

Canada-United States-Ontario-Michigan
Border Transportation Partnership

Detroit River International Crossing Environmental Assessment Study

**Practical Alternatives Evaluation
Working Paper**

Waste and Waste Management

Draft

Preface

The Detroit River International Crossing (DRIC) Environmental Assessment Study is being conducted by a partnership of the federal, state and provincial governments in Canada and the United States in accordance with the requirements of the Canadian Environmental Assessment Act (CEAA), the Ontario Environmental Assessment Act (OEAA), and the U.S. National Environmental Policy Act (NEPA). In 2006, the Canadian and U.S. Study Teams completed an assessment of illustrative crossing, plaza and access road alternatives. This assessment is documented in two reports: *Generation and Assessment of Illustrative Alternatives Report - Draft November 2006* (Canadian side) and *Evaluation of Illustrative Alternatives Report* (December 2006) (U.S. side). The results of this assessment led to the identification of an Area of Continued Analysis (ACA) as shown in Exhibit 1.

Within the ACA, practical alternatives were developed for the crossings, plazas and access routes alternatives. The evaluation of practical crossing, plaza and access road alternatives is based on the following seven factors:

- Changes to Air Quality
- Protection of Community and Neighbourhood Characteristics
- Consistency with Existing and Planned Land Use
- Protection of Cultural Resources
- Protection of the Natural Environment
- Improvements to Regional Mobility
- Cost and Constructability

This report pertains to the Maintain Consistency with Existing and Planned Land Use factor and is one of several reports that will be used in support of the evaluation of practical alternatives and the selection of the technically and environmentally preferred alternative. This report will form a part of the environmental assessment documentation for this study.

Additional documentation pertaining to the evaluation of practical alternatives is available for viewing/downloading at the study website (www.partnershipborderstudy.com).

Waste and Waste Management Working Paper

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Appendix A – Practical Alternatives Access Roads and Plazas and Crossings

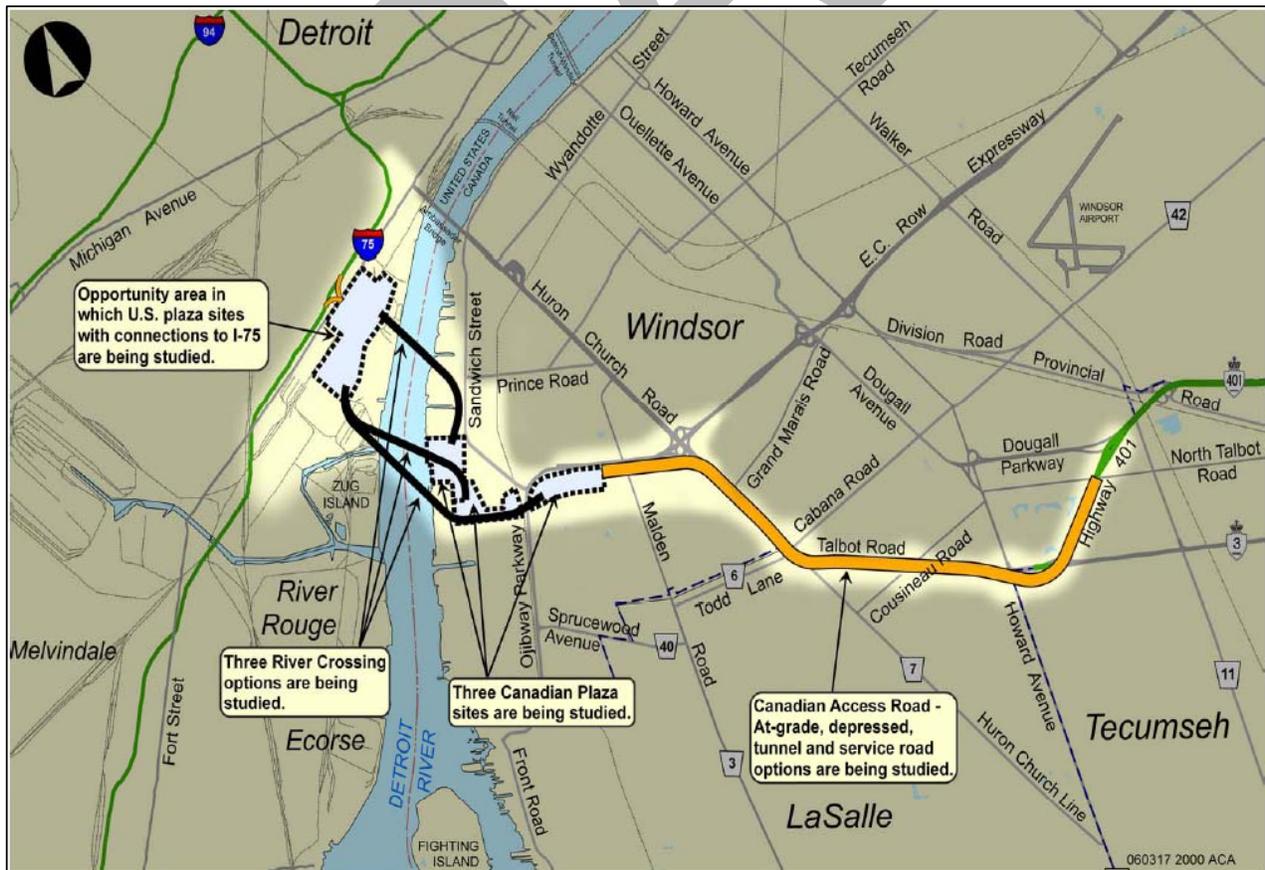
Appendix B – Summary of Practical Alternatives

1. Introduction

This working paper documents the factors considered in evaluating the potential impacts to Waste and Waste Management of the practical crossing, plaza and access road alternatives in the Area of Continued Analysis (ACA) (refer to Exhibit 1). The Area of Continued Analysis (ACA) is the geographic envelope within which practical crossing, plaza and connecting route alternatives were developed and where more intensive technical and environmental investigations were undertaken to support the generation and assessment of practical alternatives. Exhibit 1 depicts the ACA.

The western portion of the ACA on the Canadian side of the Detroit River encompasses a portion of the west Windsor industrial area at the south end of the Sandwich community and along the riverfront. East of the west Windsor industrial area, the ACA includes a continuous corridor, comprising of E.C. Row Expressway, Huron Church Road, Highway 3 and Highway 401. On the U.S. side of the Detroit River, the Area of Continued Analysis extends from Zug Island to the vicinity of the Ambassador Bridge and from the I-75 to the Detroit River. Waste and Waste Management is part of the overall evaluation factor "Maintain Consistency with Existing and Planned Land Use."

EXHIBIT 1: KEY PLAN OF THE AREA OF CONTINUED ANALYSIS



For the evaluation of the Practical Alternatives, an area of investigation was established for the Waste and Waste Management analysis that encompasses directly impacted properties by the Practical Alternatives. No on-site work was completed during this phase of the project.

For the purposes of this discussion, “directly impacted” properties refers to those properties in which all or a portion is situated within the proposed property requirements of the crossing, inspection plaza or access road. At this time properties which are not situated within the proposed property requirements can not be assessed. Properties not situated within the proposed property requirements maybe assessed after a preferred alternative is determined. Whether or not properties not situated within the proposed property requirements are assessed will depend on the likelihood of them impacting properties situated within the proposed property requirements.

This evaluation focused on the potential for the presence of pre-existing contaminants and wastes. In Ontario, environmental matters are regulated by the Ontario Ministry of the Environment (MOE), principally under the Environmental Protection Act (EPA). Under the EPA, “contaminant” means “any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that may cause an adverse effect” where adverse effect is further defined to mean one or more of:

- a) impairment of the quality of the natural environment for any use that can be made of it;
- b) injury or damage to property or to plant or animal life;
- c) harm or material discomfort to any person;
- d) an adverse effect on the health of any person;
- e) impairment of the safety of any person;
- f) rendering any property or plant or animal life unfit for human use;
- g) loss of enjoyment of normal use of property; and
- h) interference with the normal conduct of business.

The information collected for each property within the Practical Alternatives at this stage of the process is limited. The potential risk assigned may not reflect the actual risk based on probabilities and URS’ experience and therefore, onsite investigation would be required to confirm contamination.

1.1. Access Road Alternatives

There are five potential alternatives for the proposed access road and seven different combinations for plaza-crossing locations. Each of the five access road alternatives (1A, 1B, 2A, 2B & 3) has differing road alignments in certain segments of the access road, which results in slightly different impacts. The five alternatives for the proposed access road differ based on the built-form of highway and/or access roads.

Alternative 1A is an at-grade six-lane freeway with one-way service roads on either side.

Alternative 1B is a below grade six-lane freeway with one-way service roads on either side.

Alternative 2A is an at-grade six-lane freeway with two-way services roads located south of the freeway.

Alternative 2B is a below grade six-lane freeway with two-way service roads located south of the freeway.

Alternative 3 is a cut and cover tunnelled six-lane freeway underneath Huron Church/Highway 3 corridor. Huron Church/Highway 3 would remain and be used as service roads.

An exhibit of the access road alternatives is found in Appendix A.

1.2. Plaza Crossing Alternatives

There are three different proposed locations for a new border crossing in the west Windsor area and four plaza alternatives. Seven plaza/crossing combinations have been proposed:

Crossing A-Plaza A is a bridge crossing south of the Brighton Beach Power Generation Station and plaza located south of E.C. Row Expressway, east of Ojibway Parkway. The approach road between the plaza and crossing generally runs along side Broadway Street.

Crossing B-Plaza A is a bridge crossing north of the Brighton Beach Power Generation Station and plaza located south of E.C. Row Expressway, east of Ojibway Parkway. The approach road runs alongside Sandwich and Broadway Streets.

Crossing C-Plaza A is a bridge crossing in the industrial portlands near Russell Street/Sandwich Street and plaza located south of E.C. Row Expressway, east of Ojibway Parkway. There are two possible connecting road options, one runs alongside Sandwich Street and Broadway Avenue through Brighton Beach, while the other is along Sandwich Street and the western extension of Ojibway Parkway.

Crossing B-Plaza B1 is a bridge crossing north of the Brighton Beach Power Generation Station directly connected to a plaza located at the southern end of Sandwich Street, connecting to the new crossing via of Broadway Street.

Crossing C-Plaza B is a bridge crossing in the industrial portlands near Russell Street/Sandwich Street and plaza located at the southern end of Sandwich Street, north of Broadway Street. The approach road runs generally alongside Sandwich Street.

Crossing C-Plaza C is a bridge crossing in the industrial portlands near Russell Street and Sandwich Street and plaza located west of Sandwich Street, south of Prospect Avenue. The approach road runs alongside Sandwich Street.

An exhibit of the plaza-crossing alternatives is found in Appendix A.

2. Data Collection

The data collection phase of this assessment included an extensive record review using a wide variety of sources and windshield survey of selected sites. Specifically, the following data bases were used: base land use data as provided by the City of Windsor, select environmental databases, aerial photographs, available technical reports, historical topographic maps and fire insurance plans.

Publicly available environmental information programs, including Environment Canada's National Pollutant Release Inventory (NPRI) and public documents as compiled by EcoLog ERIS relating to issues such as active and closed landfills and coal gasification plants were reviewed. Historical information, including aerial photographs, Fire Insurance Plans were obtained for portions of the Practical Alternatives and reviewed (Reviewed information includes EcoLog ERIS reports covering the Practical Alternative, FIPs for the Brighton Beach area, and select aerial photos, additional information would be required for properties that require further ESA work.). EcoLog ERIS database¹ reports were obtained and reviewed for the Practical Alternatives. Findings were compiled in a working table.

Each of the properties lying partially or completely within the area of investigation was identified for assessment. General land use categories consistent with the City of Windsor Official Plan, such as open areas, residential, industrial, commercial, etc., were identified for properties impacted by the Practical Alternatives. The compiled data also included the total area in hectares (ha) of each property located within the area under investigation, the portion of each property lying within the segment and the number of properties within the area of investigation.

On May 1 and 2, 2006, a windshield survey of certain properties within the Area of Continued Analysis (ACA) was performed. Only properties potentially requiring further ESA work such as:

- Industrial and Resources; current known;
- Former Landfill;
- Utility Station, generating;
- Utility Corridor;
- Commercial - Industrial including service stations;
- Rail land, Rail lines; and
- Vacant, historical unknown or investigating historical sources,

were surveyed.

¹ EcoLog ERIS database is a privately maintained database such as environmental incidents reported to the MOE, private and retail fuel storage tanks, etc.

In addition, the Study Team's consultation program provided opportunities for the public and stakeholders to provide input including public information open houses. Through the consultation program, the public and stakeholder groups had an opportunity to identify potential sites. No sites, however, were identified through the consultation process.

The compiled data was processed for each alternative and according to each risk factor and summarized.

Note that contamination issues for properties which do not have the potential to cause an adverse affect or known public health concern and do not occur from a spill event do not necessarily need to be reported to government agencies. As such, known contamination that exists within the boundaries of a property may not be listed in any publicly available database or government agency files. Information regarding on-site contamination within the boundaries of a property may be held by the entity which owns the property; however, this type of information is not currently readily available either for Environmental Assessment purposes or to the general public.

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3. Data Analysis

The general land use categories as determined by the City of Windsor Official Plan and zoning categories within the area of investigation were supplemented by applying subcategories to further aid in the evaluation of risk of waste contamination. For example, Open Areas are generally considered to be a low risk; however, the presence of railways raises a contamination concern due to the potential for spills and the use of slag as ballast for rail bed material. Therefore, the subcategory Rail Land was added to create a revised combined land use category of Open Area – Rail Land.

Based on the May 2006 windshield survey and historical information (including, aerial photographs and Fire Insurance Plans), some specific property allocations required modification because they did not reflect the overall land use. For example, some areas initially identified as Residential appeared to contain some commercial operations, while others appeared to contain industrial activities. These properties were assigned to the subcategories “Residential-Commercial” and “Residential-Industrial”, respectively.

The following is a list of Revised Land Use Categories.

TABLE 1: REVISED COMBINED LAND USES CATEGORIES ¹

Aggregate - Industrial	Open Area - Right of Way
Agricultural	Open Area - Utility Corridor/Gas
Commercial	Open Area - Vacant
Commercial - Commercial/Service Station	Open Area - Vacant/Former Rail Land
Commercial - Industrial	Open Area - Former Service Station
Government/Institutional - Commercial/Industrial	Parks and Recreational
Government/Institutional - Government	Parks and Recreational - Former Landfill
Government/Institutional - Industrial	Residential
Government/Institutional - Institutional	Residential - Agricultural
Industrial	Residential - Commercial
Industrial - Commercial	Residential - Commercial/Industrial
Industrial – Residential	Residential - Industrial
Industrial - Trucking	Residential - Undeveloped
Industrial - Utility Corridor	Residential - Vacant
Industrial - Vacant	Resource and Industrial
Open Area	Resource and Industrial - Former Landfill

¹ General Land Use as supplied by the City of Windsor-supplemental subcategory as defined by data analysis

Open Area - Agricultural	Transportation - Rail Land
Open Area - Agricultural/Forested	Transportation - Right of Way
Open Area - Commercial/Industrial	
Open Area - Commercial/Residential	Undeveloped
Open Area - Former Landfill/Vacant	Undeveloped - Forested
Open Area - Hydro Corridor	Undeveloped - Industrial
Open Area - Industrial	Undeveloped - Residential
Open Area - Parkland	Utilities
Open Area - Rail Land	Utilities - Industrial
Open Area - Residential	

To clarify, open area land uses are parcels of land that do not have any structures or buildings on them, and are often vegetated with mature plantings. Undeveloped lands are lands that do not have any buildings on it, however, they do not necessary have vegetation located on it (can contain pavement). Vacant lands are those that are currently not used by a particular land use.

Collected data (i.e., base land use, select environmental databases, aerial photographs, available technical reports, historical topographic maps and fire insurance plans) was analyzed to identify Known contaminated sites. Data was further analyzed to evaluate the relative potential and severity for contamination. Ratings of Known, High, Moderate or Low potential for contamination were applied to properties impacted by the Practical Alternatives.

The assignment of ratings was based on the potential likelihood and severity of contamination based on land use and URS' estimate of relative risk.

For example, there is a risk of contamination on residential and agricultural lands from a variety of sources, such as historic leaking from underground fuel storage tanks or on-site vehicle repair. In comparison, the likelihood of contamination being present on industrial land is relatively high and the extent of contamination likely more severe. Therefore, such industrial areas are rated High. By contrast commercial areas do not have the same industrial processes, chemicals or storage tanks and are therefore given a relative risk rating of Medium. On lands previously used as landfills, contamination is assumed to be present and these properties were assessed as Known contamination.

When specific sites involved two or more land uses, the risk factors were modified to reflect the risks associated with each land use, as identified in Table 2.

TABLE 2: DESCRIPTION OF CRITERIA

Risk Factors	Description of Criteria / Indicators
Known risk - Displacement and/ or disruption to Known contaminated/ disposal sites	Known Contamination - Studies previously completed demonstrating impacts. For example, properties which were historically part of a municipal waste disposal landfill or construction debris disposal site. Currently, all the Known properties are associated with landfills. As more information is obtained on properties, other specific properties may be classified as Known.
High risk - Displacement and/or disruption to areas of high potential for contamination	Industrial Land Use including manufacturing and processing facilities and rail yards. These types of properties are associated with a variety of potential issues associated with materials storage, chemical management, waste generation, wastewater and/or storm water management and particulate fall out from air emissions stacks. This classification also includes commercial properties occupied by gasoline service stations where management of underground fuel tanks is known to be associated with a higher risk of contamination at properties such as service stations.
Medium risk - Displacement and/or disruption to areas of moderate potential for contamination	Commercial Land Use including light industrial operations. Commercial properties are a concern as minor mismanagement of some contaminants, such as dry-cleaning or metal working fluids, can lead to significant impacts.
Low risk - Displacement and/or disruption to areas of low potential for contamination	Residential/Parkland/Agricultural Land Uses where the potential for and extent of contamination is expected to be relatively low.

The final assignment of the Revised Combined Land Use to the risk factors, Known, High, Medium, Low, is provided in Table 3.

TABLE 3: RISK CATEGORIZATION OF REVISED COMBINED LAND USES¹

Risk Factors	Land Use
Known	Open Area - Former Landfill/Vacant
	Parks and Recreational - Former Landfill
	Resource and Industrial - Former Landfill
High	Aggregate - Industrial
	Industrial - Commercial
	Commercial - Industrial
	Commercial - Commercial/Service Station
	Government/Institutional - Industrial

<p>Risk Factors</p>	<p>Land Use</p> <ul style="list-style-type: none"> Industrial Industrial - Utility Corridor Industrial - Vacant Open Area - Hydro Corridor Open Area - Industrial Open Area - Utility Corridor/Gas Open Area - Former Service Station Residential - Industrial Resource and Industrial Trucking - Industrial Undeveloped - Industrial Utilities Utilities - Industrial
<p>Medium</p>	<ul style="list-style-type: none"> Commercial Government/Institutional - Commercial/Industrial Open Area - Commercial/Industrial Open Area - Rail Land Open Area - Vacant/Former Rail Land Residential - Commercial/Industrial Transportation - Rail Land
<p>Low</p>	<ul style="list-style-type: none"> Agricultural Government/Institutional - Government Government/Institutional - Institutional Industrial - Residential Open Area Open Area - Agricultural Open Area - Agricultural/Forested Open Area - Commercial/Residential Open Area - Parkland Open Area - Residential Open Area - Right of Way Open Area - Vacant Parks and Recreational Residential

Risk Factors	Land Use
	Residential - Agricultural
	Residential - Commercial
	Residential - Undeveloped
	Residential - Vacant
	Transportation - Right of Way
	Undeveloped
	Undeveloped - Forested
	Undeveloped - Residential

¹ Risk Categorization is subject to refinement during subsequent stages following the DRIC study environmental assessment.

The data was processed to complete the analysis and maps depicting risk factors of directly impacted properties by the Practical Alternatives is provided in this report.

Note that all directly impacted properties were considered to have some potential for contamination and all directly impacted properties within a plaza, crossing or access road segment were accounted for in the analysis.

The area of a property included within the area of investigation was provided by the Geographic Information System (GIS) program which is used to track and compile all the data obtained during the study². The waste and waste management assessment was based on the Practical Alternatives presented at the Public Information Open Houses in December 2006.

Tables indicating the total area (in hectares) of each directly impacted property and the area of each property within the Practical Alternatives proposed right of way were compiled. The information is presented in the analysis tables included at the end of this report.

² Placement of the footprint within the mapping system and property boundaries may not be exact resulting in small portions of properties being included in the analysis that in reality are not impacted. For example, the impacted portion of several properties is less than 0.0 hectares, the footprint may actually be running along the property boundary of these and the properties may not be impacted at all. The reverse of this is also true in that the impacted area of a property may be slightly larger than identified.

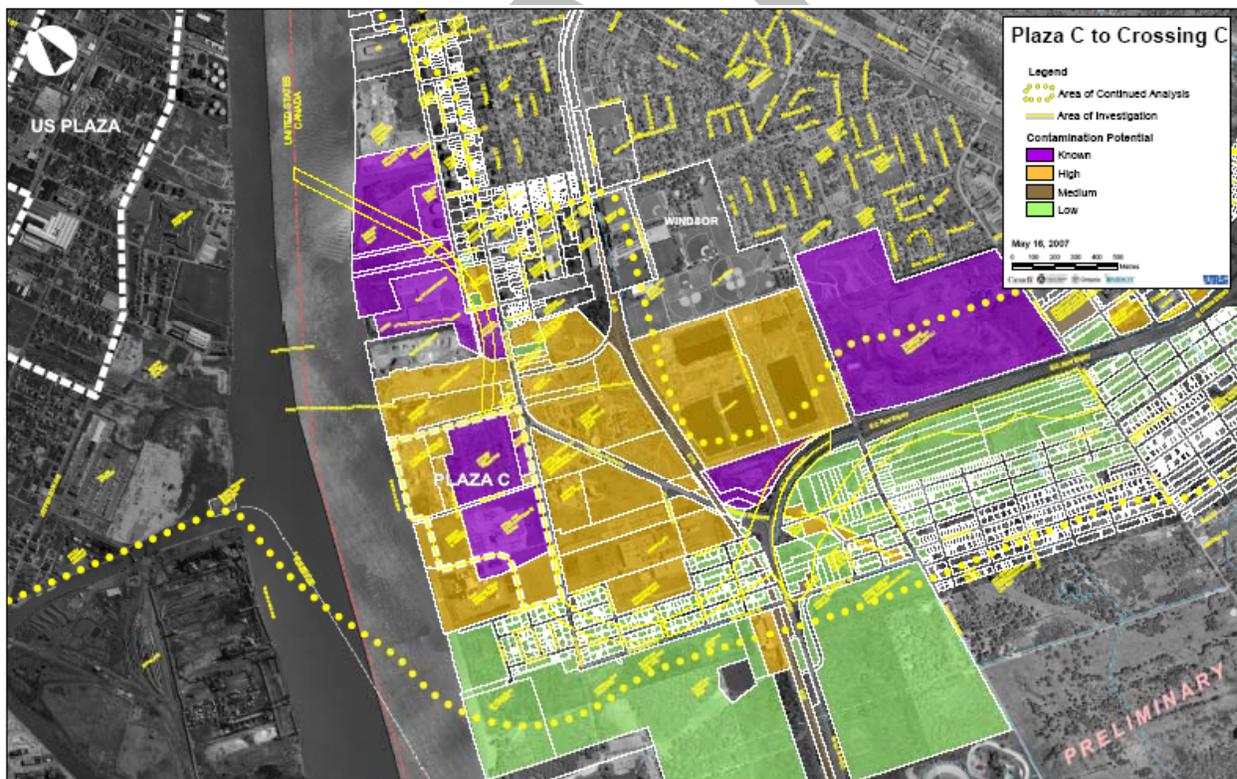
4. Evaluation of Practical Alternatives

The results generated to date indicate that properties within the area of investigation include a variety of current and historical land uses, which represent varying degrees of risk of environmental contamination.

The greatest number of industrial properties impacted are towards the Brighton Beach portion of the study area near the river, which includes properties in the Plaza Alternatives³. The higher concentration of industrial properties along the western side of the study area is believed to represent a higher risk of impacting contaminated land. Exhibits 2 to 8 depict Low, Medium, High and Known risk properties.

Plaza C Crossing C

EXHIBIT 2: PLAZA C CROSSING C



The Plaza is located on several High risk properties and three Known sites. One Known site was used for coal ash disposal from 1953 to 1962. The other landfill (closed in 1953) is occupied by a transformer station (MOE # 6058).

³ For the purposes of the Waste and Waste Management analysis, the “Plaza Alternatives” include the access road connecting to the plazas from Malden Road westerly.

The Crossings⁴ impacts Low, High and Known risk properties. In total, nine Known sites are currently impacted. The Known sites are associated with six historic landfill operations: Russell Hill Dump (MOE # 6057), which closed in 1956; an auto junk yard; Canadian Salt Dump (MOE#6051), which closed in 1951, Ojibway Inert Fill site which closed in 1995; Sandwich Street Dump (MOE# 6058), closed in 1953, a facility used for coal ash disposal from 1953–1962 and a liquid disposal site from 1972–1975 which is currently occupied by a transformer station.

The Plaza C Crossing C Alternative impacts the greatest number of Known and High risk sites (12) and the most hectares of Known and High risk properties. Of all the options, this option impacts the least number of properties overall.

Plaza B Crossing C

EXHIBIT 3: PLAZA B CROSSING C



Approximately 19.6 ha of the properties impacted by Plaza B are Low risk. While approximately 12.5 ha of the Plaza covers High risk properties.

The Crossing impacts either Known or High risk properties. The Crossing runs through the eastern side of a Known site, a former landfill. Ten other Known sites are potentially

⁴ For the purposes of the Waste and Waste Management analysis, “Crossing” includes both the river crossing and approach roadway between the plaza alternatives and river crossing alternatives.

impacted. These sites are associated with five historic landfill operations: Russell Hill Dump (MOE # 6057), which closed in 1956; an auto junk yard; Canadian Salt Dump (MOE#6051), which closed in 1951; Ojibway Inert Fill site which closed in 1995; and Sandwich Street Dump (MOE# 6058) which closed in 1953. The Crossing impacts 7.1 ha of a total Known risk land area of 62.6 ha.

PLAZA B1 CROSSING B

EXHIBIT 4: PLAZA B1 CROSSING B (EXHIBIT C)



The properties impacted by Plaza B1 are primarily Low risk; approximately 4.2 ha of land at the northern limits of the Plaza, however, impacts High risk properties.

East of the Plaza, the access road to the Plaza impacts three Known properties associated with the historic Ojibway Inert Fill site which closed in 1995. The Crossing impacts both Known and High risk properties. West of the Plaza, the Crossing runs through two Known sites. The northern Known site was used for coal ash disposal from 1953 to 1962. The southern Known site is currently occupied by a transformer station. In total, five currently identified Known sites would be impacted by the Crossing (10.4 ha of the total Known area of 32.2 ha would be impacted).

Plaza A

The properties impacted by Plaza A are primarily Low risk with the exception of three High risk properties located on the western edge of the Plaza. The three properties are associated with a hydro / pipeline corridor.

PLAZA A CROSSING A

EXHIBIT 5: PLAZA A CROSSING A (EXHIBIT D)



The properties impacted by Crossing A are primarily Low risk with the exception of approximately one hectare of land located at the south-western corner of a High risk property. The property is associated with the Brighton Beach Power Station. This is the only option which does not currently impact any Known sites.

PLAZA A CROSSING B

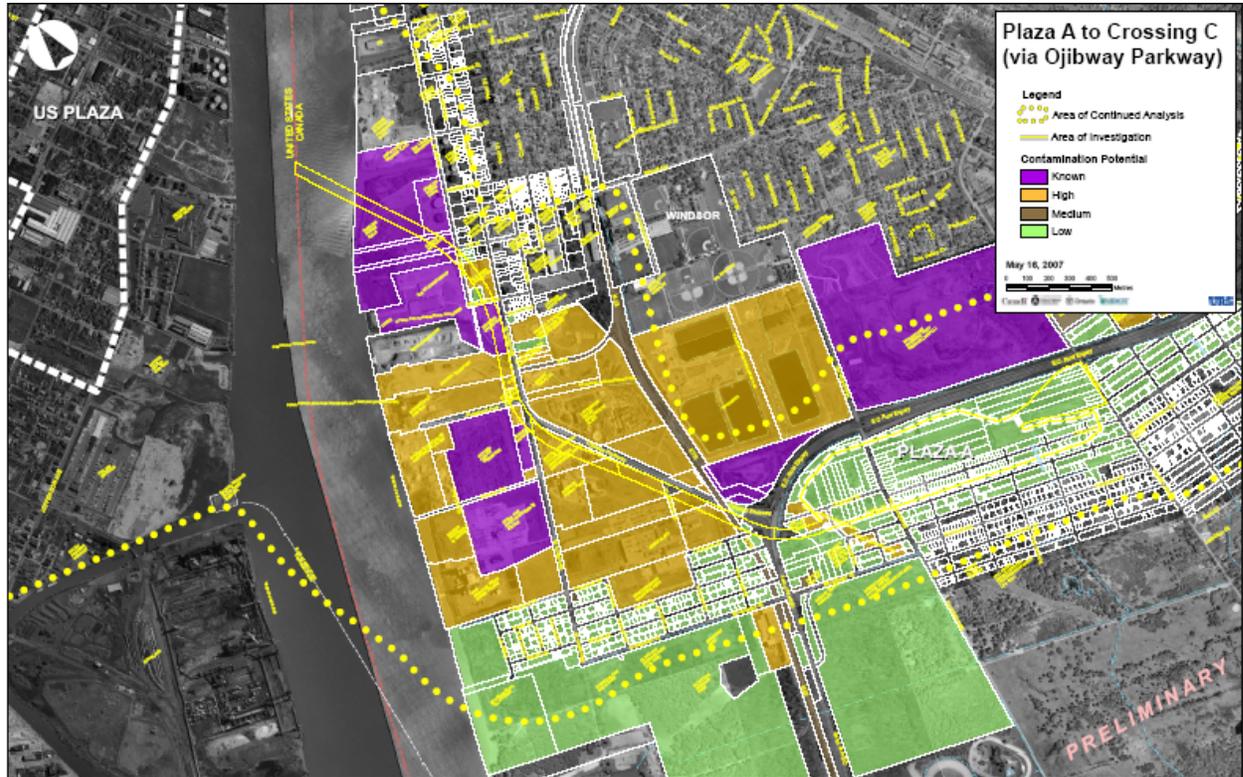
EXHIBIT 6: PLAZA A CROSSING B (EXHIBIT E)



A little more than half of the properties impacted by Crossing B are Low risk. The remaining portion of the Crossing impacts either Known or High risk properties. The Crossing impacts two Known sites, which are former landfills. One landfill reportedly operated between 1953 and 1962 and was used for coal ash disposal. The other landfill (MOE # 6058), which was closed in 1953, is located on Sandwich Street south of McKee Road. The two landfills cover a combined area of approximately 24.4 ha, of which 2.6 ha would be directly impacted by the Practical Alternative.

PLAZA A CROSSING C VIA BRIGHTON BEACH**EXHIBIT 7: PLAZA A CROSSING C VIA BRIGHTON BEACH (EXHIBIT F)**

The Crossing impacts approximately 10 Low risk properties. The remaining portion of the Crossing impacts either Known or High risk properties. The Crossing impacts 11 Known sites which cover a total of 62.6 ha. Of this, 7.1 ha of Known sites will be potentially influenced by the Crossing. The Known sites are associated with five historic landfill operations: Russell Hill Dump (MOE # 6057), which closed in 1956; an auto junk yard; Canadian Salt Dump (MOE#6051), which closed in 1951; Ojibway Inert Fill site, were closed in 1995; and Sandwich Street Dump (MOE# 6058), which closed in 1953.

PLAZA A CROSSING C VIA OJIBWAY PARKWAY**EXHIBIT 8: PLAZA A CROSSING C VIA OJIBWAY PARKWAY (EXHIBIT G)**

A little less than half of the properties impacted by Crossing C are Low risk. The remaining portion of the Crossing currently impacts Known sites or various High risk properties. The seven Known sites impacted are associated with three historic landfill operations: Canadian Salt Dump (MOE#6051) which closed in 1951; an auto junk yard; and Russell Hill Dump (MOE # 6057) which closed in 1956. The landfills cover a combined area of approximately 42.1 ha. However, a 4.0 ha area of land would be directly impacted by the Practical Alternative.

Access Roads

The Access Road corridor (i.e. from Malden Road to Highway 401) is predominantly occupied by Low risk properties. Isolated Medium and High risk properties are in this corridor, including High risk properties such as a service station located on Huron Church Road. The location of Medium and High risk properties are identified in Exhibit H provided at the end of this report. These properties may be impacted in varying degrees by the various Alternatives. There is little discernible difference among the various Access Road Alternatives with the current level of information.

Summary

All Plaza and Crossing Alternatives impact land designated as High risk. A summary of Known and High risk information is provided in Table 4.

TABLE 4: SUMMARY OF KNOWN AND HIGH RISK PROPERTIES IMPACTED BY THE ALTERNATIVES

Combinations	Total Number of Known and High Risk Properties	Area of Impact (ha)	Contamination Concern
Plaza C Crossing C	30	50.0	Higher
Plaza B Crossing C	29	23.9	Medium
Plaza A Crossing C via Brighton Beach	29	23.9	
Plaza A Crossing C via Ojibway Parkway	22	11.6	
Plaza B1 Crossing B	17	24.0	
Plaza A Crossing B	11	5.1	
Plaza A Crossing A	4	1.0	Lower

For the purposes of this assessment of Waste and Waste Management, the “preferred” alternative is defined as the alternative that is least likely to be impacted by waste contamination. Based on information reviewed and discussed during this assessment, Plaza A Crossing A is considered the preferred alternative. Only Plaza A Crossing A does not impact a Known contaminated property. It also impacts the lowest number of High risk properties and the least hectares of High risk properties of the alternatives. The least preferred alternatives include Plaza A Crossing C via Brighton Beach, Plaza B Crossing C and Plaza C Crossing C, with no appreciable difference among the three alternatives.

No Access Road Alternatives impact Known contamination properties. All Access Road Alternatives impact land designated as High risk. However, the quantity of land and number of parcels impacted varies per route. There is little discernible difference among the various Access Road Alternatives with the current level of information.

The ranking of properties within the contamination concern column of Table 4 was based on the total number of known and High risk properties impacted by the alternative with consideration given to the area impacted and the location of known and High risk properties. No preference difference is implied by the order in which alternatives occur within a priority category (i.e. Lower, Medium or Higher). Plaza A Crossing A is the only alternative that does not encounter a known contamination site and was therefore considered to be of lower contamination concern. All other alternatives are impacted by Known and High risk properties and are therefore more of a contamination concern than Plaza A Crossing A. Plaza C Crossing C is the alternative with the most contamination concern since it is the only alternative where the total Plaza is impacted by Known and High risk properties.

Figures and tables that present the Alternatives and risk factors are provided at the end of this report.

5. Impact Assessment

Proposed changes in land use raise numerous environmental concerns that need to be addressed to promote the safe use of the properties within the proposed right of ways.

Transportation corridor construction may be affected by pre-existing contamination present on lands through which roads are built, while construction and existence of the transportation corridor may in turn affect on-site contamination. For example, impacting contamination during construction may result in the requirement to remove contaminated material and arrange for off-site disposal in a secure landfill, resulting in additional, and unforeseen costs and project delays.

Additional problems with landfills are that they pose potential risks to human health and the environment including the contamination of soil and water by leachate and the production of methane gas. In addition to these risks, landfills raise potential financial issues due to the high cost of remedial measures that may be required to ensure regulatory compliance and public safety. Other concerns posed by the development on former landfills include the subsidence of surface and subsurface structures such as roads and utility service conduits. The presence of contamination may be extensive; for example, if an abandoned waste disposal site is impacted, remediation costs to remove sufficient waste to allow construction of stable roadways may become cost prohibitive. Under existing regulations, there may also be outright prohibitions against use of the waste disposal sites, unless permission is obtained from the MOE.

Properties assigned a High risk factor also may pose potential risks to human health and the environment. Based on the diversity of properties, each will require evaluation based on site activities to determine how best to accommodate a change of land use. Evaluation may include performing a Phase I Environmental Site Assessment (ESA). A Phase I ESA is an evaluation of the present environmental conditions at a site and its immediate neighbourhood, with respect to regulated materials or potential soil and groundwater contamination, which may be attributable to past or present land uses, and to evaluate potential contaminant sources associated with current activities at the site. A Phase I ESA does not include sampling and analysis. Formalized approaches for conducting a Phase I ESA have been developed by recognized agencies such as Canadian CSA Standard Z768-01 and the US American Society for Testing and Materials (ASTM) Standard Practice E 1527-00 to standardize the methodology and results. Most lending agencies, financial institutions and legal firms also consider Phase I ESAs, conducted according to the CSA standard, as the appropriate guideline for conducting ESAs.

In turn, properties assigned a Medium or Low risk factor still have the potential for waste contamination. The presence of contamination will require additional investigation during latter stages of the project.

The presence of contamination on a site does not automatically preclude the inclusion of the property in a transportation corridor. In fact, there may be benefits to the inclusion of contaminated properties among the route alternatives, including making productive use of

Brownfields. Brownfields are described as industrial and commercial properties that contain contaminated soil and groundwater resulting from past use of the property and are presently abandoned, idle, or underutilized. The land may need to be cleaned up before it can be redeveloped.

Redeveloping brownfields helps protect the environment and health of communities. It also provides social and economic opportunities. Brownfields remediation turns abandoned, contaminated lots into useful, safe land. Redeveloping a brownfield eliminates health and safety hazards and leads to improved air, water and soil quality.

It is important that the potential for environmental impact be identified and potential risks be evaluated.

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6. Further Assessment and Possible Mitigation

Information regarding waste and waste contamination issues was not collected for properties which do not currently have the potential to adversely affect adjacent properties. In order to address this data gap, site specific Phase I ESA would be required to identify issues that fall into this group but could influence the Plazas or Crossings or routes.

To assist in identifying the historical nature of specific properties and therefore the potential for and nature of any contamination, ESAs are often conducted in a tiered or phased approach.

If the Phase I ESA indicates that there is a potential for contamination, a Phase II ESA may be recommended. A Phase II ESA is more intensive, involving sampling and analysis of soil, water or other components. A Phase III ESA, if required, examines options for cleaning up the site.

Due to the associated cost and the need for permission to access sites while conducting full Phase I and Phase II ESAs, it is not proposed to conduct full Phase I or II ESAs at the preliminary stage of planning. It is advisable to initiate full Phase I or Phase II (if required) after the Technically and Environmentally Preferred Alternative (TEPA) is selected, prior to final design stage, or property acquisition, if preliminary analysis indicates a potential for contamination along the route.

Construction of the TEPA may be affected by pre-existing contamination present on lands adjacent to those through which roads are built; for example construction; and existence of the TEPA may in turn affect contaminant migration. For example compaction requirements for roadway construction may not be attainable on a former landfill site or dewatering activities as required for a depressed road may result in contaminant migration to the TEPA.

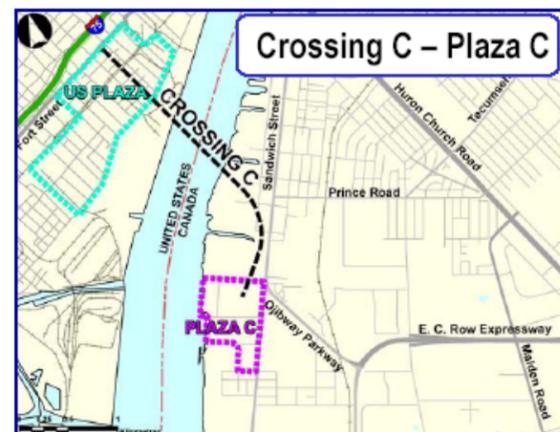
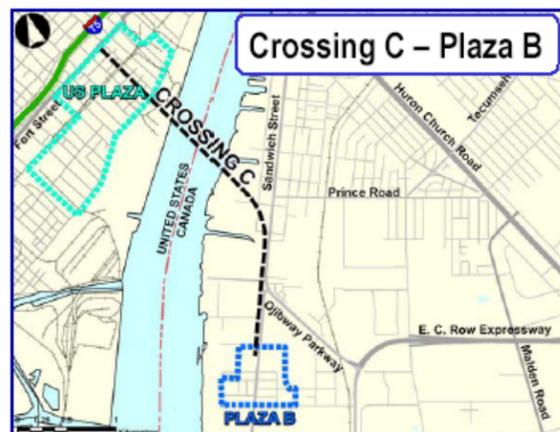
The need for an increased level of detail and collection of field data is expected through the progression of the project. As a preferred alternative is selected, it is expected more detailed research, field survey and inventory will be necessary to provide sufficient information on the potential environmental impacts of individual sites.

Known Risk Properties

To date, the identified Known sites are former landfills, however, as the analysis continues, the number of Known sites is expected to increase. Properties used for the disposal of waste materials may be subject to special regulatory approvals, remedial or mitigative measures, monitoring requirements or other environmental management controls prior to and following redevelopment. In order to assess the implications of developing on the Site, a Phase I ESA for the portion of the Site proposed for development followed by a Phase II ESA and a cost benefit analysis may be required.

Appendix A – Practical Alternatives Access Roads and Plazas and Crossings

Plazas and Crossings



Access Roads



Appendix B – Summary of Practical Alternatives

Access Road Alternatives

PRACTICAL ALTERNATIVE EVALUATION	Factor: Maintain Consistency with Existing and Planned Land Use										
Performance Measure	Criteria/Indicator	Measurement/Units	Alternative 1A		Alternative 1B		Alternative 2A		Alternative 2B		Alternative 3
			Option 1	Option 2							
CONTAMINATED SITES/ DISPOSAL SITES	Displacement and/or disruption to <i>known</i> contaminated sites/disposal sites	Impacted area in ROW/total area of ROW properties, in ha./no. impacted properties	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0
	Displacement and/or disruption to areas of high potential for contamination	Impacted area in ROW/total area of ROW properties, in ha./no. impacted properties	9.0/25.3/17	3.6/9.9/17	3.5/10.0/18	3.6/10.0/13	3.9/9.8/17	4.1/9.8/17	3.8/9.8/16	4.0/9.8/16	3.1/9.8/16
	Displacement and/or disruption to areas of moderate potential for contamination	Impacted area in ROW/total area of ROW properties, in ha./no. impacted properties	4.4/15.8/27	7.8/25.9/28	6.3/25.5/26	6.0/19.1/26	6.6/14.3/17	7.6/23.2/18	6.6/15.3/19	7.6/24.2/20	5.9/25.2/25
	Displacement and/or disruption to areas of low potential for contamination	Impacted area in ROW/total area of ROW properties, in ha./no. impacted properties	63.2/190.6/533	62.2/182.7/557	65.0/194.3/599	64.1/184.5/567	68.2/186.7/612	65.0/124.6/571	66.8/185.5/599	71.8/191.8/632	56.43/178.7/500

Plaza & Crossing Alternatives

PRACTICAL ALTERNATIVES EVALUATION	Factor: Maintain Consistency with Existing and Planned Land Use										
Performance Measure	Criteria/Indicator	Measurement/Units	Segments-Crossings to Malden Road								
			Plaza A				Plaza B		Plaza B1		Plaza C
			From Crossing A	From Crossing B	From Crossing C via Ojibway Parkway	From Crossing C via Brighton Beach	From Crossing C	From Crossing B	From Crossing C		
CONTAMINATED SITES/ DISPOSAL SITES	Displacement and/or disruption to <i>known</i> contaminated sites/disposal sites.	Impacted area in ROW/ total area of ROW properties, in ha./ no. impacted properties	0/0/0	3/24/2	4/42/7	7/63/11	7/63/11	10/32/5	28/74/12		
	Displacement and/or disruption to areas of high potential for contamination.	Impacted area in ROW/ total area of ROW properties, in ha./ no. impacted properties	01/12/2004	3/30/9	8/39/15	17/42/18	16/42/18	14/43/12	22/52/18		
	Displacement and/or disruption to areas of moderate potential for contamination.	Impacted area in ROW/ total area of ROW properties, in ha./ no. impacted properties	01/01/2004	01/01/2004	0/1/2	01/01/2006	01/01/2005	01/02/2007	01/01/2006		
	Displacement and/or disruption to areas of low potential for contamination.	Impacted area in ROW/ total area of ROW properties, in ha./ no. impacted properties	41/152/259	43/57/248	39/53/183	38/162/273	33/164/274	39/143/276	27/48/162		

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1955	55-4213 54-193
1955	55-4212 55-3
1955	55-4212 55-4
1972	1.72-4212 31-137
1972	1.72-4212 31-138
1972	1.72-4212 31-139
1972	1.72-4212 31-140
1972	1.72-4212 31-141
1972	1.72-4213 31-212
1972	1.72-4213 31-211
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