Detroit River
INTERNATIONAL CROSSING
S T U D Y

Analysis of the Seven Evaluation Factors: Technically and Environmentally Preferred Alternative

At the initial stages of the environmental assessment, the Detroit River International Crossing (DRIC) study team identified seven evaluation factors that would provide the basis for the assessment of alternatives. At the Public Information Open Houses in August 2007, the Canadian study team reported on the results of the analysis of the practical crossing, plaza and access road alternatives based on the seven evaluation factors.

We have now updated the analysis of the Practical Alternatives for the technically and environmentally preferred alternatives for the crossing, plaza and access road. Key findings are summarized as follows:

Changes to Air Quality

Access Road

- All alternatives result in decreased $PM_{2.5}$ and NO_x concentrations, and an improvement in air quality compared to the no-build alternative.[1] No one alternative consistently stands out as a preferred alternative for all segments of the proposed freeway extension and the differences between the alternatives could be considered marginal.
- All predicted NO_x concentrations in the vicinity of the corridor are predicted to be below relevant standards and guidelines.
- None of the predicted increases in concentrations would cause a change in the AQI∗ rating in the corridor.
- Under certain conditions, within 50 m of the corridor, the end-to-end tunnel results in lower maximum predicted concentrations of $PM_{2.5}$ compared to the other alternatives.
- There are slight differences in air quality impacts between the alternatives within 50 – 100 m (164 – 328 ft) from the right-of-way (ROW) under certain conditions and no discernible differences beyond 100 m.
- Below-grade alternatives including the 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.

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[1] Due to the number of alternatives and combinations being assessed, two indicator pollutants were selected for analysis. Those chosen to represent one gaseous compound and one particulate compound are nitrogen oxides (NO_X) and particulate matter less than 2.5 microns ($PM_{2.5}$). These pollutants are generally 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 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 (AQI) 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.

Plaza/Crossing

- All plazas cause increases in the predicted maximum $PM_{2.5}$ and NO_x concentrations in the vicinity of the plaza. These increases are experienced up to 250 m (820 ft) away from the property boundaries of each plaza under certain conditions.
- The effects of Plazas B, B1 and C are predominantly seen in the area to the west of Ojibway Parkway/E.C. Row Expressway interchange at non-sensitive receptors.
- Each of the three crossing alternatives results in increases in the predicted $PM_{2.5}$ and NO_x concentrations within 250 m (820 ft) of the crossings and the approach roadways between each plaza and bridge under certain conditions.
- Crossing A and B effects are primarily seen in the non-sensitive industrial lands west of Ojibway Parkway/E.C. Row Expressway interchange.
- Crossing C (including the approach roadway to the crossing from the plaza sites) results in slight increases in the predicted maximum $PM_{2.5}$ and NO_x concentrations in the portion of Sandwich Towne within 250 m.

Protection of Community and Neighbourhood Characteristics

Access Road

- Business displacement losses will be offset by gains in other businesses, or the displaced businesses will relocate to other suitable areas.
- 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 has the highest degree of disruption associated with visibility and access, since the access road is underground.
- The Parkway Alternative displaces more businesses than any other alternative but significantly fewer businesses are disrupted.
- Potential changes to community cohesion and character for specific neighbourhood communities due to the displacement and disruption of residents and social features are similar for all alternatives.
- The Parkway is slightly preferred form a community impact standpoint as it provides benefits to the community that the others do not including a green space buffer between residents and the ROW, an opportunity for additional parkland and recreational features, and connectivity between communities and community features that currently does not exist.
- Generally, where necessary, a 5 m high barrier will result in no to marginal noise impact for all access road alternatives. Further study is being undertaken in the Spring Garden area to verify the potential effectiveness of noise mitigation.
- None of the access road alternatives are expected to cause vibrations in the 50 mm/sec range; therefore, no structural damage is anticipated from vehicular traffic.

Plaza/Crossing

- Business displacement within the plaza-crossing alternatives will also be offset by gains by competitors or by displaced businesses relocating to other suitable sites. Due to the scale and location needs of some of the specific displaced businesses, some negative impacts may occur.
- Due to the current design of the plaza-crossing alternatives and the nature of the businesses disrupted, almost all businesses in the area will be able to operate in the same manner with no economic impact.

- Plaza A-Crossing A has the least business displacements while Plaza C-Crossing C displaces the greatest number of businesses in the industrial area of Windsor.
- Plaza A has the greatest potential to impact community character and cohesion due to the changes to the existing park-like setting, greater displacement of residents, and proximity to the adjacent Armanda Street residential area. Similarly, Crossing C has the greatest potential to impact community character due to its proximity to Sandwich Towne. The Plaza B1 and Crossing B alternative is considered to have the fewest overall impacts to the community, including displacement of residents and businesses, in comparison to the other alternatives.
- Crossing C option has the highest potential for noise impact in the southern portion of Sandwich Towne and would require a 4 m high noise barrier on the crossing to reduce impacts to within 5 decibels of no-build sound levels.
- For crossing options connecting to Plaza A, even after mitigation, a potential noise impact was identified for two receptors in the Ojibway Parkway to Malden Road area that are in the vicinity of the proposed approach roadway leaving Plaza A to the crossings.

Maintain Consistency with Existing and Planned Land Use

Access Road

- Impacts to the various types of land uses along the corridor are considered to be similar for all alternatives.
- 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.
- Open space and recreational lands proposed with the Parkway Alternative will introduce additional green spaces in the City of Windsor and Town of LaSalle which will add to the existing open space inventories for these municipalities.
- The Parkway alternative with its provision of buffer space between the roadway and sensitive land uses, and the opportunities for various recreational land uses such as trails and greenspace is more consistent with local municipal planning policies, and is preferred from a land use perspective.

Plaza/Crossing

- Plaza A may conflict with neighbourhood characteristics and cohesion.
- The Plaza B, B1 and C alternatives and Crossing A and B alternatives are situated mainly in industrial and portland areas and are considered to be more consistent with existing and planned land use in this area.
- Plaza C displaces a water-dependant industrial land use (Southwest Sales). Relocation of such a use to other waterfront property might be difficult.
- Overall, the preferred plaza from a land use perspective is Plaza B or B1, due to their location near industrial areas and away from residential neighbourhoods,
- Plaza C and Crossing C are also located closest to the Sandwich residential community and would conflict with community plans for the area.
- Crossing A only connects with Plaza A, and is not preferred since Plaza A is located in a predominantly residential area.
- The preferred crossing location from a land use perspective is Crossing B due it its proximity to industrial lands and its compatibility to existing land use polices.

Protection of Cultural Resources

Access Road

- Based on the assessment of impacts to known archaeological sites in the lands surveyed, there is little to no difference between access road alternatives. All alternatives have a low impact.
- In total, eleven Built Heritage Features (BHFs) 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.

Plaza/Crossing

- Archaeological remains have been found on each of the plaza sites to date which would require further assessment and possible mitigation.
- Plaza A will displace one field-identified feature, which represents a very minor impact. Plaza B, Plaza B1 and C will each displace three houses in the former Brighton Beach area; these features have no recognized heritage status although one is likely a sole surviving pre-1900 farmhouse in the immediate area. The impacts of Plazas B, B1 and C are considered to be minimal and mitigation of these features is probable.
- In general, crossing alternatives associated with Plaza A have the least amount of impact while Crossing C represents the worst of the three options due to its proximity to the historic town of Sandwich.

Protection of the Natural Environment

Access Road

- None of the access roads directly impact any designated Areas of Natural and Scientific Interest (ANSIs) including the Ojibway Prairie Complex.
- There is no significant difference among the alternatives in terms of impacts based on being at-grade or below-grade. Each has advantages and disadvantages requiring mitigation.
- The Parkway allows more opportunities for ecological connections, restoration and enhancement.
- Access roads that connect to Plazas B or C are preferred to the Plaza A connection as they displace fewer rare vegetation communities.

Plaza/Crossing

- Plaza C, Crossing C is the most preferred combination as it avoids the natural heritage features in the Brighton Beach area north of Chappus Road.
- Plaza A, Crossing A is least preferred is least preferred as it will displace the natural features in this same area.
- Plaza B1 from Crossing C may disturb designated natural heritage features because of its close proximity to the Black Oak Woods ANSI/ESA. However, these impacts may be avoidable through alterations to site design for plaza B1.

Improvements to Regional Mobility

Access Road

- All alternatives provide significant improvements 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.
- Transferring long distance traffic from existing Huron Church Road to a controlled access freeway would be a significant safety benefit.
- There are no substantive differences in the safety performance between a tunnel and non-tunnel alternatives.

Plaza/Crossing
- U.S. and Canadian border agencies have reviewed and tested functional layouts of the plaza alternatives to confirm their suitability under future traffic conditions. All plaza alternatives were found to be acceptable.
- The capacity of the new crossing will accommodate future travel demand, both in terms of meeting capacity and providing flexibility to stream traffic on the crossing to improve border processing (e.g. designated NEXUS/FAST lane).

Cost and Constructability

Access Road
- The at-grade alternatives are in the order of $620 million to $920 million (CAD).
- The below-grade options are about $1.0 billion to $1.4 billion (CAD).
- The tunnel is estimated at $3.6 billion to $3.8 billion (CAD). The increased costs for the tunnel relate directly to the increase in excavation and concrete required to build the tunnel, as well as the ventilation, electrical, drainage, communications and other Emergency Management Systems.
- The Parkway construction cost is estimated between $1.5 billion and $1.6 billion (CAD).

Plaza/Crossing
- Preliminary construction cost estimates (excluding property costs) for the access road from Malden Road to the plaza and the plaza itself range from $180 million to $280 million (CAD) depending on which plaza alternative is chosen. This does not include substantial costs associated with the relocation of the Keith Transformer Station (estimated to be an additional $180 million CAD), which would be required for Plaza C.
- Preliminary construction cost estimates (including estimates of engineering fees and inflation to the year 2011 and excluding property costs) for the Canadian portion of the crossing including the approach roadway range from $385 million to $875 million (CAD). Specifically:
    - Crossing A will cost $650 million (CAD) (approximately).
    - Crossing B will cost between $385 million to $570 million (CAD) (approximately).
    - Crossing C will cost between $680 million to $875 million (CAD) (approximately).
- This includes substantial costs (estimated to be an additional $325 million CAD) to span the area of uncertain bedrock integrity associated with historical solution mining of salt in the area, which would be required for Crossing C.

Overall Evaluation Summary

Access Road
The end-to-end tunnel does not provide significant air quality benefits and generally has the same impacts as other alternatives due to construction requirements. The tunnel also has much higher cost and has other disadvantages such as the need for ventilation buildings.

The Windsor-Essex Parkway, which includes a series of strategically located tunnels, has the highest cost of the remaining options but offers significant advantages given its overall improvement to air quality, provision of buffer space between the roadway and sensitive land uses, ability to remove traffic from view, opportunities for ecological and community connections and various recreational land uses such as trails.

The Windsor-Essex Parkway is the preferred access road solution.

Plaza/Crossing
Plaza B1 together with Crossing B are considered to be more compatible with surrounding land uses as they are situated in a predominantly industrial area.

Crossing A only connects with Plaza A, and is not preferred since Plaza A is located in a predominantly residential area. Plaza A also has the greatest impacts to natural features.

Crossing C has the greatest uncertainty in terms of cost and constructability to address bedrock integrity concerns associated with historical salt mining activities. Plaza C together with Crossing C is also the least compatible location in terms of air quality, noise, heritage, and community compatibility because of its proximity to historic Sandwich Town.

Plaza B1 together with Crossing B represents the preferred overall plaza crossing combination.

For more information on the Detroit River International Crossing study, including reports and maps, please visit our website at www.partnershipborderstudy.com