Canada

U.S. Department of Transportation
Federal Highway Administration

Ontario

MDOT
Michigan Department of Transportation

Canada-United States-Ontario-Michigan Border Transportation Partnership

Generation and Assessment of Practical Alternatives and Selection of the Technically and Environmentally Preferred Alternative

Access Road Alternatives

December 2008

URS

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1. Introduction

Based on the findings of the end-to-end evaluation of illustrative alternatives, the Partnership determined that future study of a new border crossing, inspection plaza and access road would be confined to an "Area of Continued Analysis" (ACA). These findings along with the ACA were presented through consultation activities, including at the second round of Public Information Open Houses in November/December 2005, and documented in the *Draft Generation and Assessment of Illustrative Alternatives Report, November 2005*.

The ACA is illustrated in Exhibit 1, and represents the geographic envelope within which the practical crossing, plaza and access road alternatives have been developed. More intensive technical and environmental investigations have been undertaken to support the generation and assessment of practical alternatives.

EXHIBIT 1 – AREA OF CONTINUED ANALYSIS

On the U.S. side of the Detroit River, the Area of Continued Analysis extends from Zug Island to the vicinity of the Ambassador Bridge and from the I-75 to the Detroit River.

The western portion of the ACA on the Canadian side of the Detroit River encompasses a portion of the west Windsor industrial area at the south end of the Sandwich community and along the riverfront. Within this industrial portion of the ACA, which extends from approximately Broadway Street to the vicinity of Brock Street, the study team sited practical inspection plaza alternatives and international bridge crossing alignment alternatives.

East of the west Windsor industrial area, the ACA includes a continuous corridor, approximately 250 metres each side of the E.C. Row Expressway, Huron Church Road, Highway 3 and Highway 401. Within this corridor, the study team developed access road alternatives (consisting of service road and freeway components) to connect Highway 401 to a new plaza inspection facility, as well as maintain local traffic flow and provide for local access to the border crossing system.

This report documents the factors considered in generating the practical access road alternatives, as well as descriptions of the specific alternatives considered, an assessment of impacts and benefits associated with these alternatives and the evaluation leading to the identification of the access road component of the Technically and Environmentally Preferred Alternative (TEPA).

The assessment of the practical access road alternatives is described in additional detail in a number of factor specific reports and working papers that have been prepared. These reports are available under separate cover, and include the following:

- Draft Practical Alternatives Evaluation Working Paper – Air Quality Impact Assessment (May 2008)
- Draft Practical Alternatives Evaluation Working Paper – Noise and Vibration Assessment (May 2008)
- Draft Practical Alternatives Evaluation Working Paper – Social Impact Assessment (April 2008)
- Assessment of Practical Access Road Alternatives Memorandum – Improve Regional Mobility (May 2008)
- Draft Practical Alternatives Evaluation Working Paper – Economic Impact (May 2008)
- Draft Practical Alternatives Evaluation Assessment Report – Existing and Planned Land Use (May 2008)
- Draft Practical Alternatives Evaluation Working Paper – Archaeology (April 2008)
- Draft Practical Alternatives Evaluation Working Paper – Cultural Heritage (April 2008)
- Draft Practical Alternatives Evaluation Working Paper – Natural Heritage (April 2008)
- Draft Practical Alternatives Evaluation Assessment Report – Stormwater Management Plan (March 2008)
- Draft Practical Alternatives Evaluation Working Paper – Waste and Waste Management (May 2008)
- Draft Practical Alternatives Evaluation – Constructability Report for Plaza & Crossing Alternatives (December 2008)
- Draft Practical Alternatives Evaluation – Constructability Report for Access Road Alternatives (May 2008)
- Draft Level 2 Traffic Operations Analysis of Practical Alternatives (December 2008)

The development and analysis of the practical plaza and crossing alternatives are discussed in a separate document entitled *Generation and Assessment of Practical Alternatives and Selection of the Technically and Environmentally Preferred Alternative – Plaza and Crossing Alternatives, December 2008*.

2. Practical Access Road Alternatives

2.1. Generation Criteria

In general, the alternatives developed for the new access road were based on the premise that it would extend from Highway 401 at North Talbot Road to the new plaza. Based on the mobility needs of the project, as well as community/municipal consultation, the following objectives guided the generation of Practical Alternatives in the Huron Church Road/Highway 3 corridor.

- Separate international and local traffic;
- Maintain the local and regional function of the Huron Church Road/Highway 3 corridor;
- Keep the existing traffic within the existing corridor during construction so that there will be no infiltration onto other city streets; and
- Minimize direct and indirect property impacts.

The study team considered four basic operational concepts:

- Integrated freeway with interchanges. Service roads provided, as needed, to maintain local access and circulation;
- Separate freeway paralleled by one-way service roads;
- Separate freeway paralleled by existing Huron Church Road/Highway 3;
- Tunnel below a rebuilt Huron Church Road/Highway 3 corridor.

The study team concluded that Concept 1 (an integrated freeway with local service roads as required) would not adequately achieve the above-noted objectives, specifically:

- This alternative does not separate local and international traffic. Any future back-ups or congestion associated with delays at the border could cause back-ups on the freeway and impact local/regional traffic;
- As the new freeway will be a fully controlled access facility, it will be impossible to achieve the same level of local and regional mobility as currently exists in the corridor;
- This concept does not offer any substantial advantages with respect to minimizing property impact along the right-of-way, however, it is clear that property impacts associated with interchanges at Todd Lane/Cabana Road and Cousineau Road would create both direct and indirect impacts on the adjacent communities.

The remaining three concepts were developed into five cross-section alternatives that better met the objectives. On this basis, the study team developed the following five initial access road alternatives between Highway 3 and the Malden Road area.

- Alternative 1A – At-grade six-lane freeway with parallel one-way service roads on either side of the freeway;
- Alternative 1B – Below-grade six-lane freeway with parallel one-way service roads on

either side of the freeway;

- Alternative 2A – At-grade six-lane freeway with parallel service roads on one side of the freeway;
- Alternative 2B – Below-grade six-lane freeway with parallel service roads on one side of the freeway;
- Alternative 3 – Six lane freeway in a cut and cover tunnel with service roads on the surface.

In addition, in the area of Howard Avenue to Huron Church Line, the at-grade and below-grade access road alternatives analysed include two slightly different alignment options:

- Option 1 provides for widening the access road corridor primarily to the north (Windsor) side of Highway 3; and
- Option 2 provides for widening the access road corridor primarily to the south (LaSalle) side of Highway 3.

The study team developed the appropriate horizontal and vertical alignments for each of these five alternatives by considering:

- Minimizing direct property impacts; and
- Construction staging to maintain traffic within the corridor.

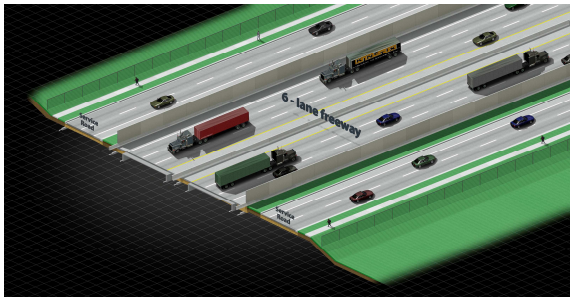
Once the horizontal and vertical alignments were developed, the appropriate right-of-way requirements were identified, considering the need for grading, drainage, utilities, berms/barriers and landscaping.

The access road alternatives were generated in accordance with Ontario Ministry of Transportation (MTO) geometric design guidelines. With the exception of the tunnel alternative, geometric design considerations (such as minimum radii, maximum grade and lane widths) consistent with a posted speed of 100 km/hr (design speed of 120 km/hr) were applied in generating the access road alternatives. The minimum radius applied to these alternatives was 650 m and the maximum grade was 3 percent. For the tunnel alternative, geometric design considerations were based on a posted speed of 80 km/hr (design speed of 90 km/hr). Although the minimum radius and maximum grade of the tunnel were the same as for the other alternatives, human factor considerations, and stopping sight distance requirements led to the reduction in posted speed.

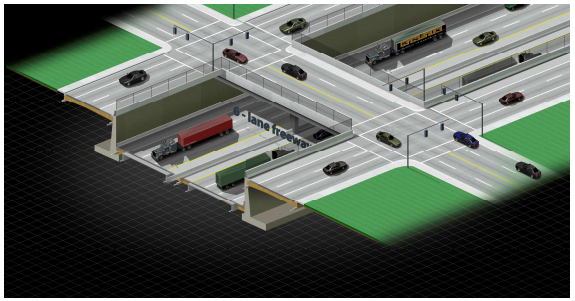
For the section west of Huron Church Road to the river, all alternatives considered an access road at-grade with overpasses at Malden Road and Matchette Road, which roughly matched the profile of the E.C. Row Expressway. This was required as a result of the poor soil conditions in this area, the proximity and profile of the E.C. Row Expressway, and other geometric constraints.

Typical cross sections of the Practical Alternatives are shown in Exhibit 2. All alternatives include a six-lane freeway and four-lane service road system.

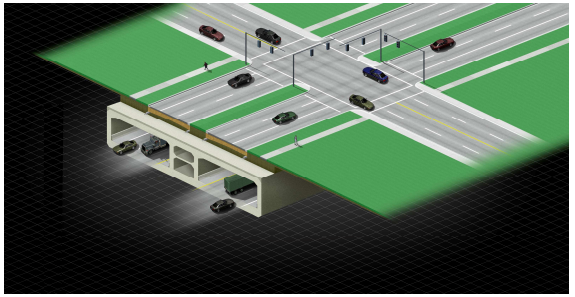
EXHIBIT 2 – TYPICAL PROPOSED CROSS-SECTIONS – PRACTICAL ALTERNATIVES



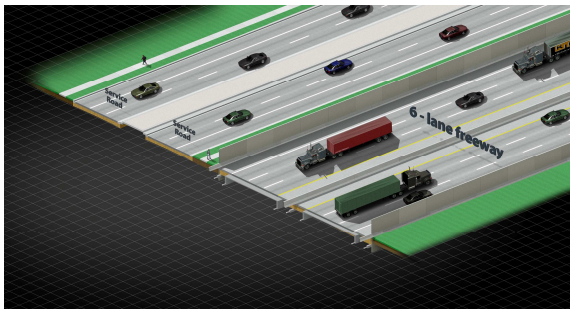
1A One-way service roads on either side of 6-lane freeway at grade.



1B One-way service roads either side of 6-lane freeway below-grade.



3 Cut and cover tunnel below rebuilt Huron Church Road/Highway 3 Corridor.



2A Six-lane freeway at grade, parallel to Huron Church Road/Highway 3.

2B Six-lane freeway below-grade, parallel to Huron Church Road/Highway 3.

2.2. Description of Access Road Alternatives

The practical access road alternatives initially considered for the analysis are shown schematically in Exhibit 3 and in additional detail in Exhibit 4 to Exhibit 8. These alternatives were presented to the public at the third round of Public Information Open Houses in March 2006. Input received at the Public Information Open Houses and subsequent Workshops included several suggestions for the access road alternatives:

- Tunnel the access road from Cabana Road/Todd Lane to E.C. Row Expressway;
- Tunnel from Howard Avenue to Turkey Creek;
- Tunnel under the existing roadway;
- Incorporate air ventilation buildings into the design of the roadway;
- Create a controlled access freeway on the existing roadways;
- Provide local access roads on either side of the freeway;
- Consider an interchange at Cousineau Road or Howard Avenue; and
- Avoid impacts to existing community facilities including schools and sports fields.

The remainder of 2006 focused on technical analysis of the five practical access road alternatives. The preliminary results of the technical analysis was presented to the public at the fourth round of Public Information Open Houses and subsequent Workshops held in December 2006/January 2007. Comments received during this round of consultation indicated that local residents wanted an access road to a new border crossing that:

- Takes trucks off local streets;
- Strong preference for below-grade roadway, including tunnel;
- Reduces the amount of pollutants in the air;
- Improves the movement of border-bound traffic;
- Is not intrusive;
- Is state-of-the-art;
- Will not be determined on cost alone;
- Improves the quality of life; and,
- Provides a long-term solution.

Consultations continued after the Open Houses and Workshops with growing interest around a concept which would be a combination of the below-grade and tunnel alternatives. The study team began developing a more “green” parkway-like alternative. The concept would include the best components of the practical alternatives based on the findings to date in a green corridor with tunnelled sections, a grade separated recreational trail system, and extensive urban design of the green areas. The modified access road alternative featured:

- A below-grade freeway from Howard Avenue to E.C. Row Expressway with 10 tunnel sections ranging from 120 m to 240 m in length, located at areas to provide community connectivity;

- A separate service road for local traffic to maintain access to neighbourhoods and local businesses;
- A widened right-of-way with 'buffer' areas to reduce the potential nuisance effects of the roadway on adjacent neighbourhoods; and,
- Provision for recreational trails along the corridor, connecting to existing trails and providing new connections along and across the Huron Church Road/Highway 3 corridor.
- Improved interchange at Howard Avenue/Highway 3 that allows for connection to a future Laurier Parkway.

This alternative was identified as The Parkway (refer to Exhibit 9). The Parkway alternative was presented for public review and comment at the fifth round of Public Information Open Houses and Workshops held in August 2007. In addition, meetings with ministries, agencies, municipalities, consultation groups and other stakeholders were also held to review the preliminary analysis of the practical access road alternatives and discuss the features of The Parkway.

EXHIBIT 3 – PRACTICAL CROSSING, PLAZA & ROUTE ALTERNATIVES

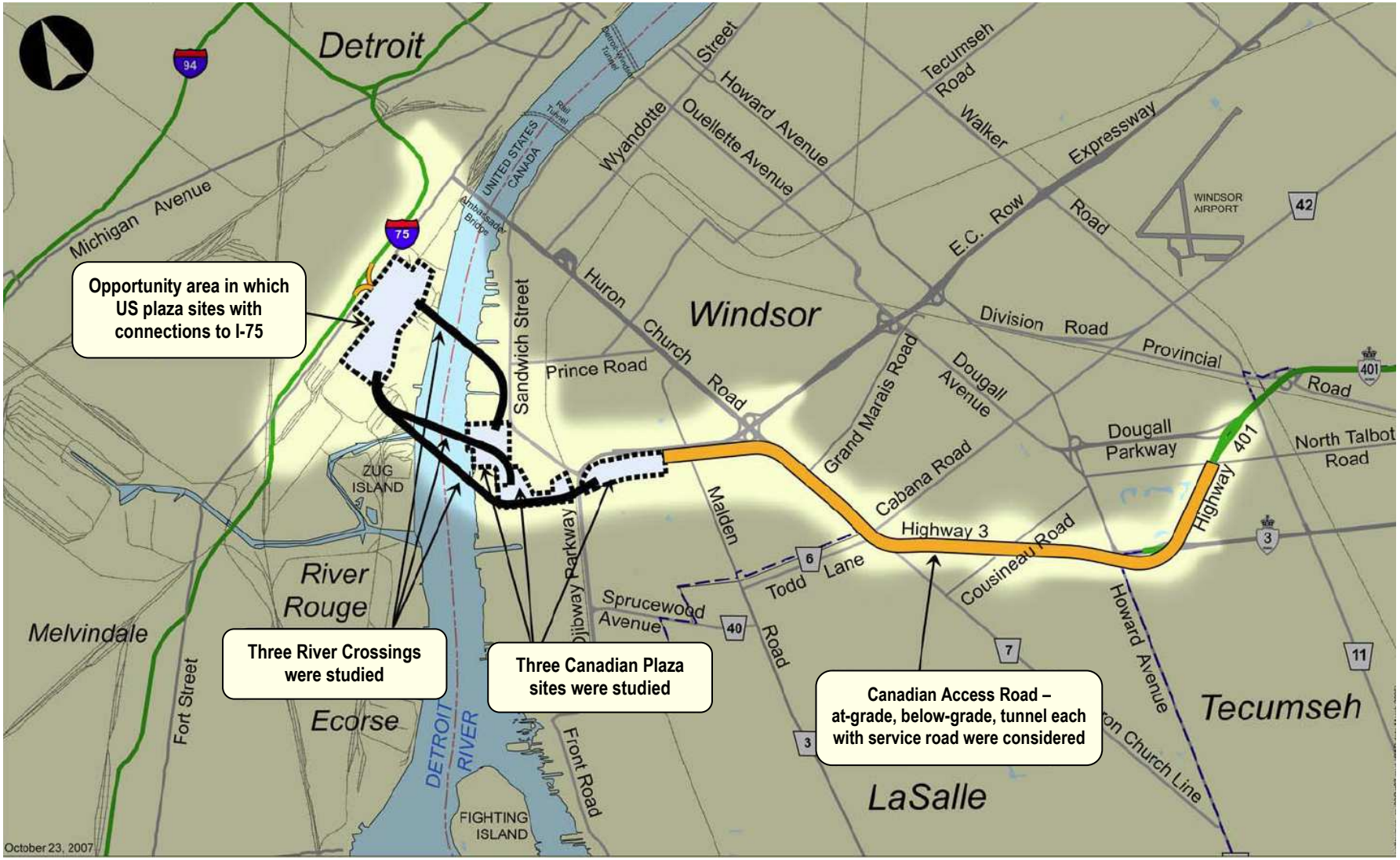
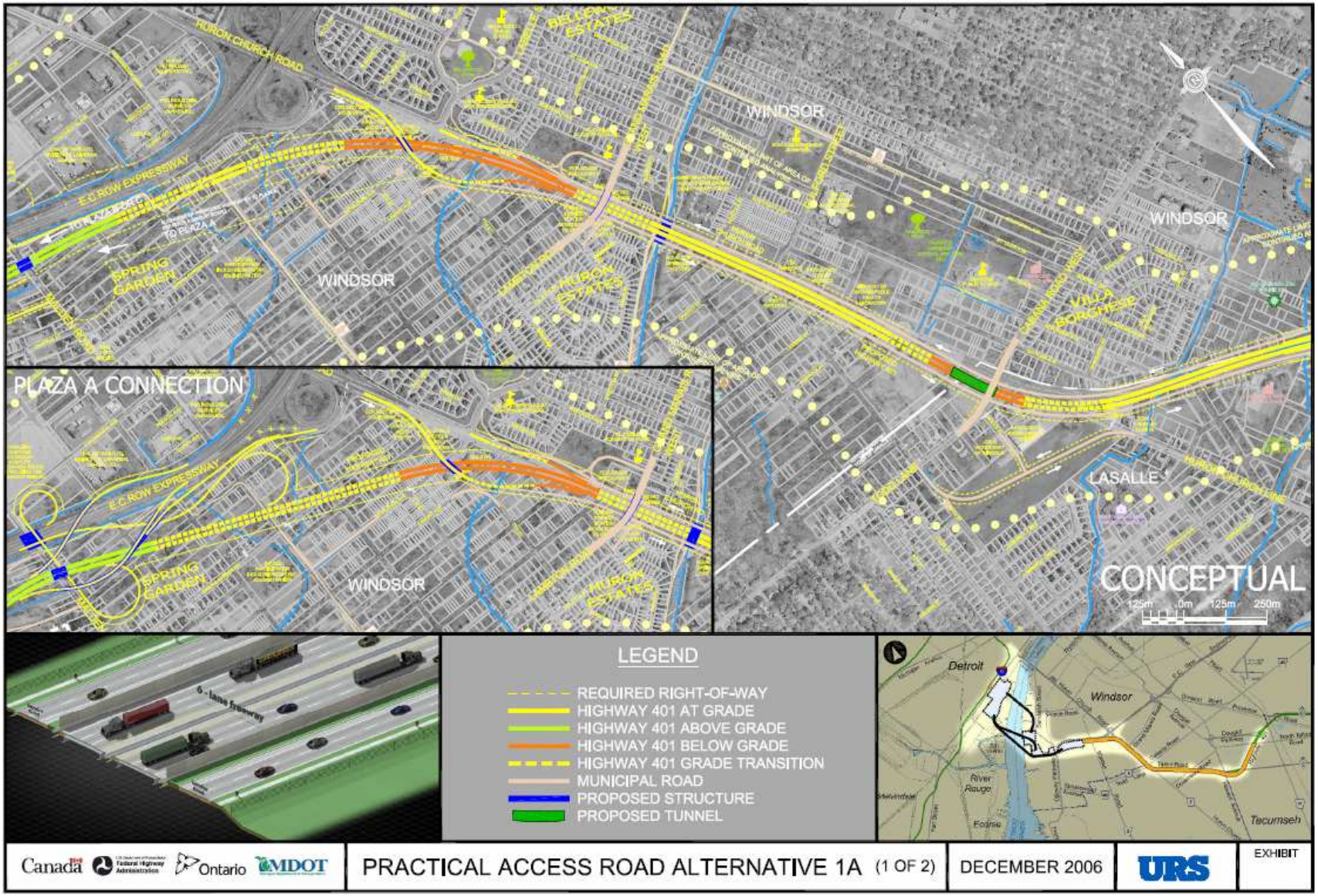


EXHIBIT 4 – PRACTICAL ACCESS ROAD ALTERNATIVE 1A




OPTION 1
OPTION 2
WINDSOR
SOUTHWOOD LAKES
TECUMSEH
OLIVER ESTATES
HERITAGE ESTATES
CONCEPTUAL
Canada
Ontario
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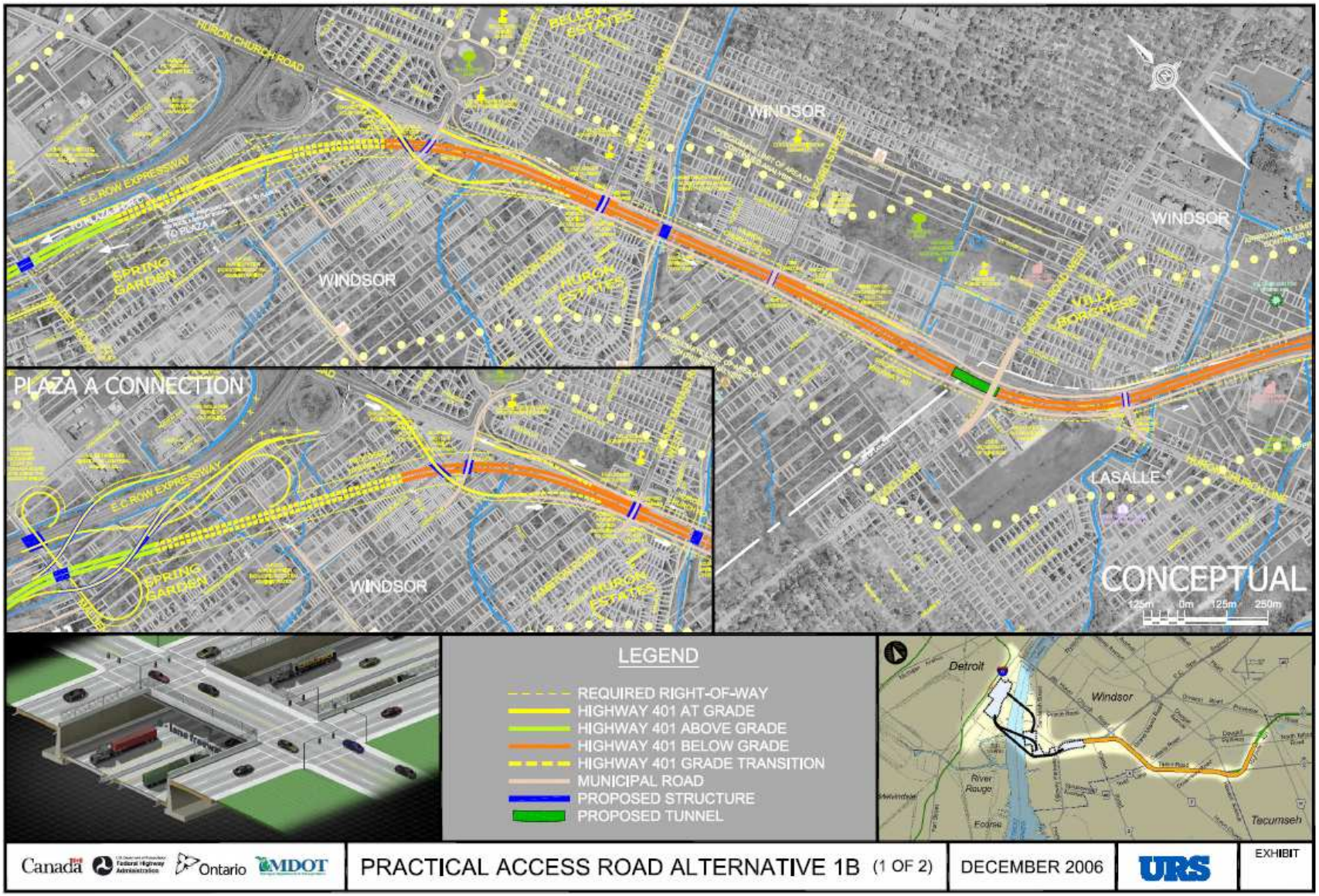
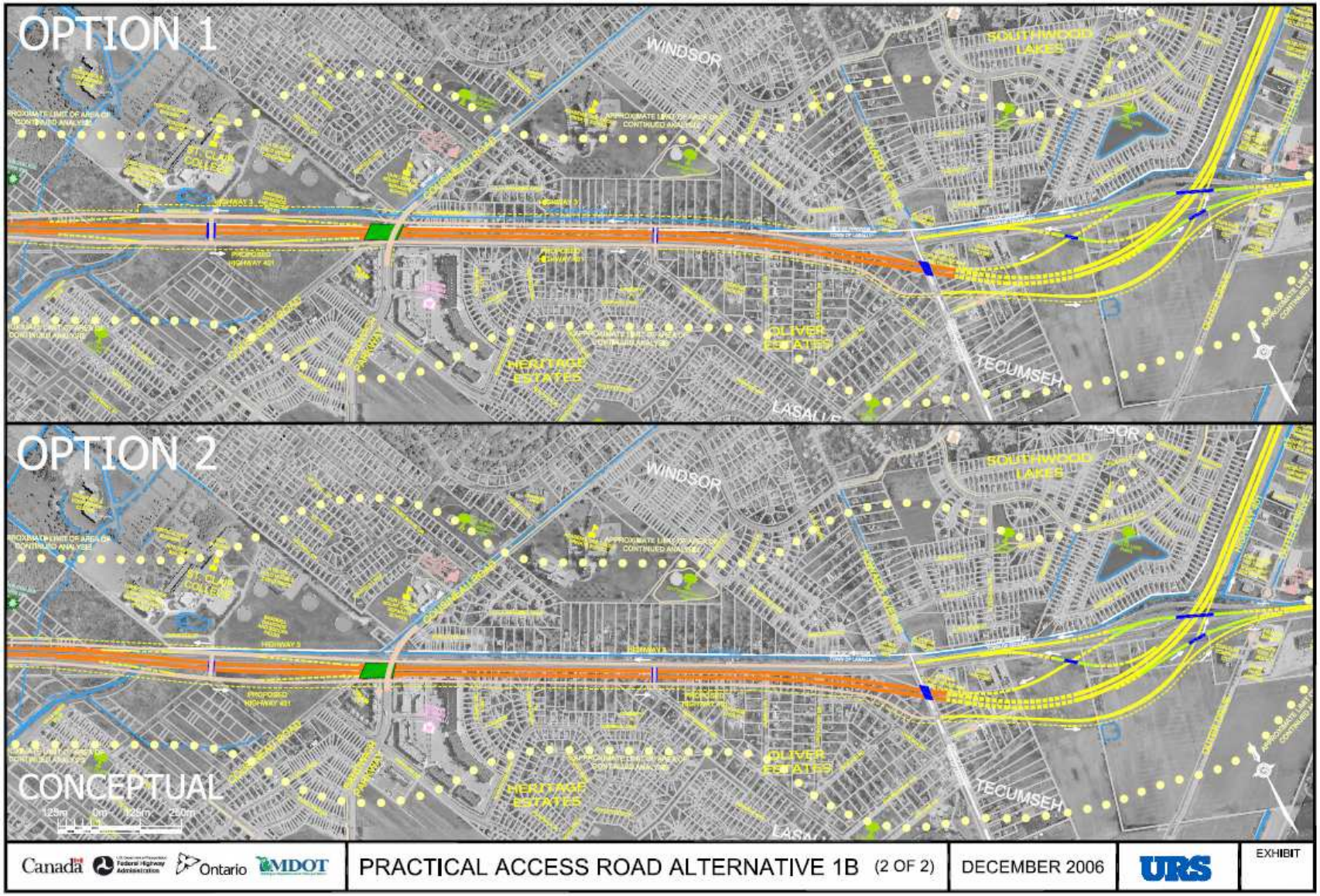
PRACTICAL ACCESS ROAD ALTERNATIVE 1A (2 OF 2)
DECEMBER 2006
URS
EXHIBIT

EXHIBIT 5 – PRACTICAL ACCESS ROAD ALTERNATIVE 1B

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PRACTICAL ACCESS ROAD ALTERNATIVE 1B (2 OF 2)
DECEMBER 2006
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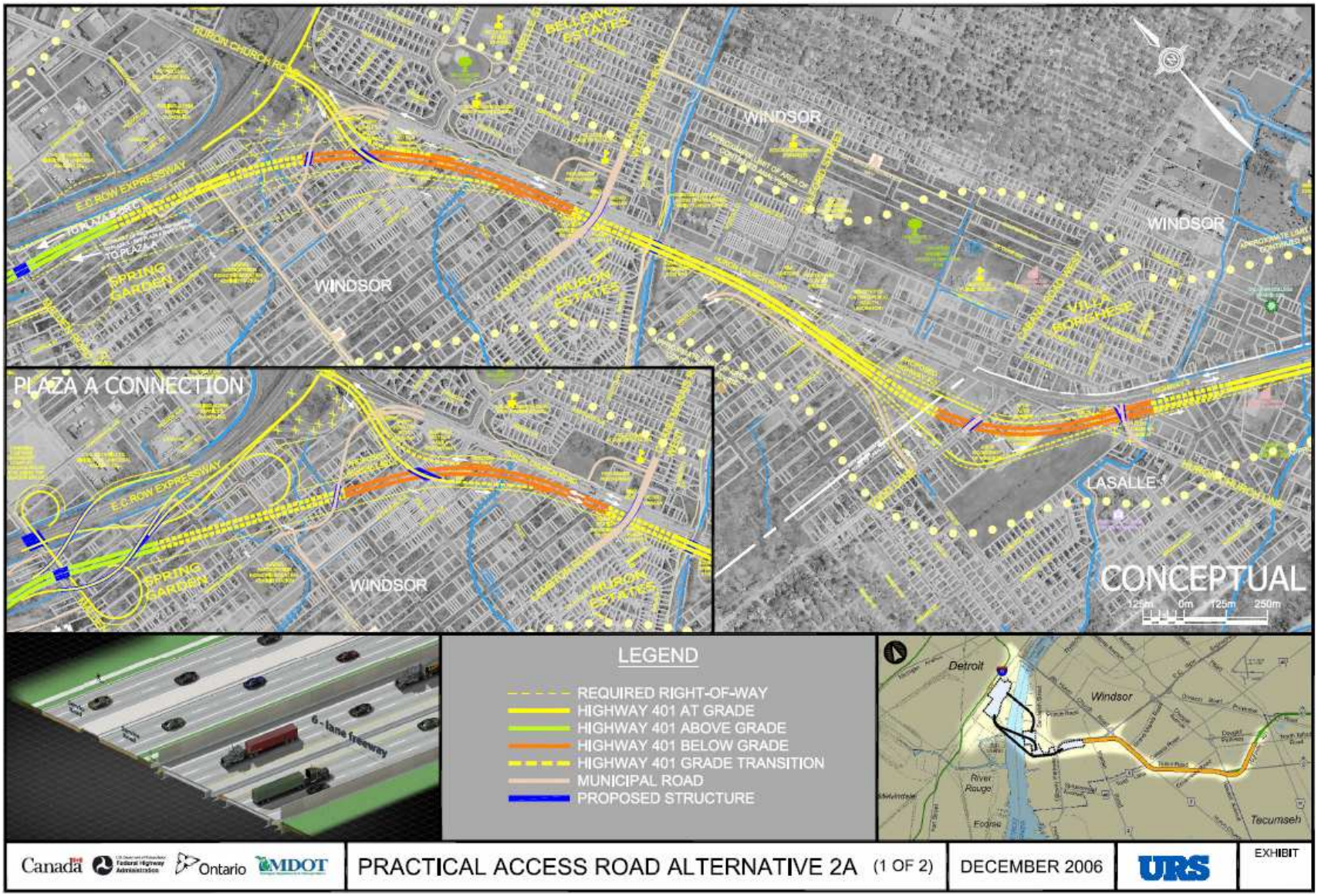
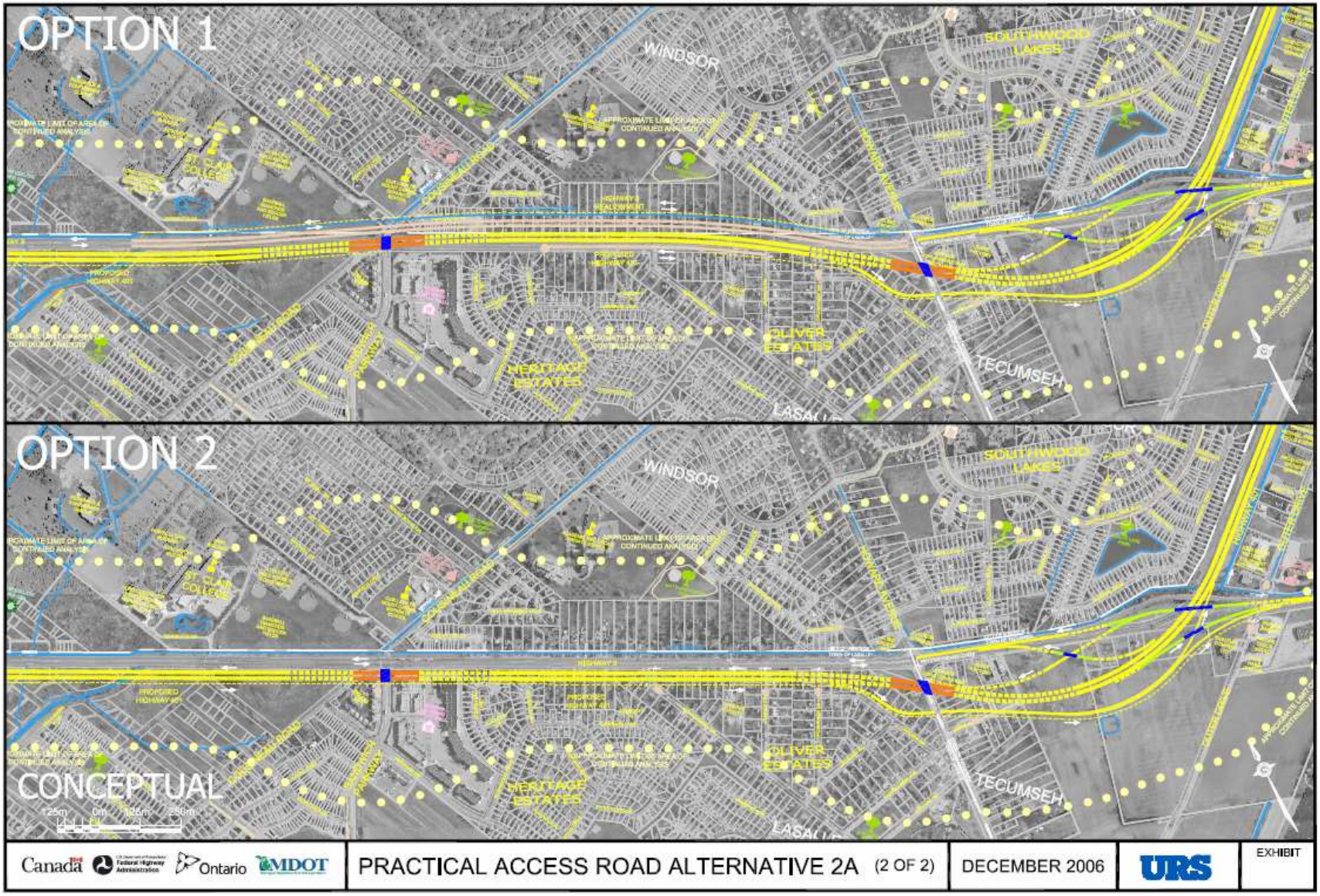
EXHIBIT

EXHIBIT 6 – PRACTICAL ACCESS ROAD ALTERNATIVE 2A

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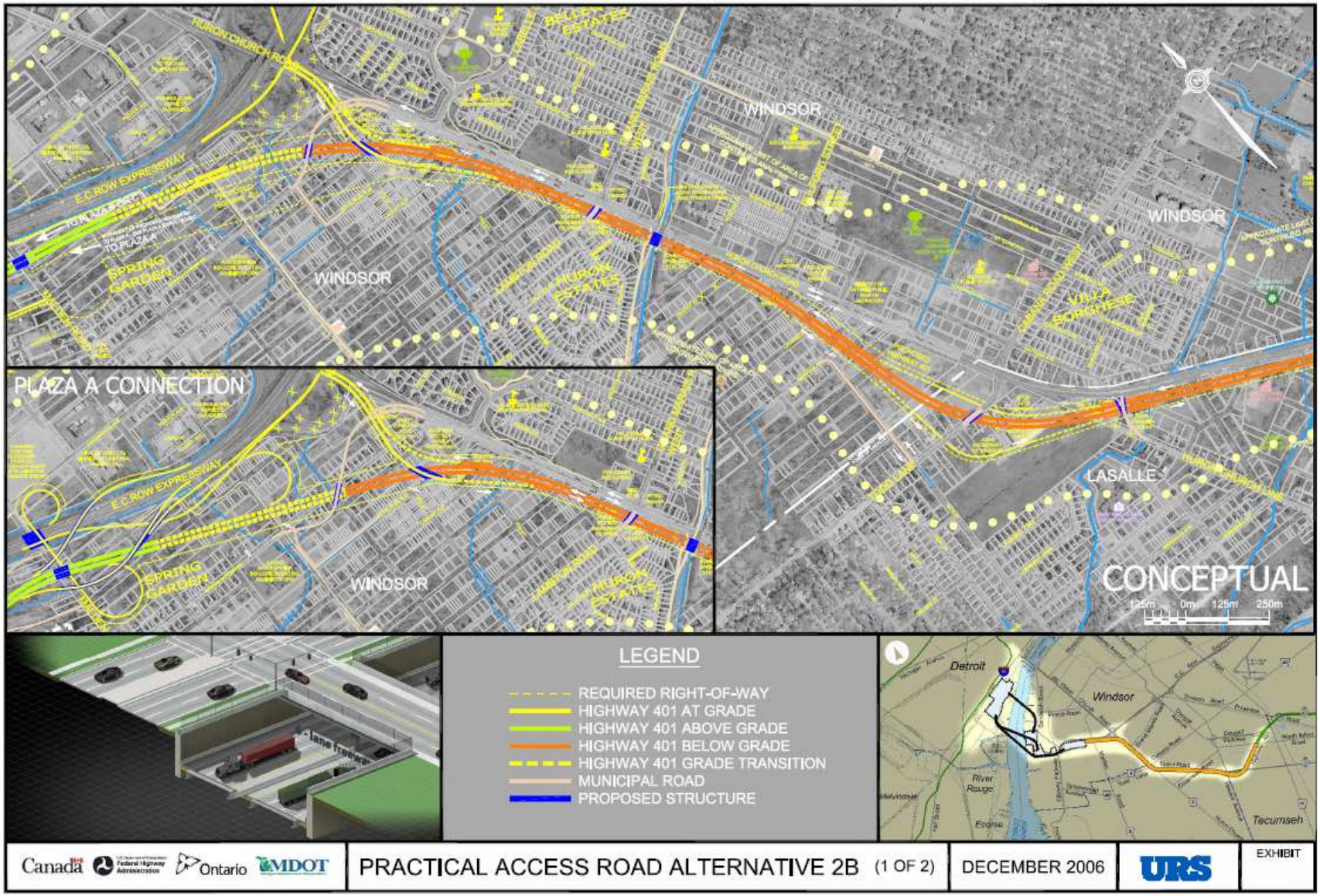
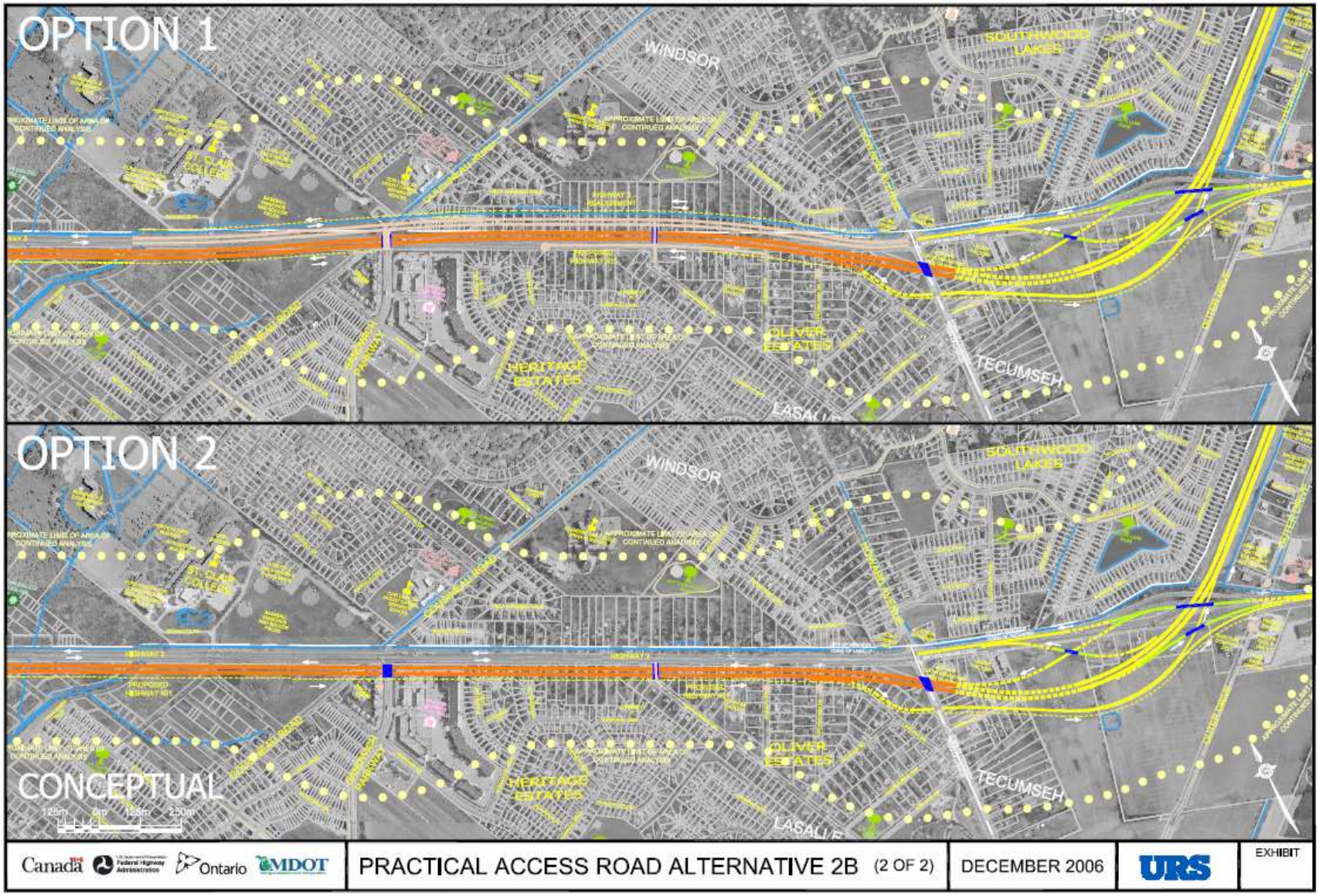
PRACTICAL ACCESS ROAD ALTERNATIVE 2A (2 OF 2)
DECEMBER 2006
URS
EXHIBIT

EXHIBIT 7 – PRACTICAL ACCESS ROAD ALTERNATIVE 2B

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Canada
Ontario
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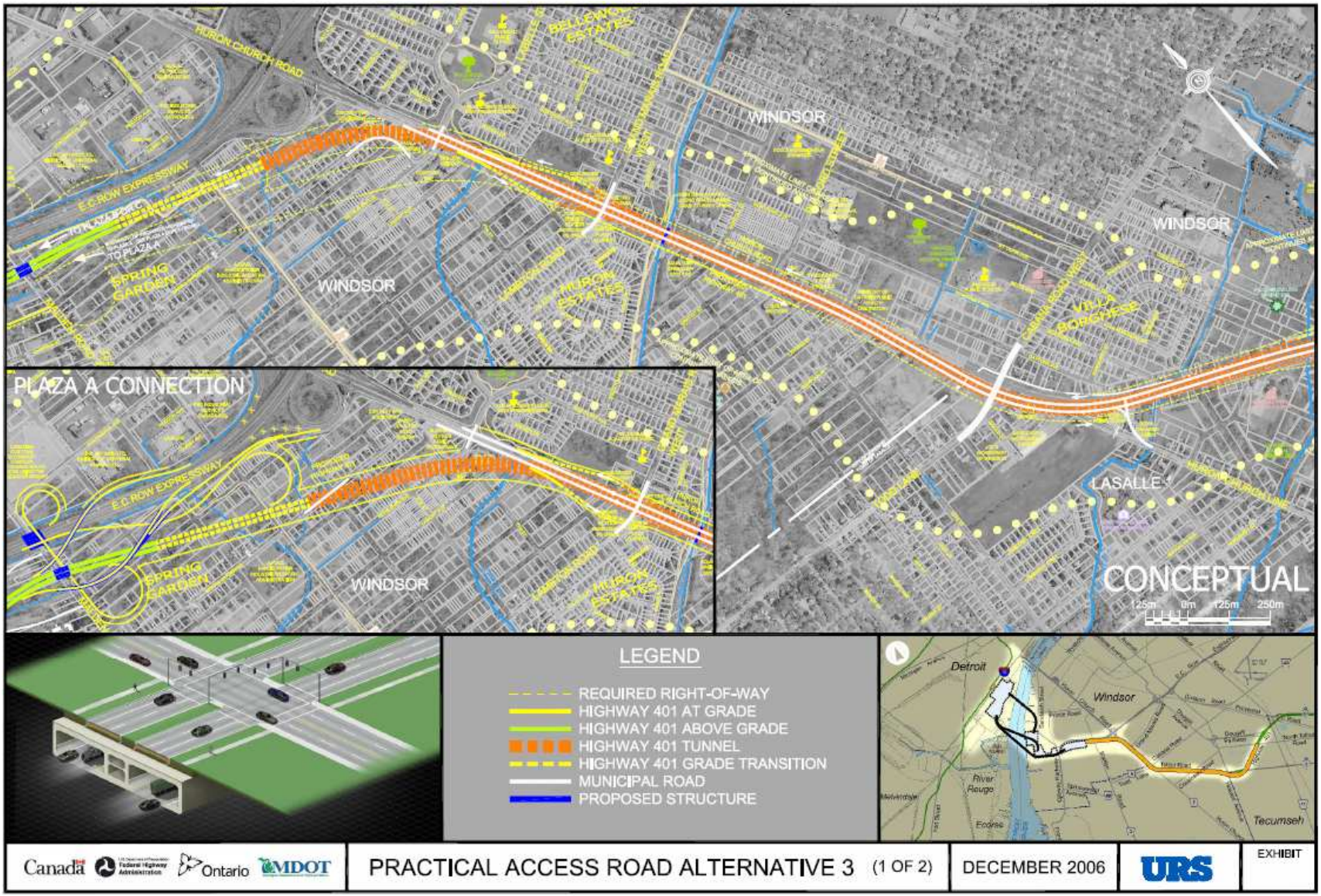
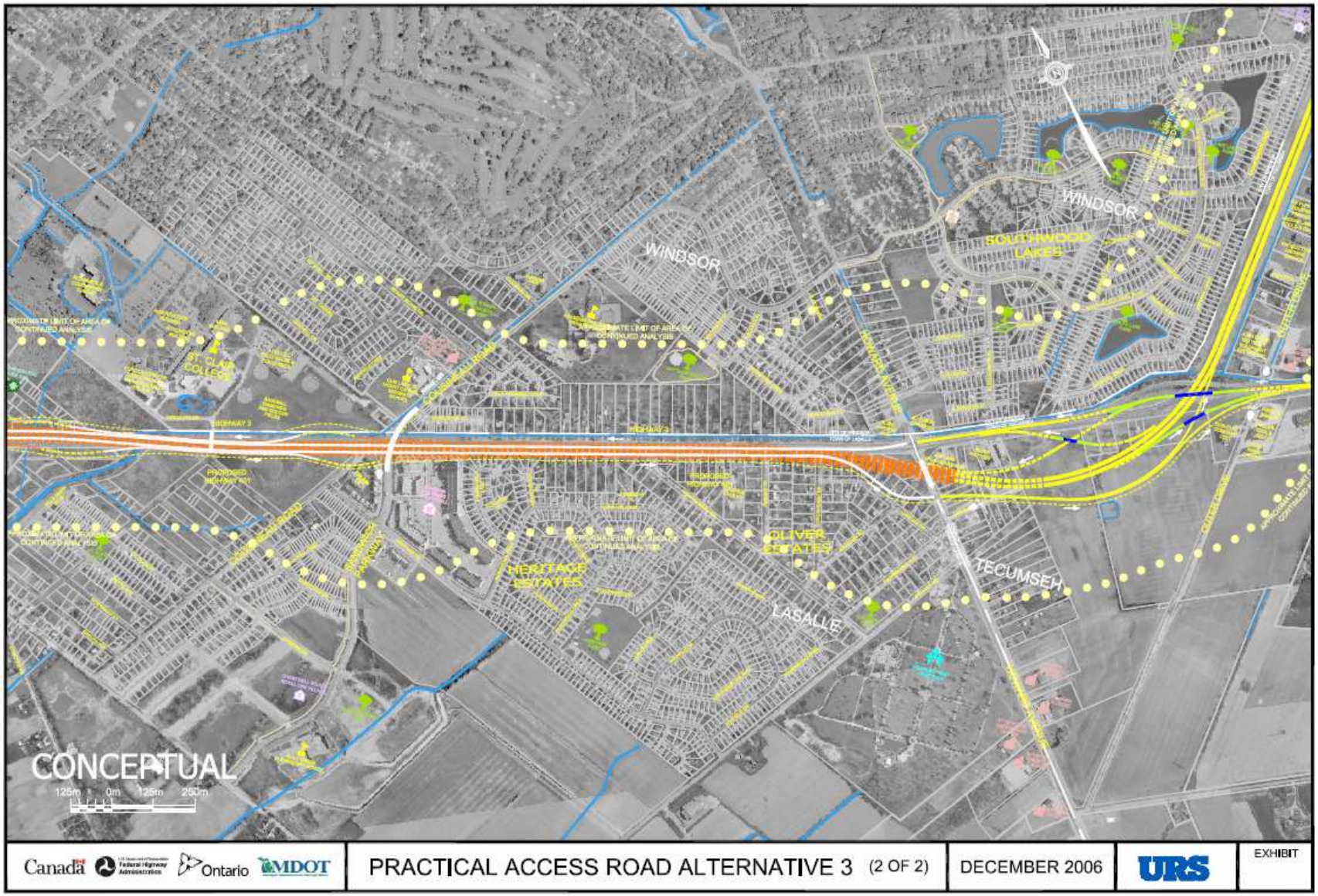
PRACTICAL ACCESS ROAD ALTERNATIVE 2B (2 OF 2)
DECEMBER 2006
URS
EXHIBIT

EXHIBIT 8 – PRACTICAL ACCESS ROAD ALTERNATIVE 3




WINDSOR
WINDSOR
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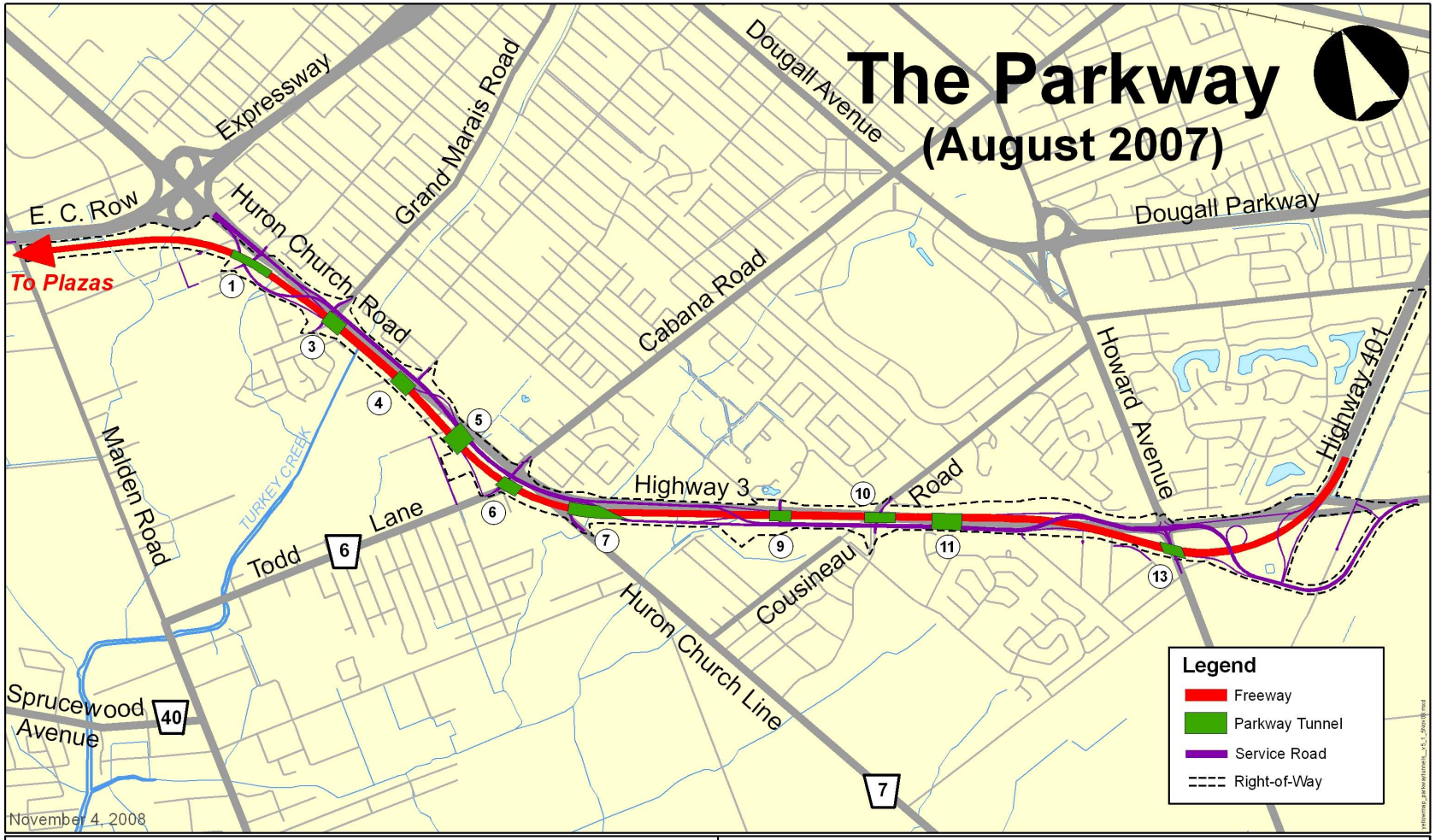
HIGHWAY 3
PROPOSED HIGHWAY 401
HERITAGE ESTATES
OLIVER ESTATES
TECUMSEH
LASALLE
CONCEPTUAL
125m 0m 125m 250m
Canada
Ontario
MDOT
PRACTICAL ACCESS ROAD ALTERNATIVE 3 (2 OF 2)
DECEMBER 2006
URS
EXHIBIT

EXHIBIT 9 – THE PARKWAY (AUGUST 2007)



I.D.	Location of Tunnel	Tunnel Length (M)	Roof Area (Sq M)	I.D.	Location of Tunnel	Tunnel Length (M)	Roof Area (Sq M)
①	Spring Garden Road / Labelle Street	240	10,810	⑦	Huron Church Line	240	17,040
③	Grand Marais Road	120	9,550	⑨	St. Clair College	120	7,225
④	Pulford Street	120	9,705	⑩	Cousineau Road	170	9,590
⑤	Reddock Street	120	15,320	⑪	Hearthwood Place	165	14,805
⑥	Cabana Road	120	8,300	⑬	Howard Avenue	120	6,900

The ten tunnel sections of The Parkway were strategically placed to maintain existing access across and along the corridor, as well to provide new connections for roads, trails and wildlife linkages. The spacing between tunnel sections was also considered. Having two (or more) tunnel sections with insufficient space between them increases the risk that under certain conditions, fire/smoke from one tunnel section could be carried into the downwind tunnel section. The tunnel sections were developed with a minimum length of 120 m and were limited to a maximum length of 240 metres. The minimum length of 120 metres was determined to be a sufficient length to allow for options for landscaping/public space to be placed on top of the tunnel so as to lessen any 'barrier effect' of the freeway for the neighbourhoods on either side of the access road. Highway tunnels longer than 240 m are subject to more complex ventilation, fire and life safety requirements and regulations that would substantially alter the design, construction, operation and maintenance requirements.

Table 1 provides the locations, lengths and rationale for the tunnel sections developed for The Parkway.

TABLE 1 – PARKWAY TUNNEL SECTION LOCATIONS, LENGTHS AND RATIONALE

Location	Length	Rationale for tunnel location/length
Bethlehem Avenue/ Labelle Street	240 m	• Maintains existing road crossing at Labelle Street/Bethlehem Avenue. • Provides improved connection between Bellewood neighbourhood/Bellewood Park/Bellewood School and Spring Garden/Bethlehem neighbourhoods/Spring Garden Road Prairie/Windsor community trails. • Tunnel length of 240 m provides opportunities for public space and Gateway features; this tunnel is situated at junction of The Parkway and Huron Church Road and is viewed by motorists entering Canada via the new crossing or the Ambassador Bridge.
Grand Marais Road/ Lambton Road	120 m	• Maintains existing road crossing at Grand Marais Road/Lambton Road. • Provides improved connection between Bellewood neighbourhood/Bellewood Park/Bellewood School and Huron Estates neighbourhood and Spring Garden Road Prairie. • Tunnel also provides improved connection for existing West Windsor Recreationway trail; presently trail passes under Huron Church Road at Grand Marais Drain; in times of high water flows in the drain, this trail is closed. With The Parkway, this trail will need to be relocated due to changes to Grand Marais Drain structure. Trail will be relocated to allow crossing of The Parkway and service road either via Grand Marais Road tunnel or Pulford Avenue tunnel. • Tunnel length constrained by road profile at south end (freeway is not as deep at the Grand Marais Drain crossing as other locations), location of exit ramp to service road and service road structure at north end.
Pulford Street	120 m	• Provides improved connection between residential area on east side of Huron Church Road and South Windsor Recreation Complex to Huron Estates neighbourhood

Location	Length	Rationale for tunnel location/length
		and Spring Garden Road Prairie. • Tunnel also provides improved connection for existing West Windsor Recreationway trail; presently, trail passes under Huron Church Road at Grand Marais Drain; in times of high water flows in the drain, this trail is closed. With The Parkway, this trail will need to be relocated due to changes to Grand Marais Drain structure. Trail will be realigned to allow crossing of The Parkway and service road either via Grand Marais tunnel or Pulford Avenue tunnel. • Tunnel length constrained by road profile at north end (freeway is not as deep at Grand Marais drain crossing as other locations) and location of entrance ramp from service road at south end.
Reddock Street	120 m	• Provides improved wildlife linkage and new community connection between Oakwood Bush/Oakwood School/Windsor community trails and Spring Garden Road Prairie. • Both the freeway and service road pass through this tunnel leaving a road-free connection at the surface. • Tunnel length constrained by service road profile at north and south ends (service road profile rises from 7 m below grade to at-grade at intersections on both sides of tunnel).
Todd Lane/ Cabana Road	120 m	• Maintains existing road crossing at Todd Lane/Cabana Road. • Provides improved connection between Villa Borghese neighbourhood/Oakwood Bush/Oakwood School and Todd Lane neighbourhood and Spring Garden Road Prairie. • Tunnel length constrained by service road profile at north end and proximity of tunnel to the south.
Huron Church Line	240 m	• Maintains an existing road connection for Huron Church Line and the service road. • Provides improved wildlife linkage and improved community connection between Lennon Drain/St. Clair College environmentally sensitive area and Cahill Drain candidate natural heritage site lands/LaSalle Woods/LaSalle community trails.
St. Clair College Entrance	120 m	• Maintains an existing road connection for the main entrance to the college and the service road. • Provides improved wildlife linkage and improved community connection between St. Clair College environmentally sensitive area/athletic fields and Cahill Drain candidate natural heritage site lands/Windsor Crossing commercial area/LaSalle community trails. • No residential neighbourhood in this immediate area, but as the main entrance to the college, this area is expected to have a relatively high volume of pedestrian and cyclist traffic. A length of 120 m was considered

Location	Length	Rationale for tunnel location/length
		adequate for meeting the connectivity requirements at this location.
Cousineau Road/ Sandwich West Parkway	170 m	• Maintains existing road crossing at Cousineau Rd/Sandwich West Parkway. • Provides improved community connection between St. Clair College and athletic fields/Our Lady of Mt. Carmel School/Kendleton Court and Villa Paradiso neighbourhoods to Heritage Estates neighbourhood/Windsor Crossing commercial area/LaSalle community trails. • Length of tunnel sections in this area is constrained by service road profile at east end (service road profile rises from 7 m below grade to at-grade at intersection at Cousineau/Sandwich West Pkwy). • Given the extent of buffer area at west end of tunnel section, a length of 170 m was considered adequate for meeting the connectivity requirements at this location.
Hearthwood Place	165 m	• Provides improved wildlife linkage and new community connection between Villa Paradiso and Kendleton Court neighbourhoods/Matthew Rodzik Park/new green space north of corridor and Heritage Estates neighbourhood/Windsor Crossing commercial area/LaSalle community trails. • Both the freeway and service road pass through this tunnel leaving a road-free connection at the surface. • The length of tunnel section is constrained by service road profile at west end (service road profile rises from 7 m below grade to at-grade at intersection at Cousineau/Sandwich West Pkwy). East limit of tunnel constrained by proximity of at-grade intersection at Montgomery Dr. and entrance ramp to freeway.
Howard Avenue	120 m	• Maintains existing road crossing at Howard Avenue. • Provides improved community connection between Shadetree neighbourhood/Matthew Rodzik Park/new green space north of corridor and Oliver Estates neighbourhood/ LaSalle community trails. • Tunnel length of 120 m provides opportunities for public space and Gateway features; this is the first tunnel along The Parkway as viewed by motorists entering Windsor/LaSalle via Highway 401 or Highway 3.

GreenLinkWindsor Concept

In October 2007, the City of Windsor presented an access road concept entitled GreenLinkWindsor (refer to Exhibit 10). Like The Parkway, the GreenLinkWindsor concept proposed for a below-grade freeway with tunnel sections, a separate service road for local traffic, a wider right-of-way with buffer areas between the corridor and adjacent

residential areas, and provision for a continuous recreational trail system along the corridor.

The GreenLinkWindsor proposal alternative featured tunnel sections greater than 240 m (two tunnels were greater than one kilometre in length), and provided a greater total length of tunnel section as compared to The Parkway. GreenLinkWindsor proposed more tunnel sections than The Parkway in the areas of Spring Garden/Bethlehem/Grand Marais, Todd Lane/Cabana Road and Cousineau Road/Sandwich West Parkway/Hearthwood Place.

In addition, the GreenLinkWindsor proposal included a tunnel section under the Grand Marais Drain. The Parkway alternative was developed to pass over the Grand Marais Drain to avoid construction in difficult ground conditions and the associated cost, schedule and constructability risks associated with a tunneled crossing in this area.

The DRIC study team estimated the cost of the GreenLinkWindsor proposal to be approximately $2.3 billion (all values year 2011 $CAD), which is $800 million more than the $1.5 billion initial estimate for The Parkway alternative.

EXHIBIT 10 – GREENLINKWINDSOR PLAN[1]

1 Copyright 2007 www.greenlinkwindsor.com

The DRIC study team carefully considered the GreenLinkWindsor concept, as well as the other comments provided by other stakeholders, including other municipalities, government agencies and the public. The comments received were used to refine The Parkway.

Based on this input, and on further deliberations by the study team, a number of refinements were made to The Parkway alternative in the period following the August 2007 Public Information Open Houses. These refinements were adopted to reduce the negative effects of The Parkway alternative and to improve the transportation benefits and community benefits to the extent practicable. The following is a discussion of the refinements that were adopted between August 2007 and April 2008:

Additional tunnel section at Spring Garden

The Parkway alternative did not initially include a tunnel section in this area. A 200 metre-long tunnel section was added to maintain the connection residents presently enjoy between Spring Garden residential area and vacant natural area adjacent to E.C. Row Expressway. The location and length of a tunnel section in this area is constrained by the roadway profile at the west end (profile begins rising from below-grade to above-grade) and the proximity of the Labelle Street/Bethlehem Avenue tunnel to the south.

Revised location and length of the Howard Avenue tunnel

The Howard Avenue tunnel section was initially proposed to maintain the existing road crossing at Howard Avenue as well as to provide improved community connection between Shadetree neighbourhood/Matthew Rodzik Park/new green space north of corridor and Oliver Estates neighbourhood/LaSalle community trails. In consultation with the Oliver Estates neighbourhood and to improve effectiveness of connectivity between communities (nearer to residences), the tunnel section was shifted westerly from Howard Avenue to the area near Chelsea Drive. A tunnel section of 240 metres in this area provides opportunities for landscaping/public space and Gateway features on this roof deck; this is the first tunnel along The Parkway as viewed by motorists entering Windsor/LaSalle via Highway 401 or Highway 3. The Howard Avenue road crossing will be accommodated by a roadway overpass.

Cousineau Road / Sandwich West Parkway tunnel refined

The length of the Cousineau Road/Sandwich West Parkway tunnel section was reduced by 50 metres to 120 metres, while the section of tunnel covering the freeway at Hearthwood Place was lengthened by 55 metres to 220 metres. The net effect of these modifications was that there was more tunneled section near adjacent residential areas, resulting in greater connectivity improvements and less aesthetic impacts.

Other tunnel lengths and locations refined

Minor adjustments were made to other tunnel locations to provide improved tunnel spacing and better alignments and locations for road and trail alignments.

Pedestrian and cyclists trails refined

The Parkway alternative presented at the August 2007 Public Information Open Houses featured a concept for a continuous pedestrian/cyclist trail system parallel to and separate from the freeway and service road. This trail system concept included grade separations (i.e. overpasses) at most road crossings so as to limit the conflicts between pedestrians, cyclists and motorists. Refinements were made to the trail system concept including removing overpasses at certain road crossings and changing or eliminating sections of

trail to reflect comments received from property owners whose property would be impacted to accommodate the trail system as well as comments from property owners adjacent to the trail system concerned about loss of privacy due to the proximity of trail overpasses to their property. In addition, some overpasses were removed and trail locations changed to provide better access between the trail system and the local street system. In identifying the refinements, an important principle of the trail concept was retained, in that trail users are able to traverse The Parkway corridor from Howard Avenue to Ojibway Parkway without having to cross a lane of traffic.

New loop ramp at Todd Lane

Consultation on The Parkway included meeting with municipal emergency services to discuss issues pertaining to emergency response to an incident in The Parkway corridor. In reviewing the proposed access points to the freeway section of The Parkway, it was identified that access to The Parkway for Windsor and LaSalle emergency services could be greatly improved with the provision of a freeway entrance ramp in the area of Todd Lane. Such a connection would provide direct access to the section of the freeway east of Todd Lane/Cabana Road which is important for emergency service access as there is a fire station on Cabana Road just east of Huron Church Road, and a LaSalle fire station on Malden Road just south of Todd Lane. Upon investigation of options for a new connection and the local constraints in this area, the study team developed a loop ramp connection from Todd Lane to the eastbound freeway. A signalized intersection at the ramp terminal will enable access to the eastbound freeway from Todd Lane for all eastbound and westbound vehicles on Todd Lane/Cabana Road, thereby providing improved access for local emergency services stationed near this area.

Highway 3/Howard Avenue Interchange modified to include a connection to Howard Avenue and the possible future Laurier Parkway Extension

In discussions with the Municipal Advisory Group (MAG), the study team identified that the section of Highway 401 between Highway 3 and Howard Avenue must address several transportation issues:

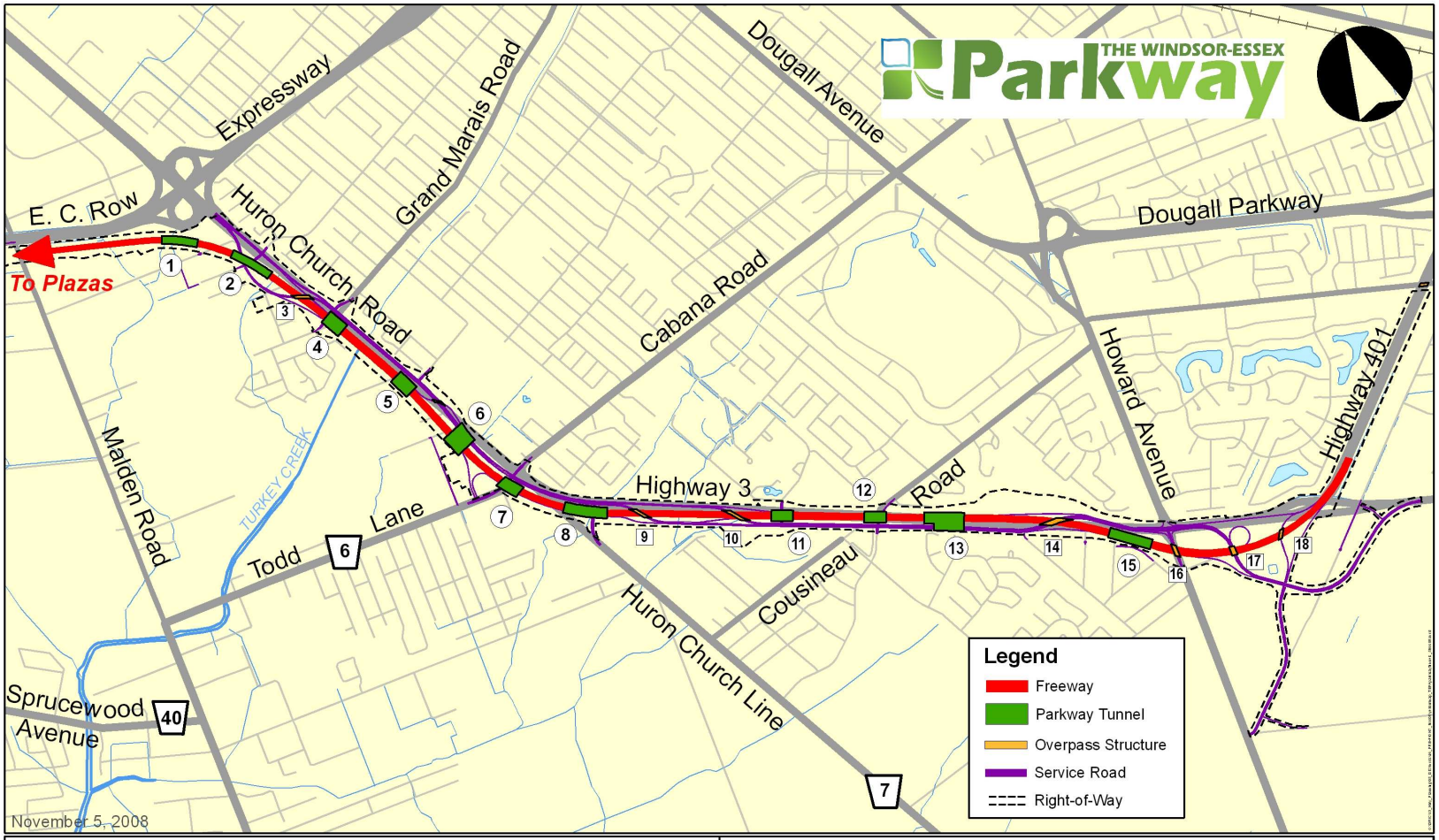
- To improve the design speed at this location over what is provided by the existing Highway 401 alignment, The Parkway includes a realignment of Highway 401 at the existing Highway 3 interchange.
- The Howard Avenue/Highway 3 intersection is a major intersection in the regional road network. This intersection would typically be a candidate site for an interchange with the new freeway; however residential development in three quadrants of this intersection represents a constraint to interchange design and construction.
- There is also the opportunity to improve connections between Highway 3 and Highway 401 (all moves between these two provincial highways are presently not provided).
- The Essex-Windsor Regional Transportation Master Plan (October 2005) identified Highway 3, the Laurier Parkway extension to Howard Avenue, as well as Howard Avenue itself, as components of a regional road network. Improving connections between these roadways would improve regional mobility.

Upon review of existing and future land use and traffic operations in the area, the study developed a concept to address the above transportation issues, by providing a new interchange at Highway 3 in the vacant lands east of Howard Avenue, with new road

connections to Highway 3 and to Howard Avenue. Such a roadway connection would allow north-south traffic destined to/from employment lands east of Windsor Airport to avoid the Howard Avenue intersection at the proposed service road. This would benefit traffic operations by reducing congestion at the Howard Avenue/service road intersection. This connection would also improve continuity for north-south traffic in this area by providing a more direct connection between Howard Avenue, the future Laurier Parkway, Highway 3 and Highway 401. Overall this connection would improve regional mobility between western Essex County, LaSalle and east Windsor/Tecumseh.

The refined Parkway alternative was identified as The Windsor-Essex Parkway (refer to Exhibit 11). The Windsor-Essex Parkway alternative was analyzed in accordance with the seven major factors and evaluated against the other at-grade and below-grade alternatives, as well as the cut and cover tunnel alternative.

EXHIBIT 11 – THE WINDSOR-ESSEX PARKWAY



I.D.	Location of Tunnel	Tunnel Length (M)	Roof Area (Sq M)
①	Spring Garden	200	9,000
②	Ramp N-E and Labelle Street	240	10,810
④	Grand Marais Road West	120	9,550
⑤	Pulford Street	120	9,705
⑥	Reddock St - Double Tunnel	120	15,320

I.D.	Location of Tunnel	Tunnel Length (M)	Roof Area (Sq M)
⑦	Cabana Road West	120	8,300
⑧	Huron Church Line	240	14,400
⑪	St. Clair College	120	7,225
⑫	Cousineau Road	120	7,225
⑬	Hearthwood Place - Double Tunnel	220	19,250
⑮	Oliver Estates Area	240	13,200

Structures 3 9 10 14 16 17 18 are proposed as roadway overpasses

3. Assessment of Access Road Alternatives

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 has been to avoid, minimize, or mitigate impacts to the extent practicable. In deciding which access road alternative is technically and environmentally preferred, value judgments were made by the study team regarding the relative importance of the various impacts and factors. This chapter explains the evaluation approach implemented to identify the technically and environmentally preferred access road alternative.

The generation and evaluation of practical access road alternatives follows from the evaluation work conducted on both the Canadian and U.S. sides for an end-to-end evaluation of illustrative alternatives. The evaluation of practical alternatives for the Canadian access road was conducted in conjunction with the evaluation of the Canadian plaza-crossing-U.S. plaza and U.S. connecting road, leading to a 'technically and environmentally preferred' end-to-end solution connecting Highway 401 in Ontario to Interstate 75 in Michigan.

The approved OEA TOR for the DRIC Study identified two evaluation methods to be employed in the evaluation process. The assessment and evaluation of these alternatives was undertaken following both a reasoned argument method, and an arithmetic method (weighted scoring). These methods are described in more detail below. The reasoned argument method was the primary method, while the arithmetic method was the secondary method, which served as a basis of comparison for the evaluation findings.

Reasoned Argument Method

The reasoned argument 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 is 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
- Study team expertise.

Arithmetic Method

The arithmetic method incorporates 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.

As discussed in the report entitled *Draft Generation and Assessment of Illustrative Alternatives Report, November 2005,* three different weighting scenarios were developed for the arithmetic method. One weighting scenario was developed by the Canadian study team, and separate weighting scenarios were developed based on input received from individuals of the general public and members of the Community Consultation Group established for this study. The weighting scenarios used for the arithmetic evaluation are provided in subsequent sections of this report.

Scoring (Degree of Impact)

Qualified study 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.

3.1. 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.

If the two approaches resulted in the identification of different preferred alternatives, the differences between the two alternatives were identified. The results of the arithmetic method were analyzed to determine the key weight-score combinations in the arithmetic evaluation. Similarly, the rationale for each trade-off decision was revisited to determine if the study team decision was appropriate. If the rationale supporting the trade-off decisions was determined to be valid and appropriate, the preferred alternative identified by the reasoned argument method would 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 would be revised.

3.2. 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 Table 2).

The Canadian and U.S. study teams jointly 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 study 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 were retained and added to, based on comments received during the public consultations. The seven 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 3 and discussed briefly in the following pages.

TABLE 2 – TABLE 3.4 OF OEA TOR – CRITERIA FOR EVALUATING ILLUSTRATIVE AND PRACTICAL ALTERNATIVES

FACTOR	CRITERIA
Socio-Economic Environment	
Property and Access	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
Community Effects	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
Governmental Land Use Strategies	8) Compatibility with government goals / objectives / policies 9) Effects on approved private development proposals
Cultural Environment	
Archaeology	10) Impacts to historic/archaeological sites
Heritage and Recreation	11) Impacts to built heritage features and cultural landscape units 12) Impacts to National, State/Provincial and local parks/recreation sites
Groundwater	13) Impacts to groundwater recharge and discharge areas, as well as identified wellhead and source protection areas and areas susceptible to groundwater contamination
Aquatic Habitat, Fisheries, and Surface Water	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
Agricultural	17) Impacts to prime agricultural areas

FACTOR	CRITERIA
Wetlands	18) Impacts to Provincially Significant Wetlands and wetland function 19) Impacts to evaluated and unevaluated wetlands
Wildlife	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
Special Areas	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
Air Quality	25) Effects on sensitive receptors to air quality 26) Air pollutants and GHG emissions
Woodlands	27) Impacts to significant forest stands and woodlots (including interior forest habitat)
Resources	28) Impacts to mineral, petroleum and mineral aggregate resources
Property Waste & Contamination	29) Effect on operating and closed waste disposal sites 30) Impacts to other known contaminated sites
Transportation	31) Transportation Operations 32) Network Compatibility 33) Border Processing
Engineering	34) Constructability Issues
Cost	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.

TABLE 3 – PRACTICAL ALTERNATIVES 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 $PM_{2.5}$ and other Green House Gases/pollutants)	Analysis for key roadway links [to be measured at practical alternatives stage].	25, 26

Rating Factor	Performance Measure Categories	Performance Measure	Corresponding Criteria Reference in OEA TOR Table 3.4
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

Rating Factor	Performance Measure Categories	Performance Measure	Corresponding Criteria Reference in OEA TOR Table 3.4
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
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

Rating Factor	Performance Measure Categories	Performance Measure	Corresponding Criteria Reference in OEA TOR Table 3.4
	Other Natural Resources	Area affected measured by area of right-of-way.	28
Improve Regional Mobility	Highway Network Effectiveness Service Levels Vehicle kilometres of Travel Vehicle Hours of Travel Distance Traveled	 Level of Service (LOS) classification by major facility type. By major facility type. By major facility type. Average km for car, local truck, and international truck.	 31, 32 31, 32 31, 32 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
Cost and Construct-ability[2]	Millions of $CAD (expressed in year 2011 dollars)	Length of alternative, preliminary construction costs, constructability including site constraints; geotechnical constraints; construction staging/ duration; traffic maintenance; risk assessment.	34, 35

3.2.1. Changes to Air Quality

The Partnership recognizes air quality is a key concern for those that live and work in the Detroit River area. Air quality effects of the practical alternatives were assessed using a combination of existing air monitoring data and air dispersion modelling. Air dispersion modelling was used to assess the impacts of future changes, such as implementation of the alternatives, and changes in fuels, vehicle technologies and traffic volumes. The predictive air quality model used is specifically designed to assess impacts from roads and highways. The model incorporates the differences between moving vehicles, and

[2] In the evaluation of illustrative alternatives, this factor was entitled Minimize Cost; for the evaluation of practical alternatives, the title of this factor was revised to Cost and Constructability to more accurately reflect the basis of the assessment.

queued vehicles that are idling, as well as differences in roads that are at-grade, below-grade, and end-to-end tunnelled or elevated on bridges.

Existing concentrations of gaseous pollutants in Windsor such as sulphur dioxide (SO2), carbon monoxide (CO), volatile organic compounds (VOCs) such as acrolein, were examined as part of the assessment of illustrative alternatives conducted in 2005, and found to be well below Ontario Ministry of the Environment Ambient Air Quality Criteria. Due to the number and length of practical access road alternatives being assessed, two indicator pollutants, one gaseous compound and one particulate compound, were selected for the analysis of the practical access road alternatives. These indicator pollutants are nitrogen oxides (NO_x) and particulate matter less than 2.5 microns ($PM_{2.5}$). These pollutants are the typical air pollutant indicator compounds with respect to transportation vehicle emissions. Changes in the total predicted concentrations of these two air pollutants were examined for each alternative in relation to the future no-build alternative. The assessment of the practical access road alternatives is described in detail in the *Air Quality Impact Assessment Practical Alternatives Evaluation Working Paper, DRAFT May 2008* available under separate cover. Additional pollutants will be examined when assessing the technically and environmentally preferred alternative (TEPA).

3.2.2. Protection of Community and Neighbourhood Characteristics

Social impacts occur when a project negatively or positively affects the way of life or lifestyle enjoyed by people, their social patterns, the social structure or character of communities, and/or the local or regional services and facilities. The social impact assessment (SIA) examined the effects to the community of South and West Windsor, as well as portions of LaSalle and Tecumseh as a result of the proposed project activities. For the purposes of the SIA, within the larger community of South and West Windsor and LaSalle, a number of smaller neighbourhood communities were identified. The effects on these smaller neighbourhoods were considered in addition to the assessment of the effects to the greater community.

The assessment of impacts to community and neighbourhood characteristics included an analysis of property impacts as well as impacts to community and neighbourhood features; noise impacts to sensitive receptors along the access road corridor; and economic impacts to businesses within and in the vicinity of the area of continued analysis. The results of the analysis are documented in several technical reports, including the *Draft Level 2 Traffic Operations Analysis of Practical Alternatives (December 2008), Draft Noise and Vibration Assessment Working Paper (May 2008)*; and the *Draft Economic Impact Working Paper (May 2008)*. The results of the various studies touching on the impacts to community and neighbourhood features are compiled in the *Draft Social Impact Assessment Working Paper (April 2008)*.

3.2.3. 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 roadway connection to a new crossing will impact on these local planning objectives. The existing and future land use patterns of affected communities were examined to assess the degree of consistency with the proposed transportation improvements. This included a 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 was evaluated.

3.2.4. Protect Cultural Resources

Various laws/regulations govern the impact of transportation facilities on properties of historic or archaeological significance and publicly owned parklands. The potential impacts of the access road on such sites/properties were defined for each practical alternative.

3.2.5. Protect the Natural Environment

The project will affect natural heritage features including terrestrial, aquatic and wetland ecosystems and their inhabitants. Within the ACA, these features 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 the access road alternatives were determined. Likewise, the potential impacts to productive resources, such as prime farmland (Ontario Class 1-3 soils) or mineral mines, were determined. Water quality issues have been 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.

3.2.6. Improve Regional Mobility

The purpose of the Detroit River International Crossing Study 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. The degree to which the options under consideration assist in efficient operation of the overall highway network has been 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).

3.2.7. Cost and Constructability

Construction of a new access road connecting to a new Detroit River international crossing will represent a major financial investment. 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 has been made of the constructability of the access road alternatives. Some of the considerations considered include site constraints, geotechnical constraints, construction staging/duration, traffic maintenance, and an implementation risk assessment.

3.3. Evaluation Process

During the illustrative alternatives stage of the work, and in consultation with stakeholders, the seven factors described above were weighted, giving more weight to factors whose impacts are considered to be more important. These factors guided the technical studies and helped the study team focus on the issues that matter most to the host communities. Evaluation throughout the study has consistently been measured against these seven

factors to provide a fair and replicable evaluation process for identifying a solution that best balances project objectives, community needs and technical requirements.

The practical alternatives have been evaluated in the overall 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. A full evaluation, however, cannot be completed without input from the community. Throughout the study, the study team met with the members of the community to gain a local perspective on these issues. The public has helped the study team identify key areas of interest, historical features, and natural areas that need preserving. Through community consultation the study team gained a greater understanding of the importance of air quality to the community and added a field measurement component into the air quality work plan. Residents have told the study team how they feel about their community, how they use their property and how the proposed project may impact those uses. The development of a new access road alternative (The Parkway) was based on comments received from the public and other stakeholders as to the importance of maintaining community connections between neighbourhoods and reducing community impacts. These are just a few examples of the influences the people of Windsor-Essex County have had on the DRIC study.

Data gathered from public meetings, open houses, workshops, focus groups and other correspondence has been included as important information to be considered in relation to the seven major factors groups in the analysis of practical alternatives.

Table 4 below lists how the various factors have been used in evaluating alternatives against each other and in comparison with future conditions without a new crossing (or the "do nothing" alternative). For complete details regarding the factors, refer to the later sections and appendices of this document.

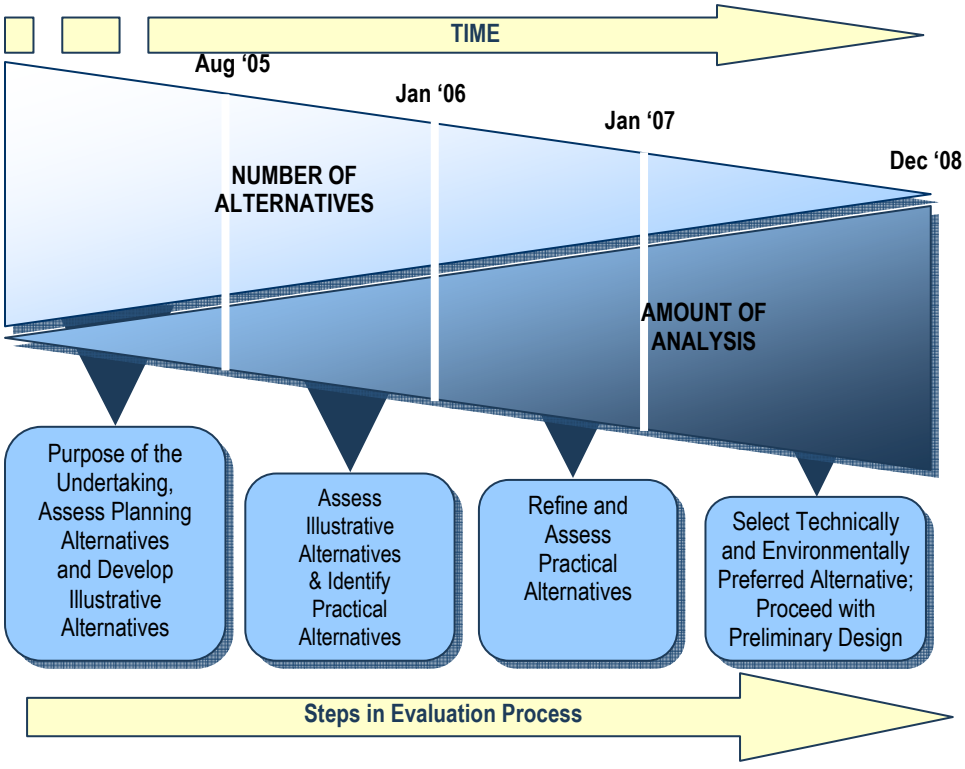
TABLE 4 – FACTORS USED IN PRACTICAL ALTERNATIVES EVALUATION – CANADIAN SIDE

FACTORS	ISSUES
Changes to Air Quality	What is the air like now and will there be changes in the levels of pollutants in the atmosphere in the next 10, 20, and 30 years?
Protection of Community and Neighbourhood Characteristics	How will each alternative affect homes and businesses? How will traffic change? Will there be additional noise and vibration? Can they be mitigated?
Consistency with Existing and Planned Land Use	What currently exists in this area? What is planned for the future of this area? Will introducing any of the alternatives into this area radically change the current uses of the area?
Protection of Cultural Resources	What historical, cultural and archaeological features exist in this area? Are there parks and recreation sites in the area? How will these be impacted by any of the alternatives and how can these be avoided or impacts be mitigated?

FACTORS	ISSUES
Protection of the Natural Environment	What is the natural environment composed of in this area? What species inhabit this area? Will the introduction of any of the alternatives negatively impact ecosystems, species, water systems or other important natural resources? Are there areas of environmental significance or species at risk that may be affected? Are impacts avoidable or can they be reduced or mitigated?
Improvements to Regional Mobility	What will be needed to improve traffic flows in this area? How can a new river crossing and plaza be efficiently managed?
Cost and Constructability	What is the cost of each alternative? Is each alternative constructable? Will each alternative provide value for the tax dollar?

It is important to note that the criteria and indicators implemented in the evaluation of practical alternatives reflect the level of detail available on the alternatives. Additional study will be undertaken for the Technically and Environmentally Preferred Alternative during future stages of design (refer to Exhibit 12).

EXHIBIT 12 – EVALUATION PROCESS



3.3.1. Public Weighting

The Partnership recognized 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 alternatives.

Pubic 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 13). 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 study teams with their opinion as to how highly (on a scale of 0 to 100) the study team should consider each of the factors in deciding on what alternatives to carry forward and which alternatives are to be set aside.

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 study team with an understanding of community values with respect to the relative importance of each environmental feature, which subsequently was considered in the study team weighting.

EXHIBIT 13 – RATING TOOL

Canada | U.S. Department of Transportation Federal Highway Administration | Ontario | MDOT Michigan Department of Transportation

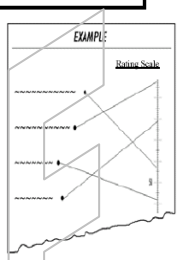
Detroit River International Crossing
Evaluation Factors Rating Tool – Canadian Version, June 2005

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 _____	●

100 90 80 70 60 50 40 30 20 10 0

Comments: _____

_____

Please complete this form and return by July 28th 2005 to:

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URS Canada Inc.,
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Markham, Ontario, L3T 7N9
Fax: (905) 882-4399 or (519) 969-5012
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Submitted By:

Name: _____

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City: _____ Postal Code: _____

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E-mail: _____

3.3.2. Canadian Study Team Weighting

Canadian Study 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 study team met to establish the numerical weight (representing level of importance) to assign each of the seven evaluation factors listed in Table 4 to be used to assess the illustrative alternatives.

Members of the Canadian study 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:

Study 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 study 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 study 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 study team was able to distinguish a degree of importance among the factors, as noted in the following:

Factor	Rationale	Rating
Improve Regional Mobility	The study 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.	100
Protection of Community & Neighbourhood Characteristics	The study 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 study team.	90

Factor	Rationale	Rating
Protection of Natural Environment	The study 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.	90
Minimize Cost[3]	The study 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.	75
Changes to Air Quality	This factor was considered of moderate importance by the study 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 study 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.	70
Protection of Cultural Resources	The study 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.	70
Maintain Consistency with Existing and Planned Land Use	The study 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.	70

The rating and weights developed by the study team, members of the public and the CCG are presented in Table 5:

TABLE 5 – RATINGS AND WEIGHTS

Factor	Study Team		Public		CCG	
	Rating	Weight (%)	Rating	Weight (%)	Rating	Weight (%)
Changes to Air Quality	70	12.39	85	17.32	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

3 In the evaluation of illustrative alternatives, this factor was entitled Minimize Cost; for the evaluation of practical alternatives, the title of this factor was revised to Cost and Constructability to more accurately reflect the basis of the assessment.

Factor	Study Team		Public		CCG	
	Rating	Weight (%)	Rating	Weight (%)	Rating	Weight (%)
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[4]	75	13.27	47	9.54	53	10.07
		100		100		100

Scoring

The Canadian study 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 study team that led the impact assessment scoring of the practical alternatives included specialists and experts in each of the evaluation factor areas on the Consultant Team. The list of lead participants is as follows:

Factor	Study Team Members	Company
Changes to Air Quality	Chris Marson Sandy Willis	SENES SENES
Protection of Community & Neighbourhood Characteristics	Gwen Brice Fred Bernard Russell Mathews	SENES SENES Hemson Consulting
Maintain Consistency with Existing & Planned Land Use	Irene Hauzar Peter Top	URS Canada URS Canada
Protection of Cultural Resources	Robert Pihl Gwen Brice	Archaeological Services Inc. SENES
Protection of Natural Environment	Grant Kauffman Storer Boone Irene Hauzar	LGL Golder Associates URS Canada
Improve Regional Mobility	Ilya Sher Bruce Mori	URS Canada IBI Group
Cost and Constructability	Murray Thompson George Katic Steve Stroh Storer Boone	URS Canada URS Canada URS Tampa Golder Associates

4 In the evaluation of illustrative alternatives, this factor was entitled Minimize Cost; for the evaluation of practical alternatives, the title of this factor was revised to Cost and Constructability to more adequately reflect the basis of the assessment from a cost and constructability perspective.

3.4. Evaluation of Access Road Alternatives

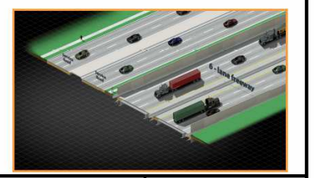
Between March 2006 and July 2007, the study team conducted the analysis of the five initial practical access road alternatives:

1) **Alternative 1A** - At-grade freeway with separate one-way service roads located on either side of the freeway
2) **Alternative 1B** - Below-grade freeway with separate one-way service roads located on either side of the freeway
3) **Alternative 2A** - At-grade freeway with separate service road located on one side of the freeway
4) **Alternative 2B** - Below-grade freeway with separate service road located on one side of the freeway
5) **Alternative 3** - Freeway in cut and cover tunnel with at-grade service road on top of tunnel

Preliminary findings of the analysis of the five initial practical access road alternatives were released for public review at Open Houses held in December 2006 and August 2007. Subsequently, the analysis of The Windsor-Essex Parkway alternative was undertaken and the results incorporated with those of the initial five access road alternatives. The evaluation of the six access road alternatives was conducted to identify the Technically and Environmentally Preferred Alternative (TEPA) for the access road. The results of this analysis and evaluation were presented at the sixth round of Public Information Open Houses in June 2008.

The results of this analysis of the six access road alternatives are documented in a number of technical documents prepared by the study team. The key findings for each of the seven evaluation factors are presented in Exhibit 14. The results of the analysis, as well as the basis for determining the preferred access road alternative are summarized in the following pages of this document.

EXHIBIT 14 – SUMMARY OF PRACTICAL ALTERNATIVES EVALUATION – ACCESS ROAD

FACTOR/ MEASURE	ALTERNATIVE 1A		ALTERNATIVE 1B		ALTERNATIVE 2A		ALTERNATIVE 2B		ALTERNATIVE 3	PARKWAY
										
	Option 1 (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)		
Changes to Air Quality										
Results of modeling (before mitigation)	• Predicted concentrations of NO_x are lower in the future compared to today's values due to changes in fuels and vehicular technologies. • Concentrations of Volatile Organic Compounds (VOC's) predicted to be well below provincial standards.		• Predicted concentrations of NO_x are lower in the future compared to today's values due to changes in fuels and vehicular technologies. • Concentrations of Volatile Organic Compounds (VOC's) predicted to be well below provincial standards. • Depressed alternatives result in slightly lower $PM_{2.5}$ concentrations in comparison to the at-grade alternatives.		• Predicted concentrations of NO_x are lower in the future compared to today's values due to changes in fuels and vehicular technologies. • Concentrations of Volatile Organic Compounds (VOC's) predicted to be well below provincial standards.		• Predicted concentrations of NO_x are lower in the future compared to today's values due to changes in fuels and vehicular technologies. • Concentrations of Volatile Organic Compounds (VOC's) predicted to be well below provincial standards. • Depressed alternatives result in slightly lower $PM_{2.5}$ concentrations in comparison to the at-grade alternatives.		• Predicted concentrations of NO_x are lower in the future compared to today's values due to changes in fuels and vehicular technologies but NO_x concentrations are greater compared to non-tunnel alternatives over a broader area (greater dispersion from ventilation stacks) • Concentrations of Volatile Organic Compounds (VOC's) predicted to be well below provincial standards. • Tunnel results in lower concentrations of $PM_{2.5}$ in vicinity of the first 50m from the ROW compared to the other alternatives.	• Predicted concentrations of NO_x are lower in the future compared to today's values due to changes in fuels and vehicular technologies. • Concentrations of Volatile Organic Compounds (VOC's) predicted to be well below provincial standards. • Depressed alternatives result in slightly lower $PM_{2.5}$ concentrations in comparison to the at-grade alternatives.
Overall Assessment	• All access road alternatives represent an improvement to local air quality over the no-build alternative. • The assessment found essentially no difference among the access road alternatives in terms of the improvements provided to local air quality compared to the no-build alternative; the end-to-end tunnel and Parkway offer a slightly greater reduction in particulate concentrations within 50m of the ROW under certain conditions compared to the other alternatives. • All alternatives were considered to have an equally low impact to air quality.									
Protection of Community and Neighbourhood Characteristics										
Potential Acquisitions										
Residences	• 180-230	• 160-210	• 180-230	• 160-210	• 190-230	• 170-220	• 180-230	• 170-220	• 140-180	• 292-342
Businesses	• 31	• 45	• 31	• 45	• 26	• 40	• 26	• 40	• 43-45	• 48
Community Features Potentially Displaced	• 3 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church	• 4 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church, Trillium Court Housing (partial)	• 3 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church	• 4 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church, Trillium Court Housing (partial)	• 3 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church (partial)	• 4 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church, Trillium Court Housing (partial)	• 3 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church (partial)	• 4 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church, Trillium Court Housing (partial)	• 4 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church, Trillium Court Housing (partial)	• 5 – Montessori Preschool, Royal Canadian Legion, Heritage Park Alliance Church, Trillium Court Housing (entire property), St. Clair College Athletic Fields
Noise Receptors with >5 dB increase (after mitigation)	• 1 (additional investigations in Malden Road/ Spring Garden area are required)	• 0 (additional investigations in Malden Road/ Spring Garden area are required)	• 1 (additional investigations in Malden Road/ Spring Garden area are required)	• 0 (additional investigations in Malden Road/ Spring Garden area are required)	• 0 (additional investigations in Malden Road/ Spring Garden area are required)	• 0 (additional investigations in Malden Road/ Spring Garden area are required)	• 0 (additional investigations in Malden Road/ Spring Garden area are required)	• 0 (additional investigations in Malden Road/ Spring Garden area are required)	• 0 (additional investigations in Malden Road/Spring Garden area are required)	• 0 (additional investigations in Malden Road/Spring Garden area are required)
Effect on Access	• 9 road closings • 20 local access connections to new transportation facility • No access to the new corridor from Cabana Road/Todd Lane; no access to Howard Avenue from Highway 401 Eastbound. • Full access to St. Clair College.		• 13 road closings • 14-15 local access connections to new transportation facility • Partial access to/ from the new corridor from/to Cabana Road/Todd Lane. • Full access to St. Clair College • No direct access to Howard Avenue.		• 15 road closings • 15 local access connections to new transportat'n facility • Full access to/ from new corridor from/to Cabana Rd/Todd Lane; no direct access to St. Clair College/Howard Ave	• 15 road closings • 14 local access connections to new transportat'n facility • Full access to/ from new corridor from/to Cabana Rd/ Todd Lane; no direct access to St. Clair College/Howard Ave	• 14 road closings • 10 local access connections to new transportat'n facility • Full access to/ from new corridor from/to Cabana Rd/ Todd Lane; no direct access to St. Clair College/Howard Ave	• 14 road closings • 11 local access connections to new transportat'n facility • Full access to/ from new corridor from/to Cabana Rd/ Todd Lane; no direct access to St. Clair College/Howard Ave	• 9 road closings • 13 local access connections to new transportation facility • No access to/from Cabana Road/Todd Lane; No access to Howard Avenue from Highway 401 Eastbound.	• 18 road closings • 17 local access connections to new transportation facility • No access to/from Cabana Road/Todd Lane from Highway 401 Westbound; No access to Howard Avenue from Highway 401 Eastbound

FACTOR/ MEASURE	ALTERNATIVE 1A		ALTERNATIVE 1B		ALTERNATIVE 2A		ALTERNATIVE 2B		ALTERNATIVE 3	PARKWAY
										
	Option 1 (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)		
Impact on Community Character/Cohesion	• Overall, similar impacts to community compared to other alternatives • Communities of Spring Garden, Bethlehem Street, Reddock Street and Talbot Road (between Cousineau Road and Howard Avenue) Montgomery-Chelsea Drive and Mero Avenue will experience change to community character and cohesion • The displacement of households within the neighbourhoods will result in a change in character within each community • Reddock Street will experience a change in community character and cohesion due to the access road alignment encroaching into the community • The Bethlehem community will experience a change in character and cohesion due to development of Bethlehem Street to accommodate local traffic traveling from Spring Garden to Huron Church Road		• Overall, similar impact to community compared to other alternatives • Communities of Spring Garden, Bethlehem Street, Reddock Street, Kendleton Court, and Talbot Road (between Cousineau Road and Howard Avenue) and Mero Avenue will experience change to community character and cohesion • Below grade alternative has lower aesthetic impacts than the at-grade options • Reddock Street will experience a change in community character and cohesion due to the access road alignment encroaching into the community • Removes traffic from the viewshed of adjacent neighbourhoods		• Overall, similar impact to community compared to other alternatives • Communities of Spring Garden, Bethlehem Street, Reddock Street and Talbot Road (between Cousineau Road and Howard Avenue) and Mero Avenue will experience change to community character and cohesion • Over half of the households on Reddock Street will be displaced • The residential in-fill area of Kendleton Court will be displaced with option 1; no households will be displaced in Kendleton Court with option 2 • Talbot Road community will experience a change in character and cohesion due to the displacement of one entire side of Talbot Road, with either option 1 or option 2		• Overall, similar impact to community compared to other alternatives • Communities of Spring Garden, Bethlehem Street, Reddock Street and Talbot Road (between Cousineau Road and Howard Avenue) and Mero Avenue will experience change to community character and cohesion • All Kendleton Court households will be displaced with alignment option 1; with alignment option 2 only one Kendleton Court household is displaced • Provides for some aesthetic benefits to the community at large and to adjacent neighbourhoods • Removes traffic from the viewshed of adjacent neighbourhoods		• Overall, similar impact to community compared to other alternatives • Impacts to Spring Garden, Talbot Road, Bethlethem Street, Mero Avenue, and Montgomery-Chelsea Drive neighbourhoods • In the Talbot Road community, the displacement of households is limited to the LaSalle side of Talbot Road; resulting in a change in community character and cohesion as approximately one half of the community is displaced • Tunnel alignment to Plaza A will result in a displacement of 32 out of 48 households on Bethlehem Street; which will result in a change in character and cohesion • Lowest aesthetic impact, but visual impact of ventilation buildings, which are not compatible with the surrounding landscape; residents will have the ventilation buildings and stacks as part of their permanent viewshed	• Impacts to Spring Garden, Talbot Road, Bethlehem Street, Reddock Street, Kendleton Court, Trillium Court neighbourhoods • Talbot Road (between Cousineau and Howard) community will experience a change in character and cohesion due to the displacement of all the households on both sides of the street • Trillium Court community will be entirely displaced, resulting in a change to community cohesion and character • In the Kendleton Court community, the displacement of households is limited to one side of the street. • Parkway provides a greenspace buffer to adjacent neighbourhood communities, thus reducing the number of residents adjacent to the roadway. • Parkway provides connectivity between communities and community features that currently does not exist. • Greenspace buffer between residents and freeway/service roads will result in fewer residents experiencing long term nuisance effects
Overall Assessment	• Overall, all alternatives are considered to have a high impact to community characteristics. • All alternatives displace a high number of residences and businesses along the corridor and represent a substantive change to the local character and cohesion for the neighbourhoods along the corridor. • The separation of local and international traffic and the additional roadway capacity provided will deter infiltration of international traffic onto local municipal streets, providing a benefit to south/west Windsor and LaSalle. • The effects of loss of businesses along the corridor is offset by the ability of these businesses to locate elsewhere in the local area, improved access for these businesses over what is presently provided, and the benefits of thousands of direct and indirect project related jobs created by the construction of the new access road. • The at-grade alternatives and below-grade alternatives 2A and 2B do not provide any improvements to community cohesion and character. The end-to-end tunnel does not provide the same benefits to community character and cohesion as it does not improve linkages across the Huron Church/Highway 3 corridor over the current condition and reduces visibility for local businesses. • The Windsor-Essex Parkway has the highest displacement of homes and businesses, but provides a greater improvement to overall community character and cohesion of the corridor by improving linkages between neighbourhoods, buffering neighbourhoods from highway nuisance effects and providing new open space/recreational facilities along the corridor. These improvements result in a better long-term solution for the community. Based on the extent of long term improvements to community character and cohesion in south/west Windsor and LaSalle, the Windsor-Essex Parkway is slightly preferred over the other alternatives as having the least overall impacts to community and neighbourhood characteristics.									
Consistency with Existing & Planned Land Use										
Consistency	• Alternative utilizes Huron Church Road/ Highway 3 Corridor (major roadway, historical connection to border crossing); • Proposed facility is consistent with local Official Plans		• Alternative utilizes Huron Church Road/ Highway 3 Corridor (major roadway, historical connection to border crossing); • Proposed facility is consistent with local Official Plans		• Alternative utilizes Huron Church Road/ Highway 3 Corridor (major roadway, historical connection to border crossing) • Proposed facility is consistent with local Official Plans		• Alternative utilizes Huron Church Road/ Highway 3 Corridor (major roadway, historical connection to border crossing) • Proposed facility is consistent with local Official Plans		• Alternative utilizes Huron Church Road/ Highway 3 Corridor (major roadway, historical connection to border crossing) • Proposed facility is consistent with local Official Plans	• Alternative utilizes Huron Church Road/ Highway 3 Corridor (major roadway, historical connection to border crossing) • Proposed facility is consistent with local Official Plans including the Healthy Communities policies and objectives • Parkway provides opportunities for additional parkland & recreational features

FACTOR/ MEASURE	ALTERNATIVE 1A		ALTERNATIVE 1B		ALTERNATIVE 2A		ALTERNATIVE 2B		ALTERNATIVE 3	PARKWAY
										
	Option 1 (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)		
Total area of land use impacts	• 78 ha	• 74 ha	• 75 ha	• 78 ha	• 81 ha	• 78 ha	• 80 ha	• 85 ha	• 65 ha	• 99 ha
Contaminated Sites/Potentially impacted area of high potential for contamination	• 17/9 ha	• 17/3.6 ha	• 18/3.5 ha	• 13/3.6 ha	• 17/4 ha	• 17/4 ha	• 16/3.8 ha	• 16/4 ha	• 16/3 ha	• 20/3 ha
Overall Assessment	• All the alternatives are developed in the same existing transportation corridor in Windsor and LaSalle and Tecumseh. • The nature of existing and planned land uses affected by all alternatives are essentially the same. • The Windsor-Essex Parkway demonstrates a greater consistency with local municipal planning in terms of meeting objectives that improve the quality of life for its residents. The tunnel sections over the below-grade freeway, additional buffer spaces along and across the corridor, opportunities for new recreational trails with connections to existing trails and wildlife linkages contribute to a corridor that better connects communities and natural features. • The Windsor-Essex Parkway alternative is preferred over the other alternatives.									
Protection of Cultural Resources										
Built Heritage Features Displaced	• 7 to 8 field identified built heritage features displaced		• 7 to 8 field identified built heritage features displaced		• 5 field identified built heritage features displaced		• 5 field identified built heritage features displaced		• 6 to 8 field identified built heritage features displaced	• 7 to 8 field identified built heritage features displaced
Disrupted	• 1 to 3 field identified built heritage features disrupted		• 1 to 3 field identified built heritage features disrupted	• 3 to 4 field identified built heritage features disrupted	• 6 field identified built heritage features disrupted		• 6 field identified built heritage features disrupted		• 3 to 5 field identified built heritage features disrupted	• 3 to 4 field identified built heritage features disrupted
Parks	• 1 Impacted – Property taking • 5 impacted – potential disruption to access	• 6 Impacted – Potential disruption to access	• 1 Impacted – Property taking • 5 impacted – potential disruption to access	• 6 Impacted – Potential disruption to access	• 1 Impacted – Property taking • 5 impacted – potential disruption to access	• 6 Impacted – Potential disruption to access	• 1 Impacted – Property taking • 5 impacted – potential disruption to access	• 6 Impacted – Potential disruption to access	• 1 Impacted – Property taking • 5 impacted – potential disruption to access	• 1 impacted-Property taking • 5 impacted – potential disruption to access • adds 240 acres of additional parkland and greenspace, and over 20 km of new recreational trails with the Windsor-Essex Parkway design
Archaeology Disturbance or destruction of known significant archaeological sites	• 1 to 2 small pre-contact habitation sites • 9 pre-contact findspots	• 1 to 2 small pre-contact habitation sties • 9 pre-contact findspots e.g. no known sites of high to moderate significance impacted	• 1 to 2 small pre-contact habitation sites • 9 pre-contact findspots	• 1 to 2 small pre-contact habitation sites • 9 pre-contact findspots	• 2 to 3 small pre-contact habitation sites • 10 to11 pre-contact findspots	• 2 to 3 small pre-contact habitation sites • 10 pre-contact findspots	• 2 to 3 small pre-contact habitation sites • 10 to 11 pre-contact findspots	• 2 to 3 small pre-contact habitation sites • 9 to 10 pre-contact findspots	• 1 to 3 small pre-contact habitation sites • 8 pre-contact findspots	• 3 to 4 small pre-contact habitation sites • 15 to 17 pre-contact findspots
Overall Assessment	• In terms of reducing impacts to built heritage features and cultural landscapes, Alternatives 2A and 2B with the alignment connecting to Plaza A have the lowest impacts. Alternatives 1A and 1B have the highest impacts, regardless of the connecting plaza alignment considered. • All the access road alternatives impact a similar number of existing municipal parks; only the Windsor-Essex Parkway provides over 100 ha (240 acres) of new open space suitable for active/passive recreational faculties and over 20 kilometres of additional recreational trails, with connections to the existing trail systems. • Given that no access road alternatives have sites with human remains or large pre-contact Aboriginal (village) sites (based on the evidence to date), all access road alternatives are assessed to have low to medium archaeological impact to known archaeological sites. • Overall, the Windsor-Essex Parkway was considered to be the preferred access road alternative on the basis of greater benefits to cultural resources by way of increasing the amount of park space and trails available to local residents, with similar low impacts to built heritage and archaeological features, compared to the other alternatives.									

FACTOR/ MEASURE	ALTERNATIVE 1A		ALTERNATIVE 1B		ALTERNATIVE 2A		ALTERNATIVE 2B		ALTERNATIVE 3	PARKWAY
										
	Option 1 (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)		
Protection of Natural Environment										
Fish and Fish Habitat	• No critical fish habitat impacted by any access road alternatives									
Plant/Vegetation Species	• 0.44 ha to 1.43 ha of provincially rare vegetation impacted	• 0.50 ha to 1.53 ha of provincially rare vegetation impacted	• 0.43 ha to 1.46 ha of provincially rare vegetation impacted	• 0.54 ha to 1.46 ha of provincially rare vegetation impacted	• 1.19 ha to 2.22 ha of provincially rare vegetation impacted	• 1.18 ha to 2.22 ha of provincially rare vegetation impacted	• 0.82 ha to 1.86 ha of provincially rare vegetation impacted	• 0.82 ha to 1.86 ha of provincially rare vegetation impacted	• 0.50 ha to 1.48 ha of provincially rare vegetation impacted	• 1.47 ha to 2.54 ha of provincially rare vegetation impacted
Wildlife Species and Habitat	• 102 to 142 specimens/colonies of species at risk	• 92 to 134 specimens/colonies of species at risk	• 112 to 152 specimens/colonies of species at risk	• 103 to 152 specimens/colonies of species at risk	• 122 to 162 specimens/colonies of species at risk	• 116 to 155 specimens/colonies of species at risk	• 105 to 145 specimens/colonies of species at risk		• 92 to 131 specimens/colonies of species at risk	• 141 to 180 specimens/colonies of species at risk • wider right of way/buffer areas provides greater opportunities for restoration and enhancement of natural features along the corridor
Overall Assessment	• Overall, all the access road alternatives are considered as having similar impacts to natural features. While no one access road alternative was identified as being preferred over all others, the alternatives that avoid the Malden Road/Spring Garden area (i.e. those with the access road alignment connecting to plazas B/C) are slightly preferred.									
Improvements to Regional Mobility										
Highway Capacity	• Six lane freeway with controlled access and service roads provides sufficient capacity to meet future (2035) travel demand; Peak Hour LOS (2035) = C									
Continuous Capacity	• All alternatives provide comparable access between the service roads and the cross streets with slight differences: • Safety of controlled access freeway for access road is greatly increased compared to present arterial roadway with signalized intersections and other entrances/conflict points • Provides increased local and regional mobility over the "do nothing" alternative • Provides substantial travel time savings for local traffic when compared to the "do nothing" alternative		• Safety of controlled access freeway for access road is greatly increased compared to present arterial roadway with signalized intersections and other entrances/conflict points • Provides increased local and regional mobility over the "do nothing" alternative • Provides substantial travel time savings for local traffic when compared to the "do nothing" alternative		• Safety of controlled access freeway for access road is greatly increased compared to present arterial roadway with signalized intersections and other entrances/conflict points • Provides increased local and regional mobility over the "do nothing" alternative • Provides substantial travel time savings for local traffic when compared to the "do nothing" alternative		• Safety of controlled access freeway for access road is greatly increased compared to present arterial roadway with signalized intersections and other entrances/conflict points • Provides increased local and regional mobility over the "do nothing" alternative • Provides substantial travel time savings for local traffic when compared to the "do nothing" alternative		• Safety of controlled access freeway for access road is greatly increased compared to present arterial roadway with signalized intersections, other entrances/conflict points • Provides increased local and regional mobility over the "do nothing" alternative • Provides substantial travel time savings for local traffic when compared to the "do nothing" alternative • The positive effects of tunnels on safety include elimination of adverse weather conditions and increased driver attention and/or slower speeds due to the confined driving space • Elements of tunnel driving that negatively affect safety may include limited visibility due to tunnel walls and light changes at the portals; it is much more difficult to control events in a tunnel crash; motorists' escape is not simple, and it is harder for emergency response teams to reach the crash site • The consequences of a crash in a tunnel are greatly increased over those on an open road, however, the frequency of catastrophic events is low, and the occurrence of general traffic crashes (on a tunneled freeway) is marginally less than on an open road	• Safety of controlled access freeway for access road is greatly increased compared to present arterial roadway with signalized intersections and other entrances/conflict points • Provides increased local and regional mobility over the "do nothing" alternative • Provides substantial travel time savings for local traffic when compared to the "do nothing" alternative • Provides more favourable traffic operations on the service road than the other alternatives • Provides higher degree of mobility between the service road and the new freeway when compared to the other alternatives.

FACTOR/ MEASURE	ALTERNATIVE 1A		ALTERNATIVE 1B		ALTERNATIVE 2A		ALTERNATIVE 2B		ALTERNATIVE 3	PARKWAY
										
	Option 1 (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)	**Option 1** (Widen to North on Hwy 3)	**Option 2** (Widen to South on Hwy 3)		
Reasonable and Secure Options	• All access road alternatives provide freeway connection to a river crossing as well as connections to Huron Church Road at E.C. Row enabling choice between new and existing crossings									
Overall Assessment	• All alternative provide a significant improvement to regional mobility by getting long distance truck traffic off local streets and providing full freeway access to/from the border. The local and regional function of the existing Highway 3/Huron Church Road corridor is improved by providing parallel service roads which can be designed to meet the needs of the community. • The Windsor-Essex Parkway provides better access between the local street system and the freeway, providing greater benefits to regional mobility than the other alternatives. This advantage led to the determination that the Windsor-Essex Parkway is preferred over the other access road alternatives.									
Cost and Constructability										
Estimated Construction Cost ($CAD 2011 dollars), North Talbot Road to Malden Road	• $750 M to $920 M		• $1.19 B to $1.36 B		• $620 M to $790 M		• $1.03 B to $1.20 B		• $3.6 B to $3.78 B	• $1.5 B to $1.6 B
Key Constructability Issues	• Traffic management during construction • Availability of resources and materials • Utility relocations • Watercourse crossings • 0.3 km zone requiring soil stabilization techniques		• Traffic management during construction • Availability of resources and materials • Utility relocations • Watercourse crossings • Soil stabilization techniques required over 2.5 km		• Traffic management during construction • Availability of resources and materials • Utility relocations • Watercourse crossings • 0.3 km zone requiring soil stabilization techniques		• Traffic management during construction • Availability of resources and materials • Utility relocations • Watercourse crossings • Soil stabilization techniques required over 2.5 km		• Traffic management during construction • Availability of resources and materials • Utility relocations • Watercourse crossings • Soil stabilization required over 2.5 km • Testing, commissioning and maintenance of tunnel support systems (ventilation, lighting communications, etc.)	• Traffic management during construction • Availability of resources and materials • Utility relocations • Watercourse crossings • Soil stabilization required to over 2.5 km • Additional annual maintenance will be required for the Cahill and Lennon Drains
Overall Assessment	• The at-grade alternatives have the lowest construction costs and the least constructability risks, while the end-to-end tunnel alternative carries the highest costs and greatest constructability risks. The below-grade alternatives, including the Windsor-Essex Parkway, carry estimated costs much less than the tunnel alternative, with lower cost and constructability risks. • Alternative 2A, which is an at-grade alternative with a parallel two-lane service road is the preferred alternative based on cost and constructability. This alternative requires the least cost and least constructability risks. The new freeway could be built alongside much of the Huron Church/Highway 3 corridor without interfering with traffic. This alternative also avoids below-grade construction at Grand Marais Drain, which is an area of high risk construction.									
Evaluation Summary	• The Windsor-Essex Parkway was identified as preferred or slightly preferred over the other access road alternatives in four of the seven key factor areas considered. In two of the seven factor areas, no clear preference was identified; in the area of Cost and Constructability, the at-grade alternative 2A was identified as the preferred alternative. The Windsor-Essex Parkway was the second-most expensive alternative and is identified as having greater cost and constructability risks than the other alternatives expect for the tunnel alternative. • Overall, the Windsor-Essex Parkway was considered to provide a better balance of impacts and benefits than the at-grade alternative 2A. The advantages of the Windsor-Essex Parkway in terms of providing greater protection to community and neighbourhood characteristics, a greater consistency with existing and planned land use, greater protection of cultural features and greater improvements to regional mobility than alternative 2A. • Although alternative 2A has more cost and constructability advantages, it offers much less community, land use, cultural and mobility advantages than the Windsor-Essex Parkway. The study team therefore identified the Windsor-Essex Parkway as the preferred access road alternative.									

3.4.1. Changes to Air Quality

The results of the analysis indicated that presently, approximately 45% of the total NO_x emissions in the Windsor airshed come from trucks and cars on the local road network. Emissions from the vehicles using the Huron Church Road corridor contribute approximately 2% of the total NO_x emissions to the Windsor airshed. Recent and on-going improvements in emission control technologies and fuels will combine to substantially reduce the emissions from transportation sources. As of June 2006, the maximum amount of sulphur in on-road diesel fuel was reduced from 500 mg/kg to 15 mg/kg. These reductions were necessary for Canadian sulphur levels in on-road fuels to be consistent with U.S. levels, and to ensure that advanced emission control technologies on newer engines would be effective. In January 2007, additional engine standards for heavy-duty vehicles came into effect. These standards reduce NO_x and particulate matter emissions by 60 per cent and 90 per cent respectively over existing levels, and require the incorporation of additional emission control technologies on these newer engines to effect these reductions.

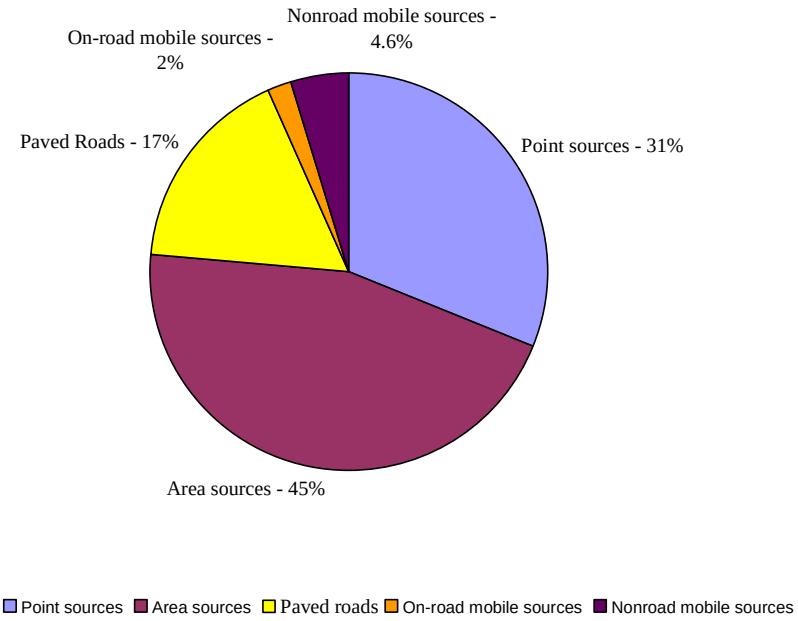
Based on these and other anticipated changes in both Canada and the U.S., preliminary estimates are that annual emissions of NO_x from road-related transportation sources in Windsor will be reduced from approximately 4,000 tonnes in 2004 to 500 tonnes in 2035. These changes will occur over time as the vehicle fleet is replaced. Based on these projected decreases, cars and trucks will likely contribute less than 10 per cent of the total regional NO_x emissions.

Emissions of $PM_{2.5}$ from road-based transportation sources are comprised of two contributing fractions. The first is tailpipe emissions resulting from fuel combustion. The second fraction is from road dust that is generated from the re-suspension of surface material and debris, tire and brake wear, and roadway abrasion.

Exhibit 15 presents the breakdown of current $PM_{2.5}$ emissions in southwestern Ontario. It is divided into:

- Point Sources (i.e. factory smoke stacks)
- Area Sources (farms, construction sites, unpaved roadways)
- Non-road Mobile Sources (rail transportation, marine transportation, construction equipment)
- Paved Roads
- On-road Mobile Sources (tailpipe emissions from cars and trucks on roads and highways).

EXHIBIT 15 – $PM_{2.5}$ EMISSIONS FOR SOUTHWESTERN ONTARIO (YEAR 2000)

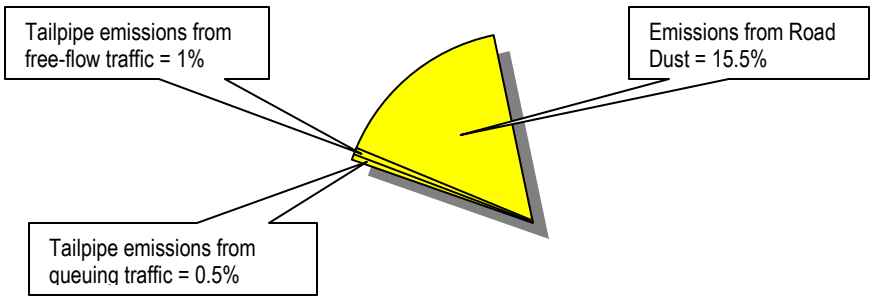


An important consideration in the changes to local air quality is the role of contributions from upwind sources and transboundary (air pollution that originates outside of the local region) air flow on total $PM_{2.5}$ concentrations in Windsor. During typical conditions, these sources comprise approximately 56% of the total concentration of particulate matter in the Windsor area. During a smog event, this contribution increases to over 80%, as polluted air flows into the region from upwind sources in the U.S.

Cars and trucks on paved roads contribute 19% of the total $PM_{2.5}$ emissions, and only 2% of this is from tailpipes. Improvements in fuels and vehicle engine technologies will result in further decreases in the tailpipe portion of $PM_{2.5}$ emissions from road-based transportation.

Total road emissions of $PM_{2.5}$ are predominantly comprised of road dust. Emissions of $PM_{2.5}$ will therefore increase as traffic increases in the Highway 3/Huron Church Road corridor. However, the tailpipe fraction of $PM_{2.5}$ emissions is currently a maximum of 30 per cent of the total road-based $PM_{2.5}$ emissions from the corridor. By 2015, this fraction will be reduced to less than 10 per cent of the total $PM_{2.5}$ emissions, because of the combined effect of cleaner fuels and the free flow traffic conditions provided by the new freeway, which will reduce the average daily volume of traffic subjected to braking, idling and acceleration at traffic signals in the Highway 3/Huron Church Road corridor. This is shown in Exhibit 16.

EXHIBIT 16 – BREAKDOWN OF 2015 $PM_{2.5}$ EMISSIONS ATTRIBUTABLE TO PAVED ROAD SOURCES IN WINDSOR AREA



By 2025, the tailpipe fraction of $PM_{2.5}$ will be further reduced to less than 0.7% of the total $PM_{2.5}$ emissions in the Windsor area, as the vehicle fleet is fully replaced with vehicles that incorporate the new engine technologies.

Implementation of any of the practical access road alternatives generally results in decreased $PM_{2.5}$ and NO_x concentrations, and an improvement in air quality compared to the no-build alternative. All predicted NO_x concentrations in the vicinity of the corridor are predicted to be below relevant standards and guidelines. Although the results of the modelling predicted certain areas within 50 to 100 metres of the corridor that may experience increases in concentrations under certain limited conditions, there were no instances of predicted increases in concentrations that would cause a change in the Air Quality Index* rating in the corridor.

Tunnel Ventilation Options

Four different options for ventilation of the cut and cover end-to-end tunnel option were assessed. Options 1A, 1B, and 1C represented differing configurations and locations of ventilation buildings, while Option 2 included jet fans placed on the tunnel ceiling throughout the tunnel with pollutants being exhausted out through the portals instead of through ventilation buildings.

The results of the atmospheric dispersion modelling assessment indicate that of the four tunnel ventilation options studied, Option 2 (i.e. using jet fans to ventilate the tunnel through the portals instead of a vent building) results in unacceptably high concentrations of $PM_{2.5}$ and NO_x at the receptors compared to the other three ventilation options.

* - The Ontario Ministry of the Environment (MOE) publishes results annually on the air quality in different locations in Ontario as part of their Air Quality program. The Air Quality Index is an indicator of air quality, based on hourly pollutant measurements of some or all of the six most common air pollutants: sulphur dioxide, ozone, nitrogen dioxide, total reduced sulphur compounds, carbon monoxide and fine particulate matter.

According to the Air Quality Reports published by MOE, Windsor experiences "very good" and "good" air quality more than 80% of the time and the poorer quality air episodes are driven almost exclusively by transboundary events and ozone levels.

The results also indicate that there is little to no difference in the maximum predicted concentrations between the three ventilation building options assessed. For the purposes of comparison to at-grade and below-grade alternatives, Option 1A was used for the ventilation configuration for the end-to-end cut and cover tunnel. The two locations along the access road corridor for the two ventilation buildings developed in consultation with the public were in the vacant field in the northwest corner of the Todd Lane/Huron Church Road intersection, and along Highway 3 in the vacant field opposite the St. Clair College main entrance.

At-grade vs. Below-grade vs. Cut and Cover End-to-End Tunnel

Air dispersion modelling of air quality impacts of the practical alternatives indicates that there are slight differences between these alternatives within 50– 100 m (164 – 328 ft) from the right-of-way (ROW) under certain conditions. Below-grade alternatives including The Windsor-Essex Parkway result in a reduction in maximum predicted $PM_{2.5}$ and NO_x concentrations in the vicinity of the ROW, in comparison to at-grade alternatives. For example, within 50 m (164 ft) from the ROW, below-grade sections show slightly lower predicted concentrations of $PM_{2.5}$ and NO_x than at-grade sections. By 100 m (328 ft) and beyond from ROW, there is no discernible difference between at-grade and below-grade alternatives.

Within 50 m (164 ft) of the ROW, the end-to-end tunnel alternative results in lower maximum predicted concentrations of $PM_{2.5}$ compared to at-grade and below-grade alternatives under certain conditions. At 100 m (328 ft) from the ROW, there is little difference between the alternatives in terms of maximum predicted $PM_{2.5}$ concentrations. At 250 m (820 ft) from the ROW there is no difference between any of the alternatives in terms of $PM_{2.5}$ concentrations.

The end-to-end tunnel alternative results in increases in the maximum predicted 1-hour and 24-hour NO_x concentrations in the vicinity of the ROW near the tunnel portals under certain conditions, compared to at-grade and below-grade options. This reflects the effect of the tunnel entrance and exit portals, in addition to the dispersion characteristics of the exhaust stacks at the ventilation buildings.

Service Road Configurations

Air dispersion modelling of air quality impacts of the practical alternatives indicates that between Alternatives 1 (one-way service roads on either side of freeway) and 2 (two-way service road on one side of freeway), there is little difference in the predicted changes to $PM_{2.5}$ and NO_x concentrations. Maximum predicted $PM_{2.5}$ and NO_x concentrations are slightly higher with the one-way service road options compared to the two-way service road options. However, air quality conditions are the same on average for each option.

Route Alignment Options between St. Clair College and Howard Avenue

Two route alignment options were studied for the area between St. Clair College and Howard Avenue. Option 1 considers a widening of the present roadway corridor more to the north (Windsor) side of Highway 3, whereas Option 2 considers a widening of the corridor more to the south (LaSalle) side of Highway 3.

The air dispersion modelling results indicate that there is little difference in the change in $PM_{2.5}$ and NO_x concentrations between Option 1 and Option 2 at receptors located within 50 m (164 ft) of the ROW between St. Clair College and Howard Avenue. Receptors within 50 m (164 ft) of the proposed ROW experience slightly lower maximum predicted NO_x and $PM_{2.5}$ concentrations with the Option 2 alignment versus the Option 1 alignment under certain conditions. This difference is primarily due to the change in the proximity of these receptors to the proposed ROW. However, on average, there is little to no difference in air quality conditions between Option 1 and Option 2 alignments.

Summary – Changes to Air Quality Assessment

- The new access road has limited influence on local air quality. Other non-roadway sources play a more significant role in determining air quality in the Area of Continued Analysis.
- All access road alternatives represent an improvement to local air quality over the no-build alternative.
- The assessment found essentially no difference among the access road alternatives (at grade, below grade, tunnel) in terms of the improvements provided to local air quality compared to the no-build alternative; the end-to-end tunnel offers a slightly greater reduction in particulate concentrations within 50 m of the ROW under certain conditions compared to the other alternatives
- All alternatives were considered to have an equally low impact to air quality.

3.4.2. Protection of Community and Neighbourhood Characteristics

The SIA determined that all access road alternatives are consistent with the historical use of the Highway 3/Huron Church Road corridor in that this corridor is recognized as an international gateway route in the City of Windsor, and Highway 3 is a provincial facility. The current roadway presently carries high volumes of traffic. Nevertheless, all alternatives are identified as having a high impact to the broader communities of South Windsor and LaSalle, and to certain smaller neighbourhood communities.

Exhibit 15 includes a summary of the key findings of the analysis of impacts to community and neighbourhood features. The access road alternatives displace a similar number of households. The displaced residences are situated along the periphery of neighbourhood communities adjacent to the current Highway 3/Huron Church Road corridor from Howard Avenue to Malden Road, and as such have varying degree of impacts on community character and cohesion. Community neighbourhoods at Spring Garden Road, Bethlehem Avenue, Reddock Street and Talbot Road (Highway 3) will experience a greater change in character and cohesion than other neighbourhood communities located along the corridor.

Although The Parkway alternative displaces the most homes compared to the other alternatives, this alternative also provides a buffer area between adjacent residential areas and the ROW. This buffer area results in less nuisance impacts for residential areas along the corridor. Nuisance impacts may result in changes to day-to-day use and enjoyment of property, and overall satisfaction in the community for residents within 50m of the ROW in the neighbourhood communities of Spring Garden, Bethlehem, Reddock Street, Kendleton Court, Talbot Road and Oliver Estates. With the cut-and-cover tunnel alternative, no buffer areas between residential areas and the service roads on the

surface of the tunnel are provided. As well, all alternatives have a similar impact on social features such as community centres and places of worship.

All alternatives separate local traffic from freeway traffic and provide a provincial freeway facility connecting Highway 401 to the international crossing and, in so doing, reduce international traffic on local streets. The Windsor-Essex Parkway alternative provides the opportunity for additional parkland and recreational features within the green space buffer along the entire corridor and on the tunnel segments. The Windsor-Essex Parkway alternative provides connectivity not previously enjoyed between neighbourhood communities on both sides of the ROW and adjacent to one another. This improvement to connectivity is a notable advantage of The Windsor-Essex Parkway alternative. With tunnel roofs and other crossings of the below-grade portion of the freeway, The Parkway reduces any 'barrier effect' between neighbourhoods along the corridor better than the other access road alternatives and much better than the no-build alternative. With the cut-and-cover tunnel option, the service road remains an at-grade roadway with no additional or improved buffer areas between the service road and the adjacent residential neighbourhoods.

Noise

The below-grade alternatives (1B and 2B, and Parkway) and end-to-end tunnel (Alternative 3) generally result in lower noise levels at the receptor locations compared with at-grade alternatives (1A and 2A). The below-grade alternatives (1B, 2B), the tunnel alternative (3) and Parkway alternative show no predicted noise impact in all route segments between Pulford Street and the existing Highway 401. For all alternatives, some exceedances were observed between Malden Road and Pulford Street, with at least one receptor experiencing a high noise impact (change greater than 10 dB above the no-build sound levels) for all three scenario years (2015, 2025, and 2035), either daytime or nighttime. Mitigation measures were considered for these noise sensitive receptors that showed more than a 5 dB increase in project sound levels above the no-build sound levels. In most cases, from Malden Road to North Talbot Road along the proposed Highway 401, a 5 m (16 ft) noise barrier was effective in reducing the predicted project noise to within 5 dB of the no-build sound levels. An exception was noted with Alternatives 1A and 1B for two receptors located on Spring Garden Road. The noise level after mitigation at these two receptor locations ranged from 5 to 7 dB above the no-build sound levels for Alternatives 1A and 1B in year 2035.

Business Impacts

The access road alternatives displace 25 to 48 businesses; between 31 and 58 businesses are also disrupted by the access road alternatives. The Windsor-Essex Parkway Alternative displaces more businesses than any other alternative but significantly fewer businesses are disrupted. The displacement of businesses along the proposed access road will have a limited overall economic impact. Despite the immediate loss of revenue and employment, the loss of businesses will be offset by gains in other businesses, or the displaced businesses will relocate to other suitable areas. Depending on the alternative selected, a loss of between 200 and 360 employees, a gross revenue loss of $20 to $40 million and an assessed property value loss of between $13 and $30 million is estimated. Alternative 2A alignment Option 1 has the lowest business displacement and limits the degree of disruption associated with visibility and access, since the access road is at-grade rather than below-grade or tunnelled. Alternative 3 (cut-

and-cover tunnel) has the highest degree of disruption associated with visibility and access, since a greater length of the access road is completely underground.

For the commercial and travel/tourism businesses located along Huron Church Road north of the E.C. Row Expressway, the impacts are expected to be nearly neutral. This is for two principal reasons:

- The dramatic decline of truck traffic is of no consequence as businesses along this section of Huron Church Road do not rely on truck traffic.
- The loss of international car traffic is likely to be more than balanced by increased opportunities for sales to local traffic.

For Huron Church Road north of E.C. Row Expressway, traffic forecasts indicate a decline in passing international automobile traffic after the completion of a new crossing, but recovering somewhat later in the forecast period. Increases in local automobile traffic throughout the forecast period more than compensate for the loss of international automobile traffic. International truck traffic decreases significantly as a result of the new crossing and access road, while local truck traffic increases marginally over the forecast period.

Impacts to other business beyond the ACA are likely to be largely positive. This is for two reasons:

- The business activity lost within the ACA is likely to be largely reflected in increases in similar businesses outside of the ACA.
- The improved transportation network, less traffic congestion and increased highway capacity, will improve the movement of goods for industrial users and increase the amount of non-local customers travelling into and out of the area for commercial and travel/tourism businesses.

The effects on the broader economic area will be entirely positive, as the new border crossing and access road will support increased trade, create greater opportunity for development along Highway 401, and significantly increase the amount of people travelling in the area, enhancing businesses and future opportunities for commercial and travel/tourism related businesses.

Other Community Impacts

For all alternatives, construction will result in minor adjustments to some public transit and school bus routes. The post construction local road network will also require minor adjustments by transportation planners for public transit and school boards. Emergency services will need to re-assess their resources, level of service, access routes for the new freeway, and in general, their ability to access their entire area of coverage with all alternatives, in order to ensure provincially mandated response times are met. Negotiations between the municipalities and the appropriate unions may be necessary if cross-boundary servicing agreements are required as a result of the new freeway and changes to the local road network. This is common to varying degrees with all access road alternatives.

The Windsor-Essex Parkway and the other below-grade alternatives as well as the end-to-end tunnel alternatives, improve the aesthetics of the corridor by lessening the visibility of traffic for the adjacent communities. However, the visual characteristics of the tunnel

ventilation buildings are not consistent with the surrounding landscape and may be considered an aesthetic intrusion for nearby residents.

Conclusion – Protection of Community and Neighbourhood Characteristics Assessment

- Overall, all alternatives are considered to have a high impact to community characteristics.
- All alternatives displace a high number of residences and businesses along the corridor and represent a substantive change to the local character and cohesion for the neighbourhoods along the corridor.
- The separation of local and international traffic and the additional roadway capacity provided will deter infiltration of international traffic onto local municipal streets, providing a benefit to south/west Windsor and LaSalle.
- The effects of loss of businesses along the corridor is offset by the ability of these businesses to locate elsewhere in the local area, improved access for these businesses over what is presently provided, and the benefits of thousands of direct and indirect project related jobs created by the construction of the new access road.
- The at-grade alternatives and below-grade alternatives 2A and 2B do not provide any improvements to community cohesion and character. The end-to-end tunnel does not provide the same benefits to community character and cohesion as it does not improve linkages across the Highway 3/Huron Church Road corridor over the current condition and reduces visibility for local businesses.
- The Windsor-Essex Parkway has the highest displacement of homes and businesses, but provides a greater improvement to overall community character and cohesion of the corridor by improving linkages between neighbourhoods, buffering neighbourhoods from highway nuisance effects and providing new open space/recreational facilities along the corridor. These improvements result in a better long-term solution for the community. Based on the extent of long term improvements to community character and cohesion in south/west Windsor and LaSalle, The Windsor-Essex Parkway is slightly preferred over the other alternatives as having the least overall impacts to community and neighbourhood characteristics.

3.4.3. Consistency with Existing and Planned Land Use

The types of land uses within the access road corridor consist of residential, commercial, and vacant or undeveloped lands. Commercial uses include highway-oriented businesses including restaurants, hotels, service stations, fast food restaurants, and shopping plazas. Residential uses include single-family homes that have frontage on Huron Church Road and Highway 3. There are a few industrial businesses located along the access road corridor. A portion of the vacant land located along the Highway 3/Huron Church Road corridor has been designated for commercial use. Future land uses that have been identified adjacent to the Highway 401/Highway 3 interchange area include new residential subdivision developments in the Town of LaSalle, which are part of the Town's long-range planning. In addition, future residential and commercial land uses have been identified adjacent to Highway 3 across from St. Clair College. Future residential land uses have been identified on the vacant lands adjacent to E.C. Row Expressway between

Huron Church Road and Matchette Road in the City of Windsor. This area is adjacent to the City's Spring Garden Secondary Planning Area.

The Highway 3/Huron Church Road corridor has served as an access road to the Ambassador Bridge for over 75 years. Land uses along the east and west sides of Huron Church Road within the city limits are subject to special policies established to reflect the status of this roadway as an international gateway route. Huron Church Road is classified in the City of Windsor Official Plan as a Class 1 Arterial Road, on the basis of the volumes carried and its significance in the road network. The road is a multi-functional transportation corridor for transportation of goods, international travellers, and local residents of Windsor-Essex County. Due to the high volume of traffic on this roadway, access along the road corridor is controlled and the City of Windsor has been closing street entrances and constructing parallel service drives to reduce points of conflict along the roadway. More recent residential developments adjacent to the corridor have been constructed with a property buffer and fences and berming along the edges of the corridor to reduce roadway impacts.

There are no properties along the access road options that have been identified as being known contaminated/disposal sites.

All of the access road alternatives represent a widening of the existing highway/high order roadway serving as the access road to an international crossing. The extent of possible impacts of the alternatives on land uses adjacent to the corridor were considered in this analysis. In addition, consideration was given to opportunities to reduce effects through access features, aesthetics and other treatments to reduce the intrusiveness of the freeway, and allow flexibility for the planning of uses for remnant properties or parcels. Context sensitive options were explored through workshops held with the community.

Although the existing roadway carries high traffic volumes and serves as the primary connection to the Ambassador Bridge for long-distance international traffic, introducing a six-lane freeway with service roads and widening the transportation corridor will have localized influences on land use resulting in changes to land use, rezoning requirements or official plan amendments for certain parcels of land.

Impacts to the various types of land uses along the corridor are considered to be similar for all alternatives. This is primarily due to the similarity in the property requirements associated with each of the alternatives. Overall, it is anticipated that the majority of land uses within Windsor, LaSalle and Tecumseh displaced by the access road alternatives can be re-established in other areas of their respective municipalities.

However, The Windsor-Essex Parkway is noted as providing greater benefits to land use in terms of having greater consistency with municipal planning objectives pertaining to improving the quality of life of local residents. The City of Windsor Official Plan (2000) encourages the development of greenway systems, on the basis that "the quality of life within Windsor will be enhanced by the establishment of a linked and continuous network of "green" land uses" and that "a network of natural environment and recreational elements will provide a means to establish Windsor as a healthy and livable city". The Parkway alternative can best provide natural environment and recreational opportunities in the Highway 3/Huron Church Road corridor including pedestrian/bicycle paths, active recreational opportunities (i.e. basketball courts or tennis courts) and wildlife linkages. The Parkway access road alternative and associated natural environment and recreational opportunities are more consistent with the policies outlined within the City of Windsor Official Plan than the other alternatives.

Highway 3 is classified as an arterial road in the Town of LaSalle Official Plan (2003). Arterial roads provide for high volumes of both passenger and commercial traffic for inter-urban travel. Direct property access on arterial roads is discouraged and controlled to limit the number and spacing of driveways. Development in the Town of LaSalle has also been planned to limit access to Highway 3 to signalized intersections only. The Windsor-Essex Parkway alternative's trail system and green space buffer areas are also highly consistent with the Town of LaSalle Official Plan policies for recreational uses. The Town's policies speak to a greenway similar to that provided by The Windsor-Essex Parkway:

This "greenway system" is a cornerstone of this Plan, and represents a major new land use planning and resource management approach for the Town of LaSalle, to be implemented over a 10 to 20 year planning horizon.

Once implemented, the "greenway system" will create numerous recreational and leisure opportunities for existing and future ratepayers of a rapidly urbanizing municipality. For instance, natural corridors, trails, bikeways joining core natural heritage sites, parks and schools will enable residents of LaSalle to travel between neighbourhoods without having to rely exclusively on cars and roads. Children and adults of all ages will be able to travel to work and school by bicycle or by foot along one of the many pathways that will be created and maintained during the life of this Plan.

Linking natural areas to each other also increase their value as habitat for wildlife. The town's "greenway system" will be integrated with the planned regional "greenway", and will support a broad range of plant and animal life due to the fact that animal and plant life will be able to move freely from one natural area to another to find food and shelter and to breed.

The essence of the Town of LaSalle "greenway system" approach is linkages – connecting wildlife habitat areas to each other, human settlements to other human settlements, urban to rural areas, waterfront to non-waterfront lands, and people to nature.

All new developments town-wide will be required to incorporate the "greenway system" elements within their respective development plans to the greatest degree possible.

The other access road alternatives do not provide the same level of consistency with the Town's Official Plan policies, particularly as they pertain to improving recreation opportunities and natural linkages for the community.

Summary – Consistency with Existing and Planned Land Use Assessment

- All the alternatives are developed in the same existing transportation corridor in Windsor and LaSalle and Tecumseh.
- The nature of existing and planned land uses affected by all alternatives are essentially the same.
- The Windsor-Essex Parkway demonstrates a greater consistency with local municipal planning in terms of meeting objectives that improve the quality of life for its residents. The tunnel sections over the below-grade freeway, additional buffer spaces along and across the corridor, opportunities for new recreational trails with connections to

existing trails and wildlife linkages contribute to a corridor that better connects communities and natural features.

- The Windsor-Essex Parkway alternative is preferred over the other alternatives.

3.4.4. Protect Cultural Resources

This factor area incorporated an assessment of impacts to built heritage features, cultural landscapes, known/high potential archaeological areas and parks.

Built heritage resources are structures or objects that people have made or modified and that are valued for the contribution they make to our understanding of the history of a place, an event, or a people. Built Heritage Features (BHFs) are generally defined as structures or objects that are 50 years of age or older. Cultural Landscape Units (CLUs) are areas of land that have experienced human modification and that are valued for the contribution they make to our understanding of the history of a place, an event or a people. As a means of determining the existence of previously identified built heritage features and cultural landscapes within the Area of Continued Analysis (ACA), contact was made with the City of Windsor's Heritage Planner, the Ministry of Culture's Ontario Heritage Properties Database and Parks Canada listing of National Historic Sites were also consulted; historical research was also conducted to identify broad agents or themes of historical change and cultural landscape development in this area. In October 2006, a field review of the ACA was conducted and previously identified features were confirmed. Additional field investigations led to the identification of features of heritage interest, including Built Heritage Features and Cultural Landscape Units. Results of the analysis of impacts to built heritage features and cultural landscape units are fully documented in the *Draft Practical Alternatives Evaluation Working Paper – Cultural Heritage (April 2008).*

A Stage 1 Archaeological Assessment involving detailed documentary research of the archaeological and land use history of an area under investigation was initially conducted to identify known/high potential archaeological sites. A Stage 2 archaeological assessment consisting of the systematic field investigation of areas determined to have archaeological potential was conducted on properties of interest impacted by, or in proximity to, the practical alternatives. The results of this work are documented in the *Draft Practical Alternatives Evaluation Working Paper – Archaeology (April 2008)*.

The assessment of impacts to parks was conducted as part of the social impact assessment and the results are documented in the *Draft Practical Alternatives Evaluation Working Paper – Social Impact Assessment (April 2008)*.

The DRIC study Area of Continued Analysis (ACA) was found to be largely free of significant cultural heritage resources. The three cultural landscapes identified within the ACA are not affected by the access road alternatives.

In total, eleven Built Heritage Features are potentially displaced by access road alternatives. Of these, two features (a pre-1900 farmhouse and the Royal Canadian Legion) are of potential heritage significance. All of the alternatives affect these two features. With the access road alignment connecting to Plaza A, Alternatives 1A and 1B will each displace seven field-identified features, while Alternative 3 displaces six. The remaining alternatives' connection to Plaza A will displace five field-identified features. Of higher impact is the alignment connecting to Plazas B and C. Alternatives 1A and 1B each displace eight field identified features, while Alternatives 2A and 2B (both options) displace five field-identified built heritage features. For the purposes of the DRIC study evaluation, access road alternatives that displace six or more features were considered as

having an adverse impact on the study area based on the quantity of their displacements. In all cases, however, the displaced features are without any recognized heritage status.

Six parks are impacted by all the access road alternatives; only one park (St. Clair College recreation fields) has a partial property taking impact. The other five parks stand to have access to the park via Huron Church/Highway 3 impacted during and/or post construction. The Windsor-Essex Parkway provides buffer space along the corridor and on the tops of the tunnel segments, which can serve as new park and open space for the community. In addition, The Windsor-Essex Parkway provides for 20 kilometres of new recreation trails along the corridor. These new trails can improve connectivity between neighbourhoods and, with connections to existing trails, further expand the local trail system. These aspects of The Windsor-Essex Parkway alternative were noted as unique and substantial advantages of this alternative over other alternatives.

A total of 42 archaeological sites were located within the ACA. All artifacts recovered from these sites were processed in Archaeological Services Inc.'s (ASI) laboratory. Data analysis included the evaluation of each site with respect to those that require further investigation through additional surface or sub-surface testing in order to assess the cultural heritage value of the individual archaeological site.

The analysis identified 20 Aboriginal site components and 23 Euro-Canadian site components along the access road corridor. Based on the assessment of impacts to known archaeological sites in the lands surveyed, there is little to no difference between access road alternatives. No alternatives impact either human remains or large pre-contact Aboriginal sites. All alternatives therefore have a low impact to archaeological sites.

Overall, The Windsor-Essex Parkway was considered to be the preferred access road alternative on the basis of greater benefits to cultural resources by way of increasing the amount of park space and trails available to local residents, with similar low impacts to built heritage and archaeological features.

Summary – Protect Cultural Resources

- In terms of reducing impacts to built heritage features and cultural landscapes, Alternatives 2A and 2B with the alignment connecting to Plaza A are the most preferred alternatives. Alternatives 1A and 1B are the least preferred, regardless of the connecting plaza alignment considered.
- All the access road alternatives impact a similar number of existing municipal parks; only The Windsor-Essex Parkway provides over 100 ha (240 acres) of new open space suitable for active/passive recreational facilities and over 20 kilometres of additional recreational trails, with connections to the existing trail systems.
- Given that no access road alternatives have sites with human remains or large pre-contact Aboriginal (village) sites (based on the evidence to date), all access road alternatives are assessed to have low to medium archaeological impact to known archaeological sites.
- Overall, The Windsor-Essex Parkway was considered to be the preferred access road alternative on the basis of greater benefits to cultural resources by way of increasing the amount of park space and trails available to local residents, with similar low impacts to built heritage and archaeological features, compared to the other alternatives.

3.4.5. Protect Natural Environment

Background data on natural heritage features was collected through review of existing information, consultation with local experts and multi-season, detailed field investigations. An Area of Investigation (AOI) located within the Area of Continued Analysis (ACA) was defined for each biological discipline based on the potential for displacement or disturbance effects. The data collected was used to compare the implications of the access road, plaza and crossing alternatives on the basis of the potential impacts to natural heritage features. The details of the data collected to date are documented in the *Draft Practical Alternatives Working Paper – Natural Heritage, May 2008*.

The most important natural heritage features in the Area of Continued Analysis (ACA) are designated as Areas of Natural or Scientific Interest (ANSIs), Environmentally Sensitive Areas (ESAs) and Candidate Natural Heritage Sites (CNHSs). The ACA avoids most of these designated natural areas:

- The Ojibway Prairie Complex is a provincially significant life science ANSI that is comprised of the following areas: Ojibway Prairie Provincial Nature Reserve; Ojibway Park; Titcombe Road North; Spring Garden Road; Black Oak Woods; and Prairie Remnants (southeast of Nature Reserve).
- Five ESAs located in the ACA and its vicinity are: Ojibway Prairie Complex; Sandwich West Woodlot/LaSalle Woods; Ojibway Black Oak Woods; Spring Garden Road Prairie; and St. Clair College Prairie.
- Three CNHSs are identified in LaSalle and 10 CNHSs are identified in Windsor.

The area investigated was found to support a large diversity of plant and animal species (617 and 139 respectively). A total of 63 provincially rare plants and three provincially rare terrestrial vertebrates were recorded during field investigations. Numerous provincially rare insects are also reported from the Ojibway Prairie Complex and its vicinity. Nine vegetation community types are listed as provincially and globally rare, including tallgrass prairie remnants located outside of the designated natural areas.

Most watercourses are designated as agricultural municipal drains and are altered by agricultural or urban development. No watercourses or waterbodies investigated support coldwater fish communities, with the exception of the Detroit River. The Detroit River, Turkey Creek, Lennon Drain, McKee Creek and Cahill Drain directly support coolwater and/or warmwater sportfish communities (i.e. pike, bass, sunfish, etc.). No highly sensitive fish habitat or fish species at risk were identified in “inland” watercourses. Species at risk and their habitat are present in the Detroit River; however, no specialized habitat for species at risk is located in the area investigated for this project.

The analysis of the access road alternatives was based on measurements and qualitative assessments of impacts to landscapes, terrestrial communities/ecosystems, aquatic communities/ecosystems, species/populations at risk and designated natural areas.

The analysis found that there is no significant difference among at-grade, below-grade and end-to-end tunnel alternatives because footprint impacts are comparable. None of the access roads directly impact any designated Areas of Natural and Scientific Interest (ANSIs) including the Ojibway Prairie Complex. Access roads 1A, 1B, 3 and The Windsor-Essex Parkway encroach on the St. Clair College Prairie ESA, while access road alternatives 2A and 2B do not. Access roads that connect Plazas B and C with the existing Highway 401 have relatively low impacts because these alternatives have less

potential to displace provincially rare vegetation communities and species at risk in the Malden Road area. Access roads that connect Plaza A with the existing Highway 401 have relatively moderate impacts because these alternatives have greater potential to displace provincially rare vegetation communities and species at risk in the Malden Road area.

The Windsor-Essex Parkway, with its wider right-of-way and buffer/greenspace areas, was noted as providing additional opportunities for mitigation of impacts to natural features compared to the other alternatives. The buffer, greenspace and tunnel roof areas represent opportunities for restoration and enhancement of natural features impacted by the access road.

Summary – Protect Natural Features

Overall, all the access road alternatives are considered as having similar impacts to natural features. While no one access road alternative was identified as being preferred over all others, the alternatives that avoid the Malden Road/Spring Garden area (i.e. those with the access road alignment connecting to plazas B/C) are slightly preferred.

3.4.6. Improve Regional Mobility

As part of this assessment, a review of the border transportation network incorporating southwestern Ontario and southeastern Michigan was undertaken. This review identified the improvements to mobility for international traffic (both truck and auto traffic) through increased capacity, improvements to border processing facilities, providing continuous access to the border crossing, and providing options in the border transportation network (redundancy) as compared to the "do nothing" alternative.

The detailed traffic analysis incorporates an assessment of existing traffic operations at key locations as well as a detailed assessment of future traffic conditions for 2015, 2025 and 2035 horizon years. Passenger and commercial traffic volume forecasts were obtained from the Travel Demand Model developed for this study (*Travel Demand Model Update Working Paper – September 2005)*. The practical alternatives were assessed for measures of effectiveness such as levels of service, intersection delays, travel times, network flexibility/local connections and anticipated changes to travel patterns.

Highway 3 and Huron Church Road are high-order arterial roadways. In addition to providing a connection between Highway 401 and Highway 3 to the Ambassador Bridge, the road provides access to commercial and residential areas, as well as community and institutional uses.

Both Highway 3 and Huron Church Road generally operate with some congestion and near capacity during the peak hours. The proportion of trucks is largest nearest to the Ambassador Bridge plaza. During off-peak periods the proportion of trucks is as high as 60 per cent and is approximately 30 per cent during peak hours. While enhancements to border processing, such as Free and Secure Trade (FAST), pre-notification requirements and additional primary inspection booths, have reduced occurrences of queuing on Huron Church Road, the transportation system remains fragile.

By 2035, both international car and truck traffic through Windsor-Detroit is expected to grow significantly. Afternoon peak hour truck traffic is expected to more than double. International car traffic is expected to increase by about 50 per cent. Under the "Do-Nothing" alternative scenario, significant road capacity problems are expected to begin to occur by 2015. Conditions will deteriorate further by 2035 with most intersections

operating over capacity. Unacceptable delays will be experienced, with travel times nearly doubling over existing conditions.

Without improvements, it is expected that capacity problems will be widespread and not limited to particular locations on Highway 3 and Huron Church Road. By 2035, a significant amount of international traffic will divert to other Windsor/LaSalle area roads to avoid congestion on Highway 3 and Huron Church Road.

All practical alternatives for the access road incorporate a new six-lane freeway between the Highway 401/Highway 3 interchange and the new inspection plaza. The proposed six-lane freeway will meet future demands to year 2035 and beyond and operate under free flow traffic conditions. The six-lane freeway will be flexible to include designated lanes for streaming of border traffic (e.g. separate lanes for FAST/NEXUS traffic).

The new crossing and access road will improve traffic conditions in the Huron Church Road/Highway 3 corridor. For example, it is estimated that in year 2015, traffic volumes southbound on Huron Church Road at College Avenue in the PM peak hour (i.e. peak hour, peak direction) without a new access road and crossing will be nearly 2100 vehicles (compares to over 1800 vehicles in 2006). With a new access road and crossing, traffic volumes southbound on Huron Church Road at College Avenue in the PM peak hour in year 2015 will be approximately 1000 vehicles. This reduction in traffic on Huron Church Road between E.C. Row Expressway and the Ambassador Bridge will greatly improve mobility on this section of roadway for international and local traffic.

All practical alternatives include service roads to enhance local access and mobility. All of the service roads will be two lanes in each direction with turning lanes where required. All of the service road alternatives provide increased local and regional mobility over the “do nothing” alternative. This is primarily due to the creation of new capacity and shifting international traffic onto the new freeway. For example, it is estimated that in year 2015, traffic volumes southbound on Huron Church Road at Todd Lane in the PM peak hour (i.e. peak hour, peak direction) without a new access road and crossing will be nearly 2100 vehicles (compares to 1900 vehicles in 2006). With the new freeway serving the international traffic, local traffic volumes southbound on the service road at Todd Lane in the PM peak hour in year 2015 will be less than 300 vehicles. All practical alternatives will provide substantial travel time savings for local traffic when compared to the “do nothing” alternative.

The connections between the local street system and the new access road also influence regional mobility. All alternatives provide connections to/from the new freeway at Highway 3, Huron Church Road (at E.C. Row Expressway) as well as at the plaza connections (Malden Road for Plaza A, Ojibway Parkway for Plazas B/C). In addition, the alternatives provide intermediate access points between the service roads and the freeway to allow local access to/from the freeway. The Windsor-Essex Parkway provides an exit and an entrance ramp to the eastbound freeway at Todd Lane/Cabana Road which provides the highest degree of access at this location. This access point was identified as a strong advantage for access to the new freeway for local emergency services. The Windsor-Essex-Parkway also includes a connection to Howard Avenue from the Highway 3 interchange, providing for better traffic operations in the Howard Avenue/Highway 3/ Highway 401 area.

A Safety Assessment undertaken by specialists found that transferring long distance traffic from existing Huron Church Road to a controlled access freeway would be a significant safety benefit. The study suggests freeways have a lower crash risk than

arterial roads. There are no substantive differences in the safety performance between a tunnel and non-tunnel alternatives. While research suggests the frequency of crashes in a tunnel are less than a non-tunnel, the consequences of crashes within a tunnel are generally more severe and challenging to deal with for emergency services.

Summary – Improve Regional Mobility

All alternatives provide a significant improvement to regional mobility by getting long distance truck traffic off local streets and providing full freeway access to/from the border. The local and regional function of the existing Highway 3/Huron Church Road corridor is improved by providing parallel service roads which can be designed to meet the needs of the community.

The Windsor-Essex Parkway provides better access between the local street system and the freeway, providing greater benefits to regional mobility than the other alternatives. This advantage led to the determination that the Windsor-Essex Parkway is slightly preferred over the other access road alternatives.

3.4.7. Cost and Constructability

An assessment of cost and constructability was based on preliminary engineering of the alternatives to define property requirements and major design elements of each alternative at a concept level of detail, development of construction staging to determine overall feasibility, traffic management requirements, and consideration of operation and maintenance costs. Details of the costs and discussions on constructability are documented in the *Draft Preliminary Construction Cost Estimate Report for Practical Alternatives (Access Road and Inspection Plaza) (May 2008)* and the *Draft Practical Alternatives Evaluation Constructability Report for Access Road Alternatives (May 2008)*.

Construction costs for the access road alternatives have been estimated based on the quantities for major construction items from the plans, profiles and cross-section drawings developed for each alternative. Unit costs were taken from the Ontario Ministry of Transportation's HICO database inventory of costs from recent highway construction projects and other sources, as appropriate. Costing for items unique to tunnels was obtained from other tunneling projects in North America. Percentages were added for minor items, engineering and contingencies leading to the development of an overall construction cost. Costs for operations and maintenance, as well as property acquisition are considered separately.

Preliminary construction cost estimates (year 2011 $CAD) for the access road practical alternatives from North Talbot Road to Malden Road range from approximately $620M to $3800M. Specifically:

- Preliminary construction costs of at-grade alternatives are estimated in the order of $620M – $920M
- Preliminary construction costs of below-grade options including The Parkway are about $1000M - $1600M
- Preliminary construction cost of the tunnel alternative is estimated between $3600M and $3800M.

The costs of the access road alternatives measured between North Talbot Road and Malden Road are as follows:

Alternative	Inspection Plaza Option	Construction Cost (2011 $CAD)
1A – At-Grade	A	920M
1B – Below Grade	A	1,360M
2A – At-Grade	A	790M
2B – Below Grade	A	1,200M
3 – Cut and Cover Tunnel	A	3,780M
Windsor-Essex Parkway – Below Grade with Tunnel Sections	A	1,600M
1A – At-Grade	B/C	750M
1B – Below Grade	B/C	1,190M
2A – At-Grade	B/C	620M
2B – Below Grade	B/C	1,030M
3 – Cut and Cover Tunnel	B/C	3,610M
Windsor-Essex Parkway – Below Grade with Tunnel Sections	B/C	1,500M

The least costly alternatives are the at-grade alternatives (1A and 2A). Although the at-grade alternative included several below grade sections at the major cross-roads, this alternative required less excavation, particularly in areas of unstable ground conditions at Grand Marais Drain and north of Todd Lane/Cabana Road, resulting in lower excavation and concrete costs. The increased costs for the tunnel alternative relate directly to increase in quantities for concrete needed to build tunnel boxes and support of excavation walls as well as the excavation, ventilation, electrical, drainage, communication and Emergency Management System costs.

Construction staging and constructability reviews completed by the study team confirm that all alternatives are constructible. All alternatives can be constructed while maintaining a minimum of 4 lanes for existing traffic within the corridor. Access to and from all major crossing roads and entrances can be maintained during construction. All alternatives will require a similar degree of utility relocation (approximately 1 year duration) prior to construction.

Soil conditions are not conducive to deep excavations. Complex staging including stability enhancement measures may be required during construction of excavations (for tunnel and below grade sections), particularly where excavations are deeper than 10 m, such as would be required for constructing a tunnel under Grand Marais Drain / Turkey Creek.

Construction of tunnels would require significantly more materials for both civil components including concrete and aggregates. For long tunnels such as proposed in Alternative 3, this includes safety support systems such as ventilation, lighting, CCTV and traffic control centre. The additional materials would require significantly more resources (construction equipment, movement of materials and manpower). This, in turn, will require a longer duration to construct (4 to 4.7 years for Alternative 3).

Extensive retaining wall systems are required for at grade and below grade alternatives, including The Parkway, with a maximum of 12 km of retaining walls required for the below grade alternatives. This results in moderate to high resource requirements for these alternatives.

The below-grade and tunnel alternatives pose the greatest risk to projected cost and schedule, with the tunnel posing the greatest risk, as they require significantly more complex construction than at-grade alternatives. These alternatives, particularly the tunnel, require a more intense construction period than the at-grade alternatives. The overall schedule depends on equipment and labour availability, and further details of staging which would be determined in later phases of design.

Summary – Cost and Constructability

The at-grade alternatives have the lowest construction costs and the least constructability risks, while the end-to-end tunnel alternative carries the highest costs and greatest constructability risks. The below-grade alternatives, including The Windsor-Essex Parkway, carry estimated costs much less than the tunnel alternative, with lower cost and constructability risks.

Alternative 2A, which is an at-grade alternative with a parallel two-lane service road is the preferred alternatives based on cost and constructability. This alternative requires the least cost and fewest constructability risks. The new freeway could be built alongside much of the Huron Church Road/Highway 3 corridor without interfering with traffic. This alternative also avoids below-grade construction at Grand Marais Drain, which is an area of high risk construction.

3.4.8. Overall Evaluation Results

The results of the access road alternatives evaluation are summarized in the following table:

Factor	Preferred Alternative
Changes to Air Quality	No Clear Preference
Protect Community and Neighbourhood Characteristics	Windsor-Essex Parkway
Maintain Consistency with Existing and Planned Land Use	Windsor-Essex Parkway
Protect Cultural Resources	Windsor-Essex Parkway
Protect the Natural Environment	No Clear Preference
Improve Regional Mobility	Windsor-Essex Parkway
Cost and Constructability	Alternative 2A

The Windsor Essex Parkway was identified as preferred or over the other access road alternatives in four of the seven key factor areas considered. In two of the seven factor areas, no clear preference was identified; in the area of Cost and Constructability, the at-grade Alternative 2A was identified as the preferred alternative. The Windsor-Essex Parkway alternative was the second-most expensive alternative and is identified as having greater cost and constructability risks than the other alternatives except for the tunnel alternative.

Overall, The Windsor-Essex Parkway was considered to provide a better balance of impacts and benefits than the at-grade Alternative 2A. The advantages of The Windsor-Essex Parkway in terms of providing greater protection to community and neighbourhood characteristics, greater consistency with existing and planned land use, greater protection of cultural features and greater improvements to regional mobility than Alternative 2A.

Although Alternative 2A has more cost and constructability advantages, it offers much less community, land use cultural and mobility advantages than The Windsor-Essex Parkway. The study team therefore identified The Windsor-Essex Parkway as the preferred access road alternative.

3.4.9. Arithmetic Evaluation

The evaluation of practical access road alternatives was also conducted using an arithmetic method based on numerical weighting and scoring of impacts. Additional details regarding the arithmetic method is provided in Section 3.1 to Section 3.3 of this document. The result of the arithmetic evaluation of access roads is provided in Table 6.

TABLE 6 – ARITHMETIC EVALUATION OF ACCESS ROAD ALTERNATIVES

ACCESS ROAD ALTERNATIVES

Factor	Weight	1A		1B		2A		2B		3		Parkway	
	Study Team	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Air	12.39	3	37.17	3	37.17	3	37.17	3	37.17	3	37.17	3	37.17
Community	15.93	1	15.93	1	15.93	1	15.93	1	15.93	1	15.93	1	15.93
Land Use	12.39	2	24.78	2	24.78	2	24.78	2	24.78	2	24.78	2	24.78
Cultural	12.39	3	37.17	3	37.17	3	37.17	3	37.17	3	37.17	3	37.17
Natural	15.93	3	47.79	3	47.79	3	47.79	3	47.79	3	47.79	3	47.79
Mobility	17.70	6	106.20	6	106.20	6	106.20	6	106.20	6	106.20	7	123.90
Cost/Constructibilty	13.27	3	39.81	2	26.54	3	39.81	2	26.54	1	13.27	2	26.54
Total	100.00	21	308.85	20	295.58	21	308.85	20	295.58	19	282.31	21	313.28
Rank	Unweighted	1		4		1		4		6		1	
	Weighted		2		4		2		4		6		1

Factor	Weight	1A		1B		2A		2B		3		Parkway	
	Public	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Air	17.32	3	51.96	3	51.96	3	51.96	3	51.96	3	51.96	3	51.96
Community	15.49	1	15.49	1	15.49	1	15.49	1	15.49	1	15.49	1	15.49
Land Use	12.89	2	25.78	2	25.78	2	25.78	2	25.78	2	25.78	2	25.78
Cultural	13.14	3	39.42	3	39.42	3	39.42	3	39.42	3	39.42	3	39.42
Natural	16.34	3	49.02	3	49.02	3	49.02	3	49.02	3	49.02	3	49.02
Mobility	15.28	6	91.68	6	91.68	6	91.68	6	91.68	6	91.68	7	106.96
Cost/Constructibilty	9.54	3	28.62	2	19.08	3	28.62	2	19.08	1	9.54	2	19.08
Total	100.00	21	301.97	20	292.43	21	301.97	20	292.43	19	282.89	21	307.71
Rank	Unweighted	1		4		1		4		6		1	
	Weighted		2		4		2		4		6		1

Factor	Weight Community Consultation Group	1A		1B		2A		2B		3		Parkway	
		Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Air	17.30	3	51.9	3	51.9	3	51.90	3	51.90	3	51.90	3	51.90
Community	13.88	1	13.88	1	13.88	1	13.88	1	13.88	1	13.88	1	13.88
Land Use	13.69	2	27.38	2	27.38	2	27.38	2	27.38	2	27.38	2	27.38
Cultural	13.12	3	39.36	3	39.36	3	39.36	3	39.36	3	39.36	3	39.36
Natural	17.11	3	51.33	3	51.33	3	51.33	3	51.33	3	51.33	3	51.33
Mobility	14.83	6	88.98	6	88.98	6	88.98	6	88.98	6	88.98	7	103.81
Cost/Constructibilty	10.07	3	30.21	2	20.14	3	30.21	2	20.14	1	10.07	2	20.14
Total	100.00	21	303.04	20	292.97	21	303.04	20	292.97	19	282.90	21	307.80
Rank	Unweighted	1		4		1		4		6		1	
	Weighted		2		4		3		4		6		1

Unweighted Scores

The unweighted scores represent the total of the impact scores determined by the study team based on the degree of impacts or benefits of each alternative. The two at-grade alternatives (1A and 2A) and The Windsor-Essex Parkway were ranked highest overall. This reflects similarities in the balance of benefits and costs – the at-grade alternatives were found to be the lowest cost alternatives with the least constructability issues. The Windsor-Essex Parkway provides more benefits to regional mobility at higher costs than the at-grade solutions.

The rankings of the other alternatives reflect the higher impacts, lower benefits and/or increased costs compared to the higher ranked alternatives.

Weighted Scores

The weighted scores reflect the level of importance as well as the degree of impacts and benefits of each alternative. The results indicate that:

- The results of the weighted scoring were the same in terms of how each alternative was ranked among the three weighting scenarios considered
- The study team, public and CCG weighting scenarios identified The Windsor-Essex Parkway as the highest ranking alternative; consistent with the unweighted scores, this result reflects the balance of high transportation benefits, comparable community and natural features impacts and comparable cost and constructability impacts
- The cut and cover tunnel alternative was the lowest ranked by all three weighting scenarios. This result reflects the relatively few benefits of a tunnel alternative in comparison to the other alternatives, at a much higher cost with greater constructability impacts.

The study team considered the results of the arithmetic method as a validation of the recommendations developed through the reasoned arguments presented in this report. As such, The Windsor-Essex Parkway was selected as the technically preferred access road alternative for this study.

3.5. Refinements to The Windsor-Essex Parkway

The results of the analysis and evaluation of the practical access road alternatives and selection of The Windsor-Essex Parkway as a component of the Technically and Environmentally Preferred Alternative (TEPA) was announced in May 2008, and presented to the public at the sixth round of Public Information Open Houses in June 2008. As previously discussed, The Windsor-Essex Parkway consisted of the major components of The Parkway with some refinements made to reflect additional community consultation and analysis. These refinements included an additional tunnel in the Spring Garden area, more green space and a refined trail network.

The remainder of 2008 focused on detailed analysis and identification of impacts and appropriate mitigation measures for the TEPA (i.e. Windsor-Essex Parkway, Plaza B1 and Crossing X-10B). Based on this, as well as ongoing consultation and comments received during the PIOHs and Workshops, a number of refinements were made to The Windsor-Essex Parkway. The following is a discussion of the refinements made to The Windsor-Essex Parkway subsequent to June 2008. These refinements to The Windsor-Essex

Parkway, combined with Plaza B1 and Crossing X-10B along with the associated mitigation measures, represent the Recommended Plan, which was presented to the public as part of the seventh round of Public Information Open Houses in November 2008.

Core-Collector System at E.C. Row Expressway

The Windsor-Essex Parkway was initially located south of the E.C. Row Expressway corridor in the Spring Garden area. A refinement was made to the TEPA that shifts a portion of The Windsor-Essex Parkway approximately 50 metres to the north and integrates it with 2 km of the E.C. Row Expressway. In this area, the eastbound and westbound lanes of E.C. Row Expressway will diverge, becoming "collector" lanes with The Windsor-Essex Parkway placed between them, becoming the "core" lanes. Transfer lanes will connect the two freeways. This concept continues to provide separation of local and international traffic, in addition to reducing the overall footprint of the freeway. The refinement will also reduce impacts to the natural environment and will locate The Windsor-Essex Parkway further from residents in the Spring Garden area.

Howard Avenue Diversion

In the initial TEPA design, Howard Avenue was continuous through the study area and the future Laurier Parkway extended east of Howard Avenue to connect with the proposed Windsor-Essex Parkway / Highway 3 interchange. Ongoing consultation identified the desire of residents and municipalities to divert long distance traffic away from Howard Avenue in Windsor, as well as the need for an improved connection to The Windsor-Essex Parkway from LaSalle/Tecumseh in the south. Based on these comments, Howard Avenue was realigned near South Talbot Road and diverted northeasterly to connect to the proposed Windsor-Essex Parkway / Highway 3 interchange. Existing Howard Avenue will terminate as a cul-de-sac near the Apostolic Church and will be accessible by a connecting road to the Howard Avenue Diversion.

Highway 3 Roundabout

A refinement in the area of The Windsor-Essex Parkway / Highway 3 interchange was made as a result of consultation with the local municipalities. This refinement includes the incorporation of a modern roundabout instead of a traditional signalized intersection at the intersection of Highway 3/Howard Avenue and the ramp terminals of The Windsor-Essex Parkway. The roundabout will provide the following advantages:

- Reduce the number and severity of collisions
- Reduce noise and air pollution by removing the idling of stopped vehicles
- Reduce delays and improve traffic flow
- Provide a unique "gateway" feature for the Windsor and Essex region.

This refinement will provide traffic from Amherstburg and LaSalle with direct access to eastbound Highway 401 and westbound lanes of The Windsor-Essex Parkway.

Tunnelled Sections

A refinement was made to the lengths of the Cousineau Road and Hearthwood tunnels. The Cousineau Road tunnel was extended to 170 m in length and the Hearthwood tunnel near Heritage Estates in LaSalle reduced by a compensating amount to retain acceptable spacing between tunnels. This arrangement is similar to that proposed in the Parkway design of August 2007. Public input in the summer of 2008 supported a longer tunnel at

Cousineau Road. Another change in the Cousineau Road area involved the acquisition of additional properties on Kendleton Court and Homestead Lane. This action will provide residents with additional buffer space between the roadways and their homes, and will provide increased recreational opportunities. These modified tunnels continue to provide for improved community connections.

Huron Church Line Intersection

A refinement was made to the location of the Huron Church Line intersection with the proposed service road. The initial design of this intersection was located in such a way that all residences on Huron Church Line maintained direct driveway access to Huron Church Line. Based on community concern with the close proximity of driveways to the intersection and a concern with headlight glare from the nearby intersection, the proposed intersection was shifted easterly. A short cul-de-sac has been introduced to provide access to the residences at the northern end of Huron Church Line. This refinement will provide increased buffer for residences near the intersection of Huron Church Line and the proposed service road, as well as safer and more convenient access for residents in close proximity to the intersection.