the ability to expand.

For the DRIC Study, inspection plaza areas of 30 to 40 ha (80 to 100 acres) were considered for new crossings, based on the preliminary assumption that international truck traffic will be distributed equally between the new crossing and the Ambassador Bridge; if a twinned Ambassador Bridge was to remain the only crossing serving international truck traffic and a new freeway connection made from Highway 401, the Ambassador Bridge would require a plaza of approximately 50 ha (120 acres) to accommodate traffic demand and border agency needs.

- **Adjacent Land Use:** The site should be located away from residential areas, schools and other community uses; sites should not be viewable from neighbouring lands; provide good visibility to surrounding areas and approaches; consider undeveloped or



lightly developed lands; avoid hazardous adjacent land uses such as chemical plants and fuel depots;

- **Environmental Issues:** consider presence of toxic and/or hazardous materials, wetlands and/or endangered species; cultural, social and economic impacts;
- **Existing Easements and Right-of-Ways:** consider gas lines, water and sewer lines, power and telecommunication lines, rail lines, and local and private roadways;
- **Emergency Services and Access:** site should be served by more than one roadway to allow for roadway interruption; consider response time for medical and fire emergency response; proximity to hospitals;
- **Site Topography:** consider sites with less than 2-3 % grades; avoid floodplains or elevations close to river or lake levels;
- **Water Availability:** consider water source and protection from sabotage or other threats of contamination.

On the basis of the guiding principles and the siting considerations identified by the Project Team, and in conjunction with the U.S. Project Team, thirteen (13) potential plaza locations were identified on the Canadian side of the river (refer to Exhibit 1.5).

In rural areas, where there are fewer land use features, plaza opportunity areas of substantial size were identified. These areas provide the maximum flexibility for accommodating a variety of configurations of plazas. In urban areas, plaza sites are generally sized closer to the required footprint of 30 to 40 ha (80 to 100 acres) in recognition of adjacent land use features.

EXHIBIT 1.5: POTENTIAL ILLUSTRATIVE INSPECTION PLAZA SITES



A conceptual plaza layout for the DRIC has been developed (see Exhibit 1.6). During later stages, more details as to the plaza footprint and layout will be developed in discussion with border agencies and local municipalities and presented to the public for comment.

Additional details of the illustrative inspection plazas are provided on the following pages.

## East Plaza Sites

### Plaza Site CE1

Size: 200 acres  $\pm$  / Distance to River: 1.6 km

The east half of the site consists primarily of “big box” retail development with sparse industrial land use on the east and south portions of the site.

Immediately east of the site is Tecumseh Mall. To the south is a mix of commercial, residential and industrial land uses. Roseville Public Elementary School is also located in the vicinity south of the site. To the east and north are dense residential areas with some parks and wood lots in the north.

The site is bounded by railway tracks to the north and to the west, Lauzon Parkway to the east and Tecumseh Road to the south.



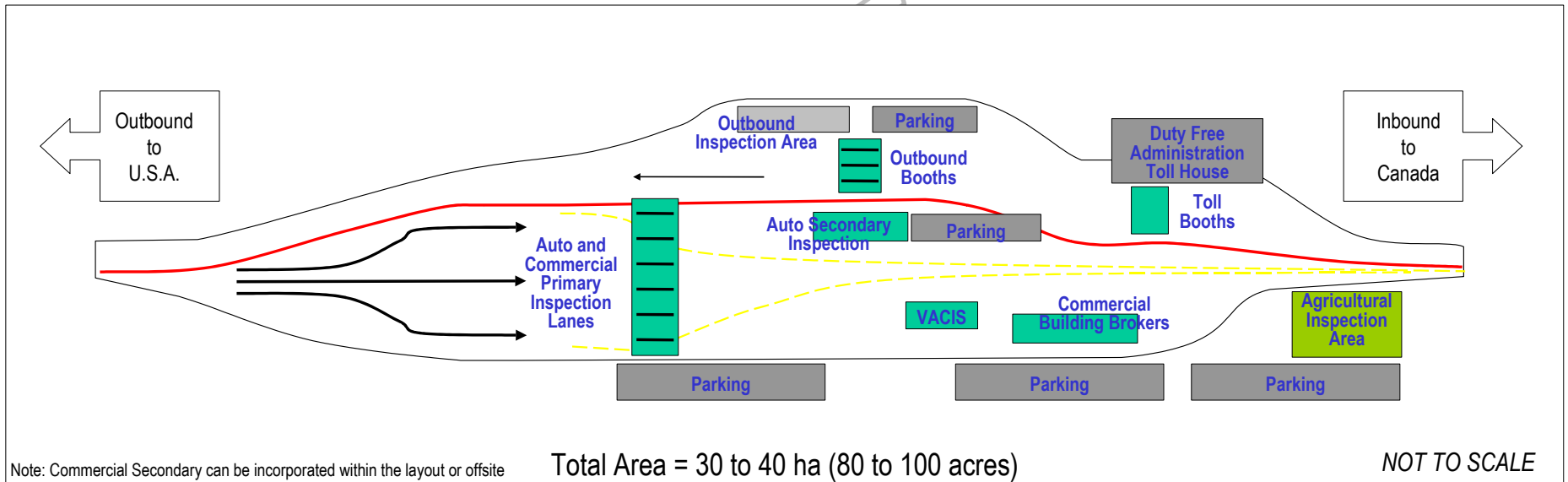
### Plaza Site CE2

Size: 520 acres  $\pm$  / Distance to River: 0.6 km

This site is generally bounded by Little River, Wyandotte Street East, Banwell Road and the Canadian National Railway. The site generally consists of new or planned residential development. The west half consists of a corridor of open and park space around Little River. On the northwest edge of the site are industrial land uses, including Little River Pollution Control Plant.



EXHIBIT 1.6: PLAZAS – CONCEPTUAL LAYOUT





## Central Plaza Sites

### Plaza Site CC1

Size: 80 acres  $\pm$  / Distance to River: 3.0 km

This site is generally bounded by Malden Road, Huron Church Road and E.C. Row Expressway. The site incorporates the existing CBSA Secondary Inspection complex used to inspect Canada-bound commercial shipments crossing the Ambassador Bridge.

The site is located in an industrial/commercial subdivision, known as the Ambassador Industrial Park. East of the site are commercial and residential land uses, as well as the South Cameron Woodlot. South of the site are woodlots, residences and the Spring Garden Forest.

The site is adjacent to residential and commercial uses, as well as Malden Park, which is a former landfill site.



### Plaza Site CC2

Size: 214 acres  $\pm$  / Distance to River: 1.5 km

This site is bounded by Ojibway Parkway, E.C. Row Expressway, Malden Road and Armanda Road/Broadway Avenue. The site consists of primarily open space, woodlots and single-family dwellings.

The site is adjacent to a number of designated natural areas as well as Brighton Beach Industrial Park and residential uses.

A utility corridor crosses through the southwest corner of the site.



**Plaza Site CC3**

Size: 80 acres ± / Distance to River: 0.5 km

This site is situated in the Brighton Beach Industrial Subdivision. The site is generally bounded by the Detroit River, Chappus Road, Ojibway Parkway and Broadway Street. This is also the site identified as the site of the proposed Traffic Management Centre in Windsor's Gateway Study<sup>3</sup>.

The site is adjacent to an automotive manufacturing plant, power generation and distribution facilities, Lou Romano Water Reclamation Plant. South of the site are the Ojibway Park and Nature Centre, the Black Oak Prairie Heritage Park and an Environmental Policy Area. West of the site is the Ontario Power Generation Brighton Beach Power Station.

The Essex Terminal Railway runs along the east side of the site and a hydro corridor runs to the north of the site.

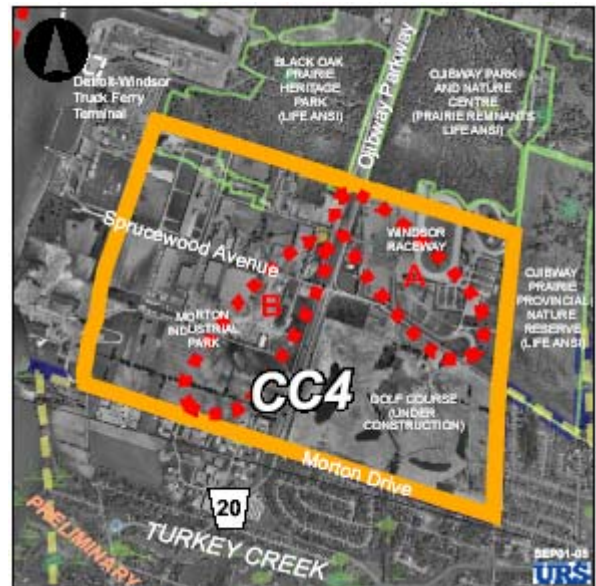


**Plaza Site CC4**

Size: 760 acres ± / Distance to River: 0.5 km

This site is generally bounded by the Detroit River, Ojibway and Black Oak designated natural areas, Matchette Road and Morton Drive.

The site is bisected by the Essex Terminal Railway and Ojibway Parkway. On the east side of Ojibway Parkway within the site are the Windsor Raceway and a golf course. On the west side of Ojibway Parkway is Morton Industrial Park.



<sup>3</sup> Windsor Gateway Report, dated January 2005, Prepared by Sam Schwartz Engineering PLLC

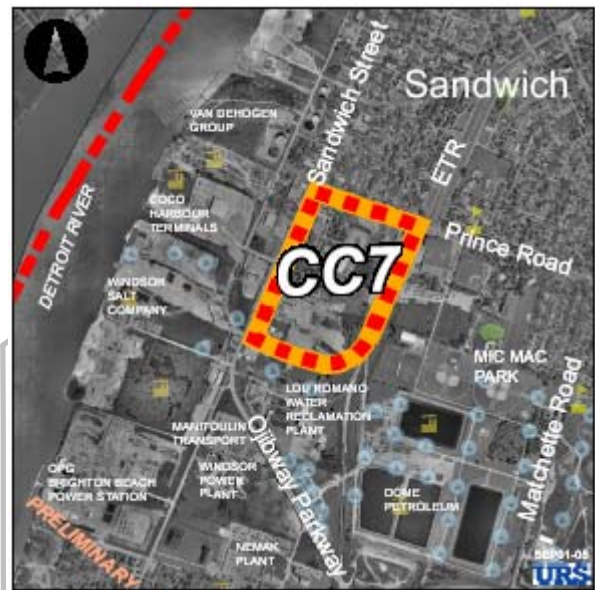


**Plaza Site CC7**

Size: 80 acres ± / Distance to River: 0.6 km

This site is generally bounded by the Detroit River, Prince Road, Essex Terminal Railway and the City of Windsor Lou Romano Water Reclamation Plant. The site is on the south end of Sandwich Towne. It is currently occupied by residential, commercial and industrial uses, including an emergency services training facility.

The site is adjacent to a dense residential area. Mic Mac Park is located east of the Essex Terminal Railway, which borders the east limit of the site.



**Plaza Site CT1**

Size: 120 acres ± / Distance to River: 0.8 km

This site is adjacent to the Ambassador Bridge. The new plaza would incorporate and expand the existing plaza site from the current 20 acres to 120 acres. The plaza site is generally bounded by Mill Street, Sandwich Street, the University of Windsor and the Essex Terminal Railway. The site is located within the neighbourhood of Sandwich, and includes residential, commercial and institutional (schools and university) uses.



The site is bisected by Huron Church Road. The east side of the site consists of the existing Ambassador Bridge Plaza. The site on the west side of Huron Church Road consists of parkland as well as a built-up residential area.

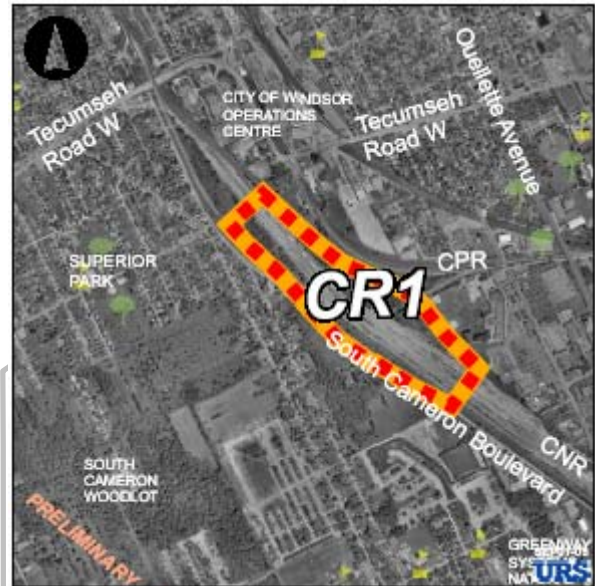
The residential area continues north of the site on the west side of Huron Church Road. North of the site and east of Huron Church Road is a cemetery and the University of Windsor. Residential areas are also located immediately to the east and south of the site, with the University of Windsor athletic facility located southeast of the site and Forster Public Secondary School located west of the site.

**Plaza Site CR1**

Size: 80 acres ± / Distance to River: 0.8 km

This site is located on the rail lands between Tecumseh Road and South Cameron Boulevard in an area referred to as the Van de Water rail yard. Active rail lines run through the site. The site includes the lands designated by the Detroit River Tunnel Partnership for use as a future customs facility. The site also includes a wood lot identified as a Candidate Natural Heritage Site.

Land uses adjacent to the site include residential and industrial areas.



**South Plaza Sites**

**Plaza Site CS1**

Size: 573 acres ± / Distance to River: N/A

The site is situated on Fighting Island in the Detroit River. The island is owned by BASF Corporation. Fighting Island is approximately 1600 acres in size and is predominantly open space. The land was used as a storage area for alkaline material generated by BASF corporation in Wyandotte, Michigan. The north portion of the island includes a training facility with meeting rooms and accommodations, as well as restored wetland habitat. BASF

has undertaken to re-naturalize the central and southern portions of the island with plantings and other improvements. Presently, there is no fixed link to the island in either Canada or the U.S.



**Plaza Site CS2**

Size: 1451 acres  $\pm$  / Distance to River: 0.5 km

This site is generally bounded by County Road 20 (Front Street), Martin Lane, Malden Road and River Canard. The Essex Terminal Railway bisects the site. The site is primarily agricultural land. There are also tributary streams running through the site.



**Plaza Site CS3**

Size: 430 acres  $\pm$  / Distance to River: 2.0 km

This site is located in the Town of Amherstburg and is generally bounded by Concession Road 2 (Thomas Road), North Side Road, Concession Road 3 (Fox Road) and Middle Side Road. The site mainly consists of agricultural lands and some residences.

The Essex Terminal Railway runs along the west limit of the site. Other land uses include industrial areas to the north, a school to the south and Point West Golf Club to the southwest.





**Plaza Site CS4**

Size: 254 acres  $\pm$  / Distance to River: 0.5 km

This site is located within the urban boundary of LaSalle and is generally bounded by Front Street, Laurier Drive, Essex Terminal Railway and Victory Street. The site includes areas of residential development and woodlots, as well as commercial land uses. There are tributaries and drains which run through the site and an ESA at the northwest limits.

The site is adjacent to residential neighbourhoods and woodlots. East of the ETR, which bounds the east limit of the site, is the Essex County Golf and Country Club. West of the site along the riverfront are marinas and designated wetlands.



## 1.2.4. Crossings

Once the plaza locations were identified on the Canadian and U.S. side of the Detroit River, the Project Team identified possible international crossings (bridge and tunnel options were considered) connecting the plaza sites. New crossings will provide six lanes over/under the Detroit River.

A cross-section along the Detroit River from Grosse Isle to the north tip of Belle Isle identifying subsurface conditions along the river is shown in Exhibit 1.7

The Detroit River is an important waterway for marine traffic on the Great Lakes. As such, bridges are required to span the river at a clearance of at least 46 m (150 ft) at the shipping channel defined by the U.S. and Canadian Coast Guard; other minimum clearances are specified elsewhere on the river. The height and potential spans on the Detroit River suggest that any bridge on the Detroit River north of Fighting Island will need to be either a suspension bridge or a cable-stayed bridge, as illustrated in Exhibit 1.8-A. Additional consultation with U.S. and Canadian government agencies and Coast Guard are required to address issues pertaining to constructing new piers in Detroit River for a new crossing in the area of the river south of Fighting Island.

The Project Team has also undertaken a review of available geotechnical information to assess the feasibility of constructing a tunnel below the Detroit River (refer to sketches in Exhibit 1.8-B).

The preliminary findings of the suitability of bridge and tunnel crossings are presented in Table 1.1. These findings suggest that:

- Rock tunneling is difficult and potentially not feasible due to the depth to bedrock in the upper portions of the river (refer to Exhibit 1.8-B), and the poor rock conditions in

the lower portions of the river.

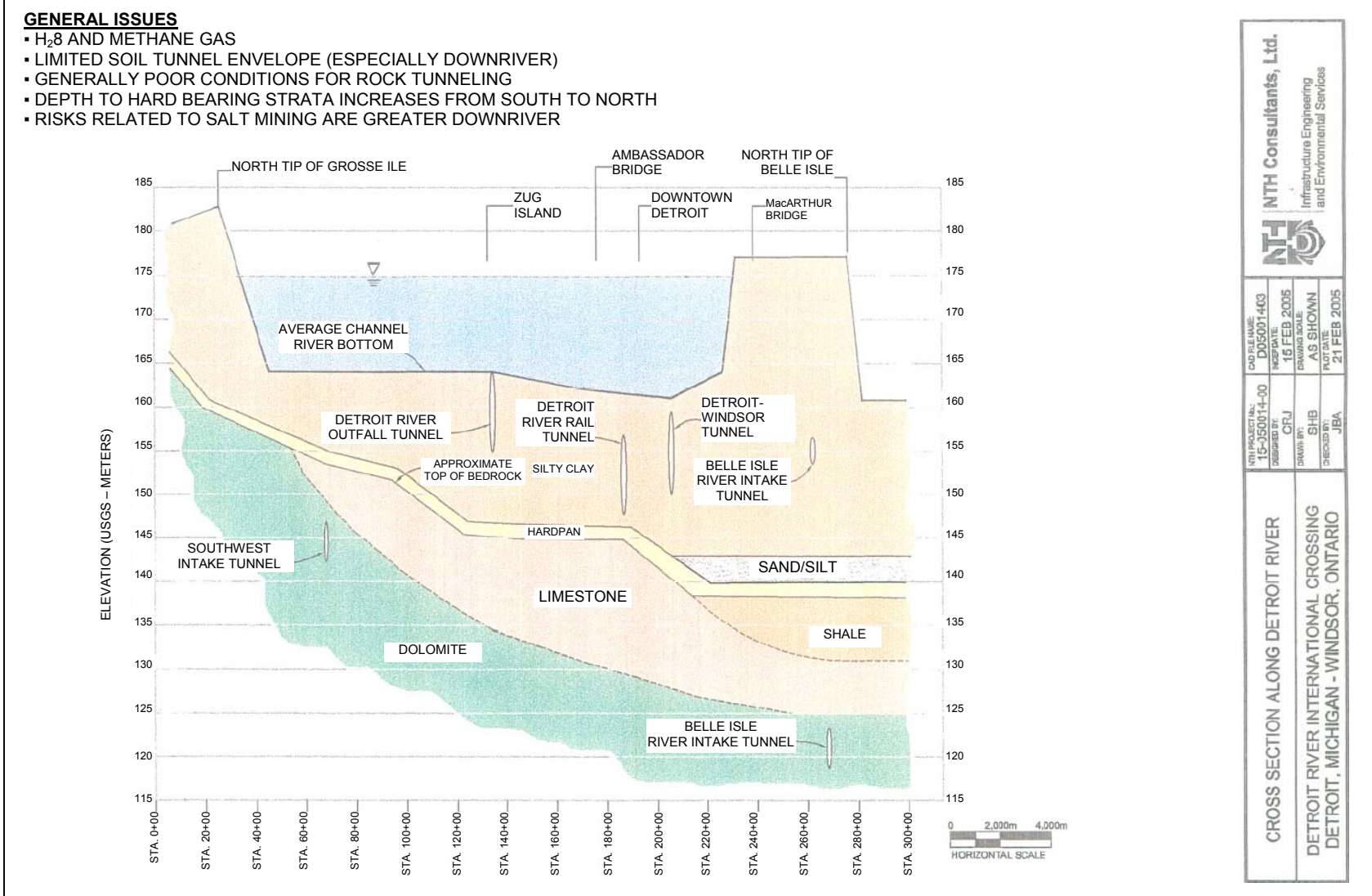
- Earth (bored) tunneling may be feasible for crossings upriver of the Zug Island area, where depths of soft earth are suitable.
- Submerged tunnels in the Detroit River are not preferred due to the disruption to river sediment and impacts to shoreline natural areas such alternatives would have on the river. Initial discussions with Ontario Ministry of Natural Resources and Michigan Department of Environmental Quality were held to discuss the possibility of using sunken tunnels for the DRIC Project. These agencies raised serious concerns as to the acceptability of this method of tunnel construction for the DRIC Project, in light of there being other less disruptive options.

Subsequent assessment of soft ground tunnelling upriver of Zug Island identified issues with respect to uplift and available soft earth cover over a new tunnel in this area of the river. Both Canadian and U.S. Project Teams concluded that for the purposes of the DRIC Study, roadway tunnels under the Detroit River are practically infeasible upriver of Zug Island.

In addition, poor rock conditions downriver of the Zug Island area and inadequate soft earth cover led both the Canadian and U.S. Project Teams to conclude that for the purposes of the DRIC Study, roadway tunnels are practically infeasible for all crossing locations.

The Illustrative river crossing locations are identified on Exhibit 1.9.

**EXHIBIT 1.7: CROSS SECTION ALONG THE DETROIT RIVER FROM GROSSE ILE TO NORTH TIP OF BELLE ILE**

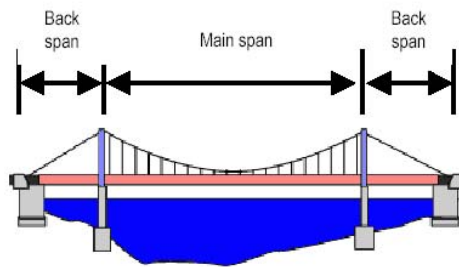




**EXHIBIT 1.8-A: DETROIT RIVER BRIDGE OPTIONS NORTH OF FIGHTING ISLAND AREA**

**Suspension Bridge**

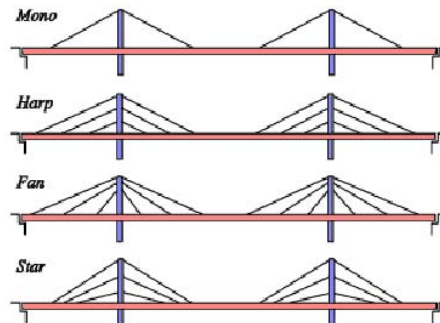
Suitable for spans over 500m.



Typical Elevation (left) and Ambassador Bridge, Windsor/Detroit (right)

**Cable Stayed Bridge**

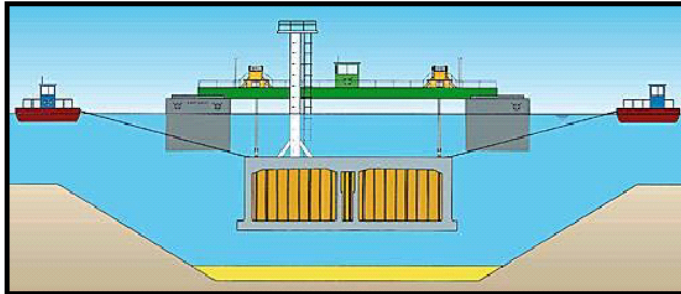
Suitable for spans up to 900m.



Typical Elevations (left) and Pont de Normandie, France (right)

**EXHIBIT 1.8-B: DETROIT RIVER TUNNEL OPTIONS CONSIDERED**

**Tunnel Boring Machine (Rock or Soft Ground Tunneling)**



**Submerged Tunnel**



**Double-Tunnel**

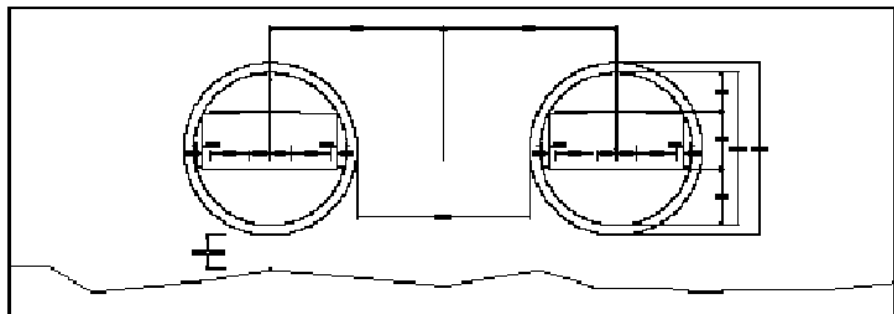


Image courtesy of Parsons Transportation/The Corradino Group

**Triple-Tunnel**

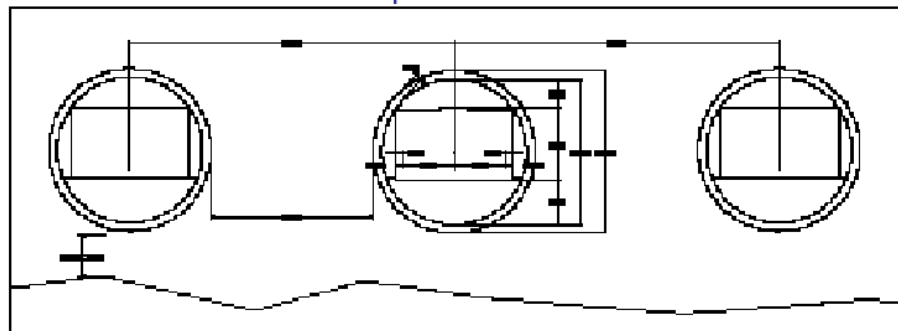
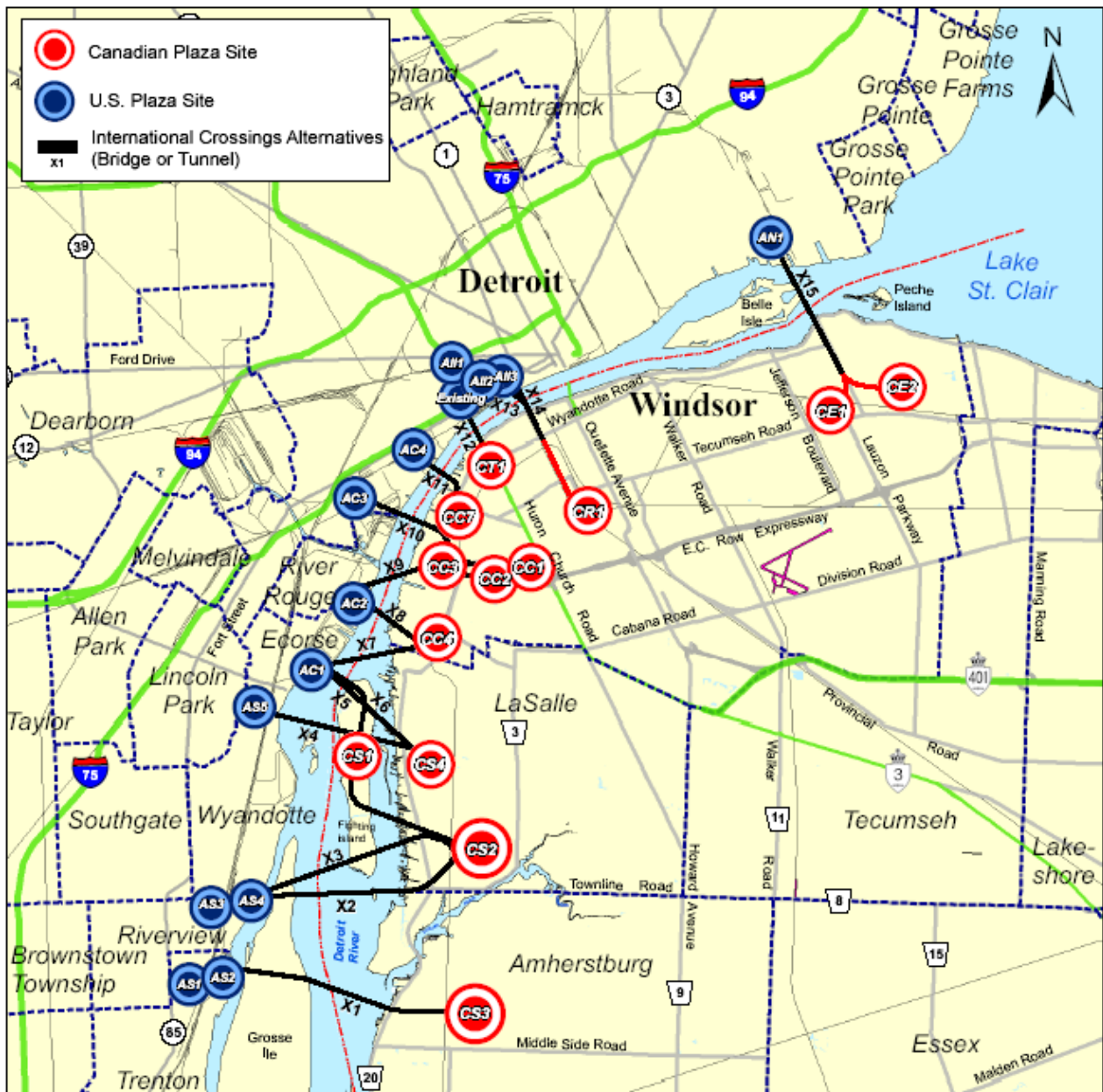


Image courtesy of Parsons Transportation/The Corradino Group

**TABLE 1.1 GEOTECHNICAL SUMMARY OF CROSSING OPTIONS AND CONCERNS**

Location	Area of Fighting Island	Area of Zug Island	Area of Ambassador Bridge	Area of Belle Isle
<b>Bridge</b>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Foundations on bedrock, 15 to 20m below ground surface</li> <li>• Potential artesian groundwater</li> <li>• Methane and hydrogensulphide</li> <li>• Approach embankments on compressible soils</li> </ul> <p>✓ Carried forward for continued study</p>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Foundations on bedrock, 25 to 30m below ground surface</li> <li>• Methane and hydrogensulphide</li> <li>• Potential artesian groundwater</li> <li>• Dry salt mining</li> </ul> <p>✓ Carried forward for continued study</p>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Foundations on bedrock, 35 to 40m below ground surface</li> <li>• Methane and hydrogensulphide</li> <li>• Potential artesian groundwater</li> <li>• Approach embankments on compressible soils</li> </ul> <p>✓ Carried forward for continued study</p>	<ul style="list-style-type: none"> <li>• Foundations on bedrock, 40 to 50m below ground surface</li> <li>• Methane and hydrogen sulphide</li> <li>• Potential artesian groundwater</li> <li>• Approach embankments on compressible soils</li> </ul> <p>✓ Carried forward for continued study</p>
<b>Immersed Tube</b>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Excavations in bedrock required</li> <li>• Potential artesian groundwater</li> <li>• Sediment disturbance and disposal creates numerous environmental concerns</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Excavations may penetrate near the bedrock interface</li> <li>• Potential artesian groundwater</li> <li>• Sediment disturbance and disposal</li> <li>• Dry salt mining</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Excavations may penetrate near the bedrock interface</li> <li>• Potential artesian groundwater</li> <li>• Sediment disturbance and disposal creates numerous environmental concerns</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Tunnel potentially seated on soft clay</li> <li>• Sediment disturbance and disposal creates numerous environmental concerns</li> </ul> <p>✗ Not practically feasible</p>
<b>Soft Ground Tunnel</b>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Insufficient soft earth cover in river bed therefore not feasible for 13m diameter tunnel</li> <li>• Groundwater control</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Insufficient soft earth cover in river bed therefore not feasible for 13m diameter tunnel</li> <li>• Groundwater control</li> <li>• Dry salt mining</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Insufficient soft earth cover therefore not feasible for 13m diameter tunnel</li> <li>• Groundwater control</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Groundwater control</li> <li>• Limited soft earth cover</li> <li>• Approach construction in soft soil</li> </ul> <p>✗ Not practically feasible</p>
<b>Rock Tunnel</b>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Potential artesian groundwater</li> <li>• Approach construction, excavations of 15 to 20m</li> <li>• Use of double-shield rock TBM</li> <li>• Poor quality of rock</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Solution Mining</li> <li>• Groundwater control</li> <li>• Gas control</li> <li>• Approach construction, excavations of 25 to 30m</li> <li>• Dry salt mining areas</li> <li>• Use of double-shield rock TBM</li> <li>• Poor quality of rock</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Approach construction, excavations of 30 to 35m</li> <li>• Groundwater control</li> <li>• Gas control</li> <li>• Use of double-shield rock TBM</li> <li>• Uplift and lack of adequate cover</li> </ul> <p>✗ Not practically feasible</p>	<ul style="list-style-type: none"> <li>• Groundwater control</li> <li>• Gas control</li> <li>• Approach construction excavations of 40 to 50m, beyond practical limit</li> <li>• Use of double-shield rock TBM</li> <li>• Uplift and adequate cover</li> </ul> <p>✗ Not practically feasible</p>

EXHIBIT 1.9: ILLUSTRATIVE CROSSING ALTERNATIVES



### 1.2.5. Route Alignments

Illustrative route alignments connecting Highway 401 in the Windsor/Essex County area to the possible plaza locations were developed based on the guiding principles identified in Section 1.2.2. As identified in the OEA Terms of Reference<sup>4</sup> (TOR), the objectives for generating alternative route alignments were to:

- Develop alternatives that are efficient/direct;
- Meet objectives and design requirements of Partnership agencies;
- Reflect the needs of border agencies; and
- Minimize/avoid impacts to significant features to the extent possible.

The significant features considered during the development of route alternatives included the following:

COMPONENT	FEATURE
Natural Environment	<ul style="list-style-type: none"> <li>• Groundwater Quality and Quantity</li> <li>• Surface Water Quality and Quantity</li> <li>• Agricultural Lands</li> <li>• Wetlands</li> <li>• Areas of Natural and Scientific Interest (ANSI's)</li> <li>• Environmentally Sensitive Areas (ESA's)</li> <li>• Woodlands</li> <li>• Wildlife Preserves</li> <li>• Species at Risk / Endangered Species</li> </ul>
Cultural Environment	<ul style="list-style-type: none"> <li>• Historical, Archaeological and Cultural Sites</li> <li>• National, State &amp; Provincial Parks, and Conservation/Recreational Areas</li> </ul>
Social Environment	<ul style="list-style-type: none"> <li>• Landfills and Hazardous Waste Sites</li> <li>• Areas of Residential Development</li> <li>• Areas of Commercial / Institutional Development</li> </ul>

The route alignments were developed as multi-lane freeways with the following design characteristics:

- Design speed of 120 km/h (75 mph);
- Initially 4 lane urban freeway, but will protect sufficient property for ultimate 6 lanes;
- 80 m to 110 m Right-of-Way;
- 3% maximum mainline grade;
- 650 m (2130 ft) minimum horizontal curve radius in urban areas; and
- 1700 m (5580 ft) minimum horizontal curve radius in rural areas.

<sup>4</sup> The OEA Terms of Reference, May 2004 for the Detroit River International Crossing Study was approved by the Ontario Minister of the Environment in September 2004



Typical cross-sections are provided on the following pages.

Route optimization software was also used to aid in the generation of Illustrative Route Alternatives. Quantum Route Optimization software was utilized in the development of illustrative alternatives to verify the range of alternatives identified by the Project Team. Quantum incorporates environmental features and cost data to systematically generate candidate route alternatives that optimize the costs of the alternatives. The information generated by Quantum was incorporated in the set of illustrative alternatives developed by the Project Team.

The illustrative route alignments connecting Highway 401 to the proposed plaza locations are identified schematically on Exhibit 1.10.

## South Alternatives

Considering the plaza locations along the Detroit River and the location of Highway 401, the Project Team developed alignments for connecting routes that would reduce impacts to land uses and avoid where possible impacts to key community features (refer to Exhibit 1.11-A). The land use in the southern area is primarily agricultural; therefore, alignments were developed which generally followed the property and field fabric in LaSalle, Amherstburg and Tecumseh. This resulted in alignments that were generally aligned east-west and north-south, rather than diagonally, to reduce impacts to agricultural operations and minimize landlocked severances.

The east-west route segments connecting to Plaza CS3 were developed to avoid the active Allied Chemical Quarry between Concession Road 6 and Howard Avenue in Amherstburg. The north-south segments followed the rear lot lines paralleling Walker Road and Howard Avenue to avoid the existing development (agricultural buildings, residences and other retail/industrial uses) that is generally located along the frontages of these principle roads. The segment paralleling Howard Avenue connects into Highway 401 at the Highway 3 exchange. The segment that parallels Walker Road avoids the settlement area of Oldcastle in the Town of Tecumseh and connects into Highway 401 in the area of Concession Road 10, where Highway 401 is on tangent.

The east-west route segments connecting to Plazas CS1 and CS2 were developed to avoid the clusters of residential development and improved lands (e.g. golf courses, race tracks) found south of the future urban area boundary in LaSalle. One east-west route segment (CF-CG) follows along this boundary north of the plaza, while another (SE-SM) is approximately one-half concession north of the LaSalle/Amherstburg municipal boundary. This latter segment swings north to avoid a crossing of the Canard River and the residential area along the north bank of the river near Malden Road. A third route segment (SH-SM) is located approximately one-half concession south of the LaSalle/Amherstburg municipal boundary. This alternative crosses the Canard River immediately east of the settlement area along the south bank of the river. The connection to Plaza CS1 is aligned south of Martin Lane, parallel with the property fabric, which is generally perpendicular to the Detroit River. As with the other southern alternatives, the east-west segments were connected to two north-south segments, connecting to Highway 401 at either Highway 3 or near Concession Road 10.

The east-west segments connecting to Plaza CS4 in LaSalle include an alignment that follows the town's future urban area boundary, then swings south to avoid the Essex Golf

and Country Club, which was identified as a significant community feature. The other route segment is located south of Bouffard Road within the town's future urban area to determine whether there would be any advantage to having a new east-west freeway facility to serve this growing community, and whether the plans for the urban area of LaSalle could accommodate a new east-west transportation corridor. These east-west segments were also connected to the two north-south segments connecting to Highway 401 at either Highway 3 or at the end of the long tangent section near Concession Road 10.

## Central Alternatives

Most of the central alternatives were located in the highly developed urban areas of Windsor and LaSalle (refer to Exhibit 1.11-B). To reduce impacts to existing communities and neighbourhoods, existing transportation corridors were considered for a new freeway connecting the central plaza sites (CC1, CC2, CC3, CC4, CC7, CT1 and CR1) to Highway 401. The Huron Church/Talbot Road/Highway 3 corridor was one alternative, as was the former CASO rail corridor (now the DRTP Rail Corridor). The E.C. Row Expressway corridor, with connections at Huron Church Road, the DRTP rail corridor, or a Lauzon Parkway Extension, was also considered as a corridor for conveying international traffic between Highway 401 and the Detroit River.

A new highway corridor was considered in the Talbot Road area to bypass the existing residential uses that currently have direct access to Talbot Road. This segment (CC-CE-CI) passes within the designated urban area boundary of LaSalle, through an active development area, and along the Huron Church Line corridor to the Huron Church Road/Todd Lane area.

Other new highway corridors were developed in the area of Ojibway Prairie. One such segment parallels Todd Lane west of Huron Church Road along the Windsor/LaSalle municipal boundary, westerly to Ojibway Parkway. This alignment is derived from the recommended alignment for a truck bypass route connected to a traffic management centre in the Brighton Beach area identified in the *Windsor Gateway Study*<sup>5</sup>.

Another segment parallels Todd Lane west of Huron Church Road along the Windsor/LaSalle municipal boundary to Malden Road, then follows the Malden Road corridor to the E.C. Row Corridor. This segment avoids severance impacts to the Ojibway Prairie Provincial Nature Reserve and the development along Huron Church Road north of Todd Lane/Cabana Road.

Alternative routes to using the Huron Church Road corridor to access the Ambassador Bridge were also developed. These included a new corridor from the western terminal of the E.C. Row Expressway along the Essex Terminal Railway (ETR) corridor to the Ambassador Bridge plaza (segment CP-CQ-CT). This segment is a part of what has been referred to locally as the Ambassador Ring Road concept. Another corridor was developed with a similar concept for using the ETR corridor to access the Ambassador Bridge from the DRTP Rail Corridor (segment CS-CT).

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<sup>5</sup> Windsor Gateway Report, dated January 2005, Prepared by Sam Schwartz Engineering PLLC

## East Alternatives

To connect plazas CE1 and CE2 to Highway 401, route segments were developed along the Lauzon Parkway/Concession Road 10 corridor and the Banwell Road/Manning Road corridor (refer to Exhibit 1.11-C). North of the E.C. Row Expressway, existing transportation corridors were considered for a new freeway to reduce impacts to existing communities and neighbourhoods. South of E.C. Row, the land uses are primarily agricultural. Two segments were considered in the Concession Road 10 corridor: one segment along Concession 10, and another between Concession 9 and 10 to reduce impacts to agricultural operations, residences and other development that is presently along the frontage of Concession Road 10.

Connections between the Concession Road 10/Lauzon Parkway corridor and the Banwell Road corridor were provided via route segments ED-EE and EG-EF (i.e. E.C. Row Expressway).

### 1.2.6. Conclusions

The illustrative crossing, plaza and connecting route alternatives were carried forward for analysis and evaluation to determine the practical alternatives to be carried forward for additional analysis.



EXHIBIT 1.10: ILLUSTRATIVE CROSSING, PLAZA AND CONNECTING ROUTE ALTERNATIVES

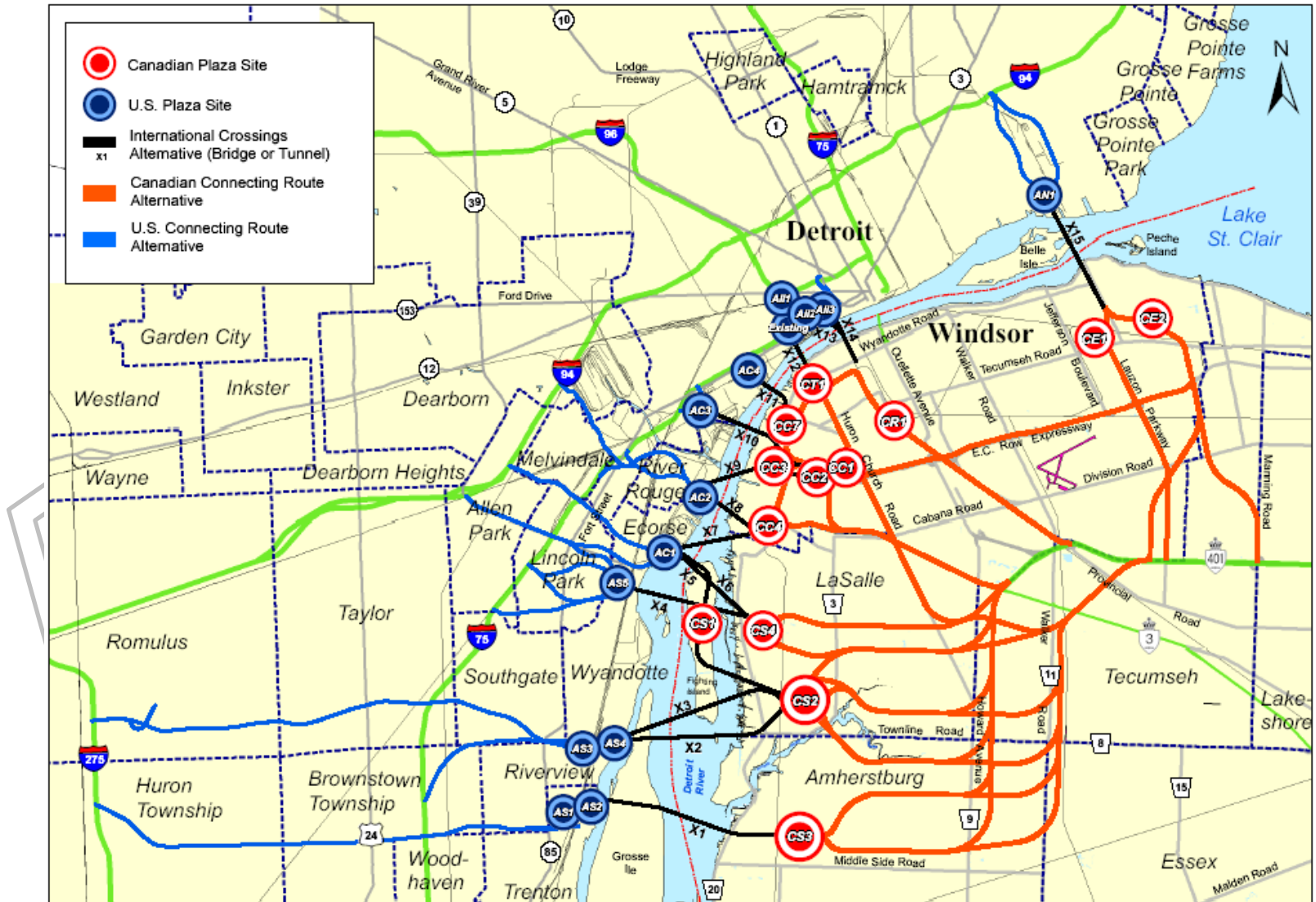


EXHIBIT 1.11-A: ILLUSTRATIVE ALTERNATIVES – SOUTH CORRIDOR – CROSSINGS X1, X2, X3, X4, X5 AND X6

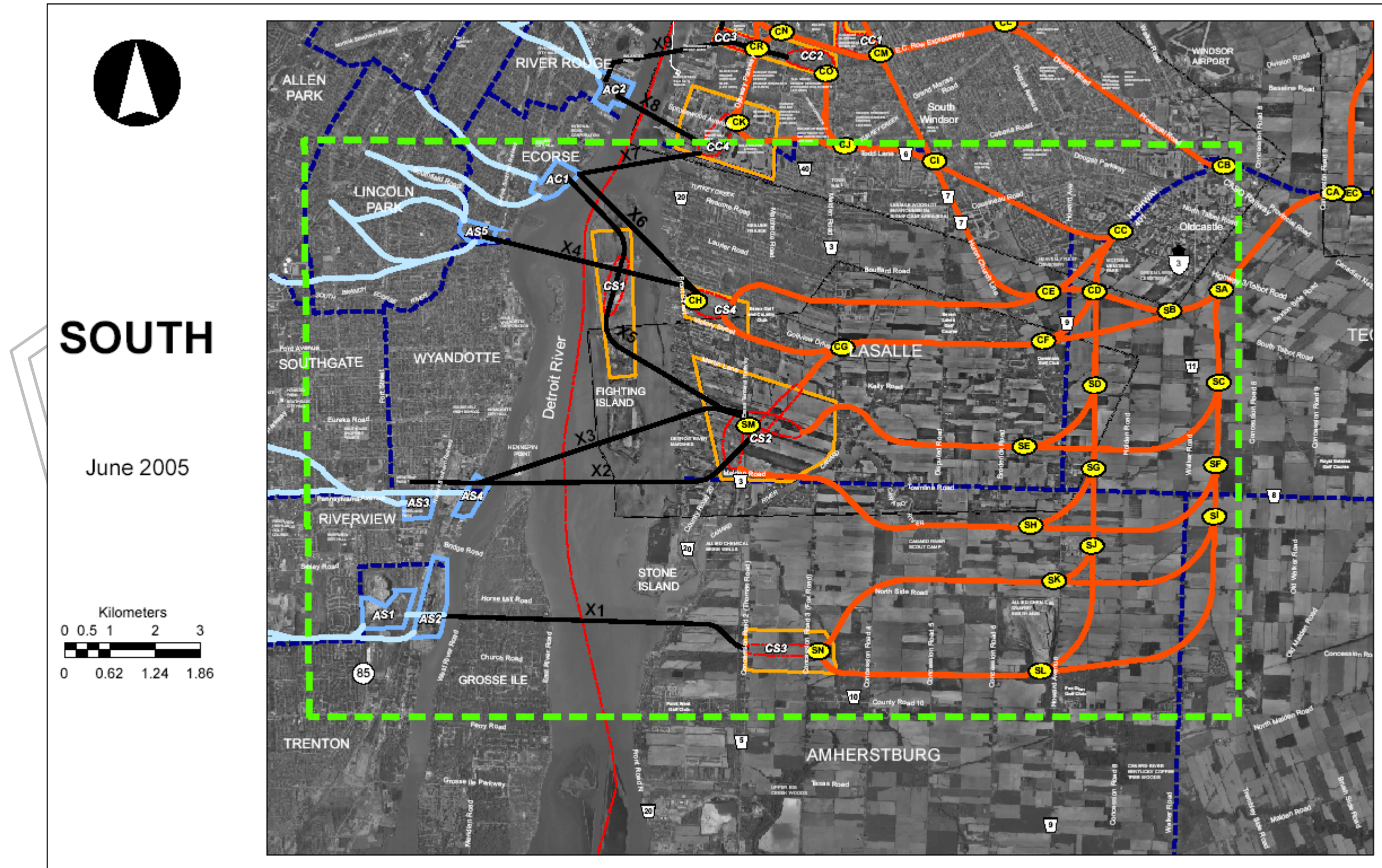




EXHIBIT 1.11-B: ILLUSTRATIVE ALTERNATIVES – CENTRAL CORRIDOR – CROSSINGS X7, X8, X9, X10, X11, X12, X13 AND X14

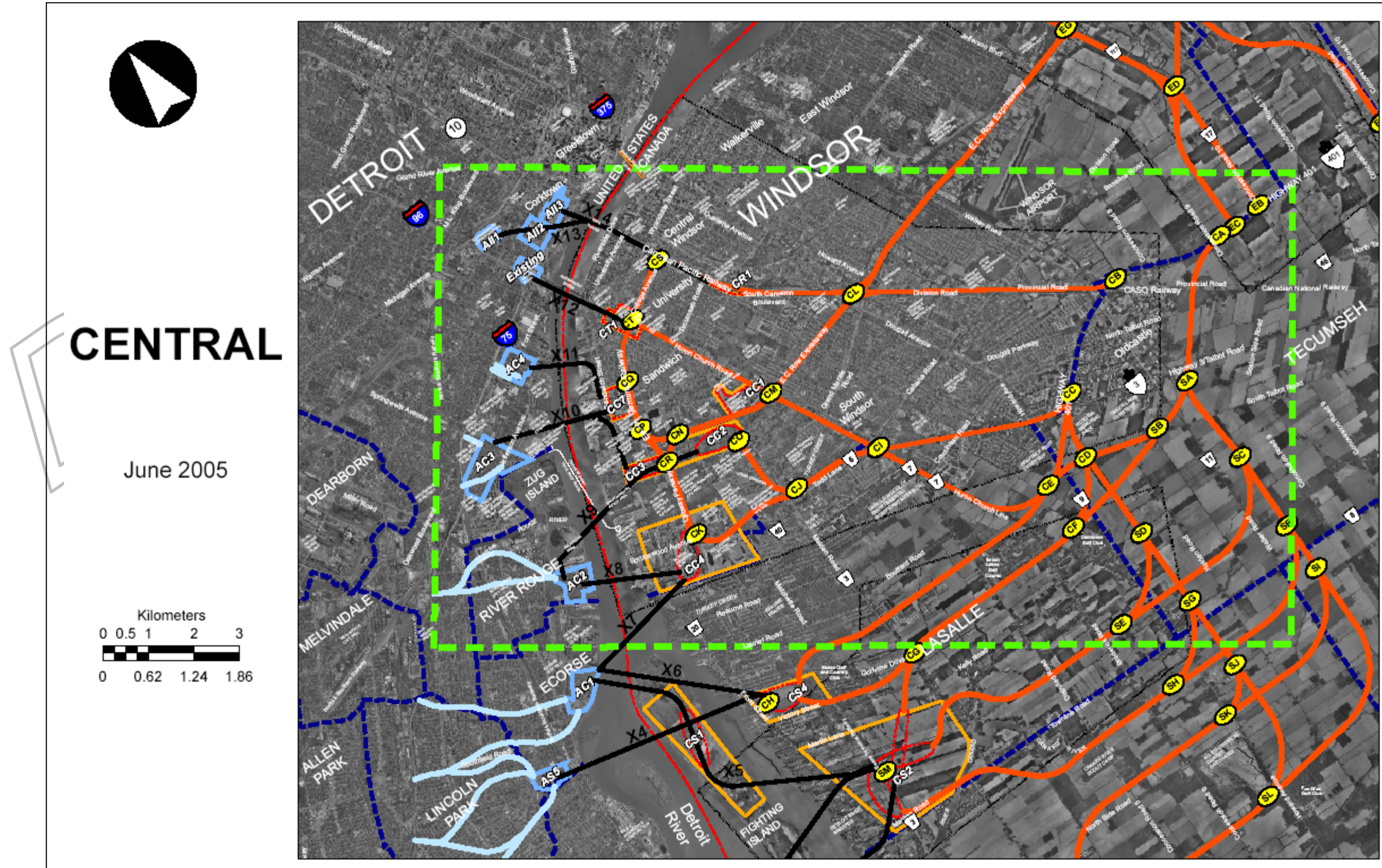
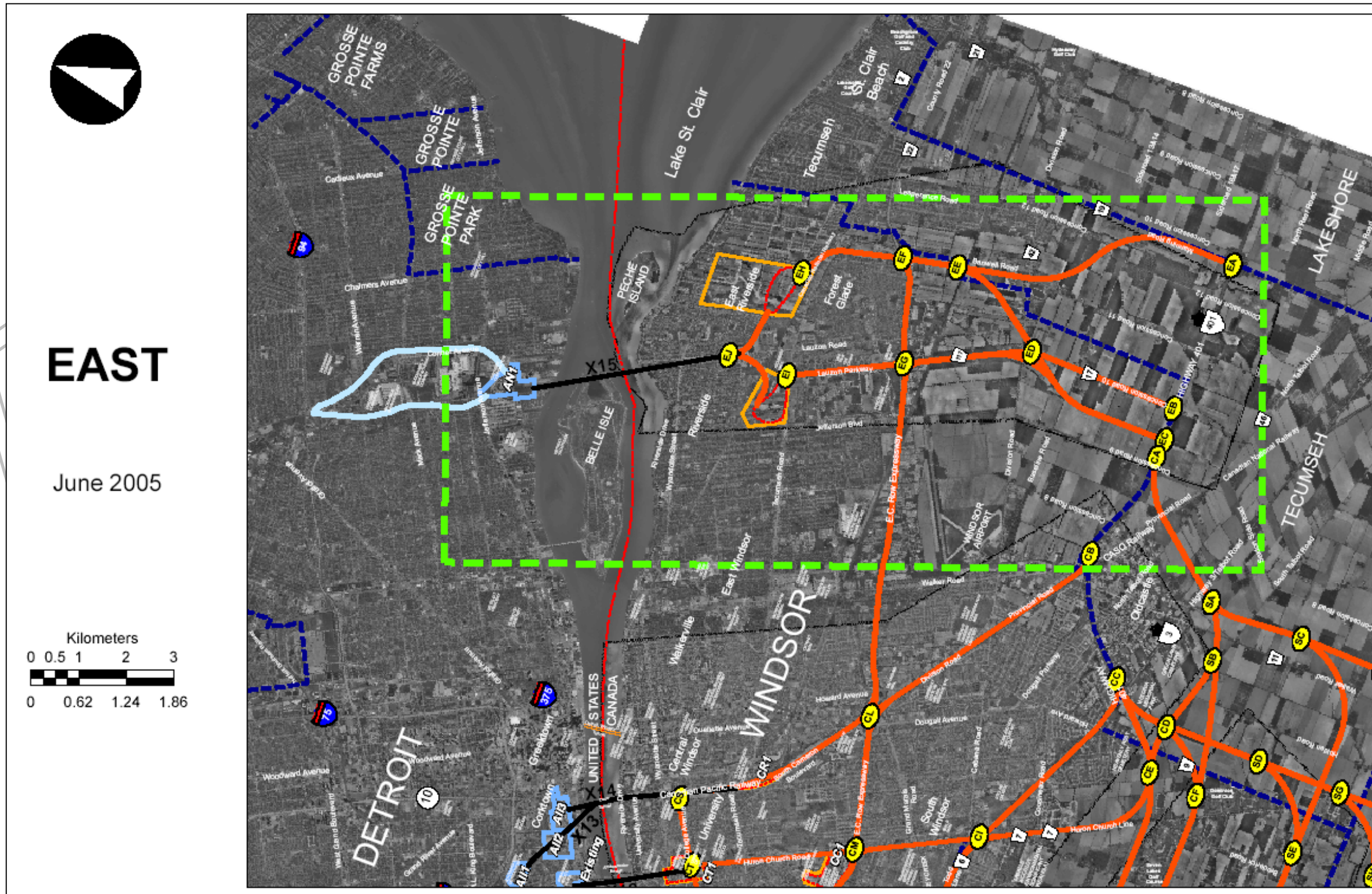




EXHIBIT 1.11-C: ILLUSTRATIVE ALTERNATIVES – EAST CORRIDOR – CROSSING X15



## 2. Illustrative Alternatives Evaluation Process – Canadian Side

### 2.1. Introduction

Given the nature and extent of land uses and development along the Detroit River in both Canada and the U.S., it will not be possible to develop a new or expanded river crossing, plaza and connecting roads that entirely avoids impacts on local communities and the environment. One of the Partnership's goals is to avoid, minimize, or mitigate impacts to the extent practicable. In deciding which alternatives should be carried forward for further analysis, value judgments were made by the Project Team, regarding the relative importance of the various impacts and factors. This chapter explains the evaluation approach implemented on the Canadian side for identifying practical crossing, inspection plaza and connecting route alternatives.

The evaluation of crossing/plaza/connecting route systems on the Canadian side was compiled with the evaluation work conducted on the U.S. side for an end-to-end evaluation of illustrative alternatives. Based on additional study, consultation, further refinement of the practical alternatives, and a further evaluation process, a 'technically and environmentally preferred' alternative will be selected.

As noted in the previous chapter, the Canadian Project Team identified 15 crossing locations, 13 Canadian inspection plaza sites and over 15 route alignments connecting the inspection plazas to Highway 401. These alternatives are shown in Exhibit 2.1.

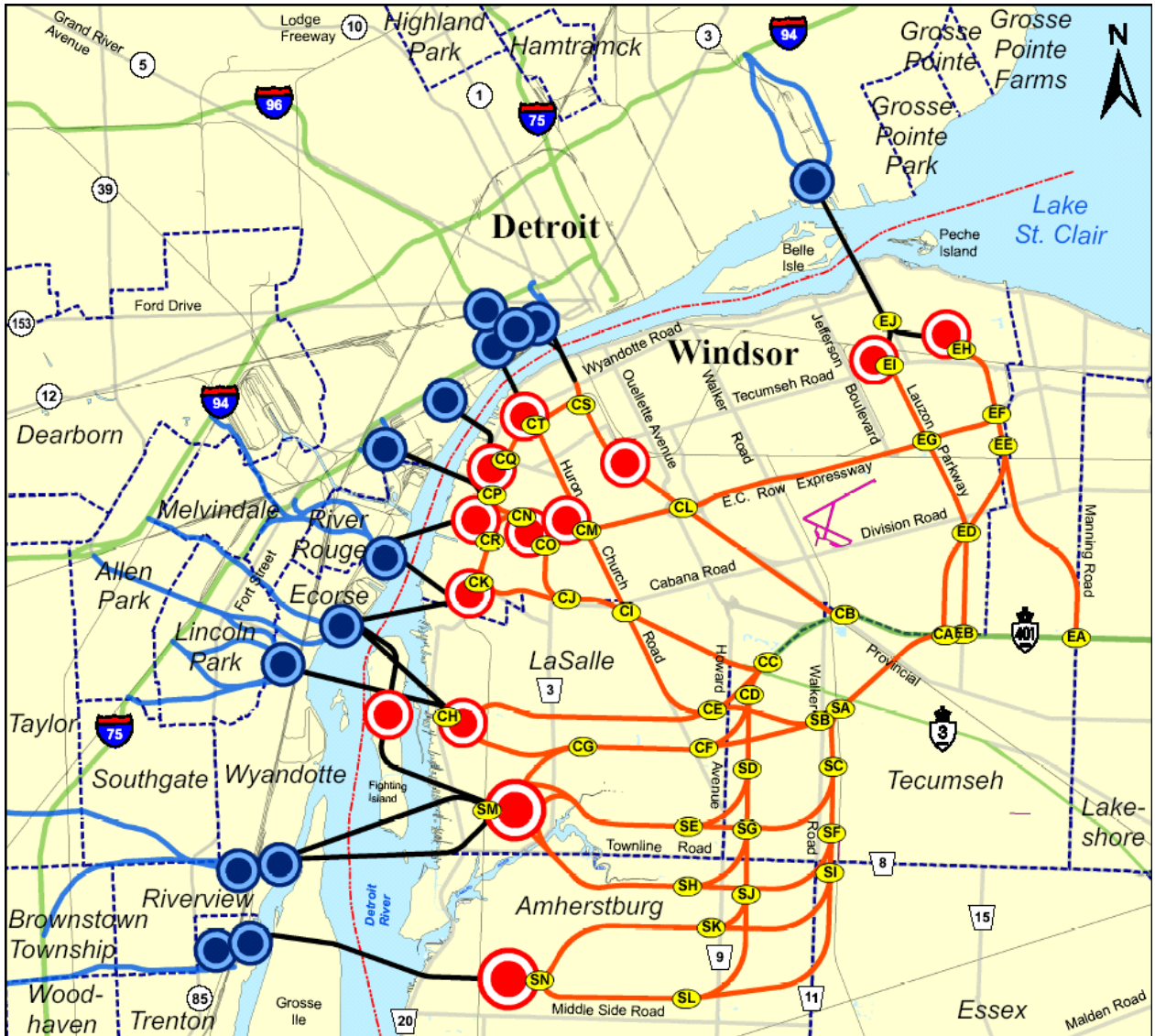
The evaluation of alternatives is an integral component of an environmental study. A sound evaluation process must be:

- 1) Comprehensive;
- 2) Understandable;
- 3) Replicable;
- 4) Traceable; and
- 5) Participatory.

The approved OEA TOR for the DRIC Study identified two evaluation methods to be employed in the evaluation process: reasoned argument method and arithmetic method.



**EXHIBIT 2.1: ILLUSTRATIVE CROSSING, PLAZA AND CONNECTING ROUTE ALTERNATIVES  
– CANADIAN SIDE**





## Reasoned Argument Method

The reasoned argument method is the primary evaluation method employed to select a technically and environmentally preferred alternative for the DRIC Study. This method highlights the differences in net impacts associated with the various alternatives. Based on these differences, the advantages and disadvantages of each alternative are identified. The relative importance of the impacts are examined to provide a clear rationale for the selection of a preferred alternative. The rationale that favours the selection of one alternative over all others is derived from the following sources:

- Government legislation, policies and guidelines;
- Existing Land Use and Municipal policy (i.e., Official Plans);
- Technical Considerations (i.e. degree to which the identified transportation problems are solved);
- Issues and concerns identified during consultation with ministries, departments and agencies, municipalities, ratepayer and interest groups and the general public (including input obtained through the weighting of the relative level of importance of evaluation criteria); and
- Project Team expertise.

## Arithmetic Method

The arithmetic evaluation is the secondary method, incorporating numeric values for both the level of importance of each environmental attribute (referred to as the weight) and the magnitude of the impact or benefit associated with an alternative (referred to as the score). The weight is multiplied by the score to obtain a total weighted score. The totals for each alternative are compared to determine the preferred alternative. The Arithmetic Method also allows for sensitivity testing as numerous weighting scenarios can be developed.

### *Weighting (level of importance)*

Generally, more weight is assigned to those factors that are felt to be more important in assessing impacts and benefits generated by alternatives, and less weight is given to those factors that are considered to be less important.

For the evaluation of illustrative alternatives, separate Canadian and American weighting scenarios were developed to allow the Canadian and U.S. teams to reflect the unique differences in study areas in the evaluation. Within Canada, one weighting scenario was developed by the Canadian Project Team; separate weighting scenarios were also developed based on input received from individuals of the general public and members of the Community Consultation Group established for this study. Details of the weighting scenarios used for the arithmetic evaluation are provided in subsequent sections of this report.

### *Scoring (degree of impact)*

Qualified Project Team specialists with expertise in impact assessment assessed the degree of impact and benefit and assigned a score for each alternative. The score

assigned to each environmental attribute by the qualified specialist is relative to the impact or benefit generated. Relative impacts can range from those that are positive (benefit the environment) to negative (detrimental to the environment).

The assessment of impacts was derived from field measurements, results of prediction models, secondary data sources and other means as appropriate.

## 2.2. Implementation of Evaluation Methods

As previously noted, the Reasoned Argument method was the primary evaluation tool to select a preferred alternative; the Arithmetic Method was used to substantiate the findings of the Reasoned Argument evaluation. The two evaluation approaches were implemented concurrently.

Where the two approaches result in the identification of different preferred alternatives, the differences between the two alternatives will be identified. The results of the Arithmetic Method will be analyzed to determine the key weight-score combinations in the Arithmetic Evaluation. Similarly, the rationale for each trade-off decision will be revisited, to determine if the Project Team decision was appropriate. If the rationale supporting the trade-off decisions is valid and appropriate, the preferred alternative identified by the Reasoned Argument method will stand. However, if the results of the Arithmetic Evaluation lead to modifications to the trade-off decision rationale, the conclusions of the Reasoned Argument method may also be revised.

Throughout the DRIC Study, the decision making process will be clearly documented and presented for stakeholder comment.

### 2.2.1. Evaluation Criteria – Canadian Side

Table 3.4 of the OEA TOR provided a listing of 18 proposed evaluation factors and 35 criteria for the DRIC Study (refer to Exhibit 2.2). The Canadian and U.S. Project Teams developed a revised evaluation table that simplifies the number of factor areas to be considered from 18 to 7, to enable the public to more easily provide input to the Project Teams in terms of rating the importance of the factors. The seven factors in the revised evaluation table are consistent with those of the OEA TOR and cover a broad range of issues, including the ability of the alternative to meet the Partnership's underlying transportation objectives, as well as natural, social, cultural, economic, and technical considerations. Performance measures used in the analysis of illustrative alternatives include the 35 criteria from the OEA TOR. These have been retained and added to based on comments received during the public consultations. The 7 evaluation factors and the performance measures used for the DRIC Study, as well as the corresponding criteria reference from Table 3.4 of the OEA TOR (where applicable) are shown in Table 2.1 and discussed briefly in the following pages.

**EXHIBIT 2.2: TABLE 3.4 OF OEA TOR – CRITERIA FOR EVALUATING ILLUSTRATIVE AND PRACTICAL ALTERNATIVES**

FACTOR	CRITERIA
<b>Socio-Economic Environment</b>	
<b>Property and Access</b>	1) Impacts to residential areas (i.e. property, access impacts) 2) Impacts to commercial/industrial areas (i.e. property, access impacts) 3) Impacts to agricultural operations
<b>Community Effects</b>	4) Nuisance impacts (e.g.. noise, lighting) 5) Impacts to cemeteries, schools, places of worship, unique community features 6) Effects on community activity / mobility 7) Effects on aesthetics / community character
<b>Governmental Land Use Strategies</b>	8) Compatibility with government goals / objectives / policies 9) Effects on approved private development proposals
<b>Cultural Environment</b>	
<b>Archaeology</b>	10) Impacts to historic/archaeological sites
<b>Heritage and Recreation</b>	11) Impacts to built heritage features and cultural landscape units 12) Impacts to National, State/Provincial and local parks/recreation sites
<b>Groundwater</b>	13) Impacts to groundwater recharge and discharge areas, as well as identified wellhead and source protection areas and areas susceptible to groundwater contamination
<b>Aquatic Habitat, Fisheries, and Surface Water</b>	14) Impacts to critical fish habitat features (spawning, rearing, nursery, important feeding areas) 15) Number of watercourse crossings required 16) Impacts to water bodies, including channel realignments and fill
<b>Agricultural</b>	17) Impacts to prime agricultural areas
<b>Wetlands</b>	18) Impacts to Provincially Significant Wetlands and wetland function 19) Impacts to evaluated and unevaluated wetlands
<b>Wildlife</b>	20) Effects on species at risk / endangered species (vegetation, fish and wildlife) 21) Effects on ecologically functional areas such as connective corridors or travel ways
<b>Special Areas</b>	22) Impacts to important wildlife areas such as deeryards, heronries, waterfowl areas, important bird areas (IBA). Other areas to be considered are any identified wildlife management, rehabilitation and research program sites. 23) Impacts to environmentally significant features such as Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSIs) or other areas of provincial, regional or local significance and the functions of these features 24) Impacts to special spaces including the Detroit River, Conservation Authority Lands and NEPA 4(f) lands including the function of these features
<b>Air Quality</b>	25) Effects on sensitive receptors to air quality 26) Air pollutants and GHG emissions
<b>Woodlands</b>	27) Impacts to significant forest stands and woodlots (including interior forest habitat)
<b>Resources</b>	28) Impacts to mineral, petroleum and mineral aggregate resources
<b>Property Waste &amp; Contamination</b>	29) Effect on operating and closed waste disposal sites 30) Impacts to other known contaminated sites

FACTOR	CRITERIA
<b>Technical Considerations</b>	
<b>Transportation</b>	31) Transportation Operations 32) Network Compatibility 33) Border Processing
<b>Engineering</b>	34) Constructability Issues
<b>Cost</b>	35) Cost

*Note: The OEA TOR identified that this set of factors and criteria represents the minimum criteria to be considered during the evaluation of alternatives (practical and illustrative alternatives) and are subject to refinement and modification during the Integrated Environmental Study Process based on study findings and input received from stakeholders.*

### Changes to Air Quality

The Partnership recognizes air quality is a key concern for those that live and work in the Detroit River area. For each of the Illustrative Alternatives, a burden analysis (total pollutant loadings to the airshed) was undertaken for the following criteria air pollutants that are emitted from vehicles exhausts; carbon monoxide (CO), nitrogen oxides (NOx), sulphur dioxide (SO<sub>2</sub>) and particulate matter in two size ranges (less than 10 microns (PM<sub>10</sub>) and less than 2.5 microns (PM<sub>2.5</sub>)). Volatile organic compounds (VOC) and the following air toxics: benzene, acetaldehyde, formaldehyde, 1,3-butadiene, acrolein, and polycyclic aromatic hydrocarbons (PAH) were considered at this stage. Note that particulate matter is also generated mechanically by the action of the vehicles on the road. The Greenhouse gases, carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) were quantified. Emission scenarios were developed for present and future dates and included a "do nothing" case.

### Protection of Community and Neighbourhood Characteristics

The location of a new or expanded crossing can greatly affect the characteristics of neighborhoods and their surrounding communities, both during construction, and once the crossing is completed. Impacts could include displacements of homes and businesses and other features, noise impacts, changes in traffic volumes and travel patterns, etc. Receptors (residences, churches, schools, libraries and similar institutions/land uses) that might be negatively affected by increased nuisance effects will be identified. Impacts to residential and institutional (schools, churches, libraries, etc.) properties and buildings will be determined. Impacts to commercial, industrial and farm properties will be determined as applicable. The intrusion of new roadway development into neighborhoods will be evaluated. To measure the effects of the plaza and key roadway links in or near neighborhood areas, future traffic volumes will be predicted, by vehicle type on selected roadway segments. Changes to local access will be defined, including that for emergency services. As well, public safety concerns related to the proposed improvements will be addressed.

## Maintain Consistency with Existing and Planned Land Use

Local plans shape the look and feel of a community, its aspirations and visions for growth. It is important to consider how a new or expanded crossing and associated plazas and roadway connections will impact on these local planning objectives. The existing and future land use patterns of affected communities will be examined to assess the degree of consistency with the proposed transportation improvements. This will include review of Official Plans and other planned developments. As well, the intrusion of a plaza or new roadway that is part of the border crossing system on contaminated sites/disposal sites will be evaluated.

## Protect Cultural Resources

Various U.S. and Canadian laws/regulations govern the impact of transportation facilities on properties of historic or archaeological significance and publicly owned parklands. The potential impacts of the river crossing, access roads, and plazas on such sites/properties will be defined for each Illustrative Alternative.

## Protect the Natural Environment

There is potential to affect natural heritage features including terrestrial, aquatic and wetland ecosystems and their inhabitants. Natural areas also play a role in cleansing of the air. Within the study area, this could include Areas of Natural and Scientific Interest, provincially and non-provincially significant wetlands, Environmentally Sensitive Areas, Candidate Natural Heritage Areas, fish habitat, species-at-risk and other designated/regulated natural heritage features. The number, extent and significance of natural heritage features that may be affected by Illustrative Alternatives will be determined. Likewise, the potential impacts to productive resources, such as prime farmland (Ontario Class 1-3 soils) or mineral mines, will be determined. Water quality issues will also be addressed in this category by defining the water crossings affected, floodplain areas affected, groundwater impacts, and possible impacts to the Detroit River, including the release of contaminated sediments. If any water intakes would be potentially affected, they will be identified.

## Improve Regional Mobility

The purpose of the Detroit River International Crossing Project is, in part, "to provide safe, efficient and secure movement of people and goods across the Canadian-U.S. border in the Detroit River area to support the economies of Michigan, Ontario, Canada and the U.S." Within this purpose, the regional transportation and mobility needs include: new border crossing capacity, improved system connectivity; improved operations and processing capabilities; and reasonable and secure crossing options. Therefore, the degree to which the options under consideration assist in efficient operation of the overall highway network will be evaluated for the study horizon year of 2035. This evaluation will in part be based on standard methodology of the Highway Capacity Manual 2000 (e.g., level of service, capacity). Total vehicle miles, vehicle hours of travel, and travel distances will also be calculated on the border road network for the study horizon year of 2035. Also included will be an assessment of the ability of an alternative 1) to provide

continuous/ongoing river crossing capacity (i.e. redundancy); and, 2) to meet the operational requirements for the plaza and crossing including considerations of security, accessibility, and flexibility for expansion.

## Minimize Cost

Construction of a new or expanded Detroit River International Crossing will represent a major financial investment. While it is recognized that the crossing serves an important trade corridor between Canada and the U.S., the costs to construct, operate and maintain it are eventually paid by the users of the crossing, whether it is by individual users through tolls, or governments through the use of public funds derived from taxpayers. Minimizing costs, while balancing the natural, social, economic, cultural, and technical considerations is an important consideration. Construction risks can lead to unforeseen delays and significant additional costs. An assessment will be made based on the constructability of the proposed crossing, plaza, and roadway system alternative. Some of the considerations will be site constraints, geotechnical constraints, construction staging/duration, traffic maintenance, and an implementation risk assessment.



**TABLE 2.1: EVALUATION FACTORS AND PERFORMANCE MEASURES – CANADIAN SIDE**

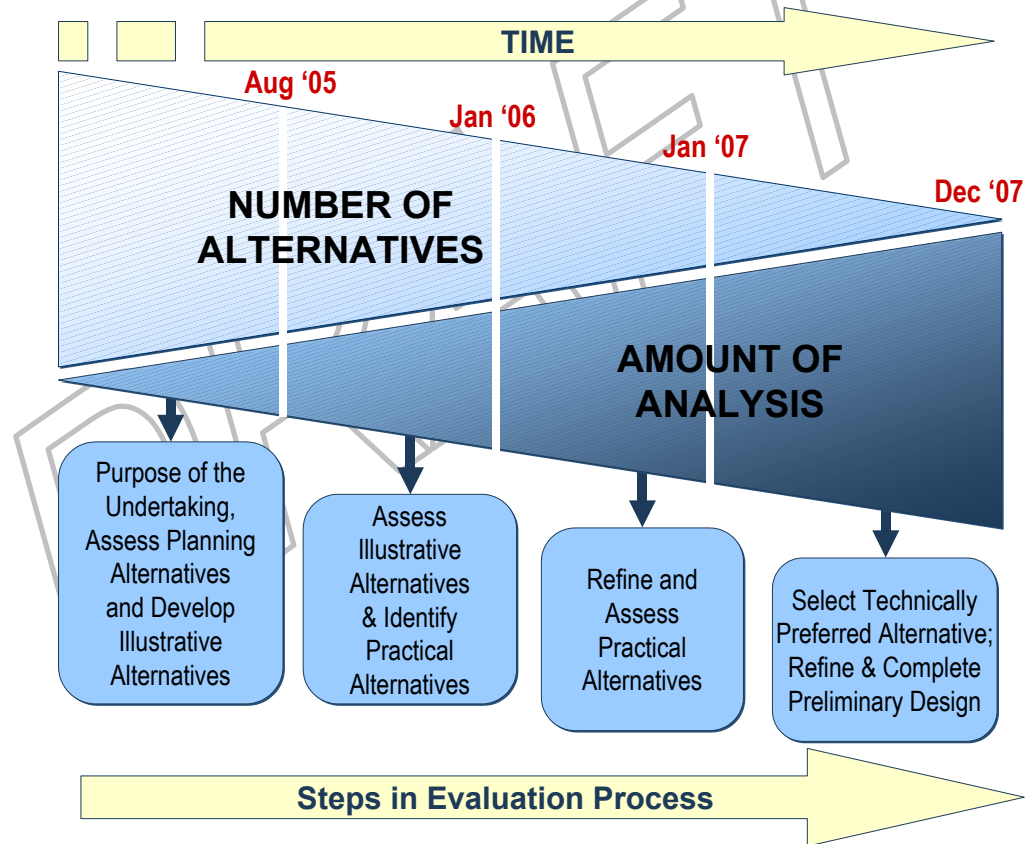
Rating Factor	Performance Measure Categories	Performance Measure	Corresponding Criteria Reference in OEA TOR Table 3.4
Changes in Air Quality	Regional Burden	Analysis based on traffic model results.	25, 26
	Dispersion (CO and PM <sub>2.5</sub> and other Green House Gases/pollutants)	Analysis for key roadway links [to be measured at practical alternatives stage]	25, 26
Protect Community/ Neighborhood Characteristics	Traffic Impacts		
	• Volumes by Vehicle Type	Peak period volumes on specific links by mode (cars, trucks, and int'l. trucks).	31, 33
	• Local Access	Number of streets crossed, closed, or connected with an interchange.	31, 33
	Noise	Analysis based on traffic model results for key roadway links.	4
	Community Cohesion/Community Character	Encroachment/severance on neighborhood based on professional judgment. Impact on delivery of community services (function of road closures) based on professional judgment.	7
	Acquisitions (Whole or Partial)		
• Residential	Number of dwelling units by type; population estimate based on average persons per dwelling unit	1	
• Business	Number of business establishments; employment estimate based on average employees per business for area.	2	
• Institutions	Number of institutions by type (church, schools, etc.).	5	
• Farm Property / Structures	Operations/structures affected.	3	
Public Safety/Security (Plaza Only)	Assessment based on professional judgment.	NEW	
Maintain Consistency with Existing and Planned Land Use	Land Use (existing and planned)	Designation of “consistent,” “not consistent,” or “not applicable” with goals, objectives and/or policies based on review of official planning documents.	8
	Development Plans	Designation of “compatible,” “not compatible,” or “not applicable” with plans for upcoming development that may not be covered by official plans.	9
	Contaminated Sites/Disposal Sites	Number of documented sites affected.	29, 30

**TABLE 2.1 CONT'D**

Rating Factor	Performance Measure Categories	Performance Measure	Corresponding Criteria Reference in OEA TOR Table 3.4
Protect Cultural Resources	Historical	Number of listed sites affected.	10
	Parklands	Number of parks by type; number of hectares affected. Includes subset for Coastal Zone Management sites.	11
	Archaeological Sites	Number of known sites affected.	12
Protect the Natural Environment	Environmental Significant Features	Area (in hectares) affected by type.	14-19, 21, 24, 27
	Surface Water Quality/Groundwater	Area of floodplains affected (hectares); number of water crossings (including secondary rivers and streams); Detroit River channel alteration; number and general location of in-water piers; wells/groundwater sources affected; number of water intakes affected.	13, 16
	Environmentally Significant Species/Habitat	Area of habitat (hectares) affected by type; list of species; other significant features.	20
	Farmland/Prime Agricultural Soils	Area affected (hectares) by soil type	17
	Other Natural Resources	Area affected measured by area of right-of-way.	28
Improve Regional Mobility	Highway Network Effectiveness		
	• Service Levels	Level of Service (LOS) classification by major facility type.	31, 32
	• Vehicle kilometres of Travel	By major facility type.	31, 32
	• Vehicle Hours of Travel	By major facility type.	31, 32
	• Distance Traveled	Average kilometres for car, local truck, and international truck.	31, 32
	Continuous/ongoing river crossing capacity (i.e. redundancy)	Assessment of availability of crossing options.	32, 33
Operational Considerations of Crossing System (River Crossing and Plaza)	Distance to plaza from international border; accessibility; serviceability; security; flexibility for expansion.	32, 33	
Minimize Cost	Millions of \$ (2005)	Length of alternative, preliminary construction costs, constructability including site constraints; geotechnical constraints; construction staging/ duration; traffic maintenance; risk assessment.	34, 35

It is important to note that the criteria and indicators implemented in the evaluation of illustrative alternatives reflect the level of detail available on the alternatives. Once the Practical Alternatives are identified, more detailed data collection will be undertaken, allowing a more detailed assessment of benefits and impacts (refer to Exhibit 2.3).

**EXHIBIT 2.3: EVALUATION PROCESS**



### 2.2.2. Reasoned Argument Method – Canadian Side

On the Canadian side, the analysis of illustrative alternatives was completed by the Project Team specialists and documented in evaluation tables. These tables provide interpretation of the analysis results (where appropriate) and a rationale for the selection of a preferred illustrative alternative. The analysis tables supporting the evaluation of Illustrative Alternatives on the Canadian side is provided in the Supporting Documents.

The findings and rationale for the selection of the alternatives to be carried forward for continued analysis are presented in Chapter 3 of this document.

## 2.2.3. Arithmetic Method – Canadian Side

### Canadian Public Weighting

The Partnership recognizes that input from the public, government ministries, departments and agencies, local municipalities and other stakeholders is essential to successful planning of major transportation improvements, such as the Detroit River International Crossing study. Stakeholders and interested individuals were encouraged to provide input to the evaluation of illustrative alternatives.

Public input to the weighting of the seven evaluation factors was obtained through a rating tool distributed at the first round of public consultation in June 2005 (refer to sample in Exhibit 2.4). Rating tools were made available at Public Information Open Houses as well as at the local Project Office and on the project website. Interested members of the public were asked to provide the Project Teams with their opinion as to how highly (on a scale of 0 to 100) the Project Team should consider each of the factors in deciding on what alternatives to carry forward for additional study.

A total of sixty-one valid rating tools were received, including 45 responses from the general public, 15 responses from members of the Community Consultation Group (CCG) and one from a government agency.


The rating tools received from the public and other stakeholders were arithmetically combined and normalized to percents. It is important to note that the public and CCG weighting scenarios were developed mathematically. The weighting scenarios therefore do not reflect a consensus among study participants; individuals that participated in the rating exercise may hold views that vary significantly from those represented in the weighting scenarios.


In addition, over 150 comment sheets were received during the first round of consultation. The most frequent comments received included concerns with:


- Protection of natural features;
- Reduction of impacts to residential areas; and
- Air quality/human health.


The range of views represented in the rating tools and comment sheets received from the first round of consultation provided the Canadian Project Team with an understanding of community values with respect to the relative importance of each environmental feature, which subsequently was considered in the Project Team Weighting.

**EXHIBIT 2.4: RATING TOOL**









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**Detroit River International Crossing**  
**Evaluation Factors Rating Tool – Canadian Version, June 2005**

The evaluation of alternatives will be considered in the context of the international and national significance of the Detroit River crossing in terms of the economy, security, and ability to provide continuous river crossing capacity. An alternative must meet the stated purpose of the undertaking:  
***To provide for the safe, efficient and secure movement of people and goods across the Canadian-U.S. border in the Detroit River area to support the economies of Michigan, Ontario, Canada and the U.S.***

**How Important Are These Factors?**

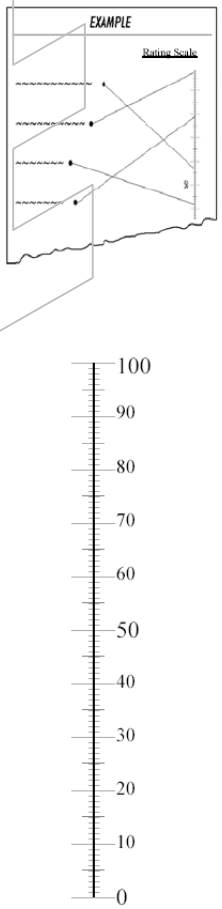
We want to know how you value the evaluation factors listed below. These factors are derived from the listing of factors proposed for the evaluation of illustrative alternatives provided in the approved Terms of Reference for the DRIC Project. To provide us with your opinion, please rate them on the scale of "1" to "100", with the highest rating for the item you believe is the most important. Draw a line from the dot following each factor on the left, to the scale on the right, to indicate your opinion. When finished, return your form to a project representative, or by fax to the number listed at the bottom of this form.

Your opinions will be used to assist the Project Team in the evaluation of the Canadian Illustrative Alternatives of the Detroit River International Crossing Study.

**Factor Rating Scale**

- Changes to Air Quality ●
- Protection of Community and Neighborhood Characteristics ●
- Consistency with Existing and Planned Land Use ●
- Protection of Cultural Resources ●
- Protection of Natural Environment ●
- Improve Regional Mobility ●
- Minimize Cost ●
- Other \_\_\_\_\_ ●

Comments: \_\_\_\_\_



**Please complete this form and return by July 28<sup>th</sup> 2005 to:**

**Mr. Len Kozachuk, P.Eng.,**  
**Consultant Deputy Project Manager**  
 URS Canada Inc.,  
 75 Commerce Valley Drive East  
 Markham, Ontario, L3T 7N9  
 Fax: (905) 882-4399 or (519) 969-5012  
 info@partnershipborderstudy.com

**Submitted By:**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

E-mail: \_\_\_\_\_



## Canadian Project Team Weighting

Canadian Project Team weighting of the relative importance of the evaluation factors was used in establishing decision rules for the reasoned argument evaluation method, as well as developing weighted scores for the arithmetic evaluation method. Prior to the evaluation of illustrative alternatives, the Canadian Project Team met to establish the numerical weight (representing level of importance) to assign each of the seven evaluation factors listed in Table 2.1 to be used to assess the illustrative alternatives.

Members of the Canadian Project Team participating in the factor weighting exercise included representatives from the Ontario Ministry of Transportation, Transport Canada and the Consultant Team. The list of participants is as follows:

Project Team Member	Organization	Project Role
Dave Wake	MTO	Project Director, Windsor Projects
Roger Ward	MTO	Project Manager
Joel Foster	MTO	Senior Environmental Planner
Kaarina Stiff	TC	Environmental Assessment Project Manager
Andrew Shea	TC	Senior Policy Advisor
Murray Thompson	URS Canada	Consultant Team Project Manager
Len Kozachuk	URS Canada	Consultant Team Deputy Project Manager
Audrey Steele	LGL Limited	Consultant Team Lead Environmental Planner

The Canadian Project Team assessed the relative importance of the evaluation factors based on the purpose and objectives of the project as well as data collected on area features; the results of this assessment is summarized as follows:

Firstly, the Project Team recognized that all seven factors are important to consider in the assessment of alternatives. In assigning a rating (between 0 and 100) for each of the factors, the Project Team was able to distinguish a degree of importance among the factors, as noted in the following:

Factor	Rationale	Rating
<b>Improve Regional Mobility</b>	The Project Team considered this factor of highest importance as it reflects one of the primary purposes of the project; a new or expanded crossing and associated inspection plazas and freeway connections are essential to the international economies of Canada and the U.S., Ontario and Michigan and the local economies in the Windsor/Essex County-Detroit/Wayne County region. The new facility will serve the border transportation network well beyond the 30-year planning horizon of this study. Given that this project is likely to generate substantial impacts to the local communities, and over time, communities will adjust to the new transportation network, it is imperative that the improvement that provides the most benefits to the border transportation network be implemented.	<b>100</b>

Factor	Rationale	Rating
<b>Protection of Community &amp; Neighbourhood Characteristics</b>	The Project Team considered this factor of high importance on the basis that the community and neighbourhoods are sensitive to impacts associated with a major transportation project such as the DRIC. The DRIC will provide direct freeway access from Highway 401 to the new/expanded crossing; as a high-volume, high-speed facility, this project will have an impact on properties and access that could change the function and character of a community or neighbourhood. Reducing the impacts on the community associated with the international traffic facility is a high priority of the Project Team.	<b>90</b>
<b>Protection of Natural Environment</b>	The Project Team considered this factor to be of high importance on the basis that the remaining woodlot, prairie and wetland features provide unique habitat for some rare and endangered species. Federal, provincial and local municipal designations have been placed on many of the remaining natural features in the project study area. Local municipalities have incorporated the sensitive natural areas into their local planning to preserve and protect these features for their habitat value, as well as being important community recreational features.	<b>90</b>
<b>Minimize Cost</b>	The Project Team considered this factor to be of moderate to high importance on the basis that this factor addresses cost and constructability of the new or expanded crossing. This project will be paid for by government funds and/or through tolls paid by users; minimizing the costs of the project will reduce the costs to users and/or taxpayers. In addition, the objectives of this project call for a new or expanded crossing to be in place as quickly as possible to reduce the potential for disruption to the movement of people and goods at this crucial border crossing. Reducing construction impacts and risks is important for the timely completion of this project.	<b>75</b>
<b>Changes to Air Quality</b>	This factor was considered of moderate importance by the Project Team on the basis that transportation is a minor contributor to ambient pollutants in the Windsor/Essex area; the majority of airborne pollutants and toxics are from industrial sources in the Windsor-Detroit area and external. The Project Team observed that by giving greater importance to protection of community and neighbourhood characteristics and protection of natural features, impacts to sensitive receivers for air quality will be reduced; it is recognized that this factor was rated as of highest importance by the public and CCG.	<b>70</b>
<b>Protection of Cultural Resources</b>	The Project Team considered this factor to be of moderate importance on the basis that much of the project area is disturbed by development and/or agriculture. As well, the level of importance assigned to this factor reflects that impacts to such features can usually be mitigated to reduce the effects to the resource. MTO has established procedures with First Nations to avoid or minimize impacts to archaeological features. Built features can usually be mitigated by avoidance or relocation of the feature.	<b>70</b>
<b>Maintain Consistency with Existing and Planned Land Use</b>	The Project Team considered this factor to be of moderate importance on the basis that many of the aspects of minimizing impacts to existing land use are addressed in the assessment of impacts to neighbourhoods and communities, and that future land use designations can be changed to reflect provincial and federal land use initiatives and priorities. It is recognized that the local municipalities in the Windsor-Essex County area have Official Plans that identify municipal planning objectives for land use and municipal aspirations for growth.	<b>70</b>

The rating and weights developed by the Project Team, members of the public and the CCG are presented in the following table:

**TABLE 2.1: RATINGS AND WEIGHTS**

Factor	Project Team		Public		CCG	
	Rating	Weight (%)	Rating	Weight (%)	Rating	Weight (%)
Changes to Air Quality	70	12.39	85	17.31	91	17.30
Protection of Community & Neighbourhood Characteristics	90	15.93	80	15.49	73	13.88
Maintain Consistency with Existing & Planned Land Use	70	12.39	62	12.89	72	13.69
Protection of Cultural Resources	70	12.39	66	13.14	69	13.12
Protection of Natural Environment	90	15.93	78	16.34	90	17.11
Improve Regional Mobility	100	17.70	76	15.28	78	14.83
Minimize Cost	75	13.27	47	9.54	53	10.07
		100		100		100

### Scoring

The Canadian Project Team used a 1 to 7 scoring scale to identify the magnitude of an impact or benefit as follows:

1	2	3	4	5	6	7
High Impact	Moderate Impact	Low Impact	Neutral/ No Impact	Low Benefit	Moderate Benefit	High Benefit

Members of the Canadian Project Team that led the illustrative alternative impact assessment scoring included specialists and experts in each of the evaluation factor areas on the Consultant Team. The list of lead participants is as follows:

Factor	Project Team Members	Company
Changes to Air Quality	Chris Marson Abby Salb	SENES SENES
Protection of Community & Neighbourhood Characteristics	Phil Shantz Russell Mathews David MacLeod	SENES Hemson Consulting Hemson Consulting
Maintain Consistency with Existing & Planned Land Use	Phil Shantz Mark Lack	SENES URS Canada
Protection of Cultural Resources	Robert Pihl Phil Shantz	Archaeological Services Inc. SENES

Factor	Project Team Members	Company
Protection of Natural Environment	Grant Kauffman Storer Boone Irene Hauzar	LGL Golder Associates URS Canada
Improve Regional Mobility	Murray Thompson Bruce Mori	URS Canada IBI Group
Minimize Cost	Murray Thompson Steve Stroh Storer Boone	URS Canada URS Tampa Golder Associates

The assessment of the impacts and benefits of each alternative and the numerical scoring is provided in Supporting Documents and summarized in the discussions in Chapter 3 of this document.

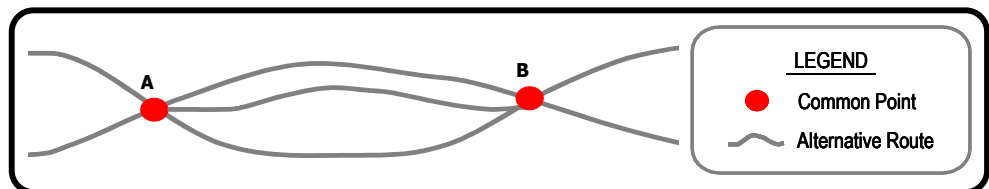
### 2.3. Evaluation Sequence

The illustrative alternatives include crossings, plazas and connecting routes. Consistent with the OEA TOR, the approach to undertaking the end-to-end evaluation involved several steps, as follows:

- 1) Assess plazas – these are fixed sites that can be readily assessed; Canadian and U.S. plazas assessed individually
- 2) Assess crossings – these are known locations between plazas; Canadian and U.S. teams jointly developed bridge/tunnel types and assessed impacts/benefits
- 3) Assess connecting routes – in Canada, there are many common points where routes intersect; the assessment was based on developing the ‘best way’ from Highway 401 to each plaza site using pairwise/multiple segment comparison of segments in developing the preferred route to each plaza;
- 4) U.S. and Canadian assessment of crossing, plaza and connecting routes were compiled and incorporated in an end-to-end assessment; and
- 5) Practical alternatives were identified considering end-to-end impacts and benefits

#### Canadian Assessment of Connecting Route Segments

The connecting route alternatives include several segments connected by common points. An analysis was undertaken to determine preferred alternatives for portions of the study area rather than comprehensively examining all combinations of alternatives for the entire region. For example, route segment alternatives between common points “A” and “B” were compared to select a preferred alternative route for that segment of the route prior to assessing alternatives beyond common point “B”.



The sequence of analysing the route segments was developed to determine the 'best way' or preferred route between Highway 401 and each of the plaza sites. (For the East plaza sites, the analysis includes assessment of the plazas to identify the 'best way' to Crossing X15.)

The following chart (see Exhibit 2.5) schematically illustrates the sequence of the 24 separate evaluations of route segments leading to the identification of the 'best way' to each of the plazas/crossings from Highway 401.

## Canadian Assessment of Illustrative Crossing/Plaza/ Connecting Route Alternatives

Once the preferred connecting route to each plaza and crossing was determined, the Canadian Project Team assessed the fifteen crossing/plaza/route systems for comparison of benefits and impacts in determining which alternatives from a Canadian perspective are recommended for consideration in the end-to-end evaluation with the U.S. Project team results.

The findings and rationale for the selection of the alternatives to be carried forward for continued analysis is presented in Chapter 3 of this document.

### 2.3.1. End-to-End Evaluation

A parallel evaluation process of evaluation crossings, plazas and connecting routes was implemented by the U.S. Project Team using the same evaluation criteria, modified as appropriate to reflect the unique requirements and characteristics of the U.S. study area. The analysis results of the U.S. Project Team are provided in Supporting Documents.

The results of the U.S. and Canadian analyses were compiled for an end-to-end assessment of illustrative crossing, plaza and connecting route alternatives connecting Highway 401 in Ontario to the interstate freeway system in Michigan.

The findings and rationale for the selection of the alternatives to be carried forward for continued analysis is presented in Chapter 3 of this document.

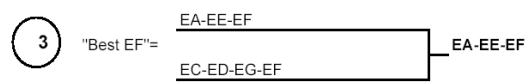
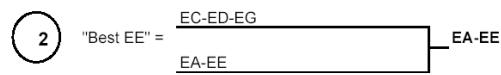
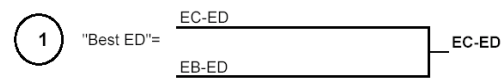


**EXHIBIT 2.5: SEGMENT EVALUATION SEQUENCE CHART**

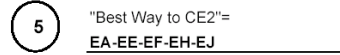
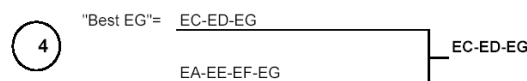
**ROUTE SEGMENT EVALUATIONS**

**EAST**

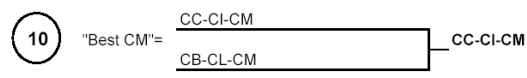
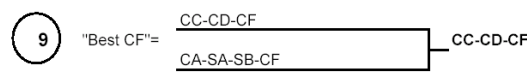
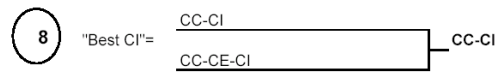
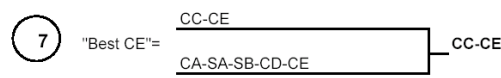
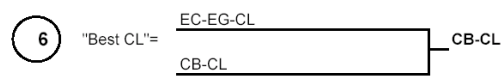
**Plaza CE2**



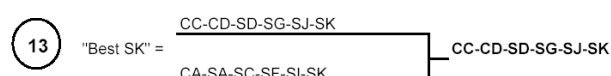
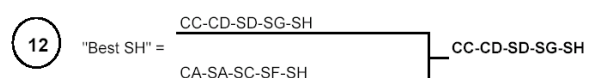
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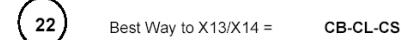
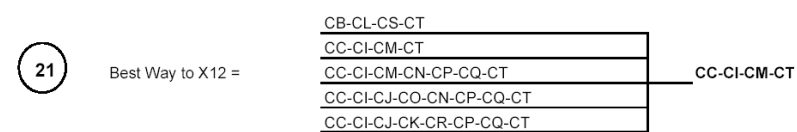
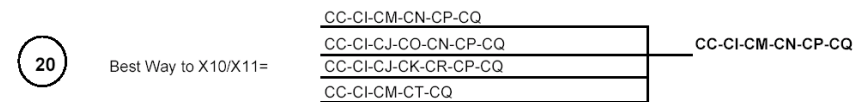
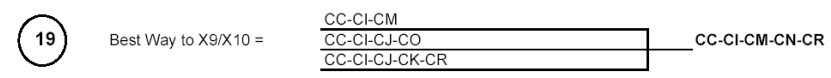
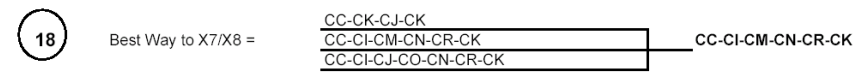
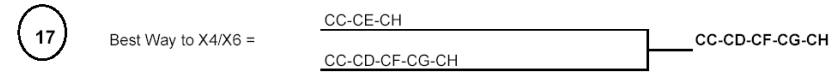
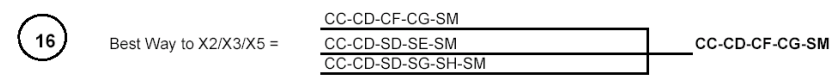
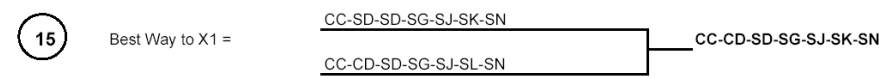
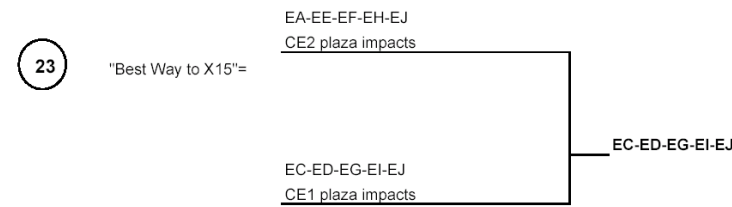
**CENTRAL**



**SOUTH**



Note: # identifies the segment evaluation for reference in Supporting Documents.



**ANALYSIS OF PLAZAS**

- 24 East
- 25 Central
- 26 South

**ANALYSIS OF CROSSINGS**

- 27 Crossings X1 to X15

**ANALYSIS OF HIGHWAY 401 TO DETROIT RIVER**

- |    |    |    |     |
|----|----|----|-----|
| 28 | X1 | 36 | X9  |
| 29 | X2 | 37 | X10 |
| 30 | X3 | 38 | X11 |
| 31 | X4 | 39 | X12 |
| 32 | X5 | 40 | X13 |
| 33 | X6 | 41 | X14 |
| 34 | X7 | 42 | X15 |
| 35 | X8 |    |     |

## 3. Illustrative Alternatives Evaluation Canadian Side

Having analyzed and evaluated the various route segments on the Canadian side connecting Highway 401 to the proposed plaza sites and crossings, the Canadian Project Team incorporated the plazas and crossings into an assessment of the illustrative crossing/inspection plaza/connecting route systems to identify the candidates for a short list of practical alternatives. This section provides the discussion of the analysis and evaluation of the Canadian side alternatives.

### 3.1. Southern Alternatives – Crossings X1, X2, X3, X4, X5 and X6

#### 3.1.1. Description and Feasibility Findings

The southern alternatives are grouped for discussion as they carry many similar characteristics: they share a common connection to Highway 401 at Highway 3; they all bypass the existing metropolitan areas of Windsor, LaSalle and Tecumseh; and they primarily traverse sparsely populated rural lands (refer to Exhibit 3.1). Another defining characteristic common to the southern alternatives is the width of the Detroit River, which varies from approximately 4500 m at the north end of Grosse Ile to 2500 m at the north end of Fighting Island. At these lengths, multi-span structures with piers in the river and/or on the islands in this area of the river would be required. In comparison, the width of the river in the central sections near the Ambassador Bridge is in the order of 600 m, and 1500 m in the eastern sections of the river near Belle Isle.

#### Route Segments

##### Connecting Route to Plaza CS3/Crossing X1

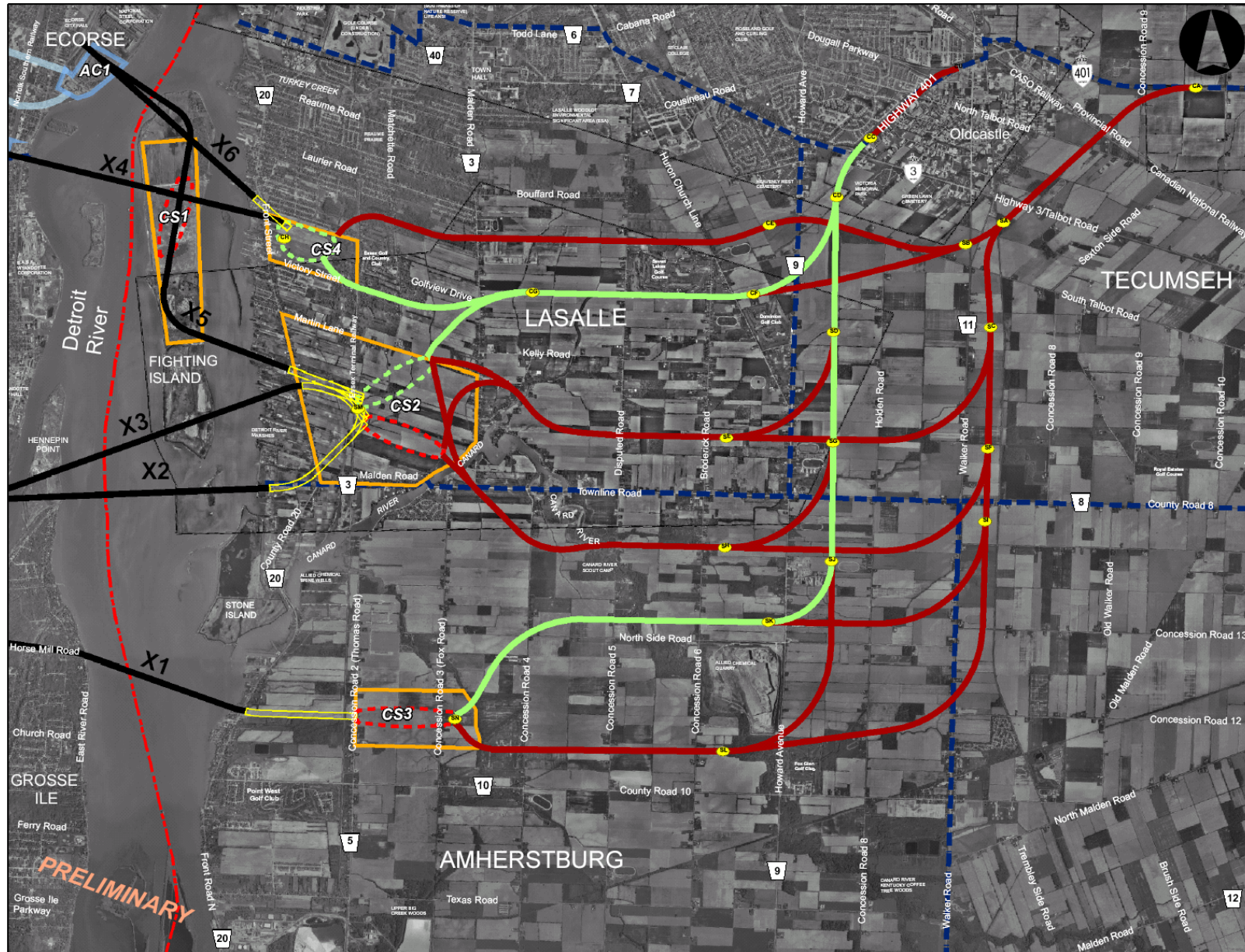
Table 3.1 provides a summary of the evaluation of the route segments connecting to plaza CS3. The best way to Plaza CS3/Crossing X1 was determined as the combination of route segments CC-CD-SD-SG-SJ-SK-SN. Details of this assessment are included in the Analysis Results – Canadian Side under separate cover.

The preferred alignment from the Highway 401/Highway 3 interchange generally parallels Howard Avenue north-south through the Town of LaSalle into the Town of Amherstburg, and runs east-west along a line north of North Side Road to Plaza CS3.

##### Connecting Route to Plaza CS2/Crossing X2/X3 and Plaza CS1/Crossing X5

Table 3.2 provides a summary of the evaluation of the route segments connecting to plaza CS2 and the east portion of crossing X5. The best way to Plaza CS2 and the east portion of crossing X5 has been determined as the combination of route segments CC-CD-CF-CG-SM.

EXHIBIT 3.1: SOUTHERN ALTERNATIVES





**TABLE 3.1: SUMMARY OF ASSESSMENT OF SOUTHERN ROUTE SEGMENTS – CONNECTION TO PLAZA CS3/CROSSING X1**

Factor	Howard Ave/North Side Road (CC-SK-SN)	Walker Rd/North Side Road (CA-SK-SN)	Howard Ave/Cty Rd 10 (CC-SL-SN)	Walker Rd/Cty Rd 10 (CA-SL-SN)
<b>Changes to Air Quality</b>	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis
<b>Community and Neighbourhood Impacts</b>	Impacts to agricultural area:  <b>Displacements:</b> <10 households; <5 Businesses; <10 Farm building complexes  <b>Disruption:</b> 60+ households within 250 m of centreline; <5 businesses; <20 farm building complexes	Impacts to agricultural area and hamlet of Paquette Corners:  <b>Displacements:</b> 10+ households <5 Businesses; <10 Farm Building Complexes  <b>Disruption:</b> 60+ households within 250 m of centreline; <5 businesses; 20+ farm building complexes	Impacts to agricultural area:  <b>Displacements:</b> <5 households <5 Businesses; <5 Farm Building Complexes  <b>Disruption:</b> 60+ households within 250 m of centreline; <5 businesses; 10+ farm building complexes	Impacts to agricultural area, MacGregor Square (development area) and hamlet of Paquette Corners:  <b>Displacements:</b> 10+ households <5 Businesses; 5+ Farm Building Complexes  <b>Disruption:</b> 80+ households within 250 m of centreline; <5 businesses; <20 farm building complexes
<b>Consistency with Land Use</b>	Impacts to rural agricultural uses; generally consistent	Impacts to rural agricultural uses; generally consistent; impacts to hamlet of Paquette Corners and Oldcastle settlement area and Trans-Canada Trail	Impacts to rural agricultural uses; generally consistent; impact to proposed gravel pit operation	Impacts to rural agricultural uses; generally consistent; impacts to MacGregor, hamlet of Paquette Corners and Oldcastle settlement area and Trans-Canada Trail
<b>Impacts to Cultural Resources</b>	2 known significant archaeological sites impacted; low potential for impacting unknown sites	3 known significant archaeological sites impacted; low potential for impacting unknown sites; impacts Trans-Canada Trail	3 known significant archaeological sites impacted; low potential for impacting unknown sites	4 known significant archaeological sites impacted; low potential for impacting unknown sites; impacts Trans-Canada Trail
<b>Natural Environment</b>	Proximity impacts to two ESA's; overall low impacts	Impacts a greater area of forest blocks than Howard Ave alternatives; overall low impacts	Direct impacts to natural features; overall low impacts	Impacts a greatest area of forest blocks than other alternatives; overall low impacts
<b>Improve Regional Mobility</b>	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic
<b>Cost</b>	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;
<b>Conclusions</b>	The Howard Avenue alternatives avoid impacts to Paquette Corners, as well as MacGregor and Oldcastle developments; North Side Road alignment preferred over Cty Rd 10 alignment due to lower impacts to cultural and natural features. <b>Route segment CC-SK-SN is preferred.</b>			

**TABLE 3.2: SUMMARY OF ASSESSMENT OF SOUTHERN ROUTE SEGMENTS – CONNECTION TO PLAZA CS2/CROSSING X2/X3 AND PLAZA CS1/CROSSING X5**

Factor	Howard Ave/LaSalle Urban Boundary (CC-CF-SM)	Walker Rd/LaSalle Urban Boundary (CA-SB-CF-SM)	Howard Ave/North of Townline Road (CC-SE-SM)	Walker Rd/North of Townline Road (CA-SC-SE-SM)	Howard Ave/South of Townline Road (CC-SH-SM)	Walker Rd/South of Townline Road (CA-SF-SH-SM)
<b>Changes to Air Quality</b>	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis
<b>Community and Neighbourhood Impacts</b>	Impacts boundary of LaSalle future urban area and agricultural area: <b>Displacements:</b> <5 households <5 Businesses; 0+ Farm Building Complexes <b>Disruption:</b> 80+ households within 250 m of centreline; <5 businesses; <10 farm building complexes	Impacts boundary of LaSalle future urban area, parks and agricultural area, <b>Displacements:</b> <5 households <5 Businesses; <5 Farm Building Complexes <b>Disruption:</b> <50 households within 250 m of centreline; <5 businesses; 15+ farm building complexes	Impacts to agricultural area: <b>Displacements:</b> 10+ households; 0+ Businesses; 5+ Farm building complexes <b>Disruption:</b> <95 households within 250 m of centreline; <5 businesses; <15 farm building complexes	Impacts to agricultural area <b>Displacements:</b> <10 households 0+ Businesses; 10+ Farm Building Complexes <b>Disruption:</b> 70+ households within 250 m of centreline; <5 businesses; <30 farm building complexes	Impacts to agricultural area and hamlet of Loiselleville: <b>Displacements:</b> 5+ households; 0+ Businesses; <10 Farm building complexes <b>Disruption:</b> 140+ households within 250 m of centreline; <5 businesses; 20+ farm building complexes	Impacts to agricultural area: hamlets of Paquette Corners and Loiselleville: <b>Displacements:</b> <15 households; 0+ Businesses; 5+ Farm building complexes <b>Disruption:</b> 140+ households within 250 m of centreline; 0+ businesses; <25 farm building complexes
<b>Consistency with Land Use</b>	Impacts boundary of LaSalle future urban area and to rural agricultural uses; generally consistent	Impacts boundary of LaSalle future urban area and to rural agricultural uses; generally consistent; impacts to Oldcastle settlement area and Trans-Canada Trail	Impacts to rural agricultural uses; generally consistent	Impacts to rural agricultural uses; generally consistent; impacts to Oldcastle settlement area and Trans-Canada Trail	Impacts to rural agricultural uses; hamlet of Loiselleville generally consistent	Impacts to rural agricultural uses; generally consistent; impacts to Oldcastle settlement area and hamlets of Paquette Corners and Loiselleville and Trans-Canada Trail
<b>Impacts to Cultural Resources</b>	No known significant archaeological sites impacted; moderate potential for impacting unknown sites	No known significant archaeological sites impacted; moderate potential for impacting unknown sites	No known significant archaeological sites impacted; low potential for impacting unknown sites	No known significant archaeological sites impacted; low potential for impacting unknown sites	No known significant archaeological sites impacted; moderate potential for impacting unknown sites	No known significant archaeological sites impacted; moderate potential for impacting unknown sites
<b>Natural Environment</b>	Avoids impacts to Canard River; low impacts to other features	Avoids impacts to Canard River; higher impacts to forest blocks and watercourses than Howard Ave option;	Direct impacts to Canard River and marshes (provincially significant);	Direct impacts to Canard River and marshes (provincially significant);	Direct impacts to Canard River and marshes (provincially significant);	Direct impacts to Canard River and marshes (provincially significant);
<b>Improve Regional Mobility</b>	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic
<b>Cost</b>	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;
<b>Conclusions</b>	Alternatives south of Townline Road impact community of Loiselleville and provincially significant Canard River wetlands and are least preferred; alternatives following LaSalle future urban boundary avoid Canard River wetlands and are therefore preferred over other alternatives; Howard Avenue alternative identified as having slightly fewer impacts to community characteristics, land use, cultural resources and natural environment. <b>Route Segment CC-SF-SM is preferred.</b>					



Details of this assessment are included in the Analysis Results – Canadian side under separate cover.

From the Highway 401/Highway 3 interchange, the alignment generally aligns with the southern limit of the future urban area in the Town of LaSalle; at Malden Road, the alignment bears south-westerly across Martin Lane, to a plaza opportunity area designated CS2, which is a large area of agricultural land north of River Canard. Within this opportunity area, plazas can be configured to connect to Crossings X2 and X3. Crossing X2 is aligned to avoid Fighting Island and cross at 90 degrees to the Detroit River.

### Connecting Route to Plaza CS2/Crossing X3

Similar to Crossing X2, Crossing X3 also connects to Plaza CS2; the X3 crossing/plaza/connecting route combination also incorporates the combination of route segments CC-CD-CF-CG-SM. The alignment of Crossing X3 crosses over the south end of Fighting Island, resulting in a slightly different location for Plaza CS2.

### Connecting Route to Plaza CS4/Crossings X4 and X6

Table 3.3 provides a summary of the evaluation of the route segments connecting to plaza CS4. The best way to Plaza CS4 has been determined as the combination of route segments CC-CD-CF-CG-CH. The alignment from the Highway 401/Highway 3 interchange also aligns with the southern limit of the future urban area in the Town of LaSalle; however, at Malden Road, the alignment continues westerly to a large open area west of the Essex Golf and Country Club, north of Victory Street. From Plaza CS4, connections to Crossing X4 over central Fighting Island to U.S. Plaza AS5, and Crossing X6 to U.S. Plaza AC1 were considered.

**TABLE 3.3: SUMMARY OF ASSESSMENT OF SOUTHERN ROUTE SEGMENTS – CONNECTION TO PLAZA CS4/CROSSING X4 AND X6**

Factor	Howard Ave/LaSalle Urban Boundary (CC-CF-CH)	Walker Rd/LaSalle Urban Boundary (CA-SB-CF-CH)	Howard Ave/Laurier Drive (CC-CE-CH)	Walker Rd/Laurier Drive (CA-SC-CE-CH)
<b>Changes to Air Quality</b>	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis
<b>Community and Neighbourhood Impacts</b>	Impacts boundary of LaSalle future urban area, residential area at Victory Street inside urban boundary; <b>Displacements:</b> 75+ households <5 Businesses; <5 Farm Building Complexes <b>Disruption:</b> 155+ households within 250 m of centreline; <5 businesses; 10+ farm building complexes	Impacts boundary of LaSalle future urban area, parks and agricultural area, <b>Displacements:</b> 75+ households <5 Businesses; <5 Farm Building Complexes <b>Disruption:</b> 125+ households within 250 m of centreline; <5 businesses; 15+ farm building complexes	Impacts to LaSalle's new community centre and recreation complex and planned Town Centre <b>Displacements:</b> <30 households; <5 Businesses; 0+ Farm building complexes <b>Disruption:</b> 215+ households within 250 m of centreline; <5 businesses; <10 farm building complexes	Impacts to LaSalle's new community centre and recreation complex, parks and planned Town Centre <b>Displacements:</b> <30 households; <5 Businesses; 10+ Farm Building Complexes <b>Disruption:</b> 175+ households within 250 m of centreline; <5 businesses; <15 farm building complexes
<b>Consistency with Land Use</b>	Impacts boundary of LaSalle future urban area and residential uses near Victory Street;	Impacts boundary of LaSalle future urban area and residential uses near Victory Street; impacts to Oldcastle settlement area and Trans-Canada Trail	Not consistent with Town of LaSalle's existing and planned urban area uses; impact to new Town Centre	Not consistent with Town of LaSalle's existing and planned urban area uses; impact to new Town Centre; impacts to Oldcastle settlement area and Trans-Canada Trail
<b>Impacts to Cultural Resources</b>	No known significant archaeological sites impacted; high potential for impacting unknown sites	No known significant archaeological sites impacted; high potential for impacting unknown sites	No known significant archaeological sites impacted; high potential for impacting unknown sites	No known significant archaeological sites impacted; high potential for impacting unknown sites
<b>Natural Environment</b>	Minimal impacts to ETS <sup>6</sup> /habitat	Minimal impacts to ETS <sup>1</sup> /habitat; higher impacts to forest blocks and watercourses than Howard Ave option;	Direct impacts to <10 ha of ETS <sup>1</sup> /habitat	Direct impacts to <10 ha of ETS <sup>1</sup> /habitat; higher impacts to forest blocks and watercourses than Howard Ave option
<b>Improve Regional Mobility</b>	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic	Provides new freeway route; limited improvement for local Windsor area int'l traffic
<b>Cost</b>	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;	Comparable to other options for cost and constructability;
<b>Conclusions</b>	Laurier Drive alternatives impact LaSalle's future urban area and carry higher natural environment impacts; Alternatives that follow urban boundary have higher direct impacts to existing residential area at Victory Street; the impacts to the planned Town Centre for LaSalle are considered to be of higher significance so Laurier Drive alternatives are least preferred; Howard Avenue alternative following LaSalle future urban boundary identified as having slightly fewer impacts to community characteristics, land use, cultural resources and natural environment. <b>Route Segment CC-CF-CH is preferred.</b>			

<sup>6</sup> Endangered or Threatened Species

## Plazas

### Plaza CS1

Plaza CS1 is proposed on the central section of Fighting Island. The best way to Crossing X5/Plaza CS1 has been determined as the combination of route segments CC-CD-CF-CG-SM, which is also the preferred alignment for connecting to Plaza CS2.

Fighting Island is a natural island on the Canadian side of the Detroit River (refer to Exhibit 3.2). The island is approximately 600 ha (1600 acres) in size and is owned by BASF Corporation. The north end of the island includes a restored wetland area, designated as a Provincially Significant Wetland and Environmentally Sensitive Area, as well as training and conference facilities for BASF employees. Plaza CS1 is sited on the middle section of the island. The middle and southern sections of the island has been used since the 1920's for disposal of alkaline waste. The waste was pumped as slurry and contained in settling basins formed by dykes and berms. The waste reportedly ranges in thickness between 0.5 m and 11m. Constructing a plaza on Fighting Island would require removal/remediation of the waste material to enable construction of the plaza. Based on a preliminary analysis of information provided by BASF, it is unlikely that any major waste removal/remediation would be permitted by Ontario Ministry of the Environment for redevelopment or reuse of the island. Construction of a plaza on Fighting Island, therefore, would require removal of the waste material to other parts of Fighting Island and importing of materials suitable for construction. The constructability of a plaza and connecting roadway in this manner has significant risks, as the nature and extent of preparation of the bottom of the settling ponds to contain the waste material is unknown; it is quite likely that the waste material was pumped directly onto the marshland peat layer. The uncertainties and construction risks associated with an inspection plaza on the island for a new border crossing of such importance to Canada and the U.S., together with the potential for enormous additional costs and time requirements associated with construction and maintenance of a plaza on the island, lead the Canadian Team to conclude that Plaza CS1 and Crossing X5 are not practical and this alternative was not recommended for further study.

### Crossings

Crossing X6 is a multi-span structure crossing the northern section of Fighting Island and connecting directly to U.S. Plaza AC1. Additional investigation by the U.S. Team has identified that Plaza AC1 is not practical, due to unacceptable impacts to the operations of National Steel associated with this proposed plaza site (for more information, refer to U.S. Analysis Results, under separate cover). Therefore, Crossing X6 was not recommended for further study.

**EXHIBIT 3.2: FIGHTING ISLAND (LOOKING SOUTH) - LOCATION OF PLAZA CS1.  
CROSSINGS X3, X4, X5 AND X6 ALSO PROPOSED TO CROSS THE ISLAND.****3.1.2. Analysis Results**

The following summarizes the results of the Canadian side impacts analysis for crossing alternatives X1, X2, X3 and X4 with their associated plaza and connecting route to Highway 401. The impact analysis is organized according to the seven performance factors developed for the project. Each performance factor incorporates many criteria, indicators and measures to provide a complete assessment of the nature and extent of the impacts and benefits of the crossing, plaza and connecting routes.

**Changes In Air Quality**

At the illustrative alternatives stage, the assessment of impacts to air quality considered the predicted change to regional air quality with a new or expanded crossing as compared to the do-nothing or 'no build' scenario. The pollutant burdens were calculated for the following pollutants and precursors: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulphur oxides (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), particulate matter less than 2.5 microns (PM<sub>2.5</sub>) (which includes Diesel Particulate Matter (DPM)), and volatile organic compounds (VOC), as well as the following air toxics: benzene, acetaldehyde, formaldehyde, 1,3-butadiene, acrolein, and polycyclic aromatic hydrocarbons (PAH). These contaminants were selected because they represent the greatest potential for off-site impacts due to tailpipe or roadway surfaces. All of the species listed above are emitted in vehicle exhaust. Fugitive dust, including fine particulate matter, such as PM<sub>10</sub> and smaller is also emitted from roadway surfaces as vehicles travel over them.

The analysis identified that crossing X1 and X4 alternatives would have little change in the regional air quality, while crossing X2 and X3 alternatives had a low impact to regional air quality due to small to moderate increases in total loadings on a system-wide basis. The potential effects on local air quality are addressed in the assessment of impacts to community and neighbourhood characteristics, and are reflected in the analysis of disruption to sensitive receivers discussed in the next section.

## Protection of Community/Neighbourhood Characteristics

The assessment of impacts to community and neighbourhood characteristics included an assessment of traffic impacts (volume of international traffic on local streets and impacts to access); potential noise impacts; impacts to community cohesion and character; and acquisitions.

A new crossing plaza and connecting route is considered to have a low impact to the rural character and cohesion of this area of Essex County. The number of homes displaced (11 for X1, 12 for X2 and 13 for X3) and businesses displaced (one or two for these three alternatives) is considered low. An area of residential disruption common to all routes was identified in south Windsor, near the Highway 3 interchange; a residential subdivision is adjacent to the existing Highway 401 right-of-way; improvements to Highway 401 in this area would disrupt approximately 52 homes within 250 metres of the right-of-way. In total, for the Crossing X1, X2 and X3 alternatives, 90 to 100 households from Highway 401 to the river will be disrupted (i.e. will be within 250 m of the new facilities). As many as 6 agricultural operations will be displaced (loss of building complexes), although many more operations will be disrupted (partial land taking). No specialty crop operations are impacted.

With the Crossing X4 alternative, Plaza CS4 (shown in Exhibit 3.3) is situated within the designated future urban boundary of LaSalle on a site that is presently open field. Adjacent land uses are primarily residential, although some natural features (woodlots) and the Essex Golf and Country Club are also nearby. A plaza site in this area is incompatible with the adjacent land uses, and the site offers little flexibility for future expansion. Approximately 80 households would be displaced and over 380 households would be disrupted (i.e. within 250 m of the ROW along the entire alignment including the plaza and crossing). Most of this impact is associated with impacts to Victory Street and the location of the plaza in the urban area of LaSalle. Sandwich Secondary School and Essex Golf and Country Club would be disrupted along this alignment, while 16 farm operations within 250 m of the ROW would be disrupted by this option, including small greenhouse operations located on Front Street. Shoreline impacts between the plaza and the river associated with the crossing include an arena, approximately 20 residences, 2 marinas, and 6 small businesses.



**EXHIBIT 3.3: LOOKING WEST AT PLAZA CS4.****Maintain Consistency with Existing and Planned Land Use**

The Crossing X1, X2 and X3 alternatives, together with the plazas CS2 and CS3 and the connecting routes are all considered to be generally consistent with existing and planned land uses as these alternatives are situated in rural and agricultural areas of LaSalle and Amherstburg.

The Crossing X4 alternative is not consistent with land use; plaza CS4 lies within the urban area boundary of LaSalle, and is located on lands designated for residential development. Crossing X4 is also located in the urban area boundary of the Town of LaSalle and will have a higher impact on future residential land use development than the other southern alternatives.

**Protect Cultural Resources**

The southern alternatives pass through primarily rural land uses which are not disturbed by development; these alternatives therefore carry a greater potential to impact areas of archaeological potential than those alternatives that affect developed areas, or areas which have been highly disturbed. The areas of higher potential are typically associated with watercourses and shoreline areas along the Detroit River. The Crossing X1 alternative (including Plaza CS3 and the connecting route) will affect three known archaeological sites; over 25 percent of the length of this alternative impacts areas of high archaeological potential. The Crossing X2 and X3 alternatives (including plaza site CS2 and the connecting route) affect one archaeological site and over 50% of the length of these alternatives impact areas of high archaeological potential. Similarly, the Crossing X4 alternative (including plaza site CS4 and the connecting route) affects one archaeological site and over 50% of the length of these alternatives impact areas of high archaeological potential.

## Protect the Natural Environment

The Crossing X1 alternative generally avoids direct impacts to designated natural features. However, it would result in the loss of approximately 22 hectares of undesignated natural heritage features, including the Detroit River. This option is considered to have a moderate impact to the natural environment.

The Crossing X2 alternative is considered to have a high impact to the natural environment; it directly impacts Detroit River Marshes Provincially Significant Wetland (PSW) and Environmentally Significant Area (ESA) and would result in the loss of approximately 55 hectares of natural heritage features (both designated and undesignated features).

The Crossing X3 alternative directly impacts Detroit River Marshes Provincially Significant Wetland (PSW) and Environmentally Significant Area (ESA) and would result in the loss of approximately 33 hectares of natural heritage features (both designated and undesignated features). This option is considered to have a moderate impact to the natural environment.

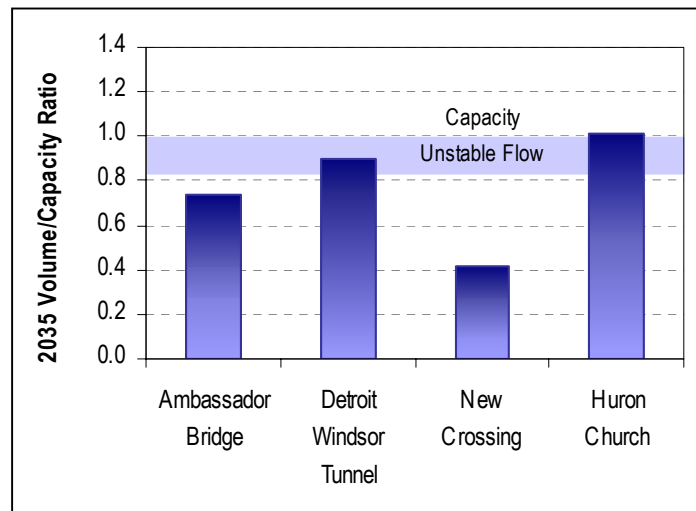
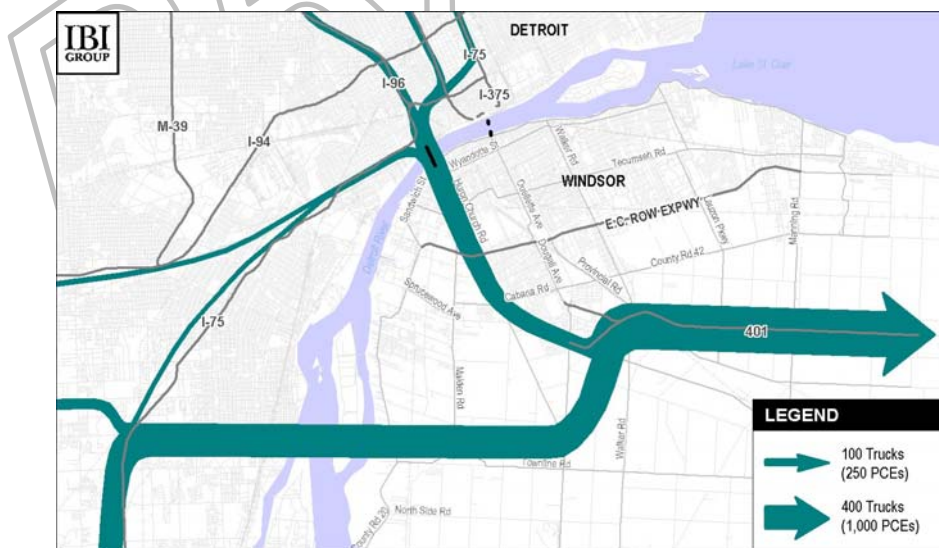
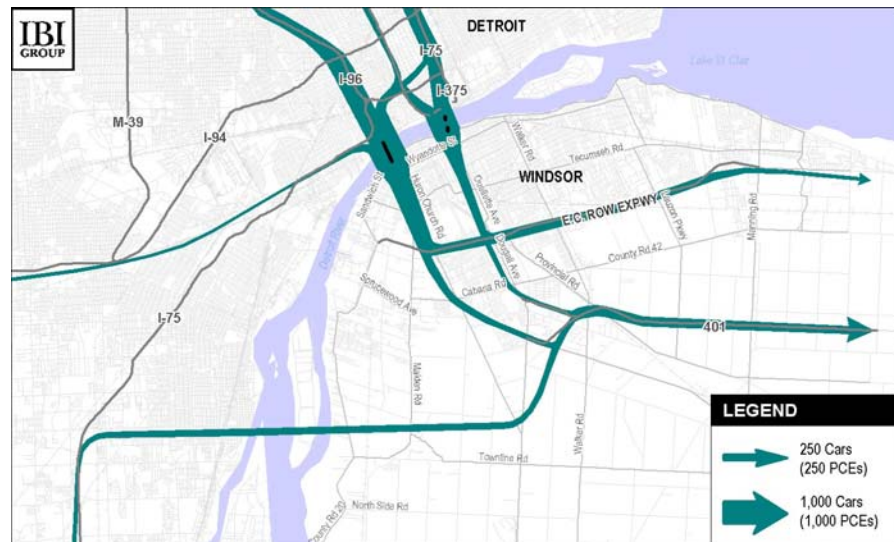
The Crossing X4 alternative is considered to have a high impact to the natural environment. This alternative directly impacts Detroit River Marshes Provincially Significant Wetland (PSW) and Environmentally Significant Area (ESA) and Fighting Island Wetland PSW and ESA; it would result in the loss of approximately 21 hectares of natural heritage features (both designated and undesignated features).

## Improve Regional Mobility

The assessment of improvements to regional mobility is based on a number of criteria and measures, including traffic operations on key roadway links for the study horizon year of 2035 including the existing crossings and roadways serving those crossings and changes in travel time and distance, as compared to the do-nothing or no-build alternative. The southern alternatives share a common connection point to Highway 401 at the Highway 3 interchange; from this point, the alternatives head southwesterly towards the Detroit River. These alternatives avoid the urban areas of Windsor, LaSalle and Tecumseh. An analysis of traffic projections based on origin-destination pairings for year 2035 (the horizon year of this study) identified that the southern alternatives offer a limited improvement to regional mobility in comparison to other alternatives. This assessment is based on a review of several indicators:

- A new crossing in the southern area of the Detroit River would provide some improvement to the regional road network by providing additional capacity to the border transportation network (refer to Exhibit 3.4); without this additional capacity, the Partnership's analysis identifies that the existing crossings would reach capacity by year 2022, resulting in severe congestion and delay for all international truck and auto traffic, for both long-distance and local trips;
- A new crossing in the southern area would serve the long-distance truck and auto trips that are passing through the Windsor/Essex County-Detroit/Wayne County region. This represents approximately 50% of international truck trips, and less than 10% of the auto trips using the border crossings.

**EXHIBIT 3.4: 2035 TRAFFIC VOLUMES AND VOLUME TO CAPACITY RATIOS OF KEY NETWORK COMPONENTS WITH SOUTHERN ALTERNATIVES**



- The 50% of truck trips and over 90% of auto trips originating in and/or destined to either Windsor or Detroit (referred to as local trips) that would continue to use the existing crossings represents such a substantial volume that the existing crossings, and the roads serving these crossings, would operate over capacity during daily peak periods in 2035. (It should be noted that for free-flow facilities, V/C ratios greater than 0.85 indicate the facility is operating near capacity (unstable flow), while ratios greater than 1.0 indicate a breakdown in the system.) The Detroit-Windsor Tunnel, which predominantly serves auto trips between Windsor and Detroit, and Huron Church Road serving the Ambassador Bridge, would experience congestion and delays on a daily basis. Such conditions are considered unacceptable impacts to the regional road network in the Windsor area. Additional transportation improvements would be required to address the need for additional capacity at the existing crossings and on the key connecting roadways in the urban area of Windsor.
- In contrast, the new crossing would operate well below capacity during peak travel periods; diverting trips to the new crossing to improve the utility of the new crossing would require a major shift in local travel patterns and create substantial out-of-way travel for local Windsor/Detroit trips.

### Minimize Cost

The assessment of cost also includes consideration of constructability and technical risks associated with each alternative. The southern alternatives pass through rural agricultural areas; construction of a new freeway in such areas can be accomplished for a lower cost than through urban areas. As well, the plazas were generally sited on open lands without substantial structures to remove or relocate.

Plazas CS2 and CS3 are located in rural areas of the Town of LaSalle and Amherstburg, respectively. The sites are primarily agricultural lands inland from the shoreline of the Detroit River. Providing the required services (power, water, water treatment) to these plaza sites was identified as being a cost/timing issue for the construction of these sites.

Crossings X3 and X4 impact leased mining areas; crossing X1 is located close to one unspecified well; these subsurface aspects of the crossings will require careful consideration, but are not considered of such import to preclude a structure in these locations.

Generally, the length of the river crossings was not considered a cost disadvantage of the southern crossing options. The construction of the multi-span sections in the Detroit River was assumed to coincide with the construction of the main span over the shipping channel in the middle of the river. So although these options are longer, the time required to construct these options was not found to be unreasonable in comparison to the other options. In addition, although the southern crossings are longer, the cost of the southern crossings, which include several simple span structures and a main span over the shipping channel to provide the required navigational clearances, were found to be comparable to shorter, but more complex suspension bridge or cable-stayed spans proposed for the narrower sections of the river.

The preliminary costs for the connecting route, plaza and one-half of the river crossing of were estimated in a range between approximately CDN\$1200 million and CDN\$1600 million, with crossing X2 and X3 alternatives estimated to be approximately 25% higher in cost than alternatives X1 and X4; crossing X4 alternative is shorter than the other alternatives, but would require construction of bridge piers on or adjacent to Fighting



Island, which has high constructability risks. The other alternatives require longer structures over the river, which also carries constructability risks.

### 3.1.3. Summary

Crossings X5 and X6 were found to be not practical based on information collected as part of the illustrative alternatives assessment; it was recommended that these alternatives not be carried forward for further study.

The southern alternatives offer limited benefits to the transportation network in the Windsor-Essex County region, and result in traffic congestion and delay during peak travel periods in year 2035 (the horizon year of this study), particularly at the Detroit-Windsor Tunnel, and on Huron Church Road leading to the Ambassador Bridge. Improving system connectivity to enhance the continuous flow of people and goods is a primary objective of this project. While these alternatives generally avoid urban areas and neighbourhoods, the poor performance in improving regional mobility is a significant disadvantage of all southern alternatives.

Crossing X4 alternative impacts a residential area in the urban area of LaSalle in the vicinity of the plaza and crossing; crossing X2 and X3 alternatives have greater impacts to designated natural features than Crossing X1 alternative. Crossing X1 and X4 alternatives would have little change in the regional air quality, while crossing X2 and X3 alternatives had a low negative impact.

The southern alternatives were considered to each have similar cost and constructability impacts.

Based on the results of this analysis, the Canadian Project Team recommended that the southern alternatives not be considered for further analysis.

## 3.2. East Alternative – Crossing X15

### 3.2.1. Description

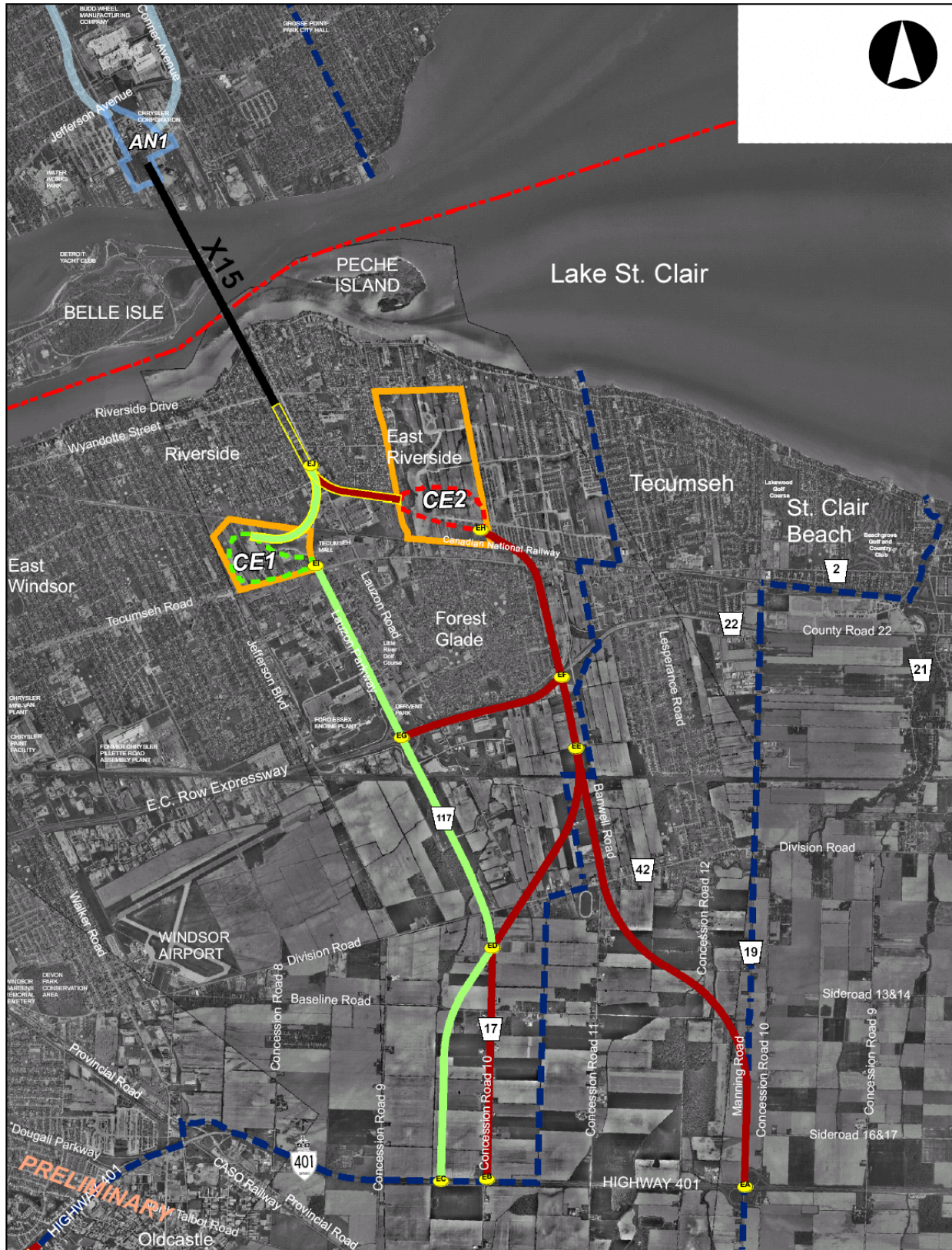
The best way to Crossing X15 has been determined as the combination of route segments EC-ED-EG-EI to Plaza CE1 (refer to Table 3.4). This route generally follows the alignment of Lauzon Parkway/Lauzon Road (see Exhibit 3.5). The proposed plaza site for this alternative is located north of Tecumseh Road west of Lauzon Road in an area currently occupied by 'big box' commercial uses, including Wal-Mart, Home Depot, Rona and other ancillary retail. The alignment of the crossing X15 is parallel to and adjacent to Lauzon Road. Due to the location of the shipping channel relative to the shoreline in this area of the Detroit River, a bridge crossing designed to provide the required navigational clearances would extend inland approximately 800 m. This area of the Detroit River features Belle Isle, a 390 ha (980 acre) urban park owned by the City of Detroit on the American side of the river, and Peche Island, a small day-use only provincial park on the Canadian side of the river.



**TABLE 3.4: SUMMARY OF ASSESSMENT OF EASTERN ROUTE SEGMENTS – CONNECTION TO CROSSING X15**

Factor	Con Rd 10/Lauzon Pkwy (EC-EG-EJ) to Plaza CE1	Manning Road/Banwell Road (EA-EF-EJ) to Plaza CE2	Manning Road/EC Row/Lauzon Pkwy (EA-EF-EG-EJ) to Plaza CE1	Con Rd 10/EC Row/Banwell Road (EC-EG-EH-EJ) to Plaza CE2
<b>Changes to Air Quality</b>	Small to moderate increase in pollutants on a system-wide basis;	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis	Small to moderate increase in pollutants on a system-wide basis
<b>Community and Neighbourhood Impacts</b>	Impacts urban areas of east Windsor north of EC Row; south of EC Row, impacts to agricultural area; following rear lot lines west of Con Rd 10 avoids impacts to 8 residences and 13 farm complexes fronting this road <b>Displacements:</b> 380+ households 15+ Businesses; <5 Farm Building Complexes <b>Disruption:</b> 1140+ households within 250 m of centreline; <75 businesses; <5 farm building complexes	Impacts urban areas of east Windsor north of EC Row; south of EC Row, impacts to agricultural area <b>Displacements:</b> 1030+ households <35 Businesses; <5 Farm Building Complexes <b>Disruption:</b> 1610+ households within 250 m of centreline; <10 businesses; <15 farm building complexes	Impacts urban areas of east Windsor north of EC Row; south of EC Row, impacts to agricultural area <b>Displacements:</b> 1020+ households 30+ Businesses; 5+ Farm Building Complexes <b>Disruption:</b> 1980+ households within 250 m of centreline; <10 businesses; <5 farm building complexes	Impacts urban areas of east Windsor north of EC Row; south of EC Row, impacts to agricultural area; following rear lot lines west of Con Rd 10 avoids impacts to 8 residences and 13 farm complexes fronting this road <b>Displacements:</b> 390+ households 15+ Businesses; <5 Farm Building Complexes <b>Disruption:</b> 1570+ households within 250 m of centreline; <75 businesses; <15 farm building complexes
<b>Consistency with Land Use</b>	Consistent with land uses south of EC Row; Plaza and route north of EC Row is not consistent with existing and planned land uses (residential/retail commercial)	Consistent with land uses south of EC Row; Plaza and route north of EC Row is not consistent with existing and planned land uses (residential/retail commercial); greater impacts to land use than Lauzon Pkwy options	Consistent with land uses south of EC Row; Plaza and route north of EC Row is not consistent with existing and planned land uses (residential/retail commercial)	Consistent with land uses south of EC Row; Plaza and route north of EC Row is not consistent with existing and planned land uses (residential/retail commercial); greater impacts to land use than Lauzon Pkwy options
<b>Impacts to Cultural Resources</b>	No known significant archaeological sites impacted; low to moderate potential for impacting unknown sites	1 known significant archaeological sites impacted; low potential for impacting unknown sites	No known significant archaeological sites impacted; low potential for impacting unknown sites	1 known significant archaeological sites impacted; low potential for impacting unknown sites
<b>Natural Environment</b>	Avoids designated Environmentally Significant Area but directly impacts 2+ha ETS/habitat	Proximity impacts to 15+ ha designated Environmentally Significant Area; directly impacts 4+ha ETS/habitat	Proximity impacts to 15+ ha designated Environmentally Significant Area; directly impacts 4+ha ETS/habitat	Proximity impacts to 15+ ha designated Environmentally Significant Area; directly impacts 2+ha ETS/habitat
<b>Improve Regional Mobility</b>	Provides new freeway route; limited improvement for local and long distance int'l truck traffic	Provides new freeway route; limited improvement for local and long distance int'l truck traffic; EA-EE-EF segment noted as being substantially more direct than the EC-EE-EF segment, reducing vehicle-km and vehicle-hours	Provides new freeway route; limited improvement for local and long distance int'l truck traffic; utilizes a portion of EC Row for international traffic; lower ability to provided continuous capacity for international traffic; EA-EE-EF segment noted as being substantially more direct than the EC-EE-EF segment, reducing vehicle-km and vehicle-hours	Provides new freeway route; limited improvement for local and long distance int'l truck traffic; utilizes a portion of EC Row for international traffic; lower ability to provided continuous capacity for international traffic; EA-EE-EF segment noted as being substantially more direct than the EC-EE-EF segment, reducing vehicle-km and vehicle-hours
<b>Cost</b>	Lower costs in comparison to other options for cost and constructability; 1 complex interchange at E.C. Row	Lower costs in comparison to other options for cost and constructability; 1 complex interchange at E.C. Row	Substantially higher costs and constructability risks in comparison to other options associated with widening and 2 complex interchanges at EC Row;	Substantially higher costs and constructability risks in comparison to other options associated with widening and 2 complex interchanges at EC Row;
<b>Conclusions</b>	All options resulted in high community impacts to area north of EC Row and overall low benefits to regional mobility. The route segments that did not use a portion of EC Row were preferred over other alternatives due to lower community and cost impacts and greater mobility benefits; Con Rd 10/Lauzon Parkway option has lower impacts to existing and planned land uses and natural features. <b>Route Segment EC-EG-EJ to Plaza CE1 is preferred</b>			

EXHIBIT 3.5: EAST ALTERNATIVE – CROSSING X15





### 3.2.2. Analysis Results

The following summarizes the results of the Canadian side impacts analysis for crossing X15 alternative with the associated plaza and connecting route to Highway 401. The impact analysis is organized according to the seven performance factors developed for the project. Each performance factor incorporates many criteria, indicators and measures to provide a complete assessment of the nature and extent of the impacts and benefits of the crossing, plaza and connecting route.

#### Changes In Air Quality

At the illustrative alternatives stage, the assessment of impacts to air quality considered the predicted change to regional air quality with a new or expanded crossing as compared to the do-nothing or 'no build' scenario. The pollutant burdens were calculated for the following pollutants and precursors: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulphur oxides (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), particulate matter less than 2.5 microns (PM<sub>2.5</sub>) (which includes Diesel Particulate Matter (DPM)), and volatile organic compounds (VOC), as well as the following air toxics: benzene, acetaldehyde, formaldehyde, 1,3-butadiene, acrolein, and polycyclic aromatic hydrocarbons (PAH). These contaminants were selected because they represent the greatest potential for off-site impacts due to tailpipe or roadway surfaces. All of the species listed above are emitted in vehicle exhaust. Fugitive dust, including fine particulate matter, such as PM<sub>10</sub> and smaller is also emitted from roadway surfaces as vehicles travel over them.

The analysis identified that crossing X15 alternative would have little change in the regional air quality as compared to the do-nothing scenario. The potential effects on local air quality are addressed in the assessment of impacts to community and neighbourhood characteristics, and are reflected in the analysis of disruption to sensitive receivers discussed in the next section.

#### Protection of Community/Neighbourhood Characteristics

The assessment of impacts to community and neighbourhood characteristics included an assessment of traffic impacts (volume of international traffic on local streets and impacts to local access); potential noise impacts; impacts to community cohesion and character; and displacements/acquisitions.

The area of Windsor north of E.C. Row (shown in Exhibit 3.6) is heavily urbanized, featuring residential, commercial and industrial uses. Lauzon Parkway is a major arterial road serving the Ford Essex Engine Plant, situated in the northwest quadrant of the E.C. Row/Lauzon Parkway interchange. Along the west side of Lauzon Parkway north to Tecumseh Road, are a mix of supplier plants, tool and die operations and commercial businesses that, in part, support the engine plant. East of Lauzon Parkway is a mix of residential areas and open space.

North of Tecumseh Road to the river, the land uses are primarily residential, with supporting retail uses. The Riverside community is an established residential neighbourhood, with schools, places of worship, commercial areas, libraries and other community features. East Riverside is a new community currently being developed north

of Tecumseh Road. Construction is currently in progress on a large (1500 unit) residential subdivision, with schools parks and other amenities.

Crossing X15 alternative would have a high impact to community/neighbourhood characteristics in Windsor. According to Census Canada data, the proposed ROW would displace approximately 570 households and over 2600 households would be disrupted (i.e. are within 250m of the ROW along the entire alignment including the plaza and crossing). In addition, approximately 40 businesses would be displaced and another 42 businesses would be disrupted. There are four institutional uses that will potentially be displaced, and 12 farm complexes are within 250 m of the proposed ROW.

### EXHIBIT 3.6: LAUZON PARKWAY – FROM DETROIT RIVER, LOOKING SOUTH.



### Consistency with Existing and Planned Land Use

The Lauzon Road/Manning Road area of Windsor and Tecumseh is a mix of rural and urban uses. South of E.C. Row Expressway, the land uses are primarily rural, lightly populated, with active agricultural operations and some small businesses. The area south of E.C. Row along Lauzon Road has been designated as a future employment area; the City of Windsor recently annexed lands in this area from the Town of Tecumseh, in part to provide additional employment lands for the City. The lands between Windsor Airport and Lauzon Road were identified in the City of Windsor *Gateway Report*<sup>7</sup> as a proposed intermodal facility. East of Lauzon Road, along the Manning Road/Banwell Corridor, the Town of Tecumseh is planning continued growth of residential subdivisions. Servicing agreements are being finalized with City of Windsor enabling expansion of residential development in this area south of E.C. Row Expressway/County Road 22.

The proposed connecting road to crossing X15 impacts the Forest Glade North Planning Area. The area is segmented into a business park and commercial centre. Significant

<sup>7</sup> Windsor Gateway Report, dated January 2005, Prepared by Sam Schwartz Engineering PLLC

commercial development has occurred along Tecumseh Road and Lauzon Road. The plaza and crossing impacts an established residential and neighbourhood commercial area.

A new border crossing facility is not compatible with existing and planned land uses in the area of Windsor north of E.C. Row Expressway. South of E.C. Row, a new transportation facility is not as disruptive and in fact is compatible with local plans by the City of Windsor for a new connection between E.C. Row and Highway 401 to improve access to east Windsor and the employment areas in this part of the city.

## Protect Cultural Resources

No archaeological or built heritage features are expected to be impacted the alignment, crossing, or plaza. However, several parks, including Kiwanis Park at the riverfront and Derwent Park at E.C. Row/Lauzon Parkway, would be disrupted by the new facility.

## Protect the Natural Environment

This alternative does not impact any provincially significant wetlands or environmentally sensitive areas; it directly impacts three Candidate Natural Heritage Sites and would result in the loss of approximately 13 hectares of natural heritage features (both designated and undesignated features). This alternative is considered to have a low impact to natural environment.

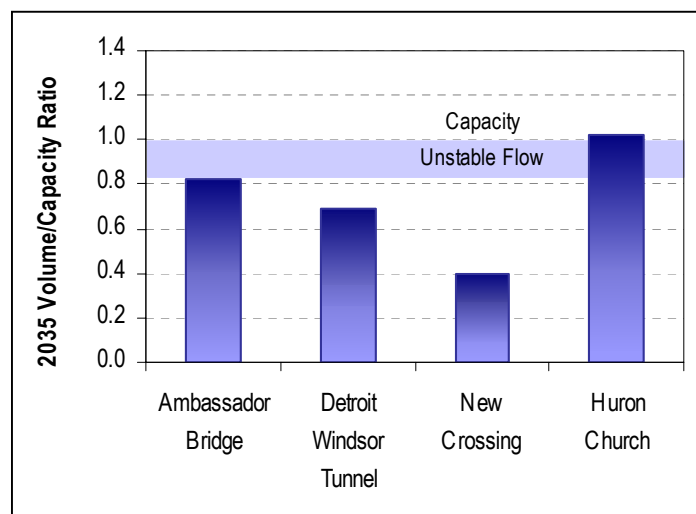
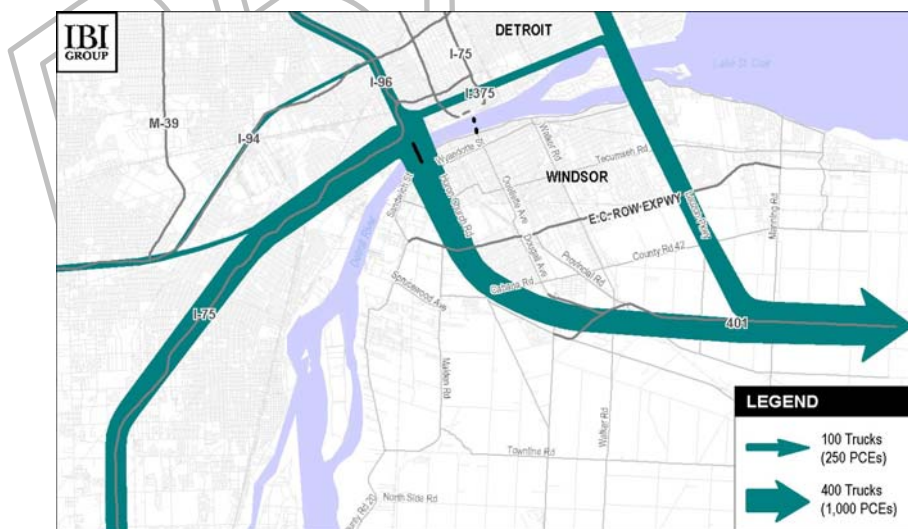
## Improve Regional Mobility

The assessment of improvements to regional mobility is based on a number of criteria and measures, including traffic operations on key roadway links for year 2035 (the horizon year of this study) including the existing crossings and roadways serving those crossings and changes in travel time and distance, as compared to the do-nothing or no-build alternative. The east alternative is situated on the east side of Windsor, near the border with Tecumseh. Presently, there is no major transportation facility connecting Highway 401 to the river in this area of the city. An analysis of traffic projections based on origin-destination pairings for year 2035 (the horizon year of this study) identified that an eastern alternative offers limited improvement to regional mobility in comparison to other alternatives. This assessment is based on a review of several indicators:

- A new crossing in the eastern area of the Detroit River would provide some improvement to the regional road network by providing additional capacity to the border transportation network (refer to Exhibit 3.7); without this additional capacity, the existing crossings would reach capacity by year 2022, resulting in severe congestion and delay for all international truck and auto traffic, for both long-distance and local trips; (It should be noted that for free-flow facilities, V/C ratios greater than 0.85 indicate the facility is operating near capacity (unstable flow), while ratios greater than 1.0 indicate a breakdown in the system.)
- An eastern crossing would serve a portion of the international truck and auto traffic (both long-distance and local), however by 2035, the travel demand on Huron Church approaching Ambassador Bridge would exceed the capacity of the roadway, resulting in congestion on this facility during peak travel periods; operations on the Ambassador Bridge itself would be approaching unstable flow on this crossing, within a few years beyond 2035, the Ambassador Bridge would be operating near capacity.



**EXHIBIT 3.7: 2035 TRAFFIC VOLUMES AND VOLUME TO CAPACITY RATIOS OF KEY NETWORK COMPONENTS WITH EAST ALTERNATIVE**



- In contrast, the new crossing with new freeway connections to Highway 401 and I-94 would operate well below capacity during peak travel periods; diverting trips to the new crossing to alleviate the existing crossing and improve the utility of the new crossing would require a substantial shift in travel patterns and create out-of-way travel for local Windsor/Detroit trips.

The plaza site is adjacent to residential and retail commercial uses which is not desirable, and has limited flexibility for future expansion without very significant property takings and disruption to community facilities.

Based on the performance of the crossings, plaza and connecting roads, this alternative was considered to have a low benefit to regional mobility.

### Minimize Cost

The assessment of cost also includes consideration of constructability and technical risks associated with each alternative. The cost of the east alternative is notably greater than that of several other alternatives, primarily due to the length of the crossing at this section of the river (approximately 1500 m (0.9 mi) wide) and the substantially higher property costs and construction costs associated with constructing a major transportation facility in an urban area, including greater impacts to residences, businesses and other existing uses, utility relocation costs and mitigation. The cost of the east alternative, including the connecting roadway, plaza and one-half the crossing cost, is estimated as approximately \$1650 Million (CDN). The constructability of this alternative would be highly affected by traffic/utility management and maintaining safety and access for people and traffic during construction.

### 3.2.3. Summary

With the east alternative, a new transportation facility would not provide adequate benefits to regional mobility. The existing crossings and key roads serving these crossings would operate at or near capacity during peak travel periods within the planning horizon of this study. Additional transportation improvements would be required to address the need for additional capacity at the existing crossings and on the key connecting roadways in the urban area of Windsor.

In addition to poor regional mobility performance, the east alternative was found to be not compatible with the established residential character of east Windsor, particularly north of E.C. Row Expressway. A new crossing and plaza in the riverfront area of east Windsor would have high impacts to the community. South of E.C. Row, a new road connection to Highway 401 was found to have little impact to community character and a fair degree of compatibility with current and future land uses.

## 3.3. Rail Corridor Alternatives – Crossings X13 and X14

The use of the former CASO rail corridor was considered in two ways: first, the Project Team considered the Detroit River Tunnel Partnership (DRTP) proposal for a two-lane truckway connecting to the refurbished rail tunnel; the Project Team also considered the use of the rail corridor for a new six-lane freeway connecting Highway 401 in Windsor to a new river crossing (bridge or tunnel) also connecting to the freeway system in Detroit. The rail corridor is identified in Exhibit 3.8.

### 3.3.1. Crossing X13 (DRTP Proposal)

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 truckway project. DRTP had begun to prepare an environmental assessment in accordance with the Canadian Environmental Assessment Act (CEAA).

#### Connecting Route

DRTP is a partnership between two major private enterprises, Canadian Pacific Railway and Borealis Transportation Infrastructure Trust. CP Rail controls the operating rights on the rail corridor that extends from the Detroit River southerly to Highway 401 and beyond (segments CB-CL-CS).

A new truck route on the Canadian side will be built along the rail corridor from the existing tunnels to Highway 401. The truckway will make use of available portions of the rail right-of-way north of the Van der Water Yard. South of the Yard, the proposal will use the entire rail right-of-way by taking the CASO rail line out of service.

DRTP owns the rail corridor and additional properties adjacent to the rail corridor. Some additional property is required on the Canadian side in the vicinity of proposed grade separations at Howard Avenue, Walker Road, Cabana Road and 6th Concession Road.

#### Plaza

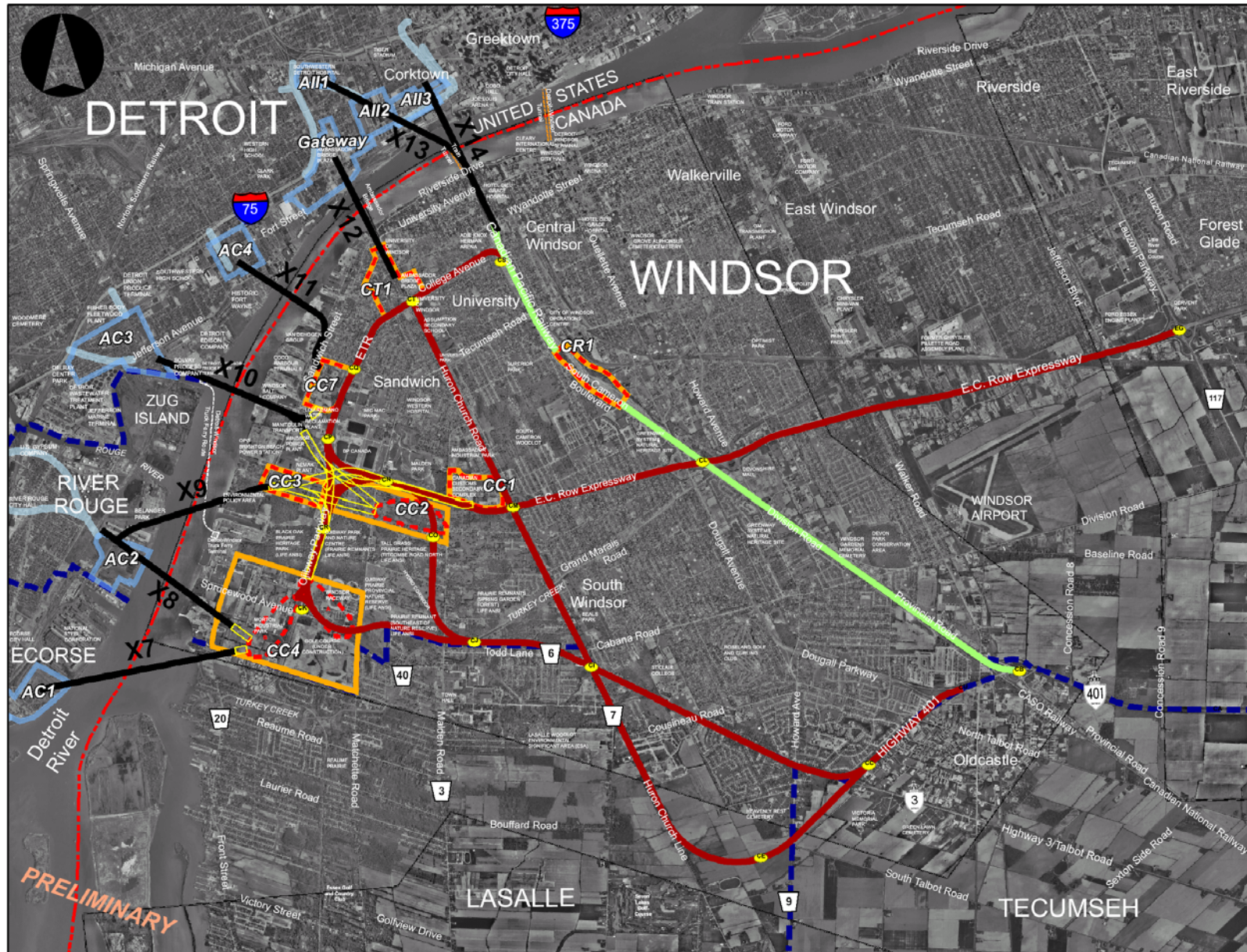
One DRTP proposal features a joint customs facility providing for both Canadian and American border inspection agencies on the Canadian side in the existing rail yard area, south of Tecumseh Road. However, there is presently no legislation to allow for such a border inspection regime. DRTP is also developing a proposal for customs facilities (primary and secondary inspections) on both sides of the border to reflect current border inspection processes. This study considered a conventional border inspection regime, with inspection facilities provided on both sides of the border, and the Canadian plaza in the Van der Water Yard south of Tecumseh Road.

#### Crossing

DRTP proposes to reconfigure the existing twin-tube rail tunnel situated between the Ambassador Bridge and Detroit-Windsor Tunnel for use by trucks. This will require enlarging the inside of the Canada-bound rail tube to accommodate truck traffic. DRTP proposes to construct a new high clearance rail tunnel west of the existing rail tunnel.



EXHIBIT 3.8: RAIL CORRIDOR ALTERNATIVES – CROSSINGS X13 AND X14





## Summary of Analysis

### Changes to Air Quality

The analysis identified that a truckway in the rail corridor would have little change in the regional air quality as compared to the do-nothing scenario. The potential effects on local air quality of a truckway are addressed in the assessment of impacts to community and neighbourhood characteristics, and are reflected in the analysis of disruption to sensitive receivers discussed in the next section.

### Protection of Community and Neighbourhood Features

Approximately 1300 homes and over 70 businesses would be disrupted by the truckway (i.e. within 250 m of centreline).

In terms of property impacts, the rail corridor is approximately 20 metres wide, which would be generally sufficient to accommodate a two-lane truckway. Additional property may be required to accommodate a two-lane truckway and maintain a single-track rail line south of E.C. Row Expressway.

Some property takings would be required at grade separations at Howard Avenue, Walker Road, 6th Concession Road and Cabana Road. Traffic will be disrupted during construction of the grade separations due to lane restrictions/road closures, which would impact local access; the timing of the construction of these grade separations will require staging to enable reasonable east-west access across the rail line.

DRTP have also identified an access connection at E.C. Row Expressway. Depending on the final design of this connection, a new interchange on the truckway at E.C. Row Expressway could have substantial property impacts in this area which is currently occupied by residential and major retail uses as well as a large scrap yard.

### Maintain Consistency with Existing and Planned Land Uses

A large impact associated with the truckway option is that it would create a second major north-south transportation corridor (in addition to Huron Church/Talbot Road) through the urban area of south/west Windsor. The existing rail corridor passes through a mix of industrial, commercial and residential land uses.

South of E.C. Row Expressway, the Provincial Road area represents one of the major retail areas in Windsor (others being the downtown and central area, and Lauzon Parkway & Tecumseh Road). The corridor is anchored by Devonshire Mall, the largest shopping centre in Southwestern Ontario, as well as the Roundhouse Plaza, which is an agglomeration of 20 stores and restaurants. The Provincial Road area also includes an outlet of most of the "big box" retailers (including Toy's R Us, Staples, Future Shop, Sears), as well as most of the major auto dealers, and numerous smaller chains and local retail service businesses.

The DRTP truckway is not compatible with the surrounding residential and commercial land uses. The City of Windsor's *Area Long Range Transportation Study (WALTS), 1998* considered protection of long-range transportation corridors in and around the City, including corridors required to address needs of international traffic. The *WALTS* report does not identify any long-term transportation corridors through central Windsor. In this

regard, a new international transportation corridor along the DRTP rail corridor into central Windsor is not compatible with existing and planned land uses in this area of the City. Conversion of a low volume rail line to a high volume roadway for international truck traffic passing through the centre of the urban area of the city would represent a significant change to the character of the community. The change to the inter-relationship between residential and commercial uses in the City of Windsor could likely not be mitigated.

### Protect Cultural Resources

Two built heritage features were identified as being potentially impacted by the truckway. Overall there would be a low impact to cultural resources.

### Protect the Natural Environment

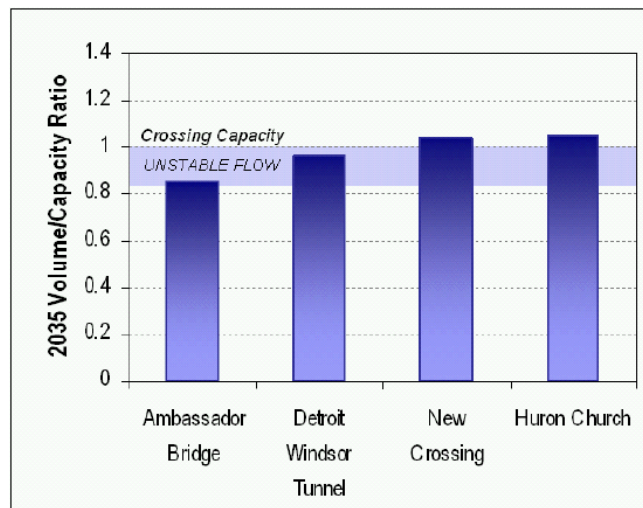
The existing rail corridor does not include any designated natural features, although the Van der water Yard area does include a candidate natural heritage site (CNHS), as designated by the City of Windsor. The truckway would result in the loss of approximately 17 ha of natural features (designated and undesignated) and directly impact over 8 ha of endangered/threatened species habitat.

### Improve Regional Mobility

The DRTP proposal provides one-truck lane of traffic in each direction and is projected to accommodate approximately 15,000 trucks daily in 2035. Given the controlled access nature of the facility and the higher average operating speeds (compared to Huron Church Road), approximately 55% of daily cross-border truck traffic is projected to use this alternative. This alternative exclusively serves truck traffic.

While the DRTP proposal provides additional capacity for trucks, the capacity provided is inadequate in comparison to the total capacity needed to accommodate the growth in travel demand to 2035 (see Exhibit 3.9). This is reflected by projected 2035 volume to capacity (V/C) ratios of 0.92 for the existing crossings, 1.05 for the Rail Corridor and 1.03 for Huron Church Road.

**EXHIBIT 3.9: 2035 VOLUME TO CAPACITY RATIOS OF KEY NETWORK ELEMENTS WITH A TWO-LANE TRUCKWAY IN RAIL CORRIDOR**



It should be noted that for free-flow facilities, V/C ratios greater than 0.85 indicate the facility is operating near capacity (unstable flow), while ratios greater than 1.0 indicate a breakdown in the system. It is concluded then, that the DRTP truckway proposal does not provide sufficient capacity or improvements to meet the long term needs of the border transportation network.

The tunnel crossing itself raises safety and operation concerns due to the restricted clearances for trucks in the refurbished rail tunnel with no options for detours around disabled or damaged trucks.

The Project Team has also examined the effectiveness of the DRTP project if such an alternative is implemented in conjunction with a second new crossing (i.e. building a new bridge/tunnel as well as the DRTP truckway). Two new crossings, in addition to the Ambassador Bridge and Detroit-Windsor Tunnel, would not substantially improve regional mobility, as the traffic would simply distribute itself among the various crossings. However, two new transportation corridors leading to the Detroit River would create a much greater impact to the local communities; details of this assessment are included in the U.S. Analysis Results document, under separate cover.

## Minimize Cost

DRTP has identified the cost of the truckway and new rail tunnel as CDN\$600 Million. DRTP has been seeking to have a portion of these costs paid for by government under Canada-Ontario border infrastructure improvement programs.

The DRTP proposal includes modifications to the interchange at existing Highway 401 to connect the truckway. This connection may require major reconfiguration to provide free flow access to/from the truckway and Highway 401. As well, DRTP has proposed a connection to E.C. Row Expressway to facilitate local truck access.

DRTP has also suggested that tunneling or cut and cover construction of the truckway may reduce the nuisance impacts (air, dust, noise) of the project to adjacent land uses. Tunneling costs are generally 8 to 10 times higher (or more) than at-grade construction on a per kilometre basis. As well, tunneling and cut and cover construction are more complex techniques than at-grade construction. The cost of tunneling or cut and cover construction would greatly increase the cost of the project, as well as the time required to complete the construction. Given the short-term improvement this project provides to the border transportation network, increasing the cost and construction duration of the project could further limit the effectiveness of this project.

## Summary

The DRTP truckway proposal does not provide sufficient capacity to meet the long-term travel demand at the Windsor-Detroit crossing, which is a major objective of this study, and has high community impacts on the Canadian side. It was recommended that this option be eliminated from further consideration in this study.

### 3.3.2. Crossing X14 (Rail Corridor with Freeway and New Crossing)

#### Connecting Route

As part of the generation of illustrative alternatives, the Project Teams developed an option for a six-lane controlled access roadway that makes use of the rail corridor in connecting Highway 401 to the Detroit River.

This alternative utilizes the DRTP rail corridor to connect Highway 401 to the river (shown in Exhibit 3.10). The assessment of this corridor is based on a 6-lane freeway designed for use by both truck and auto traffic; a right-of-way of 80 m was assumed for the freeway connection, which is wider than the existing rail corridor south of E.C. Row. In addition, this assessment has assumed that the use of the rail corridor south of Van der water Yard by CN will be discontinued either through termination of lease agreements between CP and CN, or through agreements worked out through the Rail Rationalization Study being undertaken by the City of Windsor.

#### Plaza

The plaza for this alternative is located on rail yard lands owned by DRTP approximately 2500 m (approx. 1.5 miles) inland from the river.

#### Crossing

The team also assessed six-lane bridge alternative crossing into Detroit. As noted in Chapter 1 of this report, a new freeway tunnel in the area of the rail corridor was determined to be practically infeasible. Concerns with buoyancy (uplift) and the available depth of cover in this area of the river has led the Canadian and U.S. Project Teams to conclude that the risks associated with this type of crossing would likely add significantly to the cost and time to construct.

The new crossing was assumed to be constructed east of the existing rail tunnel, to avoid conflict with the preferred location for a new high clearance rail tunnel west of the existing rail tunnel identified by DRTP. The new bridge at this location is expected to extend inland approximately 450 m.



**EXHIBIT 3.10: DRTP CORRIDOR – FROM DETROIT RIVER LOOKING SOUTH.**

### 3.3.3. Summary of Analysis

#### Changes to Air Quality

At the illustrative alternatives stage, the assessment of impacts to air quality considered the predicted change to regional air quality with a new or expanded crossing as compared to the do-nothing or 'no build' scenario. The pollutant burdens were calculated for the following pollutants and precursors: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulphur oxides (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), particulate matter less than 2.5 microns (PM<sub>2.5</sub>) (which includes Diesel Particulate Matter (DPM)), and volatile organic compounds (VOC), as well as the following air toxics: benzene, acetaldehyde, formaldehyde, 1,3-butadiene, acrolein, and polycyclic aromatic hydrocarbons (PAH). These contaminants were selected because they represent the greatest potential for off-site impacts due to tailpipe or roadway surfaces. All of the species listed above are emitted in vehicle exhaust. Fugitive dust, including fine particulate matter, such as PM<sub>10</sub> and smaller is also emitted from roadway surfaces as vehicles travel over them.

The analysis identified that the rail corridor alternative would have little change in the regional air quality as compared to the do-nothing scenario. The potential effects on local air quality are addressed in the assessment of impacts to community and neighbourhood characteristics, and are reflected in the analysis of disruption to sensitive receivers discussed in the next section.

#### Protection of Community and Neighbourhood Features

On the Canadian side, crossing X14 alternative has a high impact to community and neighbourhood features. Two areas of the rail corridor have substantial property impacts

outside the rail property: between E.C. Row and Highway 401, and north of College Street to the river for a new bridge crossing.

A new 80 m freeway right-of-way would displace the rail corridor as well as the land uses between the rail corridor and Provincial Road. Over 60 businesses would be displaced. As noted in the truckway discussion earlier in this report, the Provincial Road area represents one of Windsor's major retail areas. Devonshire Mall, the largest shopping centre in Southwestern Ontario, as well as the Roundhouse Plaza are in this area. The Provincial Road area also includes an outlet of most of the "big box" retailers (including Toy's R Us, Staples, Future Shop, Sears), as well as most of the major auto dealers, and numerous smaller chains and local retail service businesses. The disruption to this area that would result from a new freeway facility would be a major disruption to the entire retail structure of the Windsor area. While the displaced retailers could find other sites for their businesses, the now-established retail function of the area would be diminished and could not be easily replicated elsewhere.

The displaced and disrupted industrial businesses on Provincial Road include Thyssen Krupp Fabco, which employs 1,100 people, and a number of small to medium-sized industrial businesses. The disruption to this area could have a very large impact on the Windsor economy; the nature of modern manufacturing businesses means there is no certainty that displaced or disrupted businesses would be replaced in Windsor or elsewhere in the region.

Also adjacent to Provincial Road and the rail corridor are residential neighbourhoods, which are continuing to develop. Approximately 1360 residences would be disrupted (i.e. are within 250 m of the proposed centreline of the new facility). It should be noted that if the continued use of the rail corridor is recommended by the current rail rationalization study underway in the City of Windsor, the alignment of the new freeway will need to shift easterly onto Provincial Road and a new service road would be required to provide access to lands east of Provincial Road; the impacts to residential, commercial and industrial uses in this area would therefore increase beyond the numbers identified in the analysis.

Immediately north of E.C. Row Expressway is a large scrap yard (Zalev's), which would be disrupted by the new freeway. This scrap yard is a highly contaminated area, and clean-up/remediation of this site would have cost and schedule implications for this option.

The plaza on the rail yard lands would disrupt approximately 230 households, while the new crossing itself would displace approximately 100 households and disrupt over 590 households. The rail lands at the plaza site are of sufficient size to provide flexibility for expansion of the plaza, if required.

The proposed plaza site is approximately 2500 m (approx. 1.5 miles) from the new crossing. Canadian Border Services Agency (CBSA) and U.S. Department of Homeland Security (DHS) prefer plazas as close to the border as possible (e.g. less than 1500 m (0.9 mi)); the distance between the plaza at Van der Water Yard and the new crossing, combined with the fact that the connection between the plaza and the new crossing passes through an active urban area, was considered not consistent with meeting the needs of the border agencies. The special measures and resources that would be needed to provide the necessary on-going security and monitoring of this connection (e.g. fencing, lighting, cameras, patrols) were considered a disadvantage of this option in terms of meeting the needs of border agencies, in comparison to other alternatives.

The change in traffic patterns and the change in use of the rail corridor from low volume rail to a high-volume highway facility have a high impact on community character and cohesion. The residential communities in south Windsor identify themselves very strongly with the major commercial centres on Howard Avenue and Dougall Avenue. A new highway corridor is perceived to be a barrier between the residential neighbourhoods and the retail areas. Although the existing rail line acts somewhat as a barrier in the community already, the lightly utilized rail line is more a community landscape feature than a disruptive barrier.

This barrier effect would be felt to a stronger degree in the area of a new bridge crossing north of College Avenue. Presently, the rail line is not visible, as the existing crossing is a tunnel; the lands on the surface of the tunnel are used as a green space/recreation area connecting to the city's waterfront park. In this area of the city, the neighbourhoods are highly populated, mature and stable. A new freeway and major bridge structure through this area would markedly change the character and cohesion of the central Windsor/University neighbourhoods. A new structure would span the river, which is approximately 850 m wide at this location, with piers on the shore of the river, in or near the riverfront park; with a suspension bridge, the backspan would extend approximately 450 m inland. The new crossing would impact the riverfront park, recreational trails and sculpture garden, which are highly valued community features and a source of civic pride.

## Maintain Consistency with Existing and Planned Land Uses

While the corridor is currently used as a transportation route for rail, changing and expanding this corridor to provide a freeway with a new tunnel or bridge crossing the Detroit River in one of the City's oldest neighbourhoods is considered to be a highly negative impact to existing and planned land uses.

As discussed with the DRTP truckway, a new freeway following the DRTP rail corridor is not compatible with the surrounding residential and commercial land uses. A new international transportation corridor incorporating the DRTP rail corridor in central Windsor is not compatible with existing and planned land uses in this area of the City. Expansion of the lightly used rail line to a high volume roadway for international truck traffic passing through the centre of the urban area of the city would represent a significant change to the character of the community. The Provincial Road area is an important retail and industrial employment area for the city. The change to the inter-relationship between residential and commercial uses in the City of Windsor from a new freeway facility in this area could likely not be mitigated.

As well, the impacts in the Provincial Road corridor would highly disrupt manufacturing/industrial uses in this area of the city. Protection of established employment zones such as this is highly important to the City and local area.

## Protect Cultural Resources

A number of important community recreational areas would be impacted by a new bridge in this area, including 10 registered built heritage features and the riverfront parks. A new bridge has a moderate impact to cultural resources.

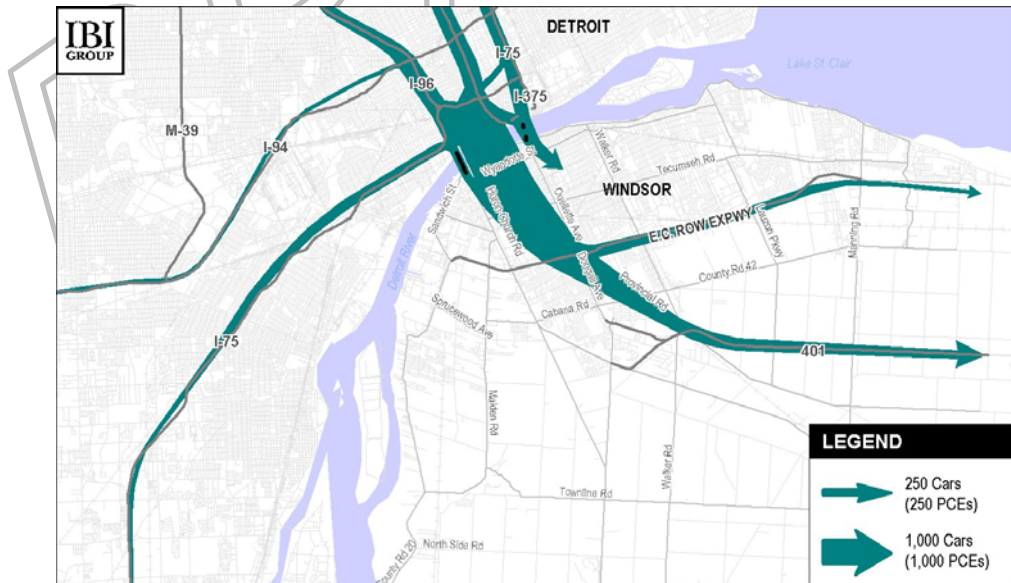
## Protect the Natural Environment

This alternative directly impacts a Candidate Natural Heritage Site and would result in the loss of approximately 21 hectares of natural heritage features (both designated and undesignated features). This alternative has a low impact to natural environment.

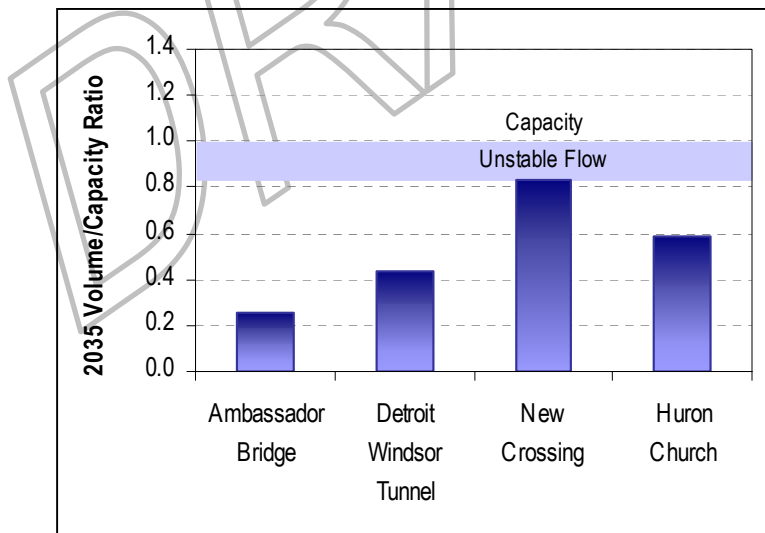
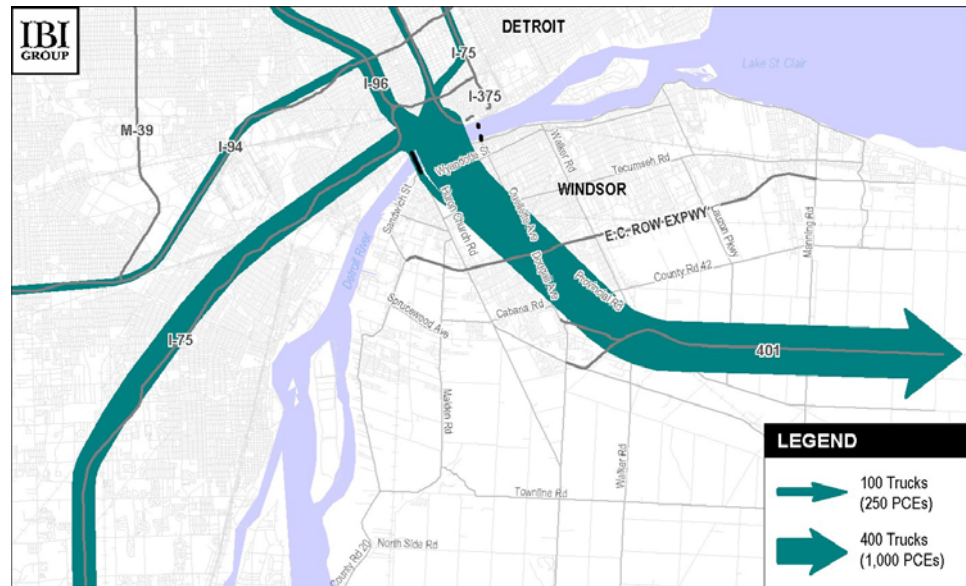
## Improve Regional Mobility

The crossing X14 alternative has a high benefit to regional mobility. The analysis of travel demand in 2035 indicates that a new crossing constructed in the rail corridor with a multi-lane freeway would attract a high proportion of the international truck and auto traffic (refer to Exhibit 3.11). As well as serving as the primary route to the new crossing for long distance international truck traffic, a freeway connecting to this crossing in central Windsor would also be more attractive for the local cross border auto and truck traffic than the existing crossings which are served by arterial roads with signalized intersections.

**EXHIBIT 3.11: 2035 TRAFFIC VOLUMES AND VOLUME TO CAPACITY RATIOS OF KEY NETWORK COMPONENTS WITH RAIL CORRIDOR ALTERNATIVE**







This alternative would convey approximately 1200 trucks and 2500 autos during daily peak hour travel, and would result in a shift in travel patterns in the city. (It should be noted that for free-flow facilities, V/C ratios greater than 0.85 indicate the facility is operating near capacity (unstable flow), while ratios greater than 1.0 indicate a breakdown in the system.) International traffic on Huron Church Road would be greatly reduced and 'local' international traffic on E.C. Row may increase, as access to the new crossing would be available for local motorists (auto and truck) via an interchange at E.C Row. With international traffic moving to these higher order roads, the minor street system in the city would convey fewer international trips, providing some benefit to local access.

### Minimize Cost

The assessment of cost also includes consideration of constructability and technical risks associated with each alternative.

The cost of the new freeway connection, plaza and one-half the bridge crossing is estimated at approximately CDN\$1600 million. The construction of this option will require some detours/traffic staging at crossing roads and relocation/removal of rail lines.

On the freeway section, the construction of an interchange at E.C. Row is highly complex due to the proximity of two existing closely spaced and high volume interchanges at this location. Dougall Avenue and Howard Avenue are two major north-south arterial roads. Dougall Avenue is the designated route to the Detroit-Windsor Tunnel from Highway 401. Howard Avenue provides primary access to Devonshire Mall, the largest shopping centre in southwestern Ontario immediately south of E.C. Row, and additional retail areas near the mall. Incorporating an access for the new freeway at E.C. Row would be highly desirable from a network connectivity point of view. However, implementing such a connection would require reconfiguration of the adjacent interchanges at Howard Avenue and Dougall Avenue to accommodate a new connection; the reconfiguration of these interchanges would result in additional displacements of properties around the interchange (primarily commercial and industrial uses); a cost of CDN\$50 million has been included in the cost of this option to address construction complexities of this interchange. Schedule implications associated with staging of the reconfigurations of the E.C. Row interchanges in conjunction with the construction of the new interchange with the rail corridor may delay the opening of this option beyond the Partnership's stated target of 2013. As well, the disruption to Dougall Avenue and Howard Avenue interchanges will impact the primary access to this important commercial centre of the city.

### 3.3.4. Summary

As a six-lane freeway with a new bridge, the Rail Corridor alternative has a high benefit to regional mobility for year 2035 (the horizon year of this study). A new crossing connected by a freeway using the rail corridor alignment would adequately serve long-distance international truck traffic and local cross-border auto and truck traffic. The existing crossings and the roadways connecting to these crossings would also operate well during daily peak travel periods.

However, the Canadian Project Team recognizes that a new freeway through central and south Windsor is not consistent with current and future land use plans for the city. This alternative was considered to have high community impacts in terms of impacts to regional commercial/retail areas and employment areas south of E.C. Row Expressway and negative impacts to community character and cohesion both in south Windsor and for the older neighbourhoods near the riverfront.

Border agencies also noted that the distance from the plaza to the new crossing is highly undesirable with respect to meeting their needs for siting plazas as close to the border as possible and the security/monitoring of a secure corridor through an urban residential area this would require. Constructability concerns were also identified with this alternative pertaining to the cost, time and disruption to traffic in central Windsor associated with the interchange at E.C. Row Expressway. This connection could significantly increase the cost and time of implementing this alternative.

Based on the high community impacts to Windsor associated with this alternative, the recommendation of the Canadian Project team was that the crossing X14 alternative not be carried forward for further analysis.

## 3.4. Central Alternatives - Crossings X7, X8, X9, X10, X11

### 3.4.1. Description and Feasibility Findings

#### Connecting Route CC-CI-CM

In determining the best route to the plazas serving the central crossings (i.e. Plazas CC1, CC2, CC3, CC4, CC7), the Project Team considered connecting route alternatives that include:

- Widen E.C. Row Expressway from Huron Church Road easterly to Lauzon Parkway, with an extension of the Parkway southerly to Highway 401;
- Widen E.C. Row Expressway from Huron Church Road easterly to the DRTP Rail Corridor, with a new roadway connection constructed using the rail corridor southerly to Highway 401;
- Expand Huron Church Road/Talbot Road to a freeway from E.C. Row Expressway to Highway 401;
- A new route from Ojibway Parkway using E.C. Row Expressway/Malden Road or passing through Ojibway Prairie to north of Todd Lane, connecting to Huron Church Road, then expanding Huron Church Road/Talbot Road to a freeway to Highway 401; and,
- A new route from Talbot Road/Todd Lane utilizing a portion of the Huron Church Line to by-pass the Talbot Road area, connecting to Highway 3/Highway 401.

The illustrative crossing, inspection plaza and connecting route alternatives are shown in Exhibit 3.12.

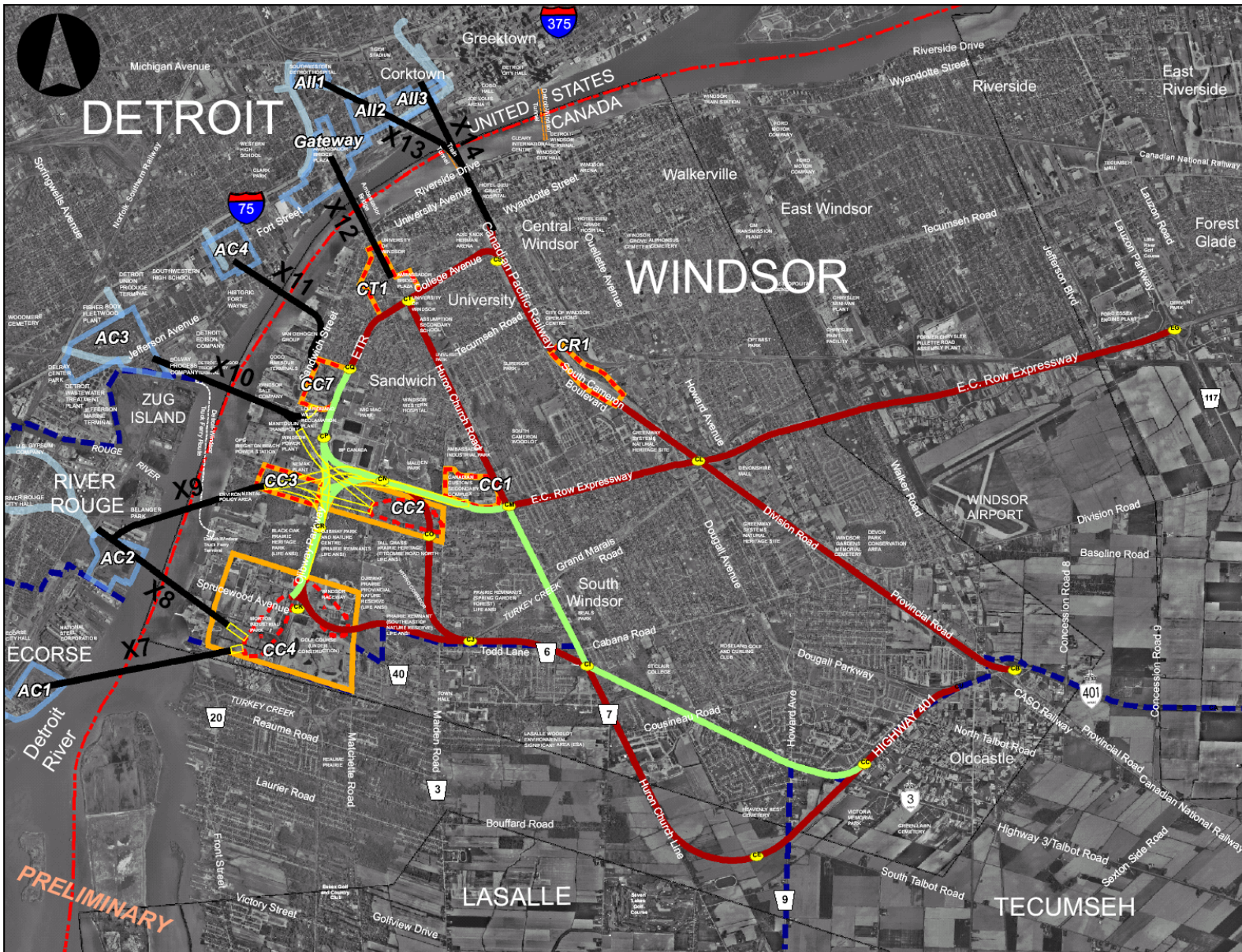
The results are summarized in Table 3.5. Recognizing the greater complexity of the trade-offs to be made in the evaluation of these segments, a discussion of the results of this analysis is also provided in the following pages.

#### **Changes to Air Quality**

Changes to air quality were assessed on a system-wide basis; a new freeway from Highway 401 to the Detroit River was found to have no impact or low impacts to the regional airshed, with small to moderate increase in pollutants on a system-wide basis.



EXHIBIT 3.12: CENTRAL ALTERNATIVES – CROSSINGS X7, X8, X9, X10 AND X11





**TABLE 3.5: SUMMARY OF ASSESSMENT OF CENTRAL CONNECTING ROUTE SEGMENTS**

Factor	HCR/ Talbot Road to ECR	ECR/Lauzon Pkwy	ECR/Rail Corridor	Talbot Road Bypass/HCR	HCR/Talbot Road- Todd Lane/ Malden Road
<b>Changes to Air Quality</b>	<b>No to Low impact</b> Small to moderate increase in pollutants on a system-wide basis	<b>No to Low impact</b> Small to moderate increase in pollutants on a system-wide basis	<b>No to Low impact</b> Small to moderate increase in pollutants on a system-wide basis	<b>No to Low impact</b> Small to moderate increase in pollutants on a system-wide basis	<b>NO to Low impact</b> Small to moderate increase in pollutants on a system-wide basis
<b>Community and Neighbourhood Impacts</b>	Impacts along existing road corridor: <b>Displacements:</b> 130+ households 25+ Businesses; <b>Disruption:</b> 1260 households within 200 m;	Impacts along existing road corridor; creates new road corridor in rural area of east Windsor: <b>Displacements:</b> 40+ households; <10 Businesses; <b>Disruption:</b> 1850 households within 200 m;	Impacts along existing road corridor; creates new road corridor in urban area: <b>Displacements:</b> 40+ households 45+ Businesses; <b>Disruption:</b> 1890 households within 200 m;	Impacts along existing road corridor; creates new corridor in LaSalle <b>Displacements:</b> 85+ households 5+ Businesses; <b>Disruption:</b> 2030 households within 200 m;	Impacts along existing HCR corridor and creates new corridor in natural areas: <b>Displacements:</b> 120+ households 25+ Businesses; <b>Disruption:</b> 1270-1370 households within 200 m;
<b>Consistency with Land Use</b>	Consistent as existing route to Ambassador Bridge; not consistent as freeway	Consistent as freeway; not consistent as primary route for int'l traffic to border crossing(s)	Consistent as freeway for ECR portion; not consistent as primary route for int'l traffic on ECR; not consistent in changing rail corridor to freeway in central urban area of Windsor	Not consistent with current/future residential community development	Not consistent with protected natural areas, residential community
<b>Impacts to Cultural Resources</b>	1 locally designated Heritage site; 2 known significant archaeological sites impacted	2 known significant archaeological sites impacted	2 Built Heritage sites; 2 known significant archaeological sites impacted	2 known significant archaeological sites impacted	2 Built Heritage Sites; 4 known significant archaeological sites impacted
<b>Natural Environment</b>	Impacts to edges of sensitive natural areas	Avoids sensitive natural areas; low impacts to other features	Avoids sensitive natural areas; low impacts to other features	Avoids sensitive natural areas; low impacts to other features	Severance impacts to designated natural areas
<b>Improve Regional Mobility</b>	Provides new freeway route; can separate int'l traffic and provide choice for local traffic	Widening of existing freeway; mixing of int'l and local traffic; no choice for local traffic	Widening of existing freeway; mixing of int'l and local traffic; no choice for local traffic	Provides new freeway route; can separate int'l traffic and provide choice for local traffic	Provides new freeway route; can separate int'l traffic and provide choice for local traffic
<b>Cost</b>	Comparable to other options for cost and constructability; traffic management	Higher costs; greater complexity of construction	Comparable to other options for cost and constructability; traffic management; complex freeway construction	Comparable to other options for cost and constructability; relocate municipal infrastructure	Comparable to other options for cost and constructability; mitigation of natural features impacts during construction

### Impact to community and neighbourhood characteristics

Talbot Road is situated within the Town of LaSalle, along the Town's boundary with the City of Windsor (see Exhibit 3.13). Lands south of Talbot Road in LaSalle are currently undergoing development to residential subdivisions. This development is a part of the Town's approved plans for the growth of the urban area that will see the population in the Town grow from over 25,000 to between 35,000 and 40,000 by the year 2019. In the Town's development plans, Huron Church/Talbot Road is identified as the major transportation corridor serving this area of the Town. A new route aligned to by-pass the Talbot Road area and follow the Huron Church Line corridor would displace approximately 85 households, and disrupt approved development plans, in addition to disruption of planned local community retail and social services. The Talbot Road by-pass alternative would have a high impact to community cohesion and character in that the area between the new route and Talbot Road would be segmented by two major transportation facilities.

Huron Church/Talbot Road is a high volume multi-lane roadway serving international traffic. Between Cousineau Road and E.C. Row Expressway, the existing Huron Church/Talbot Road corridor dominates the character of the neighbourhoods. While recent development along this corridor has been built around a high volume road corridor, many of the residences along this corridor were built prior to 1990, when volumes, particularly truck volumes on the roadway began increasing substantially. Upgrading Huron Church Road/Talbot Road to a freeway will impact approximately 130 households, primarily single-family units. Although both alternatives have a high community impact, changing the Huron Church/Talbot Road corridor to a freeway has a relatively lower impact to community character and cohesion than a Talbot Road by-pass.

#### EXHIBIT 3.13: TALBOT ROAD WEST OF HOWARD AVENUE (LOOKING WEST)



As noted with the Rail Corridor alternative, a new 80 m freeway right-of-way from Highway 401 to E.C. Row Expressway along the DRTP rail corridor would displace the rail corridor as well as the lands between the rail corridor and Provincial Road. Approximately 40 businesses would be displaced, including one major industrial use (ThyssenKrupp Falco),

as well as commercial and retail uses, including retail shopping centres, supermarkets, car dealerships, etc. and mid-size industrial operations. Devonshire Mall, the Roundhouse Plaza and numerous other retail uses would also be affected by a new freeway facility in the rail corridor. The businesses along the rail corridor represent a more sizable portion of regional economic activity and some may not be easily replaced if impacted.

By comparison, approximately 20 businesses would be impacted by the expansion of Huron Church/Talbot Road, many of which are highway-oriented (e.g. accommodations, restaurants, gas stations). Few of these businesses would be considered critical to the neighbourhood retail structure and none are significant to the regional retail structure. The industrial businesses along this section of Huron Church/Talbot Road are also smaller and more related to auto and truck services. These businesses would be more likely to find alternative locations to provide this locally-oriented activity. The business impacts associated with the expansion of the Huron Church/Talbot Road corridor were considered to be substantially less than those of the rail corridor/E.C. Row alternative.

Although the number of residences disrupted (i.e. within 250m of the centreline) by upgrading Huron Church/Talbot Road is similar to the E.C. Row/Rail Corridor alternative (approximately 1370 households with either option), the change from a low volume rail line to a high volume freeway was considered to be a higher community impact.

As for the alternative that passes north of Todd Lane, the Project Team found that local neighbourhoods in the Todd Lane/Malden Road area strongly identify themselves with the natural features in this area of Windsor and LaSalle. The neighbourhoods are within walking distance of large wooded areas, many of which are designated natural areas, and a recreational trail system. Separating these neighbourhoods from the natural features with a new freeway corridor was considered as having a higher impact to the community character and cohesion in this area of Windsor/LaSalle than the expansion of Huron Church/Talbot Road.

### **Consistency with existing and planned land use**

Generally, alternatives that made use of existing infrastructure were considered to be more consistent with existing and planned land use than other alternatives. The alternative north of Todd Lane impacting the Ojibway Prairie Provincial Nature Preserve, Spring Garden Forest and other designated natural areas was considered to be highly inconsistent with local land use. The expansion of Huron Church/Talbot Road is considered compatible with existing and planned land use.

### **Impacts to Cultural Resources**

All the alternatives result in some impacts to cultural resources; the Todd Lane/Malden Road alternatives have higher impacts than the others as they impact 4 known significant archaeological sites.

### **Impacts to Natural Environment**

An alternative extending from Huron Church Road towards the river north of Todd Lane would have significant impacts to the natural areas west of Huron Church, namely Ojibway Prairie Provincial Nature Reserve and Spring Garden Forest. The Ojibway Prairie is designated as a Provincial Nature Reserve, Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI), Environmentally Sensitive Area (ESA) and Candidate Natural Heritage Site (CNHS). Numerous plants and animals inhabiting this natural heritage area are designated as "special concern", "threatened" or "endangered"

under the Species at Risk Act and vegetation communities located within this natural heritage area are considered extremely rare on a global and provincial basis. The Ojibway Prairie is connected to the Detroit River by the Black Oak Woods, thus creating an ecologically important landscape linkage. The Project Team specialists in natural environment noted that the local, provincial and national significance of the Ojibway Prairie cannot be overstated. Over 21 ha of this protected habitat area would be impacted directly with an alternative along Todd Lane, and over 140 ha of features would be disrupted (i.e. are within 250m of the centreline).

Routes that severed portions of the Ojibway Prairie or created major barriers across natural corridors were considered to be a high impact. These high impact routes included the alignment north of Todd Lane as proposed by the *Windsor Gateway Study*<sup>8</sup>, January 2005, as well as options that utilize the Malden Road corridor and the Ojibway Parkway corridor south of E.C. Row. In its assessment, the Project Team specialists noted that a large, contiguous natural area is more diverse and stable than a small, fragmented natural area. The approach used in the assessment also follows the ecological principle that natural corridors should be maintained as pathways for material flows and animal/plant migration/dispersion.

The Huron Church/Talbot Road alternative will avoid altogether the natural heritage areas designated as Provincial Nature Reserve, ANSI and ESA with one possible minor exception on the west side of Huron Church Road; however, the route will encroach along the perimeter of natural heritage areas identified as Candidate Natural Heritage Sites by Windsor/LaSalle and Potential Natural Heritage Features identified by LGL. These areas, such as along the west side of Huron Church Road, are located adjacent or in close proximity to the Ojibway Prairie and may support similar composition, structure and function as the Ojibway Prairie. As a result, while the Huron Church/Talbot Road route is far superior to routes that sever these designated features, there may still be substantial adverse environmental effects (both displacement and disturbance) that will require mitigation.

#### **Improve regional mobility**

Expansion of Huron Church/Talbot Road has a greater ability to provide continuous/ongoing capacity for the border transportation network more than widening of E.C. Row Expressway, while also providing means to separate local and long-distance international traffic. The E.C. Row Expressway extends from the Ojibway Parkway near the river in the west end of Windsor, to County Road 22 in the Town of Tecumseh. Passing through central Windsor with interchanges at major north-south arterial roads, the expressway is a key link in the regional road network. Portions of this expressway are currently operating at or near capacity during peak travel periods. Studies have identified that expansion of this facility from the current 4 lanes to 6 to 8 lanes is required by 2021 to serve the projected growth in local traffic. Using E.C. Row east of Huron Church Road to convey international traffic to a new or expanded crossing will require additional widening of this facility to 10 to 12 lanes; while this widening can generally be accommodated within the existing right-of-way on the sections east of Dougall Avenue, west of this point, additional property will be required.

The major road network in the Windsor/Essex County region serves two primary functions: one function is to facilitate access to areas within Windsor/Essex County for

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<sup>8</sup> Windsor Gateway Report, dated January 2005, Prepared by Sam Schwartz Engineering PLLC



local traffic; the second function, owing to the region's unique proximity to border crossings into the United States, is to efficiently convey international traffic to the border crossings to facilitate the movement of people and cross-border goods. Using E.C. Row Expressway to serve both of these primary functions provides substantially fewer benefits to regional mobility. Reliable access to border crossings in this key trade corridor is of vital importance to the national, regional and local economies. Multiple freeway links connecting to the border crossings improves regional mobility. A freeway facility on the Huron Church/Talbot Road corridor has greater benefits to regional mobility than widening E.C. Row Expressway by:

- serving long distance international traffic, while also providing a choice for local traffic;
- providing additional roadway capacity to meet the long term needs of the region;
- providing flexibility in the regional network to respond to incidences (such as collisions or maintenance) and unusual events; and
- providing flexibility to respond to future changes, such as changes in local land use or changes in manufacturing processes or increased trade, resulting in increased goods movement.

On this basis, alternatives that required use of portions of E.C. Row Expressway east of Huron Church Road to convey international traffic were not preferred.

### **Cost**

In terms of cost and constructability, the widening of the section of E.C. Row expressway from Huron Church Road to Lauzon Parkway to accommodate local and long distance international traffic as well as local east-west traffic, is more complex and costlier (approximately CDN \$650 M) than either the construction of the new freeway on the rail corridor or on Huron Church Road/Talbot Road (approximately CDN\$560 M). The rail corridor option also requires widening of a section of E.C. Row; the costs and constructability of this option is considered comparable to the Huron Church Road/Talbot Road option.

The constructability of the alternatives that involve a new alignment north of Todd Lane does not involve complex traffic management, but would require consideration of minimizing impacts to the sensitive natural features associated with the Ojibway prairie.

### **Conclusion**

The HCR/Talbot Road (Segments CC-CI-CM) is preferred on the basis that this alternative:

- provides greater improvement to regional mobility than the alternatives that utilize the E.C. Row Expressway by providing another freeway connection leading to the border crossings.
- is less disruptive to existing and planned land uses than the Talbot Road bypass alternative and the Todd Lane/Malden Road/Ojibway alternatives; and
- has less impacts to the important natural features west of Huron Church Road than the Todd Lane/Malden Road/Ojibway alternatives.

Although the options that would utilize all or a portion of E.C. Row Expressway avoid the sensitive natural features west of Huron Church Road, the benefits to regional mobility associated with the Huron Church/Talbot Road alternative were considered of greater

importance than the impacts to the edges of these features in selecting the alternative to carry forward for further study.

## Plazas

In the Central Area, five illustrative plaza sites were identified in an around the industrial area along the riverfront near the terminus of the E.C. Row Expressway. This area features a mix of primarily industrial and open lands, along with natural features and some residential uses. Plazas CC3, CC4 and CC7 provide direct connections to one or more crossings. However plazas CC1 and CC2 do not provide direct connections. The Project Team assessed plazas CC1 and CC2 based on guidelines and design considerations for ports of entry provided by border agencies as noted in Section 1.2.3 of this report. The results of this assessment are summarized in Table 3.6, and discussed below.

**TABLE 3.6: SUMMARY OF ASSESSMENT OF CENTRAL ILLUSTRATIVE PLAZA ALTERNATIVES CC1 AND CC2**

	CC1	CC2
<b>Proximity to Border (Approx.)</b>	X9 – 3200 m X10 – 2900 m X11- 3800 m	X9 – 1600 m X10 – 1200 to 1600 m X11 – 1700 m
<b>Site Area</b>	32 ha (80 ac); limited flexibility for expansion	32 ha (80 ac); flexibility to expand up to 50% larger
<b>Adjacent Land Use:</b>	Industrial, commercial recreational	Residential; protected natural areas; industrial
<b>Environmental Issues:</b>	Low community impact; Approx 20+ residences displaced; 80+ disrupted; Significant impacts to Ambassador Industrial Park; impact to Malden Park; 140+ ha of natural features impacted (within 500m of plaza and connection); up to 6 known archaeological sites impacted	Moderate community impact; Approx 50-60 residences displaced; 100-120 disrupted; impact to Ojibway Park; approx 100 ha of natural features impacted (within 500m of plaza and connection); up to 5 known archaeological sites impacted
<b>Existing Easements and Right-of-Ways</b>	10 to 20 roads crossed/ closed depending on Xing; 2 interchanges at EC Row to be reconstructed; crossing of rail line to access Xing; major utilities in vicinity	7 to 11 roads crossed/ closed depending on Xing; 2 interchanges at EC Row to be reconstructed; crossing of rail line to access Xing; major utilities in vicinity
<b>Emergency Services and Access</b>	Adequate alternate access to plaza; Long connecting roads to crossing (restricted access); 1.8 km to Windsor Western Hospital	Adequate alternate access to plaza; 2.2 km to Windsor Western Hospital
<b>Site Topography:</b>	Flat/no issues	Flat/Adjacent to higher ground providing views into site (Malden Park)
<b>Water Availability</b>	No issues	No issues
<b>Conclusions</b>	Offers no substantial operational or locational advantages over other plazas – not carried forward for further consideration	Suitable alternate site for X9, X10 or X11 crossing; opportunities to reconfigure site to improve operational advantages/reduce impacts – carry forward for further analysis

The assessment of the plaza sites based on the guidelines identified by the border agencies identifies that Plaza CC1, which includes the existing secondary inspection facility for Canada-bound commercial vehicles, does not offer any operational or locational advantages over the other alternatives; this site is the furthest from any of the crossings,

requiring a secured connection between the plaza and crossing that is longer than the other plaza sites. This connection would need to be separate and secure from the E.C. Row Expressway and much greater than the 1500m distance identified as being acceptable by the Canadian border agencies (see Exhibit 3.14). This plaza site was therefore not carried forward for further consideration.

#### EXHIBIT 3.14: PLAZAS CC1 AND CC2 – FROM DETROIT RIVER LOOKING EAST



Plaza site CC2 does not connect directly to any of the crossings but is within a reasonable distance of crossings X9 and X10. The area being considered for plaza CC2 is currently low density residential land; the shape and configuration of this plaza can be altered by bringing the plaza site closer to Ojibway Parkway to facilitate connections to these crossings, with possibly providing a direct connection to X9 and X10, and a possibly an acceptable secure connection to an X11 crossing. The connection to this site for a new freeway in the Huron Church/Talbot Road corridor could be constructed in or beside the E.C. Row corridor west of Huron Church. A disadvantage of this site is that the Essex Terminal Railway (ETR) crossing would be between the plaza and the crossing.

#### Conclusion

Based on the assessment of plaza sites, the following crossing and plaza combinations were assumed in the analysis of illustrative crossing, plaza and connecting route alternatives connecting Highway 401 to a crossing at the Detroit River in the central area:

- **Crossing X8 Alternative:** Crossing X8, Plaza CC4, Route Segment CC-CI-CM-CN-CR-CK
- **Crossing X9 Alternative:** Crossing X9, Plaza CC3, Route Segment CC-CI-CM-CN-CR
- **Crossing X10 Alternative:** Crossing X10, Plaza CC3, Route Segment CC-CI-CM-CN-CR

- **Crossing X11 Alternative:** Crossing X11, Plaza CC7, Route Segment CC-CI-CM-CN-CP-CQ

## Crossing X7

Crossing X7 connected the Canadian plaza CC4 to U.S. plaza AC1. As noted in Section 1 of this document, additional investigation by the U.S. Team has identified that Plaza AC1 is not practical, due to unacceptable impacts to the operations of National Steel associated with this proposed plaza site (for more information, refer to U.S. Analysis Results, under separate cover). Therefore, Crossing X7 was set aside and will not be studied further.

### 3.4.2. Analysis Results

The following summarizes the results of the Canadian side impacts analysis for crossing alternatives X8, X9, X10 and X11 with their associated plaza and the connecting route to Highway 401 via the Huron Church/Talbot Road corridor. While the analysis results pertain to the entire alternative, from Highway 401 to the river, the connecting route from Highway 401 to the area of E.C. Row/Huron Church Road is the same for all alternatives. The distinguishing characteristics among the central alternatives are found in the connecting routes from E.C. Row/Huron Church Road to the plaza, the plazas and the crossings. The impact analysis is organized according to the seven performance factors developed for the project. Each performance factor incorporates many criteria, indicators and measures to provide a complete assessment of the nature and extent of the impacts and benefits of the crossing, plaza and connecting routes.

### Changes in Air Quality

At the illustrative alternatives stage, the assessment of impacts to air quality considered the predicted change to regional air quality with a new or expanded crossing as compared to the do-nothing or 'no build' scenario. The pollutant burdens were calculated for the following pollutants and precursors: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulphur oxides (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), particulate matter less than 2.5 microns (PM<sub>2.5</sub>) (which includes Diesel Particulate Matter (DPM)), and volatile organic compounds (VOC), as well as the following air toxics: benzene, acetaldehyde, formaldehyde, 1,3-butadiene, acrolein, and polycyclic aromatic hydrocarbons (PAH). These contaminants were selected because they represent the greatest potential for off-site impacts due to tailpipe or roadway surfaces. All of the species listed above are emitted in vehicle exhaust. Fugitive dust, including fine particulate matter, such as PM<sub>10</sub> and smaller is also emitted from roadway surfaces as vehicles travel over them.

The analysis identified that crossing X10 alternative would have little change in the regional air quality as compared to the do-nothing scenario, while crossing X8, X9 and X11 alternatives would have a low negative impact to regional air quality. The potential effects on local air quality are addressed in the assessment of impacts to community and neighbourhood characteristics, and are reflected in the analysis of disruption to sensitive receivers discussed in the next section.



## Community/Neighbourhood Characteristics

The assessment of impacts to community and neighbourhood characteristics included an assessment of traffic impacts (volume of international traffic on local streets and impacts to access); potential noise impacts; impacts to community cohesion and character; and acquisitions.

Overall, crossing X8, X9 and X10 alternatives are considered to have a moderate impact to community cohesion and character. The connecting route for all the alternatives has high community impact associated with expanding Huron Church/Talbot Road to a freeway. However these alternatives have minimal community impacts associated with the connections to the plazas and the crossings, which are generally located in industrial areas. Windsor's industrial portlands generally extend from the Turkey Creek area, where Windsor Salt has its loading facility, to the area of Detroit Street in the community of Sandwich, where stone, sand and other granular materials delivered by ship for making concrete, are unloaded and stored for distribution by truck.

The X8, X9 and X10 alternatives displace between 130 and 150 households and disrupt between 1400 and 1600 households (i.e. within 250 m of centreline); approximately 40 businesses are displaced by each of these three alternatives. Many of these are highway-oriented (e.g. accommodations, restaurants, gas stations). Few of these businesses would be considered critical to the neighbourhood retail structure and none are significant to the regional retail structure. The industrial businesses along this section of Huron Church/Talbot Road are also smaller and more related to auto and truck services. These businesses would be more likely to find alternative locations to provide this locally-oriented activity. The crossing X8 alternative will impact Windsor Salt surface and shipping operations with a new crossing.

The crossing X11 alternative has a higher impact to community cohesion and character than the other central alternatives, as this alternative affects a residential area within Sandwich. The plaza displaces over 50 households and 11 light- to medium-sized industrial operations and other manufacturing businesses. The crossing in this area of the community does not displace any households, but has a higher disruption impact to the community. In effect, a crossing in the south end of Sandwich will put two high-volume transportation corridors around this established section of Windsor.

## Existing and Planned Land Use

The crossing X8, X9 and X10 alternatives all carry similar impacts on land use. All alternatives have similar impacts along the Huron Church/Talbot Road corridor, which has adapted somewhat to the effects of a high volume roadway facility. The connections to the plaza and the plaza and crossings themselves were considered compatible with the industrial land uses in this area. The plaza for crossing X9 and X10 alternatives is situated in an area proposed for redevelopment to industrial uses. This site is the Brighton Beach industrial park, which is also the area proposed for a traffic management centre for U.S.-bound trucks identified in the City's *Gateway Report*<sup>9</sup>. This report also identified this area as being suitable for a new Canadian plaza connecting to a new crossing in this area of the river.

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<sup>9</sup> Windsor Gateway Report, dated January 2005, Prepared by Sam Schwartz Engineering PLLC

The crossing X11 alternative was considered less compatible with land uses in this area of Windsor, particularly in terms of the impacts of the plaza and crossing. While the plaza site is situated in an area currently zoned industrial, there are residences and local retail uses that would be impacted. The plaza and crossing would be on industrial lands adjacent to an established residential area north of the Prince Road area, which makes this option somewhat less consistent with the area land use.

## Cultural Resources

The central alternatives are considered to have a low to moderate impact to cultural features. All the alternatives impact two known archaeological sites in the Huron Church/E.C. Row and disrupt Holy Redeemer College (locally inventoried).

Crossing X8 alternative also impacts an additional archaeological site in the Ojibway area, and passes within 200 m of a golf course and the Ojibway Nature Centre. Crossing X9 and X10 alternatives also impact Broadway Park and have a similar disruptive impact to the Ojibway Nature Centre.

The crossing X11 alternative has higher impacts to cultural features compared to the other central alternatives. Eleven additional built features are affected by this alternative, due primarily to the proximity of this alternative to historic Sandwich.

## Natural Environment

The crossing X8 and X9 alternatives have high impacts to natural features. While all the alternatives impact the St. Clair College Prairie environmentally significant area (ESA), the connecting route for crossing X8 follows the Ojibway Parkway; this route impacts the Black Oak Prairie Heritage Park and Ojibway Prairie complex. In addition to the loss of over 26 ha of natural features, including direct impacts to over 25 ha of endangered or threatened species habitat, a new freeway in the Ojibway Prairie corridor would reduce or possibly sever the linkage between the Black Oak Prairie area and the Ojibway Prairie Complex, resulting in a landscape scale impact.

The X9 crossing directly impacts the Black Oak Prairie Heritage Park and an Environmental Policy Area along the riverfront. This alternative results in the loss of approximately 30 ha of natural features, including direct impacts to over 20 ha of endangered or threatened species habitat. This alternative also threatens connectivity between the Ojibway Prairie complex and the riverfront.

The crossing X10 and X11 alternatives avoid the Ojibway Prairie complex and riverfront natural areas and so naturally, they have lower impacts. With crossing X10 alternative, approximately 20 ha of natural features would be removed, including over 14 ha of endangered or threatened species habitat, crossing X11 alternatives results in a similar loss of natural features with a direct impact to over 13 ha of endangered or threatened species habitat.

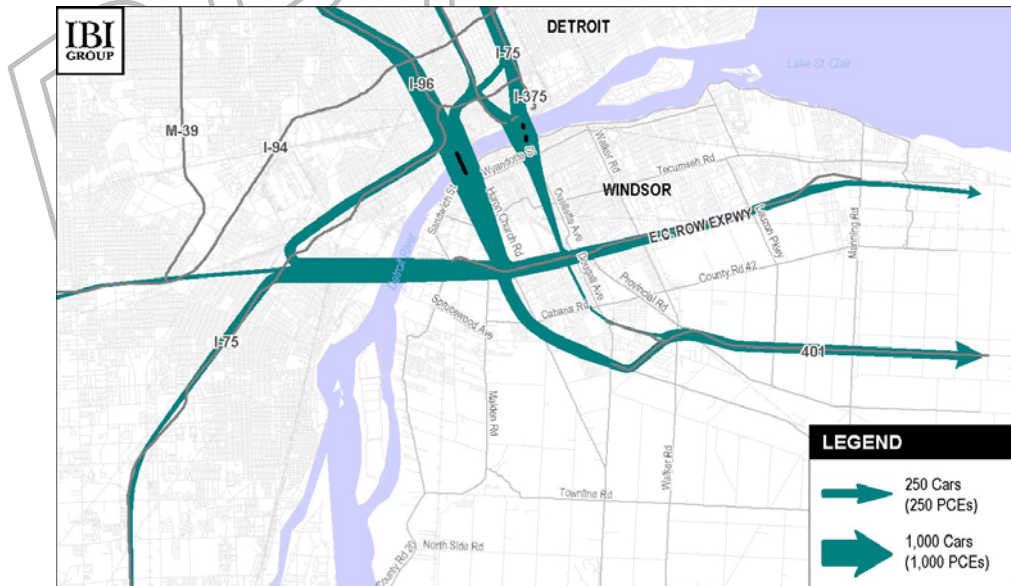
## Improve Regional Mobility

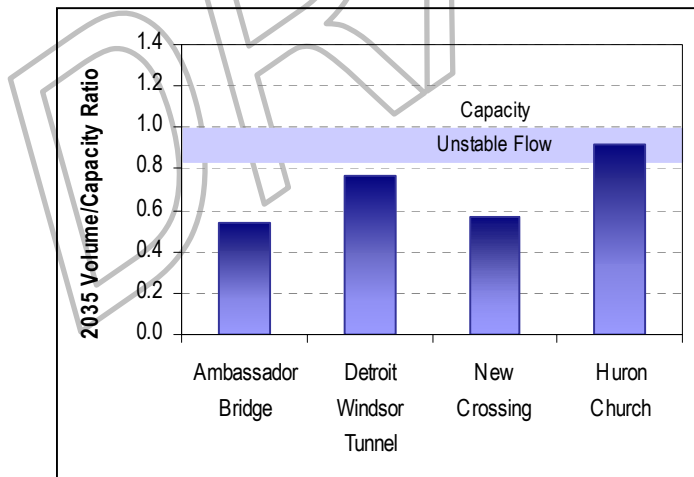
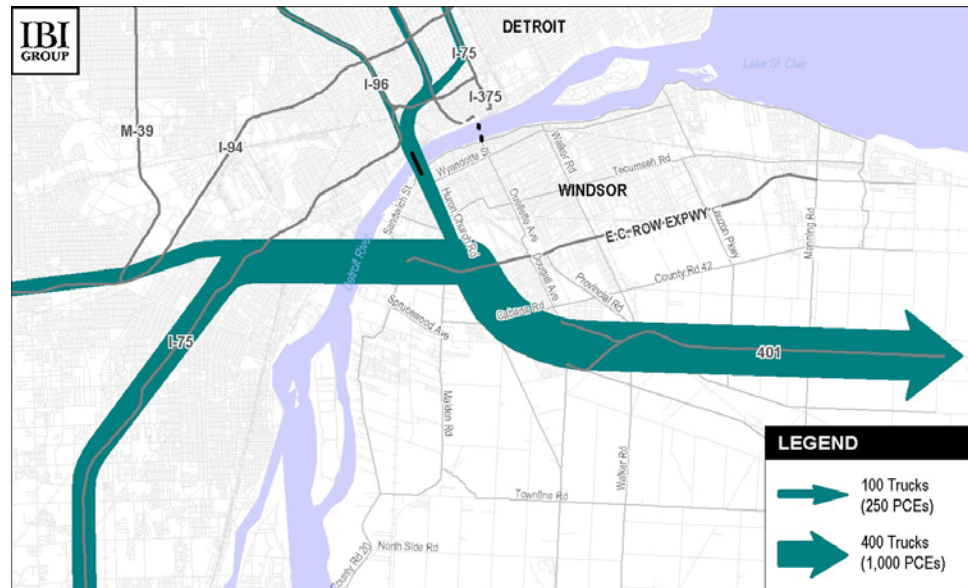
The assessment of improvements to regional mobility is based on a number of criteria and measures, including traffic operations on key roadway links for year 2035 (the horizon year of this study) including the existing crossings and roadways serving those crossings and changes in travel time and distance, as compared to the do-nothing or no-build

alternative. An analysis of traffic projections based on origin-destination pairings for year 2035 identified that the central alternatives provide high benefits to regional mobility in comparison to other alternatives. This assessment is based on a review of several indicators:

- A new crossing in the central area of the Detroit River would provide improvement to the regional road network by providing additional capacity to the border transportation network; without this additional capacity, the existing crossings would reach capacity by year 2022, resulting in severe congestion and delay for all international truck and auto traffic, for both long-distance and local trips;
- A central crossing attracts a sufficient volume of local and long distance traffic, both auto and truck trips, that the existing crossings operate below capacity during peak travel periods in 2035. (It should be noted that for free-flow facilities, V/C ratios greater than 0.85 indicate the facility is operating near capacity (unstable flow), while ratios greater than 1.0 indicate a breakdown in the system.)

**EXHIBIT 3.15: 2035 TRAFFIC VOLUMES AND VOLUME TO CAPACITY RATIOS OF KEY NETWORK COMPONENTS WITH CENTRAL ALTERNATIVE**





- A central crossing attracts the local truck and passenger car trips, which were not attracted to a southern alternative; a central crossing also attracts the long-distance truck and passenger car trips, which were not attracted to an eastern alternative; in this way, a central crossing has a greater ability to provide continuous/ongoing capacity (i.e. redundancy). In the border transportation network serving this important trade corridor, continuous/ongoing capacity (i.e. redundancy) helps to reduce the likelihood of congestion and delay at all crossings, thereby improving regional mobility.
- A central crossing better serves local international traffic using E.C. Row Expressway and Huron Church/Talbot Road to access the border crossing; this provides an improvement to the local road system in west/central Windsor;

Among the central crossings, slightly higher benefits to the local road network in Windsor were identified with crossings X9, X10 and X11, presumably due to the greater travel distance to X8 from central Windsor, compared to using the existing crossings, and the more southerly location at which this crossing connects into the freeway system in the U.S.



## Minimize Cost

The assessment of cost also includes consideration of constructability and technical risks associated with each alternative.

The costs of each of the alternatives are greatly influenced by the length of the bridge. The new bridge will span the entire river, which narrows to between 600 and 900 metres in this area. Based on preliminary planning estimates, the costs of the connecting route, plaza and one-half the crossing for the crossing X8, X9 and X10 alternatives are higher (approximately CDN\$1800 to CDN\$2000 million) than the crossing X11 alternative (approximately CDN\$1400 million), primarily due to the shorter span assumed with the latter alternative.

The central alternatives include the upgrading of Huron Church/Talbot Road to a freeway; this facility is the primary route for international traffic using the Ambassador Bridge. Construction of this aspect of the project will have relatively high constructability risks associated with traffic and utility management along the existing road corridor so as to minimize the disruption and delay to international truck traffic and maintaining safety and access for local traffic and pedestrians during construction.

The Windsor portlands are heavily industrialized and active, and include a regional water reclamation plant, major power generation plants, transformer stations and transmission corridors, energy and steam pipelines, and a rail network. A new crossing, plaza and controlled access roadway in this area will have several constructability risks.

In addition, the central crossings and plazas are proposed in an area that has been affected by salt extraction activities. While these subsurface activities do not pose a constructability risk (the salt is mined well below the top of the bedrock), the risk of excessive or sudden settlement in the surface or subsurface material, is a concern for any major facility in this area.

The plaza and crossing for the crossing X8 alternative, as well as the X9 crossing, are in an area of 'room and pillar' mining. Settlement in this area can be more easily predicted and controlled due to on-going settlement monitoring and the ability to reinforce support of the mine roof to prevent or control further settlement.

The lands north of Ojibway Parkway have historically been used for solution mining of salt. Brine wells (underground caverns in bedrock left behind from salt extraction using solution mining) pose a greater risk for unpredicted settlement. The size and location of the brine wells are not fully documented. These caverns create a potential constraint to siting of bridge pier footings, particularly for crossing X10, as structural integrity of the rock above these caverns is not fully known. In 1954, a large sinkhole resulting from the collapse of a cavern roof and gradual subsidence of the covering material destroyed a building. The sinkhole site is currently occupied by Essex Aggregates. The X10 crossing is within 600 m of 30 known brine well locations. With crossing X11 alternative, the connecting route and plaza are within 600 m of 27 brine wells. The risks with crossing X11 alternative are not considered as high as that of the crossing X10 alternative.

Geotechnical investigations are being undertaken to obtain additional information as to the condition of the bedrock in this area of the river.

### 3.4.3. Summary

The proposed crossing X8, X9, X10 and X11 alternatives offer high regional mobility benefits for year 2035 (the horizon year of this study). Any of these new crossings connected by a freeway via the Huron Church/ Talbot Road corridor would adequately serve long-distance international truck traffic and local cross-border auto and truck traffic. The existing crossings and the roadways connecting to these crossings would also operate well during daily peak travel periods. The crossing X8 alternative offers slightly lower benefits to regional mobility than the other central alternatives.

The central crossing alternatives have lower community impacts than the other alternatives considered. The connecting route utilizes an existing high-volume road corridor, and the plaza and crossings are located in an industrial area. Crossing X11 alternative has the highest community impacts, including impacts to land use and cultural features, than the other central alternatives, due to the proximity of the crossing and plaza to the residential and historic community of Sandwich. Crossing X10 alternative would have little change in the regional air quality as compared to the do-nothing scenario, while crossing X8, X9 and X11 alternatives would have a low negative impact to regional air quality.

Crossing X8 and X9 alternatives avoid the community of Sandwich but have higher impacts to natural features, with crossing alternative X8 having the highest impacts of the central crossings.

All the alternatives carry some degree of constructability and other risks, related to the current uses in the area, effects of mining activities, and the concentration of infrastructure.

The central alternatives represent a reasonable balance of transportation benefits and community impacts on the Canadian side. Of the alternatives that adequately meet the mobility needs of the region, the expansion of Huron Church/Talbot Road has lower impacts to the community than these other alternatives. Continued analysis of these central alternatives would provide opportunities to reduce the land use/community impacts, as well as address issues of constructability. The Canadian Project Team therefore recommended that crossing X8, X9, X10 and X11 alternatives be carried forward as practical alternatives.

## 3.5. Twinned Ambassador Alternative – Crossing X12

### 3.5.1. Description

#### Connecting Route - Description and Feasibility

Illustrative connecting route alternatives assessed to connect to a twinned Ambassador Bridge included:

- Expanding the Rail Corridor to a freeway from Highway 401 to the area of College Avenue/ETR corridor, then following the ETR corridor westerly to the Ambassador Bridge.
- Various alternatives connecting Highway 401 to the area of Ojibway Parkway/Essex Terminal Railway (ETR) corridor, then following along the rail corridor to the

- Ambassador Bridge (often referred to as the Ring Road concept); and,
- Upgrading Huron Church/Talbot Road to a freeway.

The alternatives considered are identified in Exhibit 3.16.

### *DRTP Rail Corridor/ETR Corridor – Route Segments CB-CL-CS-CT*

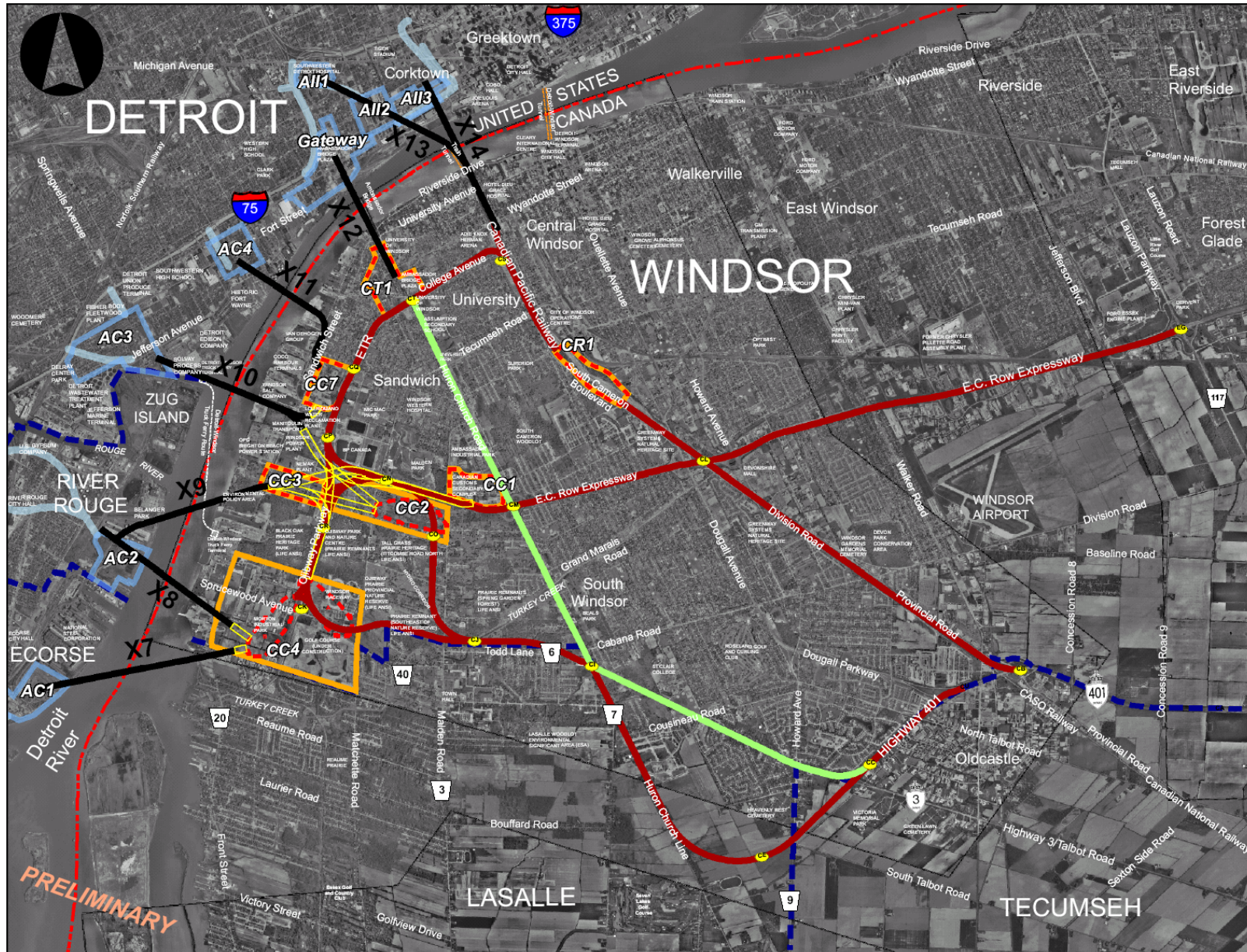
Section 3 of this document identifies the high community impacts including the impacts to community character and cohesion, and impacts to the major commercial area south of E.C. Row Expressway associated with the expansion of the Rail Corridor to a freeway. The use of the ETR corridor between the DRTP Rail Corridor and the Ambassador Bridge would have high community impacts as well, displacing an additional 175 households and 10 businesses.

The use of the ETR Corridor for a new freeway to the Ambassador Bridge is also considered to be equally inconsistent with land uses in the area, having a high impact to the central urban area of Windsor.

One advantage noted with this alternative is that a new freeway to the Ambassador Bridge using the rail corridors would improve regional mobility by having a greater ability to provide continuous/ongoing capacity in the road network for accessing the Ambassador Bridge.



EXHIBIT 3.16: TWINNED AMBASSADOR BRIDGE ALTERNATIVE – CROSSING X12





### *Ring Road Concept – Route Segments CP-CQ-CT*

The alternatives considered with the Ring Road concept included:

- Huron Church/Talbot Road and E.C. Row Expressway,
- An alignment from Huron Church/Talbot Road north of Todd Lane connecting to Ojibway Parkway near Windsor Raceway, and paralleling the ETR Corridor; and
- An alignment north of Todd Lane to Malden Road, along Malden Road to E.C. Row Expressway, and along E.C. Row Expressway to Ojibway Parkway/ETR.

All the alternatives were considered to have high negative impacts to community cohesion, character and function. The portion of the ring road from Prince Road to the Ambassador Bridge would sever the Sandwich neighbourhood; this was considered a highly negative effect on community structure and function. The ring road alternative was considered to have high negative impacts to land use, in that a new freeway through the established neighbourhood area of Sandwich is not consistent with existing and planned land uses in the area.

The ring road alternatives that impacted the Ojibway/Spring Garden designated natural features and the neighbourhoods adjacent to these features were the least preferred due to the higher impacts to natural environment and community features.

As with the rail corridors alternative, an advantage noted with the ring road alternative is that it would improve regional mobility by having a greater ability to provide continuous/ongoing capacity in the road network for accessing the Ambassador Bridge.

### *Upgrading Huron Church/Talbot Road – Route Segments CC-CI-CM-CT*

Huron Church/Talbot Road has long served as the primary route to the Ambassador Bridge for commercial traffic, travellers and commuters. The community along the Huron Church Road north of E.C. Row Expressway has been affected by the existing transportation corridor and demonstrates a much lower degree of community cohesiveness than the areas impacted by the other alternatives connecting to the Ambassador Bridge.

Upgrading Huron Church Road north of E.C. Row to a freeway will displace approximately 30 residential units (including apartments); another 800 residences would be disrupted (i.e. within 250 m of the centreline). Approximately 50 businesses would be displaced and another 25 businesses would be disrupted. The Huron Church corridor north of E.C. Row Expressway is highly tourism/traveller oriented, with a significant concentration of accommodation/restaurant businesses that are generally not highly valued in terms of community cohesion and function. Expanding Huron Church Road to a freeway was considered to have a moderate impact to community and neighbourhood characteristics.

Connecting to the Ambassador Bridge by expanding the Huron Church corridor north of E.C. Row Expressway to a freeway was considered to have lower impacts in terms of consistency with land use, in comparison to the other alternatives connecting to the Ambassador Bridge. The 2.2-kilometer stretch of Huron Church Road between E.C. Row and Tecumseh Road is characterized as a six-lane arterial road with 5 signalized intersections and over 40 commercial and private entrances. Over the past 20 years, the

City has reduced the number of street entrances and unsignalized intersections along Huron Church Road. Alternate access to many properties fronting Huron Church is available through parallel roads such as Ambassador Drive and Daytona Avenue. The land uses north of Tecumseh Road to the Ambassador Bridge plaza include a residential area along the west side, a shopping centre, Assumption High School, a fast food restaurant and a provincial tourist information centre. Also along this corridor at College Avenue is the University of Windsor Stadium and Recreation Complex. The University has recently completed a multi-million dollar upgrade of its stadium facility to accommodate international track and field events, such as the Pan-Am Games.

Expanding Huron Church Road to a freeway connecting to Ambassador Bridge provides the capacity required to meet the long-term travel demands of the region, but would not provide a new link in the network for accessing the crossing. The ability to provide continuous/ongoing capacity in the network (i.e. redundancy) is a stated objective of the Partnership. In the context of connecting to a twinned Ambassador Bridge (as opposed to a new crossing), using Huron Church was considered to provide only a low benefit to regional mobility, while the other alternatives offered a moderate benefit.

In addition, construction of a new freeway on the primary access route to the busiest border crossing between Canada and the U.S. has greater constructability risks in terms of staging, traffic management and timing of construction to minimize congestion and delay, than other alternatives. These risks have greater potential of increasing the costs of this alternative relative to the others.

## Summary – Connecting Route

All alternatives for a new freeway connecting Highway 401 to a twinned Ambassador Bridge have a high impact to the urban area of Windsor. Expanding Huron Church Road to a freeway to the Ambassador Bridge has less overall impact than a new freeway corridor to the Ambassador Bridge. While using the Huron Church corridor provides a lower benefit to regional mobility and carries greater constructability concerns, the lower impacts to the community were considered of greater importance in determining which alternative to carry forward as the connecting route to the Ambassador Bridge.

The existing right-of-way of Huron Church Road is generally 36 m wide. Expansion of this corridor to a freeway will require an 80 m right-of-way, with interchanges at major crossing roads, grade separations and service roads as required to maintain access. As the primary connecting route to the Ambassador Bridge, disruptions to international trade, and maintaining safety and access for people and goods movement, as well as the high impacts to the urban area, are concerns that remain with this alternative.

### 3.5.2. Plaza

The existing plaza at the Ambassador Bridge is approximately 8 ha (20 acres) in area. Secondary inspection of commercial shipments by Canadian Border Services Agency (CBSA) staff takes place on a remote facility approximately 6.5 ha (16 acres) in size owned by the bridge located near Huron Church Road and Ambassador Drive. Drivers directed to the secondary inspection area use public roads to access the facility. CBSA have identified that the current arrangement for secondary inspection at Ambassador Bridge is not a viable long-term arrangement. A suitable plaza size to meet the requirements of border agencies, accommodate all international truck and auto traffic and connections to a twinned Ambassador Bridge is 48 ha (120 acres). (The size of the

inspection plaza for a new crossing was estimated to be 80 to 100 acres assuming the Ambassador Bridge would be available to process 50% of the border traffic. If all the border traffic was to be processed at the twinned Ambassador Bridge, a larger plaza area is required.)

The existing plaza is bounded on the south by the Essex Terminal Rail right-of-way, and on the east by the University of Windsor campus. Therefore, a proposal for the expansion of the existing plaza was developed to the west side of the existing structure.

While having the plaza sized appropriately to allow border agencies to carry out all border processing functions and inspections at the foot of the bridge is highly desirable for the border agencies, a plaza surrounded by a residential area is not desirable.

The Canadian Project Team considered alternatives to the expansion of the existing plaza into the community of Sandwich. Plaza CT2 would completely incorporate the area south of College Avenue currently occupied by the University of Windsor Stadium and recreational complex, Assumption College and University Mall. This plaza would be separated from the twin structures by a rail line. This plaza site would have equally high impacts to the community, particularly to the university, and was not carried forward.

A remote plaza at site CC7, connected to the twin Ambassador Bridge via a secure roadway was also considered. This plaza and connected roadway configuration was found to have equally high impacts to the community as the expansion of the existing due to the impacts of the plaza combined with the severance effects of a secure roadway approximately 1500 m in length through Sandwich. Border agencies identified concerns with the length and location of the secure roadway, noting that secure roadways through densely populated urban areas carry higher risks, requiring greater security and monitoring efforts. The remote plaza concept for the Ambassador Bridge was eliminated from further consideration.

### 3.5.3. Crossing

The new span on the west side of the existing structure would avoid impacts to the University of Windsor campus, a cemetery and other features. The centreline of the new bridge would be generally aligned with Indian Road. The plaza expansion currently under construction in Canada and the improvements to the connections to the interstate freeway system in the U.S. will accommodate this new bridge location.

### 3.5.4. Analysis Results

The following summarizes the results of the Canadian side impacts analysis for crossing alternative X12 with the associated plaza and connecting route to Highway 401. The impact analysis is organized according to the seven performance factors developed for the project. Each performance factor incorporates many criteria, indicators and measures to provide a complete assessment of the nature and extent of the impacts and benefits of the crossing, plaza and connecting route.

#### Changes in Air Quality

At the illustrative alternatives stage, the assessment of impacts to air quality considered the predicted change to regional air quality with a new or expanded crossing as compared to the do-nothing or 'no build' scenario. The pollutant burdens were calculated for the

following pollutants and precursors: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulphur oxides (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), particulate matter less than 2.5 microns (PM<sub>2.5</sub>) (which includes Diesel Particulate Matter (DPM)), and volatile organic compounds (VOC), as well as the following air toxics: benzene, acetaldehyde, formaldehyde, 1,3-butadiene, acrolein, and polycyclic aromatic hydrocarbons (PAH). These contaminants were selected because they represent the greatest potential for off-site impacts due to tailpipe or roadway surfaces. All of the species listed above are emitted in vehicle exhaust. Fugitive dust, including fine particulate matter, such as PM<sub>10</sub> and smaller is also emitted from roadway surfaces as vehicles travel over them.

The analysis identified that crossing X12 alternative would have little change in the regional air quality as compared to the do-nothing scenario. The potential effects on local air quality are addressed in the assessment of impacts to community and neighbourhood characteristics, and are reflected in the analysis of disruption to sensitive receivers discussed in the next section.

## Protection of Community and Neighbourhood Characteristics

The assessment of impacts to community and neighbourhood characteristics included an assessment of traffic impacts (volume of international traffic on local streets and impacts to local access); potential noise impacts; impacts to community cohesion and character; and displacements/acquisitions.

Huron Church/Talbot Road is a high volume multi-lane roadway serving as the existing connecting route to the Ambassador Bridge. While a new highway in this corridor would affect the community function and structure, the existing high volume roadway represents an existing impact and severance to this area of the region. Expanding Huron Church/Talbot Road from Highway 401 to the plaza at Ambassador Bridge will displace approximately 135 homes and over 85 businesses, while over 2100 households and approximately 25 businesses will be disrupted (i.e. are within 250m of the centreline).

The expansion of the existing plaza at the Ambassador Bridge will have a highly negative impact to the community, particularly the neighbourhood of Sandwich. This area of Sandwich is densely populated and a mature residential area. Over 215 households will be displaced and almost 1000 households disrupted (i.e. within 200 m of the plaza) within the established urban neighbourhood. Area businesses are forming an economic development corporation to promote new growth and development opportunities in the Sandwich area. The loss of over 215 households from the immediate vicinity would have a negative effect on the local businesses serving this community. Other impacts associated with this plaza expansion include: 2 schools displaced (J.L. Forster Secondary School and St. Francis Separate School); 4 institutional uses disrupted, including a day care centre and business school; and 5 social features disrupted, including the University of Windsor, Assumption Church and the riverfront park. The plaza would be situated in residential neighbourhood (highly undesirable from the perspective of border agencies) with little opportunity for expansion to meet future needs without additional community impacts.

The twinning of the Ambassador Bridge will also have impacts to the Sandwich community: approximately 75 households displaced and over 310 households disrupted; a student residence would be displaced and the riverfront park would be disrupted.



Overall, the crossing X12 alternative would have a highly negative impact to community and neighbourhood characteristics.

## Maintain Consistency with Existing and Planned Land Use

Huron Church/Talbot Road passes through primarily commercial land uses that have developed around the high traffic volume corridor. In this sense, upgrading this roadway to a freeway was considered to be consistent with existing land uses. Recognizing that a freeway in this corridor will affect access onto this corridor, the connecting roadway was considered to have a low impact to land use.

The expansion of the plaza at the foot of the Ambassador Bridge was considered a high negative impact to land use (refer to Exhibit 3.17). A bridge plaza serving the busiest border crossing in North America adjacent to the University of Windsor and the residential community of Sandwich is highly inconsistent with existing and planned land use in this area of the city.

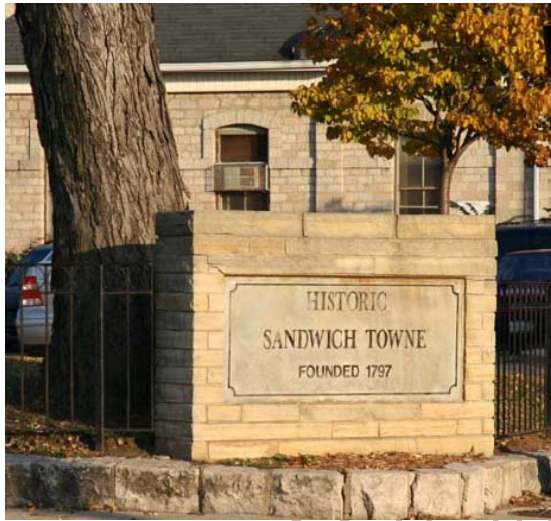
### EXHIBIT 3.17: HURON CHURCH ROAD – TECUMSEH ROAD TO AMBASSADOR BRIDGE



Overall, the crossing X12 alternative was considered to have a moderate to high impact to land use.

## Protect Cultural Resources

The crossing X12 alternative has a high negative impact to cultural resources. The community of Sandwich includes one of the oldest settlements in Canada. The original town of Sandwich retains a number of buildings of the pre-confederation era that are of historical significance and/or which exemplify the Neo-classical and Georgian styles of architecture, which were in vogue during the first half of the nineteenth century.



A number of designated heritage properties can be found along the following streets: Russell Street, Sandwich Street, Peter Street, Detroit Street, Mill Street, Brock Street, Chippewa Street, South Street, Watkins Street, Prince Road. The Ambassador Bridge, built in 1929, is listed on the Ontario Heritage Bridge List. Expanding the plaza at the Ambassador Bridge to accommodate a twinning of this structure will affect over 40 built heritage features (disruption impacts) and 3 known archaeological sites. The alternative also impacts a sizable area of high archaeological potential.

## Protect the Natural Environment

As the crossing X12 alternative utilizes existing infrastructure and the plaza impacts a residential area, it has a low impact to natural features. The alternative directly impacts the St. Clair College ESA and would result in the loss of approximately 26 hectares of natural features (both designated and undesignated).

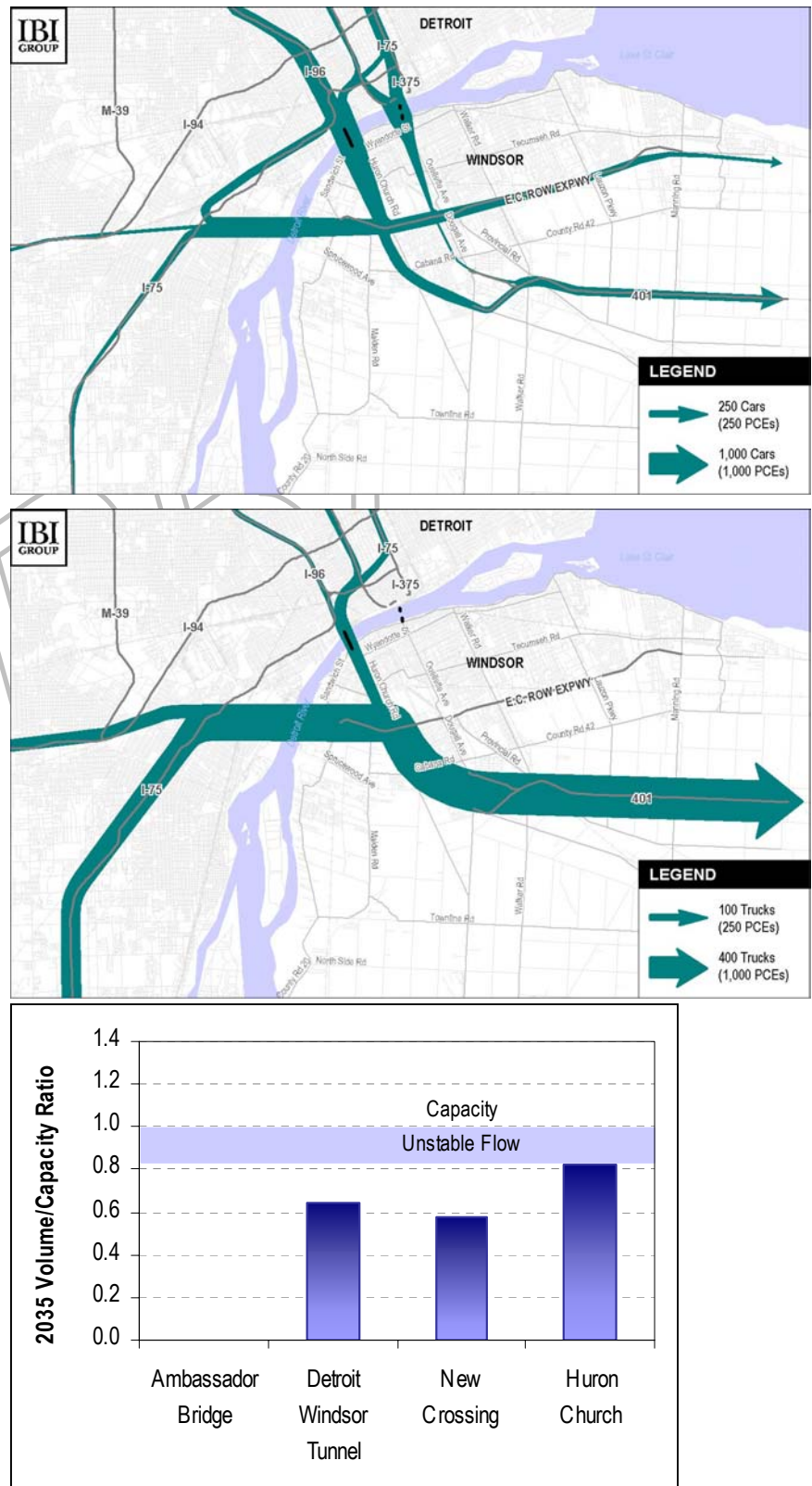
## Improve Regional Mobility

The assessment of improvements to regional mobility is based on a number of criteria and measures, including traffic operations on key roadway links including the existing crossings and roadways serving those crossings and changes in travel time and distance, as compared to the do-nothing or no-build alternative.

An analysis of traffic projections based on origin-destination pairings for year 2035 (the horizon year of this study) identified that crossing X12 alternative offers high benefits in comparison to other alternatives. This assessment is based on a review of several indicators:

- Expanding Huron Church/Talbot Road to a freeway would provide improvement to the regional road network by providing additional capacity to the border transportation network (refer to Exhibit 3.18); without this additional capacity, the existing crossings would reach capacity by year 2022, resulting in severe congestion and delay for all international truck and auto traffic, for both long-distance and local trips; (It should be noted that for free-flow facilities, V/C ratios greater than 0.85 indicate the facility is operating near capacity (unstable flow), while ratios greater than 1.0 indicate a breakdown in the system.)
- The Huron Church/Talbot Road/Ambassador Bridge corridor would sufficiently serve a portion of the international truck and auto traffic (both long-distance and local) such that by 2035, the travel demand on Huron Church approaching Ambassador Bridge would be below the capacity of the roadway, providing stable conditions on this facility during peak travel periods; operations on the Ambassador Bridge itself would be stable, with sufficient spare capacity on the facility to serve travel demand beyond 2035.

**EXHIBIT 3.18: 2035 TRAFFIC VOLUMES AND VOLUME TO CAPACITY RATIOS OF KEY NETWORK COMPONENTS WITH TWIN AMBASSADOR BRIDGE ALTERNATIVE**





- Twinning of the Ambassador Bridge has lower ability to providing continuous/ongoing river crossing capacity (i.e. redundancy) than a new crossing; a twinned structure can provide some flexibility in operations in response to certain types of incidences and maintenance operations, but would have lower flexibility than a new link in the border network. Huron Church Road serves two primary functions in the regional road network: one function is to facilitate access to areas in west Windsor for local traffic; the second function, owing to its connection to the Ambassador Bridge, is to efficiently convey international traffic to the border crossings to facilitate the movement of people and cross-border goods. Using Huron Church Road to serve both of these primary functions provides fewer benefits to regional mobility.

Overall, this alternative was considered to have a moderate to high benefit to regional mobility.

### Minimize Cost

The assessment of cost also includes consideration of constructability and technical risks associated with each alternative. The cost of the crossing X12 alternative is comparably higher than that of several other alternatives, primarily due to the substantially higher property and construction costs associated with constructing a major transportation facility in an urban area, including greater impacts to residences, businesses and other existing uses, utility relocation costs and mitigation. In addition, this alternative includes added costs of traffic management, reflecting the fact that this option represents construction of a new freeway in the same corridor as the existing road connection to the Ambassador Bridge. The cost of the crossing X12 alternative, including the connecting roadway, plaza and one-half the crossing cost, is estimated as approximately \$1540 Million (CDN).

Construction of a new freeway on the primary access route to the busiest border crossing between Canada and the U.S. has greater constructability risks in terms of staging, traffic management and timing of construction to minimize congestion and delay, than other alternatives. These risks have greater potential of increasing the costs of this alternative as well as increasing delay to international traffic relative to the others.

### 3.5.5. Summary

A second or expanded span at the Ambassador crossing can provide some benefit to the border transportation network in the Windsor-Detroit area by providing additional border crossing capacity for international traffic.

A six-lane freeway connecting to a twinned or expanded Ambassador Bridge has a high benefit to regional mobility. An expanded crossing connected by a freeway on the Huron Church/Talbot Road corridor would adequately serve long-distance international truck traffic and local cross-border auto and truck traffic. The Detroit-Windsor Tunnel would also operate well during daily peak travel periods and congestion on Huron Church Road would be reduced in comparison to other alternatives.

However, expansion of the existing crossing and connections has a limited ability to provide continuous/ongoing river crossing capacity (i.e. redundancy), in comparison to providing a new crossing and connections.

The Canadian Project Team also recognizes that expansion of the crossing and existing plaza creates high impacts to the historic Sandwich community around the existing bridge and plaza. This alternative would have high community impacts in terms of residential



displacements and disruption, impacts to built heritage features, and community character and cohesion.

The expansion of Huron Church/Talbot Road to a freeway also has high community impacts, particularly on the section north of E.C. Row Expressway. The constructability of this option is made additionally complex by the need to keep international truck and auto traffic moving efficiently at this important border crossing during construction.

### 3.6. Conclusions of Evaluation of Illustrative Alternatives - Canadian Side

The results of the evaluation of the illustrative alternatives on the Canadian side are summarized in Tables 3.7-A to 3.7-C at the end of this section. The Canadian Project Team identified alternatives that, based on the Canadian analysis, are recommended for consideration in the end-to-end analysis with the U.S. Project Team results.

#### South Alternatives – Crossings X1, X2, X3, X4, X5, X6

Further investigation by the Canadian Project Team into the feasibility of constructing an inspection plaza on Fighting Island identified significant constructability, environmental and cost issues with the Crossing X5 alternative. In addition, further investigation by the U.S. Project Team into the feasibility of constructing an inspection plaza on lands currently used for slag processing related to the National Steel operation identified significant community impacts and unacceptable disruption to the steel mill operation. The U.S. Team eliminated the AC1 plaza site from further consideration.

Southern crossing alternatives X5 and X6 were therefore eliminated from further consideration.

With any of the remaining southern crossings, a new transportation facility would not provide adequate benefits to regional mobility up to year 2035 (the horizon year of this study). The existing crossings and key roads serving these crossings would operate at or near capacity during peak travel periods within the planning horizon of this study. Additional transportation improvements would be required to address the need for additional capacity at the existing crossings and on the key connecting roadways in the urban area of Windsor.

The southern alternatives offer limited benefits to the transportation network in the Windsor-Essex County region, and result in traffic congestion and delay during peak travel periods in year 2035 (the horizon year of this study), particularly at the Detroit-Windsor Tunnel, and on Huron Church Road leading to the Ambassador Bridge. Improving system connectivity to enhance the continuous flow of people and goods is a primary objective of this project.

The southern alternatives carried lower community impacts than the other alternatives in terms of lower direct impacts to households and businesses. However, on the basis of that a new transportation facility would not meet the Partnership's objectives for improving regional mobility, the Canadian Project Team recommended that the south alternatives not be carried forward for further study.

## Central Alternatives – Crossings X7, X8, X9, X10 and X11

Crossing X7 connected the Canadian plaza CC4 to U.S. plaza AC1. Additional investigation by the U.S. Team has identified that Plaza AC1 is not practical, due to unacceptable impacts to the operations of National Steel associated with this proposed plaza site (for more information, refer to U.S. Analysis Results, under separate cover). Therefore, Crossing X7 was set aside and will not be studied further.

A summary of the assessment of crossing X8, X9, X10 and X11 alternatives is provided in Table 3.7-A. The proposed crossing X8, X9, X10 and X11 alternatives offer high regional mobility benefits. Any of these new crossings connected by a freeway the Huron Church/Talbot Road corridor would adequately serve long-distance international truck traffic and local cross-border auto and truck traffic through year 2035 (the horizon year of this study). The existing crossings and the roadways connecting to these crossings would also operate well during daily peak travel periods. The crossing X8 alternative offers slightly lower benefits to regional mobility than the other central alternatives.

Crossing X11 alternative has higher community impacts than the other central alternatives, including impacts to land use and cultural features, due to the proximity of the crossing and plaza to the residential and historic community of Sandwich.

Crossing X8 and X9 alternatives avoid the community of Sandwich, but have higher impacts to natural features associated with impacts to connectivity between the sensitive natural areas in the Ojibway area and the riverfront.

All the alternatives carry some degree of constructability and other risks related to the current uses in the area, presence and effects of mining activities, and the concentration of infrastructure.

The central alternatives represent the best balance of transportation benefits and community impacts on the Canadian side. Of the alternatives that adequately meet the mobility needs of the region, a new freeway in the Huron Church/Talbot Road corridor south of E.C. Row Expressway has lower impacts to the community than a new freeway through the Ojibway area or expansion of the E.C. Row Expressway. The impacts of the plaza and crossing sites in the industrial areas are also lower than those of the crossing X12 and X14 alternatives.

Continued analyses of these central alternatives would provide opportunities to reduce the land use/community and natural feature impacts, as well as address issues of constructability. The Canadian Project Team therefore recommended that the crossing X8, X9, X10 and X11 alternatives be carried forward as practical alternatives.

## Ambassador Bridge Alternative – Crossing X12

A six-lane freeway connecting to a twinned Ambassador Bridge has a high benefit to regional mobility through year 2035 (the horizon year of this study). An expanded crossing connected by a freeway on the Huron Church/Talbot Road corridor would adequately serve long-distance international truck traffic and local cross-border auto and truck traffic. The Detroit-Windsor Tunnel would also operate well during daily peak travel periods and congestion on Huron Church Road would be reduced in comparison to other alternatives.

However, expansion of the existing crossing and connections offers limited improvement to providing continuous/ongoing river crossing capacity, in comparison to providing a new

crossing and connections. Expanding the existing plaza and construction of a new freeway in the Huron Church Road corridor has high potential for disrupting international traffic in this important trade corridor. With the Crossing X12 alternative, the entire length of Huron Church Road up to the Ambassador Bridge would require reconstruction.

The Canadian Project Team also recognizes that expansion of the crossing and existing plaza creates high impacts to the historic Sandwich community. This alternative would have high community impacts in terms of residential displacements and disruption, impacts to built heritage features, and community character and cohesion. The community impacts associated with twinning of Ambassador Bridge, expansion of the existing bridge plaza and expansion of Huron Church Road to a freeway are notably higher than those of the central alternatives.

Based on higher community impacts, higher degree of disruption to international traffic on Huron Church Road and the community during construction and the limited improvement to continuous/ongoing capacity in the network in comparison to the central alternatives, the Canadian Project Team recommended that twinning of the Ambassador Bridge, expansion of the Canadian plaza and a new freeway connection to Highway 401 not be carried forward as a practical alternative.

This decision does not prevent the owners of the Ambassador Bridge from continuing with its separate environmental studies in accordance with the legislative requirements in both countries for permits/approvals for a new bridge at this location.

### Rail Corridor Alternative – Crossings X13 and X14

The Rail Corridor was assessed as:

- a two lane truckway utilizing the two existing single track rail tunnels refurbished to provide two lanes of truck traffic (one lane in each direction);
- a six-lane freeway with a new six-lane road tunnel (three lanes in each direction) constructed beneath the Detroit River; and,
- a six-lane freeway with an new six-lane road bridge constructed over the Detroit River

The DRTP truckway proposal does not provide sufficient capacity to meet the projected travel demand at the Windsor-Detroit crossing up to year 2035 (the horizon year of this study) and has high community impacts on the Canadian side. This option was eliminated from further consideration in this study.

A six-lane freeway tunnel crossing was assessed and considered practically infeasible for this study. As a six-lane freeway with a new bridge or tunnel, the Rail Corridor alternative has a high benefit to regional mobility through year 2035. A new crossing connected by a freeway using the rail corridor alignment would adequately serve long-distance international truck traffic and local cross-border auto and truck traffic. The existing crossings and the roadways connecting to these crossings would also operate well during daily peak travel periods.

However, the Canadian Project Team recognizes that a new freeway through central and south Windsor is not consistent with current and future land use plans for the city. A new freeway corridor through central and south Windsor is not compatible with existing and planned land uses in this area of the city. This alternative was considered to have high community impacts in terms of impacts to regional commercial/retail areas and employment areas south of E.C. Row Expressway and negative impacts to community

character and cohesion both in south Windsor and for the older neighbourhoods near the riverfront.

Border agencies also noted that the distance from the plaza to the new crossing is highly undesirable with respect to meeting their needs for siting plazas as close to the border as possible and the security/monitoring of a secure corridor through an urban residential area this would require.

Constructability concerns were also identified with this alternative pertaining to the cost, time and disruption to traffic in central Windsor associated with the interchange at E.C. Row Expressway. The U.S. and Canadian Project Teams considered a tunnel under this section of the Detroit River practically infeasible due to the time and cost implications for the project.

On the basis that other alternatives provide comparable transportation benefits with lower community impacts, the disadvantages of the rail corridor alternatives outweighed the advantages and the Canadian Project team did not recommend the rail corridor alternatives be carried forward for further study.

### East Alternative – Crossing X15

With the east alternative, a new transportation facility would not provide adequate benefits to regional mobility up to year 2035 (the horizon year of this study). The existing crossings and key roads serving these crossings would operate at or near capacity during peak travel periods within the planning horizon of this study. Improving system connectivity to enhance the continuous flow of people and goods is a primary objective of this project. Additional transportation improvements would be required to address the need for additional capacity at the existing crossings and on the key connecting roadways in the urban area of Windsor.

In addition to poor transportation performance, the east alternative was found to be not compatible with the established residential character of east Windsor, particularly north of E.C. Row Expressway. A new crossing and plaza in the riverfront area of east Windsor would have high impacts to the community. South of E.C. Row, a new road connection to Highway 401 was found to have little impact to community character and a fair degree of compatibility with current and future land uses.

On the basis of that a new transportation facility would not meet the Partnership's objectives for improving regional mobility and would have higher community impacts than other alternatives, the Canadian Project team recommended that the east alternative not be carried forward for further study.



**TABLE 3.7-A: SUMMARY OF ASSESSMENT OF ILLUSTRATIVE ALTERNATIVES, CANADIAN SIDE, SOUTH AREA - HIGHWAY 401 TO DETROIT RIVER**

Factor	Crossing X1/Plaza CS3	Crossing X2/Plaza CS2	Crossing X3/Plaza CS2	Crossing X4/Plaza CS4
<b>Changes to Air Quality</b>	<b>No impact</b> Slight decrease in pollutants on a system-wide basis	<b>Low impact</b> Small to moderate increase in pollutants on a system-wide basis	<b>Low impact</b> Moderate increase in pollutants on a system-wide basis	<b>No impact</b> Little to increase in pollutants on a system-wide basis
<b>Community and Neighbourhood Impacts</b>	<b>Low impact</b> <b>Displacements:</b> 10+ households < 5 Businesses; <b>Disruption:</b> 90+ households within 250 m of centreline; <5 businesses	<b>Low impact</b> <b>Displacements:</b> 10+ households; <5 Businesses; <b>Disruption:</b> 100+ households within 250 m of centreline; <5 businesses	<b>Low impact</b> <b>Displacements:</b> 10+ households 1+ Businesses; <b>Disruption:</b> 90+ households within 250 m of centreline; <5 businesses	<b>Low impact</b> <b>Displacements:</b> 80+ households <5 Businesses; <b>Disruption:</b> 380+ households within 250 m of centreline; <5 businesses
<b>Consistency with Land Use</b>	<b>Low impact</b> Connecting route primarily impacts rural areas of LaSalle and Amherstburg, which are somewhat consistent for a new freeway; plaza and crossing have limited impacts on planned land use	<b>Low impact</b> Connecting route primarily impacts rural areas/boundary of future urban area of LaSalle, which are somewhat consistent for a new freeway; plaza and crossing have limited impacts on current/planned land use	<b>Low impact</b> Connecting route primarily impacts rural area/boundary of future urban area of LaSalle, which is somewhat consistent for a new freeway; plaza and crossing have limited impacts on current/planned land use	<b>Moderate impact</b> Connecting route impacts primarily rural area/boundary of future urban area of LaSalle, which is somewhat consistent for a new freeway; plaza and crossing are within in the urban area boundary of LaSalle impacting current/ future residential land use – not consistent
<b>Impacts to Cultural Resources</b>	<b>Low impact</b> Impacts to 0 built feature, 3 known archaeological sites; moderate potential for impacting unknown sites	<b>Low impact</b> Impacts to 0 built feature, 1 known archaeological site; high potential for impacting unknown sites	<b>Low impact</b> Impacts to 0 built features; 1 known archaeological site; high potential for impacting unknown sites	<b>Low impact</b> Impacts to 0 built features; 1 known archaeological sites; high potential for impacting unknown sites
<b>Natural Environment</b>	<b>Moderate Impact</b> Loss of 22+ ha of designated/ undesignated features; direct impacts to 17+ ha of ETS <sup>10</sup> /habitat;	<b>High Impact</b> Loss of 55+ ha of designated/ undesignated features; direct impacts to 31+ ha of ETS <sup>1</sup> /habitat;	<b>Moderate Impact</b> Loss of 33+ ha of designated/ undesignated features; direct impacts to 44+ ha of ETS <sup>1</sup> /habitat;	<b>Moderate Impact</b> Loss of 21+ ha of designated/ undesignated features; direct impacts to 32+ ha of ETS <sup>1</sup> /habitat
<b>Improve Regional Mobility</b>	<b>Low Benefits</b> Provides additional capacity/new crossing; inadequate benefits to existing crossings and key connecting roadways in Windsor which operate over capacity during daily peak travel periods in long term; does not meet Partnership objectives	<b>Low Benefits</b> Provides additional capacity/new crossing; inadequate benefits to existing crossings and key connecting roadways in Windsor which operate over capacity during daily peak travel periods in long term; does not meet Partnership objectives	<b>Low Benefits</b> Provides additional capacity/new crossing; inadequate benefits to existing crossings and key connecting roadways in Windsor which operate over capacity during daily peak travel periods in long term; does not meet Partnership objectives	<b>Low Benefits</b> Provides additional capacity/new crossing; inadequate benefits to existing crossings and key connecting roadways in Windsor which operate over capacity during daily peak travel periods in long term; does not meet Partnership objectives
<b>Cost</b>	<b>High Impacts</b> CDN\$850 M <sup>11</sup> ; Constructability risks include construction of 2 km crossing over Detroit River on Canadian side	<b>High Impacts</b> CDN\$1030 M <sup>2</sup> ; Constructability risks include active salt mines and construction of 2+ km crossing over Detroit River on Canadian side.	<b>High Impacts</b> CDN \$980 M <sup>2</sup> ; Constructability risks include active salt mines, Fighting Island soils/ contamination issues and construction of 2+ km crossing over Detroit River on Canadian side.	<b>High Impacts</b> CDN\$870 M <sup>2</sup> ; Constructability risks include active salt mines, Fighting Island soils/ contamination issues, construction of 2 km crossing over Detroit River/Fighting Island on Canadian side.

**Conclusions:**  
The Southern alternatives generally have lower impacts to community features, which is a primary objective of this project, and have comparable costs and constructability risks to the other alternatives. However, these alternatives do not provide adequate improvement to regional mobility in the long term. These alternatives are therefore not recommended for continued analysis.

<sup>10</sup> Endangered or threatened species

<sup>11</sup> Preliminary planning costs of connecting route, plaza and one-half of crossing

**TABLE 3.7-B: SUMMARY OF ASSESSMENT OF ILLUSTRATIVE ALTERNATIVES, CANADIAN SIDE, CENTRAL AREA - HIGHWAY 401 TO DETROIT RIVER**

Factor	Crossing X8/Plaza CC4	Crossing X9/Plaza CC3	Crossing X10/Plaza CC3	Crossing X11/Plaza CC7
<b>Changes to Air Quality</b>	<b>Low impact</b> No noticeable change in regional airshed	<b>Low impact</b> No noticeable change in regional airshed	<b>Low impact</b> No noticeable change in regional airshed	<b>Low impact</b> No noticeable change in regional airshed
<b>Community and Neighbourhood Impacts</b>	<b>Moderate impact</b> <b>Displacements:</b> 130+ households 40+ Businesses; <b>Disruption:</b> 1600+ households within 250 m of centreline; 10+ businesses	<b>Moderate impact</b> <b>Displacements:</b> 150+ households; 40+ Businesses; <b>Disruption:</b> 1400+ households within 250 m of centreline; <10 businesses	<b>Moderate impact</b> <b>Displacements:</b> 140+ households 45+ Businesses; <b>Disruption:</b> 1450+ households within 250 m of centreline; 10+ businesses	<b>Moderate to high impact</b> <b>Displacements:</b> 180+ households 55+ Businesses; <b>Disruption:</b> 2080+ households within 250 m of centreline; <10 businesses
<b>Consistency with Land Use</b>	<b>Moderate impact</b> Huron Church/Talbot is somewhat consistent for a new freeway; plaza and crossing in active industrial areas considered consistent	<b>Low impact</b> Huron Church/Talbot is somewhat consistent for a new freeway; plaza and crossing in undeveloped industrial areas highly consistent	<b>Low impact</b> Huron Church/Talbot is somewhat consistent for a new freeway; plaza and crossing in undeveloped industrial areas highly consistent	<b>Low to Moderate impact</b> Huron Church/Talbot is somewhat consistent for a new freeway; plaza adjacent to residential not consistent; crossing in industrial areas consistent
<b>Impacts to Cultural Resources</b>	<b>Moderate impact</b> Impacts to 1 built feature, 3 known archaeological sites; high potential for impacting unknown sites	<b>Moderate impact</b> Impacts to 1 built feature, 6 known archaeological sites; high potential for impacting unknown sites	<b>Moderate impact</b> Impacts to 2 built features; 2 known archaeological sites; high potential for impacting unknown sites	<b>Moderate to High impact</b> Impacts to 10 built features; 2 known archaeological sites; high potential for impacting unknown sites
<b>Natural Environment</b>	<b>High Impact</b> Severs Ojibway features from riverfront; Loss of approx. 26 ha of designated/ undesignated features; direct impacts to 25+ ha of ETS <sup>12</sup> /habitat;	<b>High Impact</b> Potential for severing Ojibway features from riverfront; Loss of approx. 30 ha of designated/ undesignated features; direct impacts to 20+ ha of ETS <sup>1</sup> /habitat;	<b>Moderate Impact</b> Loss of 20+ ha of designated/ undesignated features; direct impacts to 14+ ha of ETS <sup>1</sup> /habitat;	<b>Moderate Impact</b> Loss of 25+ ha of designated/ undesignated features; direct impacts to 13+ ha of ETS <sup>1</sup> /habitat;
<b>Improve Regional Mobility</b>	<b>High Benefits</b> Provides additional capacity/new crossing; existing crossings operate well; D-W tunnel approaching unstable flow in 2035	<b>High Benefits</b> Provides additional capacity/new crossing; existing crossings operate well; D-W tunnel approaching unstable flow in 2035	<b>High Benefits</b> Provides additional capacity/new crossing; existing crossings operate well;	<b>High Benefits</b> Provides additional capacity/new crossing; existing crossings operate well;
<b>Cost</b>	<b>High Impacts</b> CDN\$1.5 B <sup>13</sup> ; Constructability risks include traffic/utility management on HCR/Talbot corridor, active mines, brine wells	<b>High Impacts</b> CDN\$1.4 B <sup>2</sup> ; Constructability risks include traffic/utility management on HCR/Talbot corridor, active mines, brine wells	<b>High Impacts</b> CDN\$1.4 B <sup>2</sup> ; Constructability risks include traffic/utility management on HCR/Talbot corridor, active mines, brine wells	<b>High Impacts</b> CDN\$1.2 B <sup>2</sup> ; Constructability risks include traffic/utility management on HCR/Talbot corridor, active mines, brine wells
<b>Conclusions:</b> The Central alternatives represent a reasonable balance between benefits to regional mobility and community impacts. These alternatives are recommended for continued analysis.				

<sup>12</sup> Endangered or threatened species

<sup>13</sup> Preliminary planning costs of connecting route, plaza and one-half of crossing

**TABLE 3.7-C: SUMMARY OF ASSESSMENT OF ILLUSTRATIVE ALTERNATIVES, CANADIAN SIDE, X12, X14 AND X15 - HIGHWAY 401 TO DETROIT RIVER**

Factor	Crossing X12/Plaza CT1	Crossing X14/Plaza CR1	Crossing X15/Plaza CE1
<b>Changes to Air Quality</b>	<b>No impact</b> Slight increase in pollutant levels on a system-wide basis vs. do nothing	<b>No impact</b> Little change in pollutant levels on a system-wide basis vs. do nothing	<b>No impact</b> Little change in pollutant levels on a system-wide basis vs. do nothing
<b>Community and Neighbourhood Impacts</b>	<b>High impact</b> <b>Displacements:</b> 420+ households 85+ Businesses; <b>Disruption:</b> 3490+ households within 250 m of centreline; 25+ businesses	<b>High impact</b> <b>Displacements:</b> 125+ households; 75+ Businesses; <b>Disruption:</b> 2180+ households within 250 m of centreline; 10+ businesses	<b>High impact</b> <b>Displacements:</b> 570+ households 40+ Businesses; <b>Disruption:</b> 2600+ households within 250 m of centreline; 40+ businesses
<b>Consistency with Land Use</b>	<b>Moderate impact</b> Huron Church/Talbot is somewhat consistent for a new freeway; plaza and crossing in historic residential area are highly inconsistent	<b>High impact</b> High impacts to land use; especially regional commercial uses; crossing, plaza and freeway highly inconsistent with local land uses and city plans	<b>High impact</b> Crossing, plaza and route north of EC Row highly inconsistent with current and planned land uses; route south of EC Row to Highway 401 is somewhat consistent
<b>Impacts to Cultural Resources</b>	<b>High impact</b> Impacts to 45 built features, 3 known archaeological sites; high potential for impacting unknown sites	<b>High impact</b> Impacts to 14 built features, no known archaeological sites impacted; moderate potential for impacting unknown sites	<b>Moderate impact</b> Impacts to 10 built features; no known archaeological sites impacted; moderate potential for impacting unknown sites
<b>Natural Environment</b>	<b>Low Impact</b> Loss of 15+ ha of designated/ undesignated features; direct impacts to 11+ ha of ETS <sup>14</sup> /habitat;	<b>High Impact</b> Loss of 21+ ha of designated/ undesignated features; direct impacts to 18+ ha of ETS <sup>1</sup> /habitat;	<b>Low Impact</b> Loss of 13+ ha of designated/ undesignated features; direct impacts to 9+ ha of ETS <sup>1</sup> /habitat;
<b>Improve Regional Mobility</b>	<b>High Benefits</b> Provides additional capacity/new crossing; existing crossings operate below capacity; D-W tunnel approaching unstable flow in 2035 during daily peak travel periods in long term	<b>High Benefits</b> Provides additional capacity/new crossing; existing crossings and connecting roadways operate well during daily peak travel periods in long term;	<b>Low Benefits</b> Provides additional capacity/new crossing; inadequate benefits to existing crossings and key connecting roadways in Windsor which operate over capacity during daily peak travel periods in long term; does not meet Partnership objectives
<b>Cost</b>	<b>High Impacts</b> CDN\$1.5 B <sup>15</sup> ; Constructability risks include traffic/utility management and access on HCR/Talbot Rd/Hwy 3; complex interchange at Huron Church and EC Row Expressway	<b>High Impacts</b> CDN\$1.9 B <sup>2</sup> ; Constructability risks include interchange reconfiguration at Hwy 401; complex interchange at EC Row including reconfiguration of Howard and Dougall interchanges; traffic/utility management and access in Provincial Road corridor; maintenance of rail traffic.	<b>High Impacts</b> CDN\$1.6 B <sup>2</sup> ; Constructability risks include interchange on EC Row/Lauzon Parkway; traffic/utility management and access on Lauzon Parkway/plaza area/new crossing
<b>Conclusions:</b> The Crossing X12 and X14 alternatives provide adequate improvements to regional mobility but have higher community impacts than the central alternatives. The crossing X15 alternative has high community impacts and does not provide adequate improvement to regional mobility in the long term. These alternatives are therefore not recommended for continued analysis.			

<sup>14</sup> Endangered or threatened species

<sup>15</sup> Preliminary planning costs of connecting route, plaza and one-half of crossing

## Summary

Based on the results of the evaluation of crossing/plaza/connecting route systems connecting the 15 crossings to Highway 401, the Canadian Project Team brought forward the following preliminary recommendations for comparison to the U.S. findings as part of an end-to-end evaluation:

- **Crossing X1, X2, X3 and X4 alternatives** not be carried forward; these alternative do not meet Partnership objectives for improvement to regional mobility;
- **Crossing X5, X6 and X7 alternatives** be eliminated from further consideration due to issues of constructability/feasibility;
- **Crossing X8 and X9 alternatives** be subject to a review by both teams in determining whether to carry forward as practical alternatives; Crossings X8 and X9 alternatives provide high benefits to regional mobility and avoid the community of Sandwich, but have higher impacts to natural features than other central alternatives on the Canadian side; in determining whether to carry these alternatives forward as practical alternatives, the impacts and benefits of these alternatives on the U.S. side must be considered;
- **Crossing X10 and X11 alternatives** be carried forward for further study; these alternatives were found to have the best overall balance of meeting regional mobility needs and impacts to community features.
- **Crossing X12 alternative** not be carried forward due to the high community impacts, high potential for disruption to international traffic during construction and the limited ability to provide continuous/ongoing river crossing capacity;
- **Crossing X13 alternative** be eliminated from further consideration due to inadequate capacity to meet long-term needs and high community impacts;
- **Crossing X14 alternative** not be carried forward; this alternative has high impacts to communities and neighbourhoods in central and south Windsor;
- **Crossing X15 alternative** not be carried forward; this alternative does meet Partnership objectives for improvement to regional mobility and has high community impacts;

These recommendations corresponded to an area of continued study on the Canadian side extending from the Windsor/ LaSalle border to the north end of the portlands in Sandwich town (refer to Exhibit 3.19).



EXHIBIT 3.19: RECOMMENDED AREA OF CONTINUED STUDY, CANADIAN SIDE



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### 3.7. Results of Arithmetic Method – Canadian Side

The evaluation of illustrative crossing, plaza and connecting route alternatives was also conducted using an arithmetic method based on numerical weighting and scoring of impacts. The full discussion of the arithmetic method is provided in Section 2.2 of this document. The results of the arithmetic evaluation of route segments are included in Supporting Documents.

As noted in the previous section, crossing X5, X6 and X7 alternatives were eliminated from further study on the basis that additional investigation of plaza sites CS1 on Fighting Island and AC1 on the National Steel property determined that these sites were not feasible. As well, the DRTP two-lane truckway proposal (using crossing X13) was eliminated from further study on the basis that the capacity provided by this alternative was not sufficient to meet the long-term travel demand needs of the region. A new freeway tunnel as crossing X13 was also eliminated from further study due to issues of constructability.

The results of the arithmetic evaluation of the eleven crossing/plaza/connecting route alternatives are provided in Table 3.8 and summarized in Table 3.9.

#### Unweighted Scores

The unweighted scores represents the total of the impact scores determined by the Canadian Project Team based on the degree of impacts or benefits of each alternative. Crossing X1 and X10 alternatives were ranked highest overall, with crossing alternatives X3, X4 and X11 also highly ranked.

The higher rankings of the crossing X10 and X11 alternatives can be attributed to the balance of benefits to regional mobility and impacts to the community that these options represent compared to the other alternatives.

The higher rankings of crossing X1, X3 and X4 alternatives can be primarily attributed to relatively low community impacts associated with these options due to the less developed rural areas these alternatives are located in. However, these southern alternatives do not meet Partnership objectives for providing free flow of people and goods at the border crossings through the year 2035 (the planning horizon year for this study). These alternatives are not recommended for further study.

Crossing X8 and X9 alternatives had the lowest unweighted scores of the central alternatives, reflecting that these alternatives have less of a balance in terms of benefits to regional mobility and impacts to the community.

#### Weighted Scores

The weighted scores reflect the level of importance as well as the degree of impacts and benefits of each alternative. The Canadian Project Team developed a set of weights for the seven major evaluation factors. A weighting scenario was also developed by arithmetically combining the factor weights provided by individuals of the public through a rating tool exercise conducted as part of the first round of consultation in June 2005. A third weighting scenario was developed by arithmetically combining the factor weights assigned in rating tools submitted by individuals of the Community Consultation Group (CCG).

TABLE 3.8: RESULTS OF ARITHMETIC EVALUATION

ARITHMETIC EVALUATION - Project Team Weighting Scenario																							
Summary of Evaluation (1)	Weighting (2)	X1		X2		X3		X4		X8		X9		X10		X11		X12		X14		X15	
		Score (4)	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score
Changes in Air Quality	12.39	4	49.56	3	37.17	3	37.17	4	49.56	3	37.17	3	37.17	4	49.56	3	37.17	4	49.56	4	49.56	4	49.56
Protect Community/ Neighbourhood Characteristics	15.93	3	47.79	3	47.79	3	47.79	3	47.79	2	31.86	2	31.86	2	31.86	2	31.86	1	15.93	1	15.93	1	15.93
Maintain Consistency with Existing and Planned Land Use	12.39	3	37.17	3	37.17	3	37.17	2	24.78	2	24.78	3	37.17	3	37.17	3	37.17	2	24.78	1	12.39	1	12.39
Protect Cultural Resources	12.39	3	37.17	3	37.17	3	37.17	3	37.17	2	24.78	2	24.78	2	24.78	2	24.78	1	12.39	1	12.39	2	24.78
Protect the Natural Environment	15.93	2	31.86	1	15.93	2	31.86	2	31.86	1	15.93	1	15.93	2	31.86	2	31.86	3	47.79	3	47.79	3	47.79
Improve Regional Mobility	17.70	5	88.50	5	88.50	5	88.50	5	88.50	7	123.90	7	123.90	7	123.90	7	123.90	7	123.90	7	123.90	5	88.50
Minimize Cost	13.27	1	13.27	1	13.27	1	13.27	1	13.27	1	13.27	1	13.27	1	13.27	1	13.27	1	13.27	1	13.27	1	13.27
<b>Unweighted Score</b>		21		19		20		20		18		19		21		20		19		18		17	
<b>Ranking</b>		1		6		3		3		9		6		1		3		6		9		11	
<b>Project Team Weighted Score</b>	100.00	305.32		277.00		292.93		292.93		271.69		284.08		312.40		300.01		287.62		275.23		252.22	
<b>Ranking</b>		2		8		4		4		10		7		1		3		6		9		11	
ARITHMETIC EVALUATION - Public Weighting Scenario																							
Summary of Evaluation	Weighting (3)	X1		X2		X3		X4		X8		X9		X10		X11		X12		X14		X15	
		Score (4)	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score
Changes in Air Quality	17.32	4	69.28	3	51.96	3	51.96	4	69.28	3	51.96	3	51.96	4	69.28	3	51.96	4	69.28	4	69.28	4	69.28
Protect Community/ Neighbourhood Characteristics	15.49	3	46.47	3	46.47	3	46.47	3	46.47	2	30.98	2	30.98	2	30.98	2	30.98	1	15.49	1	15.49	1	15.49
Maintain Consistency with Existing and Planned Land Use	12.89	3	38.67	3	38.67	3	38.67	2	25.78	2	25.78	3	38.67	3	38.67	3	38.67	2	25.78	1	12.89	1	12.89
Protect Cultural Resources	13.14	3	39.42	3	39.42	3	39.42	3	39.42	2	26.28	2	26.28	2	26.28	2	26.28	1	13.14	1	13.14	2	26.28
Protect the Natural Environment	16.34	2	32.68	1	16.34	2	32.68	2	32.68	1	16.34	1	16.34	2	32.68	2	32.68	3	49.02	3	49.02	3	49.02
Improve Regional Mobility	15.28	5	76.40	5	76.40	5	76.40	5	76.40	7	106.96	7	106.96	7	106.96	7	106.96	7	106.96	7	106.96	5	76.40
Minimize Cost	9.54	1	9.54	1	9.54	1	9.54	1	9.54	1	9.54	1	9.54	1	9.54	1	9.54	1	9.54	1	9.54	1	9.54
<b>Public Weighted Score</b>	100.00	312.46		278.80		295.14		299.57		267.84		280.73		314.39		297.07		289.21		276.32		258.90	
<b>Ranking</b>		2		8		5		3		10		7		1		4		6		9		11	
ARITHMETIC EVALUATION - Community Consultation Group Weighting Scenario																							
Summary of Evaluation	Weighting (3)	X1		X2		X3		X4		X8		X9		X10		X11		X12		X13/14		X15	
		Score (4)	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score	Score	Weight x Score
Changes in Air Quality	17.30	4	69.20	3	51.90	3	51.90	4	69.20	3	51.90	3	51.90	4	69.20	3	51.90	4	69.20	4	69.20	4	69.20
Protect Community/ Neighbourhood Characteristics	13.88	3	41.64	3	41.64	3	41.64	3	41.64	2	27.76	2	27.76	2	27.76	2	27.76	1	13.88	1	13.88	1	13.88
Maintain Consistency with Existing and Planned Land Use	13.69	3	41.07	3	41.07	3	41.07	2	27.38	2	27.38	3	41.07	3	41.07	3	41.07	2	27.38	1	13.69	1	13.69
Protect Cultural Resources	13.12	3	39.36	3	39.36	3	39.36	3	39.36	2	26.24	2	26.24	2	26.24	2	26.24	1	13.12	1	13.12	2	26.24
Protect the Natural Environment	17.11	2	34.22	1	17.11	2	34.22	2	34.22	1	17.11	1	17.11	2	34.22	2	34.22	3	51.33	3	51.33	3	51.33
Improve Regional Mobility	14.83	5	74.15	5	74.15	5	74.15	5	74.15	7	103.81	7	103.81	7	103.81	7	103.81	7	103.81	7	103.81	5	74.15
Minimize Cost	10.07	1	10.07	1	10.07	1	10.07	1	10.07	1	10.07	1	10.07	1	10.07	1	10.07	1	10.07	1	10.07	1	10.07
<b>Public Weighted Score</b>	100.00	309.71		275.30		292.41		296.02		264.27		277.96		312.37		295.07		288.79		275.10		258.56	
<b>Ranking</b>		2		8		5		3		10		7		1		4		6		9		11	

NOTES:  
 (1) - Crossing X5, X6, X7 and X13 alternatives were eliminated from further study and therefore were not ranked  
 (2) - Members of the Canadian Project Team collaboratively developed one set of weightings.  
 (3) - Public and Canadian Consultation Group weighting scenarios were developed by arithmetically combining individual submissions on factor weightings  
 (4) - Scores were assigned to each alternative by Project Team specialists and are the same for all weighting scenarios



**TABLE 3.9: SUMMARY OF RESULTS OF ARITHMETIC EVALUATION**

ALTERNATIVE	UNWEIGHTED		CANADIAN PROJECT TEAM**		CANADIAN PUBLIC***		CONSULTATION GROUP***	
	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK
X1	21	1	305.32	2	312.46	2	309.71	2
X2	19	6	277.00	8	278.80	8	275.30	8
X3	20	3	292.93	4	295.14	5	292.41	5
X4	20	3	292.93	4	299.57	3	296.02	3
X5	<i>Eliminated - not feasible*</i>							
X6	<i>Eliminated - not feasible*</i>							
X7	<i>Eliminated - not feasible*</i>							
X8	18	9	271.69	10	267.84	10	264.27	10
X9	19	6	284.08	7	280.73	7	277.96	7
X10	21	1	312.40	1	314.39	1	312.37	1
X11	20	3	300.01	3	297.07	4	295.07	4
X12	19	6	287.62	6	289.21	6	288.79	6
X13 TRUCKWAY	<i>Eliminated - not feasible*</i>							
X14	18	9	275.23	9	276.32	9	275.10	9
X15	17	11	252.22	11	258.90	11	258.56	11

\* - Crossing X5, X6, X7 and X13 alternatives were eliminated from further study and therefore were not ranked

\*\* - Members of the Canadian Project Team collaboratively developed one set of weightings.

\*\*\* - Public and Canadian Consultation Group weightings were developed by arithmetically combining individual submissions on factor weightings

The results indicate that:

- The Canadian Project Team, public and CCG weighting scenarios identified crossing X10 as the highest ranking alternative; consistent with the unweighted scores, this result reflects the balance of high benefits to regional mobility and generally low to moderate impacts to the community associated with the options in the Windsor portlands area.
- Crossing X1, X3 and X4 alternatives were highly ranked by the Canadian Project Team, public and CCG weighting scenarios; consistent with the unweighted scoring results, this reflects the effect on regional air quality (no change) and relatively low impacts to community and natural features, which were all highly weighted by most members of the public.
- The Canadian Project Team weighting scenario identified crossing X11 scenario as the third highest rated alternative (after X10 and X1). This weighted score reflects that the alternative has higher community impacts than the southern alternatives, but lower impacts than other alternatives in the urban area of Windsor (i.e crossing X12 and X14 alternatives). This balance is also reflected in the public and CCG weighted score scenarios; the crossing X11 alternative was ranked fourth, higher than the other 'urban' alternatives.
- Crossing X8 and X9 alternatives had lower weighted scores than the other central crossing alternatives;

The Alternatives Analysis – Canadian Side document (under separate cover) provides the results of the arithmetic and reasoned argument evaluations for the route segment alternatives that were assessed to determine the preferred route for the roadway connecting to the plaza/ crossing. In these evaluations, the results of the Canadian Project Team were consistent with those of the public weighting scenario in every evaluation, i.e. the highest ranking route segment identified by the Project Team weighted scores was also the highest ranking route segment as identified by the public weighted scores in every evaluation.



The Project Team considered the results of the arithmetic method as a validation of the recommendations developed through the reasoned arguments presented in this report and Supporting Documents.

### 3.8. Summary of Evaluation of Illustrative Alternatives - U.S. Side

The U.S. Project Team analyzed 37 combinations (or systems) of illustrative crossing, inspection plaza and connecting route alternatives connecting the 15 crossing locations at the Detroit River to the interstate freeway system in the U.S. These alternatives were assessed in terms of the same seven performance factors used by the Canadian evaluation, however with certain unique criteria and measures that reflect the requirements and conditions on the U.S. side of the river.

The U.S. Project Team assessed the performance based on level of benefit or impact associated with each crossing/plaza/connecting route system. The performance of each system was compared to the others to identify the top performing systems which were recommended to be carried forward for comparison to the results of the Canadian evaluation as part of an end-to-end process.

Details of the analysis results documented by the U.S. Project Team are provided under separate cover. A summary discussion of the findings of the U.S. Project Team brought forward as part of an end-to-end evaluation is provided in this section of the report.

#### Downriver Alternatives – Crossings X1, X2, X3, X4, X5, X6

Further investigation by the U.S. Project Team into the feasibility of constructing an inspection plaza on lands currently used for slag processing and disposal related to the National Steel operation identified significant community impacts and unacceptable disruption to the steel mill operation. The U.S. Team eliminated the AC1 plaza site from further consideration.

Crossing alternatives X5 and X6 were therefore eliminated from further consideration by the Canadian and U.S. teams.

The U.S. Project Team analyzed 21 crossing/plaza/route alternatives in this area of the river; none were recommended to be carried forward on the basis that from the U.S. perspective, they are neither effective in meeting the needs of the project while reducing associated impacts, nor cost-effective.

The findings of the U.S. analysis of improvement to regional mobility supported the Canadian team's assessment that the downriver alternatives would not adequately meet the long-term needs of the regional transportation network. The U.S. analysis found that a new downriver crossing would have limited improvement to traffic operations on the U.S. freeway system in the region; the downriver alternatives had poorer performance than most of the alternatives in terms of improvements to regional mobility, and none were among the top performers overall.

In terms of protecting community/neighbourhood characteristics, four of the five crossing X4/Plaza AS5 alternatives were the top performers among the 37 alternatives analyzed; these alternatives feature a crossing in the Fighting Island area connected to a plaza site in Ecorse which is an abandoned industrial site. Of these, one alternative (X4/S5/Moran/I-

75) was also among the top performers in constructability. The other downriver alternatives had poorer performance than the other alternatives in terms of community impacts.

The southern alternatives also generally resulted in higher impacts to natural features than other alternatives considered; most of the southern alternatives had poorer performance than the other alternatives and none were among the top performers.

Five downriver alternatives were the top performers in terms of maintaining air quality. By virtue of their more direct end-to-end alignment between the interstate freeway system and Highway 401, the alternatives reduce total vehicle-miles and vehicle-hours on the U.S. network, resulting in a slightly higher reduction in emissions than other alternatives.

### North Alternatives – Crossing X15

The U.S. Project Team analyzed two crossing/plaza/route systems in Belle Isle/East Detroit area of the river; neither was recommended to be carried forward on the basis that, from the U.S. perspective, they are neither effective nor cost-effective. The findings of the U.S. analysis of improvement to regional mobility supported the Canadian team's assessment that a new crossing in the Belle Isle area would not adequately meet the long-term needs of the regional transportation network. The U.S. analysis found that a new crossing in the Belle Isle area would have only limited improvement to traffic operations on the U.S. freeway system in the region. Both alternatives had a poorer performance in improving regional mobility than most of the other alternatives.

The alternatives in the Belle Isle area were found to have poorer performance than most other alternatives in terms of impacts to community and neighbourhood characteristics, consistency with land use plans, impacts to cultural resources, impacts to air quality.

While the north alternatives were found to perform better than most alternatives on the U.S. side in terms of impacts to natural features and constructability, they were not among the best performers in these factor areas in comparison to other alternatives.

### I-75/I-96 Area – Crossings X13 and X14

The U.S. Project Team analyzed four crossing/plaza/route systems in the 'Interstates' area, which includes the rail corridor proposed for the DRTP truckway (crossing X13 alternative). The findings of the U.S. assessment of the truckway proposal supported the Canadian analysis that the capacity provided by the truckway proposal is not sufficient to meet the long-term needs of the region. The U.S. assessment found that the truckway had little benefit to mobility in terms of reducing congestion at the existing crossings in 2035. Further, the U.S. analysis identified that with additional border capacity in place through another new or expanded road crossing on the Detroit River in addition to the DRTP proposal, the truckway will carry virtually no truck traffic during the 2035 peak travel periods.

In addition, on the U.S. side, the truckway proposal connecting to I-75 was found to have negative community impacts and impacts to cultural features associated with the plaza and the crossing; the connecting route was determined to be incompatible with local land use, conflicting with plans for residential/commercial revitalization in this area of the city.

The U.S. assessment of the truckway proposal concludes that the truckway proposal does not meet the needs of the Partnership and is not recommended to be carried forward for

further analysis as a practical alternative under the DRIC study. The DRTP could continue to seek U.S. and Canadian permits/approvals for a truckway and new high clearance rail tunnel as part of a separate process. As a new freeway tunnel, the X13 crossing was determined to be practically infeasible and eliminated from further study.

Two crossing X14 alternatives connecting the rail corridor in Canada to a new plaza and road connection to the freeway system in downtown Detroit were considered on the U.S. side. Overall, the crossing X14 alternatives performed better than most other alternatives, although neither was a top performer.

The X14/Plaza I12/Connection to M-10 alternative performed better than most alternatives in terms of community/neighbourhood impacts, consistency with local planning, protecting natural features and improving regional mobility; this alternative was also among the top performers in terms of constructability. The U.S. analysis noted that a crossing and inspection plaza in this area of Detroit would negatively affect the local community including impacts to businesses, schools and residences.

The X14/Plaza I13/Connection to M-10 alternative performed better than most alternatives in terms of improving regional mobility; this alternative was also among the top performers in terms of protecting natural features and constructability.

Both alternatives had a poorer performance than most other alternatives in terms of protection of cultural features and maintaining air quality. The Corktown Historic District, several sites eligible for registration as nationally significant cultural sites and the city's Riverwalk were identified as important features potentially impacted by a new crossing/plaza/route system in this area of the city.

The U.S. analysis determined that neither of these alternatives was among the top overall performers on the U.S. side; however the X14 alternatives performed better than most alternatives overall. The U.S. team carried both X14 alternatives forward to the end-to-end evaluation for consideration on the short list of practical alternatives.

## I-75/I-96 Area – Crossing X12 Alternative

The crossing X12 alternative (twin Ambassador Bridge) was identified as one of the top overall performers on the U.S. side in terms of effectiveness and cost-effectiveness.

The Ambassador Bridge is connected to three interstate freeways in Michigan. The existing Ambassador Bridge plaza is currently undergoing an expansion, and Michigan Department of Transportation is currently overseeing construction of improved connections between the Ambassador Bridge plaza and the interstate freeway system as part of its Gateway Project.

Expansion of the existing bridge was the top performer on the U.S. side in terms of community/neighbourhood impacts, consistency with local planning and protecting natural features and among the top performers in terms of constructability. This alternative also had a better performance than most alternatives in terms of improvement to regional mobility.

The notable impacts associated with the expansion of the Ambassador Bridge plaza include impacts to the local community: the plaza expansion will displace 26 homes and 7 businesses, disrupt 150 homes and have a negatively impact community cohesion and character in a disadvantaged area of the city;

The crossing X12 alternative was found to have a poorer performance than most other alternatives in terms of maintaining air quality and protecting cultural features. The expansion of the plaza and construction of a new span at this location will have a high impact to cultural resources, impacting eight candidate sites eligible for designation as nationally significant and 18 known archaeological sites; there is a high potential for more as yet undiscovered sites being disturbed by construction activity.

In comparison to other crossing alternatives, the impacts and costs associated with the crossing, inspection plaza and connecting route are less with the crossing X12 alternative than most other alternatives considered. The U.S. team recommended the crossing X12 alternative for consideration on the short list of practical alternatives

### Central Alternatives – Crossings X7, X8, X9, X10 and X11

Further investigation by the U.S. Project Team into the feasibility of constructing an inspection plaza on lands currently used for slag processing related to the National Steel operation identified significant community impacts and unacceptable disruption to the steel mill operation. The U.S. Team eliminated the AC1 plaza site and crossing X7 from further consideration. Both the U.S. and Canadian Teams therefore eliminated crossing X7 from further consideration.

The U.S. Project Team analyzed eleven crossing/plaza/route systems in the central area of the river. The findings of the U.S. analysis supported the Canadian team's assessment that a new crossing in the central area would meet the long-term needs of the regional transportation network and provide high benefits to regional mobility. All eleven alternatives performed better than most of the other alternatives considered in terms of improvement to regional mobility; further, the eleven central alternatives were the top performers in this factor.

The U.S. analysis of cost-effectiveness, which considered the benefits and impacts as well as cost of the crossing, plaza and route on the U.S. side, identified three central alternatives as being among the top overall performers:

- Crossing X11/Plaza AC4/Connecting route Dragoon/I-75
- Crossing X10/Plaza AC3/Connecting route Dearborn/I-75
- Crossing X10/Plaza AC3/Connecting route Springwells/I-75.

These alternatives, located between Zug Island and the Ambassador Bridge, are located in an area of southwest Detroit that is a mix of industrial, residential, institutional and cultural land uses. Plazas AC3 and AC4 were identified as having negative impacts to community cohesion and character, as well as environmental justice impacts. Plaza AC3 would likely result in the displacement of approximately 300 residential units, while plaza AC4 would displace over 60 residences. The AC4 plaza and connecting route to I-75 was found to be somewhat consistent with local plans, while plaza AC3 was not consistent with plans for residential redevelopment.

Other central alternatives that had overall better performance than most other alternatives included alternatives connected to Plaza AC2 (i.e. crossings X8 and X9). Plaza AC2 is sited on the grounds of the National Steel plant. The plaza site is currently used for storage of raw materials for the rolling mill adjacent to the site. The crossings X8 and X9 would directly impact this rolling mill. A new crossing and plaza in this area would require relocating the rolling mill without disrupting the mill's production. Unlike the slag pile issue



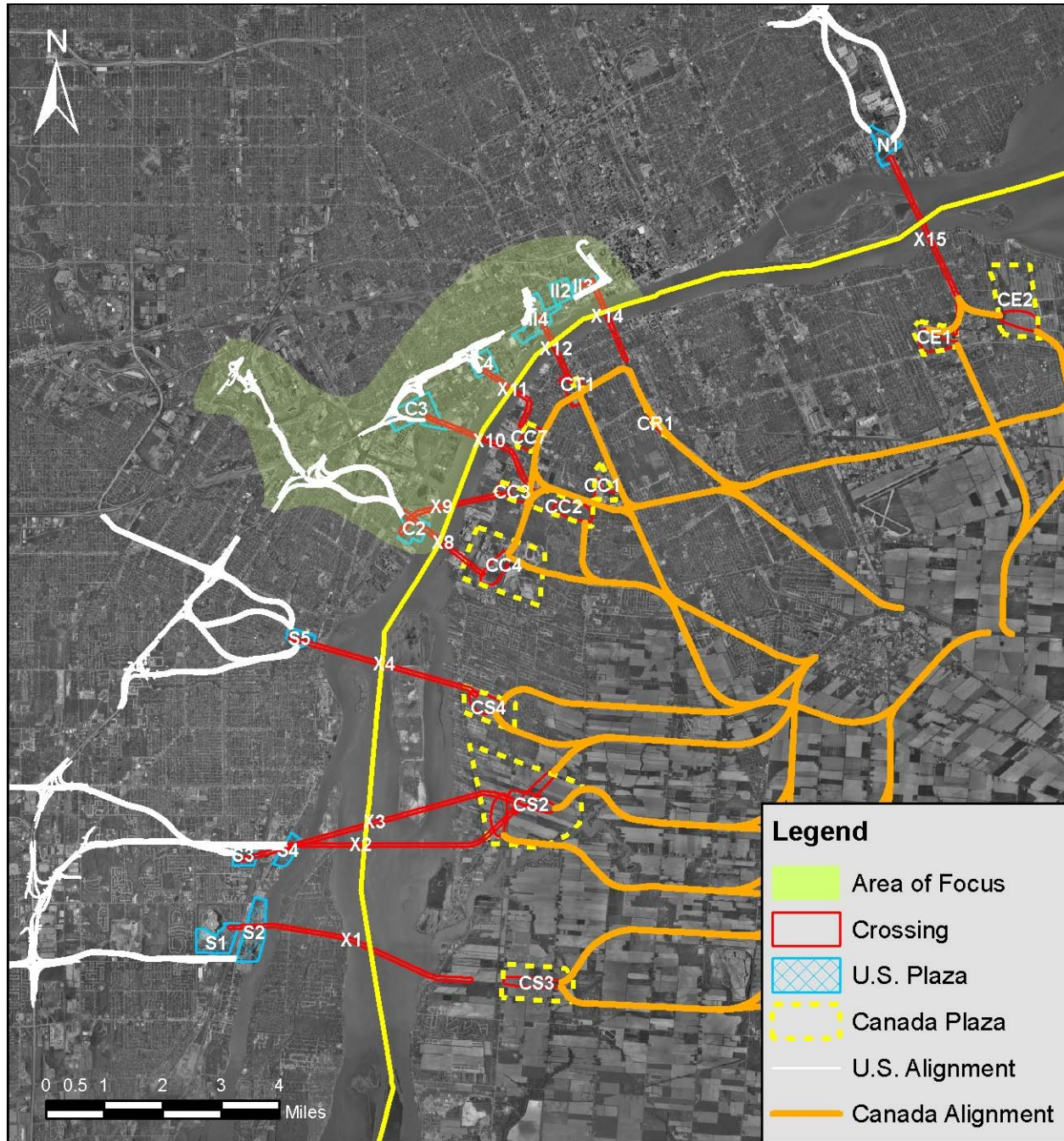
identified with plaza AC1, relocating the rolling mill could likely be accomplished within other parts of the National Steel property without adversely affecting the mill's operations or the surrounding community. However, the relocation of the rolling mill increases constructability risks associated with the new crossing in terms of time and cost.

The U.S. Project Team recommended these alternatives for consideration on the short list of practical alternatives as part of an end-to-end evaluation.

## Conclusions – U.S. Side Evaluation

Following the assessment of 37 crossing/plaza/connecting route systems connecting the 15 crossings in the Detroit River to the interstate freeway system, the U.S. Project Team identified an area of focus for a new border crossing system within which a short list of practical alternatives could be identified that would meet the needs of the border transportation network and while having acceptable impacts on the U.S. side (refer to Exhibit 3.20). This area extended from the River Rouge/Melvindale area in the south to the downtown Detroit/M-10 area.

**EXHIBIT 3.20: U.S. AREA OF FOCUS FOR FURTHER ANALYSIS**



Source: The Corradino Group of Michigan, Inc.

### 3.9. End-to-End Evaluation of Illustrative Alternatives

The Canadian Team recommendations of alternatives to be carried forward as practical alternatives corresponded to an area of continued study on the Canadian side of the Detroit River extending from the Windsor/ LaSalle border to the north end of the portlands in Sandwich town.

The U.S. Project Team also identified an area of focus for a new border crossing system within which a short list of practical alternatives could be identified that would meet the needs of the border transportation network while having acceptable impacts on the U.S. side. This area extended from the River Rouge/Melvindale area in the south to the downtown Detroit/M-10 area.

Based on the evaluation conducted by the two teams, both Project Teams identified the following:

- **Crossings X1, X2, X3, X4, X5, X6, X7, X13 and X15 should be eliminated from further study;** this is jointly supported by the analysis of both Project Teams;
- **Crossings X10 and X11 should be carried forward for further study;** this is jointly supported by the analysis of both Project Teams;
- **Crossings X8 and X9 to be reviewed in determining whether to carry forward as practical alternatives;** both teams recommended carrying forward Crossings X8 and X9 for consideration as practical alternatives, however, the analysis of both teams suggests these alternatives do not perform as well on either side of the river as other recommended crossing alternatives;
- **Crossings X12 and X14 to be reviewed in determining whether to carry forward as practical alternatives;** the U.S. Project Team recommended both of these alternatives be carried forward for consideration as practical alternatives while the Canadian Project Team did not.

The Partnership, together with the Canadian and U.S. Project Teams jointly reviewed the Crossing X8, X9, X12 and X14 evaluation results on an end-to-end basis in determining the final recommendations for alternatives to be carried forward for continued analysis.

#### Crossings X8 and X9

The Canadian evaluation identified that crossing X8 and X9 alternatives offer high regional mobility benefits. The Canadian Team also identified that, in terms of improvements to regional mobility, the crossing X8 alternative offers slightly lower benefits to regional mobility than the other central alternatives.

On the Canadian side, the crossing X8 and X9 alternatives have high impacts to the significant natural features in the Ojibway area of west Windsor. The connecting route for crossing X8 follows the Ojibway Parkway; this route impacts the Black Oak Prairie Heritage Park and Ojibway Prairie complex. This alternative would result in the loss of over 25 ha of designated and undesignated natural features and a similar area of endangered or threatened species habitat. More significantly, a new freeway in the Ojibway Prairie corridor would likely sever the linkage between the Black Oak Prairie area and the Ojibway Prairie Complex, resulting in a landscape scale impact.

The X9 crossing directly impacts the Black Oak Prairie Heritage Park and an Environmental Policy Area along the riverfront. This alternative results in the loss of approximately 30 ha of natural features, including direct impacts to over 20 ha of endangered or threatened species habitat. The X9 crossing also threatens connectivity between the Ojibway Prairie complex and the riverfront.

The U.S. Project Team identified constructability risks associated with Plaza AC2 (i.e. crossings X8 and X9). Plaza AC2 is sited on the grounds of the National Steel plant. The plaza site is currently used for storage of raw materials for the rolling mill adjacent to the site. The crossings X8 and X9 would directly impact this rolling mill. A new crossing and plaza in this area would require relocating the rolling mill without disrupting the mill's production. The relocation of the rolling mill increases constructability risks associated with the new crossing in terms of cost and time, possibly impacting upon the Partnership's ability to meet the stated objective of completing the crossing by 2013.

On the basis that the X8 and X9 alternatives are not the top performers in either country, and that both alternatives have unique high impacts and risks, on an end-to-end basis, the disadvantages of these options outweighed the advantages.

**Crossing X8 and X9 alternatives were eliminated from further study.**

## Crossing X12

In the evaluation of illustrative alternatives, the crossing X12 alternative was unique in that this alternative had relatively high negative impacts on the Canadian side in comparison to other Canadian alternatives, but relatively low negative impacts on the U.S. side compared to other U.S. alternatives. In terms of benefits provided to mobility, the alternative provides improved regional mobility for the border transportation network on both sides of the river, but was considered by the Canadian Team to have limited ability to provide continuous/ongoing capacity on the basis that this alternative would not provide a new crossing.

In consideration of the high community impacts to the residential area impacted by the expansion of the Canadian bridge plaza and the expansion of Huron church Road to a freeway facility on the Canadian side, and the potential for disruption to border traffic during construction of the plaza and freeway, on an end-to-end basis, the disadvantages of this alternative outweighed the advantages.

**Crossing X12 was eliminated from further study. The expanded U.S. plaza of the Ambassador Bridge, with the improved connections to the interstate freeway system will be carried forward within the Area for Continued Analysis as a possible U.S. plaza site for a new crossing connecting to a new inspection plaza and connecting roadway on the Canadian side located downriver of the Ambassador Bridge.**

## Crossing X14

The Canadian Team determined that as a six-lane freeway with a new bridge or tunnel, the Rail Corridor alternative has a high benefit to regional mobility. However, a new freeway through central and south Windsor is not consistent with current and future land use plans for the city. This alternative would have high community impacts associated with a new freeway corridor through central and south Windsor in terms of impacts to regional commercial/retail areas and employment areas south of E.C. Row Expressway



and negative impacts to community character and cohesion both in south Windsor and for the older neighbourhoods near the riverfront. . The Canadian Project team also noted concerns with constructability of this alternative and concerns with the security/monitoring of the remote plaza approximately 2500 m (1.5 mi.) inland from the border.

On the basis that other alternatives provided comparable transportation benefits with lower community impacts, the Canadian Project team did not recommend the rail corridor alternatives be carried forward for further study.

Two crossing X14 alternatives connecting the rail corridor in Canada to a new plaza and road connection to the freeway system in downtown Detroit were considered on the U.S. side.

The X14/Plaza I12/Connection to M-10 alternative performed better than most alternatives in terms of community/neighbourhood impacts, consistency with local planning, protecting natural features and improving regional mobility; this alternative was also among the top performers in terms of constructability. The U.S. analysis noted that a crossing and inspection plaza in this area of Detroit would negatively affect the local community including impacts to businesses, schools and residences.

The X14/Plaza I13/Connection to M-10 alternative performed better than most alternatives in terms of improving regional mobility; this alternative was also among the top performers in terms of protecting natural features and constructability.

Both alternatives had a poorer performance than most other alternatives in terms of protection of cultural features and maintaining air quality. The Corktown Historic District, several sites eligible for registration as nationally significant cultural sites and the city's Riverwalk were identified as important features potentially impacted by a new crossing/plaza/route system in this area of the city.

The U.S. team further noted that that neither of the X14 alternatives was among the top overall performers on the U.S. side.

Other alternatives provided comparable transportation benefits with lower community impacts on the Canadian side, and that other alternatives were more effective and cost-effective in terms of meeting the needs of the project and having acceptable impacts on the U.S. side. On an end-to-end basis, the disadvantages of the rail corridor option outweighed the advantages.

**Crossing X14 alternative was eliminated from further study.**

## Area of Continued Analysis

The results of the end-to-end evaluation of illustrative alternatives led to the identification of an area of continued analyses for possible practical crossing, plaza and connecting route alternatives. These practical alternatives will refinements of crossing alternatives X10 and X11, as well as possible alternatives connecting to the Ambassador Bridge Gateway and expanded plaza area on the U.S. side.

This area extending from Zug Island to the vicinity of the Ambassador Bridge on the U.S. side, and from Broadway Avenue to Brock Street in Sandwich on the Canadian side is shown in Exhibit 3.21 at the end of this section.

On the Canadian side, this area would encompass plazas CC2, CC3 and CC7 and be defined to provide sufficient area to enable a range of connecting route alignments and

crossing alignments to be developed for continued analysis. The area would also accommodate refinement to the locations and alignments of crossing, plaza and connecting route alignments in the Ojibway Industrial Park area. The residential community of Sandwich, Black Oak/Ojibway protected natural areas would serve to limit the extent of the area for continued analyses on the Canadian side. The area also includes the Huron Church/Talbot Road corridor and the Highway 401 corridor from Highway 3 to Dougall Parkway, which will be examined for freeway design alternatives, including interchange locations and configurations, crossing road treatments (closure or grade separation) and service roads for access.

On the U.S. side, the area would encompass the area of southwest Detroit between the I-75 corridor and the riverfront between Zug Island and the Ambassador Bridge. Possible improvements to connections to I-94 along Schaefer Road or Outer Drive will also be examined.

The generation of the practical plaza sites, crossing location and alignments and connections to freeways in this area of continued analyses will require a high degree of technical investigations, coordination between the U.S. and Canadian Project Teams and consultation with the affected communities, cooperating and review agencies, property owners and crossing owners, operators and proponents on both sides of the river.

EXHIBIT 3.21: AREA OF CONTINUED ANALYSIS

