Facts at a Glance: The Detroit River International Crossing Study
December 2006 Public Information Open Houses

For almost two years, teams of experts in both Canada and the United States have been working diligently on the Detroit River International Crossing study. From developing a coordinated study framework to narrowing the focus of the study to practical alternatives within the Area of Continued Analysis, we are making excellent progress.

Over the past eight months, the Canadian study team has been intently focused on collecting more detailed data and conducting specific technical studies of the Practical Alternatives announced in March 2006. We continue to work closely with the community to both meet the purpose of the study – to provide for the safe, efficient and secure movement of people and goods across the Canadian-U.S. border in the Windsor-Detroit corridor – and to achieve the local community's goals of:

- **improving quality of life**
- **taking trucks off city streets**
- **improving the movement of traffic across the border**

We're listening to you. In fact, over 125 public consultation sessions have been held since the beginning of the study, and we have met with more than 50 stakeholder groups including local homeowners and business owners since March 2006, as part of ongoing consultation.

All options being considered achieve the community's goals outlined above, and we are working to further refine the alternatives to ensure that when the final preferred alternative is identified in 2007, community and environmental impacts are minimized as much as possible. How we do that is by evaluating each of the alternatives based on the seven evaluation factors. Detailed fact sheets on the seven evaluation factors, and the technical findings, are contained in this package and can also be found on our website www.partnershipborderstudy.com.

These Open Houses are different from previous ones held in June and November 2005 and March 2006 because **no announcements or decisions have been made**. **No alternatives will be eliminated at this time**, and all options identified in the Area of Continued Analysis continue to be considered.

The purpose of these PIOHs is simply to inform you, the public, about the preliminary technical data and findings we have made since March 2006, and provide a summary of that data and preliminary analyses of the practical alternatives. No preferred alternative has been identified at this time, and all of the alternatives have certain advantages and disadvantages. The analysis is ongoing, and the results are subject to refinements and do not reflect mitigation measures, such as context sensitive solutions that the community is helping to develop. Some key highlights of the findings include:

Access Roads

Changes to Air Quality

- Total concentrations of nitrogen oxides are predicted to decrease due to improvements in fuels and engine technologies, even though traffic volumes will increase.
- Predicted concentrations of fine particulate are projected to be higher in the future due to increases in traffic volumes. Although tailpipe emissions are decreasing, there will be a greater contribution from road dust.
- Depressed roadway sections result in lower concentrations of fine particulate and nitrogen oxides in the vicinity of the right-of-way (ROW) compared to at-grade alternatives.
- Tunnel results in lower concentrations of fine particulate in the vicinity of the ROW compared to at-grade alternatives, however nitrogen oxide concentrations increase over a broader area compared to at-grade alternatives because of a greater dispersion from ventilation stacks.

Protection of Community and Neighbourhood Features

- Between 125 to 210 households and 25 to 45 businesses would potentially need to be acquired.
- Noise impacts of at-grade and depressed alternatives can be addressed through mitigation.
- Noise modelling of tunnel option is still in progress.

Consistency with Land Use

- All alternatives make use of existing Huron Church Road/Highway 3 corridor, which is the historical connection to the border crossing, and the proposed route is consistent with official plans.
- There are impacts to existing residential, commercial and zoned vacant lands with all alternatives.

Regional Mobility

- If no new crossing system is built, significant capacity problems are expected to begin by 2015 and by 2035 most intersections will operate over capacity.
- In the absence of a new crossing system, travel times will nearly double, and capacity problems will be widespread. Excess traffic demand will spill over onto other municipal streets.
- New six-lane roadway will meet future demands to 2035 and beyond, and the provision of local service roads will save substantial travel times for local traffic, when compared to "do nothing."

Cost and Constructability

- All access road alternatives are constructible, and traffic flow can be reasonably maintained in the Huron Church Road/ Highway 3 corridor throughout the construction period.
- Access road construction is complicated by the high water table and relatively poor ground conditions, and those problems increase with the depth of construction.
- The cost of the three alternatives from Highway 401 to Malden Road ($CDN 2011):

    - At-grade alternatives: $620 million to $920 million
    - Depressed alternatives: $1.0 billion to $1.4 billion
    - Tunnel alternatives: $3.8 billion

Plazas and Crossings

- There is a combined total of 18 possible alternatives for plaza-crossing-plaza solutions between Canada and the U.S.

Protection of Community and Neighbourhood Features

- In Canada, Plaza A alternatives have the highest number of residential displacements (70).
- Crossing C alternatives have the highest business and industry impacts (13), including the only local marine fuelling station.
- Crossing C alternatives have the highest noise impacts before mitigation (180) due to proximity to Sandwich.

Protection of Cultural Features

- Between five to eight homes dating pre-1930 could be displaced, depending on the plaza and crossing alternative.
- All three crossing alternatives affect cultural landscapes.

Regional Mobility

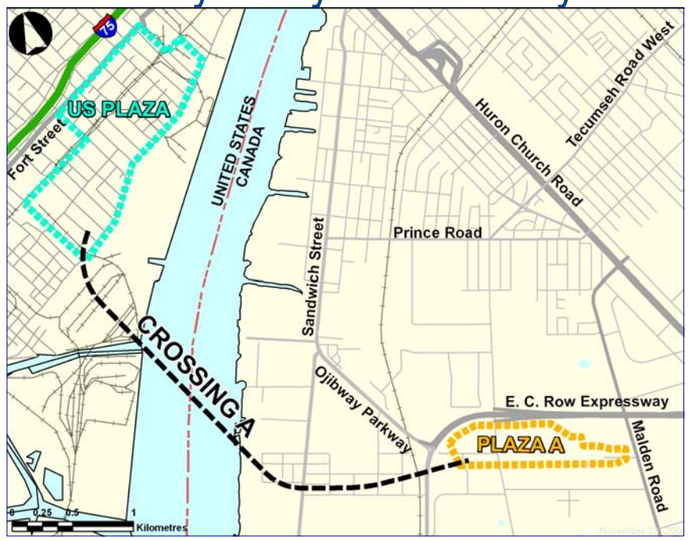
- Confirmed all alternatives are practical in terms of location and layout, subject to the final results of geotechnical investigations. Plazas and crossings meet all transportation and mobility needs.

Cost and Constructability

- Geotechnical investigations are ongoing and will be completed by early 2007.
- Construction cost of the crossing is somewhat a function of the length of span.
- Shortest bank-to-bank is Crossing C (0.7 km), with longest bank-to-bank Crossing A (1.1 km).
- Shortest plaza-to-plaza is Crossing B to Plaza B1 (2.9 km), with longest plaza-to-plaza is Crossing C to Plaza A (5.4 km).

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

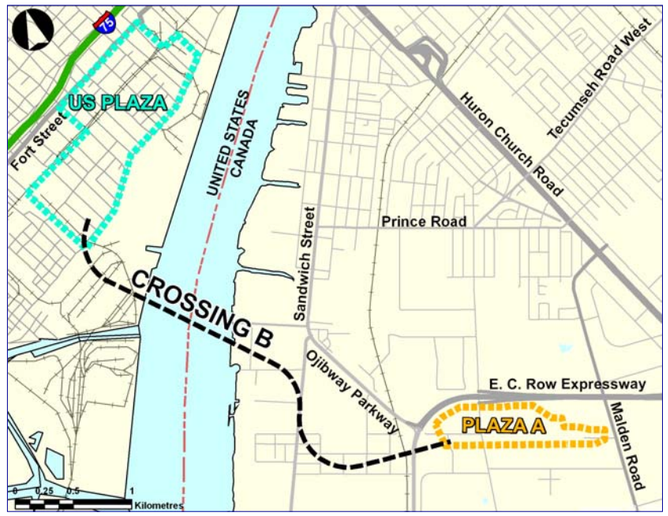
US Plaza – Crossing A – Plaza A
Preliminary Analysis Summary



Length of River Crossing (Bank to Bank) = 1.1 km
Total Length of Crossing (Plaza to Plaza) = 4.3 km

US Analysis						Evaluation Factor	CDN Analysis	
Plaza 4	Crossing A	Plaza Loc 6	Crossing A	Measure			Measure	Crossing A - Plaza A
Refer to Graphic		Refer to Graphic		CO Concentration Hotspots		**Changes in Air Quality**	Preliminary Assessment (subject to additional modelling)	Increases in $PM_{2.5}$ and NO_X in vicinity of crossing and approach roadway as well as plaza.
14	0	14	0	Streets Closed	Traffic	**Protection of Community and Neighbourhood Characteristics**	Effect on Local Access - Roads crossed/closed	7/7
101	0	101	4	Frontline Exposure (Total Residential)	Noise		Receptors with change in noise levels >5 dBA (before mitigation; compared to future do-nothing)	21
151	0	151	0	Occupied Residential	Potential Acquisition		Potential Acquisitions Households	67
18	3	18	3	Active Businesses			Potential Acquisitions Businesses/Industries	0
3-New Day Church, Saint Paul Church, Abundat Life Church	0	3-New Day Church, Saint Paul Church, Abundat Life Church	0	Schools/Places of Worship/Significant Others			Social features (institutional) displaced	1 - Erie Wildlife Rescue
No	Yes	No	Yes	Consistency	Official Plans	**Maintain Consistency with Existing and Planned Land Use**	Consistency	· **Plaza** location not consistent with existing land uses of the Spring Garden Planning Area; impacts to existing and planned residential uses. · **Crossing** and approaches located in vacant industrial area; consistent.
6	2	6	2	Number	Environmental Sites Affecting Plan Implementation		Known Contaminant Sites Impacted	0
0	0	0	0	Number/Site	Above Ground Historic Resources	**Protect Cultural Resources**	Designated built heritage features potentially displaced	6
1-Rademacher Park	0	1-Rademacher Park	0	Number/Site	Parklands		Direct Impacts to Parks	Ojibway Park (0.7 ha)
2	0	2	0	Number	Archaeologic Sites		Potential archaeological sites affected	6
1-St.Paul A.M.E	0	1-St.Paul A.M.E	0	Number/Site	Potentially Eligible Structure			
0	0	0	0	Number/Site	Significant Habitat	**Protect the Natural Environment**	Feature Impacts	· Loss of up to 2.9 ha of rare tallgrass prairie community. · Loss of 0.2 ha (plus pier area) of fish habitat . · Potential loss of threatened Butler's gartersnake habitat. · Loss of up to 149 specimens/colonies of provincially rare plants.
37,000 Vehicles		37,400 Vehicles		2035 ADT	2035 Average Daily Crossing Volume 2-Way (ADT)	**Improve Regional Mobility**	2035 Average Daily Car and Truck Volume	Canadian Plaza and Crossing sized to accommodate 39,000 vehicles daily in 2035 (AADT, truck and auto)
				Key Issues		**Cost and Constructability**	Is it constructable?	Yes, subject to result of brine well investigations on U.S. side.
Utility Relocation, Braided Ramps	Bridge Length/Complexity, Contaminated Soils	Utility Relocation, Braided Ramps	Bridge Length/Complexity, Contaminated Soils				Key Issues	· Direct impacts OPG Brighton Beach Power Station shore facilities, · 2 crossings of HydroOne Power transmission lines, · 2 grade separated crossings of ETR Railway, · 2 crossings of BP Canada High Pressure line. · Length of crossing A span.

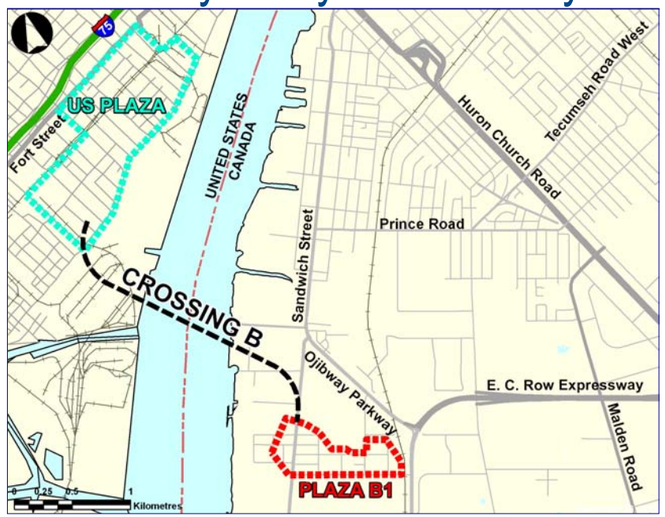
US Plaza – Crossing B – Plaza A Preliminary Analysis Summary



Length of River Crossing (Bank to Bank) = 0.8 km
Total Length of Crossing (Plaza to Plaza) = 4.3 km

US Analysis						Evaluation Factor	CDN Analysis	
Plaza 4	Crossing B	Plaza Loc 6	Crossing B	Measure			Measure	Crossing B - Plaza A
Refer to Graphic		Refer to Graphic		CO Concentration Hotspots		Changes in Air Quality	Preliminary Assessment (subject to additional modelling)	Increases in $PM_{2.5}$ and NO_X in vicinity of crossing and approach roadway as well as plaza.
14	0	14	0	Streets Closed	Traffic	Protection of Community and Neighbourhood Characteristics	Effect on Local Access - Roads crossed/ closed	4/9
101	0	101	4	Frontline Exposure (Total Residential)	Noise		Receptors with change in noise levels >5 dBA (before mitigation; compared to future do-nothing)	21
151	0	151	0	Occupied Residential	Potential Acquisition		Potential Acquisitions Households	70
18	2	18	2	Active Businesses			Potential Acquisitions Businesses/Industries	0
3 - New Day Church, Saint Paul Church, Abundat Life Church	0	3 - New Day Church, Saint Paul Church, Abundat Life Church	0	Significant Others/ Schools/Places of Worship			Social features (institutional) displaced	1 - Erie Wildlife Rescue
No	Yes	No	Yes	Consistency	Official Plans	Maintain Consistency with Existing and Planned Land Use	Consistency	· **Plaza** location not consistent with existing land uses of the Spring Garden Planning Area; impacts to existing and planned residential uses. · **Crossing** and approaches located in occupied and vacant industrial areas; consistent.
6	2	6	2	Number	Environmental Sites Affecting Plan Implementation		Known Contaminant Sites Impacted	2
0	0	0	0	Number/Site	Above Ground Historic Resources	Protect Cultural Resources	Designated built heritage features potentially displaced	6
1-Rademacher Park	0	1-Rademacher Park	0	Number/Site	Parklands		Direct Impacts to Parks	Ojibway Park (0.7 ha)
2	0	2	0	Number	Archaeologic Sites		Potential archaeological sites affected	6
1 - St.Paul A.M.E	0	1 - St.Paul A.M.E	0	Number/Site	Potentially Eligible Structure			
0	0	0	0	Number/Site	Significant Habitat	Protect the Natural Environment	Feature Impacts	· Loss of up to 2.9 ha of rare tallgrass prairie community. · Loss of 0.2 ha (plus pier area) of fish habitat . · Potential loss of threatened Butler's gartersnake habitat. · Loss of up to 149 specimens/colonies of provincially rare plants.
37,000 Vehicles		37,400 Vehicles		2035 ADT	2035 Average Daily Crossing Volume 2-Way (ADT)	Improve Regional Mobility	2035 Average Daily Car and Truck Volume	Canadian Plaza and Crossing sized to accommodate 39,000 vehicles daily in 2035 (AADT, truck and auto)
Utility Relocation, Braided Ramps	Contaminated Soils, Utilities	Utility Relocation, Braided Ramps	Contaminated Soils, Utilities	Refer to Individual Crossing Alignments	Key Issues	Cost and Constructability	Is it constructable?	Yes, subject to result of brine well investigations
							Key Issues	· Relocation/reconfiguration Keith transformer station, · 8 crossings of HydroOne transmission lines, · 2 crossings of ETR Railway, · 2 Crossings of BP Canada High Pressure line.

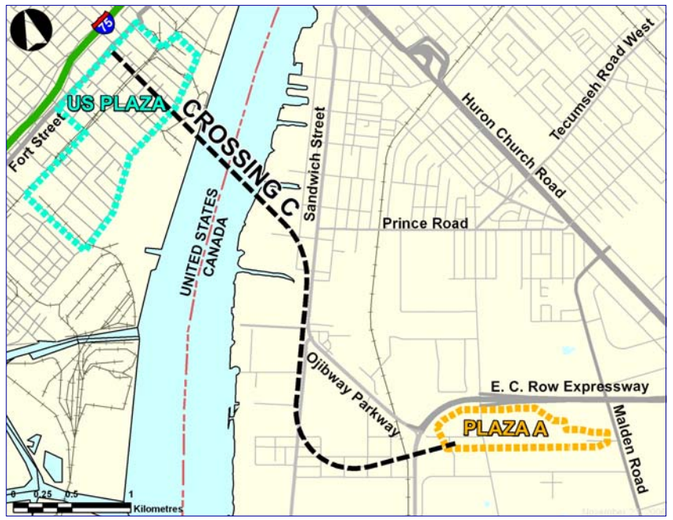
US Plaza – Crossing B – Plaza B1 Preliminary Analysis Summary



Length of River Crossing (Bank to Bank) = 0.8 km
Total Length of Crossing (Plaza to Plaza) = 2.9 km

US Analysis						Evaluation Factor	CDN Analysis	
Plaza 4	Crossing B	Plaza Loc 6	Crossing B	Measure			Measure	Crossing B - Plaza B1
Refer to Graphic		Refer to Graphic		CO Concentration Hotspots		Changes in Air Quality	Preliminary Assessment (subject to additional modelling)	Increases in $PM_{2.5}$ and NO_X in vicinity of crossing and approach roadway as well as plaza.
14	0	14	0	Streets Closed	Traffic	Protection of Community and Neighbourhood Characteristics	Effect on Local Access - Roads crossed/ closed	4/12
101	0	101	4	Frontline Exposure (Total Residential)	Noise		Receptors with change in noise levels >5 dBA (before mitigation; compared to future do-nothing)	23
151	0	151	0	Occupied Residential	Potential Acquisition		Potential Acquisitions Households	36
18	2	18	2	Active Businesses			Potential Acquisitions Businesses/Industries	1 - A&P Metals
3 - New Day Church, Saint Paul Church, Abundat Life Church	0	3 - New Day Church, Saint Paul Church, Abundat Life Church	0	Significant Others/ Schools/Places of Worship			Social features (institutional) displaced	1 - Erie Wildlife Rescue
No	Yes	No	Yes	Consistency	Official Plans	Maintain Consistency with Existing and Planned Land Use	Consistency	· **Plaza** location located in occcupied and vacant industrial areas; consistent · **Crossing** and approaches located in occupied and vacant industrial areas; consistent.
6	2	6	2	Number	Environmental Sites Affecting Plan Implementation		Known Contaminant Sites Impacted	5
0	0	0	0	Number/Site	Above Ground Historic Resources	Protect Cultural Resources	Designated built heritage features potentially displaced	8
1-Rademacher Park	0	1-Rademacher Park	0	Number/Site	Parklands		Direct Impacts to Parks	Ojibway Park (0.7 ha)
2	0	2	0	Number	Archaeologic Sites		Potential archaeological sites affected	6
1 - St.Paul A.M.E	0	1 - St.Paul A.M.E	0	Number/Site	Potentially Eligible Structure			
0	0	0	0	Number/Site	Significant Habitat	Protect the Natural Environment	Feature Impacts	· Loss of 1.1 ha of rare tallgrass prairie community. · Loss of 0.6 ha (plus pier area) of fish habitat . · Potential loss of threatened Butler's gartersnake habitat. · Loss of up to 79 specimens/colonies of provincially rare plants.
37,000 Vehicles		37,400 Vehicles		2035 ADT	2035 Average Daily Crossing Volume 2-Way (ADT)	Improve Regional Mobility	2035 Average Daily Car and Truck Volume	Canadian Plaza and Crossing sized to accommodate 39,000 vehicles daily in 2035 (AADT, truck and auto)
Utility Relocation, Braided Ramps	Contaminated Soils, Utilities	Utility Relocation, Braided Ramps	Contaminated Soils, Utilities	Refer to Individual Crossing Alignments	Key Issues	Cost and Constructability	Is it constructable?	Yes, subject to result of brine well investigations
							Key Issues	· Relocation/reconfiguration Keith transformer station, · 11 Crossings of HydroOne transmission lines, · 3 crossings of ETR Railway, · 4 Crossings of BP Canada High Pressure line.

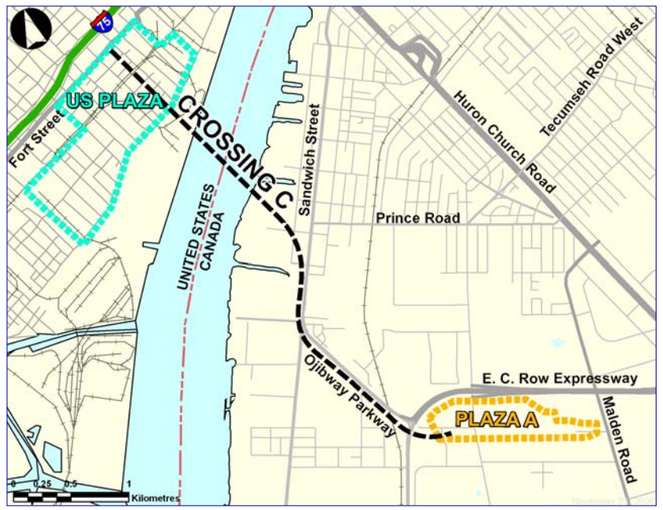
US Plaza – Crossing C (via Brighton Beach) – Plaza A Preliminary Analysis Summary



Length of River Crossing (Bank to Bank) = 0.7 km
Total Length of Crossing (Plaza to Plaza) = 5.4 km

US Analysis						Measure		Evaluation Factor	CDN Analysis	
Plaza 5B	Crossing C	Plaza 6A	Crossing C	Plaza 2	Crossing C				Measure	Crossing C - Plaza A (via Brighton Beach Industrial Area)
Refer to Graphic		Refer to Graphic		Refer to Graphic		CO Concentration Hotspots		Changes in Air Quality	Preliminary Assessment (subject to additional modelling)	Increases in $PM_{2.5}$ and NO_x in vicinity of crossing and approach roadway as well as plaza.
14	0	17	4	17	0	Streets Closed	Traffic	Protection of Community and Neighbourhood Characteristics	Effect on Local Access - Roads crossed/ closed	7/3
95	0	105	4	72	0	Frontline Exposure (Total Residential)	Noise		Receptors with change in noise levels >5 dBA (before mitigation; compared to future do-nothing)	180
113	0	168	16	160	0	Occupied Residential	Potential Acquisition		Potential Acquisitions Households	72
26	0	18	3	22	0	Active Businesses			Potential Acquisitions Businesses/Industries	9-Sterling Marine Fuels, K Scrap, Vollmer & Associates, Trucking Operation, Central Transport, OLCO, The Auto Shop, Sure Seal, Prism-Berlie
1-Faith Tabernacle Church	0	3-New Day Church, Saint Paul Church, Abundant Life Apostolic Overcoming Holy Church of God	0	4-First Latin Baptist, Detroit Friends Meeting Quakers, Old Landmark Church, Beard School (Partial)	0	Significant Others/ Schools/Places of Worship			Social features (institutional) displaced	1 - Erie Wildlife Rescue
Yes	Yes	No	Yes	No	Yes	Consistency	Official Plans	Maintain Consistency with Existing and Planned Land Use	Consistency	· **Plaza** location not consistent with existing land uses of the Spring Garden Planning Area; impacts to existing and planned residential uses. · **Crossing** and approaches located in occupied and vacant industrial areas; consistent.
7	3	6	3	7	3	Number	Environmental Sites Affecting Plan Implementation		Known Contaminant Sites Impacted	11
0	0	1	1	1	1	Number/Site	Above Ground Historic Resources	Protect Cultural Resources	Designated built heritage features potentially displaced	8
1-Detroit City Park	0	1-Rademacher Park	0	1-Rademacher Park	0	Number/Site	Parklands		Direct Impacts to Parks	Ojibway Park (0.7 ha)
2	1	2	1	2	1	Number	Archaeologic Sites		Potential archaeological sites affected	6
2-Roberts Brass MFG, Detroit Savings Bank	1 - Mistersky Power Station	1 - St.Paul A.M.E Church	1	1 - St.Paul A.M.E Church	1	Number/Site	Potentially Eligible Structure			
0	0	0	0	0	0	Number/Site	Significant Habitat	Protect the Natural Environment	Feature Impacts	· Loss of up to 2.9 ha of rare tallgrass prairie community. · Loss of 0.2 ha (plus pier area) of fish habitat . · Potential loss of threatened Butler's gartersnake habitat. · Loss of up to 149 specimens/colonies of provincially rare plants.
32,000 Vehicles		24,200 Vehicles		27,900 Vehicles		2035 ADT	2035 Average Daily Crossing Volume 2-Way (ADT)	Improve Regional Mobility	2035 Average Daily Car and Truck Volume	Canadian Plaza and Crossing sized to accommodate 39,000 vehicles daily in 2035 (AADT, truck and auto)
Significant Sewer Relocation, Potential Contaminated Soils, Railway Relocation	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Refer to Individual Crossing Alignments	Key Issues	Cost and Constructability	Is it constructable?	Yes, subject to result of brine well investigations
									Key Issues	· Direct impact to Sterling Marine Fuels fueling depot, · Relocation/reconfiguration of Keith transformer station, · 2 Crossing of outlet pipe from Lou Romano Water Reclamation Plant, · 6 Crossings of HydroOne Transmission lines · 2 Grade separated crossing of ETR Railway, · 4 Crossings of BP Canada High Pressure Pipe. · Length of approach roadway between Crossing C and Plaza A

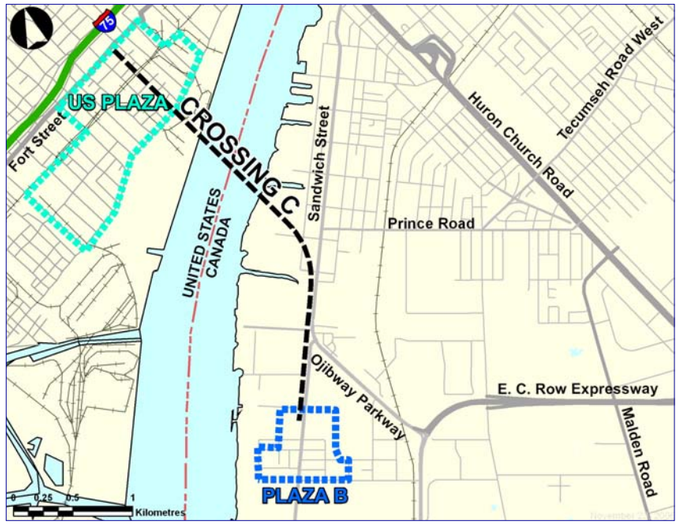
US Plaza – Crossing C (via Ojibway Parkway) – Plaza A Preliminary Analysis Summary



Length of River Crossing (Bank to Bank) = 0.7 km
Total Length of Crossing (Plaza to Plaza) = 4.8 km

US Analysis						Measure		Evaluation Factor	CDN Analysis	
Plaza 5B	Crossing C	Plaza 6A	Crossing C	Plaza 2	Crossing C				Measure	Crossing C - Plaza A (via Ojibway Parkway)
Refer to Graphic		Refer to Graphic		Refer to Graphic		CO Concentration Hotspots		Changes in Air Quality	Preliminary Assessment (subject to additional modelling)	Increases in $PM_{2.5}$ and NO_x in vicinity of crossing and approach roadway as well as plaza.
14	0	17	4	17	0	Streets Closed	Traffic	Protection of Community and Neighbourhood Characteristics	Effect on Local Access - Roads crossed/ closed	7/4
95	0	105	4	72	0	Frontline Exposure (Total Residential)	Noise		Receptors with change in noise levels >5 dBA (before mitigation; compared to future do-nothing)	180
113	0	168	16	160	0	Occupied Residential	Potential Acquisition		Potential Acquisitions Households	67
26	0	18	3	22	0	Active Businesses			Potential Acquisitions Businesses/Industries	9-Sterling Marine Fuels, K Scrap, Vollmer & Associates, Trucking Operation, Central Transport, OLCO, The Auto Shop, Sure Seal, Prism-Berlie
1-Faith Tabernacle Church	0	3-New Day Church, Saint Paul Church, Abundant Life Apostolic Overcoming Holy Church of God	0	4-First Latin Baptist, Detroit Friends Meeting Quakers, Old Landmark Church, Beard School (Partial)	0	Significant Others/ Schools/Places of Worship			Social features (institutional) displaced	1 - Erie Wildlife Rescue
Yes	Yes	No	Yes	No	Yes	Consistency	Official Plans	Maintain Consistency with Existing and Planned Land Use	Consistency	· **Plaza** location not consistent with existing land uses of the Spring Garden Planning Area; impacts to existing and planned residential uses. · **Crossing** and approaches located in occupied and vacant industrial areas; consistent.
7	3	6	3	7	3	Number	Environmental Sites Affecting Plan Implementation		Known Contaminant Sites Impacted	2
0	0	1	1	1	1	Number/Site	Above Ground Historic Resources	Protect Cultural Resources	Designated built heritage features potentially displaced	8
1-Detroit City Park	0	1-Rademacher Park	0	1-Rademacher Park	0	Number/Site	Parklands		Direct Impacts to Parks	Ojibway Park (0.7 ha)
2	1	2	1	2	1	Number	Archaeologic Sites		Potential archaeological sites affected	6
2-Roberts Brass MFG, Detroit Savings Bank	1 - Mistersky Power Station	1 - St.Paul A.M.E Church	1	1 - St.Paul A.M.E Church	1	Number/Site	Potentially Eligible Structure			
0	0	0	0	0	0	Number/Site	Significant Habitat	Protect the Natural Environment	Feature Impacts	· Loss of up to 2.9 ha of rare tallgrass prairie community. · Loss of 0.2 ha (plus pier area) of fish habitat . · Potential loss of threatened Butler's gartersnake habitat. · Loss of up to 149 specimens/colonies of provincially rare plants.
32,000 Vehicles		24,200 Vehicles		27,900 Vehicles		2035 ADT	2035 Average Daily Crossing Volume 2-Way (ADT)	Improve Regional Mobility	2035 Average Daily Car and Truck Volume	Canadian Plaza and Crossing sized to accommodate 39,000 vehicles daily in 2035 (AADT, truck and auto)
Significant Sewer Relocation, Potential Contaminated Soils, Railway Relocation	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Refer to Individual Crossing Alignments	Key Issues	Cost and Constructability	Is it constructable?	Yes, subject to result of brine well investigations
									Key Issues	· Direct impact to Sterling Marine Fuels fueling depot, · 2 Crossing of outlet pipe from Lou Romano Water Reclamation Plant, · 6 Crossings of HydroOne Transmission lines · 2 Grade separated crossing of ETR Railway, · 4 Crossings of BP Canada High Pressure Pipe. · Length of approach roadway between Crossing C and Plaza A

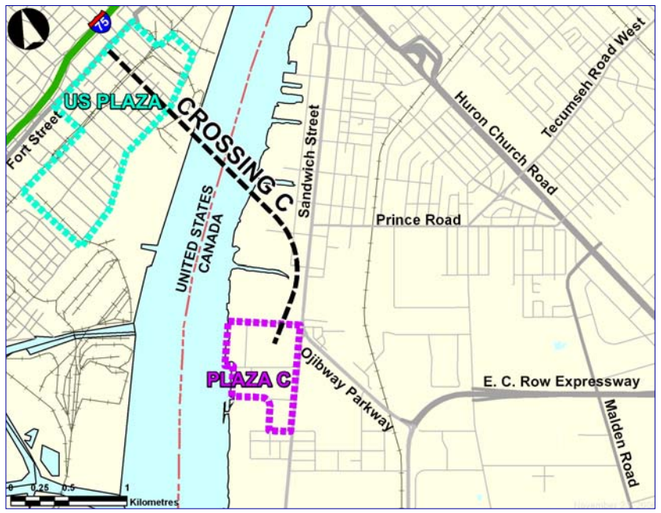
US Plaza – Crossing C – Plaza B
Preliminary Analysis Summary



Length of River Crossing (Bank to Bank) = 0.7 km
Total Length of Crossing (Plaza to Plaza) = 3.8 km

US Analysis						Measure		Evaluation Factor	CDN Analysis	
Plaza 5B	Crossing C	Plaza 6A	Crossing C	Plaza 2	Crossing C				Measure	Crossing C - Plaza B
Refer to Graphic		Refer to Graphic		Refer to Graphic		CO Concentration Hotspots		Changes in Air Quality	Preliminary Assessment (subject to additional modelling)	Increases in $PM_{2.5}$ and NO_x in vicinity of crossing and approach roadway as well as plaza.
14	0	17	4	17	0	Streets Closed	Traffic	Protection of Community and Neighbourhood Characteristics	Effect on Local Access - Roads crossed/ closed	7/16
95	0	105	4	72	0	Frontline Exposure (Total Residential)	Noise		Receptors with change in noise levels >5 dBA (before mitigation; compared to future do-nothing)	180
113	0	168	16	160	0	Occupied Residential	Potential Acquisition		Potential Acquisitions Households	38
26	0	18	3	22	0	Active Businesses			Potential Acquisitions Businesses/Industries	9-Sterling Marine Fuels, K Scrap, Vollmer & Associates, Trucking Operation, Central Transport, OLCO, The Auto Shop, Sure Seal, A&P Metals
1-Faith Tabernacle Church	0	3-New Day Church, Saint Paul Church, Abundant Life Apostolic Overcoming Holy Church of God	0	4-First Latin Baptist, Detroit Friends Meeting Quakers, Old Landmark Church, Beard School (Partial)	0	Significant Others/ Schools/Places of Worship			Social features (institutional) displaced	1 - Erie Wildlife Rescue
Yes	Yes	No	Yes	No	Yes	Consistency	Official Plans	Maintain Consistency with Existing and Planned Land Use	Consistency	· **Plaza** location located in occupied and vacant industrial areas; consistent. · **Crossing** and approaches located in occupied and vacant industrial areas; consistent.
7	3	6	3	7	3	Number	Environmental Sites Affecting Plan Implementation		Known Contaminant Sites Impacted	11
0	0	1	1	1	1	Number/Site	Above Ground Historic Resources	Protect Cultural Resources	Designated built heritage features potentially displaced	9
1-Detroit City Park	0	1-Rademacher Park	0	1-Rademacher Park	0	Number/Site	Parklands		Direct Impacts to Parks	Ojibway Park (0.7 ha)
2	1	2	1	2	1	Number	Archaeologic Sites		Potential archaeological sites affected	6
2-Roberts Brass MFG, Detroit Savings Bank	1 - Mistersky Power Station	1 - St.Paul A.M.E Church	1	1 - St.Paul A.M.E Church	1	Number/Site	Potentially Eligible Structure			
0	0	0	0	0	0	Number/Site	Significant Habitat	Protect the Natural Environment	Feature Impacts	· Encroachment of Black Oak Woods ANSI · Loss of up to 1.4 ha of rare tallgrass prairie community. · Loss of up to 0.4 ha (plus pier area) of fish habitat. · Potential loss of threatened Butler's gartersnake habitat. · Loss of up to 79 specimens/colonies of provincially rare plants.
32,000 Vehicles		24,200 Vehicles		27,900 Vehicles		2035 ADT	2035 Average Daily Crossing Volume 2-Way (ADT)	Improve Regional Mobility	2035 Average Daily Car and Truck Volume	Canadian Plaza and Crossing sized to accommodate 39,000 vehicles daily in 2035 (AADT, truck and auto)
Significant Sewer Relocation, Potential Contaminated Soils, Railway Relocation	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Refer to Individual Crossing Alignments	Key Issues	Cost and Constructability	Is it constructable?	Yes, subject to result of brine well investigations
									Key Issues	· Direct impacts to Sterling Marine Fuels fueling depot, · 2 Crossing of outlet pipe from Lou Romano Water Reclamation Plant, · Relocation/reconfiguration of Keith transformer station, · 7 Crossings of HydroOne Power transmission lines, · 3 Grade separated crossings of ETR Railway, · 6 Crossings of BP Canada High Pressure Pipe.

US Plaza – Crossing C – Plaza C
Preliminary Analysis Summary



Length of River Crossing (Bank to Bank) = 0.7 km
Total Length of Crossing (Plaza to Plaza) = 3.2 km

US Analysis						Measure		Evaluation Factor	CDN Analysis	
Plaza 5B	Crossing C	Plaza 6A	Crossing C	Plaza 2	Crossing C				Measure	Crossing C - Plaza C
Refer to Graphic		Refer to Graphic		Refer to Graphic		CO Concentration Hotspots		Changes in Air Quality	Preliminary Assessment (subject to additional modelling)	Increases in $PM_{2.5}$ and NO_x in vicinity of crossing and approach roadway as well as plaza.
14	0	17	4	17	0	Streets Closed	Traffic	Protection of Community and Neighbourhood Characteristics	Effect on Local Access - Roads crossed/ closed	13/5
95	0	105	4	72	0	Frontline Exposure (Total Residential)	Noise		Receptors with change in noise levels >5 dBA (before mitigation; compared to future do-nothing)	180
113	0	168	16	160	0	Occupied Residential	Potential Acquisition		Potential Acquisitions Households	37
26	0	18	3	22	0	Active Businesses			Potential Acquisitions Businesses/Industries	13-Sterling Marine Fuels, K Scrap Metal, Vollmer & Associates, Trucking Operation, Central Transport, OLCO, The Auto Shop, Southwestern Sales Corp, OPG, A&P Metals, Van De Hogan, Essex Aggregates, Windsor Salt
1-Faith Tabernacle Church	0	3-New Day Church, Saint Paul Church, Abundant Life Apostolic Overcoming Holy Church of God	0	4-First Latin Baptist, Detroit Friends Meeting Quakers, Old Landmark Church, Beard School (Partial)	0	Significant Others/ Schools/Places of Worship			Social features (institutional) displaced	1 - Erie Wildlife Rescue
Yes	Yes	No	Yes	No	Yes	Consistency	Official Plans	Maintain Consistency with Existing and Planned Land Use	Consistency	· **Plaza** located in occupied and vacant industrial areas; consistent. · **Crossing** and approaches located in occupied and vacant industrial areas; consistent.
7	3	6	3	7	3	Number	Environmental Sites Affecting Plan Implementation		Known Contaminant Sites Impacted	12
0	0	1	1	1	1	Number/Site	Above Ground Historic Resources	Protect Cultural Resources	Designated built heritage features potentially displaced	9
1-Detroit City Park	0	1-Rademacher Park	0	1-Rademacher Park	0	Number/Site	Parklands		Direct Impacts to Parks	Ojibway Park (0.7 ha)
2	1	2	1	2	1	Number	Archaeologic Sites		Potential archaeological sites affected	6
2-Roberts Brass MFG, Detroit Savings Bank	1 - Mistersky Power Station	1 - St.Paul A.M.E Church	1	1 - St.Paul A.M.E Church	1	Number/Site	Potentially Eligible Structure			
0	0	0	0	0	0	Number/Site	Significant Habitat	Protect the Natural Environment	Feature Impacts	· Loss of 0.9 ha of rare tallgrass praine community. · Loss of 0.7 ha (plus pier area) of fish habitat. · Potential loss of threatened Butler's gartersnake habitat. · Loss of up to 79 specimens/colonies of provincially rare plants.
32,000 Vehicles		24,200 Vehicles		27,900 Vehicles		2035 ADT	2035 Average Daily Crossing Volume 2-Way (ADT)	Improve Regional Mobility	2035 Average Daily Car and Truck Volume	Canadian Plaza and Crossing sized to accommodate 39,000 vehicles daily in 2035 (AADT, truck and auto)
Significant Sewer Relocation, Potential Contaminated Soils, Railway Relocation	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Utility Relocation, Potential Contaminated Soils	Contaminated Soils, Sterling Fuels, River Width	Refer to Individual Crossing Alignments	Key Issues	Cost and Constructability	Is it constructable?	Yes, subject to result of brine well investigations
									Key Issues	· Direct impacts to Sterling Marine Fuels fueling depot, · 9 Crossings of HydroOne transmission lines (including 3 lines within plaza), · Relocation of Keith transformer station, · 2 Crossings of Outlet pipe from Lou Romano Water Reclamation Plant, · 3 crossing of ETR Railway, · 6 crossings of BP Canada High Pressure line.

FACTOR/ MEASURE	ALTERNATIVE 1A		ALTERNATIVE 1B		ALTERNATIVE 2A		ALTERNATIVE 2B		ALTERNATIVE 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)	Option 1 (Widen to North on Hwy 3)	Option 2 (Widen to South on Hwy 3)	
Changes to Air Quality									
Results of modeling to date (before mitigation)	• Concentrations of Volatile Organic Compounds (VOC's) predicted to be well below provincial standards • Predicted concentrations of NOx associated with the alternatives are lower in the future compared to today's values due to changes in fuels and vehicle technologies • Depressed roadway sections result in lower concentrations of $PM_{2.5}$ and NO_X in vicinity of ROW compared to at grade alternatives • Tunnel results in lower concentrations of $PM_{2.5}$ in vicinity of ROW compared to at grade alternatives, but NO_X concentrations increase over a broader area compared to at grade alternatives (greater dispersion from ventilation stacks)								
Protection of Community and Neighbourhood Characteristics									
Potential Acquisitions Residences Businesses	• 150-190 • 30	• 145-185 • 45	• 150-190 • 30	• 150-190 • 45	• 175-210 • 25	• 160-200 • 40	• 170-205 • 25	• 160-200 • 40	• 125-175 • 44
Community Features Potentially Displaced	3 (Royal Canadian Legion, Heritage Park Alliance Church, Erie Wildlife Rescue)								
Noise Receptors with >5 dB increase (before mitigation)	• 90 +/-	• 50 +/-	• 40 +/-	• 40 +/-	• 140 +/-	• 90 +/-	• 60 +/-	• 60 +/-	• To be determined
Effect on Access	• 10 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;		• 12 road closings • 15 local access connections to new transportation facility • Partial access to/from the new corridor from/to Cabana Road/Todd Lane; No access to Howard Avenue from Highway 401 Eastbound		• 14 road closings • 14 local access connections to new transportation facility • Full access to/from the new corridor from/to Cabana Road/Todd Lane; Access to Howard Avenue from Highway 401 Eastbound	• 15 road closings • 7 local access connections to new transportation facility • Full access to/from the new corridor from/to Cabana Road/Todd Lane; Access to Howard Avenue from Highway 401 Eastbound	• 13 road closings • 10 local access connections to new transportation facility • Full access to/from the new corridor from/to Cabana Road/Todd Lane; Access to Howard Avenue from Highway 401 Eastbound	• 14 road closings • 11 local access connection to new transportation facility • Full access to/from the new corridor from/to Cabana Road/Todd Lane; Access to Howard Avenue from Highway 401 Eastbound	• 8 road closings • 13 local access connections to new transportation facility • No access to/from Cabana Lane/Todd Lane; No access to Howard Avenue from Highway 401 Eastbound
Consistency with Existing & Planned Land Use									
	All alternatives make use of Huron Church Road/Highway 3 Corridor (major roadway, historical connection to border crossing); localized land use impacts with all alternatives Proposed route is consistent with local Official Plans Impacts to existing residential, commercial and vacant lands zoned commercial/residential with all alternatives								
Protection of Cultural Resources									
Built Heritage Features	All access road alternatives potentially displace nine built heritage features								
Parks	All alternatives impact 6 parks (Bellewood Park, Aboriginal (Indian) Memorial Park, Beals Park (Oakwood Bush), Veteran's Memorial Park, St. Clair College Athletic Field, Matthew Rodzick Park)								
Archaeology	No known sites of high to moderate significance are impacted; no notable difference among the alternatives in terms of potential to disturb archaeological features								

FACTOR/ MEASURE	ALTERNATIVE 1A		ALTERNATIVE 1B		ALTERNATIVE 2A		ALTERNATIVE 2B		ALTERNATIVE 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)	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 identified for any access road alternatives								
Plant/Vegetation Species	• 0.38 ha to 0.82 ha of tallgrass prairie impacted	• 0.49 ha to 0.92 ha of tallgrass prairie impacted	• 0.43 ha to 0.86 ha of tallgrass prairie and deciduous swamp impacted	• 0.55 ha to 0.84 ha of tallgrass prairie and deciduous swamp impacted	• 1.54 ha to 1.98 ha of tallgrass prairie and deciduous swamp impacted	• 1.54 ha to 1.98 ha of tall grass prairie and deciduous swamp impacted	• 0.92 ha to 1.36 ha of tall grass prairie and deciduous swamp with impacted	• 0.92 ha to 1.36 ha of tallgrass prairie and deciduous swamp impacted	• 0.48 ha to 0.87 ha of tallgrass prairie impacted
Wildlife Species and Habitat	• 70 to 129 specimens/colonies of provincially rare plants impacted	• 60 to 149 specimens/colonies of provincially rare plants impacted	• 70 to 139 specimens/colonies of provincially rare plants impacted	• 60 to 149 specimens/colonies of provincially rare plants with Plaza A connection	• 80 to 159 specimens/colonies of provincially rare plants impacted	• 120 to 159 specimens/colonies of provincially rare plants with Plaza B or C	• 70 to 139 specimens/colonies of provincially rare plants impacted	• 70 to 139 specimens/colonies of provincially rare plants impacted A	• 70 to 139 specimens/colonies of provincially rare plants impacted
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	• Safety of controlled access freeway for access road is greatly increased compared to present arterial roadway with signalized intersections and other entrances/conflict points • Elements of tunnel driving that negatively effect 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 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. • The consequences of a crash in a tunnel are greatly increased over those on an open road, however the frequency of a catastrophic event are low, and the occurrence of general traffic crashes (on a tunneled freeway) is marginally less than on an open road. • The crash risk near the portals of the tunnel is higher than elsewhere within the tunnel • All practical alternatives will provide substantial travel time savings for local traffic when compared to the “do nothing” alternative • All of the service road alternatives provide increased local and regional mobility over the “do nothing” alternative								
Reasonable and Secure Options	• All access road alternatives provide connections to Huron Church Road at E.C. Row enabling choice between new and existing crossings								
Cost and Constructability									
Estimated Construction Cost ($CAD)	$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
Key Issues	• Traffic management during construction • Utility relocations • Watercourse crossings		• Traffic management during construction • Utility relocations • Watercourse crossings • The high water table and relatively poor ground conditions, particularly towards the north and west ends of the project, complicate access road construction. These problems increase with the depth of construction.		• Traffic management during construction • Utility relocations • Watercourse crossings		• Traffic management during construction • Utility relocations • Watercourse crossings • The high water table and relatively poor ground conditions, particularly towards the north and west ends of the project, complicate access road construction. These problems increase with the depth of construction		• Traffic management during construction • Utility relocations • Watercourse crossings • Construction of the tunnel alternative is more complex and more intense than other alternatives due to the necessity to build the tunnel box, ventilation, electrical and communication systems

Detroit River
INTERNATIONAL CROSSING
S T U D Y

The Environmental Study Process

The Windsor-Detroit border is the busiest commercial land border crossing in North America and trade travelling through this corridor is expected to increase well into the future. This is good news for the economies of Windsor-Essex County and for the provincial and national economies as well.

The governments of Canada, the U.S., Ontario and Michigan have recognized the importance of the Windsor-Detroit Gateway and have come together to form the Border Transportation Partnership (the Partnership). The purpose of the Detroit River International Crossing (DRIC) study is to provide for the safe, efficient and secure movement of people and goods across the Canada-U.S. border in the Detroit River area to support the economies of Ontario, Michigan, Canada and the U.S. In other words, construct a new end-to-end transportation system that will link Highway 401 to the U.S. interstate system with inspection plazas and a new river crossing in between.

A Coordinated Process

This international transportation improvement project will require approvals from governments on both sides of the border. The Partnership has developed a coordinated process that will enable the joint selection of a recommended river crossing location that meets the requirements of the O*ntario Environmental Assessment Act* (OEAA), *Canadian Environmental Assessment Act* (CEAA), and U.S.*National Environmental Policy Act* (NEPA) in an effective and efficient manner.

A key principle of this process is that all affected and interested parties are being given the opportunity to participate and offer input throughout the study. The Partnership is proactively seeking community and stakeholder input at key points during the study.

Requirements of the *Ontario Environmental Assessment Act* (OEAA)

As required under the OEAA, a Terms of Reference (TOR) document was prepared and received approval prior to commencement of the DRIC Environmental Assessment study. This document outlines the framework that the DRIC study team must follow in completing the environmental assessment including key opportunities for public participation.

At the completion of this study, the Environmental Assessment (EA) Report will be submitted to the Ontario Minister of Environment for approval. The formal review process provides opportunities for public comment.

Requirements of the *Canadian Environmental Assessment Act* (CEAA)

CEAA applies to certain projects that require a decision by the Canadian Federal Government. In the case of this study Transport Canada has partnered with the Ontario Ministry of Transportation in the conduct of the Canadian portion of the study. The requirements of the OEAA and CEAA are being coordinated in a manner that will ensure that the most rigorous EA standards are met.

A Project Description document has been prepared for the DRIC study and federal agencies with an interest in the study have been identified.

A Screening Report identifying project impacts and mitigation needs will be prepared and reviewed by the appropriate federal authorities.

As part of the coordinated EA process, the federal Draft EA Guidelines and Public Consultation Plan are being provided for public review. Members of the public are invited to review these documents and provide comments to the study team. Draft copies are available to view at the Public Information Open Houses (PIOHs) and members of the study team are available to answer questions. These documents can also be downloaded or viewed on line at the

Partnership web site (www.partnershipborderstudy.com). Information on the federal environmental assessment process is also available on the following web site: http://www.ceaa.gc.ca.

Requirements of the *U.S. National Environmental Policy Act* (NEPA)

In the United States, the umbrella environmental law is the National Environmental Policy Act (NEPA). NEPA provides for a decision-making process relying on interdisciplinary analysis, and consultation and commenting by the public, stakeholders and regulatory agencies.

For major federal actions an Environmental Impact Statement (EIS) is prepared. A draft EIS is to explain the purpose and need for a project, examine alternatives, describe the impacts of the practical alternatives, and document the public involvement and coordination that occurs. The draft EIS is released for formal comment and a public hearing is held. Subsequently, a decision is made on a Preferred Alternative, based on the comments received and any further analysis that is required to respond adequately to the comments. That decision is made available to the public and agencies through the formal availability of the Final EIS. When comments on the FEIS are addressed and the decision is to pursue an "action" alternative, a Record of Decision (ROD) is prepared. Under NEPA, a ROD allows a project to advance to the design stage.

What does all of this mean?

The DRIC study is following three legislated processes. These processes require that the DRIC Environmental Study be thorough, open, transparent and fully accessible to the public for scrutiny and evaluation. The DRIC study team is fully committed to working with the public, communities, and interested groups in Windsor-Essex County, in consultation with the U.S. partners, to develop a solution that best meets future transportation needs, while minimizing community impacts.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

The Seven Evaluation Factors

As part of the Environmental Study, the DRIC study teams in Canada and the U.S. established seven evaluation factors to assess the various alternatives identified by the study team. In consultation with stakeholders, these factors were weighted, giving more weight to factors whose impacts are considered to be more important. These factors have guided the technical studies and have helped the DRIC study teams focus on the issues that matter most to the host communities. Evaluation throughout the Environmental Study has been and will continue to be measured against the seven factors. This will ensure a fair and replicable evaluation process takes place and a solution is identified that best balances project objectives, community needs and technical requirements.

The evaluation of the Practical Alternatives will be considered 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 Canadian DRIC study, the study team has met with the members of the community to get 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 current air quality measurements to the community and added a field measurement component into the air quality workplan. 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. 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. The public has a role to play in the evaluation of the Practical Alternatives and the public's continued involvement will guarantee the success of the DRIC study.

The table below shows how the various factors are used in evaluating alternatives against each other and in comparison with future conditions without a new crossing (or the "do nothing" alternative).

Factors	What does this mean?
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?
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?

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Changes to Air Quality

Identifying how the Detroit River International Crossing (DRIC) study may change air quality is an important consideration in the DRIC Environmental Assessment.

Air quality effects of the Practical Alternatives are currently being assessed using a combination of existing air monitoring data and air dispersion modelling. Air dispersion modelling must be 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 being used is specifically designed to assess impacts from roads and highways. The model incorporates the differences between moving vehicles, and queued vehicles that are idling, as well as differences in roads that are at-grade, depressed, tunnelled or elevated on bridges.

Existing concentrations of gaseous pollutants in Windsor such as SO_2, CO and VOCs (such as acrolein) were assessed as part of the assessment of Illustrative Alternatives and found to be well below Ontario Ministry of the Environment (MOE) Ambient Air Quality Criteria (AAQCs) under future traffic conditions. The two indicator pollutants selected for this phase of the analysis to represent one gaseous compound and one particulate compound are Particulate Matter less than 2.5 microns ($PM_{2.5}$) and Nitrogen Oxides (NO_x). Changes in the total predicted concentrations of these two air pollutants were examined for each alternative in relation to one another.

The results presented herein are discussed as a "work in progress" since generation of results and analysis are still ongoing.

How the Analysis was Done

The analysis was completed using the following approach:

- determine background concentrations
- compile data on existing $PM_{2.5}$ and NO_x concentrations
- input traffic data for existing and future conditions, including access road, plaza and crossing alternatives
- calculate pollutant emissions from the highway corridor for existing and future conditions, and
- use air dispersion model (CAL3QHCR) with meteorological data from Windsor Airport to determine future air pollutant concentrations in the vicinity of the corridor (essentially all of west Windsor) and at sensitive receptor locations (such as schools).

Data on the existing air pollutant concentrations in the Windsor area was obtained from the two MOE air monitoring stations located on College Street and on University Avenue. The highest 24-hour 90th percentile $PM_{2.5}$ and NO_x concentrations measured at these stations in the past four years were conservatively selected as the interim background concentrations, which were added to all model predicted results. Data from the two new DRIC air monitoring stations will be used to refine the background concentrations.

Traffic data was provided by IBI Group for all main roads in the corridor for existing, baseline conditions (2006) and the future "do nothing" case (2035), as well as for each access road, plaza and crossing alternative in 2035.

Emission rates from these vehicles were input into the U.S. Environmental Protection Agency CAL3QHCR roadway dispersion model, which is accepted for use in Ontario by the MOE. The model was run using meteorological data from Windsor Airport, to determine predicted air pollutant concentrations at points on a grid that covered west Windsor, in addition to specific sensitive receptor locations and receptors used in the Social Impact Assessment (SIA), such as schools and places of worship.

Results to Date

Although this phase of the study focused on $PM_{2.5}$ and NO_x specifically, additional pollutants will be examined when assessing the technically and environmentally preferred alternative.

Presently, road based transportation sources are responsible for approximately 45% of the total NO_x emissions in the Windsor airshed. Emissions from the Huron Church Road corridor contribute approximately 2% of the total NO_x emissions to the Windsor airshed. Improvements in technologies and fuels will combine to reduce the emissions from transportation sources. Based on the regulated and anticipated changes in both Canada and the U.S., preliminary estimates indicate that annual emissions of NO_x from road related transportation sources in Windsor will be reduced from approximately 4000 tonnes in 2004 to 500 tonnes in 2035. Based on these projected decreases, road transportation related sources will likely comprise a much smaller fraction of the total emissions. For example, if emissions from all other sources remain the same, transportation related sources in Windsor will comprise less than 10% of the total regional NO_x emissions, even considering future growth in traffic volumes.

Fine particulate matter ($PM_{2.5}$) emissions from road based transportation sources are comprised of two contributing fractions. The first is tailpipe emissions resulting from fuel combustion. The second, and higher fraction, is from road dust, which is generated from the resuspension of surface material and debris, tire and brake wear, and roadway abrasion. Since total road emissions of $PM_{2.5}$ are predominantly comprised of road dust, $PM_{2.5}$ emissions will 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% of the total road based $PM_{2.5}$ emissions in Windsor. In future, tailpipe emissions of $PM_{2.5}$ will be reduced to less than 10% of the total $PM_{2.5}$ emissions through providing a continuous freeway for international traffic (avoids braking, idling and acceleration at traffic signals) between the present terminus of Highway 401 and the new border crossing and improvements in fuels and vehicle technologies.

Preliminary Assessment of Alternatives

Access Road Alternatives

Service Road Configurations

Preliminary modelling of air quality impacts of the Practical Alternatives indicates that between Alternatives 1 (one-way service roads) and 2 (parallel 2-way service raods), there is very little difference in the predicted changes to $PM_{2.5}$ and NO_x concentrations.

Route Alignments 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 preliminary air dispersion modelling results indicate that there is a slight difference in the change in $PM_{2.5}$ and NO_xconcentrations between Option 1 and Option 2 at receptors located within 50 m (164 ft) of the right-of-way (ROW) between St. Clair College and Howard Avenue. Receptors located to the north of the proposed ROW experience slightly higher predicted concentrations with the Option 1 alignment versus the Option 2 alignment. This difference is primarily due to the change in the proximity of these receptors to the proposed ROW.

Right-of-Way Elevation (i.e. at-grade vs. depressed vs. tunnelled)

Preliminary modelling of air quality impacts of the Practical Alternatives indicates that within 50 – 100 m (164 – 328 ft) from the ROW there are differences between the alternatives. For example, within 100 m (328 ft) from the ROW, depressed sections show slightly lower predicted concentrations of $PM_{2.5}$ and NO_x than at-grade sections. Beyond 100 m (328 ft), there is no discernible difference between at-grade and depressed alternatives.

Depressed alternatives result in a reduction in $PM_{2.5}$ concentrations in the vicinity of the ROW, in comparison to at-grade alternatives. NO_x concentrations are also reduced with depressed alternatives in comparison to at-grade alternatives in the vicinity of the ROW.

The tunnel alternative results in lower concentrations of $PM_{2.5}$ relative to at-grade and depressed alternatives in the vicinity of the ROW.

The tunnel alternative with a ventilation building results in slight decreases in the maximum predicted 1-hour NO_x concentration in the vicinity of the ROW, relative to at-grade and depressed options. However, slight increases in the maximum predicted 1 hour NO_x concentrations are indicated over a broader area in comparison to the at-grade and depressed options. This reflects the dispersion characteristics of the exhaust stacks at the ventilation buildings.

Tunnel Ventilation Options

Four different options for tunnel ventilation are being assessed. These are as follows:

- Option 1A – Two ventilation buildings each located approximately one third away from the main tunnel entrance/exits
- Option 1B – Two ventilation buildings each located at the main tunnel entrance/exits
- Option 1C – A single ventilation building located approximately half-way between the tunnel main entrance/exits
- Option 2 – Jet fans placed on the tunnel ceiling throughout the tunnel with pollutants being exhausted out the portals instead of ventilation buildings

The preliminary 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) is least preferable as it produces the highest concentrations in $PM_{2.5}$ and NO_x at the receptors relative to the other three ventilation options. Also, the jet fans tunnel alternative resulted in higher predicted 1 hour maximum NO_x concentrations in comparison to the at-grade and depressed options, for all of the sensitive and SIA receptors examined.

Of the three ventilation building options assessed, each showed similar slight changes in NO_x and $PM_{2.5}$ concentrations, relative to each other. In general, Option 1B indicated slightly higher concentrations for both $PM_{2.5}$ and NO_x at many of the sensitive and SIA receptors examined.

Plaza Alternatives

Four plaza alternatives are currently being studied (Plazas A, B, B1 & C). The preliminary results indicate that each of the four plaza alternatives studied results in increases in the predicted maximum $PM_{2.5}$ and NO_x concentrations in the vicinity of each of them. 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. In Sandwich Towne, there is no discernible difference in the maximum predicted concentrations between Plaza B and Plaza C.

The effects of Plaza A are seen primarily in the immediate vicinity of the plaza footprint. However, there is no discernible difference in maximum predicted $PM_{2.5}$ and NO_x concentrations between Plaza A and Plaza B alternatives in this area. This is likely due to the effects of the connecting road that leads to Plaza B.

Crossing Alternatives

Three bridge crossing alternatives are currently being studied. Preliminary atmospheric dispersion modeling indicates that each of the three crossing alternatives results in increases in the predicted $PM_{2.5}$ and NO_x concentrations in the vicinity of the crossings and the connecting route between each plaza and bridge. Changes in the predicted concentrations of $PM_{2.5}$ and NO_x resulting from Crossings A and B are primarily seen in the area to the west of Ojibway Parkway/E.C. Row Expressway interchange at non-sensitive receptors. In Sandwich Towne, there is no discernible difference in the predicted maximum $PM_{2.5}$ and NO_x concentrations from these crossing alternatives.

However, Crossing C (including the connection to the crossing from the plaza sites) shows slight increases in the predicted maximum $PM_{2.5}$ and NO_x concentrations in Sandwich Towne.

Remaining Activities

Modelling of the changes in air quality is ongoing. Further analysis of the data is required to assess all of the potential changes to air quality, to assess specific impacts or benefits related to individual alternatives. The results presented in this document are preliminary, and are subject to change.

Additional activities to be completed are as follows:

- additional analysis of alternatives, including modelling of interim future years (2015 and 2025)
- further refinement of traffic data, emissions and final QA/QC of results
- assessment of refinements to alternatives.

These tasks will be completed in the following months, such that all analysis will be completed and the results finalized in 2007.

Protection of Community and Neighbourhood Characteristics: Noise Impact Assessment

This document provides an overview of the noise impact analysis completed to date as part of the Detroit River International Crossing (DRIC) Environmental Assessment.

Noise is generally described as unwanted sound. However, noise and sound are sometimes used interchangeably. The unit used for measuring sound is the decibel (dB). To better reflect the response of human receptors to sounds measured by instruments, "*weighting scales*" are used. The "*A weighted scale*" is used to duplicate the human response to the audible frequency range. Sound levels so adjusted are referred to as "*A weighted decibels*" and assigned the unit abbreviation dBA.

Purpose of the Noise Impact Assessment

The Ontario Ministries of Transportation (MTO) and the Environment (MOE) have developed a specific protocol for establishing noise impacts from transportation projects. In general terms, the noise impact is determined by comparing the noise specifically caused by the project, with the existing noise experienced by sensitive receptors in the vicinity of the project. Where the project noise exceeds the background/existing noise levels by five or more decibels (dB) mitigation measures including sound barriers are to be considered for the project.

How the Analysis was Done

The methodology for estimating noise levels consisted of the following key steps:

1. Traffic data was established for the current year, as well as for future years (2015, 2025 and 2035), representing baseline conditions and for each access road alternative. For each alternative, certain key information was determined, including Annual Average Daily Traffic (AADT), percentage of automobiles, percentage of heavy and medium trucks, speed limit, road elevation, local topography, surrounding ground conditions, etc.
2. Sensitive noise receptors were identified. The receptors selected for assessment were those that were most potentially impacted by the various alternatives. Multiple receptors were selected to capture the anticipated variations in exposure to noise from traffic based on the alignment of existing roads, the alignment of the Practical Alternatives, and variations in traffic volumes. On this basis, a total of 35 receptors were selected.
3. For the year 2035, baseline ("no-build") and project noise levels were estimated at each of the receptors identified for each access road alternative, using the MOE's STAMSON traffic noise model. The key inputs to the STAMSON noise model are: traffic volume, percentage of automobiles, percentage of heavy and medium trucks, posted speed limit, road gradient, road surface type, local topography, surrounding ground surface cover, noise source height, receptor height and source to receptor distance.
4. The CADNA-A noise model was used to estimate receptor noise levels for each of the four plaza and corresponding crossing alternatives. This model, approved by the MOE, can be used to predict noise levels from both stationary and mobile noise sources. The modelling approach considered vehicle queuing, idling and acceleration. The key inputs to this model included maximum hourly vehicular traffic (cars and trucks), plaza layout, vehicle sound levels, locations of vehicles at plaza sites.

Results to Date

1. In general, in comparison with at-grade alternatives (1A and 2A), the depressed alternatives (1B and 2B) seem to generate lower noise levels at the receptor locations. Of all the alternatives, Alternative 2B had the least occurrences where the project sound levels exceeded the background sound levels by greater than five dB. Noise mitigation is to be considered whenever the project sound levels exceed the receptor background sound levels by greater than five dB.
2. The route segment extending from Malden Road to Pulford Street showed increases in sound levels beyond the future base case ("do nothing" alternative)) with both the at-grade and depressed alternatives. The increases in

this route segment were often greater than five dB at the receptors; therefore, noise mitigation measures are to be considered.

3. In cases along the access roads where receptors were estimated to receive greater than a five dB increase in sound levels, additional assessment was undertaken. For each segment where such exceedance was predicted, the effect of a 5 m (16 ft) high noise barrier was estimated for either the receptor with the highest estimated exceedance, or the area within the segment with the highest cluster of homes. In all cases, the noise barrier was effective in reducing the predicted project noise to within five dB of the estimated baseline noise levels.
4. Receptors along the crossing approach roadway from Matchette Road to Malden Road, which connects to the Plaza B, B1 and C alternatives, are likely to experience a high noise impact from all access road alternatives (i.e. greater than 10 dB increase above background receptor sound levels). The impact is expected to be highest near the Matchette Road/E.C. Row Expressway intersection, due to the proximity of the closest receptor to the roadway right-of-way (~50 m or 164 ft), the roadway elevation (8 m or 26 ft above grade), and high traffic volumes. The effectiveness of implementing noise mitigation measures in this area is currently being assessed.
5. The noise from the plaza locations will not result in significant noise level increases at the receptors closest to the plazas. In most cases, the receptors are more than 50 m (164 ft) away from the plazas. However, a high noise impact (greater than 10 dB above background receptor sound levels) is anticipated for receptors adjacent to all crossings. Noise mitigation measures are to be considered for these crossings.

Remaining Activities

The assessment of the changes to noise levels associated with the tunnel alternative (Alternative 3) will be completed. This will include consideration of noise emanating from the portal areas as well as the ventilation buildings. In addition, the noise impact assessment for all alternatives will be completed for the 2015 and 2025 traffic scenarios.

Once completed, this work will be incorporated into the assessment of Practical Alternatives.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Protection of Community and Neighbourhood Characteristics: Social Impact Assessment

Social impact assessment is being undertaken to assess the social consequences that are likely to follow from the construction and operation of the Detroit River International Crossing (DRIC), including the access roads and plaza, as well as to identify ways of reducing negative effects.

How the Analysis was Done

Social impacts can occur at various units of social order: individuals, businesses, families, communities, economic sectors or broader societal units such as whole cultures or nations. For the purposes of this analysis, a property was considered displaced (buyout) if any part of the property is directly impacted by the proposed right-of-way (ROW) of the access road, the service roads, plazas or crossings. A final decision on acquiring properties will be made on a property-by-property basis once the study team has identified a preferred alternative and the associated property requirements are defined.

The social impact assessment for the analysis of Practical Alternatives for the DRIC study involved an assessment of several indicators, including:

- number of households/dwellings displaced
- number of households/dwellings disrupted
- number of special populations displaced
- qualitative and quantitative assessment of social features and uses displaced
- qualitative and quantitative assessment of social features and uses disrupted
- qualitative assessment of the impact on community cohesion, character, and function.

The property limits of potentially displaced households were obtained from the local municipality and mapped using ArcGIS 9.1 Geographical Information System (GIS) software.

Residences that could be displaced by any of the Practical Alternatives under consideration were mailed a questionnaire. Follow-up contact was made to non-respondents by re-sending the questionnaires and by contacting them directly by phone. Of a total of 479 questionnaires, 294 (61%) of property owners completed the questionnaire.

Focus group meetings were used to collect information from residents that may be displaced or disrupted. Residents living within the DRIC Area of Continued Analysis were invited to a focus group meeting held October 21, 2006. A total of 78 people representing 57 households attended the focus group meetings.

Participants completed a mental mapping exercise that provided information on how participants define their neighbourhood boundaries and interact within the community, including where people shop for groceries, worship, and recreate.

Results to Date

Households/Dwellings Displaced

Property requirements and the consequent displacement of households and dwellings (all forms of housing) can have a negative impact on community residents (owners and tenants). The total number of households potentially displaced was identified. For this study, the terms ‘households’ and ‘dwellings’ are used interchangeably.

Preliminary results indicate that:

- The number of households potentially displaced by the access road alternatives varies between 125 to 220, depending on the alignment and location of service roads.
- The tunnel alternative generally results in fewer household displacements than the other alternatives.

- The one-way service road alternatives (Alternatives 1A and 1B) displace fewer households than the parallel service road alternatives (Alternatives 2A and 2B).
- More households are displaced by the access road to Plaza A than with a connection to the other plazas.
- More households are displaced with the Plaza A alternative than Plaza B, B1 or C alternatives.
- More households are displaced by the access road by widening to the north (Windsor) side of Highway 3 than the south (LaSalle) side.

The completed questionnaires of potentially displaced households identified that:

- households with children under 18 represent 32% of total households
- households with adults over 65 years of age account for 26% of total households
- most dwellings are detached single family homes (79%) with 38% of residents living there for less than five years and 27% of residents living there between 11 and 30 years.

Households/Dwellings Disrupted

The extent to which each alternative may have short-term (i.e. during construction) and long-term (i.e. post-construction) disruptive effects to residents adjacent to the ROW, such as: dust, noise, lighting, visual intrusion, traffic, vibration, limitations in access to properties, loss of enjoyment of property, interruption of day to day activities, and pedestrian access/safety, as well as the ability to mitigate such effects, is presently being assessed.

In general, a mental mapping exercise conducted as part of a Focus Group workshop with residents showed that:

- Residents engage in activities within their general neighbourhood vicinity.
- Residents often considered their home as the hub of their community.
- Many residents consider Highway 3 and Huron Church the physical barrier or boundary to their neighbourhood.
- Neighbourhood boundaries vary from small areas concentrated in close proximity to homes, while others are widespread over several kilometres.
- Many residents indicated they appreciate the accessibility of the transportation network (E.C.Row Expressway, Highway 401, Highway 3).
- A common shopping spot is the Zehrs in LaSalle.

Focus group participants also discussed a series of questions aimed at understanding how they feel about their community, how they use their property and how the proposed project may impact on those uses. This data is being interpreted for inclusion in the assessment of the Practical Alternatives and additional workshops are being organized to gather more community input on disruption.

Social Features and Uses Displaced

Property requirements and the consequential displacement of social, recreational and cultural institutions can have a substantial negative impact on the users, employees and managers of such facilities. The measurement involved a quantitative assessment of the total number of institutional uses, wholly or partially, in the proposed ROW based on GIS mapping, field reconnaissance and key informant interviews. Interviews with facilities/institutional members provided information on programs, facility uses, service catchment areas, membership population, and access routes to the facilities.

The maximum number of institutions wholly and partially displaced along the ROW is three facilities with uses relating to religious functions, community outreach, recreation and leisure. This information will be used to compare the project alternatives.

Social Features and Uses Disrupted

The extent to which each alternative may have short-term (i.e. during construction) and long-term (i.e.post-construction) disruptive effects to institutional uses adjacent to the ROW such as: dust, noise, odour, lighting, visual

intrusion, traffic, vibration, limitations in access to properties, and pedestrian access/safety, as well as the ability to mitigate such effects, is presently being assessed. Institutional/social/recreational disruption is based on the qualitative assessment of information gathered from site visits, facility interviews with employees, focus group meetings and review of secondary literature/document sources.

Site visits were made to the facilities within close proximity to the Practical Alternatives which include: parks (Broadway, Ojibway, Malden, Indian Memorial, Bellwood, Beals, Veterans, St. Clair Athletic Field and Matthew Rodzick); Victoria Memorial Cemetery; recreational facilities (Oakwood Community Centre, South Windsor Recreational Complex); schools (Oakwood Public School, Montessori Pre-School, Ste. Cecile Academy of Music, Ste. Cecile Academy, The Children's House Montessori, Our Lady of Mount Carmel Separate School); and places of worship (Heritage Park Alliance Church, Our Lady of Mount Carmel Catholic Church, Evangelical Slavic Mission, Oakwood Bible Chapel, St. Charbel Maronite Catholic Church). These visits noted functional uses and public access to the sites/facilities. Site visits coupled with key informant interviews gathered information on the types of uses, description of existing facilities/equipment, population/catchment areas served, and personal opinions on how the DRIC project might affect the daily activities associated with each social feature.

General findings indicate that all parks and facilities would experience varying degrees of short-term disruption due to noise, traffic congestion, dust, and limitations in road access during construction. Some facilities voiced long-term disruption concerns due to reduced access points (that may sever their service area), heavier traffic and associated child/elderly safety concerns in accessing and using certain facilities/institutions. As these results are preliminary, detailed listings of disruption impacts for each facility will be prepared and incorporated in the analysis of Practical Alternatives.

Effects on Community Cohesion, Character and Function

Community cohesion is generally described as a measure of how a community is tied together. Some residents have identified that Huron Church Road and Highway 3 represents a barrier or boundary in their communities, citing high traffic volumes and limited access across and along the corridor. As well, residents are concerned that the proposed project has the potential to segment and divide existing neighbourhoods and communities. Social patterns, functions, and linkages in the community may also be disrupted, such as changes to community centre catchment areas as a result of changes in access. The Practical Alternatives also have the potential to address these issues and to upgrade or enhance connections between existing communities where there is currently a lack of social cohesion. A qualitative assessment of the impact of the undertaking on the function of existing neighbourhoods and identification of methods to reduce any such impacts is ongoing. Once completed, this information will be used in the assessment of the Practical Alternatives.

Data collection that contributes to this part of the analysis includes examination of existing and planned land uses as presented in Official Plans and other planning documents, field examination, focus group inputs, household questionnaires, comments recorded at public and stakeholder meetings, and key informant interviews.

Remaining Activities

The results of the analysis to date will be used to review alternative alignments and make refinements where possible to further reduce property and community impacts. Additional information on community features and characteristics is also being collected. This information will be incorporated in the analysis prior to determining a technically and environmentally preferred alternative.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Protection of Community and Neighbourhood Characteristics: Economic Impact Assessment

As part of the Detroit River International Crossing (DRIC) Environmental Assessment, the potential economic impacts of the access road, plaza and crossing alternatives are being assessed.

Purpose of The Economic Impact Analysis

The purpose of the economic impact analysis is to identify the potential positive and negative economic affects of a new border crossing and Highway 401 extension to the local and regional economies of the Windsor area.

The focus of the economic impact analysis is on assessing economic impacts to businesses along, and in close proximity to, the access road, plaza and crossing alternatives, within the Area of Continued Analysis (ACA). Economic impact data generated from this assessment will be used in conjunction with data from other disciplines, in the overall evaluation of the Practical Alternatives.

How the Analysis was Done

Over the past six months, several methods of data collection and analysis were used. These included:

- business surveys
- municipal business directories
- municipal property assessment data
- meetings with local business owners
- traffic forecasts
- other field analysis.

The principle considerations in assessing the degree of economic impact are:

- number of employees affected
- gross revenues of affected businesses
- impact on municipal tax base
- reliance of business on non-local traffic.

Results To Date

A substantial amount of analysis has been conducted regarding local business operations in Windsor and the potential impacts of the new highway access road and new international crossing.

Three areas of impact were identified:

- along the proposed highway access road
- within the plaza and crossings
- outside of the ACA.

Some of the preliminary findings include:

Commercial

- Approximately 83 businesses exist today along the proposed access road, not including businesses within designated industrial parks. The majority of these businesses are highway-oriented, including restaurants, accommodation, retail and gas stations. The largest concentration of businesses is found in the Windsor Crossing Premium Outlets, with 45 businesses.
- Between 25 and 45 businesses along Highway 3/Huron Church Road will be displaced by any option. Other remaining businesses will likely be disrupted through property infringement and/or by a reduction in traffic access or visibility.
- The displacement and disruption of commercial businesses is estimated to result in a loss of revenue of approximately $10 million and approximately 100 jobs.
- The nature of the retail businesses affected is such that this economic activity and the jobs lost will likely be replaced elsewhere in the Windsor area through both existing and new developments.
- There are notable differences among the various access road alternatives in terms of economic impact. The tunnel option (Alternative 3) is considered to have the highest impact to local businesses. In addition to the number of businesses and the volume of business activity displaced – 44 businesses which is higher than some of the options – there will be substantial disruption to the majority of the remaining businesses, especially as a result of loss of highway visibility. The at-grade freeway option with adjacent 2-way service roads comprised mostly of the existing Huron Church Road (Alternative 2A) displaces the fewest number of businesses relative to the rest of the alternatives and is expected to create the least economic disruption with less obstruction to both access and visibility.

Industrial

- Businesses in the area of the crossings and Plazas B and C are predominately industrial in nature. These businesses are some of Windsor's largest employers.
- Economic impact varies greatly between each of the potential locations of the crossings and plazas. Preliminary economic impacts from displacement/dislocation within certain crossing and plaza locations can result in approximately 100 job losses and a loss of revenue close to a $100 million.
- These impacts to industrial businesses are more directly associated with displacement and property infringement. Access and visibility are less of a concern for such businesses.
- With Crossing A connecting to Plaza A, no businesses are expected to be displaced or substantially disrupted. Crossing B connecting to Plaza A is very similar with limited business disruption expected.
- All options that involve Crossing C displace at least five businesses and disrupt several more. The businesses that are displaced and disrupted are all significant industrial businesses.

Outside of the ACA

- Regional economic impacts, beyond the ACA, are mostly positive. Industrial businesses, especially those close to the proposed crossing and access route, will be positively affected as a result of less local traffic congestion and improved transportation for the movement of people goods, as a result of less local and border traffic congestion and increased highway capacity and speed.
- Commercial businesses, including those that are tourism based, will also benefit from less traffic congestion for tourists travelling through the region.
- Businesses likely to be negatively affected are those businesses that are highway dependant; namely, those that rely on heavy volumes of non-local traffic i.e. restaurants, accommodation, and gas stations. These affects can be mitigated depending on degree of access provided with new access road and associated signage.

Interpretation

The economic impact assessment has led to two preliminary conclusions:

1) The negative economic impacts are expected to be almost entirely locally oriented, affecting businesses within the ACA and some within close proximity. The businesses that are potentially affected, with the exception of some industrial businesses and the Windsor Crossing Premium Outlets, are relatively small in terms of employment and annual revenue.

2) The positive economic impacts that the proposed access road and new international crossing will have in Southern Ontario and the greater Windsor region, including the city of Windsor and the towns of LaSalle and Tecumseh will be substantial. International exports account for $225 billion in provincial GDP, this represents over 40% of Ontario's GDP. It is estimated that the Windsor-Essex County area accounts for over 3%, $7.5 billion, of Ontario's international export GDP. Given the economic scale, any improvement to the speed and efficiency of goods and services crossing the border will have a tremendous impact on the economies of both Ontario and the Windsor-Essex County area. In addition, there is expected to be greater opportunity for industrial and large-scale commercial development along Highway 401 within the Windsor-Essex County area. The region will become more attractive for tourists from the United States to travel into the Windsor area and the reduction of traffic along local streets will, in many cases, assist local businesses.

The negative local economic impacts of the proposed highway, plaza and border crossing are not perceived to be substantial enough to out-weigh the expected regional and provincial economic benefits.

Remaining Activities

Businesses that have not completed a survey will be contacted for their input in order to allow as many businesses as possible to be accounted for and heard from in the analysis. This information will be used to update and refine the data collected to date and incorporated in the assessment of Practical Alternatives.

Consistency with Existing and Planned Land Use

As part of the impact assessment of the DRIC study, an analysis of potential land use impacts was, and continues to be, conducted. This assessment's goal is to examine what currently exists in this area, what is planned and what impacts the Practical Alternatives may have on the land use.

How the Analysis was Done

An analysis of land use has been conducted for the Practical Alternatives for the access road, inspection plaza and river crossing based in part on information provided in the City of Windsor Official Plan (April 2000), zoning bylaws for the City of Windsor, the Huron Church Road Urban Design Master Plan & Development Guidelines (February 2006), the Olde Sandwich Towne Community Planning Study Report (October 2006), as well as Town of LaSalle and Town of Tecumseh Official Plans. Field reviews were also conducted to verify current land uses. Approved development plans obtained by the study team were also incorporated in the analysis.

Results to Date

Access Road Alternatives

The Highway 3/Huron Church Road corridor has served as an access road to the Ambassador Bridge for over 75 years. 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 shield roadway impacts. Development in the Town of LaSalle has also been planned to limit access to Highway 3 at signalized intersections only.

Land uses within the access road corridor consist of residential, commercial, and vacant or open 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 strategy. In addition, future commercial land uses have been identified adjacent to Highway 3 across from St. Clair College and future residential land uses have been identified on the vacant lands adjacent to E.C. Row Expressway.

As the future right-of-way for the access road is wider than that of the existing road right-of-way, there will be impacts to land use with the access road alternatives. The extent of impacts of the alternatives and opportunities to reduce the effects of these impacts to land uses adjacent to the corridor is being investigated. Effects may be reduced through access features, aesthetics and other treatments to reduce the presence of the freeway, and planning of uses for remnant properties or parcels

The proposed access road will alter somewhat the land use characteristics of the Highway 3/Huron Church Road corridor. 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 (at-grade, depressed or tunnelled) and widening the transportation corridor will have localized impacts on land use.

The new access road has the potential to impact land uses in the area of the E.C. Row Expressway, due to a loss of vacant lands zoned for residential uses, but which presently provide a naturalized buffer between residential and transportation uses. The Plaza A option is located between the E.C. Row Expressway and a predominantly residential and natural area in the Spring Garden Planning Area, as defined by the City of Windsor Official Plan. The

Spring Garden Planning Area is a largely residential community encircling an expansive natural area feature, the Spring Garden Area of Natural and Scientific Interest (ANSI). A new residential subdivision development has begun in this area with approximately 20 homes completed. Placing a plaza adjacent to a residential and natural area is not consistent with the established zoning for the area. It has the potential to conflict with the neighbourhood characteristics of the area and may disrupt the manner in which this area functions as a cohesive neighbourhood.

Plaza and Crossing Alternatives

The plaza alternatives situated primarily in the industrial area of west Windsor are more consistent with existing and planned land use. A plaza is considered more compatible with industrial uses. Plaza C disrupts water-dependant industrial land uses, as such, relocation of these industrial uses elsewhere along the Detroit River may be difficult. Plaza C and Crossing C are also located closest to the Sandwich community. Recently, the City of Windsor adopted the Olde Sandwich Towne Community Planning Study Report, which is designed to provide direction for residents and business owners to actively participate in the plan-making and priority-setting process for the community. The plan outlines the continuation of industrial land uses in the waterfront area under consideration for Crossing C.

Impacts to individual properties (e.g. property acquisition, displacements and indirect effects) are considered in the 'Protection of Community and Neighbourhood Characteristics' and 'Maintain Air Quality' factors.

Hazardous Waste and Waste Management

Consideration of hazardous waste, waste management and potential impacts to contaminated sites is considered as part of the broader 'Maintain Consistency with Existing and Planned Land Use' factor. The evaluation of hazardous waste and waste management sites were based on data collected from selected environmental databases, aerial photographs, base land uses, technical reports, historical topographic maps and fire insurance maps. There are no known properties along the access road options that have been identified as being contaminated/disposal sites. Land uses associated with industrial operations near the western riverfront (i.e. in vicinity of Plazas B, B1 and C as well as Crossings B and C) are among those that are listed as being known contaminate/disposal sites. These sites include properties that historically were part of a municipal waste disposal landfill or construction debris disposal site, but that are currently assigned to different land uses, such as a hydro corridor across the landfill.

Remaining Activities

Consultation with municipal planning staff and the local communities will be held to more specifically identify land use impacts associated with the project and means of mitigating such impacts, as appropriate. This work will be undertaken as part of the on-going consultation process for the DRIC study.

As part of the impact assessment of the Detroit River International Crossing (DRIC) study, an assessment of built heritage features and cultural landscapes is being undertaken. 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.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Protection of Cultural Resources:
Built Heritage Features Impact Assessment

As part of the impact assessment of the Detroit River International Crossing (DRIC) study, an assessment of built heritage features and cultural landscapes is being undertaken. 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.

Purpose of the Cultural Heritage Features Impact Assessment

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. Additional information was sought from the residents of Sandwich with respect to locally identified sites of heritage significance.

Built Heritage Features (BHF): generally defined as structures or objects that are 50 years of age or older.

Cultural Landscapes 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.

How the Analysis was Done

Historical research was conducted to identify broad agents or themes of historical change and cultural landscape development in this area. Previously identified heritage resources were then categorized according to their heritage protection status and their inclusion on municipal, provincial and federal inventories and heritage designation lists. All heritage sites and heritage sensitive areas were mapped using Geographic Information Systems (GIS) data co-ordinates.

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 (BHFs) and Cultural Landscape Units (CLUs) that were then added to the inventory. An inventory page was prepared for each above-ground cultural heritage resource and all features of heritage interest were mapped using GIS data co-ordinates.

Results to Date

Within the ACA there are 17 BHFs and three CLUs. Of these, one property is listed on the City of Windsor's heritage inventory and one monument was erected by the Historic Sites and Monuments Board of Canada to commemorate the Capture of Detroit. The majority of the field identified built heritage features were constructed between 1900 and 1930 and are residences of the same general building type and era. These houses represent the first suburban infill of rural agricultural lands in the early twentieth century. The heritage significance of these houses has not been determined but will be confirmed as part of the assessment of Practical Alternatives. At this time, it is known that only three BHFs pre-date 1900. Also of interest is Branch 594 of the Royal Canadian Legion, which was constructed in the early 1960s. Although the Legion does not meet the 50 year cut off date, it is considered to be of historic importance to the community.

The three CLUs identified within the ACA are:

1. a reported tunnel associated with the Underground Railroad in Sandwich (background research has yet to confirm the location this feature)
2. the abandoned Brighton Beach subdivision, and
3. historic Sandwich.

Although no significant portion of Sandwich is within the ACA, Sandwich as a whole is a heritage sensitive area and the selection of a bridge crossing location must take into account any direct or indirect impacts on the adjacent historic community. These impacts may include the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting.

For the purposes of this assessment, a heritage feature was considered to be displaced if the proposed right-of-way for the new crossing, plaza or access road passed through the property limits of the heritage feature. A feature was considered disrupted (indirectly affected) if the edge of the proposed right-of-way was within 50 m (164 ft) of the heritage feature.

Access Road Alternatives

In total, nine built heritage features will be potentially displaced by access road alternatives. Of these, two features (a pre-1900 farmhouse and the Royal Canadian Legion) are of potential heritage significance.

Plaza Alternatives

Plaza A will displace two features in the Malden Road area. Both are houses constructed prior to 1940, one of which is on the municipal heritage inventory. Plaza B and Plaza B1 will both displace three houses in the former Brighton Beach area. These features are of indeterminate significance although one is likely a pre-1900 farmhouse.

Crossing Alternatives

Depending on which crossing alternative is selected, between two and five homes constructed before 1954 will be disrupted or displaced. Crossing A doesn't displace any BHFs but it disrupts three, Crossing B displaces three BHFs, Crossing C1 will displace five BHFs (including a historic monument) and Crossing C2 will displace three BHFs (including a historic monument).

Practical Alternative	BHFs Displaced	BHFs Disrupted	CLUs Displaced	CLUs Disrupted
Access Roads	9			
Plaza A	2			
Plaza B	3			
Plaza B1	3			
Crossing A		3		Portions of Brighton Beach area
Crossing B	3			
Crossing C	5			
Crossing C2	3			

In addition, the three crossings have the potential to disrupt identified cultural landscapes in this area of the city. Portions of the Brighton Beach area will be affected by all crossing alternatives, while Crossing C will disrupt two additional CLUs - the underground tunnels reported to be in the Chappell/Russell area and the Sandwich vista.

Remaining Activities

The next steps in the cultural heritage impact assessment include verification of the heritage significance of those features in the ACA that are potentially displaced or disrupted by the Practical Alternatives. This can include further research, field reviews, and interviews with property owners and/or local heritage conservation representatives. Additional research will be conducted to confirm the location of the Underground Railroad tunnel.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Protection of Cultural Resources: Archaeological Assessment

As part of the impact assessment of the Detroit River International Crossing (DRIC) study, an assessment of the impacts of the archaeological sites and areas of archaeological potential within the Area of Continued Analysis (ACA) is being undertaken.

Following the generation of Practical Alternatives for the crossing, plaza and access road, 'properties of interest' in the vicinity of these alternatives were identified for investigation. The archaeological assessment is ongoing. Many of the properties of interest have been investigated over the past several months.

How the Analysis was Done

The archaeological assessment involves up to four stages of investigation:

Stage 1 – Evaluation of Archaeological Potential
Stage 2 -- Property Assessment
Stage 3 – Site-specific Assessment
Stage 4 – Protection and Avoidance, Excavation or Construction Monitoring.

To date, Stage 1 has been completed and the DRIC study team and their consultants are currently conducting Stage 2 archaeological fieldwork.

Stage 1: Evaluation of Archaeological Potential

The tasks involved in the Stage 1 investigation include:

- detailed documentary research of the archaeological and land use history
- an inspection visit to the area to gain first hand knowledge of the area's geography, topography, and current conditions and to determine and map the potential for archaeological resources
- evaluate the area's potential to contain archaeological remains.

Based on the Ontario Ministry of Culture's criteria for determining archaeological potential (Ministry of Culture 2006), the following areas within the Area of Continued Analysis (ACA) were considered to have archaeological site potential, pending a determination of the likely integrity of any archaeological resources.

For Aboriginal (Pre-contact and Contact Period) Archaeological Sites

- Areas within 250 m (820 ft) of a known archaeological site, where location information for the site is relatively precise
- For sites with relatively imprecise location information, the area wherein such sites are likely to be located based on available descriptive information
- Areas within 300 m (980 ft) of a primary water source such as a lakeshore, river, or large creek
- Areas within 300 m (980 ft) of an ancient water source such an ancient shoreline, relict beach features, or former watercourse as shown on historic mapping
- Areas within 200 m (656 ft) of a secondary water source such as a stream, spring, wetland, swale, or drain
- Areas within 200 m (656 ft) of the edge of the Ojibway Prairie.

For Euro-Canadian Archaeological Sites

- Areas within 250 m (820 ft) of a known archaeological site, where location information for the site is relatively precise
- For sites with relatively imprecise location information, the area wherein such sites are likely to be located based on available descriptive information
- Designated heritage properties and easements
- Cemeteries

- Core settlement areas (towns, villages) where it is possible to make a reliable determination based on analysis of period maps
- Areas within 100 m (328 ft) of the centreline of existing roadways that follow the approximate alignment of historic roadways, or within 100 m (328 ft) of the approximate alignment of no-longer-extant roadway corridors as determined by period map examination
- Areas within 250 m (820 ft) of the likely location of historic features (dwellings, mills, churches, cemeteries, etc.) as shown on more precise period maps.

During the Stage 1 assessment of the ACA, archaeological potential was determined to be present. As a result, the archaeological assessment proceeded to Stage 2 fieldwork.

Stage 2: Property Assessment (Survey)

The Stage 2 assessment consists of the systematic field investigation of areas determined to have archaeological potential. This assessment was conducted on properties in the areas of interest impacted by or in proximity to the Practical Alternatives. Permission to Enter (PTE) from the property owner was obtained before the property of interest was investigated. This assessment involves the documentation and inventory of archaeological resources within those areas. Field methodology involves two types of survey - pedestrian and test pit.

Lands subject to Stage 2 archaeological field survey have been assigned priority levels (Priority 1 through Priority 5, with Priority 1 being the highest). The priority levels indicate the order in which lands are being surveyed and were determined based on criteria pertinent to the project: proximity to sensitive known Aboriginal sites, and critical to the evaluation and siting of the various Practical Alternatives.

Pedestrian survey is conducted on lands with open surface visibility (e.g. lands that are ploughed or with open, immature crops), and it involves the location, mapping and collecting of artifacts observed on the surface.

Test pit survey is conducted on lands with closed surface visibility (e.g. scrub farmland, windrows, lands within forest or valley floor, or with dense, mature crop), and it involves the location, mapping and collection of artifacts by test pitting using hand shovels.

Results to Date

Sixteen Aboriginal and 14 Euro-Canadian archaeological sites have been located within the higher priority lands of interest that have been surveyed to date. No substantive finds are associated with any of these sites, with the exception of one find of pre-contact ceramic shards.

With respect to the Practical Alternatives for the access road, at this time, there is no notable difference among the alternatives in terms of potential to disturb archaeological features. No known sites of high to moderate significance are impacted. Additional investigations are being undertaken to verify the finds made and complete the field reviews.

Analysis of crossings and plazas are incomplete at this time. The majority of the lower priority lands are situated in these areas.

Remaining Activities

The consultants are continuing Stage 2 archaeological assessment as follows:

Priority 1 Lands

- Over 95% of the available properties of interest have been surveyed to date within the ACA.
- Outstanding properties to survey: 3 small parcels outside of right-of-way lands at north-west quadrant of Huron Church Road and E.C. Row Expressway.

Priority 2 Lands

- Over 95% of available properties of interest have been surveyed to date.
- Outstanding properties to survey must be ploughed prior to pedestrian survey.

Priority 3 Lands

- Approximately 60% of the available properties of interest have been surveyed to date.
- Expect to complete Priority 3 lands by early December.

Once the fieldwork is complete, the Stage 2 assessment report will be produced. This report will make recommendations on further archaeological assessment where necessary. It is anticipated that Stage 2 archaeological assessment will continue in 2007 on Priority 4 and 5 lands within the ACA.

It is also anticipated that Stage 3 archaeological assessment (and possibly Stage 4 archaeological work) may be conducted on sites determined by the Stage 2 assessment to have archaeological interest, and this work would likely commence in 2007.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Protection of Natural Environment: Natural Heritage Features Impact Assessment

Assessing the project impacts to natural features such as fish and fish habitat, vegetation and vegetation communities and wildlife and wildlife habitat is an important part of the Detroit River International Crossing (DRIC) Environmental Assessment. The analysis of natural heritage features entailed a three-season program of field investigations, as well as research and interviews.

FISH AND FISH HABITAT

The DRIC study team investigated all watercourses and waterbodies located within the Area of Continued Analysis (ACA) to confirm the presence/absence of fish and fish habitat and species at risk.

How the Analysis was Done

Background information was obtained from Fisheries and Oceans Canada, Ontario Ministry of Natural Resources (MNR) and Essex Region Conservation Authority (ERCA). Field investigations were performed in May, September and October 2006. The fish community was investigated at 58 stations using backpack electrofishing equipment, minnow traps, dip nets or direct observation. Fish habitat along 38 watercourse reaches was characterized and photographed. The Detroit River bed was also videotaped using underwater video camera and sediment was sampled.

Results to Date

Most watercourses in the ACA are designated as agricultural municipal drains and are altered by agricultural or urban development. No watercourses or waterbodies in the ACA support coolwater or coldwater fish communities. The Detroit River, Turkey Creek, Lennon Drain, McKee Creek and Cahill Drain directly support warmwater sportfish communities (i.e. bass, sunfish, etc.). Remaining fish habitat supports warmwater baitfish communities (i.e. minnows, chubs, etc.). Many watercourses function as drains and do not support fish habitat. No critical fish habitat or fish species at risk were identified in the ACA.

VEGETATION AND VEGETATION COMMUNITIES

The DRIC study team investigated all vegetation communities located within the ACA to classify vegetation communities, inventory plants and confirm the presence/absence of species at risk.

How the Analysis was Done

Background information was obtained from MNR, ERCA and local field naturalists. Field investigations were performed in April, May, June, July, August and September 2006, throughout the growing season. Vegetation communities were delineated on air photos and refined through ground truthing. The Ecological Land Classification (ELC) system was used to describe vegetation communities.

A plant survey was conducted in each vegetation community to identify composition, structure and function. Representative photographs were taken. Species at risk were identified in the field where possible or photographs or samples were taken for identification or verification purposes. The locations of species at risk were recorded using a Global Positioning System (GPS).

Results to Date

- Seven types of vegetation communities located in the ACA are considered rare, very rare or extremely rare in Ontario and very rare, imperiled or critically imperiled globally.
- Fifty-five plant species located in the ACA are considered rare, very rare or extremely rare in Ontario.
- Three plant species (dense blazing star, colicroot and climbing prairie rose) are regulated as "threatened."
- One plant species (butternut) is regulated as "endangered" in Schedule 1 of the *Species at Risk Act*.

Access Road Alternatives

Among the access road alternatives:

- Alternative 2A (at-grade with parallel service road) impacts a greater area of tallgrass prairie and deciduous swamp (between 1.54 and 1.98 ha) than the other access road alternatives.
- Alternative 2B (depressed with parallel service road) impacts between 0.92 and 1.36 ha.
- Alternatives 1A (at-grade with one way service roads) and 1B (depressed with one way service roads) and Alternative 3 (cut and cover tunnel) impact between 0.38 and .092 ha.
- Access roads connecting to Plaza A impact a greater area of tallgrass prairie than those connecting to Plazas B, B1 or C, reflecting the presence of tallgrass prairies in the Spring Garden Road/Malden Road area.

Between 70 and 159 specimens/colonies of provincially rare plants are impacted by the access road alternatives, with minor differences among the alternatives in terms of impacts.

Plaza Alternatives

Among the plaza alternatives:

- Plaza A impacts approximately 3 ha of tallgrass prairie.
- Plazas B and B1 impact between 1.1 and 1.4 ha.
- Plaza C impacts 1 ha.

The impacts with Plaza B and C alternatives result primarily from the roadway connections into the plazas from the Malden Road area.

Practical Alternative	Impacts to tallgrass prairie and deciduous swamp	Impact to specimens/ colonies
Access Road 1A	Between 0.38 – 0.92 ha	
Access Road 1B	Between 0.43 and 0.86 ha	
Access Road 2A	Between 1.54 – 1.98 ha	
Access Road 2B	Between 0.92 and 1.36 ha	
Plaza A	3 ha	Up to 149
Plaza B	Between 1.1 – 1.4 ha	Up to 79
Plaza B1	Between 1.1 – 1.4 ha	Up to 79
Plaza C	1 ha	Up to 79

Similarly, Plaza A results in a greater impact to specimens/colonies of provincially rare plants (up to 149 specimens/colonies impacted) in comparison to Plaza B/B1 (both up to 79 specimens/colonies impacted) and Plaza C (up to 79 specimens/colonies impacted).

WILDLIFE AND WILDLIFE HABITAT

The study team investigated all wildlife habitats located in the ACA to identify important habitat for wildlife, inventory wildlife and confirm the presence/absence of species at risk.

How the Analysis was Done

Background information was obtained from the MNR, ERCA and local field naturalists. Field investigations were performed in March, April, May, June, July, August, September, October and November 2006. Wildlife habitat was delineated on air photos and refined through ground truthing. The Ecological Land Classification (ELC) system was used to describe wildlife habitat, where appropriate.

Wildlife was identified through direct observation, vocalizations, tracks, scats and browse. One hundred and twenty point-count breeding bird surveys were performed at 60 stations. Species at risk were identified in the field and a photograph was taken for verification purposes. The locations of species at risk were recorded using a GPS.

Results to Date

One hundred and twenty-one wildlife habitat units were identified and fifty species of breeding birds were recorded in the ACA. Three eastern foxsnake and four Butler's gartersnake were recorded in the ACA. Both species are regulated as "threatened" in Schedule 1 of the *Species at Risk Act*.

One notable potential impact among the alternatives is to the habitat of the Butler's gartersnake. The area between Malden Road and Matchette Road alongside E.C. Row Expressway has been identified as habitat for Butler's gartersnake. This area is more highly impacted by Plaza A, although the access road into Plazas B, B1 and C also impacts this area to a lesser extent.

Remaining Activities

Information collected from background sources and through field investigations will be compiled and used to compare Practical Alternatives. No further field investigations are planned at this time.

The results of this assessment will be reviewed with appropriate government agencies following the Public Information Open Houses.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Improvements to Regional Mobility

As part of the impact assessment of the Detroit River International Crossing (DRIC) study, a review of transportation systems in 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.

How the Analysis was Done

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.

Existing traffic volumes were collected from a variety of sources including a series of traffic surveys undertaken by the study team in February 2006. The Practical Alternatives were assessed for measures of effectiveness such as levels of service, intersection delays, travel times, as well as network flexibility/local connections and anticipated changes to travel patterns.

The Synchro 6 and HCS 2000 software packages were used to predict traffic operations for various traffic, road network and horizon year scenarios. The analysis was undertaken for the intersections, arterial roadway sections as well as freeway segments within the Area of Continued Analysis.

Existing Conditions

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.

Currently, both Highway 3 and Huron Church Road are generally operating with some congestion and near capacity during the peak hours. The proportion of trucks is largest nearest to the Ambassador Bridge plaza and during off-peak periods is as high as 60% and is approximately 30% during peak hours. Enhancements to border processing, such as FAST and pre-notification requirements along with additional primary inspection booths have reduced occurrences of resultant queues on Huron Church Road. Even with these enhancements the transportation system remains fragile.

Future Conditions

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% over the next 30 years. If no new crossing facility is built, significant road capacity problems are expected to begin to occur by 2015. Conditions will deteriorate further by 2035 to a point where most intersections will operate over capacity. Unacceptable amounts of delay will be experienced, with travel times nearly doubling over existing conditions.

In the absence of improvements, it is expected that capacity problems will be widespread and not isolated to particular locations on Highway 3 and Huron Church Road. Traffic growth on Highway 3 and Huron Church Road will be constrained by its capacity limitations. By 2035, a significant amount of international traffic will divert to other Windsor/LaSalle area roads in order to avoid congestion on Highway 3 and Huron Church Road.

Practical Alternatives

Access Road Alternatives

All Practical Alternatives for the access road incorporate a new 6-lane freeway facility between the Highway 401/Highway 3 interchange and the new inspection plaza. The proposed new six-lane freeway will meet future demands to year 2035 and beyond by providing free flow traffic conditions from Highway 401 to the new inspection plaza. The six-lane freeway will also provide flexibility to designate lanes for streaming of border traffic (e.g. separate lanes for FAST/NEXUS traffic) in the vicinity of the new inspection plaza.

A service road will also be incorporated to enhance local access and mobility. All of the service roads will be two lanes in each direction with auxiliary 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. All Practical Alternatives will provide substantial travel time savings for local traffic when compared to the do nothing alternative.

Practical Alternatives 1A and 1B provide one-way service roads on each side of the freeway between Howard Avenue and the E.C. Row Expressway. Practical Alternatives 2A and 2B provide a parallel two-way service road beside the freeway. Major side streets will be connected across the new freeway and access ramps will connect the service roads to the freeway at key locations. Practical Alternatives 1A and 1B provide the most opportunities for connections between the service roads and the freeway. Practical Alternative 3 is a tunnel option that would have the two-way service road at-grade and generally above the tunnel itself. Existing side-street connections between Howard Avenue and Labelle Street/Spring Garden Road could remain in place under this alternative.

Plaza Alternatives

In terms of providing improved border processing facilities to meet future travel demand and security requirements at the border crossing, both the Canadian and U.S. study teams are developing plaza alternatives that are much larger than those currently existing at the Ambassador Bridge and the Detroit-Windsor Tunnel. The plazas will be designed to serve the future (2035) travel demands at the border crossing. These new plazas are being developed in consultation with Canada Border Services Agency and the U.S. Department of Homeland Security Customs and Border Protection Branch to provide sufficient areas for primary inspection lane booths and on-site secondary inspection of people and goods. All the plaza alternatives will allow for dedicated NEXUS and FAST lanes and will provide for a substantial improvement of border processing capabilities including areas for permanent gamma ray inspection equipment.

Crossing Alternatives

The new Detroit River crossing is being developed as a six-lane bridge, providing three Canada-bound lanes and three U.S.-bound lanes. 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).

Remaining Activities

The next steps for the access road are to refine the access points, interchanges and cross-street intersection configurations to improve operations and reduce impacts, where possible.

With respect to the plazas, U.S. and Canadian border agencies are reviewing the layouts of the plaza alternatives and will provide suggestions for operational improvements. These comments will be incorporated in the assessment of the alternatives.

For the crossing, a bridge type study is being undertaken to determine the preferred bridge alternative at each of the three crossing locations.

Cost and Constructability

An assessment of cost and constructability is being undertaken as part of the impact assessment for the Detroit River International Crossing (DRIC) study. This assessment includes the access road, plaza areas and the international bridge. The assessment includes engineering design sufficient to define the 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.

How the Analysis was Done

Construction costs for the access road and plaza have been estimated based on the engineering concepts presented at PIOH 3 with refinements based on the results of consultation to date. Quantities for major construction items were estimated from the plan, profile and cross-section drawings. Unit costs were taken from the Ontario Ministry of Transportation's inventory of costs from recent highway construction projects and other sources, as appropriate. Percentages are added for minor items, engineering and contingencies leading to development of an overall construction cost. Costs for operations and maintenance, as well as property acquisition are considered separately.

The costs for the international bridge are being developed jointly with the U.S. team. Engineers from both Canadian and U.S. teams are undertaking a Bridge Type Study that is considering numerous options for cable stayed and/or suspension bridges at each crossing location. The study is considering optional locations for piers, anchor blocks and touchdown points, as well as elements that affect the width of the bridge (lane widths, shoulder areas, medians, sidewalks and protection of the cables). Consultation is ongoing with the Canadian and U.S. Coast Guards and Great Lakes Shippers to consider the possibility of placing piers in the river, which would result in a shorter main bridge span and could reduce the cost of the main structure.

Results to Date

Access Road Alternatives - Construction

The construction staging and constructability reviews to date confirm that all the alternatives are constructible, and that traffic flow can be reasonably maintained in the Highway 3/Huron Church Road corridor throughout the construction period. It is clear that access road construction is complicated by the high water table and relatively poor ground conditions, particularly towards the north and west ends of the project. These problems increase with the depth of construction. Complex construction staging will also be required for alternatives at the Grand Marais Drain/Turkey Creek. Construction of the tunnel alternative is more complex and time consuming than other alternatives due to the necessity to build the tunnel box, ventilation, electrical and communication systems.

Plaza Alternatives - Construction

With respect to the plaza locations, the major differences in cost and constructability are associated with plaza C. Construction of plaza C would require the relocation of the Keith Transformer Station, which would add considerable time and cost to the project.

Crossing Alternatives - Construction

Construction staging and constructability issues for the international bridge alternatives often relate directly to the main span and the overall length of approach between the bridge and the plaza. The detailed Bridge Type Study currently in progress will identify these matters more explicitly.

Access Road Alternatives - Cost

Preliminary construction cost estimates for the access road from Highway 401 to Malden Road from approximately $620M to $3.8B. Specifically:

- the at-grade alternatives are in the order of $620M – $920M
- the depressed options are about $1.0B - $1.4B
- the tunnel is estimated at $3.8B. 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.

Practical Alternative		Estimated Access Road Costs $CDN 2011
Access Road	Plaza	Highway 401 to Malden Road
1A	A	$920,000,000
1B	A	$1,360,000,000
2A	A	$790,000,000
2B	A	$1,200,000,000
3	A	$3,780,000,000
1A	B & C	$750,000,000
1B	B & C	$1,190,000,000
2A	B & C	$620,000,000
2B	B & C	$1,030,000,000
3	B & C	$3,610,000,000

Plaza Alternatives - Cost

Cost for the access road from Malden Road to the plaza, the plaza itself and the approach roadway to the international bridge range from $180 - $280M depending on which plaza alternative is chosen (not inclusive of costs associated with the potential relocation of the Keith Transformer Station under plaza C).

Crossing Alternatives - Cost

The international bridge costs are being developed in collaboration with the U.S. team and are not yet available; however, it is clear that longer span structures will be significantly more costly.

Remaining Activities

The current estimates provide a reasonable basis for a construction cost comparison of alternatives and will provide useful input to the assessment and evaluation. Further work will be done to refine construction, operating and maintenance costs.

Cost and constructability estimates will continue to be updated in concert with any refinements to the alternatives or the development of any new combination alternatives. In addition, the completion of the Bridge Type Study will provide more insight into bridge costs. The Bridge Type Study is expected to short-list the most practical bridge types for each proposed crossing location.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Property Acquisition

Throughout 2006, the Detroit River International Crossing (DRIC) study team will continue to investigate methods and design options to avoid or reduce impacts to the community. Unfortunately, because of the dense land use in the Windsor-Essex area, impacts to the local community are an inevitable part of building a new border crossing system, including a river crossing, inspection plaza and access road, in the Windsor-Detroit Gateway.

Once the preferred option is identified in 2007, you can expect the formal property acquisition process to start in 2008. Because options are still being studied and evaluated, the DRIC study team is not in a position to identify the required property at this time.

Once the project is at that stage, the government will work with homeowners and business owners to acquire property in a mutually agreeable way.

The acquisition process follows these general steps:

- The Ministry of Transportation (MTO) will contact you if any part of your land is required.
- The property acquisition procedures will be explained to you in detail.
- You may be asked to allow members of the survey crew onto your property to survey property requirements.
- Ministry staff or a fee appraiser will appraise your property according to fair market value.
- A ministry real estate officer will explain the appraiser's findings, the pending construction plans, your rights as a property owner, and will present an offer of compensation.

Compensation is based on the market value of your property. In the case of a partial acquisition, compensation is based on the loss in market value to your property. Market value is based on what similar land in the neighbourhood might be expected to sell for if sold on the open market by a willing seller to a willing buyer. Upon final settlement, there are provisions for payment of other reasonable expenses actually incurred.

Prior to the technically and environmentally preferred alternative being identified by the DRIC study team, owners can request the "Advance Purchase" of their property on a willing seller/willing buyer basis, if the property in question is substantially impacted by one or more of the alternatives under consideration. A property owner must demonstrate hardship based on the following criteria:

- if permits for development or redevelopment, which would otherwise have been approved, are denied because of the Ministry proposal

OR

- if a property is substantially contained in the proposed right of way and has not sold after being listed on the open market at a reasonable price for a reasonable period of time

OR

- if the owners are faced with personal circumstances such as financial issues, health issues or other extenuating circumstances that necessitate the sale of the subject property.

Compensation for advance property purchase is limited to the market value of the land plus reasonable legal fees for the conveyance by deed. The purchase is not to be treated as an expropriation and therefore the entitlements under the *Expropriations Act* do not apply.

If you are not satisfied with the offer of compensation presented, there is a legislated appeal process available to you. Your rights will be fully explained to you by the ministry's real estate officer.

For more information on property purchasing, contact the Ministry of Transportation, Windsor Border Initiatives Implementation Group, Program Delivery Office at 659 Exeter Road, London, ON N6E 1L3. Phone: (519) 873-4800. Fax: (519) 873-4789.
To read the Public Transportation and Highway Improvement Act, visit:
http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90p50_e.htm

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Tunnelling Types

The Detroit River International Crossing (DRIC) study team is evaluating a tunnel as one of five practical alternatives for the access road from Highway 401 to E.C. Row Expressway. Plans, profiles and cross sections have been developed for this alternative and will be analyzed and compared with the other access road alternatives. All alternatives will be assessed according to the seven major evaluation factors for this project.

Findings to Date

An assessment made by the study team's geotechnical experts has determined that there is a high water table and generally poor soil conditions, especially at the north and west ends of the Area of Continued Analysis (ACA). It has also been found that there is the potential for encountering hydrogen sulfide gases.

How the Analysis was Done

Two basic types of tunnel construction have been considered, namely "cut and cover" and "bored".

Cut and Cover Tunnels

Cut and cover tunnels are constructed using conventional excavation techniques and can include the initial construction of the side walls to minimize the overall width of the excavation.

Although there is a high water table and generally poor soils, an assessment by the study team's geotechnical experts has concluded that cut and cover tunnelling is a feasible construction method. Several cut and cover methods of construction are likely to be employed at various locations along the alignment. These include:

1) *Conventional (2:1 slopes)*. This alternative requires extensive excavation and backfill, and is not generally being considered where it would result in severe property impacts. This alternative will be considered in areas where property is available.
2) *Caisson Wall, Cut and Cover-Bottom-up*. This alternative utilizes drilling (auger) rigs to install caissons, which will form part of the tunnel walls. This alternative is typically constructed by the 'Bottom-Up' Method and has reduced property requirements relative to the Conventional Method. Once the caissons are in place, the soil between the walls is excavated to a depth below the tunnel floor. The tunnel floor slab is poured, followed by the side walls of the tunnel, which are constructed from the 'bottom-up'. Once the tunnel walls have been completed, the roof of the tunnel is constructed, and the surface roadway on top of the tunnel is completed.
3) *Diaphragm Wall, Cover and Cut-Top-Down*. This method utilizes a trench cutter for installation of concrete walls using bentonite slurry to stabilize trench. This method can achieve higher production rates than caisson wall system, and also has reduced property requirements relative to the Conventional Method. Once the concrete walls of the tunnel have been built, the roof of the tunnel is constructed, and the surface roadway on top of the tunnel is completed. Excavation proceeds from the roof of the tunnel 'top-down' to below the tunnel floor. The tunnel floor slab is constructed last.

The cut and cover tunnel can be constructed in stages so that traffic can be maintained within the corridor throughout construction. Base stability conditions may require special construction techniques at deeper excavation depths, where the soils are poorest.

Bored Tunnels

Bored tunnels are constructed with the use of tunnel boring machines, which are pre-fabricated prior to actual construction. Open cut construction is required at each end of the tunnel (the portals) as well as at locations along the tunnel where access ramps are planned.

The largest boring machines currently being made in the world are slightly over 15 m (49 ft) in diameter. A 15 m (49 ft) diameter tunnel cannot accommodate the required cross-section of the access road. The proposed cross-section includes three 3.75 m (12 ft) wide lanes, plus inside and outside shoulder widths of 3.0 m (9.8 ft) each; based on Ontario highway design standards. Additional speed change lanes would be included near access ramps as required. To accommodate this cross-section, a tunnel boring machine exceeding 19 m (62 ft) in diameter would be required. This is notably larger than any that have been built in the world to date. The 19 m (62 ft) diameter tunnel boring machine would be required to construct the northbound lanes. A second 19m (62 ft) diameter boring machine could be used to construct the southbound lanes. Alternatively a single 19m (62 ft) diameter boring machine could be used to first bore the northbound lanes and after completion then bore the southbound lanes. This would greatly increase the length of time to construct.

Construction of two bored tunnels would result in a limited thickness of soil above the tunnels. Surface settlements are estimated to be between 100 mm to 200 mm (4 to 8 in).This would result in extensive damage to existing buildings along the corridor, the surface roadway and to all utilities.

Due to the inadequate size of a tunnel boring machine, as well as the risks associated with the generally poor soil conditions, the potential for settlements at the surface and the high groundwater table bored tunnels are not being considered further, especially when an alternative tunnelling method (cut and cover) is considered feasible.

Highway Safety

Studies show that overall, operating speeds are generally lower in the tunnel, since drivers typically react to the different driving environment (enclosed by concrete walls) by slowing down. While the potential consequences of catastrophic crashes within the contained area of a tunnel are greater than on an open road, these types of incidents are infrequent. The occurrence of general traffic crashes is similar for these two types of facilities. Collected evidence suggests that placing an urban freeway in a tunnel should result in a safety performance that is no worse than using a surface freeway. However, there is no reference data that can be used to determine if mainline merge, diverge, and/or weaving areas caused by on and off ramps in the tunnel significantly affect safety performance.

Ventilation

Mechanical ventilation of a long tunnel such as the one being considered is required to control air quality and visibility in the tunnel and at the portals.

A mechanical ventilation system consisting of air flow ducts in the tunnel and one or more ventilation buildings with fans to force air in/out of the tunnel would be required. These ventilation systems would also be designed to control the direction of air flow and smoke in the case of an emergency. It is estimated that the ventilation building(s) would be about 18 m (59 ft) high (i.e. 4-5 storeys) plus the height of the stack. The total height including the stack could be up to 45 m (147 ft). Preliminary locations for ventilation buildings have been developed and are indicated on the drawings on display at the Public Information Open Houses (PIOH).

Safety Features

Several safety features will have to be incorporated into the design of a tunnel. These include:

- ventilation systems and buildings
- illumination

- Closed Circuit Television (CCTV)
- Intelligent Transportation Systems (ITS)
- emergency access between tunnels
- emergency access and egress between the tunnel and the surface
- ice prevention at portals and ramps
- emergency telephone systems
- containment of spills
- flood prevention system
- smoke detector, carbon monoxide and dioxide monitoring system
- fire suppression systems
- emergency power supply
- storage for emergency supplies
- additional training for Emergency Services staff and education for motorists.

These features are being considered as part of the development of the tunnel alternative and the study team will have further discussion with Emergency Services providers in this regard.

Remaining Activities

The cut and cover tunnel alternative will be evaluated as one of the five practical alternatives. Shorter tunnel sections may be considered in combination with other concepts. Further cost estimating and analysis including development of ventilation systems and fire/life safety systems are required. Risk assessment studies are ongoing as the study team continues to assess issues related to tunnelling and the other access road options.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Ambient Air Monitoring

As part of the Environmental Assessment process, the Detroit River International Crossing (DRIC) study team has established two ambient air monitoring stations in the Area of Continued Analysis (ACA), along the existing Huron Church/Talbot Rd. corridor. The purpose of the monitoring program is to collect data on the total pollutant concentrations that are routinely observed in the corridor, rather than specifically determine the fraction that originates from the roadway. This information will be useful for the air modelling assessment in that it will firmly establish the baseline air contaminant concentrations in the vicinity of the route. The monitoring program commenced in September 2006 and will continue until the end of September 2007.

Purpose of Ambient Air Monitoring

The data will be used to:

- establish current conditions within the corridor
- assist in determining background air concentrations of the pollutants being measured
- benchmark the air dispersion modelling.

The measured concentrations will be compared to relevant federal and provincial Ambient Air Quality Criteria (AAQCs) and standards to assess whether they are presently within acceptable levels. In addition, the monitoring data will be used in combination with air dispersion modelling to determine the contribution from background sources in the area (i.e. Zug Island, other local industries). This background contribution will be added to all modelled results for the assessment of the Practical Alternatives. Also, the data will be used to validate the air dispersion modelling completed for the assessment. This will be done by modelling the existing conditions and comparing the model predicted concentrations (including background) with the measurements for each pollutant. A statistical analysis will then be completed to determine whether the model accuracy is within acceptable levels.

Station Locations

Suggested locations for each station were obtained from the DRIC Community Consultation Group (CCG). The final locations were selected based on the technical requirements/limitations of the available properties (i.e. site access, power availability, trees) and permissions from the property owners. Both stations are located within 45 m (147 ft) of the edge of the roadway, along Highway 3/Huron Church Road.

The first station was deployed in an open field adjacent to the Ontario Public Health Laboratory, which is located at 3400 Huron Church Rd. (between Cabana and Pulford). The second station is located adjacent to 2015 Talbot Road, which is on the south side of the road, approximately at the intersection of Talbot Road and Geraedts Drive, which is the main entrance to St. Clair College. Both locations experience significant traffic. In addition, the station at St. Clair College will experience the effects of idling traffic, as vehicles queue at the intersection. A traffic counting station on Huron Church Road, located in the St. Clair College area will provide continuous traffic counts to correlate with the measurements.

Pollutants Being Measured

Nitrogen oxides (NO_x) and fine particulate matter (PM_{10} & $PM_{2.5}$) are generally the typical air pollutant indicator compounds of major concern with regard to transportation related vehicle emissions. Other criteria air pollutants such as CO are also related to transportation sources, but generally are not problematic in terms of health and environmental effects. A variety of toxic volatile organic compounds (VOCs) associated with vehicle exhaust are also of concern. Four of these have been selected for monitoring. These are:

- benzene
- acrolein *
- formaldehyde *
- acetaldehyde *

The pollutants listed above are those typically associated with diesel powered heavy trucks. Those denoted with an asterisk are believed to be primarily responsible for the characteristic odour of diesel exhaust. In addition to the air pollutant concentrations, meteorological data will be continuously collected at both stations, such that the data can be correlated with the meteorological conditions. The parameters being measured are:

- wind speed and direction
- temperature
- relative humidity

Station Operation

The two ambient air monitoring stations are completely automated. The instruments are sheltered in climate controlled trailers and are operated following regulatory procedures and protocols accepted by the Ministry of the Environment (MOE) and the U.S. Environmental Protection Agency (EPA). Most measurements (NO_x, PM_{10}, $PM_{2.5}$, & meteorology) are being made continuously on an hourly basis. The air monitors self-calibrate daily, but are checked and manually re-calibrated every two weeks as part of a routine maintenance schedule.

Continuous sampling methods for speciated VOCs are not presently available. Consequently, samples are being collected twice weekly at each location, and forwarded to an accredited laboratory for analysis.

Monitoring Methods

Nitrogen Oxides

Nitrogen oxides are a mix of species, including predominantly nitrogen oxide (NO) and nitrogen dioxide (NO_2), in addition to smaller amounts of NO_3, N_2O, N_2O_3, N_2O_4 and N_2O_5. Nitrogen dioxide (NO_2) is the species of importance in terms of health and environmental effects as it can cause acid rain and exacerbate respiratory ailments in humans. Ambient NO_X is being monitored continuously using a chemiluminescence analyzer, which is the U.S. EPA/MOE preferred method. Since all NO_X can potentially be converted to NO_2 in the presence of unlimited ozone, total NO_X is reported as "total NO_X as NO_2".

Fine Particulate Matter (PM_{10} & $PM_{2.5}$)

Several different methods are available to measure the fine fraction of particulate matter (PM_{10} & $PM_{2.5}$). These are the Tapered Element Oscillating Microbalance (TEOM), the Partisol, and the Beta Attenuation Monitor (BAM). Based on past experience and MOE preference, the DRIC team has selected TEOMs (PM_{10}) and BAMs ($PM_{2.5}$) for use in this program. TEOMs measure fine particulate concentrations on an hourly basis through the change in the vibration (or oscillation) frequency of a very sensitive balance. Particulate matter is drawn into the sampler at a known flow rate. As the particulate builds up, the frequency changes, which translates into the air concentration. BAMs measure fine particle concentrations via the transmission of beta rays through a special filter tape. Particulate matter is drawn into the sampler at a known flow rate, and deposited on the filter. Each hour the beta transmission is re-measured, and the difference between two measurements is used to determine the air concentration.

Air Toxics

Two samples will be collected weekly at each station for each air toxic included in the monitoring program. Once collected, all samples will be transported to an accredited laboratory for analysis. The table below presents the sampling methods used for each pollutant, as well as the expected detection limits.

Table 1: Air Toxics Sampling Methods

Air Toxic	Sampling Method	Detection Limit (µg/m^3)
Benzene	U.S. EPA TO-15 (SUMMA Canisters)	0.2 (0.05 ppbv)
Acetaldehyde & Formaldehyde	U.S. EPA TO-11A (DNPH sorbent tubes)	1.0
Acrolein	U.S. EPA TO-15 (SUMMA Canisters)	0.1 (0.11 ppbv)

Reporting

The results of the monitoring program will be summarized and released to the public on a quarterly basis. The quarterly reports will be submitted with full analysis and interpretation of the data, including correlation with the collected traffic data and meteorology.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Air Dispersion Modelling

Air or atmospheric dispersion modelling is an essential step in the air quality assessment process as it is the only way to evaluate the impact of future changes in air pollutant emission sources. With respect to the Detroit River International Crossing (DRIC) study, these changes include implementation of alternatives, changes in fuels, vehicle technologies and traffic volumes.

How the Analysis was Done

Dispersion modelling is used to predict atmospheric concentrations of pollutants at specific locations. The process involves using a computer model to mimic the way pollutants are emitted from sources, and how the atmosphere disperses them. The model takes emissions from a source, estimates how high into the atmosphere they will go, how widely they will spread and how far they will travel based on hourly meteorological data. The model then outputs the concentrations that will occur at the selected receptors.

For the analysis of Practical Alternatives, an air dispersion model was set up for each of the alternative access roads, plazas, and crossings. The selected dispersion model was the CAL3QHCR model, which is specifically designed for roads and highways, and is approved for use in Ontario by the Ontario Ministry of the Environment (MOE). The model assesses emissions from moving vehicles differently from those that are queued and idling at intersections and inspection plazas. The model also differentiates between at-grade, depressed and elevated sources. In addition, the evaluation of the tunnel alternative (Alternative 3) requires assessment of tunnel ventilation buildings and emissions from the tunnel entrance and exit portals. This was done using the ISCST3 air dispersion model in combination with the CAL3QHCR model.

The approach, methods and computer models used to conduct the air dispersion modelling is documented in the *DRIC Air Quality Impact Assessment Work Plan*, which was reviewed by MOE, Health Canada, as well as other agencies and the public early in the project.

Model Inputs and Set-up

Air dispersion models typically require the following inputs: hourly meteorological data, receptors, source characteristics, and emission rates.

Meteorological Data

Air dispersion models use hourly meteorological data over a five year period to simulate all of the possible meteorological conditions that could be experienced in an area. The data typically includes mixing height, temperature, cloud cover, cloud opacity, wind speed and wind direction.

For the assessment of Practical Alternatives, one set of model runs was conducted using meteorological data from 2000 through 2004. The model results indicated that the meteorological data from 2003 resulted in the highest atmospheric concentrations for both contaminants to be evaluated (NO_x and $PM_{2.5}$). Thus, the analysis for all alternatives will be completed using 2003 meteorological data.

Receptors

A network of receptors covering the Area of Continued Analysis (ACA) as well as other areas in south and west Windsor, LaSalle and Tecumseh outside the ACA, was created. Sensitive receptors (schools, churches, parks, etc.) were specifically identified and included in the model runs.

Source Characteristics and Emissions

Each emission source included in an air dispersion model is described and input separately. Source characteristics required for input to the CAL3QHCR model include road segment identification with geographic coordinates, segment width, traffic volumes for free-flowing and idling traffic, and emission factors. Additional information on signal timing and intersection capacity is required for road segments where vehicles queue, such as intersections. The Universal Transverse Mercator (UTM) coordinates of all road segments and intersections were determined from digital AutoCAD maps in combination with Geographic Information Systems (GIS). Over 700 free-flowing roadway sources and almost 150 queue sources were included in each model run for the assessment of the access road alternatives.

Hourly traffic volumes were provided for the air dispersion modelling analysis by the study team. Hourly volumes of domestic and international cars and trucks on each roadway segment were used to estimate emissions of $PM_{2.5}$ and NO_x from each source. Separate weekday and weekend traffic patterns were used to represent actual expected traffic conditions. Idling traffic volumes and queue lengths were calculated by the CAL3QHCR air dispersion model based on the number of vehicles that approach an intersection, the signal timing and the capacity of each intersection. The approach volumes were conservatively assumed to be same as the free-flowing traffic volume.

Emission factors were developed separately for vehicle exhaust and surface roadway emissions (i.e. road dust) using Environment Canada's MOBILE 6.2C model and U.S. Environmental Protection Agency emission factor methodologies. Separate emission factors were developed for cars and trucks, and incorporate:

- regulatory changes in fuels and engine technologies
- differences in Canadian and U.S. fuels and vehicles
- Canadian and U.S. fleet turnover rates.

In regards to traffic movements, the following assumptions were made:

- Vehicles on the highway will be moving.
- Vehicles on service roads (and north of E.C. Row Expressway) will move, but will queue at signalized intersections.
- Inbound vehicles at the inspection plaza will queue at booths.
- Outbound vehicles at the inspection plaza will not queue.

The traffic conditions at the inspection plazas were modelled using the same queuing algorithm that was used for the intersections. The amount of queuing at the plazas was estimated using the hourly traffic volume and the number of inspection booths estimated to be open during each hour, in addition to the average duration of each vehicle at a booth. Cars and trucks were modelled separately. Design information regarding plaza operations and vehicle processing rates were provided by the study team.

Tunnel Ventilation Buildings

The tunnel ventilation buildings are not a roadway source, and thus require the use of a different model. The ISCST3 model, which is used for assessing the impact of stationary emission sources such as industrial stacks, was used to model the tunnel entrance/exit portals and ventilation buildings. The tunnel conceptual design is such that emissions should not escape from the portals (i.e. exhaust flow is always greater than supply flow, such that air is continually drawn into the tunnel through the ramps and portals). However, there is a "piston effect" as cars drive out of the tunnel, which will result in some emissions from these areas. A total of 5% of the emissions were assumed to escape from the tunnel at these locations. The hourly predicted concentrations from the vent buildings and portals were added to the hourly predicted concentrations from the roadway sources (i.e. from the CAL3QHCR model) to determine the total model predicted concentrations.

Remaining Activities

As discussed earlier, air dispersion models calculate air pollutant concentrations at the receptor locations specified. For this project, receptors along the roadway were identified, in addition to specific sensitive receptor locations. The maximum predicted concentrations for each alternative will be compared to predicted concentrations at the same locations without implementing the alternatives (i.e. the future do nothing case). In this manner, the benefits and potential impacts of each alternative will be assessed. The results will also be compared to federal and provincial air quality criteria and standards. In instances where exceedances occur, an analysis of the frequency of, and/or change in the frequency of, exceedance will be carried out.

Construction Staging of Access Road Alternatives

Construction staging is defined as the steps the contractor will need to take during construction in order to build the access road. A plan for construction staging will need to be implemented to ensure safe and efficient construction operations as well as to minimize community impacts during construction. The Detroit River International Crossing (DRIC) study team has been reviewing construction staging practices and applying their knowledge gained from other complex freeway construction projects to develop preliminary staging plans for the access road.

Highway 3 and Huron Church Road Traffic During Construction

The objective during construction of the new access road is to maintain existing traffic on the Highway 3 and Huron Church Road corridors. Four lanes of traffic will be maintained along Highway 3 during construction. It is also planned that six lanes of traffic will be maintained along Huron Church Road during construction as required. Access to and from all major crossing roads, commercial and residential entrances will be maintained during construction.

Sequence of Construction

For each Practical Alternative, the access road is comprised of a freeway section (the Highway 401 extension) and the future service roads (Highway 3/Huron Church Road). The following is a typical sequence of construction for this type of infrastructure project:

Practical Alternatives 1A and 1B (at-grade or depressed with one way service roads)

The first phase of construction will focus on the relocation of utilities and other municipal services. There are numerous utilities located within the corridor, including Hydro, Bell, Union Gas, cable television as well as municipal services such as watermains, storm sewers, municipal drains and sanitary sewers.

The next construction phase would focus on building the future service roads, the realignment of the existing municipal roadways (where necessary), and the construction of any temporary staging roads. During this phase, traffic will remain primarily on the existing Highway 3/Huron Church Road with some routing onto localized temporary staging roads within the corridor.

The final phases of construction would focus on completing the new freeway itself. At-grade sections can be constructed using conventional freeway construction methods typically used on 400-series highways throughout the province. Depressed sections will be constructed by using excavation techniques suitable for urban areas. A variety of methods can be employed to minimize the overall property requirements of the project. During the final phases, traffic will be relocated onto the newly constructed service roads with some routing onto localized temporary staging roads within the corridor.

Practical Alternatives 2A and 2B (at-grade or depressed with a parallel service road)

The construction staging sequence and methods for these Practical Alternatives are similar to those for practical alternatives 1A and 1B. However, the alignment for Practical Alternatives 2A and 2B is, for the most part, beside the existing roadway so there will be less utility relocation and realignment of roadways required to construct these alternatives. During construction, traffic will remain primarily on the existing Highway 3/Huron Church Road with some routing onto localized temporary staging roads within the corridor.

Practical Alternative 3 (tunnel)

The first phase of construction will focus on the relocation of utilities and other municipal services. There are numerous utilities located within the corridor, including Hydro, Bell, Union Gas, cable television as well as municipal services such as watermains, storm sewers, municipal drains and sanitary sewers.

The tunnel box itself would be constructed in two stages. In each stage, the first sequence of tunnel construction would focus on the realignment of the existing roadways (where necessary) and temporary staging roads. During this phase traffic will remain primarily on the existing Highway 3/Huron Church Road with some routing onto localized

temporary staging roads within the corridor. The next phase of construction would focus on the construction of the tunnel structure itself using the cut and cover tunnel method. During this phase, traffic will be routed primarily onto temporary staging roads within the corridor.

Once construction of the tunnel structure is in place, remaining features such as ventilation systems, pumping stations, power systems will be constructed, and the surface road network will be completed.

Duration of Construction

The depressed and tunnel alternatives require significantly more complex construction than the at-grade alternatives. These alternatives, particularly the tunnel, will require a more intense construction period than the at-grade alternatives. The overall schedule will depend on equipment and labour availability, and further details of staging which will be determined in later phases of design.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Transportation of Dangerous Goods

A decision about whether or not hazardous or dangerous goods are allowed to use an international crossing is up to the owner/operator of the specific crossing. Since the Detroit River International Crossing (DRIC) study is still in the environmental assessment phase, no decision has been made yet on this issue. However, the study team is considering this issue as part of the environmental assessment study. This document summarizes the current situation for the transportation of dangerous goods at the Windsor-Detroit border crossings and the regulations that apply to the transportation of dangerous goods.

Current Situation

The transportation of dangerous goods is regulated in both Canada and the United States. Under Michigan state law, trucks carrying classes 1, 3, 6 and 7 dangerous goods, which include corrosive, explosive, radioactive and flammable loads, are prohibited from the Ambassador Bridge and Detroit-Windsor Tunnel. As a result, trucks carrying dangerous goods must use the Detroit-Windsor Truck Ferry to cross the Detroit River. Approximately 100 trucks per day use the Detroit-Windsor Truck Ferry.

The nearest alternative border crossing for trucks carrying listed dangerous goods is the Bluewater Bridge at Sarnia-Port Huron, which can add an additional two hours of travel time for trucks destined for western or southern United States. Most trucks that use alternate crossings do so because of the markets they serve, and not as an alternative to using the ferry service.

Dangerous Goods:
Class 1 - Explosives, including explosives.
Class 3 - Flammable and combustible liquids within the meaning of the Explosives Act.
Class 6 - Poisonous (toxic) and infectious substances.
Class 7 - Radioactive materials and radioactive prescribed substances within the meaning of the Atomic Energy Control Act.

Regulations Controlling Dangerous Gods Transport

In 1974, the Government of Canada developed a uniform set of standards to promote public safety in the handling and transportation of dangerous goods for all modes of transport. These standards are reflected in the current federal *Transportation of Dangerous Goods Act* and associated regulations.

Ontario passed the *Dangerous Goods Transportation Act* in 1981. Regulations under the Act adopt the on-highway requirements of the federal regulations.

Transportation Requirements

Trucks carrying dangerous goods are permitted to use both highways and municipal streets to deliver goods to and from user locations. Most loads of dangerous goods being transported must meet the following requirements:

- The load must be accompanied by a shipping document, which includes specific information.
- Containers must display appropriate safety marks and placards.
- The driver must be a trained person or be under the direct supervision of a trained person. The trained person must have been issued a training certificate by their employer and have it in their possession when transporting dangerous goods.
- The goods must be transported in a “prescribed” means of containment. The means of containment must be designed, closed, secured and maintained so that under normal conditions of transport there will be no accidental release of dangerous goods that could endanger public safety.

Inspection and Enforcement

The Government of Canada is responsible for inspection and enforcement of off-highway shippers and manufacturing processes. On provincial highways such as Highways 401 and 3, these responsibilities belong to the Ministry of Transportation and the Ontario Provincial Police.

Ministry of Transportation Enforcement Officers and police officers receive comprehensive training necessary to ensure that the regulations are properly enforced.

Design Objectives and Public Safety

Intersections and entrances onto roadways increase accident potential. As a result, the introduction of a controlled access highway from Highway 401 to a new river crossing location would reduce accident potential. In addition, measures such as electronic messaging to warn drivers of unusual conditions and speed transition zones at the approach to the plaza area can also be included in the roadway design to enhance safety.

Other Safety Measures

The DRIC study team is working closely with emergency service providers to ensure that potential risks posed by accidental release of hazardous materials are considered in the environmental assessment and can be incorporated into the highway design. Access to accident locations and the ability to contain spills within the corridor will be important design requirements.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Accidents and Malfunctions

One of the key objectives of the Detroit River International Crossing (DRIC) study is to provide for reasonable river crossing options to facilitate the safe, secure and efficient movement of people and goods. The DRIC study team has developed Practical Alternatives for the access road, plaza and crossing to meet the anticipated future travel demand. As part of the assessment of benefits and impacts of these alternatives, it is important to determine how each alternative would maintain a continuous, ongoing flow of traffic in the event of accidents and malfunctions in the transportation network.

The assessment of the ability to address accidents and malfunctions is part of the broader evaluation factor group 'Improve Regional Mobility'. The environmental assessment will also consider the environmental effects associated with accidents and malfunctions.

How the Analysis was Done

The assessment of accidents and malfunctions will include a review of safety performance as well as the assessment of potential effects from accidental spills (e.g. fuels, oils, hydraulic fluids), as well as other accidents and malfunctions that could be expected to occur, such as collisions, power failures and extreme weather conditions.

The approach to conducting the assessment of accidents and malfunctions is as follows:

- undertake a comparative safety review of the Practical Alternatives to address the relative safety of each Practical Alternative
- undertake a review of potential security issues related to plaza and crossing sites and layouts
- meet with local, provincial and federal safety, security and emergency services representatives to identify potential safety and security issues and response measures appropriate for the new crossing.

Results to Date

Safety Review

Initial findings of a safety review of the Practical Alternatives for the access road has found that:

- the proposed controlled access freeway facility greatly improves safety in comparison to the current arterial roadway with signalized intersections and other entrances/conflict points
- the risk of driving in tunnels is different than on open roads
- elements of tunnel driving that negatively effect safety may include:
    - limited visibility due to tunnel walls
    - 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 positive effects of tunnels on safety include:
    - elimination of adverse weather conditions
    - increased driver attention and/or slower speeds due to the confined driving space
- the consequences of catastrophic crashes within the contained area of a tunnel are greater than on an open road, however these types of incidents are infrequent, and the occurrence of general traffic crashes is similar for these two types of facilities
- the crash risk near the portals of the tunnel is higher than elsewhere within the tunnel.

Security Assessment

In collaboration with the federal departments responsible for critical infrastructure protection, the RCMP, Canada Border Services Agency (CBSA), and Natural Resources Canada, the study team has examined the crossing alternatives from a security perspective, including consideration of the adjacent land uses and national and local response capabilities. Based on the information available to date, each of the Practical Alternatives is considered viable from a security point of view. The study team and these agencies will continue to assess and monitor local and national security issues to ensure that appropriate security considerations are integrated into the design of the new crossing facilities.

Meetings with Emergency Services Representatives

Meetings with local municipal emergency services representatives, provincial emergency planning representatives, CBSA and RCMP were held to discuss issues of fire and life safety and emergency response. Key issues identified in the assessment of alternatives included:

- some options, particularly the tunnel option, will require special equipment and training for emergency response staff
- back-up systems for ventilation (air handling), lighting and pumps should be incorporated into the design of any tunnel
- distance between access points with the tunnel option (greater than 3 km or 1.8 miles) is a concern to local emergency services; access from either direction is required with intermittent openings to maneuver equipment inside the tunnel
- local access for emergency services must be maintained during construction
- one-way service roads may increase response times for emergency services as compared to the two-way service road option
- communications systems for the tunnel should be tied into local emergency response
- access to the plazas (secure areas) for emergency services must be considered.

Remaining Activities

Additional details on the design of air handling, illumination and communications systems will be identified for purposes of incorporating into cost estimates and reliability assessment. As well, issues pertaining to emergency response will be incorporated in the design of alternatives as appropriate to verify the feasibility of response measures.

This information will be incorporated into the assessment of the ability of each alternative to provide for a reasonable and secure river crossing option.

Detroit River
INTERNATIONAL CROSSING
S T U D Y

Ojibway Prairie Complex

As part of the Detroit River International Crossing study, potential impacts on the Ojibway Prairie Complex are being evaluation. The Ojibway Prairie Complex is one of the few remaining tallgrass prairies in Ontario. It is estimated that tallgrass prairies once covered between 80,000 and 200,000 ha of Southern Ontario; now, approximately 2,100 ha, or 1%, remains.

Prairies are an assemblage of grasses, sedges and wildflowers with minimal trees. Prairies have 0% to 10% tree cover; savannahs have 10% to 35% tree cover; and, woodlands have more than 35% tree cover. Precipitation is the determining factor, with wetter conditions in Ontario resulting in tallgrass prairies, as opposed to mixed or shortgrass prairie types found elsewhere.

Tallgrass prairies develop under the right combination of soil type, precipitation and fire. Prairies typically require deep sandy soils with wet springs and dry summers and can withstand droughts. Fire plays an important role in prairie communities because it causes die-back of non-fire tolerant plants and trees that are not part of the tallgrass community. Prairie species are fire tolerant due to extensive root systems. Several plants form the basis of tallgrass communities - big bluestem grass, Indian grass, yellow star grass, and giant sunflower.

The Ojibway Prairie Complex covers an area of approximately 350 ha including:

- three parcels that are managed by the City of Windsor (Ojibway Park, Tallgrass Prairie Heritage Park and Black Oak Heritage Park) totaling 127 ha
- the Ojibway Prairie Provincial Nature Reserve totaling 105 ha
- the Spring Garden Natural Area totaling 117 ha.

Collectively, these sites are designated the Ojibway Prairie Remnants Area of Natural and Scientific Interest (ANSI). ANSIs are publicly or privately owned areas of land and associated waters, selected on the basis of earth or life science features that have provincially important natural heritage, scientific or educational values. The Ojibway Prairie Remnants is designated as a Provincially Significant Life Science ANSI which includes significant landscapes, environments, biotic communities and native flora and fauna of provincial interest. Most parcels of the Ojibway Prairie Remnants are also designated as an Environmentally Sensitive Area by the Essex Region Conservation Authority.

The Ojibway Prairie Complex supports several vegetation communities that are critically imperiled and extremely rare globally and in Ontario. The Complex also supports a number of significant species with federal and provincial status. A total of ten species are listed as Schedule 1 under the federal *Species at Risk Act* (SARA), with four of these species also listed under the provincial *Endangered Species Act* (ESA). Schedule 1 species and their habitats are currently protected under SARA. Schedule 2 and 3 species are being re-assessed to determine if they should be listed in the regulations. An additional 11 species are currently listed as threatened and five species are listed as special concern. There are also over 100 provincially uncommon, rare or extremely rare species located in the Ojibway Prairie Complex.

The Ojibway Prairie Complex is protected by several levels of government. At the federal level, species at risk and their habitat are regulated by the *Species at Risk Act*. The Ontario *Endangered Species Act* regulates endangered species and their habitat at the provincial level. The Provincial Policy Statement passed under Section 3 of the *Planning Act* commits the provincial government to protect provincially significant ANSIs and significant portions of the habitat of threatened and endangered species. The Ojibway Prairie Provincial Nature Reserve, one component of the Ojibway Prairie Complex, is regulated as a Provincial Nature Reserve under the *Provincial Parks Act*. At the local municipal level, the Ojibway Prairie Complex is designated for environmental protection in the City of Windsor Official Plan. The Essex Region Conservation Authority also seeks to protect lands designated Environmentally Sensitive Areas within their jurisdiction.

Foundations Investigations

Planning a major construction project like the Detroit River International Crossing (DRIC) requires a thorough understanding of soil conditions, groundwater conditions and depth to sound bedrock. This information is used to determine the strength of the underlying soil and rock and its ability to support foundations for bridges and retaining walls as well as utilities and the roadway itself. The DRIC study team has reviewed much of the available soils data provided from other investigations that have been competed in and around the Area of Continued Analysis over the years. The generation of Practical Alternatives for the crossing, plaza and access road has identified locations of bridges, retaining walls and other structures. One of the activities required to aid in the preliminary design of these features is foundations investigations.

Current aspects of the foundations program include:

A) A deep drilling program in the vicinity of the new proposed international bridge crossing alternatives

B) A conventional drilling program along the access road corridor.

A) Current Foundations Investigations Program for International Bridge Crossing

The first part of the foundations investigations program includes drilling 12 deep boreholes in the vicinity of Practical Alternative Crossing B and C alignments due to the existence of brine wells from historical salt mining activities in the area. Each borehole will be drilled to a depth of up to 500 m (1640 ft). The drilling program is being undertaken to better understand the effects of solution mining of salt deposits and to confirm the integrity of the underlying bedrock to support a new international bridge spanning the Detroit River. The drilling of boreholes is not proposed along Crossing A as this alignment is sufficiently removed from areas of solution mining. Drilling operations are currently underway. A similar drilling program is being undertaken on the U.S. side of the river.

The second part of the investigations includes geophysical and other testing that will be conducted within each borehole during drilling and prior to the installation of the borehole casings. Once drilling has been completed and the borehole casings installed, the ground between boreholes will be characterized using cross-hole seismic tomography. Seismic tomography is similar to a CAT scan where signals are sent through an object in different directions and the signals are compiled to construct a cross section of the object or, in this case, a land mass. The results of the cross-hole tomography survey will lead to the identification of anomalies that may exist between boreholes, as well as imaging of individual soil layers.

A Geoadvisory Group has been assembled to assist the study team in completing the foundations investigations program. The group is comprised of geotechnical experts from Canada and the United States. The results of the drilling program, including seismic tomography, will be reviewed by the group and will be used in the evaluation process for selecting the preferred alternative of the new international bridge crossing.

B) Foundations Investigations Program for the Access Road Practical Alternatives

This program, completed in November 2006, included drilling 24 boreholes along the access road corridor. The boreholes extended to a maximum depth of 35 m (114 ft). Most of the boreholes were located within existing road allowances, including Highway 3, Huron Church Road and E.C. Row Expressway. Boreholes along the corridor were required to provide additional information on existing soil types. This information was needed to provide preliminary structural design recommendations for various structural components for the access road Practical Alternatives. Structural components include walls, roof, floor slabs and footings for tunnels, retaining walls for depressed sections, and bridge abutments for overpasses and underpasses.

Existing Soil and Groundwater Conditions

The existing soils within the study limits generally consist of soft silty clay. West of the Huron Church Road and E.C. Row Expressway interchange, the soil conditions become progressively softer, and less favourable for conventional construction methods. A majority of the bedrock is comprised of limestone, ranging in depths of 20 m (65 ft) below

ground surface at the Detroit River, to 25 m (82 ft) at Ojibway Parkway and EC Row Expressway to 35 m (114 ft) at the existing terminus of Highway 401.

High groundwater conditions exist within the study limits, particularly near the Detroit River. Groundwater elevations range between 0.5 m to 6.0 m (1.6 to 19 ft) below the ground surface. Strategies for groundwater control will be required for all methods of construction.

Drill Rigs being used on Foundations Investigations Program for International Bridge Crossing

Cable Tool Rig on OPG Property, Nov 2006

Coring on Sterling Fuels Property, Nov 2006

Context Sensitive Solutions

A key component that is part of the analysis of Practical Alternatives for the Detroit River International Crossing (DRIC) Environmental Assessment is the incorporation of Context Sensitive Solutions (CSS). CSS is an opportunity for the public and key stakeholders to provide input on the look and feel of the new access road, inspection plaza and bridge. The purpose in using CSS in this study is to help ensure that the design of the access road, inspection plaza and river crossing seeks to preserves the scenic, aesthetic, historic, and environmental resources of the community, while maintaining safety and mobility.

How the Analysis was Done

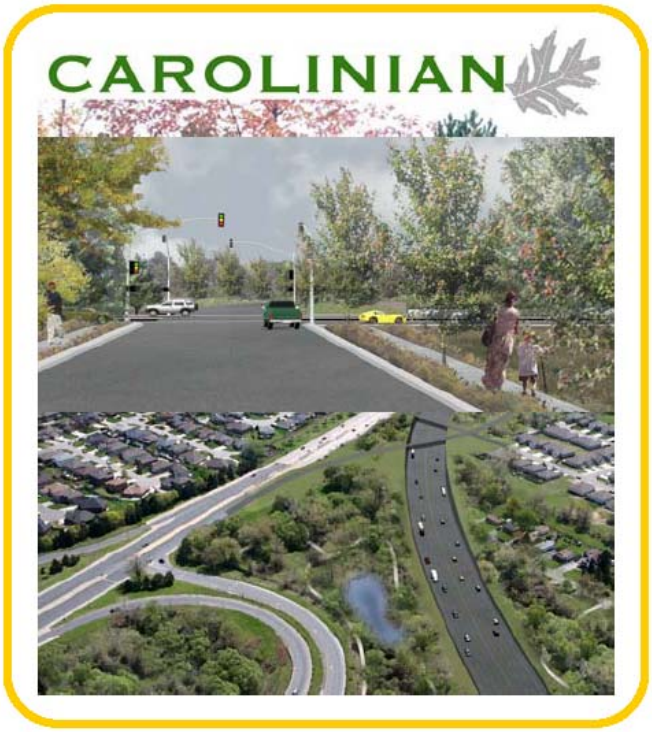
As part of the development of CSS ideas and options, the DRIC study team consulted the Huron Church Road Urban Design Master Plan & Development Guidelines Report (February 2006) which outlines various options to develop high quality urban design elements along the roadway, taking into consideration the existing traffic issues for both vehicles and pedestrians and nearby residents. The Huron Church Road Master Plan includes a design vision and framework for the coordination of the visual, functional, and operational dimensions of Huron Church Road, including lighting, planting, walkways, signage, public art, furniture, and property development. Elements of the Master Plan have been incorporated into the CSS work that has been completed to date. For example, design elements have been incorporated into the examples of aesthetic treatments to noise walls throughout the corridor.

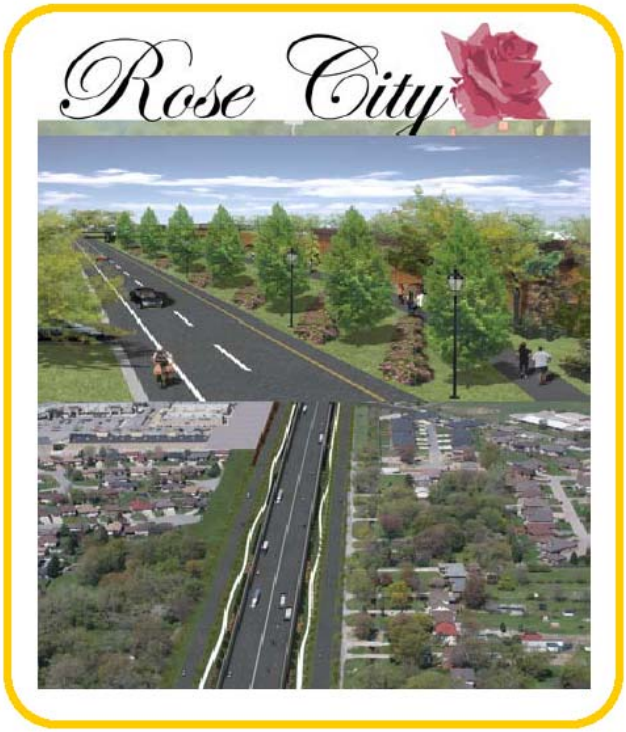
Context Sensitive Solutions Events

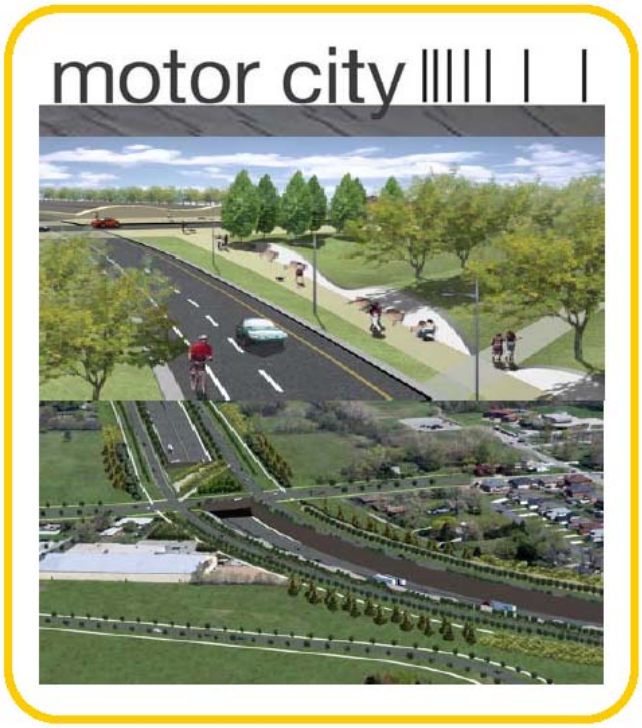
Members of the public have had the opportunity to provide input to different concepts and themes for the look and fit of the new access road, plaza and crossing alternatives over the course of 2006. Workshops were held throughout the year.

Workshop Date/Topic	Workshop Agenda
January 2006 Inspection Plaza Location Development	• participants were asked to define preferred inspection plaza locations • several locations were mapped based on community input
February 2006 Access Road Refinement	• participants were asked to provide input into the aesthetic look of the new freeway • participants suggested berming and noise wall treatments
April 2006 Access Road Refinement	• participants provided input regarding refining the design of the access road alternatives
June 2006 Context Sensitive Solutions Preference Workshop	• participants were asked for their preferences/ opinions regarding the type/and look of the new crossing, aesthetic treatment options in and around the plazas, and the landscape treatment options along the access road alternatives • participants indicated what concepts they preferred; what themes the new access road, plaza and crossing should convey
October 2006 Access Road and Plaza Theme Examples	• workshop built upon concepts shown at the June 2006 workshop • participants were shown examples of landscape treatments as they relate to three focus areas of the access roads, and landscape treatments for the plazas

Workshop Date/Topic	Workshop Agenda
	• three themes were developed: Carolinian, Rose City, and Motor City • participants were asked for their preferences/opinions regarding the themes developed for the aesthetic treatments of the access road and plazas
November 2006 Crossing Type Preference	• joint workshop with U.S. DRIC team; drop-in format; participants used computer workstations, hands on drawing areas to produce drawings for the physical preferences of a new crossing • focused on bridge crossing type, lighting treatment options, crossing theme (friendship and history), colour of bridge crossing







Results to Date

Many of the workshop participants indicated that they were pleased to see examples of what the landscape treatments could look like at different locations throughout the corridor. The outcomes from the October workshops indicated that participants favoured the Carolinian theme for the future landscaping of the new transportation facility. The Carolinian theme was favoured for its natural appearance and relative ease of maintenance. Participants also preferred the Rose City formal plantings at pedestrian-centred areas, and along the service road. Participants did not favour the Motor City theme for its contemporary look, which some felt would become dated in the future.

The outcome of the November crossing workshops indicated that the public favoured the suspension bridge style with a historic theme and the cable-stayed bridge with a friendship theme. Preferences were almost split regarding the suspension and cable-stayed bridges.

Remaining Activities

The Olde Sandwich Town Community Planning Study Report (October 2006) was recently finalized. The study team will review the recommendations of the report to determine if there are additional considerations for the CSS process. Additional workshops will be held in early 2007 in which the public will have the ability to give feedback and provide insight on further design modifications and changes. The input and feedback received at all the workshops will be incorporated into the design of the preferred alternative, which will be determined in 2007.