

Evaluation of Illustrative Alternatives Technical Report Volume 2: Technical Analysis

The Detroit River International Crossing Study



October 2007

FOREWORD

Background

The Detroit River International Crossing (DRIC) Study is a bi-national effort to complete the environmental study processes for the United States, Michigan, Canada and Ontario governments. The study will identify solutions that support the region, state, provincial and national economies while addressing civil and national defense and homeland security needs of the busiest trade corridor between the United States and Canada (Figure F-1).

Figure F-1
Detroit River International Crossing Study
Existing Detroit River International Crossings



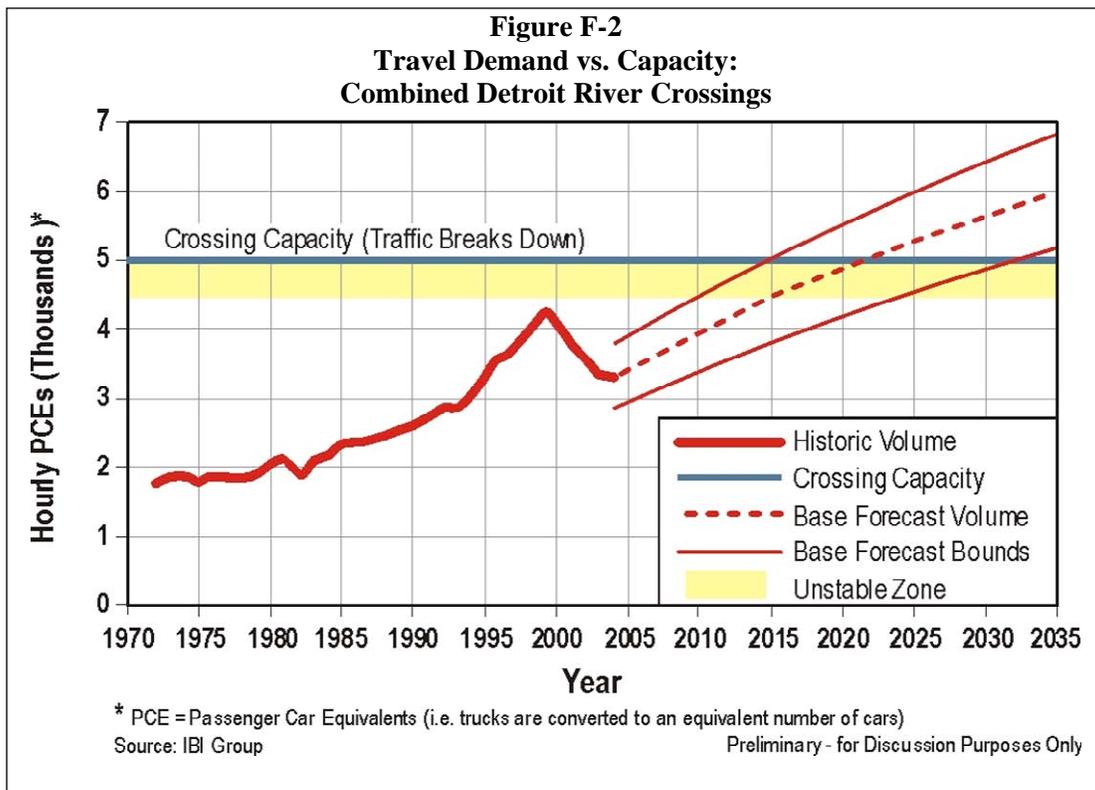
The purpose of the Detroit River International Crossing Project is to: (for the foreseeable future, i.e., at least 30 years):

- Provide safe, efficient and secure movement of people and goods across the Canadian-U.S. border in the Detroit River area to support the economies of Michigan, Ontario, Canada and the U.S.
- Support the mobility needs of national and civil defense to protect the homeland.

To address future mobility requirements (i.e., at least 30 years) across the Canada-U.S. border, there is a need to:

- Provide new border crossing capacity to meet increased long-term demand;
- Improve system connectivity to enhance the seamless flow of people and goods;
- Improve operations and processing capability; and,
- Provide reasonable and secure crossing options in the event of incidents, maintenance, congestion, or other disruptions.

Over the next 30 years, Detroit River area cross-border passenger car traffic is forecast to increase by approximately 57 percent, and movement of trucks by 128 percent. Traffic demand could exceed the “breakdown” cross-border roadway capacity as early as 2015 under high growth scenarios. Even under “low” projections of cross-border traffic, the “breakdown” roadway capacity of the existing Detroit River border crossings (bridge and tunnel combined) will be exceeded by 2033 (Figure F-2). Additionally, the capacity of the connections and plaza operations will be exceeded in advance of capacity constraints of the roadway. Without improvements, this will result in a deterioration of operations, increased congestion and unacceptable delays to the movement of people and goods in this strategic international corridor.



The forecast of capacity indicates that there will be inadequacies in: 1) the roads leading to the existing bridge and tunnel; 2) the ability to process vehicles through customs and immigration; and, 3) the capacities (number of lanes) of the Ambassador Bridge and Detroit-Windsor Tunnel themselves. So, even though incremental adjustments can and will be made to the plazas and, even though there is adequate border crossing capacity today (bridge and tunnel combined), the planning, design and construction of

any major international crossing takes time. Therefore, it is prudent to address, now, how and when the capacity need is to be satisfied at the crossing itself as well as the connecting roads.

The Detroit River International Crossing Study (DRIC) Draft Environmental Impact Statement (DEIS) addresses the analyses of issues/impacts on the U.S. side of the border for the crossing system over the Detroit River between Detroit, Michigan, and Windsor, Ontario, Canada. The alternatives are comprised of three components: the crossing, plaza (where tolls are collected and Customs inspections take place), and interchange connecting the plaza to I-75 (Figure F-3).

Figure F-3
Detroit River International Crossing Study
U.S. Area of Analysis for Crossing System



Source: The Corradino Group of Michigan, Inc.

This is a Summary of the Detroit River International Crossing Study Evaluation of Illustrative Alternatives on the U.S. side of the border conducted in 2005. It is one of 13 technical reports supporting the Draft Environmental Impact Statement. This summary is Volume 1 of a three-volume set of reports. Volume 2 presents the details of the technical evaluation process. Volume 3 graphically displays the data reported upon in Volumes 1 and 2. The purpose of this summary is to concisely report on the evaluation process and results contained in Volumes 2 and 3.

Introduction

The Detroit River International Crossing Study (DRIC) involves application of a structured process to evaluate Illustrative Alternatives that is consistent with laws and regulations guiding such analyses and past experiences on comparable projects. This process was used to determine which of the Illustrative Alternatives would be subject to more in-depth analysis to be documented in the Draft Environmental Impact Statement (DEIS). The DEIS is to be published by the end of 2007 (Figure F-4).

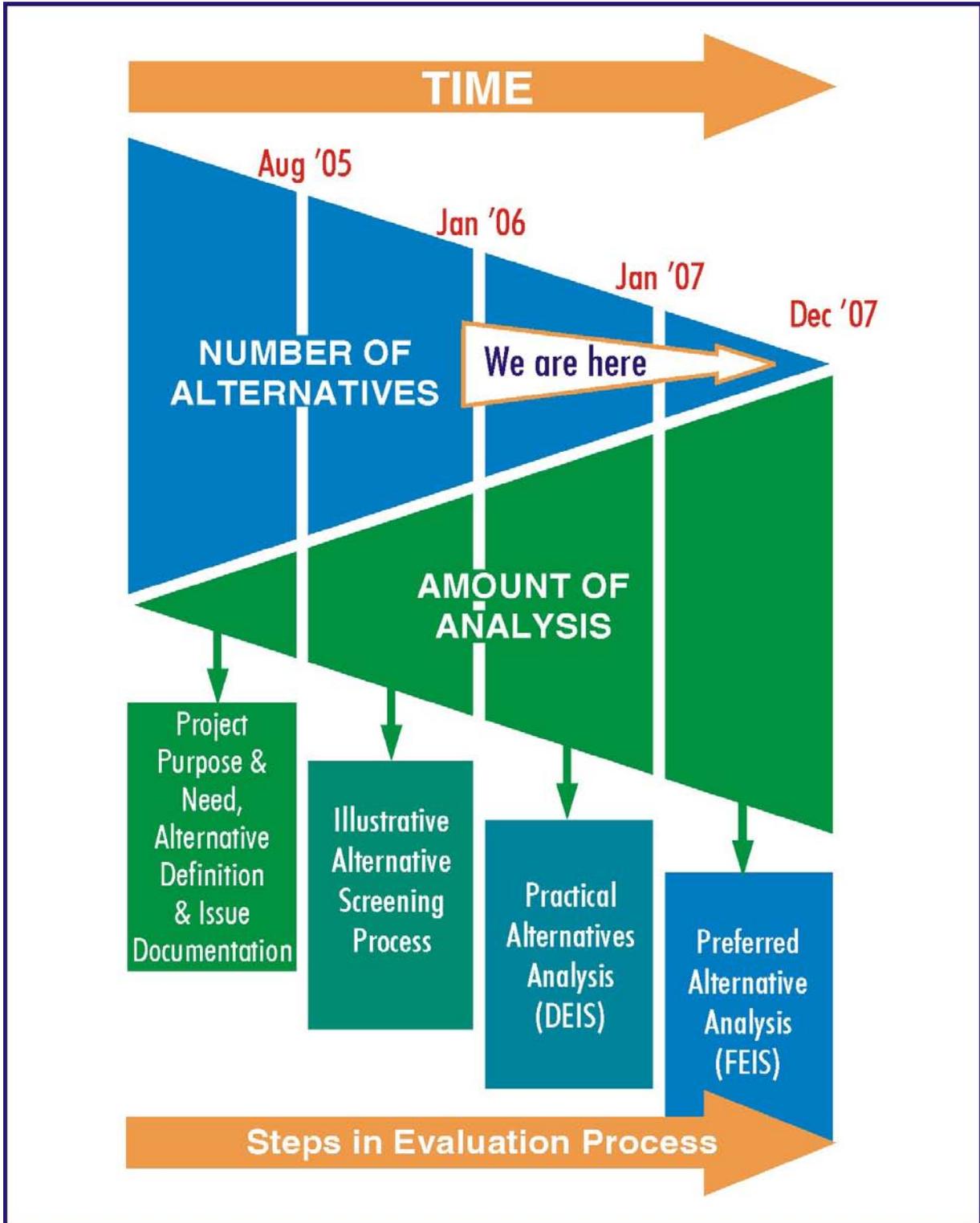
The evaluation process began when the Border Partnership Steering Committee, with input from the Working Group and its consultants,¹ identified options that would meet the project's purpose and need.

Project Purpose
<p><i>The Purpose of the Detroit River International Crossing Project is to: (for the foreseeable future, i.e., at least 30 years):</i></p> <ul style="list-style-type: none">■ <i>Provide safe, efficient and secure movement of people and goods across the Canadian-U.S. border in the Detroit River area to support the economies of Michigan, Ontario, Canada and the U.S.</i>■ <i>Support the mobility needs of national and civil defense to protect the homeland.</i>
Project Need
<p><i>To address future mobility requirements across the Canada-U.S. border, there is a need to:</i></p> <ul style="list-style-type: none">■ <i>Provide new border crossing <u>capacity</u> to meet increased long-term demand;</i>■ <i>Improve <u>system connectivity</u> to enhance the seamless flow of people and goods;</i>■ <i>Improve operations and <u>processing capability</u>; and,</i>■ <i>Provide reasonable and secure crossing options in the event of incidents, maintenance, congestion or other disruptions.</i>

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¹ The Partnership Steering Committee is comprised of representatives of the Federal Highway Administration, Transport Canada, the Ministry of Transportation Ontario and the Michigan Department of Transportation. The staff members of these organizations comprise the Working Group. The Consultant teams are led by URS Canada (Canadian Team) and The Corradino Group of Michigan (U.S. Team).

Figure F-4
Evaluation Process



Source: The Corradino Group of Michigan, Inc.

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Detroit River International Crossing Study Evaluation of Illustrative Alternative Plazas on U.S. Side of the Border

1. INTRODUCTION

This is the Technical Analysis of the Detroit River International Crossing Study (DRIC) Evaluation of Illustrative Alternatives on the U.S. side of the border. It is the second of a three-volume set of reports. Volume 1 presents a summary of the details presented in this report. Volume 3 graphically displays the data reported upon in Volumes 1 and 2. The purpose of this report is to document the details of the DRIC Illustrative Alternatives evaluation.

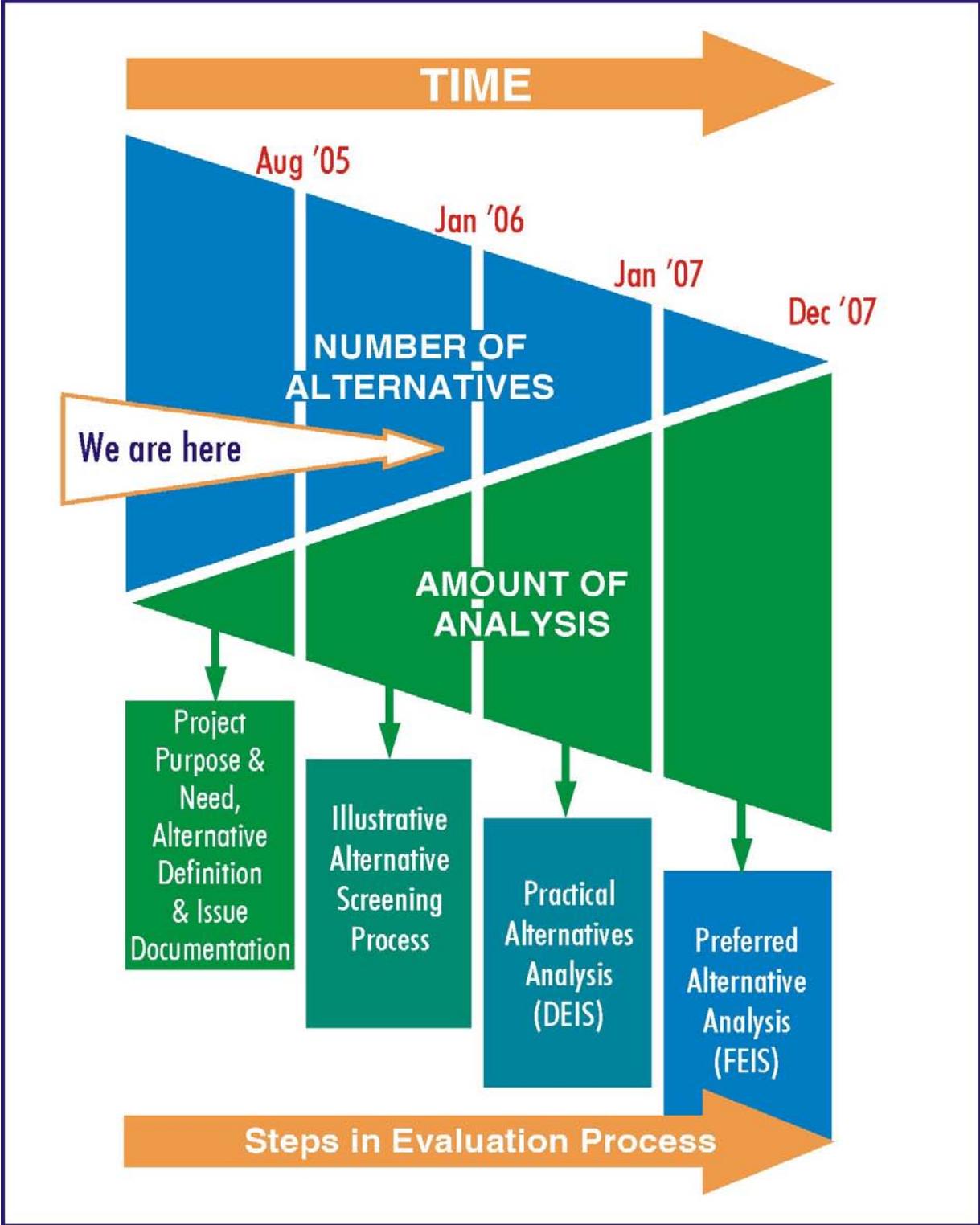
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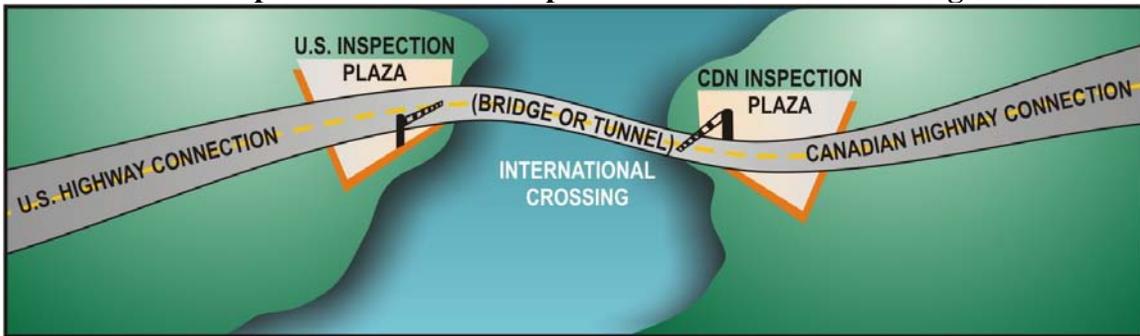
Figure 1-1
Evaluation Process



Source: The Corradino Group of Michigan, Inc.

These are Illustrative Alternatives, as they were considered feasible when developed in June 2005, in connecting Highway 401 in Canada to I-75, I-94 and/or I-275 in Wayne County, Michigan. Each end-to-end Illustrative Alternative has several components (Figure 1-2): highway route + plaza + border crossing + plaza + highway route. The complete depiction of the DRIC end-to-end alternative crossing systems is shown on Figure 1-3.

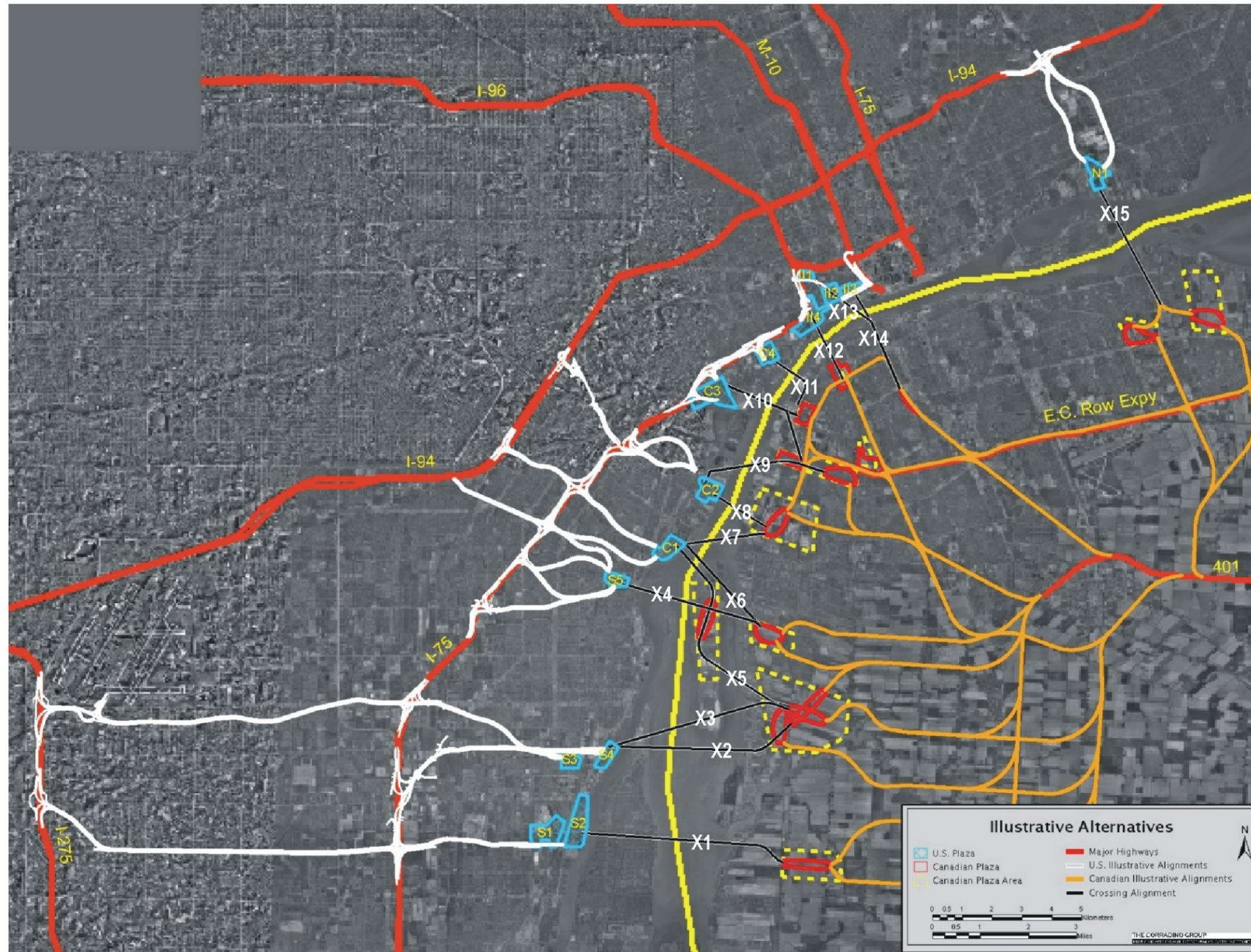
Figure 1-2
Components of New or Expanded International Crossing



Source: The Corradino Group of Michigan, Inc.

This report summarizes the analysis of the river crossing system components and their effects on the U.S. side of the border. The results have been combined with evaluations on the Canadian side of the border of plazas, crossings and routes/interchanges. The resulting recommendations, which are based on this joint evaluation, will be presented for public comment beginning in late November 2005. Following public review and comment, the Border Partnership Steering Committee will decide by March 2006 the final list of Practical Alternatives.

**Figure 1-3
Preliminary End-to-End Illustrative Alternatives**



Source: The Corradino Group of Michigan, Inc.

2. EVALUATION PROCESS

This report deals with the evaluation of U.S. plazas, routes connecting the plazas to the nearby freeway system, and the border crossings that span the Detroit River. Evaluations are focused on U.S. impacts, except in the areas of Regional Mobility and Regional Air Quality for which impacts to the entire SEMCOG/Windsor-Essex region were evaluated. The evaluation process follows the overall methodology incorporated in the scoping information document³, which is summarized in Table 2-1. The evaluation factors are:

- Protect Community/Neighborhood Characteristics
- Maintain Consistency with Local Planning
- Protect Cultural Resources
- Protect the Natural Environment
- Improve Regional Mobility
- Maintain Air Quality
- Assess How Project Can Be Built

A definition of each of the evaluation factors, performance measure categories and the associated performance measures is provided below.

2.1 Protect Community/Neighborhood Characteristics

Six different performance measure categories are involved in this area.

To determine neighborhood **traffic impacts**, volume changes on links in the local roadway system that would be affected by connecting to a border crossing are analyzed. Those streets that would be closed during construction (temporarily) as well as permanently have been listed. Likewise, those streets that would remain open but crossed or rerouted are also listed to determine the degree to which the community's basic street network would be modified. Lastly, if there are mainline railroads that may be rerouted because of the plaza's location, they are listed as well.

The number of dwelling units has been calculated within 150 feet of each component of the border crossing system that would have front line (unblocked) exposure to **noise**. Additionally, any significant sensitive receptors such as churches, parks, historic sites and the like, within the 150-foot band are also cited.

³ Scoping Information, Detroit River International Crossing Study, July 2005.

**Table 2-1
Detroit River International Crossing Study
Evaluation Factors and Performance Measures
Illustrative Alternatives Phase**

Evaluation Factor	Performance Measure Category		Performance Measures	
			Description/Units	Data Source
Protect Community/ Neighborhood Characteristics	Traffic Impacts	Volume Change – Key Links	Vehicles	DRIC Travel Demand Model
		Streets Closed (permanently)	Number	GIS/Field Review
		Streets Closed (temporarily)	Number	GIS/Field Review
		Streets Crossed	Number	GIS/Field Review
		Streets Rerouted	Number	GIS/Field Review
		Streets with Interchange	Number	GIS/Field Review
		Mainline Raillines Rerouted	Number	GIS/Field Review
	Noise	Frontline Exposure	Number of dwelling units exposed	Transportation Noise Model (TNM) Version 2.5
		Significant Receptors Exposures	Number/Specify	Field Review, TNM
	Community Cohesion/Character	Change from No Action	Positive/Negative/Neutral	Professional Judgment
	Potential Acquisition	Residential Units	Occupied	GIS/Field Review
			Vacant	GIS/Field Review
		Residential Population	Number	GIS/Field Review
			Active	GIS/Field Review
		Business Units	Vacant Buildings	GIS/Field Review
			Estimated Employees in Affected Census Blocks	Number
		Other Land Uses Affected	Schools	GIS/Field Review
			Senior Service Facilities	GIS/Field Review
			Government Facilities	GIS/Field Review
			Places of Worship	GIS/Field Review
			Medical Facilities	GIS/Field Review
			State/Federal Government Facilities	GIS/Field Review
			Community Services	GIS/Field Review
			Vacant	GIS/Field Review
	Environmental Justice/Title VI	EJ Populations in Affected Census Block Groups	EJ Population (non poverty)	U.S. Census Data
			Population Groups Affected	U.S. Census Data
			% Households in Poverty/Above or Below 9.9% Regional Threshold	U.S. Census Data
		Title VI Groups in Census Tracts	Households in Poverty	U.S. Census Data
			Presence of Regionally Prominent Ancestral Groups	U.S. Census Data
	Public Safety/Security (Plaza Only)	Proximity to Industry	Number of heavy industry businesses within 1/2 mile	GIS/Field Review
			Number of medium industry businesses within 1/2 mile	GIS/Field Review
			Number of light industry/office businesses within 1,000 ft/300m	GIS/Field Review
		Proximity to Residential/Retail	Number of residences within 500 ft/150m	GIS/Field Review
Number of retail businesses within 500 ft/150m			GIS/Field Review	
Proximity to Hazardous Materials		Number of EPA Licensed Hazmat TSD Facilities within one-half mile		
		Number of MDEQ Licensed TSD Facilities within one-half mile		
Emergency Response		Distance to nearest fire station (mi)	GIS/Field Review	
		Distance to nearest police station (mi)	GIS/Field Review	
		Number of streets closed (perm.)	GIS/Field Review	
		Number of streets closed (temp.)	GIS/Field Review	
		Mainline Raillines Rerouted	GIS/Field Review	
Maintain Consistency with Local Planning	Official Plans	Consistency	YES/NO	Professional Judgment
	Other Plans	Consistency	YES/NO	Professional Judgment
		Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Underground Storage Tanks	Number
	EPA/DEQ Licensed Hazmat TSD Facility		Number	Web-based EPA files
	National DEQ Priority List (Superfund)		Number	Web-based MDEQ/EPA files
	RTK Cerclis (Superfund)		Number	Web-based MDEQ/EPA files
	Michigan Contaminated Site		Number	Web-based MDEQ files

Table 2-1 (cont'd)
Detroit River International Crossing Study
Evaluation Factors and Performance Measures
Illustrative Alternatives Phase

Evaluation Factor	Performance Measure Category		Performance Measures		
			Description/Units	Data Source	
Protect Cultural Resources	Above Ground Historic Resources	Historic Districts	Number	Web-based SHPO files	
		Listed NRHP Sites/Structures	Number	Web-based SHPO files	
		Listed SHRS Sites/Structures	Number	Web-based SHPO files	
		Locally Listed Sites/Structures	Number	Local Historic Groups	
		Potentially Eligible Sites/ Structures	Number	Field Review	
	Archaeology	Previously Recorded Sites	Number	SHPO files	
	Below Ground Resources	Potential to Find/Record	High/Medium/Low	Field Review	
	Parkland	All Public Parks	Number/Acres	Municipal Web sites/Field Review	
6(f) Parks		Number/Specify	Web site – National Park Service		
Coastal Zone Management Projects		Number of Project/Specify	MDEQ and Grant Applications		
Protect the Natural Environment	Surface Water	Floodplain	Number/Acres	GIS/Field Review	
		Surface Run Off	Acres	Calculation	
		Primary Steams	Number/Specify	GIS/Field Review	
		Secondary Streams	Number/Specify	GIS/Field Review	
		Other Water-crossings	Number/Specify	GIS/Field Review	
	Groundwater	Municipal Wells	Number	Contact with Municipalities	
		Water In-takes	Number/Specify	Contact with Municipalities	
	Significant Habitat	Wetlands	Acres	Field Review	
		Fens/Bogs	Number/Acres	Field Review	
		Endangered Species	Potential Species	U.S. Fish & Wildlife/MDEQ	
		Designated Wildlife Refuges	Number/Acres	U.S. Fish & Wildlife/MDEQ	
	Prime/Unique Farmland	Farmland	Acres	GIS/U.S. Department of Agriculture	
	Mineral Resources	Salt/Limestone	Type/Specify	Field Review/Industry sources	
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action	SEMCOG Travel Demand Model	
			With New Crossing	SEMCOG Travel Demand Model	
			Difference from 2035 – No Action	SEMCOG Travel Demand Model	
			Percent Difference	SEMCOG Travel Demand Model	
			No Action	SEMCOG Travel Demand Model	
		VHT (int'l traffic only, PM Peak Hour for 2035)	With New Crossing	SEMCOG Travel Demand Model	
			Difference from 2035 – No Action	SEMCOG Travel Demand Model	
			Percent Difference	SEMCOG Travel Demand Model	
		V/C (total traffic)	Table 5-10, Figure 5-11	SEMCOG Travel Demand Model	
		Diversion due to disruption at crossing	Difference of Int'l VMT with Ambassador Bridge Closed and New Crossing Open	SEMCOG Travel Demand Model	
Difference of Int'l VHT with Ambassador Bridge Closed and New Crossing Open	SEMCOG Travel Demand Model				
Detour of Local Arterials	Number of SEMCOG Network Links Rerouted	SEMCOG Travel Demand Model			
Maintain Air Quality	Regional Burden	Change from No Action	VOC	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			CO	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			NOX	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			PM2.5	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			PM10	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
	Hotspot		Benzene	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			1,3 Butadiene	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			Formaldehyde	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			Acetaldehyde	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
			Acroline	lbs. in PM peak hour	EPA MOBILE6.2 & model runs
	Carbon Monoxide (CO)	Parts Per Million	Approved Federal Model (CALQ3HC)		

Table 2-1 (cont'd)
Detroit River International Crossing Study
Evaluation Factors and Performance Measures
Illustrative Alternatives Phase

Evaluation Factor	Performance Measure Category	Performance Measures			
		Description/Units	Data Source		
Assess How Project Can Be Built	Traffic Maintenance	Streets closed during construction	Number	GIS/Field Review	
		Adjacent businesses affected by construction	Number within 500 ft/150m	GIS/Field Review	
		Adjacent schools or public use facilities affected by construction	Number within 500 ft/150m	GIS/Field Review	
	Site constraints limiting access to the plaza for the river crossing or the roadway connections.	Plaza proximity to crossing landing	Distance (ft/m)	GIS/Field Review	
		Raillines adjacent to or through plaza site	Number	GIS/Field Review	
		Utilities adjacent to or through plaza site	Number	GIS/Field Review	
		Presence of heavy industry adjacent to or on plaza site	Yes/No	GIS/Field Review	
		Contaminated sites/hazardous materials within 500 ft/150m (single sites may have multiple designations)	EPA Licensed Hazmat TSD Facilities		Web-based EPA files
			National Priority List (Superfund)		Web-based MDEQ files
			RTK Cerclis (Superfund)		Web-based MDEQ files
	Michigan Contaminated Sites			Web-based MDEQ files	
	Geotechnical constraints – identify any unusual geotechnical features/issues that may be problematic for construction	DEQ Licensed TSD Facilities		Web-based MDEQ files	
		Proximity to solution mining areas	Number within 1,000 ft/300m	GIS	
		Presence of poor soil conditions (e.g., compressible/expansive and organic)	Yes/No	GIS/Literature Review	
		Presence of noxious gases (e.g., Hydrogen Sulfide and Methane)	Yes/No	Literature Review	
	Relative risk of known site conditions (environmental, geotechnical, other physical/construction methodologies)	Presence of artesian groundwater	Yes/No	Literature Review	
		Engineering Consideration	High/Medium/Low	Professional Judgment	

Source: The Corradino Group of Michigan, Inc.

The professional assessment of whether a **community's cohesion/character** would be affected by a component of the crossing system is based upon an understanding of the characteristics of the affected neighborhood(s)/community(ies). The entirety of the information presented in this category is used to make that judgment.

The **potential acquisition** of residential units (single-family and apartments) and the number of inhabitants who may have to be relocated is included in the assessment by each component of the border crossing system. Similarly, the number of businesses potentially affected, along with an estimate of the number of direct jobs at those businesses that are expected to be relocated, have been identified. Lastly, other land uses that could be affected are incorporated into the analysis. They include: schools, senior service facilities, city government facilities, places of worship, medical facilities, state/federal government facilities, and community service facilities, such as recreation centers, counseling centers, and the like.

Presidential Executive Order 12898 on **Environmental Justice** (EJ) sets out objectives and procedures: *to identify, address and avoid disproportionately high and adverse health and environmental effects on minority populations and low-income populations.* The population groups likely to be affected directly and/or indirectly by a component of the border crossing system have been defined by using Census data at the "block-group" level. In addition, the number of people potentially impacted have been estimated. It is noteworthy that this latter number may exceed those people potentially relocated because the block-group data are much broader than the in-field counts of dwelling units that could be acquired. Nonetheless, it serves as an estimate of EJ impacts.

Those social/cultural groups covered by **Title VI** of the Civil Rights Act of 1964 are also reviewed in this evaluation category. Title VI mandates that discrimination not occur on the basis of race, color or national origin in connection with programs and activities receiving federal financial assistance. To properly account for Title VI issues, all groups which comprise at least two percent of the SEMCOG region's population were chosen for analysis. These include Arab, Asian, Black or African-American, English, French, German, Hispanic/Latino, Irish, Italian, Polish and Scottish. Because the data to address Title VI ancestry issues are only available at the large Census tract level (as compared to the Census block-group level for minority populations), only the ancestral groups that could be potentially affected by a border crossing component are identified at this time, not the specific number of people. More detailed analysis of ancestry (and Environmental Justice) issues will be conducted for the Practical Alternatives analysis.

In order to determine the relationship of the plaza (and only the plaza) to the **security** of the neighborhood/community in which it may reside, and the effect of the surroundings on the plaza's security, several factors have been examined. A "proximity index" has been used to determine the number of heavy⁴ industries and medium⁵ industries within one-half mile of the plaza's edge (not its center); this is a "risk-to-plaza" issue as the activities at these industries can affect the security of the plaza. Likewise, the number of light industry and office businesses within 1,000 feet/300 meters of the plaza's edge have been determined. The proximity index for residences and retail businesses is even more narrow at 500 feet/300 meters. These two latter proximity indices are associated with a plaza's potential risk to the community if an incident were to occur at the plaza.

In order to determine the possible effect of the plaza on emergency services response, the plaza's distance to the nearest fire and police stations have been measured as well as a listing of the number of streets that may be closed temporarily during construction and permanently after the plaza is in operation. Likewise, the mainline railroads that would be crossed have also been defined because crossing a rail line may impede the responsiveness of emergency services.

The last issue in this category of public safety/security, as it relates to both the risk to the plaza and the plaza's potential risk to a community, is the number, within one-half mile of the plaza, of any Michigan Department of Environmental Quality/EPA-licensed Transfer/Storage/Distribution (TSD) facility, which handles potentially hazardous materials.

2.2 Maintain Consistency with Local Planning

To determine the effects of each crossing system component on the planning for a community, an assessment has been made of the **consistency** of the crossing system component **with official, government-adopted plans**. Likewise, there are a number of instances in which the community has expressed an interest in changing the development pattern. For example, there has been comment at DRIC public meetings about a new housing plan for the Delray area. While plans such as these have not been formally adopted, its public mention has been recognized and the **consistency** of the crossing system component with such **unofficial plans** has been defined.

Lastly, in this category, is a listing of the number of **contaminated sites that could impede implementing the development plan**. The greater the number and type of environmental

⁴ Heavy industry is defined as those industrial land uses that present a potential for significant difficulty in demolition or removal as well as legacy issues that would affect construction such as environmental contamination. Such land uses may include chemical production facilities, hazardous waste processing facilities, foundries and blast furnaces, steel mills, etc.

⁵ Medium industry is considered a location of moderate manufacturing or industrial activity such as a distribution facility or a small (non-auto) assembly plant.

issues, the more difficult it will be to accomplish a development plan. These include not only the previously-defined MDEQ/EPA-licensed TSD facilities but also Superfund sites.

2.3 Protect Cultural Resources

This evaluation factor covers five issues. First, the **aboveground historic resources**, on either the national or state list, as well as those that may be listed locally (say, by Wayne County) have been determined. An assessment is also made of whether other sites and structures **might be eligible** for listing on the *National Historic Register*, even though not now listed. The latter is a professional assessment made by cultural resource specialists.

In the area of **archaeology**, the number of previously-recorded sites have been identified. And, the potential to find/record additional **belowground** archaeological resources of significance is also cited. The number of **public parks** potentially affected is listed and whether they are afforded **4(f) or 6(f)** protections by U.S. law. Lastly, any **Coastal Zone Management (CZM) projects** that may be affected are cited. CZM projects have constraints affecting their use.

2.4 Protect the Natural Environment

This evaluation factor includes five categories by which to measure performance. Under the **surface water** category, the number of floodplains crossed and the number of acres affected have been defined. Likewise, the amount of runoff from each plaza has been calculated. Such runoff will be treated before being discharged into any water body. A listing is also presented of the primary and secondary streams potentially affected. Crossings of other water bodies, such as drainage features, are also cited.

In the **groundwater** category, the number of municipal wells directly affected by the construction of each border crossing component is specified, as well as water intakes to various plants and other facilities.

In the **significant habitat communities** evaluation area, the type of wetland encountered is specified along with the number of acres expected to be impacted. Unique, non-replaceable, wetlands known as fens and bogs are listed separately. Evidence of the existence of endangered species is also evaluated for potential effects. Suitable habitat for endangered species has also been identified.

The impact on any **prime or unique farmland** is included in this category, measured by the number of acres that would be taken out of production after being acquired. The impact on

mineral resources, such as the salt and limestone, are identified, by type. Mineral resources are not likely to be limited in their extraction.

2.5 Improve Regional Mobility

The crossing system will be designed and built to handle the traffic demand for the long-range (2035) future and beyond. The crossing and connecting freeway will be three lanes in each direction with interchanges appropriately spaced and designed to provide local access but not impede flow from/to the crossing. So, each component of the crossing system, including the plaza, will have adequate capacity. Therefore, the “capacity” need is measured by the connecting roadway system’s response to the new crossing.

Measures used to define the system’s ability to address the capacity need are provided both systemwide and by link. **Systemwide, vehicle miles and vehicles hours-of-travel (VMT and VHT)** are critical measures because, if the new crossing system does not save travel time and distance, then it does not meet the project’s need.

Link-specific data are also important in defining regional mobility. The analysis of the crossing system components focuses on a number of key links in the southeastern Michigan roadway system, including the existing river crossings, to measure: (1) international travel; and, (2) overall congestion (international and all other traffic) calculated as the ratio of the total peak hour traffic volume-to-capacity of the roadway link. These measures allow an understanding of the degree to which the capacity of the network that serves the proposed crossing system meets future needs as influenced by international travel.

Another measure of the crossing system’s effectiveness is its ability to provide redundancy in serving the region’s mobility defined by the **vehicle miles and vehicle hours of travel with the Ambassador Bridge closed**. Finally, to assess regional mobility, the number of **links in the SEMCOG network** that would be rerouted or **permanently closed** are identified.

2.6 Maintain Air Quality

Air pollution burden calculations were done to assess the relative effect of the Illustrative Alternative proposals for afternoon peak hour traffic in the design year of 2035. “Pollutant burden” means the amount of pollution in terms of mass. It is not a concentration. The burden is for international traffic only, i.e., the traffic crossing the border.

Emissions are calculated using a U.S. EPA computer program called MOBILE6.2 (latest version). The inputs to this model that reflect regional conditions have been checked with SEMCOG. Emission factors vary by speed and are typically modeled in five mile-per-hour increments (5 mph, 10 mph, 15 mph, etc.). Most pollutants decrease as speed increases. Slower speeds generally produce more pollutants per mile, although this relationship becomes more complex at higher speeds. To generate the pollutant burdens for the Illustrative Alternatives, the average system speed was calculated by dividing the total VMT by the total VHT.

Emission factors were generated for several National Ambient Air Quality Standard pollutants: volatile organic compounds (VOCs), carbon monoxide (CO), nitrogen oxides (NO_x), and larger and smaller particulates (PM₁₀ and PM_{2.5}, respectively). These are pollutants for which the U.S. EPA has set standards to protect public health and welfare. Emission factors for several air toxics were also calculated: benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acroline. The resulting emission factors for each of these pollutants were multiplied by the difference in vehicle miles as compared to the No Action condition.

Carbon monoxide (CO) concentrations at/near plazas and on crossings and connecting roadway links can be compared to the National Ambient Air Quality Standard (NAAQS) for CO using CAL3QHC, which is a computer program developed by U.S. EPA and the Federal Highway Administration. It is a dispersion model used to determine CO concentrations at receptor locations downwind of “at-grade,” “fill,” “bridge,” and “cut section” highways located in relatively uncomplicated terrain. CAL3QHC adds features that account for queuing and, therefore, allows estimates of CO values at specific locations, such as where vehicles pay tolls or pass through customs inspection facilities. For the Illustrative Alternatives, assumptions were made regarding the plaza, roadway and crossing operations during a typical 2035 afternoon peak traffic hour, related to number of lanes, delay and volumes from the traffic model runs. The result is that CO in parts per million (ppm) was estimated to be less than two. The ambient (background) levels of CO in Wayne County in 2005 are between 2.5 and 3.7 ppm. So, adding the site-specific concentration to the background will not produce CO concentration values greater than the NAAQS standard of 35 ppm.

2.7 Assess How the Project Can Be Built (Constructability)

There are four important areas of measurement in this evaluation area. First, **maintenance of traffic** is a key activity to efficiently and safely construct the crossing component. To define this issue, the number of streets that would be closed is established. Maintaining traffic for businesses within 500 feet/150 meters of the construction area as well as any adjacent schools and other public-use facilities is also defined in the maintenance-of-traffic area.

Site constraints, such as the number of rail lines and utilities adjacent to or running through the crossing component at the current time, are identified. They may have to be relocated, affecting construction. So would a heavy industry operation. And, environmental contamination will have to be remediated.

Geotechnical constraints affecting constructability include the proximity within 900 feet to a solution mining area (i.e., brine well) and the presence of poor soil conditions, noxious gases, or artesian groundwater.

A “rollup” factor of addressing all of the above-listed issues is then cited as “**relative risk.**” It reflects the professional engineering judgment of the likelihood of constructing on time and within budget each border crossing component based on soil conditions, the presence of noxious gases and/or artesian groundwater.

3. EVALUATION FACTOR WEIGHTING

The seven evaluation factors listed on Table 2-1, and discussed above, were then assigned a value of importance (weight) by both the citizens who engaged in the process and the MDOT Technical Team. A total of 875 completed forms (out of 941 forms submitted) were included in the analysis.

The members of the MDOT Technical Team involved in the weighting process are:

Mohammed Alghurabi, P.E., B.S.C.E.
Geraldyn Ayers, B.A.
Margaret Barondess, B.A., M.A.
Thomas Hanf, B.A., M.A.
Andy Irwin, B.A., B.S.
Carmine Palombo, P.E.
Bob Parsons, B.S.
Kris Wisniewski, B.A., M.P.A.
Andy Zeigler, B.S., RLA

The members of the consulting team involved in the evaluation factor weightings are:

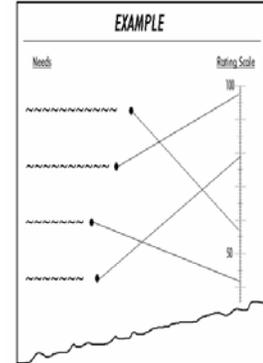
Regine Beauboeuf, P.E., B.S.C.E.
Mark Butler, AICP, B.A., M.S., M.P.A.
Bruce Campbell, P.E., B.S., M.S.
Joe Corradino, P.E., B.S.C.E., M.S.C.E.
Jim Hartman, P.E., B.S.C.E.
Jeff Mason, A.S.L.A., B.L.A.
Mike Nurse, P.W.S., B.S., M.S.
Doug Strauss, P.E., B.S.C.E.
Ted Stone, B.A.
Donald Weir, R.P.A., M.A.

The scoring form shown on Table 3-1 was used. The results of this weighting process for the citizens and for MDOT's Technical Team are shown on Figure 3-1.

**Table 3-1
Detroit River International Crossing Study
Scoring Form – Evaluation Factors**

How Important Are These Items?

We want to know how you value the seven evaluation factors listed below. To provide us your opinion, please rate them on the scale of "1" through "100", with the highest rating indicating the item you believe is most important. Draw a line from the dot (*) following each factor on the left, to the scale on the right, to indicate your opinion. If you choose, you can have all factors at the same point on the scale at the right. When finished, return your form to a project representative, or by email, or by fax at the addresses listed at the bottom of this form.



Your opinions will be used to evaluate the impacts of the Illustrative Alternatives of the Detroit River International Crossing Project. In that process the Detroit River International Crossing Partnership must also consider the project's Purpose and Need Statement (attached). Therefore, a proposed river crossing alternative's international and national importance from economic and travel/transportation (including freight) perspectives may be overriding considerations throughout the evaluation. Thank you.

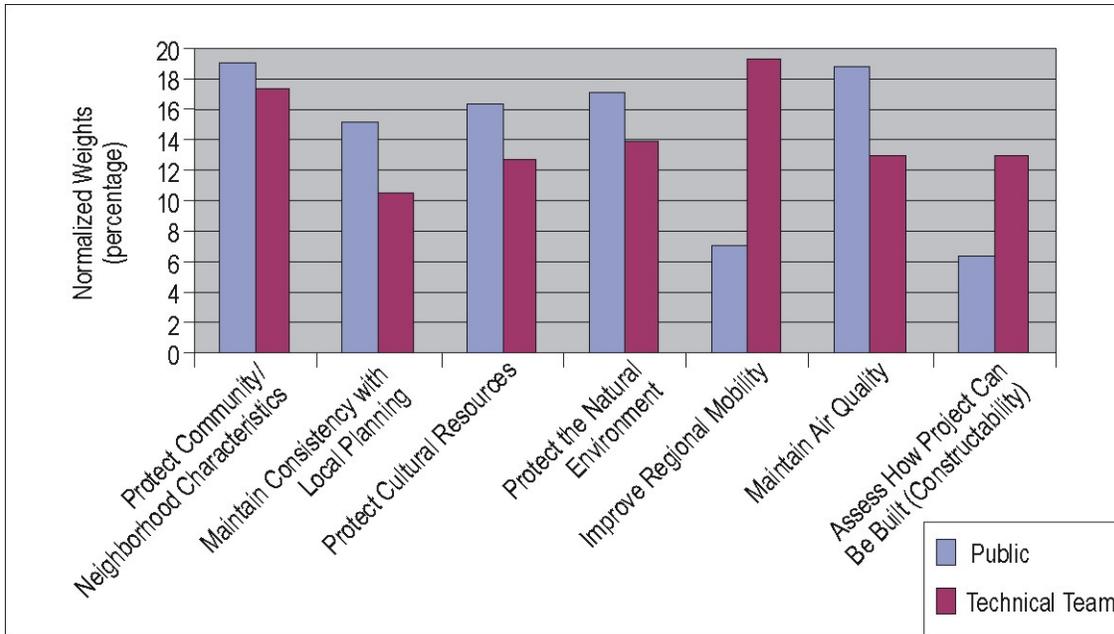
<u>Factor</u>		<u>Rating Scale</u>
Maintain Air Quality	•	
Protect Community/Neighborhood Characteristics	•	
Maintain Consistency with Local Planning	•	
Protect Cultural Resources	•	
Protect the Natural Environment	•	
Improve Regional Mobility	•	
Assess How Project Can Be Built	•	

Name of Person Completing Form: _____

www.partnershipborderstudy.com
Hotline: 800.900.2649
Fax: 248.799.0146

Please return the completed form by July 31, 2005.

Figure 3-1
Detroit River International Crossing Study
Evaluation Factor Weightings
(Normalized to 100%)
Citizens and MDOT Technical Team



Source: The Corradino Group of Michigan, Inc.

The results shown in Figure 3-1 indicate:

- Similar rankings by the two groups for the evaluation factor of “Protect Community/Neighborhood Characteristics” which the public ranked first (19.00%) and the MDOT Technical Team ranked second (17.44%) with weights about 1.6 percentage points apart.
- Both groups rank third the evaluation factor “Protect the Natural Environment” with weights about 3.25 percentage points apart (public at 17.09 percent/MDOT Technical Team at 13.87 percent).
- The evaluation factor “Protect Cultural Resources” was ranked fourth by the public (16.53%) and sixth by the MDOT Technical Team (12.77%) with weights 3.75 percentage points apart.

- The public ranked the factor “Improve Regional Mobility” sixth (7.06%), about one-third the weight of the MDOT Technical Team (19.46%). This factor is weighted highest by the MDOT Technical Team. The spread in weights is the greatest of all factors at about 12.5 percent.
- The public ranked last the factor “Assess How Project Can Be Built” (6.26%) while the MDOT Technical Team ranked it fourth at a weight of 13.05 percent, which is almost twice that of the public and reflects a spread of almost seven percent.
- The public assigned the second highest weight (18.88%) to the “Maintain Air Quality” factor. The MDOT Technical Team placed it fifth at 12.97 percent – a difference of about six percent.
- For the evaluation factor “Maintain Consistency with Local Planning” a difference of about 4.75 percent exists between the public’s weighting (15.18%) and that of the MDOT Technical Team (10.44%).

In summary, the public sees all the factors, but Regional Mobility and Constructability, of about equal importance (15 to 19%). It sees Regional Mobility and Constructability much less important with weights at about six percent.

The MDOT Technical Team views the factors related to Air Quality, Consistency with Local Planning, Protecting the Natural Environment and Protecting Neighborhoods at a high level. But, it views Regional Mobility as the most important factor, and at a much higher weight than the public.

These scores were done independently by each group with the MDOT Technical Team completing its weighting before the public weights were calculated. All weights were tabulated on a normalized basis so individual totals equal 100.00 percent.

3.1 Performance Measurement Process

Each set of weights has been applied in the scoring of the components of Illustrative Alternative crossing systems. In doing so, the “performance” of each Illustrative Alternative is first measured by the consultants by studying the data in the categories listed on Table 2-1. For example, when examining the data for the evaluation factor of Protect Cultural Resources, the number of historic/archaeologic and park sites potentially impacted, along with their listing on a

national or state register, contributed to the score of 0 to 100 assigned by each member of the evaluation team – a score lower than 50 is considered a poor performance. The total score of each alternative is developed by multiplying the performance score for a specific evaluation factor by the weight of that factor established by: 1) the public, and 2) the MDOT Technical Team. When the weighted scores are added, two totals are available per Illustrative Alternative. Those totals inform the decision of which alternatives are dropped from further consideration.

It is noteworthy that cost was applied after the evaluation scoring to determine “cost effectiveness,” defined as “score (points) per dollar,” for the border crossing system on the U.S. side, i.e., crossing, plaza and connecting route. This measure was also important to deciding the list of alternatives to be dropped from further consideration.

The remainder of this report presents a discussion of unique characteristics (Section 4); evaluation data and performance scoring of plazas (Section 5); river crossings (Section 6); and, connecting routes (Section 7). The results of the analysis are presented in Section 8. The recommendation is included in Section 9. It is emphasized, as has been done repeatedly in the past, that the Partnership will consistently and continuously examine each alternative’s national and international importance from economic and travel/transportation (freight) perspectives as overriding considerations in finalizing the list of Practical Alternatives.

4. UNIQUE CIRCUMSTANCES

As the data collection and evaluation processes unfolded, information was analyzed to determine if there were any unique alternatives or crossing system components that did not serve the project’s purpose and need or were not practical to implement with minimal impacts and in a timely way. There are three such cases that affect a number of Illustrative Alternatives: 1) the proposed Detroit River Tunnel Partnership plan to convert the existing rail tunnels to truck use and construct a third tunnel for rail use; 2) the U.S. Steel property as affected by proposed Plazas C-1 and C-2; and, 3) the unique circumstance surrounding use of Fighting Island, which, while located on the Canadian side of the border, has an effect on the U.S. proposals.

4.1 The Detroit River Tunnel Partnership (DRTP) Proposal

A key issue that guides the definition and analysis of an Illustrative Alternative is whether it meets the project’s purpose and need. The best indicator of this is Regional Mobility, although other evaluation factors were also considered (included in Volume 2 of this report).

The DRTP proposal is defined in the Detroit River International Crossing Study as Crossing X-13 (refer to Figure 1-3) – a one lane in each direction truck tunnel that uses the DRTP-controlled railroad right-of-way on each side of the Detroit River. In the U.S., the plaza is labeled II-1 and is depicted in Figure 4-1. An evaluation of the potential impacts of this crossing system indicates the crossing itself, labeled X-13, performs poorly in the categories of “Protecting Neighborhoods” and “Protecting

Cultural Resources” as it comes up to ground level from the tunnel section. The impact on the Michigan Central Railroad Station historic property (plus the MC Depot railroad yard ramp and tunnel, and the Lutheran Brothers Warehouse [1627/1629 Howard Street], all considered eligible for the *National Register of Historic Places*) contribute to its poor performance in the area of “Protecting Cultural Resources.” The impact on three archaeological sites (the Howley site, the Gold site and the May’s Creek Burial site) also affects the DRTP crossing’s performance in the cultural resources evaluation area.

Figure 4-1
Plaza II-1
I-75/Michigan Avenue



Source: The Corradino Group of Michigan, Inc.

The connection of the plaza to the roadway system is judged to perform poorly in the category of “Consistency with Local Planning.” Official plans by the City of Detroit for the area which the connecting route will penetrate are directed to residential/commercial revitalization, not a transportation corridor. The connection from the plaza to the roadway system performs poorly in the Regional Mobility area as part of an overall crossing system. It performs well in all other categories.

The plaza’s characteristics are considered negative in the area of “Protecting Community/ Neighborhoods.” This is attributable to its: 1) potential direct and indirect effects on minority and low-income people; 2) relocating the Southwestern Hospital and a nearby church; and, 3) relocating local businesses which employ more than 100 people. The DRTP plaza is judged to have a positive performance in all other plaza evaluation categories but Regional Mobility, which will be discussed in the last part of this section.

These factors, when combined with the DRTP’s performance in the area of Regional Mobility (Table 4-1), eliminate it from further consideration in the DRIC Study. The performance measures used in the Regional Mobility evaluation area (listed on Table 2-1) are defined as follows. (All are calculated for the afternoon peak hour in 2035.)

- Vehicle miles of travel (VMT) for international trips – This is the sum over all roadway links in the network of link distance multiplied by the number of international cars and trucks on the link. It is reported as the difference from the No Action alternative.
- Vehicle hours of travel (VHT) for international trips – This is the sum over all roadway links in the network of link travel time multiplied by the number of international cars and trucks on the link. It is reported as the difference from the No Action alternative.
- Ratio of Volume to Capacity (V/C) – The V/C ratio is defined as the directional one-hour volume divided by the directional one-hour capacity for every link in the network.
- Crossing and Route Volumes – This is the total volume loaded on each crossing for the modeling period. Volumes are also reported for the connecting routes from a plaza to the interstate highway system.
- Diversion Due to Disruption – This is the systemwide difference of international VMT and VHT compared to the basic roadway system but with the Ambassador Bridge link removed and the Detroit-Windsor Tunnel still operating.

Table 4-1
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Regional Mobility Characteristics
2035 PM Peak Hour Traffic

Evaluation Factor	Performance Measure Category		Description/Units	D RTP
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action	1,089,636
			With New Crossing	1,088,426
			Difference from 2035 – No Action	-1,210
			Percent Difference	-0.11%
		VHT (int'l traffic only, PM Peak Hour for 2035)	No Action	22,113
			With New Crossing	21,864
	Diversions due to disruption at Ambassador Bridge	DHT (int'l traffic only, PM Peak Hour for 2035)	Difference from 2035 – No Action	-249
			Percent Difference	-1.13%
		Difference of Int'l VMT without Amb Br.		-1,504
			Difference of Int'l VHT without Amb Br.	9,073

Source: The Corradino Group of Michigan, Inc.

Based on analysis of international travel in the 2035 afternoon peak hour, the DRTP proposal (labeled “New Crossing” in Table 4-1), when added to the Ambassador Bridge and the Detroit-Windsor tunnel, only reduces SEMCOG/Windsor/Essex County regional vehicle miles of travel by about one tenth of a percent (i.e., red cell). It reduces vehicle hours of travel by only one percent (yellow cell). No other crossing proposal performs at these low levels in addressing 2035 traffic movements. And, the DRTP proposal will do little in 2035 to reduce congestion on the Ambassador Bridge or the Detroit-Windsor Tunnel as defined by the Max V/C (volume-to-capacity ratio) columns on Table 4-2.

Table 4-2
Detroit River International Crossing Study
International Traffic Volume and Maximum Volume-over-Capacity Ratios (V/C)
for Key Regional Roadway Links
2035 PM Peak Hour Traffic

2035 PM Peak Hour	No Action		DRTP	
	Int'l Volume	Max V/C	Int'l Volume	Max V/C
New Crossing (DRTP)	N/A	N/A	601	0.78
Ambassador Bridge	3,694	1.12	3311	1.10
Detroit River Tunnel	1,914	1.12	1825	1.02

Source: The Corradino Group of Michigan, Inc.

To measure the redundancy of the DRTP proposal, the travel model was applied with the Ambassador Bridge removed from the roadway network. If the Ambassador Bridge were closed for an extended period of time, the DRTP proposal would fail to effectively serve the diverted traffic. Specifically, closure of the Ambassador Bridge with the DRTP proposal in place would

create more than 9,000 vehicle hours of additional travel in the 2035 peak hour as the regional network with the truck tunnel does not efficiently accommodate the diverted traffic (blue cell on Table 4-1).

Another test of the Regional Mobility characteristics of the DRTP proposal is a combination of it with other “new” crossings either Downriver or farther upstream. Referring to Figure 4-1, the tests were applied by combining the DRTP proposal with a new crossing at X-2 (Table 4-3A) or X-4 (Table 4-3B) or X-11 (Table 4-3C). In all analyses, the No Action crossings of the Ambassador Bridge, the Detroit-Windsor Tunnel and the Blue Water Bridge are included.

Table 4-3A
Detroit River International Crossing Study
Analysis of DRTP with Downriver Crossing X-2 + Ambassador Bridge
+ Detroit-Windsor Tunnel + Blue Water Bridge
2035 PM Peak Hour Traffic^a

New Crossing at X2/S3 and DRTP		New Crossings		Existing Crossings			Total
		X2	DRTP	AMB	DW Tunnel	BW Bridge	
Alignment A37 ^b		Plaza S3					
U.S.-Canada	Cars	453	0	1,670	1,266	447	3,836
	Trucks	660	179	120	30	354	1,343
Canada-U.S.	Cars	199	0	493	309	400	1,401
	Trucks	277	55	152	2	331	817
Both Directions	Cars	652	0	2,163	1,575	847	5,237
	Trucks	937	234	272	32	685	2,160
Total		1,589	234	2,435	1,607	1,532	7,397

^aIndividual computer model assignments will vary slightly from one to another.

^bAlignment for X2/S3 via Eureka to I-275.

Source: The Corradino Group of Michigan, Inc.

Table 4-3B
Detroit River International Crossing Study
Analysis of DRTP with Downriver Crossing X-4 + Ambassador Bridge
+ Detroit-Windsor Tunnel + Blue Water Bridge
2035 PM Peak Hour Traffic^a

New Crossing at X4/S5 and DRTP		New Crossings		Existing Crossings			Total
		X4	DRTP	AMB	DW Tunnel	BW Bridge	
Alignment A36 ^b		Plaza S5					
U.S.-Canada	Cars	550	0	1,600	1,237	449	3,836
	Trucks	636	190	139	32	366	1,363
Canada-U.S.	Cars	201	0	484	311	403	1,399
	Trucks	253	56	151	2	337	799
Both Directions	Cars	751	0	2,084	1,548	852	5,235
	Trucks	889	246	290	34	703	2,162
Total		1,640	246	2,374	1,582	1,555	7,397

^aIndividual computer model assignments will vary slightly from one to another.

^bAlignment for X4/S4 via Dix North to I-75.

Source: The Corradino Group of Michigan, Inc.

Table 4-3C
Detroit River International Crossing Study
Analysis of DRTP with Central Crossing X-11 + Ambassador Bridge
+ Detroit-Windsor Tunnel + Blue Water Bridge
2035 PM Peak Hour Traffic^a

New Crossing at X11/C4 and DRTP		New Crossings		Existing Crossings			Total All Crossing Traffic
		X11	DRTP	AMB	DW Tunnel	BW Bridge	
Alignment A35		Plaza C4					
U.S.-Canada	Cars	2,058	0	364	966	449	3,837
	Trucks	862	65	37	30	381	1,375
Canada-U.S.	Cars	559	0	177	258	406	1,400
	Trucks	400	0	38	1	347	786
Both Directions	Cars	2,617	0	541	1,224	855	5,237
	Trucks	1,262	65	75	31	728	2,161
Total		3,879	65	616	1,255	1,583	7,398

^aIndividual computer model assignments will vary slightly from one to another.

Source: The Corradino Group of Michigan, Inc.

Under these three scenarios, the DRTP proposal would carry less than 3.5 percent of all international traffic during the 2035 afternoon peak hour. This is another indication that the Regional Mobility needs of the DRIC will not be met by the Detroit River Tunnel Partnership proposal, alone or in combination with other proposals. Therefore it is eliminated from further DRIC Study analysis. But, this decision does not prevent DRTP from continuing its own environmental studies in accordance with the processes in the U.S. and Canada.

4.2 U.S. Steel Property and Plazas C-1 and C-2

Plaza C-1 covers the area of the slag operation at U.S. Steel. Hot waste material travels in specially-designed vehicles from the main plant along the river's edge to the slag area where it is dumped to cool. After cooling, much of the material is trucked away from the site using local streets. Hundreds of truck trips per day are involved in this operation.

After several discussions of the C-1 plaza concept with U.S. Steel, it is clear the slag operation is one of the most critical functions, if not **the** most critical function in maintaining its operations. If a plaza were located there, it would not be practical to relocate the slag operation to another part of the U.S. Steel property site because of their potential effects on U.S. Steel's operations and those of its contactors/vendors and their people. Relocating the slag operation offsite would have to be to an area no farther away from the plant it serves than it is today. This points to one example location that straddles the boundary of the cities of Ecorse and River Rouge that is large enough (67 acres) to provide a major buffer of the area where the actual slag handling would occur (Figure 4-2). The cost to acquire and prepare this area for the slag operation is estimated to be close to \$100 million.

Figure 4-2
Detroit River International Crossing Study
Example of Relocation Site for U.S. Steel Operations



But, the problem of addressing the slag operation goes beyond cost. Relocating it to the nearby neighborhood is a virtual impossibility because of its potential effects and the liability of those effects on the surrounding community, the employees of U.S. Steel and its suppliers/contractors/vendors. Therefore, this plaza site was removed from further consideration.

Plaza C-2 (Figure 4-3) is also a U.S. Steel property. Connection to the river crossing would cause the relocation and building of a new, replacement rolling mill. It must be in full operation before the existing mill is closed. This could add three (or more) years to the DRIC implementation schedule. The cost of a new rolling mill is estimated at \$500 million. And, if the land could not be found on the U.S. Steel property, the mill's relocation to an area, like that shown on Figure 4-2, would be necessary. This could add millions to the project's cost. Nonetheless, Plaza C-2 is carried through the evaluation process, with the \$500 million cost for a replacement rolling mill included in the analysis. No property costs for a new site for the rolling mill have been included.

Figure 4-3
Plaza C2
U.S. Steel North



Source: The Corradino Group of Michigan, Inc.

4.3 Fighting Island

Discussions with BASF, owners of Fighting Island, indicate if the island “is touched, it is bought in its entirety” (Figure 4-4). Those discussions also indicate BASF has a royalty interest in the mining of salt under Fighting Island by another company. The northern part of the island is a corporate retreat. Other parts of the island are used for hunting and as a laboratory for educational purposes. BASF believes the 1,600-acre island has value and must be transferred in total. BASF indicates the liability, associated with years of dumping waste products on the island, must also be transferred in its entirety.

BASF has been advised by the MDOT Technical Team that Fighting Island could have a fair market value of “zero” because of the contamination. The company disagrees. Experience indicates resolution of such matters is left to the courts. In order to be conservative, no cost for acquiring Fighting Island has been included in this analysis. Nonetheless, this issue will loom large if use of this island is pursued.

Figure 4-4
Detroit River International Crossing Study
Fighting Island



Source: The Corradino Group of Michigan, Inc.

5. EVALUATION DATA – PLAZAS

This section of the report presents the information used to evaluate 12 U.S. plazas (not counting Plaza C-1 on the U.S. Steel property and II-1 associated with the DRTP plaza) of the Illustrative Alternatives by each of the seven evaluation factors. The analysis is subdivided by geographical sections of the study area dealing with: 1) the Downriver Area; 2a) the Central Area; 2b) the I-75/I-96 Area; and, 3) the Belle Isle Area.

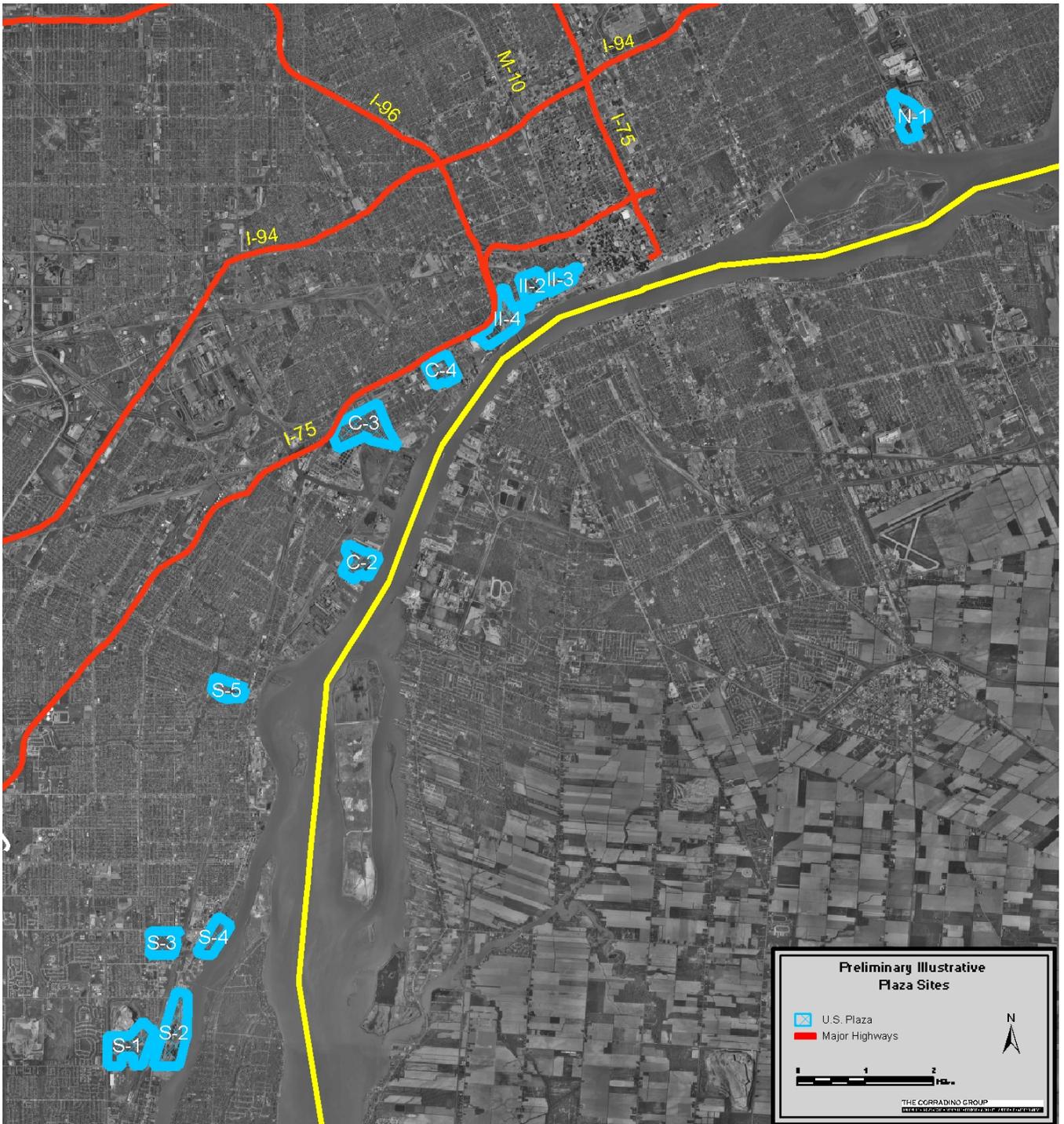
Plaza locations on the U.S. side of the border were developed by reviewing the typical plaza/border station defined by the U.S. Department of Homeland Security/Customs and Border Protection Agency and the General Services Administration. They identified the minimum desirable plaza size at 80 to 100. Based upon travel demand analysis from the Planning/Needs & Feasibility Study, the riverfront from Grosse Ile to Belle Isle was studied for plaza locations meeting this criterion. Aerial photography, Geographic Information System (GIS) data, and field reviews were used to identify plaza locations. Areas with few structures, brownfields, or less densely-used tracts of land were a first priority for siting plazas. However, to address the project's purpose and need, more densely-developed and more active properties could not be avoided. This is particularly the case in the central part of the study area.

Twelve Illustrative Alternative plaza locations were analyzed (Figures 5-1 and 5-2). In all locations, the potential impact of a plaza on its surroundings lead to the definition of size and shape. For example, where a utility is on the perimeter of a plaza site but that utility does not affect the plaza's function or size, it was excluded from the plaza site. Likewise when such exclusion/carving left a remnant of a parcel that was not useful to the owner, the entire parcel was included in the plaza site. Finally, where the area that would remain if the plaza were constrained in size, was expected to be so negatively affected and/or left in a tenuous position to continue to function successfully, the entire area was included in the plaza site.

5.1 Protect Community/Neighborhood Characteristics

There are six performance measure categories in this evaluation area: local traffic impacts, noise, community cohesion/character, property acquisition, Environmental Justice/Title VI, and public safety/security. A summary of the issues affected is provided in Table 5-1. Specific details, including graphics, are included in Volume 3A of this series of reports. The discussion of these issues, provided below, is divided into plazas by geographical area. Comparisons are only for those alternatives in that area. An overall comparison by the "Community/Neighborhood" evaluation factor for all plazas is provided at the end of this section of the report. Section 5.8 then compares the overall performance of all plaza alternatives for all evaluation factors.

**Figure 5-1
Preliminary Illustrative Plaza Sites**



Source: The Corradino Group of Michigan, Inc.

Downriver Area Plazas

**Figure 5-2a
Plaza S1
Quarry on North Side of King Road**



**Figure 5-2b
Plaza S2
McClouth Steel**



**Figure 5-2c
Plaza S3
Atofina Chemical Co. West**



**Figure 5-2d
Plaza S4
Atofina Chemical Co. East**



**Figure 5-2e
Plaza S5
Michigan Steel Works Co.**



Source: The Corradino Group of Michigan, Inc.

Central Area Plazas

Figure 5-2f
Plaza C2
U.S. Steel North



Figure 5-2g
Plaza C3
Delray West



Figure 5-2h
Plaza C4
Dragoon



Source: The Corradino Group of Michigan, Inc.

I-75/I-96 Area Plaza

Figure 5-2l
Plaza N1
Jefferson/Conner Street



Source: The Corradino Group of Michigan, Inc.

**Table 5-1
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Community/Neighborhood Characteristics
Supporting Data – Plazas Only**

Evaluation Factor	Performance Measure Category	Description/Units	Plaza												
			S1	S2	S3	S4	S5	C2	C3	C4	II2	II3	II4	N1	
Protect Community / Neighborhood Characteristics	Traffic Impacts	Volume Change - Key Links	See Attachment 2: Key Links												
		Streets Closed (permanently)	Number	0	0	0	0	0	0	23	9	5	5	14	6
		Streets Closed (during construction)	Number	0	0	0	0	0	0	26	9	5	8	17	6
		Streets Crossed	Number	0	0	0	0	0	0	0	0	0	0	0	0
		Streets Rerouted	Number	0	0	0	0	0	0	3	0	0	3	3	1
		Streets with Interchange	Number	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Mainline Raillines Rerouted	Number	0	0	0	0	0	0	2	3	0	0	0	0
		Frontline Exposure	Number of dwelling units exposed	32	14	63	0	36	0	4	20	48	0	20	0
	Significant Receptors ¹ Exposures	Number /Specify ¹	0	0	3	1	1	0	2	2	0	2	4	0	
	Community Cohesion/ Character	Positive/Negative/Neutral	Neutral	Neutral	Neutral	Neutral	Negative	Neutral	Negative	Negative	Neutral	Negative	Negative	Negative	
	Potential Acquisition	Residential Units	Occupied	0	0	0	0	0	0	304	61	0	0	26	0
			Vacant	0	0	0	0	0	0	18	4	0	0	0	0
		Residential Population	Number	0	0	0	0	0	0	894	179	0	0	73	0
		Business Units	Active	1	0	0	0	1	1	13	9	13	32	7	12
			Vacant	1	1	0	0	1	0	19	10	8	9	14	1
		Estimated Employees in affected Census Blocks ²	Number	10	0	0	0	15	79	390	150	396	841	658	236
		Other Land Uses Affected	Schools	0	0	0	0	0	0	0	0	0	0	2	0
			Senior Service Facilities	0	0	0	0	0	0	0	0	0	0	0	0
			City/Government Facilities	0	0	0	0	0	0	0	0	0	0	2	0
			Places of Worship	0	0	0	0	0	0	7	0	0	0	0	0
	Medical Facilities		0	0	0	0	0	0	0	0	0	0	0	0	
	State/Federal Government Facilities		0	0	0	0	0	0	0	0	0	0	0	1	
	Community Services		0	0	0	0	0	0	0	0	0	0	0	1	
	Vacant	0	0	0	0	0	0	0	0	0	0	0	0		
	Environmental Justice / Title VI	EJ Populations in affected Census Block Groups	EJ Population (non poverty)	0	0	40	87	344	0	1,269	617	0	729	1,266	638
			Population Groups Affected	None	None	American Indian	Asian, Hispanic	American Indian, Hispanic	None	African American, Hispanic	American Indian, Hispanic	none	African American, Asian	American Indian, Native Hawaiian, Hispanic	African American
			% Households in Poverty / Above or Below 9.9% Regional Threshold ³	0.0%/Below	0.0%/Below	2.7%/Below	5.6%/Below	14.4%/Above	0%/Below	33.5%/Above	37.5%/Above	0.0%/Below	10%/Above	32.6%/Above	34.9%/Above
		Households in poverty	0	0	6	18	80	0	276	138	0	75	183	73	
	Title VI Groups in Census Tracts	Presence of Regionally Prominent Ancestral Groups	English, French, German, Irish, Italian, Polish, Scottish	English, French, German, Irish, Italian, Polish, Scottish	English, French, German, Irish, Italian, Polish	English, French, German, Irish, Italian, Polish	French, Irish, Scottish	None	None	None	None	None	None	None	
			Number of heavy industry businesses w/ 1/2 mile	1	0	1	1	0	5	3	2	0	0	0	2
	Public Safety/ Security (Plaza Only)	Proximity to Industry	Number of medium industry businesses w/ 1/2 mile	4	4	3	3	1	3	4	4	8	7	13	1
			Number of light industry/office businesses w/ 1000ft/300m	0	0	15	0	0	0	1	5	38	25	3	0
			Number of residences w/ 500ft/150m	160	10	102	0	38	0	14	5	31	147	141	0
		Proximity to Residential / Retail	Number of businesses w/ 500ft/150m	15	15	1	0	1	1	5	16	10	3	21	12
			Number of EPA/DEQ Hazmat TSD Facilities w/ 500ft/150m	0	0	0	1	0	0	0	1	0	0	0	1
Proximity to Hazardous Materials		Distance to nearest fire station (mi)	1	2.1	2	2	2.4	1.6	0.8	1	0.6	0	1.7	1.6	
		Distance to nearest police station (mi)	2.1	2.6	1.9	3.1	2.5	1.6	2.6	0.7	2.2	2.1	1.3	0.8	
		Number of streets closed (perm.)	0	0	0	0	0	0	23	9	5	6	14	6	
		Number of streets closed (during const.)	0	0	0	0	0	0	26	9	5	8	17	6	
Emergency Response		Mainline Raillines Rerouted	0	0	0	0	0	0	2	3	0	0	0	0	

Notes:
1. Sensitive noise receptors are historic sites, medical facilities, parks, places of worship, schools, within fifty meters of an alignment, plaza, or crossing.
S3: 3 parks
S4: 1 park
S5: 1 park
C3: 1 park, 1 place of worship
C4: 1 place of worship, 1 medical facility
II3: 1 school, 1 park
II4: 1 school, 1 park, 1 historic site, 1 historic site/place of worship
3600\evaluations\current matrices\illmatrix.plazas.xls\comm char

2. Employee estimates provided by Tetrad Computer Applications and are based on employees per Census Block Group - proportionately disaggregated to the block level for blocks within or partially within plaza boundaries. Plazas have been field surveyed to determine occupancy status of businesses.
3. The poverty threshold for the SEMCOG region is 9.9%. Block groups with percentage of households living in poverty above 9.9% qualify as environmental justice communities.

Source: The Corradino Group of Michigan, Inc.

Downriver Area

Traffic Impacts – Traffic changes in the afternoon peak hour in the year 2035 at 60 “local” locations in the SEMCOG roadway network are included in Attachment 2. Those data most applicable to plazas in the Downriver Area are shown on Figures 5-3, 5-4 and 5-5. They indicate that, overall, traffic on local roadways around plazas in the Downriver Area will not be negatively impacted compared to the No Action condition as most international traffic will use freeway connections, not local streets, to reach its final destination.

No major streets are expected to be closed (either temporarily or permanently), crossed or rerouted to construct/operate the Downriver plazas. And, there are no mainline railroads would have to be rerouted for the Downriver plazas. A number are adjacent to them.

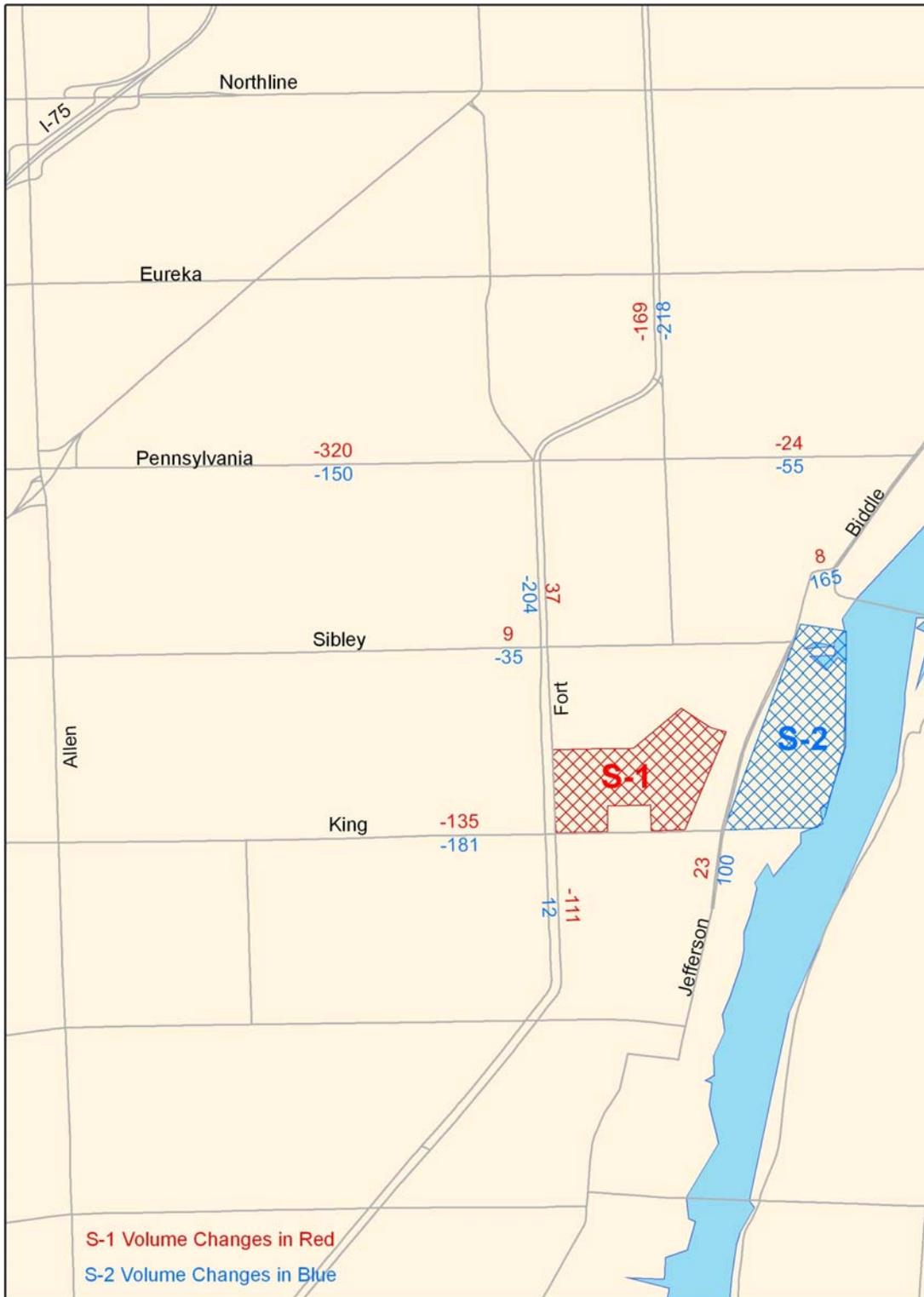
Noise – At Plaza S-4, while there are no residential units are likely to be affected by plaza traffic noise, one nearby park (Wyandotte Golf Shores) is expected to receive unwanted noise. With Plaza S-2, noise is expected to be a concern at about a dozen residential units but no other sensitive receptors. With Plazas S-1 and S-5, about three dozen residential units are expected to be affected by unwanted noise emanating from the plaza. Plaza S-5 will also create noise at one nearby park (Council Point Park). The most significant noise effect of the Downriver plazas is associated with Plaza S-3, which is likely to affect more than five dozen residential units and three nearby parks (Vreeland Park, Pennsaly Park and Wyandotte Memorial Park).

Community Cohesion/Character – Plazas S-1, S-2, S-3 and S-4 would be located in industrial areas and, therefore, the plaza itself (not the adjoining roadway system or border crossing) is expected to have neither a positive nor negative effect on the community’s character. However, the remaining Downriver site, Plaza S-5, is expected to have a negative effect on the area in which it would be placed because of the nearby residential development.

Potential Acquisition – There will be no residential displacements associated with the Downriver plazas. Plazas S-1 and S-5 would cause the relocation of one active business each. That would likely involve the relocation of 10 to 15 employees at Plaza S-1 and Plaza S-5, respectively.

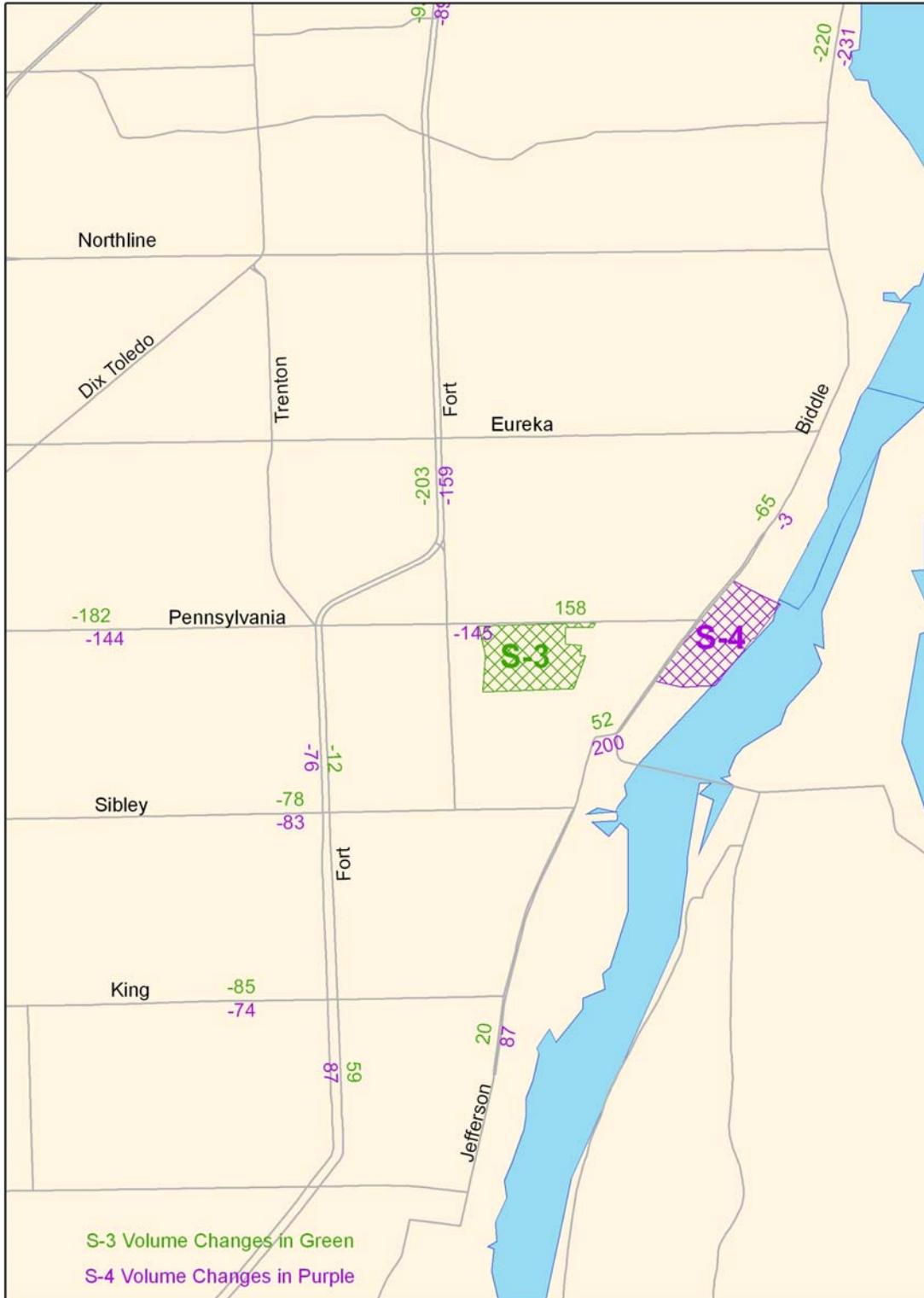
The Downriver plazas would not involve relocation of schools, places of worship, and other community facilities.

Figure 5-3
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plazas S-1 and S-2



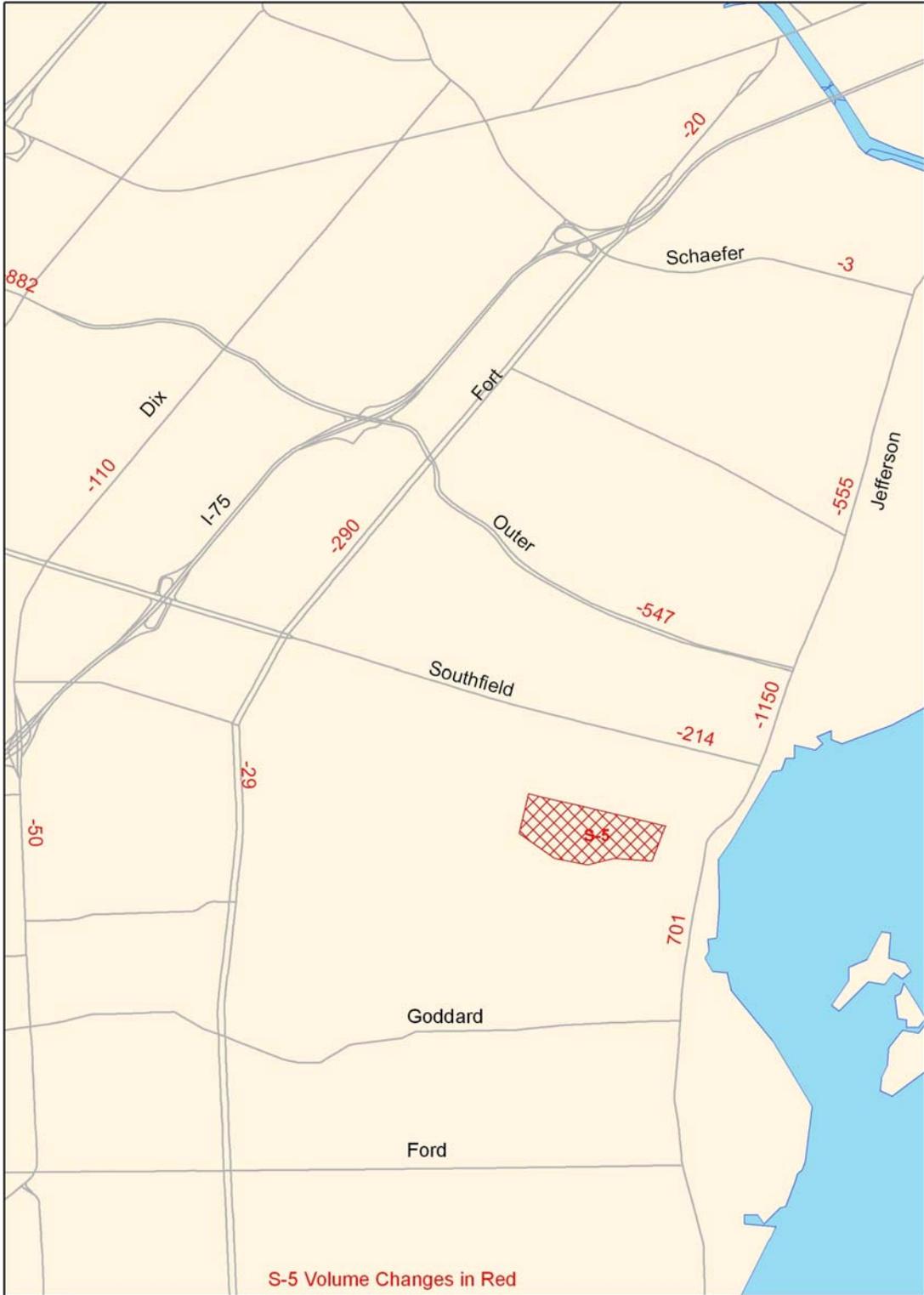
Source: The Corradino Group of Michigan, Inc.

Figure 5-4
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plazas S-3 and S-4



Source: The Corradino Group of Michigan, Inc.

Figure 5-5
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plaza S-5



Source: The Corradino Group of Michigan, Inc.

Environmental Justice/Title VI – Plazas S-1 and S-2 will not have an effect on a minority population nor would they affect households that are classified as having incomes below the poverty level. Plazas S-3, S-4 and S-5, in increasing amounts, would have effects on the following minority populations: American Indians, Asians, and Hispanics. Likewise, between six and 80 households with incomes below the poverty level are expected to be affected by Plazas S-3, S-4 and S-5. Several key ancestral populations, other than those of minority status, that are covered by Title VI of the Civil Rights Act of 1964, will be indirectly affected as they exist in the general area of the plazas. These are English, French, German, Irish, Italian, Polish and Scottish.

Public Safety/Security – With respect to public safety/security, Plazas S-3 and S-4 are within one-half mile of a chemical plant; Plaza S-1 is within one-half mile of a quarry; Plazas S-2 and S-5 have no heavy industry within a half mile.

All of the Downriver plazas are within one-half mile of a medium industry: four medium industries are within one-half mile of Plazas S-1 and S-2; three for Plazas S-3 and S-4; and, one medium industry with Plaza S-5. Plazas S-1, S-2, S-4 and S-5 will not be within 1,000 feet of a light industrial facility or office building. However, Plaza S-3 will be within 1,000 feet of 15 such facilities.

Plazas S-1 and S-3 are each within 500 feet of over 100 residential units, while Plazas S-2, S-4 and S-5 would affect from 0 to 40 residences. Plazas S-1 and S-2 would be within 500 feet of up to 15 businesses; there is no more than one business within 500 feet of Plazas S-3, S-4 and S-5.

No licensed HAZMAT facilities are within 500 feet of Plazas S-1, S-2, S-3 and S-5. One such facility is within 500 feet of the Plaza S-4.

The distance to the nearest fire station, in case of an emergency at a plaza, is between one mile (Plaza S-1) and about 2-1/2 miles (Plaza S-5). The nearest police station is generally between two and three miles of each of the five Downriver plazas. No major streets would be temporarily or permanently closed by the new plaza to affect emergency response nor will any existing rail line that now has to be crossed be relocated to affect an emergency response path.

Central Plazas

Traffic Impacts – Traffic data on local roads in the vicinity of the Central plazas are displayed in Attachment 1 as well as in Figures 5-6 and 5-7. They illustrate that, overall, local road traffic will not be negatively impacted compared to the No Action condition as most international traffic will use freeways, not local streets, to reach its final destination.

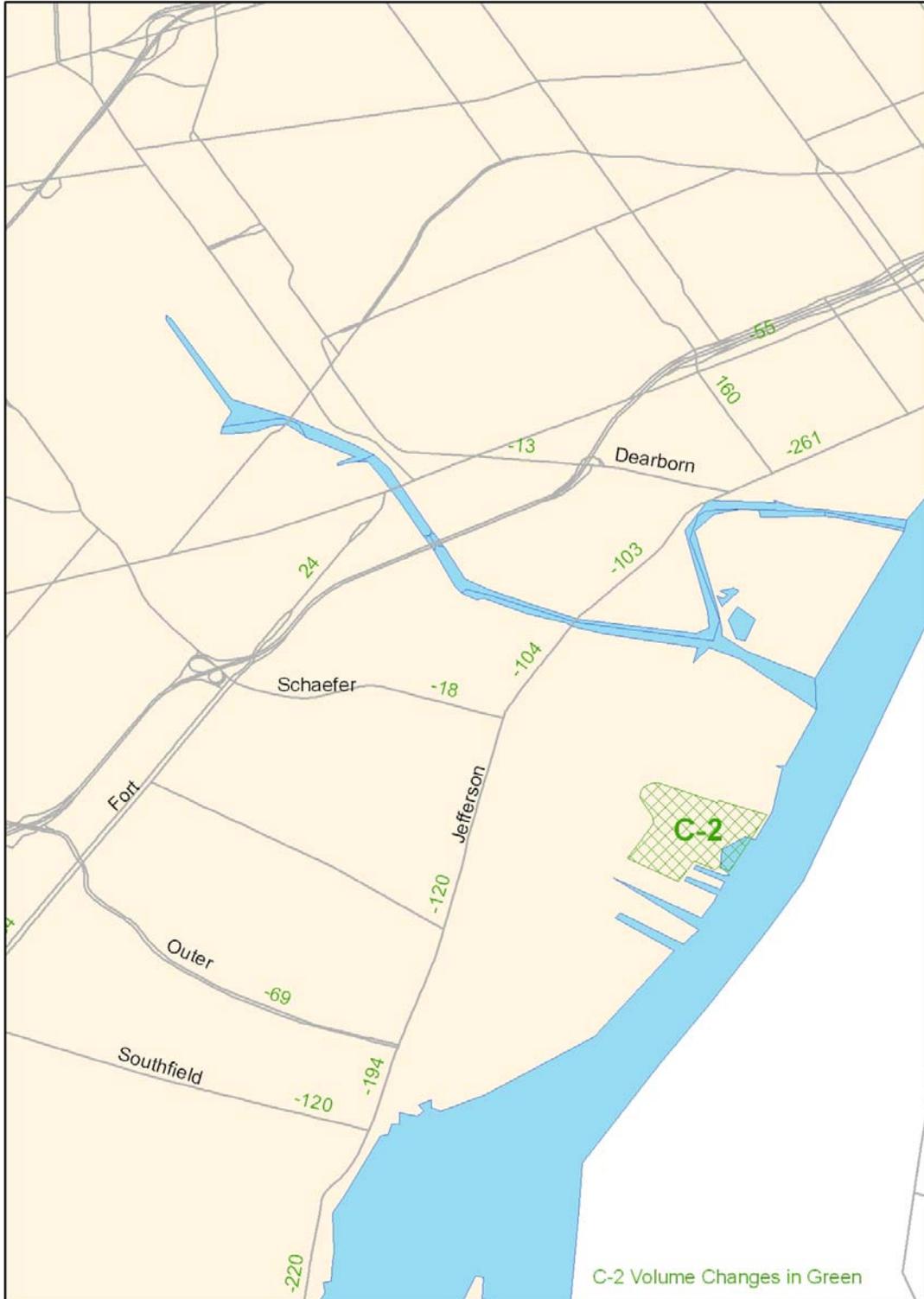
Plaza C-2 will cause no major streets to be closed for plaza development, either temporarily or permanently. Plaza C-3 would be involved with the temporary or permanent closure of about two dozen streets and rerouting three streets around the plaza (Dearborn, Westend and Jefferson). Plaza C-4 would be associated with the temporary and permanent closure of nine streets. Additionally, Plazas C-3 and C-4 would require the relocation of two and three mainline railroads, respectively.

Noise – Twenty or fewer dwelling units would be exposed to unwanted noise within 150 feet of Plazas C-2 through C-4. And, Plaza C-3 would impact two sensitive receptors – a place of worship (St. John Cantius Roman Catholic Church), and a park (Delray Playfield Park). Plaza C-4 would also impact one place of worship (First Latin American Baptist Church) and a medical facility (Boniface Community Services).

Community Cohesion/Character – The impact of Plaza C-2 on the industrial setting in which it would be located is considered neither positive nor negative as it relates to community cohesion and character. On the other hand, Plazas C-3 and C-4 would impact residential areas and would have a negative effect on their community cohesion/character. It is reiterated that this is only an assessment of the plaza, not the connecting roadway system.

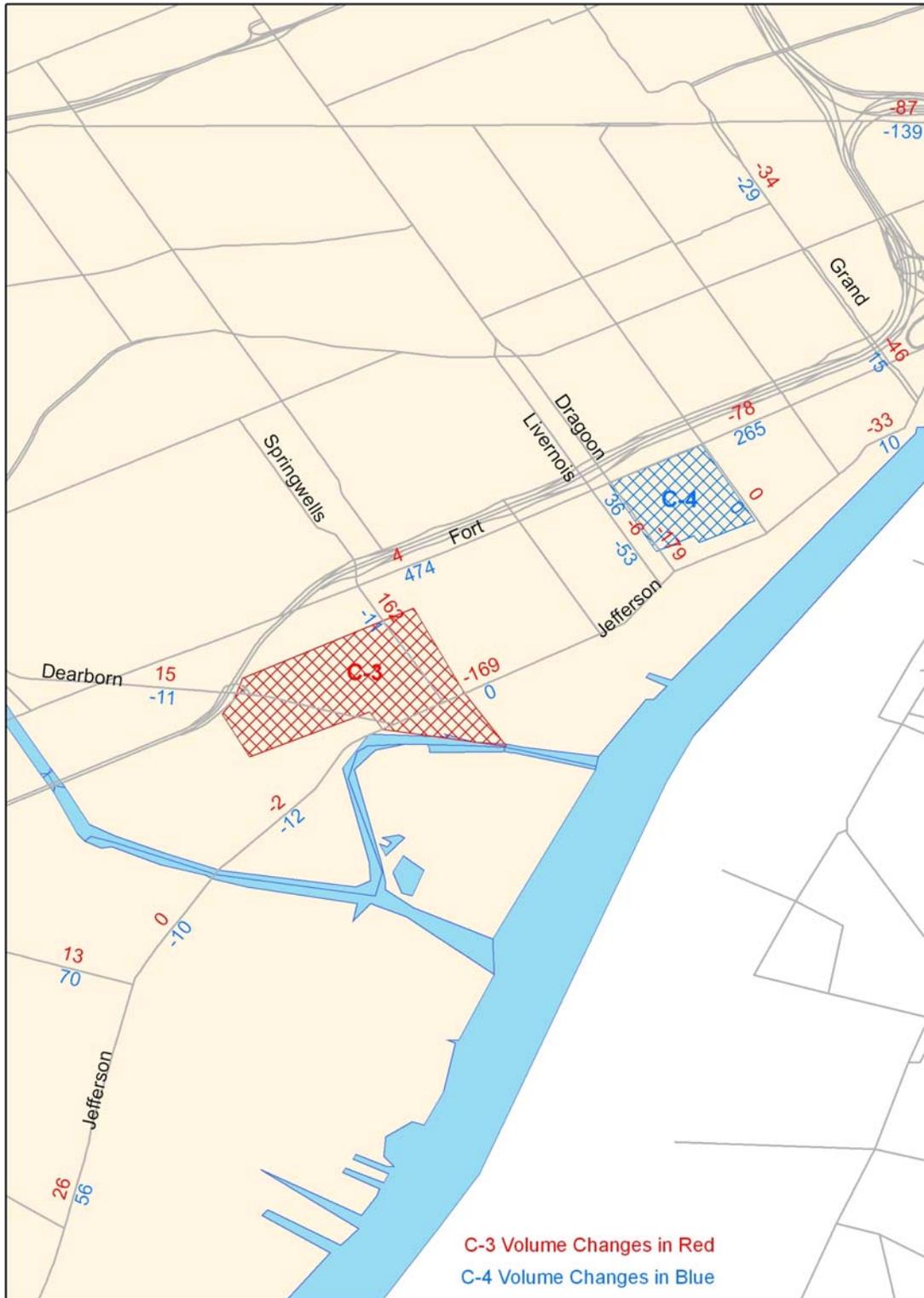
Potential Acquisitions – Plaza C-2 is not expected to cause the relocation of any residential structures. However, each would affect one active business with 80 employees. Plaza C-3 would likely cause the relocation of almost 900 people in 300 residential units. Additionally, 13 active businesses would be affected by Plaza C-3 with almost 400 employees. Plaza C-4 could cause the relocation of 61 residential units with almost 180 people. Nine active businesses employing 150 people would also be potentially relocated. No land uses other than business are likely to be directly relocated by Plaza C-2. However, Plaza C-3 would affect seven places of worship (Jehovah Jirem, Peter’s Rock Missionary Baptist Church, Holy Cross Roman Catholic Church, Sweet Communion, True Light Church of God in Christ, House of God, and New Greater Love Missionary Baptist Church). Plaza C-4 could cause the relocation of one medical facility (Boniface Community Services).

Figure 5-6
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plaza C-2



Source: The Corradino Group of Michigan, Inc.

Figure 5-7
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plazas C-3 and C-4



Source: The Corradino Group of Michigan, Inc.

Environmental Justice/Title VI – Plaza C-2 will have no direct effect on minority populations or those below the poverty level as the plaza site is in an industrial area. On the other hand, Plaza C-3 will affect, at least indirectly, almost 1,300 minority people of either African-American or Hispanic origin. Almost 300 households with incomes below the poverty line are expected to be affected by Plaza C-3, at least indirectly. Plaza C-4 will affect about 600 people of minority status – American Indian and Hispanic. The number of poverty households likely affected totals approximately 140. Key ancestral populations, other than those of minority status, are not likely to be affected by Plazas C-2, C-3 and C-4.

Public Safety/Security – Plaza C-2 is within one-half mile of five heavy industrial facilities, including two U.S. Steel facilities, a chemical plant, a tank farm, and a Detroit Energy facility. Plaza C-3 is within one-half mile of the U.S. Steel foundry, a tank farm, and a water treatment plant. Plaza C-4 is within one-half mile of a tank farm and a power plant. Three or four medium industrial facilities are expected to be within one-half mile of each Central Area plaza. And, while no light industry or office facilities are within 1,000 feet of Plaza C-2, one facility is near Plaza C-3 and five are near Plaza C-4.

Up to 16 businesses will be within 500 feet of the Plaza C-4. Hazardous material handling facilities are not within 500 feet of Plazas C-2 and C-3. However, one such facility is within 500 feet of Plaza C-4.

Emergency Response – The Central Area plazas are typically within 1-1/2 miles of a fire station and between one to 2-1/2 miles of a police station. The change in traffic patterns for emergency response will be most significantly affected by Plaza C-3, which would close, either permanently or temporarily, almost two dozen streets. Plaza C-4 could cause nine street closures. And, Plazas C-3 and C-4 will be associated with the rerouting of two and three rail lines, respectively.

I-75/I-96 Area

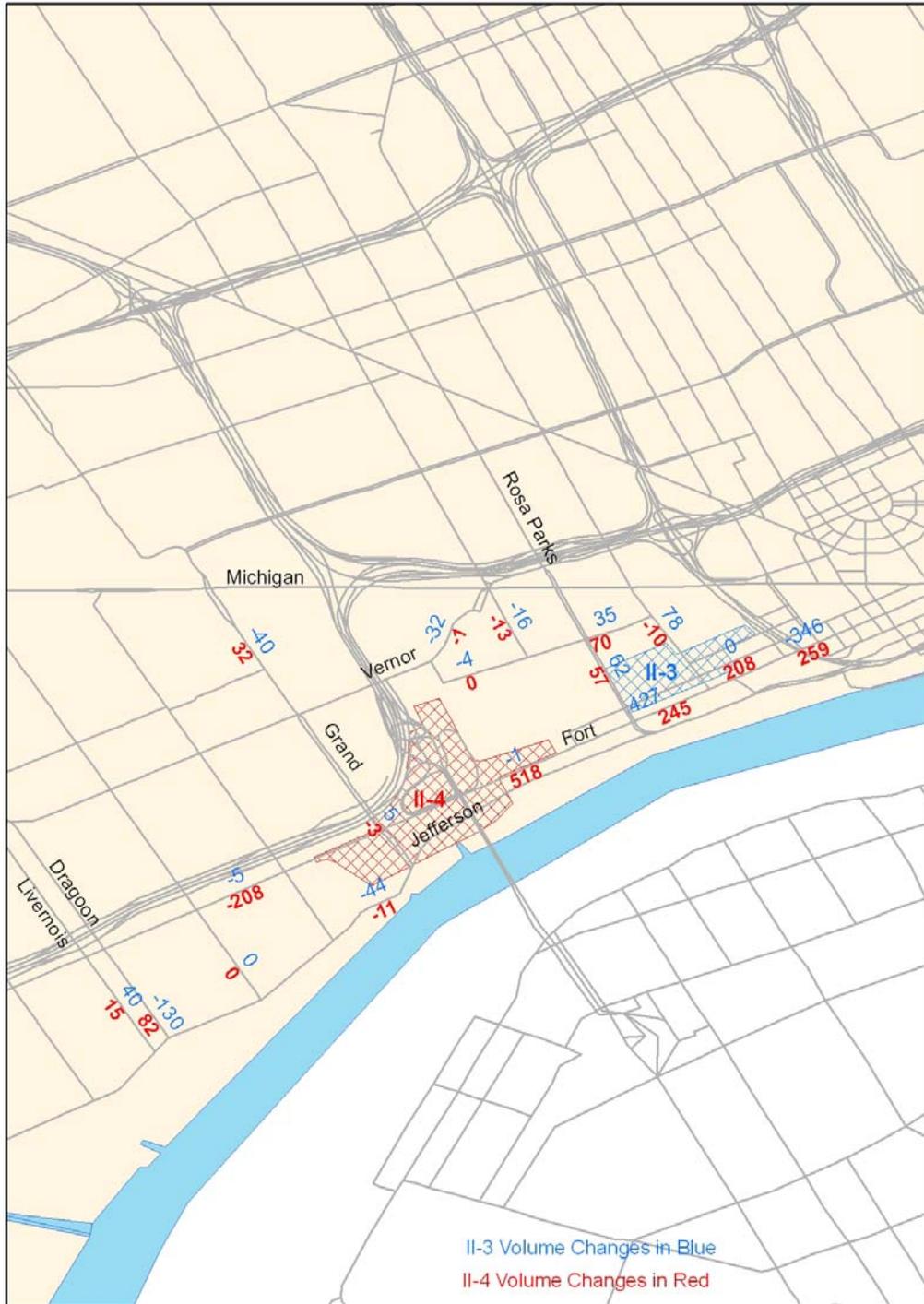
Traffic Impacts – Figures 5-8 and 5-9 illustrate the expected traffic changes on key local roads in the vicinity of the plazas in the I-75/I-96 Area. The data indicate that, overall, local road traffic will not be negatively impacted compared to the No Action condition as most international traffic will use freeways, not local streets, to reach its final destination.

Figure 5-8
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plaza II-2



Source: The Corradino Group of Michigan, Inc.

Figure 5-9
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plazas II-3 and II-4



Source: The Corradino Group of Michigan, Inc.

Five streets would be closed to accommodate Plaza II-2 or II-3. Plaza II-3 would close: Lafayette and reroute its traffic to Fort Street via Rosa Parks and 5th Street; Trumbull, with its traffic rerouted to Rosa Parks via Bagley and Fort; and, Howard Street, with its traffic rerouted to Fort via Brooklyn. Plaza II-4 would close more than a dozen streets and cause rerouting of Grand, Fort and Jefferson. No mainline railroads would have to be relocated to develop the I-75/I-96 Area plazas.

Noise – The unwanted noise impact on residences is lowest in the I-75/I-96 Area with Plaza II-3 (zero), while Plaza II-2 is expected to affect 48 residences within 150 feet of the plaza’s edge. Plaza II-4 is expected to affect 20 residences. A park (Savage Memorial Park) and a school (Cesar Chaves Middle School) could be potentially affected by unwanted noise emanating from Plaza II-3. One park (Riverside Park), a school (Ser-Casa Richard Elementary School) and two historic sites (Hubbard Farm Historic District and Ste. Anne Catholic Church) would be affected by unwanted noise emanating from the II-4 plaza.

Community Cohesion/Character – The location of Plaza II-2 (only the plaza) is expected to have neither a positive nor negative effect on community cohesion because of the industrial nature of the areas in which the plaza will be located. On the other hand, Plazas II-3 and II-4 are expected to have a negative effect on community cohesion because of the residential pattern in which they would be placed.

Potential Acquisition – No residential units are expected to be acquired for Plazas II-2 and II-3. On the other hand, Plaza II-4 is expected to involve acquisition of 26 residential units with 73 occupants. The number of business units potentially relocated would range from seven with Plaza II-4, to 13 with Plaza II-2, to 32 with Plaza II-3. This would cause the potential relocation of from about 400 jobs (Plaza II-2) to almost 850 jobs (Plaza II-3).

The other land uses that could be affected by the development of Plaza II-3 include two schools (Consortium College Preparatory High School and Mercy Education Project) as well as two City of Detroit facilities. Plaza II-4 would affect one federal facility and one community-related facility.

Environmental Justice/Title VI – Plaza II-2 in the I-75/I-96 Area is not likely to displace people of minority origin. On the other hand, Plaza II-3 would impact, at least indirectly, 700 to 750 people of African-American and/or Asian origins. Plaza II-4 would impact, at least indirectly, 1,300 people of Hispanic and American Indian origins. No other key ancestral groups, than those of minority origin, are likely to be affected by the I-75/I-96 Area plazas’

development. The impacts on households with incomes below the poverty level is zero for Plaza II-2, 75 for Plaza II-3, and about 180 for Plaza II-4.

Public Safety/Security – None of the I-75/I-96 Area plazas would be within one-half mile of a major industry. However, each would be within one-half mile of between seven (II-3) and 13 (II-4) medium industries. Plazas II-2 and II-3 would affect the largest number of light industry and office businesses within 1,000 feet of the plaza’s edge (Plaza II-2 @ 38 and II-3 @ 25). Three businesses would likely be affected by Plaza II-4.

Plazas II-3 and II-4 would be within 500 feet of 140 to 150 residences. Plaza II-2 is within 500 feet of about 30 residences. Plaza II-2 would affect 10 businesses within 500 feet; Plaza II-3 would affect 3; and, Plaza II-4 would affect the largest number at 21 businesses within 500 feet of the plaza’s edge. There are no hazardous material handling facilities within 500 feet of the proposed plazas in the I-75/I-96 Area.

Emergency Response – Each of the plazas in the I-75/I-96 Area is within 0.5 to 1.5 miles of a fire station and within 1.5 to 2 miles of a police station. Emergency response vehicles will have adjustments made to their travel patterns when the plaza is constructed and afterwards because between five (Plaza II-2) and seven (Plaza II-4) streets would be closed permanently. Almost the same number of streets would be closed temporarily. No railroads would be rerouted to affect emergency response.

Plaza N-1 – Belle Isle

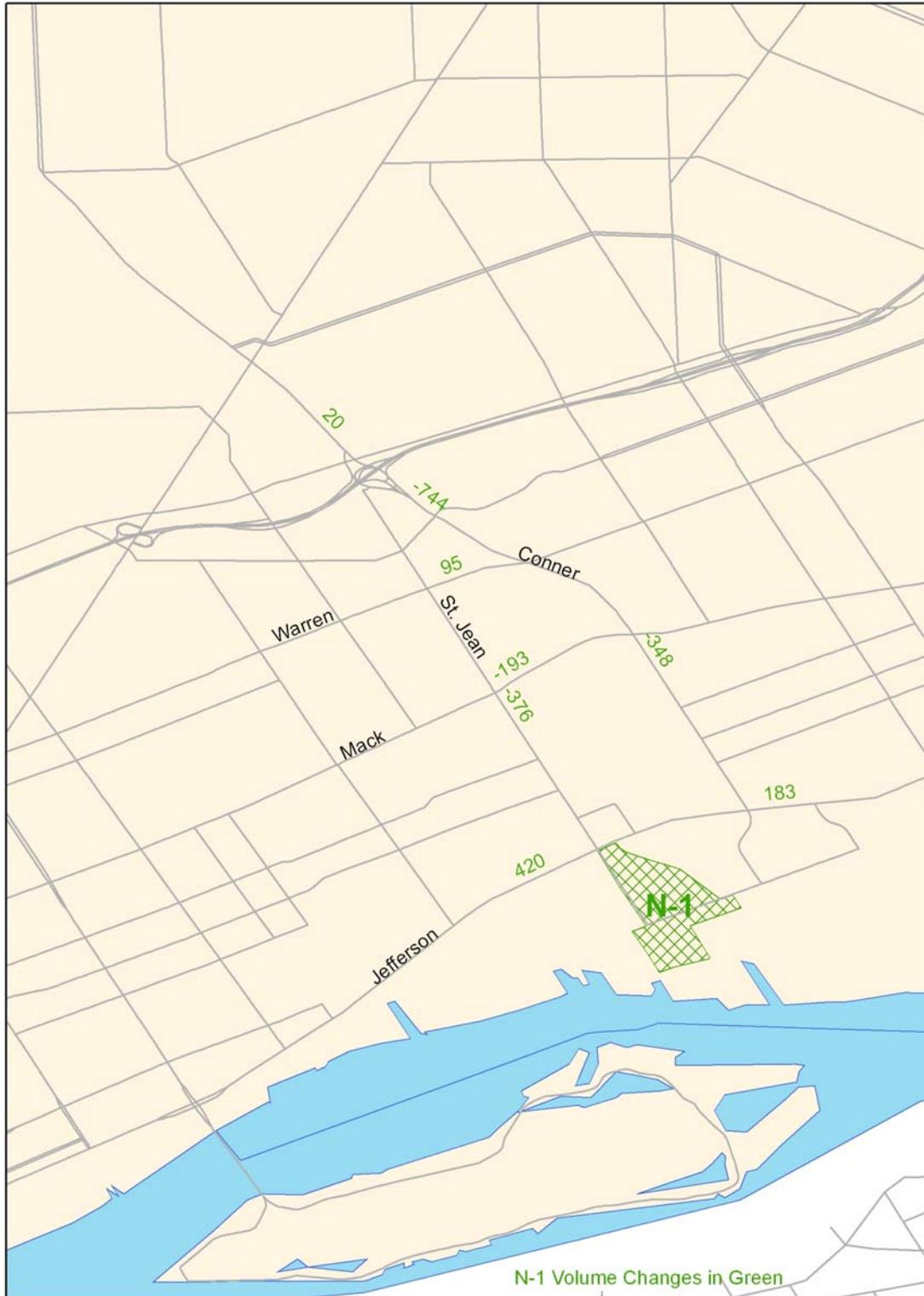
Traffic Impacts – The local street traffic is included in Attachment 2 and depicted on Figure 5-10. The data indicate that, overall, local road traffic will not be negatively impacted compared to the No Action condition as most international traffic will use freeways, not local streets, to reach its final destination.

There will be six streets closed, both temporarily and, then, permanently, for Plaza N-1. No main rail lines will need to be relocated.

Noise – No residential units are within 150 feet of the plaza area and no sensitive receptors are expected to be impacted by unwanted noise.

Community Cohesion/Character – The impact of Plaza N-1 is expected to be negative on community cohesion as a result of developing Plaza N-1 in this section of East Detroit.

Figure 5-10
Detroit River International Crossing Study
2035 Traffic Volume Changes on Local Links in the SEMCOG Network
Compared to the No Action Alternative
Plaza N-1



Source: The Corradino Group of Michigan, Inc.

Potential Acquisition – No residential units are expected to be acquired for the plaza; however, 12 active businesses employing almost 240 people are expected to be relocated. No special land uses, such as churches or medical facilities, are likely to be relocated by the N-1 plaza's development.

Environmental Justice/Title VI – Almost 650 people of African-American origin are expected to be impacted, at least indirectly, by the plaza's development. Over 70 households are below the poverty level. No other key ancestry populations are expected to be affected by this plaza's development.

Public Safety/Security – Two major industries, including a power plant and a chemical facility, are within one-half mile of the Plaza N-1. Also, one medium industry is within a quarter mile of the plaza. No light industry is within 1,000 feet, nor are there any residences within 500 feet. But, there are 12 business establishments within 500 feet of Plaza N-1. There is also one major hazardous materials handling facility licensed by EPA within 500 feet of the plaza.

Emergency Response – Police and fire stations are generally between 1 and 1.5 miles of the plaza. Six streets would be closed as result of the plaza's development, likely altering the response of the emergency vehicles. However, no railroads are expected to be relocated.

5.1.1 Performance Evaluation

The team of consultants identified at the beginning of Section 3 studied community/neighborhood characteristics associated with the 12 plazas and visited the sites. The evaluation included a presentation of the information by the specialist in charge of compiling it. Following a team discussion of the data, each of the ten evaluators assigned a performance score to each plaza. The overall results are shown in Table 5-2 – no plaza performs very high. The results further indicate Plazas C-3, C-4, II-3, II-4 and N-1 received negative scores (less than 50). Two plazas receive scores above 60 (Plaza S-2 at 63.2 and Plaza S-5 at 60.5). The remaining plazas are scored between 50 and 60 in this area of performance evaluation. Again, this is an evaluation only of the plaza, not of the river crossing or the routes connecting the plaza to the freeway system.

Table 5-2
Detroit River International Crossing Study
Evaluation Factor: Protect Community/Neighborhood Characteristics
U.S. Plazas

Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Performance Score	57.5	63.2	55.4	55.1	60.5	50.3	35.9	39.9	54.7	42.3	40.8	40.9
Ranking (1 to 12)	3	1	4	5	2	7	12	11	6	8	10	9

Source: The Corradino Group of Michigan, Inc.

5.2 Maintain Consistency with Local Planning

There are two performance measures categories in this evaluation area: consistency with plans and environmental conditions (Table 5-3). The discussion of these issues, provided below, is divided into plazas by geographical area. Comparisons are only for those alternatives in that area. An overall comparison of plazas by the “Local Planning” evaluation factor is provided at the end of this section of the report. Section 5.8 then compares the overall performance of all plaza alternatives for all evaluation factors.

Downriver Area

Consistency with Plans – As noted in the methodology discussion, there are official plans for each of the plaza areas, some older than others. Additionally, unofficial plans exist for the redevelopment of some plaza areas. For the Downriver part of the study area, the official plans call for other land uses than industrial/transportation for the areas in which Plazas S-1, S-2, S-4 and S-5 would be located. Therefore, introducing a plaza in these areas is not consistent with those plans. On the other hand, there is no change in land use planned for Plaza S-3, which was formerly occupied by a chemical plant. The introduction of a plaza in its place would be consistent with the current use and consistent with the plan to continue industrial use. Proposed Plazas S-1, S-2 and S-5 are inconsistent with unofficial plans for the areas in which they would be placed, but for Plazas S-3 and S-4, no “unofficial” plans could be found to change current land uses.

Environmental Conditions – The premise here is: the greater the number of complicated environmental conditions, particularly those of Superfund status, the less likely it is that a plan will be implemented. For Plazas S-1, S-2 and S-3 there are no complicated environmental issues that are now listed by state or federal agencies and, therefore, the ability to accomplish the redevelopment plans for the plaza areas is much higher than if the areas were affected by significant contamination. On the other hand, Plaza S-4 is affected by the location nearby of a hazardous materials handling facility, two Superfund sites, and a Michigan contaminated site

**Table 5-3
 Detroit River International Crossing Study
 Evaluation of Illustrative Alternatives
 Consistency with Local Planning
 Supporting Data – Plazas Only**

Evaluation Factor	Performance Measure Category		Description/Units	Plaza												
				S1	S2	S3	S4	S5	C2	C3	C4	II2	II3	II4	N1	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO	No	No	Yes	No	No	Yes	No	Yes	Yes	No	Yes	No	
	Other Plans	Consistency	YES/NO	No	No	NA	NA	No	No	No	No	NA	NA	Yes	No	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Undgrd. Stor. Tanks	Number		0	0	0	0	0	0	1	1	4	3	5	2
		EPA/DEQ Hazmat TSD Facility	Number		0	0	0	1	0	0	0	1	0	0	0	1
		National Priority List (Superfund)	Number		0	0	0	0	1	0	0	0	0	0	0	0
		RTK Cerclis (Superfund)	Number		0	0	0	2	0	0	0	1	0	0	2	0
		Michigan Contaminated Site	Number		0	0	0	1	0	0	0	2	0	0	0	0

Source: The Corradino Group of Michigan, Inc.

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making the plan to redevelop the area more difficult to accomplish. The plans for Plaza S-5 have the potential of being impacted by the location of a Superfund site.

Central Area

Consistency with Plans – The introduction of a plaza to sites C-2 and C-4, both of which are largely, if not entirely, non-residential and expected to continue as such, would be consistent with those land uses. On the other hand, official plans exist for residential redevelopment in the area of Plaza C-3. Therefore, introduction of a plaza to that location is not consistent with a locally-adopted plan. The unofficial plans for the site of Plaza C-2 is continuation of industrial use of the land by the current users. Therefore, a plaza at either location is not consistent with those plans. Unofficial plans for sites of Plazas C-3 and C-4 are for residential revitalization. So, a plaza at either location is inconsistent with those unofficial plans.

Environmental Conditions – Plaza C-2 is not affected by listed contaminated sites as the U.S. Steel property is not expected to change ownership or use in the plans that exist for the area. On the other hand, two listed Michigan contaminated sites will affect the plans to redevelop each of Plazas C-3 and C-4 for residential/commercial uses. Additionally, Plaza C-4 is affected by the nearby presence of a licensed HAZMAT handling facility and a Superfund site.

I-75/I-96 Plazas

Consistency with Plans – Plaza sites II-2 and II-4 are planned to continue as non-residential areas, while Plaza II-3 is considered to have stable residential assets and planned to retain them. As a result, the introduction of a plaza to site II-3 is inconsistent with current plans for that area. A plaza at locations II-2 and II-4 is considered consistent with the official plans. No “unofficial” plans could be located for Plaza sites II-2 and II-3. But, the unofficial plan for the site where Plaza II-4 is located is a bridge plaza.

Environmental Conditions – Each of Plazas II-2 and II-3 are not affected by significant contamination even though several underground storage tanks are listed in the area. Those can be removed/remediated without much difficulty. On the other hand, Plaza II-4 is affected by two Superfund sites which make accomplishing the plans for the site more difficult.

Belle Isle Area

Consistency with Plans – The introduction of the proposed Plaza N-1 to the area around Belle Isle is not consistent with either the official or the unofficial plan for redevelopment of the area.

Environmental Conditions – Plaza site N-1 is affected by one nearby HAZMAT handling facility, which will impact the ability to implement the redevelopment plan.

5.2.1 Performance Evaluation

Table 5-4 indicates that the evaluators assigned a score below 50, a negative indicator, to Plazas S-1, S-2, S-4, S-5, C-3, II-3 and N-1. They are considered to be inconsistent with local planning for the areas in which they are proposed to be located. Plazas S-3, C-2, C-4, II-2, and II-4 are considered compatible with the planning for these areas.

Table 5-4
Detroit River International Crossing Study
Evaluation Factor: Maintain Consistency with Local Planning
U.S. Plazas

Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Performance Score	36.5	36.7	73.5	49.1	44.9	66.7	45.4	71.3	78.0	46.3	82.8	44.9
Ranking (1 to 12)	12	11	3	7	9	5	8	4	2	6	1	10

Source: The Corradino Group of Michigan, Inc.

5.3 Protect Cultural Resources

There are four performance measure categories here: aboveground historic resources, archaeology, belowground historic resources; and, public parkland. A summary of the issues affected is provided in Table 5-5. Specific details, including graphics, are included in Volume 2 of this report. The discussion of these issues, provided below, is divided into plazas by geographical area. Comparisons are only for those alternatives in that area. An overall comparison of plazas by the “Cultural Resources” evaluation factor for all plazas is provided at the end of this section of the report. Section 5.8 then compares the overall performance of all plaza alternatives for all evaluation factors.

Downriver Area

Aboveground Historic Resources – This category of performance deals with the definition of historic districts and the listing of historic sites and structures. Additionally, the potential of a site/structure to be “listed” on the *National Register of Historic Places* is included in the evaluation based on professional review by cultural specialists. For Plazas S-1, S-2, S-3 and S-4, there are no listed aboveground historic resources likely to be affected. However, there is the potential to list the Michigan Steel Works/Great Lakes Steel property are 450 Mill Road in Ecorse at the site of Plaza S-5.

**Table 5-5
 Detroit River International Crossing Study
 Evaluation of Illustrative Alternatives
 Cultural Resources
 Supporting Data – Plazas Only**

Evaluation Factor	Performance Measure Category		Description/Units	Plaza													
				S1	S2	S3	S4	S5	C2	C3	C4	II2	II3	II4	N1		
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Listed NRHP Sites/Structures	Number	0	0	0	0	0	0	0	0	1	0	0	0	0	0
		Listed SHRS Sites/ Structures	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Locally Listed Sites/Structures	Number	0	0	0	0	0	0	1	0	0	0	0	0	0	0
		Potentially Eligible Sites/Str.	Number	0	0	0	0	0	1	0	4	1	2	5	8	1	
	Archaeology ¹	Prev. Recorded Sites	Number	0	0	1	0	0	0	2	0	0	6	18	0		
	Below Ground Resources ¹	Potential to Find/Record	High/Med/Low	Low	Low	Medium	Low	Medium	Low	High	Medium	Medium	High	High	Medium		
	Parkland	All Public Parks	Number/ Acres	0	0	0	0	0	0	0	0	0	0	1/5.4	0		
		6(f) Parks	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0		
		Coastal Zone Management	Number of Projects/Specify ²	0	0	0	0	0	0	0	0	0	0	1	0		

Notes:
 1: See Appendix 2, a separate document, for identification of individual sites.
 2: II4: Detroit River Riverwalk between downtown and Ambassador Bridge. Partially funded, unconstructed, status unknown. Impact of II4 plaza on project minimal.

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Source: The Corradino Group of Michigan , Inc.

Archaeology – No known archaeological sites are affected by Plazas S-1, S-2, S-4 and S-5. There is an archaeological site associated with the Plaza S-3 known as the Jones House.

Belowground Resources – The potential to find significant/”recordable” belowground archaeological resources is low for Plazas S-1, S-2 and S-4 per the assessment of cultural specialists. The potential at Plazas S-3 and S-5 is rated as medium.

Public Parks – No public parks would be affected by the Downriver plazas.

Central Area

Aboveground Historic Resources – One locally-listed historic site (the Great Lakes Engineering Works) is associated with Plaza C-2. Plaza C-3 includes a nationally-listed historic structure (the McMillan School) as well as four sites that are potentially eligible for listing on the *National Register*: St. John’s Cantius Catholic Church complex; the Holy Cross Hungarian Roman Catholic Church; the Szent Janos “Gor Kat Magyr Templon” Church complex; and, the art deco commercial building at 8035 South Street. Plaza C-4 is associated with a site that could be potentially listed on the *National Register* – the Detroit Savings Bank/George International Building at 5705 Fort Street.

Archaeology – There are no known sites of archaeological significance expected to be affected by Plazas C-2 and C-4. Plaza C-3 could be affected by two sites (Great Mount at River Rouge and the Dearborn Road Cemetery).

Belowground Resources – There is a high potential for finding additional belowground archaeological resources at the site of Plaza C-3, based upon the assessment of cultural specialists. Medium potential exists for discovery of significant/recordable belowground archaeological resources associated with Plaza C-4. A low potential for such discovery is associated with Plaza C-2.

Public Parks – There are no public parks associated with the development of Plazas C-2 through C-4.

I-75/I-96 Area

Aboveground Resources – There are no listed sites for Plazas II-2 through II-4. There are two sites expected to be impacted by Plaza II-2 that have the potential to be listed on the *National Register of Historic Places* – the Michigan Central Railroad/Detroit River Tunnel and the Lutheran Brothers Commerce Center at 2030 Howard. Five sites that could be listed on the *National Historic Register* are in the Plaza II-3 area:

- The Lafayette Lofts at 1301 Lafayette
- Ladder Co. 12 at 1627/1629 Lafayette
- Commercial Building at 1627/1629 Lafayette
- The DB Display Group at 1700 West Fort
- The Detroit Showcase Building at 1670 West Fort

Plaza site II-4 is associated with eight sites/structures that could be eligible for the *National Historic Register*:

- Greyhound Terminal on Fort Street
- Fleet Specialty Warehouse, 2600 W. Fort Street
- Bond & Burke Machinery, 2707 W. Fort Street
- Detroit Trucking Company, 2660 W. Fort Street
- Cloyd Container Corp., 2801 W. Fort Street
- House at 133 W. Grand Boulevard
- Latino Family Services Center, 3815 W. Fort Street
- Moore's Auto Parts/Engine Parts, 3845 W. Fort Street

Archaeology – Plaza II-2 is not associated with any known archaeological sites. Plaza II-3 is associated with six archaeological sites; Plaza II-4 is associated with 18 archaeological sites.

Belowground Resources – The potential to find additional belowground archaeological sites of significance is high with Plazas II-3 and II-4. It is medium with respect to Plaza II-2, per the analysis of cultural resource specialists.

Public Parks – No public parks are affected by Plazas II-2 and II-3, nor are there any Coastal Zone Management projects impacted. Plaza II-4 is associated with the impact of more than six acres of public parkland (the Riverside Park). Additionally, Plaza II-4 will affect the Riverwalk between the Ambassador Bridge and Renaissance Center; it is a Coastal Zone Management project.

Belle Isle

Aboveground Historic Resources – The Belle Isle plaza site (N-1) does not impact any known listed aboveground historic resources. However, there is the potential to add a site to the list – Kennelly & Sisman factory (vacant) at Lycaete Street.

Archaeology – There are no known archaeological sites affected by Plaza N-1.

Belowground Resources – The potential for the discovery of belowground resources is considered medium by the cultural specialist.

Public Parks – No public parklands are expected to be impacted by Plaza N-1.

5.3.1 Performance Evaluation

The performance evaluation of cultural resource characteristics of the plazas indicates that negative impacts would occur if a plaza were developed at Sites C-3, II-3 and II-4 (Table 5-6). On the other hand, relatively few cultural resource effects are expected to be encountered in developing plazas as Sites S-1, S-2, S-3 and S-4, all with performance scores above 80. Lower performance scores are associated with Plazas S-5, C-2, C-4, II-2 and N-1.

Table 5-6
Detroit River International Crossing Study
Evaluation Factor: Protect Cultural Resources
U.S. Plazas

Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Performance Score	89.5	89.2	80.9	89.4	71.5	63.2	42.2	72.0	59.0	49.3	37.7	71.5
Ranking (1 to 12)	1	3	4	2	6	8	11	5	9	10	12	7

Source: The Corradino Group of Michigan, Inc.

5.4 Protect Natural Environment

In this evaluation area, there are five performance measure categories: surface water, ground water, significant habitat communities, prime/unique farmland, and mineral resources. A summary of the issues affected is provided in Table 5-7. Specific details, including graphics, are included in Volume 2 of this report. The discussion of these issues, provided below, is divided into plazas by geographical area. Comparisons are only for those alternatives in that area. An overall comparison of plazas by the “Natural Resources” evaluation factor for all plazas is provided at the end of this section. Section 5.8 then compares the overall performance of all alternatives for all evaluation factors.

Downriver Area

Surface Water – Plaza S-1 will not affect any floodplain areas. On the other hand, Plaza S-4 will impact three floodplains comprising almost 100 acres. Fewer than 10 acres would be affected by Plazas S-2, S-3 and S-5.

Plazas will create various amounts of water runoff, all of which will be treated. Nonetheless, between two and three dozen acres of surface runoff will be produced by Plazas S-3, S-4 and S-5. Between 70 and 90 acres of runoff would be generated by Plazas S-1 and S-2.

No primary or secondary streams would be affected by a plaza’s development in the Downriver Area. One drain would be crossed by Plaza S-3. No other water crossings are expected to be affected by the Downriver plazas.

Ground Water – No ground water impacts are anticipated with any of the Downriver plazas.

Significant Habitat Communities – Plazas S-2 and S-5 are not expected to have wetlands impacts. Plaza S-1 is expected to impact over nine acres; Plaza S-3 about 12 acres; and, Plaza S-4 about 18 acres.

Two endangered species must be accounted for at Plazas S-3, S-4 and S-5 – the Eastern Fox Snake and Indiana Bat. No Downriver plaza is expected to create impacts on designated wildlife refuges. Again, it is noted that this is an assessment for the plazas only, not the road or the crossing connecting to the plaza.

Table 5-7
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Natural Environment
Supporting Data – Plazas Only

Evaluation Factor	Performance Measure Category		Plaza	S1	S2	S3	S4	S5	C2	C3	C4	II2	II3	II4	N1
		Description/Units													
Protect The Natural Environment	Surface Water	Floodplain	Number/Acres	0/0	1/2.7	1/0.4	3/96.2	3/7.4	2/1.8	1/7.6	0/0	0/0	0/0	0/0	0/0
		Surface Run Off	Acres	73	88	34	33	24	44	225	36	30	75	64	111
		Primary Streams	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0
		Secondary Streams	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0
		Other Water-crossings	Number/Specify	0	0	1 (linear drain)	0	0	0	0	0	0	0	0	0
	Groundwater	Municipal Wells	Number	0	0	0	0	0	0	0	0	0	0	0	0
		Water In-takes	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0
	Significant Habitat	Wetlands	Acres	9.31	0	11.6	17.8	0	21.31	0	0	7.6	0.7	0	0
		Fens / Bogs	Number/Acres	0	0	0	0	0	0	0	0	0	0	0	0
		Endangered Species ³	Potential Species	0	0	2	0	2	0	0	1	1	1	1	1
		Designated Wildlife Refuges	Number/Acres	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	Prime/Unique Farmland	Farmland	Acres	0	0	0	0	0	0	0	0	0	0	0	0
	Mineral Resources	Salt /Limestone	Type/Specify	Salt/Limestone	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt

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Notes:

- 1: Primary Streams are classified as water courses with an average width greater than 50ft/15m
- 2: Secondary streams are classified as water courses with an average width less than 50ft/15m.
- 3: Based on preliminary site investigation of the plaza sites (viewing from public access points), none of the plant or animal species listed as endangered species within the quads for this region are expected to occur within the boundaries of the plazas with the unlikely but possible exceptions of the Peregrine Falcon, Eastern Fox Snake, and Indiana Bat in specific plaza locations. This analysis and site investigation are preliminary in nature and access to the plaza site is necessary for more detailed investigations. Specifically, the potential presence of each species within plazas are:
S3: Eastern Fox Snake, Indiana Bat
S5: Eastern Fox Snake, Indiana Bat
C4: Peregrine Falcon
II2: Peregrine Falcon
II3: Peregrine Falcon
II4: Peregrine Falcon
N1: Peregrine Falcon

Source: The Corradino Group of Michigan, Inc.

Prime/Unique Farmland – No prime or unique farmland is expected to be impacted by any of the Downriver plazas.

Mineral Resources – Each of the Downriver plazas will be near/over salt deposits in the Detroit River Area. Extraction of the minerals is not expected to be limited by any plaza. Plaza S-1 will have an impact on limestone mining at the Sibley Limestone Quarry near the plaza site.

Central Area

Surface Water – Two floodplains are expected to be impacted by Plaza C-2 (1.8 acres), one floodplain by Plaza C-3 (about 8 acres) and no impact at Plaza C-4.

Plaza C-3 will generate the largest amount of surface water runoff. Again, this water will be treated before release. No primary or secondary streams or other water crossings would be affected by the plazas in the Central Area.

Groundwater – No groundwater intakes or municipal wells would be affected by the Central Area plazas there.

Significant Habitat Communities – The only plaza likely to impact wetlands in the Central Area is C-2 (21+ acres). The Peregrine Falcon is an endangered species that has been sighted in the area around Plaza C-4. None of the plaza sites in the Central Area impact designated wildlife refuges.

Prime/Unique Farmland – No Central Area plaza site will have an impact on prime or unique farmland.

Mineral Resources – Salt is likely to be below the ground surface where all plazas in the Central Area are located. Nonetheless, this will not limit its extraction.

I-75/I-96 Area

Surface Water – None of the plazas are expected to impact floodplains in this area. Surface runoff is expected to range between 30 and 75 acres. No primary or secondary streams are likely to be affected by the plazas nor would any other water crossings be impacted.

Ground Water – No ground water impacts are expected with the plazas in the I-75/I-96 Area.

Significant Habitat Communities – There are no wetlands expected to be impacted by Plaza II-4. Plaza II-3 is likely to impact less than one acre while Plaza II-2 will impact almost 8 acres of wetlands. Each of these plaza areas must consider the potential impact on the habitat (tall structures) of the Peregrine Falcon, as it has been sighted in downtown Detroit, which is near these plazas.

Prime/Unique Farmlands – No farmlands are likely to be impacted by any of the plazas in this area.

Mineral Resources – Salt is an underground resource throughout this area; its extraction should not be affected by any plaza location.

Belle Isle Area

Surface Water – No floodplains are likely to be impacted by Plaza N-1. No primary or secondary streams or other water crossings would be affected.

Ground Water – No municipal wells or other water intakes are likely to be impacted by Plaza N-1.

Significant Habitat Communities – Plaza N-1 would involve no impacts to wetlands of any type. The Peregrine Falcon is an endangered species known to have frequented this area. The plaza does not affect any designated wildlife refuges.

Prime/Unique Farmland – No farmland would be involved in developing Plaza N-1.

Mineral Resources – Salt is a mineral resource at the location of this plaza site; its extraction is not expected to be limited by developing Plaza N-1.

5.4.1 Performance Evaluation

The analysis by the evaluators indicates that the greatest negative effect on the natural environment is associated with Plazas S-4 (wetlands/floodplain impacts) and C-2 (wetlands impact) (Table 5-8). A relatively low score is also given to Plaza S-3 (wetlands, floodplain and endangered species impacts). The least likely disturbance to the natural environment is associated with Plaza sites C-4, II-4 and N-1.

Table 5-8
Detroit River International Crossing Study
Evaluation Factor: Protect the Natural Environment
U.S. Plazas

Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Performance Score	60.8	79.5	53.9	46.6	73.1	46.5	75.4	84.4	62.2	71.9	83.1	83.6
Ranking (1 to 12)	9	4	10	11	6	12	5	1	8	7	3	2

Source: The Corradino Group of Michigan, Inc.

5.5 Regional Mobility

As noted in the methodology section, the evaluation here examines effects on the regional transportation system and congestion at a number of links on the interstate system. It is based on data from the end-to-end (Canada-to-U.S.) analysis of alternatives, of which the U.S. plaza is a part. Table 5-9 provides the overall data on the regional effects while Table 5-10 and Figure 5-11 depict information on a more localized/link-by-link basis.

The following discussion of regional mobility is by geographical area. Comparisons are only of the alternatives in that area. An overall comparison of plazas by the “Regional Mobility” evaluation factor for all plazas is presented at the end of this section of the report. Section 5.8 then compares the overall performance of all alternatives for all evaluation factors.

Downriver Area

Regional Analysis – Both vehicle hours and vehicle miles of 2035 international travel in the afternoon peak hour (Year 2035) are included on Table 5-9 for the Downriver crossing corridors. While each Downriver crossing system is associated with a savings in vehicle miles of travel, compared to the No Action condition (where just the Ambassador Bridge and the Detroit-Windsor Tunnel are available crossings in the Detroit River area), those reductions are in the neighborhood of less than one-half percent. On the other hand, peak vehicle hour savings range from 2.5 to 3 percent, compared to the No Action condition. In terms of cost (not calculated here), vehicle hours will have a more significant effect on the overall efficiency of the transportation system for commerce and industry.

**Table 5-9
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Regional Mobility
Supporting Data – Plazas Only**

Evaluation Factor	Performance Measure Category	Description/Units	Plaza													
			S1	S2	S3	S4	S5	C2	C3	C4	II2	II3	II4	N1		
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636
			With New Crossing	1,086,489	1,086,502	1,084,428	1,084,152	1,084,337	1,085,734	1,087,503	1,089,045	1,088,719	1,089,075	1,091,580	1,091,683	
			Difference from 2035 - No Action	-3,147	-3,134	-5,208	-5,484	-5,299	-3,902	-2,133	-591	-917	-561	1,944	2,047	
		VHT (int'l traffic only, PM Peak Hour for 2035)	Percent Difference	-0.29%	-0.29%	-0.48%	-0.50%	-0.49%	-0.36%	-0.20%	-0.05%	-0.08%	-0.05%	0.18%	0.19%	
			No Action	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	
			With New Crossing	21,533	21,529	21,484	21,477	21,457	21,383	21,424	21,371	21,343	21,340	21,396	21,509	
		V/C (total traffic)	Difference from 2035 - No Action	-580	-584	-629	-636	-656	-730	-689	-742	-770	-773	-717	-604	
			Percent Difference	-2.62%	-2.64%	-2.84%	-2.88%	-2.97%	-3.30%	-3.11%	-3.36%	-3.48%	-3.50%	-3.24%	-2.73%	
			Refer to Table 5-10 and Figure 5-11	Refer to Table 5-10 and Figure 5-11												
		Diversion due to disruption at crossing	Difference of Int'l VMT with Amb Br. Closed and New Crossing Open	17,455	16,990	11,218	9,919	5,646	858	1,416	-23	1,312	1,185	1,701	13,372	
			Difference of Int'l VHT with Amb Br. Closed and New Crossing Open	559	532	212	179	-107	-486	-549	-709	-664	-667	-713	-160	
		Detour of Local Arterials	Number of SEMCOG Network Links Rerouted	0	0	0	0	0	0	3	0	0	3	3	1	

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Notes:

1: Plazas are connected to specific alignment alternatives: (final interchange via crossing)

S1: to I-275/King via X1

S2: to I-275/King via X1

S3: to I-275/Eureka via X2

S4: to I-275/Eureka via X2

S5: I-94 Southfield via X4

C2: I-94/Schaefer South via X8

C3: I-75/Dearborn via X10

C4: I-75/Dragoon via X11

II2: M-10/Lafayette via X14

II3: M-10/Lafayette via X14

II4: I-75/Gateway via X12

N1: I-94/St.Jean via X15

2: SEMCOG Links closed or rerouted:

C3: Dearborn, Westend, and Jefferson rerouted around periphery of plaza;

II3: Lafayette closed - traffic rerouted to Fort via Rosa Parks and 5th Street. Trumbull closed - traffic rerouted to Rosa Parks via Bagley and Fort. Howard closed - traffic rerouted to Fort via Brooklyn.

II4: Grand, Fort, and Jefferson rerouted around periphery of plaza;

N1: Freud, closed - traffic rerouted to Jefferson via St.Jean.

Source: The Corradino Group of Michigan, Inc.

Table 5-10
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives: Plazas
Regional Mobility Attachment
International Traffic Volume and Maximum Volume over Capacity Ratios (V/C)
for Key Regional Roadway Links
2035 PM Peak Hour Traffic

2035 PM Peak Hour		No Action (A0)		S1 (A1)		S2 (A2)		S3 (A7)		S4 (A8)		S5 (A14)		C2 (A20a)	
		Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C
N	New Crossing	#N/A	#N/A	1,397	0.34	1,419	0.34	1,602	0.38	1,630	0.38	1,923	0.44	2,575	0.56
A	Ambassador Bridge	3,694	1.12	2,708	0.98	2,692	0.97	2,588	0.94	2,566	0.94	2,358	0.85	1,850	0.64
T	Detroit River Tunnel	1,914	1.12	1,711	0.94	1,708	0.94	1,667	0.91	1,661	0.91	1,579	0.86	1,424	0.78
1	I-94 east of Conner	624	0.90	557	0.89	555	0.89	545	0.89	544	0.89	542	0.89	548	0.89
2	I-94 east of I-75	682	1.00	628	1.00	627	1.00	616	1.00	613	1.00	628	1.00	634	1.00
3	I-75 north of I-94	926	0.81	918	0.81	917	0.81	927	0.81	927	0.81	908	0.81	889	0.81
4	M-10 north of I-94	410	0.60	392	0.60	394	0.60	363	0.59	362	0.59	317	0.58	303	0.58
5	I-96 west of I-94	1,020	0.62	845	0.61	841	0.61	800	0.61	796	0.61	722	0.61	646	0.60
6	I-96 west of I-275	18	0.95	39	0.95	39	0.95	44	0.95	45	0.95	25	0.95	26	0.95
7	I-94 west of I-96	195	0.88	183	0.87	182	0.87	157	0.88	156	0.88	92	0.88	115	0.87
8	I-94 west of Southfield	527	0.80	197	0.77	196	0.77	160	0.75	160	0.75	936	0.84	818	0.80
9	I-94 east of Middlebelt	457	0.99	147	0.96	146	0.96	118	0.91	117	0.91	794	1.00	744	0.99
10	I-94 west of I-275	385	1.00	598	1.02	601	1.02	661	1.04	663	1.04	691	1.01	652	1.00
11	I-75 south of Ambassador	1,759	0.91	803	0.76	790	0.76	734	0.75	720	0.75	793	0.74	742	0.71
12	I-75 south of Southfield	1,025	0.97	481	0.96	472	0.96	458	0.97	445	0.97	1,014	1.00	1,032	0.98
13	I-75 south of King	939	0.99	1,029	1.02	1,023	1.00	933	0.99	887	0.98	939	0.99	948	0.99
14	Schaefer east of I-94	6	0.58	9	0.58	9	0.58	9	0.59	10	0.59	7	0.49	0	0.32
15	Southfield north of I-94	1	0.83	6	0.83	6	0.83	11	0.84	11	0.84	158	0.87	130	0.85
16	Southfield south of I-94	52	0.89	44	0.90	43	0.90	38	0.87	32	0.87	23	0.69	102	0.88
17	Telegraph north of I-94	0	0.66	9	0.66	9	0.66	8	0.66	6	0.66	9	0.64	1	0.66
18	Telegraph south of I-94	3	0.80	30	0.76	29	0.76	26	0.76	23	0.76	3	0.77	3	0.80
19	I-275 north of I-94	10	0.75	57	0.75	58	0.75	85	0.75	87	0.75	38	0.75	30	0.75
20	I-275 south of King	8	0.75	14	0.78	14	0.78	14	0.79	14	0.79	9	0.74	8	0.74

2035 PM Peak Hour		No Action (A0)		C3 (A24)		C4 (A26)		I12 (A30)		I13 (A31)		I14 (A27)		N1 (A32)	
		Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C	Int'l Volume	Max V/C
N	New Crossing	#N/A	#N/A	2,676	0.56	3,937	0.77	3,614	0.70	3,697	0.71	4,494	0.80	1,980	0.37
A	Ambassador Bridge	3,694	1.12	1,736	0.59	628	0.22	1,154	0.40	1,082	0.36	149	0.12	2,484	0.78
T	Detroit River Tunnel	1,914	1.12	1,402	0.77	1,251	0.70	1,039	0.57	1,028	0.57	1,145	0.66	1,254	0.72
1	I-94 east of Conner	624	0.90	559	0.89	562	0.89	578	0.89	579	0.89	574	0.89	665	0.87
2	I-94 east of I-75	682	1.00	620	1.00	639	0.99	685	0.99	690	1.00	649	0.99	1,223	1.00
3	I-75 north of I-94	926	0.81	893	0.81	885	0.81	899	0.81	903	0.81	903	0.81	796	0.81
4	M-10 north of I-94	410	0.60	372	0.60	338	0.58	689	0.64	716	0.64	348	0.59	469	0.62
5	I-96 west of I-94	1,020	0.62	764	0.62	870	0.62	879	0.62	851	0.62	1,140	0.62	899	0.62
6	I-96 west of I-275	18	0.95	24	0.95	23	0.95	19	0.95	19	0.95	22	0.95	20	0.95
7	I-94 west of I-96	195	0.88	76	0.87	66	0.86	305	0.89	412	0.90	75	0.87	366	0.89
8	I-94 west of Southfield	527	0.80	630	0.81	609	0.81	496	0.80	516	0.80	523	0.81	532	0.80
9	I-94 east of Middlebelt	457	0.99	680	0.99	654	0.99	441	0.99	439	0.99	496	0.99	458	0.99
10	I-94 west of I-275	385	1.00	592	1.00	578	1.00	370	1.00	367	1.00	422	1.00	386	1.00
11	I-75 south of Ambassador	1,759	0.91	808	0.70	1,967	0.77	732	0.77	742	0.78	2,146	1.01	1,469	0.87
12	I-75 south of Southfield	1,025	0.97	1,040	0.98	1,037	0.97	1,032	0.97	1,031	0.98	1,035	0.97	1,025	0.97
13	I-75 south of King	939	0.99	953	0.99	950	0.99	947	0.99	946	0.99	948	0.99	940	0.99
14	Schaefer east of I-94	6	0.58	8	0.61	7	0.61	1	0.57	1	0.57	7	0.61	3	0.57
15	Southfield north of I-94	1	0.83	13	0.82	1	0.82	1	0.83	1	0.84	1	0.83	1	0.83
16	Southfield south of I-94	52	0.89	206	0.91	204	0.91	74	0.90	49	0.89	96	0.90	49	0.89
17	Telegraph north of I-94	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66	0	0.66
18	Telegraph south of I-94	3	0.80	1	0.81	1	0.81	2	0.80	2	0.80	1	0.81	3	0.80
19	I-275 north of I-94	10	0.75	27	0.75	15	0.75	9	0.75	9	0.75	13	0.75	10	0.75
20	I-275 south of King	8	0.75	8	0.75	8	0.75	8	0.75	8	0.75	7	0.75	8	0.75

Source: The Corradino Group of Michigan, Inc.

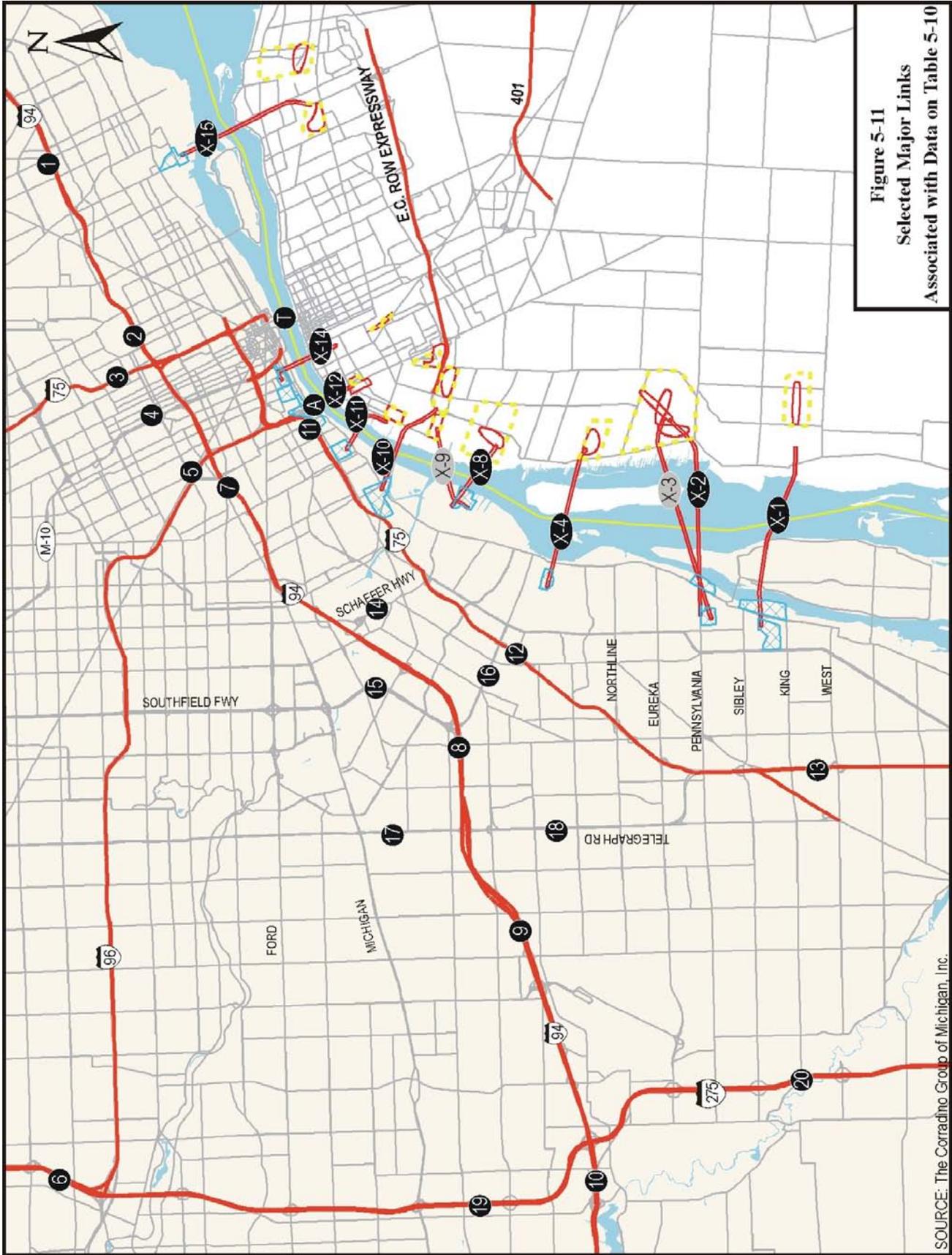


Figure 5-11
Selected Major Links
Associated with Data on Table 5-10

SOURCE: The Corradino Group of Michigan, Inc.
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Another measure of regional travel change is the effect associated with potential closure of the Ambassador Bridge while the new crossing is in operation. As can be seen from the data on Table 5-9, the Downriver crossing sites will experience increases in vehicle miles of travel as traffic would shift to the new crossing to make its way to its final destination with the Ambassador Bridge closed. Crossing systems involving Plazas S-1, S-2 and S-3 are associated with over 11,000 additional VMT in the 2035 afternoon peak hour. The crossing system of which Plaza S-4 is a part is associated with an increase of almost 10,000 additional VMT, indicating this crossing is also “out of the way” of much international traffic. When examining vehicle hours of travel, only crossing S-5 would cause a regional reduction. All other crossings served by a Downriver plaza would increase the vehicle hours of travel for trips diverted from the Ambassador Bridge, if it were closed, in making their way to their destinations.

No major SEMCOG network links would have to be rerouted to accommodate these new plazas.

Link-by-Link Analysis – The traffic analysis of those links listed on Table 5-10, and depicted on Figure 5-11, indicates the Downriver crossings help reduce traffic on the Ambassador Bridge and Detroit-Windsor Tunnel and thereby reduce the expected peak hour congestion on them. However, the data also indicate that all Downriver crossing systems, except the one associated with Plaza S-5, would carry traffic requiring one lane in each direction during the PM peak hour. The DRIC Study requirement is three lanes in each direction built to accommodate traffic, not just in the 30-year horizon, but for up to 100 years.

Another important characteristic to examine is the traffic change at various links throughout the roadway system (Table 5-10, Figure 5-11). The only significant difference occurs at I-75 south of the Ambassador Bridge (Point 11). A new southern crossing would shift enough traffic to reduce the expected congestion in 2035 at that location from a V/C ratio of over 90 percent to one of approximately 75 percent. This is caused largely by the shift in international trucks to the south. Most of these vehicles are less likely to have any business in Michigan.

Central Area

Regional Analysis – The four plazas in the Central Area have the ability to reduce vehicle miles of travel by less than one-half percent compared to the No Action condition (Table 5-9). However, they have the potential of reducing by three to three-and-a-half percent the vehicle hours of travel associated with 2035 afternoon peak hour international traffic. If the Ambassador Bridge were closed, additional vehicles miles of travel would be incurred but vehicle hours of travel would be saved, if the new crossing system were located in the Central Area.

Only Plaza C-3 would require the rerouting of roadways in the SEMCOG network: Dearborn, Jefferson and Westend.

Link-by-Link Analysis – The data on Table 5-10 indicate that the plazas in the Central Area will attract significant traffic from the existing crossings and require at least 2 lanes in the peak direction in the 2035 peak hour. The crossing system associated with Plaza C-4 will have the most significant effect of reducing the traffic on the existing border crossing facilities. All Central Area alternatives have the ability to reduce the congestion in the area of I-75 south of the Ambassador Bridge by as much as 20 percent. Another interesting effect with the crossing system associated with Plaza C-2 is the ability to reduce traffic on Schaefer Road. In this instance, the concept of building a freeway connection from the plaza to I-75 and then onto I-94 leaves Schaefer Road free to accommodate non-international/local traffic, like among the Ford Rouge Plant facilities/operations. It is fair to assume the concept of a freeway-to-freeway connection between I-94 and I-75 along Schaefer Road would have a similar effect if connected to Plazas C-3 and C-4.

I-75/I-96 Area

Regional Analysis – All three of the plazas here also will create a regional reduction in vehicle hours of travel significantly greater than vehicle miles of travel saved (Table 5-9). The crossing systems connected to Plazas II-2, II-3 and II-4 would save more than 700 vehicle hours of travel in the 2035 peak hour.

Link-by-Link Analysis – The crossing systems connected to Plazas II-2, II-3 and II-4 will significantly reduce the congestion on the Ambassador Bridge. Plazas II-2 and II-3 will have some effect on I-75 south of the Ambassador Bridge.

Belle Isle

Regional Analysis – The Belle Isle crossing system will save less than two-tenths of a percent of vehicle miles traveled by international traffic in the 2035 afternoon peak hour, compared to the No Action condition (Table 5-9). Its savings will be in the neighborhood of 2.7 percent of vehicle hours of travel, which is among the lowest of all the plazas/crossing systems analyzed. And, under the condition that the Ambassador Bridge is shut for an extended period, the crossing in the Belle Isle Area will not efficiently serve the diverted travel as typified by the large number of additional vehicle miles of travel experienced. The N-1 plaza will require one major roadway to be rerouted or closed (Freud Street).

Link-by-Link Analysis – The link-by-link data of the Belle Isle crossing system connected to the N-1 plaza indicate that it will have a positive effect through diverting traffic from the Ambassador Bridge and Detroit-Windsor Tunnel; however, it will have no significant effect on I-75 or other major roadways in the area (Table 5-10). I-94 in the vicinity of the new crossing, which is considered to be improved by 2035, from today’s conditions, will not be significantly affected by the shift of international traffic.

5.5.1 Performance Evaluation

The evaluators assigned relatively low performances (scores of 50 to 60 points) to the crossing systems tied to all Downriver plazas (S-1, S-2, S-3, S-4, and S-5) and the Belle Isle Area plaza (N-1) (Table 5-11). The better performers are the crossing systems related to Plazas C-2, C-3, C-4, II-2, II-3 and II-4.

Table 5-11
Detroit River International Crossing Study
Evaluation Factor: Improve Regional Mobility
U.S. Plazas

Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Performance Score	53.7	54.1	56.6	58.2	60.9	85.5	86.3	87.8	82.3	82.6	80.1	57.2
Ranking (1 to 12)	12	11	10	8	7	3	2	1	5	4	6	9

Source: The Corradino Group of Michigan, Inc.

5.6 Maintain Air Quality

In this area, two sets of data are provided: regional pollutant burden and carbon monoxide concentrations on the plaza. The discussion of these issues, provided below, is divided into plazas by geographical area. Comparisons are only for those alternatives in that area. An overall comparison of plazas by the “Air Quality” evaluation factor for all plazas is provided at the end of this section of the report. Section 5.8 then compares the overall performance of all alternatives for all evaluation factors.

Downriver Area

The evaluation data provided on Table 5-12 for the air quality information include both regional pollutant burden as well as the CO concentration calculated on the plaza for international traffic. It is important to note that each Downriver alternative will draw some traffic from the existing river crossings (Ambassador Bridge and Windsor Tunnel) and will change the vehicle miles

Table 5-12
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Air Pollutants
Supporting Data – Plazas Only

Evaluation Factor	Performance Measure Category		Plaza		S1	S2	S3	S4	S5	C2	C3	C4	II2	II3	II4	N1	
			Description/Units														
Maintain Air Quality	Regional Burden	Change from No Action Condition (pounds per peak hour)	VOC	VOC	-0.4	-0.4	-0.6	-0.7	-0.7	-0.5	-0.3	-0.1	-0.1	-0.1	0.2	0.3	
			CO	CO	-11.6	-11.6	-19.3	-20.3	-19.6	-14.5	-7.9	-2.2	-3.4	-2.1	7.2	7.6	
			NOX	NOX	-0.4	-0.4	-0.7	-0.7	-0.7	-0.5	-0.3	-0.1	-0.1	-0.1	0.3	0.3	
	CO Hotspot on Plaza	PPM in peak hour	CALQ3HC	PM2.5	PM2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				PM10	PM10	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
				Benzene	Benzene	-0.01585	-0.01578	-0.02623	-0.02761	-0.02668	-0.01964	-0.01074	-0.00298	-0.00461	-0.00282	0.00978	0.01031
				1,3 Butadiene	1,3 Butadiene	-0.00156	-0.00156	-0.00259	-0.00272	-0.00263	-0.00194	-0.00106	-0.00029	-0.00045	-0.00028	0.00096	0.00102
				Formaldehyde	Formaldehyde	-0.00489	-0.00487	-0.00810	-0.00853	-0.00824	-0.00606	-0.00331	-0.00092	-0.00142	-0.00087	0.00302	0.00318
				Acetaldehyde	Acetaldehyde	-0.00225	-0.00224	-0.00372	-0.00392	-0.00378	-0.00278	-0.00152	-0.00042	-0.00065	-0.00040	0.00139	0.00146
				Acroline	Acroline	-0.00024	-0.00024	-0.00040	-0.00043	-0.00041	-0.00030	-0.00017	-0.00005	-0.00007	-0.00004	0.00015	0.00016
					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	

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Source: The Corradino Group of Michigan, Inc.

(VMT) and vehicle hours (VHT) of international travel on the regional road system (refer to Table 5-9). The data indicate that, among the Downriver alternatives, Plazas S-3, S-4 and S-5 are forecast to have a greater reduction in air pollutants (associated with the regional vehicle miles and vehicle hours of travel saved). The diversion of traffic from the existing crossings is less with Plazas S-1 and S-2 and, therefore, regional pollutant burden reduction is expected to be less, but the effect is still considered positive overall.

The carbon monoxide concentration that is generated in the peak hour by international travel using the Downriver plazas is expected to be less than 1 part per million (ppm). The federal standard for CO is 35 ppm. The ambient (background) levels for CO in 2005 in Wayne County are between 2.5 and 3.7 ppm. The contribution from any plaza is a fraction of the ambient level and far below the federal standard when added to the background CO concentration.

Central Area

Plaza C-2 is associated with an end-to-end roadway crossing system with savings in VMT and significant savings in VHT in the year 2035 (refer to Table 5-9). As a result, its pollution burden reduction is the largest of the Central Area plazas. Plazas C-3 and C-4 reduce regional travel less than the crossing system connected to Plaza C-2 and, so, are associated with less reduction in pollutant burden. The concentrations of carbon monoxide on the Central Area plazas are expected to be less than 1 ppm and not cause a violation of the federal standard when added to the background CO concentration.

I-75/I-96 Area

The three plazas serving the area around I-75/I-96 are uniquely different. Plaza II-4 is a part of a crossing system that is associated with a small increase in regional pollutant burden because of the less direct access through the Ojibway Parkway in Canada as compared to other routes. On the other hand, Plazas II-2 and II-3 are associated with a crossing system that would result in some savings in regional VMT/VHT and, therefore, a small reduction in regional pollution burden. The concentrations of carbon monoxide on the plazas are expected to be less than 1 ppm and not cause a violation of the federal standard when added to the background CO concentration.

Belle Isle Area

A crossing system with a plaza at the N-1 location in the Belle Isle Area will increase the vehicle miles of travel on the regional roadway system. As a result, the pollutants on the regional system are expected to increase. The concentration of carbon monoxide on the plaza is expected to be

less than 1 ppm and not cause a violation of the federal standard when added to the background CO concentration.

5.6.1 Performance Evaluation

The performance evaluation for the Air Quality evaluation factor indicates that the most significant performers are: Plazas S-3, S-4, S-5 and C-2. Each received a total performance score over 80 (Table 5-13). Those plazas that are providing some reduction in regional pollutant burden, but not as significant a reduction, received a score in the 70s; they include S-1, S-2 and C-3. Plazas II-4 and N-1 are forecast to increase the pollutant burdens associated with international travel and, therefore, received performance scores that are the lowest in the air quality category.

Table 5-13
Detroit River International Crossing Study
Evaluation Factor: Maintain Air Quality
U.S. Plazas

Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Performance Score¹	77.7	77.6	85.6	85.9	84.8	80.3	73.6	65.4	68.9	65.0	39.2	39.2
Ranking (1 to 12)	5	6	2	1	3	4	7	9	8	10	12	11

¹ Average of individual scores of 10 evaluators.

Source: The Corradino Group of Michigan, Inc.

5.7 Assess How Project Can Be Built (Constructability)

This evaluation factor, otherwise known as “constructability,” includes four performance measures: maintenance of traffic during construction; site constraints limiting access to the plaza; geotechnical constraints; and, the relative risk of known site conditions (Table 5-14). The discussion of these issues, provided below, is divided into plazas by geographical area. Comparisons are only for those alternatives in that area. An overall comparison of plazas by the “Constructability” evaluation factor for all plazas is provided at the end of this section. Section 5.8 then compares the overall performance of all alternatives for all evaluation factors.

Downriver Area

Maintenance of Traffic – The Downriver plazas will require no streets to be closed during construction. Construction of Plazas S-1 and S-2 will likely affect 15 businesses within 500 feet of the plaza. Plazas S-3 and S-5 are expected to impact only one business within that distance, while Plaza S-4 will affect none. There are no schools or public use facilities within 500 feet of any plaza that could be affected by construction.

Table 5-14
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Constructability
Supporting Data – Plazas Only

Evaluation Factor	Performance Measure Category		Description/Units	S1	S2	S3	S4	S5	C2	C3	C4	II2	II3	II4	N1	
	Assess How Project Can Be Built	Traffic Maintenance	Streets Closed During Construction	number	0	0	0	0	0	0	26	9	5	8	17	6
Adjacent businesses affected by construction			Number w/i 500ft/150 meters	15	15	1	0	1	1	5	16	10	3	17	12	
Adjacent schools or public use facilities affected by construction			Number w/i 500ft/150 meters	0	0	0	0	0	0	1	0	0	3	2	1	
Site constraints limiting access to the plaza for the river crossing or the roadway connections		Plaza proximity to crossing landing	Distance (ft/m)	0ft/0m	0ft/0m	0ft/0m	2460ft/800m - 3121ft/920m	0ft/0m								
		Raillines adjacent to or through plaza site	Number	4	6	3	4	3	3	8	2	3	2	3	3	
		Utilities adjacent to or through plaza site	Number	10	1	1	0	5	1	7	0	0	0	0	2	
		Presence of heavy industry adjacent to or on plaza site	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
		Contaminated Sites/Hazardous Materials within 500ft/150m (single sites may have multiple designations)	EPA/DEQ Hazmat TSD Facility		0	0	0	1	0	0	0	1	0	0	0	1
			National Priority List (Superfund)		0	0	0	0	1	0	0	0	0	0	0	0
			RTK Cerclis (Superfund)		0	0	0	2	0	0	0	1	0	0	2	0
Michigan Contaminated Sites				0	0	0	1	0	0	2	2	0	0	0	0	
Geotechnical constraints- identify any unusual geotechnical features/issues that may be problematic for construction		Proximity to solution mining areas	Number w/i 1,000 ft/300 meters	4	5	14	35	1	0	14	0	0	0	0	0	
		Presence of poor soil conditions (e.g., compressible/expansive & organic)	Yes/No	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	
		Presence of noxious gasses (e.g., Hydrogen Sulfide and Methane)	Yes/No	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	
		Presence of artesian groundwater	Yes/No	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	
Relative risk of known site conditions (environmental, geotechnical, other physical/construction methodologies)		Engineering Consideration	High/Medium/Low	Medium	High	Medium	High	High	Low	Medium	Low	Medium	Medium	Medium	Low	

Source: The Corradino Group of Michigan, Inc.

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Site Constraints Limiting Access – Plazas S-1, S-3 and S-5 are expected to be directly connected to the river crossing component of the system. On the other hand, the bridge would have to “double back” to connect with the Plazas S-2 and S-4 as they are on the river’s edge. More constraining is the fact that each of the Downriver plaza sites will be affected by railroad lines running adjacent to (not through) the plaza. At least three and up to six lines are involved. Also of concern is the presence of utilities on two plaza sites. While there are none to affect Plaza S-4, utilities are adjacent or through the sites of Plazas S-1 (10); S-2 and S-3 (1); and, S-5 (5). The presence of active/inactive heavy industry on or adjacent to all Downriver plaza sites will make clearance of the sites complicated. The presence of contaminated materials of significance would affect the construction of Plazas S-4 and S-5. No significant contaminated material sites are listed for Plazas S-1, S-2 and S-3.

Geotechnical Constraints – Each of the Downriver plaza alternatives are within 1,000 feet of brine wells. Plaza S-4 is most affected as it is within 1,000 feet of almost three dozen known brine well locations. Poor soil conditions are only a factor at Plaza S-5. The presence of artesian ground water that would affect construction is also an issue at Plaza S-5. On the other hand, noxious gases, including hydrogen sulfide and methane, are expected to be a concern during construction at all five Downriver plaza sites.

Relative Risk – As a result of examination of the physical, environmental and geotechnical constraints listed above, it is believed that the risk to completing plaza construction, within time and budget, is highest with Plazas S-2, S-4 and S-5, and lower, but not insignificant, with Plazas S-1 and S-3.

Central Area

Maintenance of Traffic – Plaza C-2 will not be affected by street closures during construction. However, Plaza C-3 will be affected by the closure of 26 local streets, and Plaza C-4 by nine. Constructing Plaza C-4 will have an effect on the traffic using 16 businesses within 500 feet. Five or fewer businesses will be affected by Plazas C-2 and C-3. Traffic of one public facility will be affected by the construction of Plaza C-3 (the Delray Community Center); Plazas C-2 and C-4 has no such facilities within 500 feet.

Site Constraints Limiting Access – Each of Plazas C-3 and C-4 will be directly connected to the border crossing. A small distance (50 feet) would exist between the Plaza C-2 and the crossing and over 200 feet would be the distance between the crossing and Plaza C-3.

Rail lines are running through or adjacent to the Central Area plaza sites at the present time and would have to be dealt with (one onsite, two adjacent). There are seven utilities on the site of Plaza C-3 that would have to be addressed. No utilities would affect Plaza C-4, and one would affect Plaza C-2.

The presence of active/inactive heavy industry affects all three Central Area plaza sites.

No known major listed contaminated sites affect Plaza C-2. Two Michigan contaminated sites affect each of Plazas C-3 and C-4. Additionally, one hazardous material handling facility will affect Plaza C-4.

Geotechnical Constraints –Plazas C-2 and C-4 are not affected by proximity within 1,000 feet to known solution mining areas. On the other hand, Plaza C-3 is within 1,000 feet of 14 such areas.

All three plaza sites in the Central Area will be affected by known poor soil conditions, noxious gases, and artesian water.

Relative Risk – The results of the conditions discussed above indicate that the risk to accomplishing the construction of the project on time and within budget is low for Plazas C-2 and C-4, and medium for Plaza C-3.

I-75/I-96 Area

Maintenance of Traffic – All four of the I-75/I-96 Area plazas are affected by some street closures during construction. But, Plaza II-4 is the most significantly affected with more than a dozen streets that would need to be closed. Construction of Plaza II-2 would affect as many as 10 businesses; Plaza II-3, three businesses; and, Plaza II-4, 17 businesses. Several public use facilities are likely to be affected during construction of each plaza in the I-75/I-96 Area as follows:

- Plaza II-2
 - ✓ The Latino Family Services Center
 - ✓ Cesar Chavez Academy
 - ✓ Roberto Clemente Recreation Center
- Plaza II-3
 - ✓ Cesar Chavez Academy
 - ✓ Wayne County Community Center

- ✓ Most Holy Trinity Catholic School
- ✓ IBEW Community Center
- ✓ Engine 8 Fire Station
- Plaza II-4
 - ✓ Webster Elementary School
 - ✓ Roberto Clemente Recreation Center
 - ✓ Engine 29 Fire Station
 - ✓ Riverside Park

Site Constraints Limiting Access – Each of Plazas II-2 and II-4 would be affected by three major railroad lines that run adjacent to the plaza. Plaza II-2 would be affected by two adjacent railroad lines. None would be affected by a major onsite utility. And, the presence of heavy industry affects none of the I-75/I-96 plaza sites.

Contamination of significance does not affect Plazas II-2 or II-3. But, Plaza II-4 is affected by two Superfund sites.

Geotechnical Constraints – None of the I-75/I-96 Area plazas is within 1,000 feet of brine wells. Poor soil conditions are likely to be associated with construction of Plaza II-2. Noxious gases and the presence of artesian water is likely to affect all three I-75/I-96 Area sites.

Relative Risk – There is a medium risk associated with constructing all I-75/I-96 Area plazas on time and within budget.

Belle Isle

Maintenance of Traffic – Construction of the Belle Isle plaza will cause the closure of six streets. Traffic to 12 businesses within 500 feet of the plaza and one public facility (the Detroit 5th Precinct Police Department), would be affected by constructing Plaza N-1.

Site Constraints Limiting Access – Three rail lines run adjacent to the Plaza N-1 site affecting construction. By the same token, there are two utilities and an EPA-licensed HAZMAT handling facility that will have to be dealt with. Heavy industry is adjacent to the site.

Geotechnical Constraints – The N-1 plaza is not near a solution mining area nor will it be negatively affected by poor soils, noxious gases, or the presence of artesian ground water.

Relative Risk – The relative risk associated with the above-listed factors for the N-1 plaza to be completed on time and within budget is low.

5.7.1 Performance Evaluation

While all plazas are constructible, the performance evaluation indicates that the plazas that present fewer challenges are C-4 and N-1 with performance scores above 80 (Table 5-15). Other positive performers include Plazas S-3, C-2, II-2, II-3 and II-4, all with scores above 70. The lowest performing score is associated with constructing a plaza at site S-4 (58.1).

**Table 5-15
Detroit River International Crossing Study
Evaluation Factor: Assess How Project Can Be Built
U.S. Plazas**

Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Performance Score	65.6	61.7	72.8	58.1	67.6	74.1	61.6	82.1	75.8	78.5	70.4	84.5
Ranking (1 to 12)	9	10	6	12	8	5	11	2	4	3	7	1

Source: The Corradino Group of Michigan, Inc.

5.8 Overall Evaluation of U.S. Plazas

Table 5-16 has been compiled to complete the evaluation of the alternative plaza sites. It summarizes the performance by site for each of the seven evaluation factors discussed earlier. A brief review of the characteristics of each plaza indicates:

<p><u>Downriver Area</u></p> <ul style="list-style-type: none"> • Plaza S-1: Performs <u>best</u> in Protecting Cultural Resources. Performs <u>least</u> in Consistency with Local Planning. • Plaza S-2: Performs <u>best</u> in Protecting Cultural Resources. Performs <u>least</u> in Consistency with Local Planning. • Plaza S-3: Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Natural Environment. • Plaza S-4: Performs <u>best</u> in Protecting Cultural Resources. Performs <u>least</u> in Protecting the Natural Environment. • Plaza S-5: Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Consistency with Local Planning.

Table 5-16
Detroit River International Crossing Study
Unweighted Performance Scores
U.S. Plazas

Plaza Evaluation Factor	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Protect Community/Neighborhood	57.5	63.2	55.4	55.1	60.5	50.3	35.9	39.9	54.7	42.3	40.8	40.9
Consistency with Local Planning	36.5	36.7	73.5	49.1	44.9	66.7	45.4	71.3	78.0	46.3	82.8	44.9
Protect Cultural Resources	89.5	89.2	80.9	89.4	71.5	63.2	42.2	72.0	59.0	49.3	37.7	71.5
Protect Natural Environment	60.8	79.5	53.9	46.6	73.1	46.5	75.4	84.4	62.2	71.9	83.1	83.6
Improve Regional Mobility	53.7	54.1	56.6	58.2	60.9	85.5	86.3	87.8	82.3	82.6	80.1	57.2
Maintain Air Quality	77.7	77.6	85.6	85.9	84.8	80.3	73.6	65.4	68.9	65.0	39.2	39.2
Constructability	65.6	61.7	72.8	58.1	67.6	74.1	61.6	82.1	75.8	78.5	70.4	84.5

Source: The Corradino Group of Michigan, Inc.

Central Area

- Plaza C-2: Performs best in Improving Regional Mobility.
Performs least in Protecting the Natural Environment.
- Plaza C-3: Performs best in Improving Regional Mobility.
Performs least in Protecting the Community/Neighborhoods.
- Plaza C-4: Performs best in Improving Regional Mobility.
Performs least in Protecting Community/Neighborhood.

I-75/I-96 Area

- Plaza II-2: Performs best in Improving Regional Mobility.
Performs least in Protecting the Community/Neighborhoods.
- Plaza II-3: Performs best in Improving Regional Mobility.
Performs least in Protecting the Community/Neighborhoods.
- Plaza II-4: Performs best in Protecting the Natural Environment.
Performs least in Maintaining Air Quality.

Belle Isle Area

- Plaza N-1: Performs best in Constructability.
Performs least in Maintaining Air Quality.

When examining the scoring of the plazas by evaluation factor, the following are the best and least performers:

Protect the Community/Neighborhood: Best Performers: Plazas S-2 and S-5
Least Performers: Plazas C-3, C-4, II-3, II-4 and N-1
Note: None performs exceptionally well.

Consistency with Local Planning: Best Performer: Plaza II-4
Least Performers: Plazas S-1, S-2, S-4, S-5, C-3, II-3
and N-1

Protect Cultural Resources: Best Performers: Plazas S-1, S-2 and S-4
Least Performers: Plazas C-3, II-3 and II-4

Protect the Natural Environment: Best Performers: Plazas C-4, II-4 and N-1
Least Performers: Plazas S-4 and C-2

Improve Regional Mobility:	Best Performers: Plazas C-2, C-3, C-4, II-2, II-3 and II-4 Least Performer: Plaza S-1, S-2, S-3, S-4 and N-1
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Maintain Air Quality:	Best Performers: Plazas S-3, S-4, S-5 and C-2 Least Performers: Plazas II-4 and N-1
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Constructability:	Best Performers: Plazas C-4 and N-1 Least Performer: S-4
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These performances were then combined with the evaluation factor weights. When comparing the Citizens' and Technical Team's weighted scores (Table 5-17), it can be seen the two groups agree that Plazas S-3, S-5, C-4 and II-2 are among the top five performers. Plaza C-4 is also among the highest scorers in the Regional Mobility area, which is a direct measure of a proposed alternative's ability to meet the project's needs in several areas. The weights of the Citizens cause the Downriver plazas (S-1, S-2, S-3 and S-4) to perform higher than when using the Technical Team weights. The difference in weights also cause Plaza II-2 to be ranked fifth applying the Citizens' weights and Plaza II-2 to be ranked second when applying the Technical Team weights. The latter difference is largely attributable to the high weight given by the Technical Team to regional mobility, an area in which Plaza II-2 performs well.

These performances will be combined with other components of the crossing system (crossings and routes) to help develop the decision on Practical Alternatives.

Table 5-17
Detroit River International Crossing Study
Weighted Performance Scores
U.S. Plazas

Group \ Plaza	S-1	S-2	S-3	S-4	S-5	C-2	C-3	C-4	II-2	II-3	II-4	N-1
Citizen Weight	64.21	68.23	68.97	64.62	67.16	63.91	57.41	68.41	66.17	58.52	58.21	57.41
Ranking (1 to 12)	7	(3)	(1)	6	(4)	8	11/12	(2)	(5)	9	10	11/12
Technical Team Weight	62.79	65.92	66.76	62.66	66.18	66.98	61.23	71.59	68.69	63.23	61.96	59.79
Ranking (1 to 12)	8	6	(4)	9	(5)	(3)	11	(1)	(2)	7	10	12

Source: The Corradino Group of Michigan, Inc.

6. EVALUATION DATA – RIVER CROSSINGS

The presentation of crossing evaluation data is subdivided by geographical area dealing with: 1) the Downriver Area; 2) the Central Area; 3) the I-75/I-96 Area; and, 4) the Belle Isle Area. It is noteworthy, as depicted in Figure 6-1, several crossings have alternative plaza connections. For example, Crossing X-1 in the Downriver Area connects to both Plazas S-1 and S-2; Crossings X-2 and X-3 connect to each of Plazas S-3 and S-4. In the I-75/I-96 Area, Crossing X-14 connects to Plazas II-2 and II-3. Also, because of the elimination of Plazas C-1 and II-1 from the analysis, Crossings X-5, X-6 and X-7 have been removed from the analysis. As a result, there are 15 Illustrative Alternatives to cross the Detroit River.

The tunnel options considered are:

- Rock bored (Slurry Shield)
- Soft ground bored (Earth Pressure Balance)
- Submerged
- Mined (drill and blast)

The techniques to build such tunnels are described here.

1. Slurry Shield Tunnel Boring Machines (TBM) through rock – while preferred to blasting in urban areas, this method is considered impracticable because of the poor rock conditions in the Detroit River Area (Table 6-1). Further, slurry shield boring is a new technology and, from a practical standpoint, is yet to be proven.
2. Earth Pressure Balance Tunnel Boring Machine (TBM) – suitable for tunneling in the soft clay overburden by controlling the pressure at the working-face. This method of construction, which was considered possible in the Central and Belle Isle Areas, requires state-of-the-art machinery and techniques and is further discussed below (Table 6-1).
3. Submerged tunnel – is suitable anywhere the riverbed can be reasonably dredged to place the finished tunnel fully below the existing riverbed level. It has the advantage of a flexibly-shaped cross-section (not restricted to circular), which could minimize depth of dredging (through increasing width). But, the environmental impact of dredging in this section of the Detroit River would create such disturbance to sediment, including contaminated and toxic riverbed sediments, that the effect on river biology is considered unacceptable (Table 6-1).

Figure 6-1a
Detroit River International Crossing Study
River Crossings X-1, X-2 and X-3



Source: Parsons Transportation Group

Figure 6-1b
Detroit River International Crossing Study
River Crossings X-4 through X-9



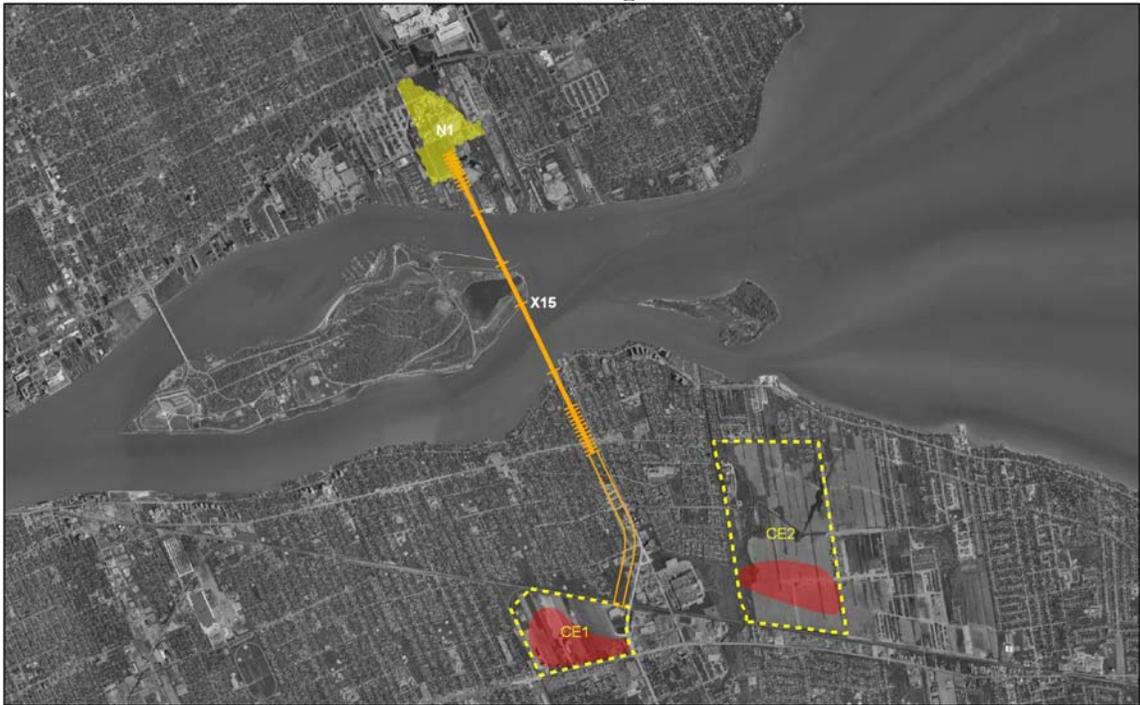
Source: Parsons Transportation Group

Figure 6-1c
Detroit River International Crossing Study
River Crossings X-10 through X-14



Source: Parsons Transportation Group

Figure 6-1d
Detroit River International Crossing Study
River Crossing X-15



Source: Parsons Transportation Group

**Table 6-1
Detroit River International Crossing
Tunnel Practical Feasibility**

Category	Downriver	Central	Belle Isle
Soft Ground Bored Tunnel	Not Practically Feasible ▪ Insufficient soil depth	Possibly Practically Feasible ▪ Soil depth varies from marginal to insufficient	Practically Feasible ▪ Marginal soil depth
Rock Tunnel	Not Practically Feasible ▪ Poor rock ▪ Deep tunnel/long approaches ▪ Poor history	Not Practically Feasible ▪ Poor Rock ▪ Even deeper tunnel/long approaches ▪ Poor history	Not Practically Feasible ▪ Poor rock ▪ Very deep tunnel/long approaches
Submerged Tunnel	Not Practically Feasible ▪ Rock excavation required ▪ Environmental issues	Technically Practical – Engineering Not Practically Feasible – Environmental Issues	Technically Practical – Engineering Not Practically Feasible – Environmental Issues

Source: Parsons Transportation Group

4. Drilling and blasting through bedrock – this method has a very poor history with construction difficulties, abandonment and fatalities. A recent attempt in the Rouge River near Zug Island was abandoned in 2003. The rock is of poor quality and fissured with infiltration of water and dangerous noxious gases. There is artesian pressure (2 to 3 meters of head above the river) due to the presence of aquifers. There is also the difficulty of blasting in urban areas. This method of construction is considered impracticable.

A complete report on these factors, entitled “Preliminary Tunnel Evaluation, Proposed Detroit River International Crossing,” is available on the project’s Web site (www.partnershipborderstudy.com). The information provided in that document led to the conclusion that, while a bridge crossing is feasible and prudent along the Detroit River from the Belle Isle to Downriver areas, only a soft ground bored tunnel appeared to be feasibly practical and, then, only in the Central and Belle Isle Areas (Table 6-1). But, it was noted that even in these latter areas, a soft ground tunnel may not be practical if two tunnels, each three lanes wide, have to be bored.

Soft ground bored tunnels are only practical under the Detroit River where the silty-clay overburden is deep enough to support tunnel-boring with adequate safe clearance above the bedrock and below the riverbed. This restricts soft-bore tunneling to proposed Crossings X-10, X-11 in the Central Area, X-14 in the I-75/I-96 Area and Crossing X-15 at the eastern tip of

Belle Isle. The desired minimum depth from the top of the tunnel to the riverbed above was assumed initially to be approximately one tunnel diameter to prevent “floating” of the tunnel.

To determine the practical feasibility of the soft ground bored tunnels, two configurations were considered (Figure 6-2):

- Twin-bore tunnel, three lanes per bore, approximate outer diameter of each bore at 15.4 meters (about 45 feet).
- Three-bore tunnel, two lanes per bore, approximate outer diameter of each bore at 11.5 meters (about 38 feet).

Geological profiles were developed for each option along the longitudinal crossing alignments. The tunnel profile for each of the four crossings was plotted, based on the “one-diameter” minimum clearance below riverbed. The results are presented in Table 6-2A. From that analysis it was concluded that tunnels at Crossings X-10 and X-11 impact too deeply through the hardpan and into the underlying bedrock to be considered practically achievable.

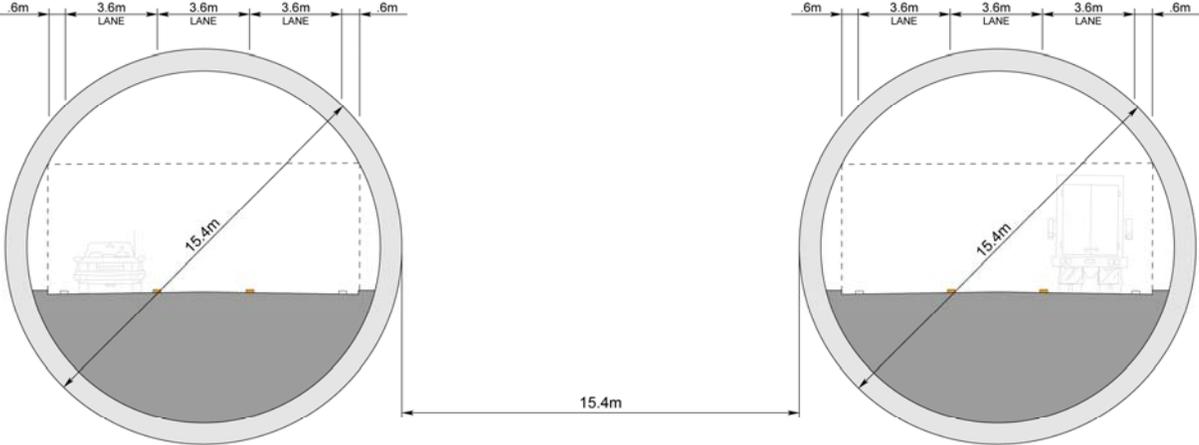
**Table 6-2A
Detroit River International Crossing Study
Analysis of Twin and Triple Bore Tunnels**

Crossing	Approximate River Width	Tunnel Cross-section		Remarks
		Twin-bore 3 lanes/bore 15.2 m. diameter (approximately 50 feet)	Triple-bore 2 lanes/bore 11.5 m. diameter (approximately 38 feet)	
X-10	600 meters (approximately 2,000 feet)	Totally within bedrock	Almost totally within bedrock	Inadequate clearance
X-11	600 meters (approximately 2,000 feet)	Totally within bedrock	Almost totally within bedrock	Inadequate clearance
X-14	720 meters (approximately 2,400 feet)	Partially within bedrock	Marginal	11.5 m (38 feet) diameter may be possible
X-15	1,900 meters (approximately 6,200 feet)	Partially within bedrock	Marginal	11.5 m (38 feet) diameter may be possible

Crossings X-14 and X-15 were then studied in more detail for only the 11.5 meter (38 feet) diameter bores by:

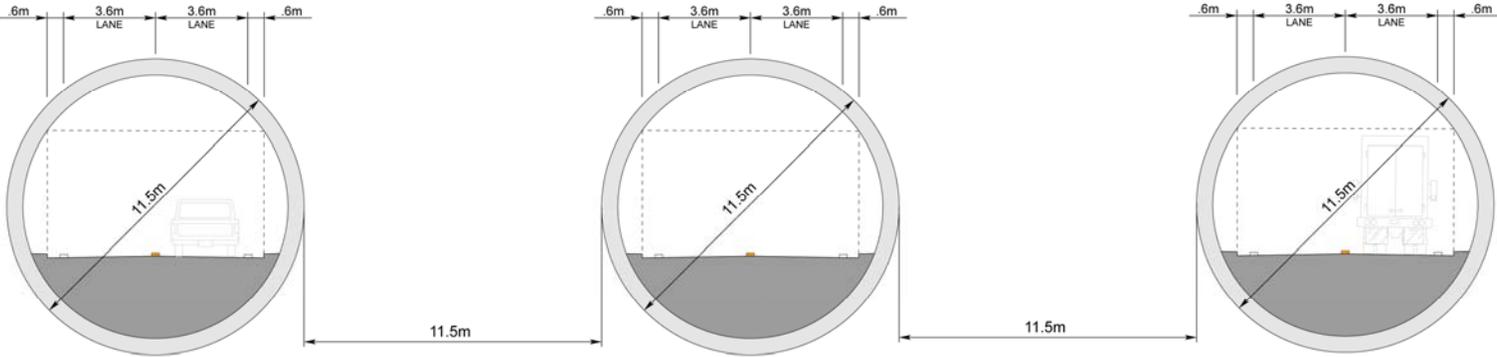
- Assuming a three-meter clearance above the hardpan stratum
- Checking this result for vertical clearance below the riverbed and using the profile to establish a preliminary tunnel length.

Figure 6-2
Detroit River International Crossing Study
Tunnels Cross Sections



DOUBLE-BORE

15.4M (50 feet) Bore with 3 Traffic Lanes per Tunnel



TRIPLE-BORE

11.5M (38 feet) Bore with 2 Traffic Lanes per Tunnel

Source: Parsons Transportation Group

The results are presented in Table 6-2B.

Table 6-2B
Detroit River International Crossing Study
Analysis of 11.5 meter (38 ft.) Turn-Bore Tunnel

Crossing No.	Approximate Tunnel Length	Minimum Clearance to Riverbed
X-14	980 m (approximately 3,200 feet)	3 m (approximately 10 feet)
X-15	2,460 m (approximately 8,100 feet)	6 m (approximately 20 feet)

They indicate an 11.5 meter (38 feet) diameter tunnel constructed in the clay overburden at either Crossing X-14 or X-15 does not appear practically feasible as the tunnel clearance to the riverbed is less than the desired 11.5 meters (38 feet). In this situation, floating of the tunnel (i.e., buoyancy) is a major concern, due to the shallow ground cover (3 to 6 meters or about 10 to 20 feet). This was overcome in a similar case (under the Elbe River, Germany, with 14.2 meter diameter tunnel and 7 to 13 meter cover) by laying a dense overlay of material in the riverbed to prevent the tunnel from floating, blow-outs and settlements. This cannot be done in the Detroit River as it is a navigable channel and because of the environmental conditions associated with placing such material on the riverbed. Because six-lane tunnels in any configuration are not considered practically feasible from an engineering perspective, the alternatives examined at all crossings are suspension or cable stay type bridges.

6.1 Protect Community/Neighborhood Characteristics

There are five performance categories in this evaluation of crossings: local traffic impacts, noise, community cohesion/character, property acquisition, and environmental justice/Title VI. Table 6-3 summarizes the issues examined. Specific details, including graphics, are included in Volume 3B of this series of reports. The discussion of these issues, provided below, is divided into crossings by area. Comparisons are only for those alternatives in that area. Overall, the comparison by the “Community/Neighborhood” evaluation factor for all river crossings is provided at the end of this section of the report. Section 6.8 compares the overall performance of all crossing alternatives for all evaluation factors.

**Table 6-3
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Community/Neighborhood Characteristics
Supporting Data – Crossings Only**

Evaluation Factor	Performance Measure Category	Description/Units	Crossing		X1	X1	X2	X2	X3	X3	X4	X8	X9	X10	X11	X12	X14	X14	X15	
			S1	S2	S3	S4	S3	S4	S5	C2	C2	C3	C4	I14	I12	I13	N1			
Protect Community / Neighborhood Characteristics	Traffic Impacts	Volume Change - Key Links	See Attachment 2: Key Links																	
		Streets Closed (permanently)	Number	1	1	0	0	0	0	0	0	0	0	0	0	2	0	3	1	0
		Streets Closed (during construction)	Number	6	6	2	2	3	3	1	0	0	1	3	0	0	4	2	0	0
		Streets Crossed	Number	6	6	1	1	2	2	1	0	0	1	1	0	4	2	0	0	
		Streets Rerouted	Number	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
		Streets with Interchange	Number	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Mainline Rallines Crossed	Number	4	0	4	4	4	4	4	0	0	0	0	0	2	0	0	0	0
	Noise	Frontline Exposure	Number of dwelling units exposed	63	63	0	0	0	0	0	33	0	0	0	0	0	48	0	0	
		Significant Receptors ¹ Exposures	Number /Specify ¹	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Community Cohesion/ Character	Positive/Negative/Neutral		Negative	Negative	Negative	Negative	Negative	Negative	Negative	Neutral	Neutral	Neutral	Neutral	Negative	Neutral	Negative	Negative	Negative	
	Potential Acquisition	Residential Units	Occupied	30	30	0	0	0	0	16	0	0	12	0	0	0	0	0	0	
			Vacant	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	
		Residential Population	Number	75	75	0	0	0	0	39	0	0	29	0	0	0	0	0	0	
		Business Units	Active	1	0	1	1	1	1	4	2	2	5	3	0	14	3	1	0	
			Vacant	2	0	1	1	1	1	0	0	0	3	0	0	2	0	1	0	
		Estimated Employees in affected Census Blocks ²	Number	17	0	367	367	405	405	349	79	79	20	151	0	866	209	5	0	
		Other Land Uses Affected	Schools	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
			Senior Service Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			City/Government Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Places of Worship	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
			Medical Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			State/Federal Government Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
			Community Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Vacant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
	Environmental Justice / Title VI	EJ Populations in affected Census Block Groups	EJ Population (non poverty)	100	100	164	148	87	40	4	0	0	0	0	649	1,489	729	0	0	
			Population Groups Affected	Hispanic	Hispanic	American Indian	American Indian	Asian, Hispanic	American Indian	American Indian, Hispanic	None	None	None	None	African American, American Indian, Native Hawaiian, Hispanic	African American, American Indian, Hispanic	African American, Asian, Hispanic	None	0	
			% Households in Poverty / Above or Below 9.9% Regional Threshold ³	3.1%/below	3.1%/below	6.2%/below	6.4%/below	5.6%/below	2.7%/below	11.3%/above	0%/below	0%/below	0%/below	0%/below	23.3%/above	19.2%/above	10%/above	0%/below		
		Households in poverty	33	33	70	76	18	6	1	0	0	0	0	45	255	75	0	0		
		Title VI Groups in Census Tracts	Presence of Regionally Prominent Ancestral Groups	English, French, German, Irish, Italian, Polish	English, French, German, Irish, Italian, Polish	English, French, German, Irish, Italian, Polish, Scottish	French, Irish, Polish, Scottish	None	None	None	None	None	None	None	None	None				

Notes;
1. Sensitive noise receptors are historic sites, medical facilities, parks, places of worship, schools, within fifty meters of an alignment, plaza, or crossing.
2. Employment estimates based on professional judgment as determined by field surveys and census data provided by Tetrad Computer Applications. Plazas have been field surveyed to determine occupancy status of businesses.
3. The poverty threshold for the SEMCOG region is 9.9%. Block groups with percentage of households living in poverty above 9.9% qualify as environmental justice communities.

Source: The Corradino Group of Michigan, Inc.

Downriver Area

Traffic Impacts – Traffic changes in the afternoon peak hour in the year 2035 at 60 “local” locations in the SEMCOG roadway network are included in Attachment 1. Those data most applicable to the areas where crossings land are shown on Figure 5-3, 5-4 and 5-5, to which the reader is referred. They indicate that, overall, traffic on local roadways in the Downriver Area will not be negatively impacted compared to the No Action conditions as most international traffic will use freeway connections, not local streets, to reach its final destination.

One local street on Grosse Ile would be permanently closed by Crossing X-1. Additionally, six streets associated with Crossings X-1/S-1 and X-1/S-2 would be closed on a temporary basis for bridge construction. Two streets would have to be closed temporarily with Crossing X-2 either connecting to Plaza S-3 or S-4. The same is the case for Crossing X-3 when connected to Plaza S-3 or S-4. One street would have to be rerouted with Crossing X-2; no streets would have to be rerouted to accommodate Crossings X-1, X-3 or X-4. Four mainline railroads would be crossed by all the Downriver Area crossings of the Detroit River.

Noise – The largest noise exposure to dwelling units (63) is associated with Crossing X-1. No residential units are expected to be impacted by noise from Crossings X-2 or X-3. Thirty-three dwellings will have frontline noise exposure to Crossing X-4. The only sensitive receptor affected by noise is the Grosse Ile Presbyterian Church near Crossing X-1.

Community Cohesion/Character – Crossings X-1, X-2 and X-3 are expected to have negative effects on the Downriver Area largely because they cross in proximity to Grosse Ile. Crossing X-4, connecting to Plaza S-5, is expected to have a neutral effect, at best, on community cohesion/character as it does not impact Grosse Ile and penetrates an area that is largely industrial. It is stressed this is an evaluation of the crossing not the plaza.

Potential Acquisition – Crossings X-2 and X-3 are not expected to cause any displacement of residential units. On the other hand, up to 30 residential units are expected to be acquired by Crossing X-1.

One active business is expected to be acquired in each of the following cases: by connecting Crossing X-1 with Plaza S-1, by connecting Crossing X-2 with either Plaza S-3 or S-4, and by connecting Crossing X-3 with either Plazas S-3 or S-4. No active businesses are expected to be acquired by connecting Crossing X-1 to Plaza S-2. The acquisition of other significant uses like schools, places of worship, government facilities and community service centers is not required for crossings in the Downriver Area.

Environmental Justice/Title VI – In the Downriver Area, the most significant potential impact on minorities and low-income people is associated with the Crossing X-2, when connected to Plazas S-3 or S-4. The least impact is associated with Crossing X-4, when connected to Plaza S-5. Several key cultural populations are in the vicinity of each proposed Downriver crossing; these include those of English, French, German, Irish, Italian, Polish and Scottish ancestry.

Central Area

Traffic Impacts – Traffic data on local roads in the Central Area affected by a river crossing are displayed on Figure 5-6 and 5-7. They illustrate that, overall, local road traffic will not be negatively impacted compared to the No Action alternative as most international traffic will use freeways, not local streets, to reach its final destination.

There will be no temporary or permanent street closings associated with the Crossings X-8 and X-9. Crossing X-10, when connected to Plaza C-3, will require one street to be temporarily closed. Two streets would be permanently closed and an additional street will be temporarily closed by Crossing X-11. Neither of these proposed bridges will cross mainline railroads before landing in their respective plazas.

Noise – There will be no residential units affected by crossings in the Central Area. No significant non-residential receptors will be affected by noise by any Central Area crossing.

Community Cohesion/Character – Because of the industrial settings in the Central Area, there is neither a positive nor negative effect expected of Crossings X-8, X-9 and X-10 on the area's community cohesion/character. Crossing X-11 will penetrate a residential area and will have a negative effect on it. It is stressed that plaza impacts, like those of Plaza C-3, are accounted for earlier.

Potential Acquisition – No acquisition of residential properties is expected with the Crossings X-9, X-9 and X-11. About a dozen units are expected to be acquired to connect Crossing X-10 with Plaza C-3, causing relocation of about 30 people.

Two businesses are expected to be affected by Crossings X-8 and X-9 causing the relocation of about 80 employees. Crossing X-10, connected to Plaza C-3, is likely to impact five active businesses, causing the relocation of 20 employees. Crossing X-11, connected to Plaza C-4, will likely affect three active businesses and the relocation of about 150 employees.

Only Crossing X-10 is expected to be associated with an impact on other non-residential/non-business land uses. It is likely to cause the relocation of the House of God Church.

The crossings in the Central Area (not the plazas) are not likely to affect populations that are minority or low-income. Connections to Crossings X-8, X-9, X-10 and X-11 will not affect any key cultural groups.

I-75/I-96 Area

Traffic Impacts – Figures 5-8 and 5-9, presented earlier, illustrate the expected traffic changes on key local roads in the I-75/I-96 Area where the bridges would land. The data indicate that, overall, local road traffic will not be negatively impacted compared to the No Action condition as most international traffic will use freeways, not local streets, to reach its final destination.

Crossing X-12 will not cause streets to be permanently closed. Crossing X-14 will require three streets to be closed when connected to Plaza II-2. X-14 will cause one street to be closed if it's connected to Plaza II-3. Crossing X-12 will cross at least one rail line, while Crossing X-14 will affect none.

Noise – Crossing X-14 is likely to impact up to 48 dwelling units but no other sensitive receptors. Crossing X-12 is expected to affect 20 residential units.

Community Cohesion/Character – Crossing X-14 is associated with a negative effect on the community cohesion/character of the surrounding area. On the other hand, Crossing X-12 is likely to have neither a positive nor negative effect on the area that it penetrates.

Potential Acquisition – No residential units are expected to be acquired by constructing Crossings X-12 or X-14. On the other hand, Crossing X-14, connected to Plaza II-2, would likely cause the relocation of 14 active businesses employing more than 850 people. Crossing X-14, connected to Plaza II-3, would cause three businesses to be relocated with more than 200 employees. No business relocations are expected with the construction of Crossing X-12.

Virtually no other land uses are likely to be impacted by Crossing X-12. Crossing X-14 is expected to impact the U.S. Post Office. Crossing X-14 is also expected to cause the relocation of the International Brotherhood of Electrical Workers Community Center. Also, Crossing X-14, when connected to Plaza II-2, will cause the relocation of the Cesar Chaves Middle School.

Environmental Justice/Title VI – There will be significant effects, at least indirectly, on the minority populations (African American, Asian, Hispanic, Indian and Native Hawaiian) with the Crossings X-12 and X-14. Also, a relatively large number of low-income households would be impacted by the crossings. On the other hand, no impact to any other cultural group, other than minorities, is expected to occur.

Belle Isle Area

Traffic Impacts – Crossing X-15 is not expected to have any negative effect on local traffic, close any street or relocate any rail line.

Noise – No unwanted noise effects on sensitive users or residential units are expected with Crossing X-15.

Community Cohesion/Character – A negative effect on community cohesion/character is expected with Crossing X-15.

Potential Acquisition – One business with five employees is the only acquisition of commercial or residential property for the Belle Isle Area crossing.

Environmental Justice/Title VI – No people of minority or other cultural background will be relocated by the crossing in the Belle Isle Area.

6.1.1 Performance Evaluation

The team of consultants scored each of the 16 river crossings (Table 6-4). The Downriver crossings X-1, X-2 and X-3, along with Crossing X-14, are all evaluated as having a negative effect on community/neighborhood characteristics.

Table 6-4
Detroit River International Crossing Study
Evaluation Factor: Protect Community/Neighborhood Characteristics
U.S. Crossings

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	11-2	11-3	N-1
Performance Score	40.4	40.7	46.8	46.8	47.8	47.1	54.3	62.7	56.8	50.9	49.9	63.8	42.1	46.8	57.9
Ranking (1 to 15)	15	14	10/11/12	10/11/12	8	9	5	2	4	6	7	1	13	10/11/12	3

Source: The Corradino Group of Michigan, Inc.

6.2 Maintain Consistency with Local Planning

There are two performance measure categories in this evaluation area, consistency with plans and environmental conditions (Table 6-5). Discussion of these issues, provided below, is divided into crossings by area. Comparisons are only for those alternatives in that area. An overall comparison of crossings by the “Local Planning” evaluation factor for all river crossings is provided at the end of this section of the report. Section 6.8 then compares the overall performance of all crossing alternatives for all evaluation factors.

Downriver Area

Consistency with Plans – For the Downriver Area, river crossings X-1, X-2 and X-4, when connected to Plazas S-1, S-2, S-4 and S-5 are inconsistent with local plans. On the other hand, Crossing X-3, when connected to Plaza S-3, which is occupied by a chemical plant, is considered consistent with the plans that call for the continuation of industrial uses.

Environmental Conditions – The plans for redeveloping to non-industrial uses the area penetrated by Crossing X-1, when connected to Plaza S-2, and Crossings X-2 and X-3, when connected to Plaza S-4, will be made easier by the absence of listed contaminated sites. A Superfund site will make more difficult implementing the plans to redevelop the area penetrated by crossing, when connected to Plaza S-5.

Central Area

Consistency with Plans – In the Central Area, Crossings X-10 and X-11 are incompatible with plans for the area they will penetrate, i.e., Delray.

Environmental Conditions – Efforts to implement the plans to redevelop the areas penetrated by Crossings X-10 and X-11 will be affected by significant environmental conditions – one Michigan contaminated site each, and a Superfund site at X-11.

I-75/I-96 Subarea

Consistency with Plans – Crossing X-12 is compatible with the official long-term development plans for the areas that it will penetrate. On the other hand, the Crossing X-14 is inconsistent with the official plans for the redevelopment of the areas (Plazas II-2 and II-3) at which it will touch down. Crossing X-14 are also inconsistent with the unofficial River Walk plans for the area.

**Table 6-5
 Detroit River International Crossing Study
 Evaluation of Illustrative Alternatives
 Consistency with Local Planning
 Supporting Data – Crossings Only**

Evaluation Factor	Performance Measure Category		Description/Units	Crossing															
				X1 S1	X1 S2	X2 S3	X2 S4	X3 S3	X3 S4	X4 S5	X8 C2	X9 C2	X10 C3	X11 C4	X12 II4	X14 II2	X14 II3	X15 N1	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO	No	No	Yes	No	Yes	No	No	Yes	Yes	No	Yes	Yes	No	No	No	
	Other Plans	Consistency	YES/NO	NA	No	NA	No	NA	No	No	NA	NA	No	No	Yes	No	No	No	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Undgrd. Stor. Tanks	Number		0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
		EPA/DEQ Hazmat TSD Facility	Number		0	0	1	0	1	0	0	0	0	0	0	0	1	1	0
		National Priority List (Superfund)	Number		0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
		RTK Cerclis (Superfund)	Number		0	0	1	0	2	0	0	0	0	1	0	0	0	0	0
	Michigan Contaminated Site	Number		0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	

Source: The Corradino Group of Michigan, Inc.

3600\evaluations\current matrices\illaltmatrix.crossings.xls\planning

Environmental Conditions – The plans for the area served by Crossing X-12 are not affected by significant environmental contamination. Implementing redevelopment plans for the area penetrated by Crossing X-14 would be affected by one hazardous materials TSD facility.

Belle Isle Area

Consistency with Plans – The proposed river crossing in the Belle Isle Area is not consistent with official or unofficial plans for redeveloping the East Detroit area which the crossing would penetrate.

Environmental Conditions – Plans to redevelop the area penetrated by Crossing X-15 would not be affected by significant environmental conditions.

6.2.1 Performance Evaluation

Crossing X-12 is expected to perform best in this evaluation area (Table 6-6) as it is considered more consistent than any other crossing with the proposed development plans for the area. The poorest performers are Crossings X-1; X-2, when connected to Plaza S-4; X-4, X-10, X-11, X-14 and X-15 – all score below 50. The remainder of the crossings typically have scores in the 60s.

**Table 6-6
Detroit River International Crossing Study
Evaluation Factor: Maintain Consistency with Local Planning
U.S. Crossings**

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
Plaza	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	11-2	11-3	N-1
Performance Score	43.5	37.5	69.5	48.8	68.5	50.5	42.0	70.5	69.5	44.8	44.7	86.4	48.9	49.1	47.1
Ranking (1 to 15)	13	15	3/4	9	5	6	14	2	3/4	11	12	1	8	7	10

Source: The Corradino Group of Michigan, Inc.

6.3 Protect Cultural Resources

There are four performance measure categories in this evaluation area: aboveground historic resources, archaeology, belowground historic resources, and public parkland. Table 6-7 summarizes the issues examined. Specific details, including graphics, are included in Volume 2 of this report. Discussion of these issues, provided below, is divided into crossings by geographical area. Comparisons are only for those alternatives in that area. An overall comparison of crossings by the “Cultural Resources” evaluation factor for all crossings is provided at the end of this section of the report. Section 6.8 then compares the overall performance of all alternatives for all evaluation factors.

**Table 6-7
 Detroit River International Crossing Study
 Evaluation of Illustrative Alternatives
 Cultural Resources
 Supporting Data – Crossings Only**

Evaluation Factor	Performance Measure Category	Description/Units	Crossing															
			X1 S1	X1 S2	X2 S3	X2 S4	X3 S3	X3 S4	X4 S5	X8 C2	X9 C2	X10 C3	X11 C4	X12 II4	X14 II2	X14 II3	X15 N1	
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Listed NRHP Sites/Structures	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Listed SHRS Sites/ Structures	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Locally Listed Sites/Structures	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Archaeology ¹	Potentially Eligible Sites/Str.	Number	1	0	0	0	0	0	2	0	0	0	1	1	0	0	
		Prev. Recorded Sites	Number	0	0	1	0	0	0	0	0	0	0	0	4	0	0	
	Below Ground Resources ¹	Potential to Find/Record	High/Med/Low	Medium	Medium	Low	Low	Low	Low	Medium	Low	Low	Medium	Medium	High	Medium	Low	
		All Public Parks	Number/ Acres	0	0	0	0	0	0	0	0	0	0	2/10.8	0	0	1/12.36	
	Parkland	6(f) Parks	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0	0	1/12.36	
		Coastal Zone Management	Number of Projects/Specify ²	0/0	0/0	0/0	0/0	0/0	0/0	1/0.68	0/0	0/0	0/0	0/0	1/2.49	1/4.1	1/4.1	2/2.4

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Notes:
 1: See Volume 2, a separate report, for individual sites.
 2: Coastal Zone Management Projects:
 X4: Public River Access/Use
 X12, X13, X14: River Corridor Walk
 X15: Lake Sturgeon Habitat

Source: The Corradino Group of Michigan, Inc.

Downriver Area

Aboveground Historic Resources – Crossings X-2, X-3 and X-4 are expected to have no impact on listed aboveground historic sites. Also, one property likely to be affected by Crossing X-1 is expected to be eligible for the *National Register of Historic Places* (7540 Horse Mill Road). Two such eligible properties would likely be affected by Crossing X-4 (87 Biddle and 124 Biddle).

Archaeology – None of the Downriver crossings are expected to have an impact on a known archaeological site.

Belowground Resources – Crossings X-1 and X-4 have medium potential for impacting belowground archaeological resources. Crossings X-2 and X-3 are considered by the cultural specialists to have low potential in this area.

Public Parkland – Neither public parks nor Coastal Zone Management projects are expected to be affected by Crossings X-1, X-2, X-3 and X-4 in the Downriver Area.

Central Area

Aboveground Resources – The Central Area crossings are not expected to impact an aboveground listed historic site. Only Crossing X-11, connected to Plaza C-4, is expected to affect the site of the circa 1920 Misterosky Power Plant that could be eligible for the *National Register of Historic Places*, according to the cultural resource specialists.

Archaeology – The Central Area crossings are not expected to impact a known archaeological site.

Belowground Resources – Crossings X-10, connected to Plaza C-3, and X-11, connected to Plaza C-4, are expected to have medium potential for impacting belowground archaeological resources. All other Central Area crossings are expected to have low potential in this area.

Public Parkland – Public parks are not expected to be impacted by building the Detroit River crossings in the Central Area.

I-75/I-96 Area

Aboveground Resources – Crossings X-12 and X-14 are not expected to impact any listed aboveground historic resource. But, Crossing X-12 will have an impact on the Ambassador Bridge, considered by cultural specialists to be eligible for the *National Register of Historic Places*.

Archaeology – Crossing X-14 is not expected to impact any known archaeological resource. Crossing X-12 is expected to impact four archaeological sites.

Belowground Resources – There is a high potential associated with Crossing X-12 to impact additional belowground archaeological resources. The potential for such impact is medium with Crossing X-14.

Public Parkland – Crossing X-14 is not expected to impact public parklands but it is likely to affect about six acres of the RiverWalk, which is a Coastal Zone Management project. Crossing X-12 will also affect the RiverWalk. And, Crossing X-12 is expected to affect a total of 11 acres in two parks (Riverside Park and Riverside Park Extension).

Belle Isle Area

Aboveground Resources – Belle Isle is listed on the *National Register of Historic Places* and, therefore, will experience a significant impact with the construction of a bridge at Crossing X-15.

Archaeology – No archaeological resources are expected to be affected by a crossing at X-15.

Belowground Resources – The potential is low for impacting additional belowground resources in constructing Crossing X-15.

Public Parklands – Belle Isle is a significant public park and will be impacted by a river crossing. Two Coastal Zone Management projects are expected to be impacted (the D.R. Sturgeon Habitat Restoration and the Blue Heron Lagoon Restoration) by Crossing X-15.

6.3.1 Performance Evaluation

The evaluation of the Cultural Resource characteristics of the crossings indicates that significant negative effects would occur if Crossing X-15 were built (Table 6-8). Much better performance in the area of protecting cultural resources would be experienced with Crossings X-2, X-3, X-8, X-9, and X-10.

Table 6-8
Detroit River International Crossing Study
Evaluation Factor: Protect Cultural Resources
U.S. Crossings

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
Plaza	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	11-2	11-3	N-1
Performance Score	68.9	68.9	86.2	86.3	86.3	86.3	65.0	86.3	86.1	82.9	72.4	49.1	76.1	77.8	31.1
Ranking (1 to 15)	11/12	11/12	5	1/4	1/4	1/4	13	1/4	6	7	10	14	9	8	15

Source: The Corradino Group of Michigan, Inc.

6.4 Protect the Natural Environment

There are five performance measure categories in this evaluation area: surface water, groundwater, significant habitat communities, prime/unique farmland, and mineral resources. Table 6-9 summarizes the issues examined. Specific details, including graphics, are included in Volume 2 of this report. Discussion of these issues is divided into crossings by geographical area. Comparisons are only for those alternatives in that area. An overall comparison of crossings by the “Natural Environment” evaluation factor for all crossings is provided at the end of this section of the report. Section 6.8 then compares the overall performance of all crossings for all evaluation factors.

Downriver Area

Surface Water – The Downriver crossings will impact between two and five acres of floodplain. Crossings X-1, X-2, X-3 and X-4 would cross the Detroit River twice plus the Trenton Channel. Crossing X-1, when connected to Plaza S-1, would also impact the Thorofare Canal. Crossing X-4 would cross the Detroit River once without crossing an intervening stretch of land or another channel.

Groundwater – No groundwater impacts are expected to be created by the Downriver crossings.

Significant Habitat Communities – Between 0.5 and 2.5 acres of wetlands will be affected by Crossings X-2, X-3 and X-4. But, none of these wetland areas is considered a fen or a bog. On the other hand, Crossing X-1 would likely impact almost seven acres of wetlands, but not a fen nor a bog.

**Table 6-9
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Natural Environment
Supporting Data – Crossings Only**

Evaluation Factor	Performance Measure Category	Description/Units	Crossing		X1	X1	X2	X2	X3	X3	X4	X8	X9	X10	X11	X12	X14	X14	X15		
			S1	S2	S3	S4	S3	S4	S5	C2	C2	C3	C4	II4	II2	II3	N1				
Protect The Natural Environment	Surface Water	Floodplain	Number/Acres	2.66	2.66	5.14	5.14	4.55	4.55	1.80	0.55	1.82	0.00	0.28	0.20	0.26	0.26	0.26	1.00		
		Surface Run Off	Acres	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
		Primary Streams	Number/Specify	2: Detroit R., Trenton Ch.	1: Detroit R. (twice)																
		Secondary Streams	Number/Specify	1: Thorofare Ca.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1: Blue Heron Lagoon
		Other Water-crossings	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Groundwater	Municipal Wells	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Water In-takes	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Significant Habitat	Wetlands	Acres	6.82	6.82	1.12	1.12	2.30	2.30	0.41	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	4.63	
		Fens / Bogs	Number/Acres	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	0/0	0/0	0/0	0/0	
		Endangered Species ³	Special Known/Potential	1/6	1/6	1/6	1/6	1/6	1/6	0/3	1/2	1/2	1/2	1/1	0/4	0/4	0/4	0/4	0/4	3/15	
		Designated Wildlife Refuges ⁴	Number/Acres	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1/N/A	N/A								
	Prime/Unique Farmland	Prime Farmland	Acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Mineral Resources	Salt /Limestone	Type/Specify	Salt/Limestone	Salt/Limestone	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	

Notes:
1: Primary Streams are classified as water courses with an average width greater than 50ft/15m
2: Secondary streams are classified as water courses with an average width less than 50ft/15m.
3: See Volume 2, a separate report, for inventory of species affected.
4: The Detroit River International Wildlife Refuge encompasses all crossings south of Zug Island (X1 - X9); X15 crosses over the area of the Blue Heron Lagoon Natural Area Restoration Project.

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Source: The Corradino Group of Michigan, Inc.

The Downriver crossings would impact the habitat of the Common Tern. There is the potential to impact the habitat of the Lake Sturgeon, the Silver Chub, the Eastern Fox Snake, the Indiana Bat, the Spotted Turtle, the Common Tern, and the Eastern Massasauga. All river crossings would impact the International Wildlife Refuge, which has significant potential to provide habitat for unique animal and plant species.

Prime/Unique Farmland – No Downriver crossing is expected to impact farmland.

Mineral Resources – All Downriver crossings will have an effect on the underlying salt minerals. Their extraction is not expected to be limited by any crossing. Additionally, Crossing X-1 will have an impact on the mining of limestone at the nearby Sibley Limestone Quarry.

Central Area

Surface Water – The Central Area crossings are likely to impact less than half an acre of floodplain except for Crossing X-9, which is expected to impact almost two acres of floodplain. Each of the bridges in this area will cross the Detroit River but no other primary streams and no secondary streams. No other water crossings, or drains, will be affected by the river crossings in the Central Area.

Groundwater – There are no expected groundwater effects on municipal wells or other water intakes in the Central Area by the proposed crossings. No impacts are expected on groundwater resources.

Significant Habitat Communities – Crossings X-8, X-9, X-10 and X-11 are not expected to affect wetlands. The habitat of the Sturgeon will be impacted by Crossings X-8, X-9, X-10 and X-11. These crossings are also likely to affect the habitat of the Northern Riffleshell, Purple Wartyback, Round Hickorynut, Snuffbox, and Northern Madtom.

Prime/Unique Farmland – The Central Area has no farmland and, therefore, no impacts.

Mineral Resources – Salt is an underground resource found throughout this area. Its extraction should not be affected by any crossing.

I-75/I-96 Area

Surface Water – The I-75/I-96 Area crossings are likely to impact about a quarter acre of floodplains. No secondary streams or water features are affected by the crossings in this area.

Groundwater – There are no expected groundwater effects by the proposed crossings on municipal wells or other water intakes in the I-75/I-96 Area.

Significant Habitat Communities – Crossing X-14 is not expected to affect wetlands. Crossing X-12 is likely to impact 0.2 wetland acres. No known habitats of endangered species are likely affected by the proposed crossings in the I-75/I-96 Area. But, with all crossings in this area, there is the potential to impact the habitats of: the Northern Riffleshell, Purple Wartback, Round Hickorynut, Snuffbox, Lake Sturgeon, and Northern Madtom.

Prime/Unique Farmland – The I-75/I-96 Area has no farmland.

Mineral Resources – Salt is an underground resource throughout this area. Its extraction should not be affected by any crossing.

Belle Isle Area

Surface Water – About one acre of floodplain is expected to be affected by a crossing of Belle Isle. The Blue Heron Lagoon, a significant resource, will be crossed.

Groundwater – No groundwater impacts are expected with Crossing X-15.

Significant Habitat Communities – About five acres of wetlands would be impacted by Crossing X-15. And, the habitat of three known endangered species (the Sullivan Snakeweed, the Prairie Dogwood, and the Pumpkin Ash) are expected to be affected. Additionally, the habitats of 15 endangered species are potentially affected by the Belle Isle crossing.

Prime/Unique Farmland – No impacts to farmland are expected with Crossing X-15.

Mineral Resources – Salt is an underground resource throughout this area. Its extraction should not be affected by any plaza.

6.4.1 Performance Evaluation

The analysis by the evaluators indicates that the greatest negative impact on the natural environment is associated with the Downriver Crossings X-1, X-2, X-3 and the Belle Isle Crossing X-15 (Table 6-10). Crossings X-10, X-11, X-12 and X-14 are expected to have relatively limited effect on the natural environment.

Table 6-10
Detroit River International Crossing Study
Evaluation Factor: Protect the Natural Environment
U.S. Crossings

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
Plaza	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	II-2	II-3	N-1
Performance Score	36.6	36.6	43.0	43.0	40.7	40.7	47.4	66.4	64.6	71.8	74.8	77.9	82.1	76.9	36.4
Ranking (1 to 15)	13/14	13/14	9/10	9/10	11/12	11/12	8	6	7	5	4	2	1	3	15

Source: The Corradino Group of Michigan, Inc.

6.5 Regional Mobility

As noted in the methodology section, this evaluation factor examines the effects of a new crossing on the regional transportation system plus a number of interstate highway links. It is based on data of the end-to-end (Canada-to-U.S.) alternatives of which the crossing is a key part. Table 6-11 provides the overall data on the regional effects while Table 5-10 and Figure 5-11, presented earlier, depict information on a more localized (link-by-link) basis.

The following discussion of regional mobility is by area. Comparisons are only of the alternatives in that area. An overall comparison by the “Regional Mobility” evaluation factor for all crossings is presented at the end of this section of the report. Section 6.8 then compares the overall performance of all alternatives for all evaluation factors.

Downriver Area

Regional Analysis – Each Downriver crossing is associated with a savings in vehicle miles of travel in the year 2035 peak afternoon traffic hour compared to the No Action condition (where just the Ambassador Bridge and the Detroit-Windsor Tunnel are available crossings in the Detroit River area). Those reductions are in the neighborhood of less than one-half percent. On the other hand, peak hour vehicle hour savings range from 2.5 to 3 percent compared to the No Action condition. In terms of costs (not calculated here), vehicle hours will have a more significant effect on the overall efficiency of the transportation system for commerce and industry.

**Table 6-11
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Regional Mobility
Supporting Data – Crossings Only**

Evaluation Factor	Performance Measure Category	Description/Units	Crossing																
			X1 S1	X1 S2	X2 S3	X2 S4	X3 S3	X3 S4	X4 S5	X8 C2	X9 C2	X10 C3	X11 C4	X12 II4	X14 II2	X14 II3	X15 N1		
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	
			With New Crossing	1,086,489	1,086,502	1,084,428	1,084,152	1,085,365	1,085,082	1,084,337	1,085,734	1,085,500	1,087,503	1,089,045	1,091,580	1,088,719	1,089,075	1,091,683	
			Difference from 2035 - No Action	-3,147	-3,134	-5,208	-5,484	-4,271	-4,554	-5,299	-3,902	-4,136	-2,133	-591	1,944	-917	-561	2,047	
			Percent Difference	-0.29%	-0.29%	-0.48%	-0.50%	-0.39%	-0.42%	-0.49%	-0.36%	-0.38%	-0.20%	-0.05%	0.18%	-0.08%	-0.05%	0.19%	
		VHT (int'l traffic only, PM Peak Hour for 2035)	No Action	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113
			With New Crossing	21,533	21,529	21,484	21,477	21,522	21,504	21,457	21,383	21,415	21,424	21,371	21,396	21,343	21,340	21,509	
			Difference from 2035 - No Action	-580	-584	-629	-636	-591	-609	-656	-730	-698	-689	-742	-717	-770	-773	-604	
			Percent Difference	-2.62%	-2.64%	-2.84%	-2.88%	-2.67%	-2.75%	-2.97%	-3.30%	-3.16%	-3.11%	-3.36%	-3.24%	-3.48%	-3.50%	-2.73%	
		V/C (total traffic)	Refer to Table 5-10 and Figure 5-11	Refer to Table 5-10 and Figure 5-11															
		Diversion due to disruption at crossing	Difference of Int'l VMT with Amb Br. Closed and New Crossing Open	17,455	16,990	11,218	9,919	12,777	11,610	5,646	858	2,319	1,416	-23	1,701	1,312	1,185	13,372	
			Difference of Int'l VHT with Amb Br. Closed and New Crossing Open	559	532	212	179	288	257	-107	-486	-492	-549	-709	-713	-664	-667	-160	
		Detour of Local Arterials	Number of SEMCOG Network Links Rerouted	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	

Notes:
1: Crossings are connected to specific alignment alternatives: (final interchange via plaza)
X1: to I-275/King via S1 or S2
X2: to I-275/Eureka via S3 or S4
X3: to I-275/Eureka via S3 or S4
X4: I-94 Southfield via S5
XB: I-94/Schaefer via C2

X10 I-75/Dearborn via C3
X11: I-75 Dragoon(Military) via C4
X12: I-75/Gateway via II4
X14: M-10/Lafayette via II2, II3
X15: I-94/Conner via N1

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Source: The Corradino Group of Michigan, Inc.

Another measure of regional travel change is the effect associated with the potential closure of the Ambassador Bridge while a new crossing is in operation. As can be seen from the data on the lower portion of Table 6-9, Crossings X-1, X-2 and X-3 would all be associated with an increase of at least 10,000 vehicles miles of international travel in the 2035 afternoon peak hour, if the Ambassador Bridge were closed. Crossing X-4, connected to Plaza S-5, would be associated with almost 6,000 additional vehicle miles of travel, if the Ambassador Bridge were closed.

Link-by-Link Analysis – The analysis of those links listed on Table 5-10 indicate the Downriver crossings help reduce the traffic on the Ambassador Bridge and the Detroit-Windsor Tunnel and thereby reduce the expected peak hour congestion on them. However, the data also indicate that the Downriver crossing systems would only carry one lane of traffic in each direction during the PM peak hour. The DRIC study requirement is a six-lane facility (three in each direction) to accommodate traffic in the 30-year horizon, and beyond.

Another important characteristic to examine is the traffic change at locations throughout the freeway system (Table 5-10 and Figure 5-9). The only significant difference from the No Action condition occurs at I-75 south of the Ambassador Bridge (Point 11). A new southern crossing will shift enough traffic to reduce the expected congestion in 2035 at that location from a congestion ratio of over 90 percent to one of approximately 75 percent. This is caused largely by the shift in international trucks to the south. Most of the vehicles are less likely to have any business in Michigan.

Central Area

Regional Analysis – The seven crossings in the Central Area have the ability to reduce vehicle miles of travel by less than one-half percent compared to the No Action condition. However, they have the potential of reducing by 2.5 to 3.5 percent the vehicle hours of travel associated with 2035 afternoon peak hour international traffic. If the Ambassador Bridge were closed, between 500 and 700 vehicle hours of travel in the PM peak period would be saved if the river crossing system were built in the Central Area.

Link-by-Link Analysis – The data on Table 5-10 indicate that the crossings in the Central Area will attract significant traffic from the existing river crossings and require at least two lanes in the peak direction in the 2035 peak hour. The system associated with Crossing X-11 will have the most significant effect of reducing the traffic on the existing border crossing facilities.

All Central Area alternatives have the ability to reduce congestion in the area of I-75 south of the Ambassador Bridge by 14 to 20 percent. Another interesting effect with Crossings X-8 and X-9 is the ability to reduce traffic on Schaefer Road. In these instances, the concept of building the freeway connection from the plaza to I-75 and then on to I-94 leaves Schaefer Road freed-up to accommodate non-international/local traffic, like among the Ford Rouge Plant facilities/operations. It is fair to assume that the concept of a freeway-to-freeway connection installed between I-94 and I-75 along Schaefer Road would have a similar effect if associated with Crossings X-10 and X-11.

I-75/I-96 Area

Regional Analysis – Crossings X-12 and X-14 would experience savings of between 3 and 3.5 percent of vehicle hours of travel. Crossings X-12 and X-14, which would save about 600 to 700 vehicle hours of travel, if the Ambassador Bridge were closed.

Link-by-Link Analysis – Crossing X-14 would be associated with reduced congestion on the Ambassador Bridge and would have some positive effect on I-75 congestion south of the Bridge because it is connected through Plazas II-2 and II-3 to the Lodge Freeway.

Belle Isle Area

Regional Analysis – A Belle Isle crossing will experience virtually no change in vehicle miles of travel for international traffic in the 2035 afternoon peak hour, compared to the No Action condition. The savings will be about 2.7 percent in vehicle hours of travel, which is among the lowest of all crossing systems analyzed. And, under the condition that the Ambassador Bridge is closed, Crossing X-15 in the Belle Isle Area would not efficiently serve the diverted travel as typified by an increase of more than 13,000 VMT experienced by the diverted traffic with virtually no change in VHT.

Link-by-Link Analysis – The link-by-link traffic data associated with of the Belle Isle crossing system shown on Table 5-10 indicate that it will have a positive effect on relieving congestion on the Ambassador Bridge and the Detroit-Windsor tunnel under normal conditions. However, it will have no significant effect on I-75 or other freeways in the area. I-94 in the vicinity of the new crossing, which is considered to be improved by 2035 from today's conditions, will not be significantly affected by the shift of international traffic.

6.5.1 Performance Evaluation

While all crossings address the regional mobility needs, relatively low performance scores are recorded by Crossings X-1, X-2, X-3 and X-4 as well as X-15. The better performers are Crossings X-8, X-9, X-10, X-11, X-12 and X-14 (Table 6-12).

Table 6-12
Detroit River International Crossing Study
Evaluation Factor: Improve Regional Mobility
U.S. Crossings

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
Plaza	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	11-2	11-3	N-1
Performance Score	53.7	53.8	56.0	57.5	58.7	59.7	61.8	84.6	84.8	86.2	88.4	79.8	82.4	82.8	57.2
Ranking (1 to 15)	15	14	13	11	10	9	8	4	3	2	1	7	6	5	12

Source: The Corradino Group of Michigan, Inc.

6.6 Maintain Air Quality

Air quality, along with regional mobility, are analyzed for the complete crossing system. Two sets of data are provided: regional pollutant burden and carbon monoxide concentrations of the crossing. The discussion of these issues, provided below, is divided by area. Comparison are only for those alternatives in that area. An overall comparison of crossings by the “Air Quality” evaluation factor for all crossings is provided at the end of this section of the report. Section 6.8 then compares overall performance of all alternatives for all evaluation factors.

Downriver Area

Each Downriver alternative will draw some traffic from the existing river crossings (Ambassador Bridge and Detroit-Windsor Tunnel) and, therefore, will change the vehicle miles (VMT) and vehicle hours (VHT) of international travel on the regional roadway system (Table 6-13). The data indicate that, among the Downriver alternatives, Crossing X-2, when connected to Plazas S-3 or S-4; and Crossing X-4, when connected to Plaza S-5, will have a greater reduction in air pollutants associated with international regional travel than the other Downriver crossings. Crossing X-1, when connected to either Plaza S-1 or S-2, will have the least effect on regional pollutant burden reduction among Downriver alternatives.

Table 6-13
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Air Quality
Supporting Data – Crossings Only

Evaluation Factor	Performance Measure Category		Crossing		X1	X1	X2	X2	X3	X3	X4	X8	X9	X10	X11	X12	X14	X14	X15	
			Description/Units		S1	S2	S3	S4	S3	S4	S5	C2	C2	C3	C4	I14	I12	I13	N1	
Maintain Air Quality	Regional Burden	Change from No Action Condition (pounds per peak hour)	VOC	VOC	-0.4	-0.4	-0.6	-0.7	-0.5	-0.6	-0.7	-0.5	-0.5	-0.3	-0.1	0.2	-0.1	-0.1	0.3	
			CO	CO	-11.6	-11.6	-19.3	-20.3	-15.8	-16.8	-19.6	-14.5	-15.3	-7.9	-2.2	7.2	-3.4	-2.1	7.6	
			NOX	NOX	-0.4	-0.4	-0.7	-0.7	-0.5	-0.6	-0.7	-0.5	-0.5	-0.3	-0.1	0.3	-0.1	-0.1	0.3	
				PM2.5	PM2.5	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	0.0	0.0
				PM10	PM10	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				Benzene	Benzene	-0.0158	-0.0158	-0.0262	-0.0276	-0.0215	-0.0229	-0.0267	-0.0196	-0.0208	-0.0107	-0.0030	0.0098	-0.0046	-0.0028	0.0103
				1,3 Butadiene	1,3 Butadiene	-0.0016	-0.0016	-0.0026	-0.0027	-0.0021	-0.0023	-0.0026	-0.0019	-0.0021	-0.0011	-0.0003	0.0010	-0.0005	-0.0003	0.0010
				Formaldehyde	Formaldehyde	-0.0049	-0.0049	-0.0081	-0.0085	-0.0066	-0.0071	-0.0082	-0.0061	-0.0064	-0.0033	-0.0009	0.0030	-0.0014	-0.0009	0.0032
				Acetaldehyde	Acetaldehyde	-0.0022	-0.0022	-0.0037	-0.0039	-0.0031	-0.0033	-0.0038	-0.0028	-0.0030	-0.0015	-0.0004	0.0014	-0.0007	-0.0004	0.0015
				Acroline	Acroline	-0.0002	-0.0002	-0.0004	-0.0004	-0.0003	-0.0004	-0.0004	-0.0003	-0.0003	-0.0002	0.0000	0.0002	-0.0001	0.0000	0.0002
	CO Hotspot on Plaza	PPM in peak hour	CALQ3HC		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	

Source: The Corradino Group of Michigan, Inc.

3600\evaluations\current matrices\illaltmatrix.crossings.xls\air quality

The carbon monoxide concentration that is expected to be generated in the 2035 peak hour by international travel using the Downriver crossings is expected to be less than 1 part per million on the crossing itself. The federal standard for carbon monoxide (CO) is 35 parts per million (ppm). The ambient (background) levels of CO in 2005 in Wayne County are between 2.5 and 3.7 ppm. The contribution from any crossing is a fraction of the ambient level and far below the federal standard.

Central Area

Of the Central Area crossings, X-9 is associated with the most significant savings in regional pollutant burden. Crossing X-11 is expected to have the least positive effect on regional air quality.

The concentrations of carbon monoxide on the Central Area crossings are expected to be less than 1 part per million and not cause the violation of federal standards.

I-75/I-96 Area

Crossing X-12 is the companion span to the Ambassador Bridge. It is associated with a small increase in regional pollutant burden due to international traffic using the facility in 2035. This results because of a less-direct connection to the crossing in Canada, as compared to other alternatives. Crossing X-14 is associated with some savings in vehicle miles and vehicle hours of travel and, therefore, create a small reduction in regional pollution burden.

Concentrations of carbon monoxide on the crossings are expected to be less than one part per million and that cause a violation of the federal standard for CO.

Belle Isle Area

A crossing in the Belle Isle Area will increase the vehicle miles of travel on the regional roadway system. As a result, air pollutants at the regional level are expected to increase.

The concentration of carbon monoxide on the crossing is expected to be less than one part per million and not cause a violation of federal standards.

6.6.1 Performance Evaluation

The team of consultants studied the air quality data associated with the 15 river crossings. The overall results, shown in Table 6-14, indicate that the most significant performers are Crossings X-2, X-3 and X-4. On the other hand, Crossings X-12 and X-15 are expected to have poorer performances as they are associated with a small increase in air pollutants associated with international traffic on a regional basis.

Table 6-14
Detroit River International Crossing Study
Evaluation Factor: Maintain Air Quality
U.S. Crossings

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
Plaza	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	11-2	11-3	N-1
Performance Score	74.3	74.3	81.3	81.8	81.3	81.4	81.9	80.7	80.8	73.1	63.4	43.3	67.0	66.6	42.8
Ranking (1 to 15)	8/9	8/9	4/5	2	4/5	3	1	7	6	10	13	14	11	12	15

Source: The Corradino Group of Michigan, Inc.

6.7 Assess How Project Can Be Built (Constructability)

This evaluation factor, also known as Constructability, includes four performance measures: maintenance of traffic during construction; site constraints limiting access to the crossing; geotechnical constraints; and the relative risk of site conditions (Table 6-15). The discussion of these issues, provided below, is divided by area. Comparisons are only for those alternatives in that area. An overall comparison of crossings by the “Constructability” evaluation factor for all 15 crossings is provided at the end of this section of the report. Section 6.8 then compares overall performance of all alternatives for all evaluation factors. It is noted Crossings X-8 and X-9 are considered suspension bridges. All other crossings will be cable-stayed or suspension bridges.

Downriver Area

Maintenance of Traffic – The Downriver Crossings X-1, X-2 and X-3 will require between three and six streets to be closed during construction. Crossing X-4, connected to Plaza S-5, will require one street to be closed during construction.

Table 6-15
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Constructability
Supporting Data – Crossings Only

Evaluation Factor	Performance Measure Category	Description/Units	Crossing		X1	X1	X2	X2	X3	X3	X4	X8	X9	X10	X11	X12	X14	X14	X15	
			S1	S2	S3	S4	S3	S4	S5	C2	C2	C3	C4	II4	II2	II3	N1			
Assess How Project Can Be Built	Traffic Maintenance	Streets Closed During Construction	number	6	6	2	2	3	3	1	0	0	1	3	0	4	2	0		
		Businesses affected by construction	Number w/i 328 ft/100 meters	2	0	1	1	1	1	0	0	0	0	3	0	0	2	0	1	
		Schools or public use facilities affected by construction	Number w/i 328 ft/100 meters	0	0	1	0	1	0	0	0	0	0	1	0	0	3	2	0	
	Site constraints limiting access to the plaza for the river crossing or the roadway connections.	Plaza proximity to crossing landing	Distance (ft/m)	0	0	0	2460 ft/800 m	0	3021 ft/920 m	0	0	0	0	0	0	0	900 ft/275 m	0	0	
		Rail lines affected	Number	4	0	4	4	4	4	4	1	5	5	1	2	0	0	0	0	
		Utilities affected	Number	1	1	3	1	2	1	3	0	0	0	0	0	0	0	0	1	
		Presence of heavy industry adjacent to or on plaza site	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	
		Contaminated Sites/Hazardous Materials within 500ft/150m (single sites may have multiple designations)	EPA/DEQ Hazmat TSD Facility		0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0
			National Priority List (Superfund)		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
			RTK Cerclis (Superfund)		0	0	1	0	2	0	0	0	0	0	1	0	0	0	0	0
			Michigan Contaminated Sites		0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0
		Amount of crossing over/on land	Length (feet)	15,760	15,760	9,417	9,417	11,096	11,096	5,435	1,614	4,743	9,620	5,002	4,559	5,084	5,084	5,084	12,402	
		Total length of crossing	Length (feet)	25,364	25,364	20,812	20,812	21,117	21,117	14,071	4,451	7,957	12,129	6,888	6,694	7,216	7,216	7,216	16,928	
		Total length of bridge	Length (feet)	15,266	15,266	18,417	18,417	16,785	16,785	14,071	8,036	7,957	8,200	6,888	6,694	7,216	7,216	7,216	11,529	
		Length of main structure	Length (feet)	3,937	3,937	4,854	4,854	5,248	5,248	3,280	5,904	5,182	5,642	3,116	4,264	5,576	5,576	5,576	8,430	
		Piers in water	Number	22	22	31	31	18	18	22	0	0	0	0	0	0	0	0	2	
		Piers in close proximity to navigation channel	Number w/i 200 ft	2	2	2	2	0	0	2	0	0	0	0	0	0	0	0	0	
	Geotechnical constraints- identify any unusual geotechnical features/issues that may be problematic for construction	Proximity to solution mining areas	Number w/i 1,000 ft/300 meters	0	0	29	29	33	33	1	0	0	7	0	0	0	0	0		
		Presence of poor soil conditions (e.g., compressible/expansive & organic)	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	
		Presence of noxious gasses (e.g., Hydrogen Sulfide and Methane)	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
		Presence of artesian groundwater	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Relative risk of known site conditions (environmental, geotechnical, other physical/construction methodologies)	Engineering Consideration	High/Medium/Low	Medium	Medium	High	High	High	High	Medium	Low	High	Medium	Low	Low	Low	Low	Low		

Source: The Corradino Group of Michigan, Inc.

3600\evaluations\current matrices\illaltmatrix.crossings.xls\buildability

Crossing X-1, when connected to Plaza S-2, would affect no businesses during construction. The same is true for Crossing X-4 when connected to Plaza S-5. Crossing X-2, when connected to Plazas S-3 or S-4; and, Crossing X-3, when connected to Plazas S-3 or S-4, will each affect one business during construction. Crossing X-1, when connected to Plaza S-1, will affect two businesses during construction.

Only one public facility (Wyandotte Waste Water Treatment Plant) will be affected during construction by each of Crossing X-2, when connected to Plaza S-3, and Crossing X-3, when connected to Plaza S-3. Other crossings would have no effect.

Site Constraints – Each of Downriver crossings (X-1, X-2, X-3 and X-4) would be affected by four rail lines during construction.

Construction of Crossing X-1 would have to deal with one major utility, while construction of Crossings X-2 and X-4 would be affected by two major utilities each. Crossing X-3 would be impacted three major utilities.

All crossings would have to contend with the presence of heavy industry.

Construction of Crossing X-1, when connected to Plaza S-2, would be significantly affected by environmental contamination. Construction of Crossing X-4 would have to deal with one Superfund site. All other crossings would not be impacted by major environmental issues.

Crossings X-1 and X-2, when connected to Plaza S-3, will have main structures of about 4,000 feet (1,220 meters). Crossing X-2, when connected to Plaza S-4, and Crossing X-3 will have main structures of about 5,000 feet (1,520 meters). The shortest main span is associated with Crossing X-4.

Geotechnical Constraints – Crossings X-2 and X-3 will be significantly impacted by the presence of brine wells, and all crossings will have to address poor soil conditions, noxious gases, and artesian groundwater.

Relative Risk – The risk associated with various physical, environmental and geotechnical conditions is considered highest to constructing, on time and within budget, Crossings X-2 and X-3. Medium risk is associated with Crossings X-1 and X-4.

Central Area

Maintenance of Traffic – Crossings X-10 and X-11 would require one street and three streets to be closed, respectively, during their construction. Crossings X-8 and X-9 would affect none. Construction of Crossing X-10 would affect three businesses, and Crossing X-11, none. There would be no adjacent public use facilities affected by any of the Central Area crossings except X-10, which would impact Ste. John Cantius Roman Catholic Church.

Site Constraints – Construction of Crossing X-8 would be affected by one rail line. Crossings X-9 and X-10 would be affected by five rail lines. Crossing X-11 would not cross a rail line. Only Crossing X-10 would have to address major utilities onsite during construction. Construction of all crossings would be affected by the presence of heavy industry.

The shortest main structures (about 3,000 feet [900 meters]) are associated with Crossing X-11; the longest (more than 5,000 feet [1,520 meters]), with Crossings X-8, X-9 and X-10.

No significant contamination would affect construction of Crossings X-8 and X-9. Crossings X-10 and X-11 would have to deal with a Michigan Contaminated Site.

Geotechnical Constraints – There would be limited exposure to known brine wells associated with Crossing X-10. No exposure to known brine wells on the U.S. side of the river within 900 feet (275 meters) would be associated with constructing Crossings X-8, X-9 and X-11.

All crossings would have to address poor soil conditions, noxious gases, and the presence of artesian groundwater.

Relative Risk – The risk is considered high with constructing, on time and in budget, Crossing X-9. That risk for Crossing X-10 is considered medium. The risk is low in dealing with geotechnical, environmental and site constraints for Crossing X-11.

I-75/I-96 Area

Maintenance of Traffic – Construction of Crossing X-12 would not require any streets to be closed. Two streets each would be closed during construction of Crossing X-14, when connected to Plaza II-3. Four streets would have to be closed in constructing Crossing X-14, when connected to Plaza II-2.

No businesses would be impacted during construction with Crossings X-12 with Plaza II-4, or X-14 with Plaza II-3. Two businesses would be affected during construction of Crossing X-14, when connected to Plaza II-2.

Three public facilities (Cesar Chaves Middle School, the International Brotherhood of Electrical Workers Community Center, and the Michigan Intelligence Transportation System Center) would be affected by constructing X-14 to Plaza II-2; and two by constructing X-14 to Plaza II-3 (U.S. Postal Service Historic Building and Salvation Army).

Site Constraints – Construction of Crossing X-12 would be affected by two rail lines. On the other hand, no utilities or heavy industries would be engaged by any of the I-75/I-96 crossings.

The X-14 crossing in the I-75/I-96 area would be affected by one significant environmental issue (a Superfund site). Crossing X-12 would not be affected in this manner.

The main structures of the I-75/I-96 crossings are about 4,000 to 5,600 feet (1,200 to 1,700 meters).

Geotechnical Considerations – No known brine wells are expected to be within 900 feet (275 meters) of the I-75/I-96 Area crossings. But, all crossings are expected to be impacted by poor soil conditions, noxious gases, and artesian groundwater.

Relative Risk – In light of these conditions, the overall relative risk is considered low with building Crossings X-12 and X-14.

Belle Isle Area

Maintenance of Traffic – Construction of Crossing X-15 would not require street closures. One adjacent business would be affected but no public-use facilities.

Site Constraints – No rail lines or utilities, but one heavy industry, would impact the crossing's construction. And, no significant environmental contamination is expected to affect construction at Crossing X-15.

The main structure of Crossing X-15 is the longest of all bridges considered (about 8,400 feet [2,560 meters]).

Geotechnical Conditions – Constructing Crossing X-15 would engage poor soil conditions, noxious gases, and artesian groundwater.

Relative Risk – The risk to constructing Crossing X-15 on time and within budget is considered high.

6.7.1 Performance Evaluation

The evaluation indicates that Crossings X-4 and X-11 have the highest performance score in the constructability area (Table 6-16). The least performers in constructability are Crossings X-2, X-3, and X-15.

Table 6-16
Detroit River International Crossing Study
Evaluation Factor: Assess How Project Can Be Built
U.S. Crossings

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
Plaza	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	11-2	11-3	N-1
Performance Score	60.8	60.8	50.9	50.9	49.9	49.9	69.0	61.6	60.0	58.5	84.85	68.8	62.2	60.9	48.4
Ranking (1 to 15)	7/8	7/8	11/12	11/12	13/14	13/14	2	5	9	10	1	3	4	6	15

Source: The Corradino Group of Michigan, Inc.

6.8 Overall Evaluation of U.S. Crossings

The overall evaluation of this second component of the border crossing system – the river crossing – indicates the following (Table 6-17).

Downriver Area

- Crossing X-1/Plaza S-1: Performs best in Maintaining Air Quality.
Performs least in Protecting the Natural Environment.
- Crossing X-1/Plaza S-2: Performs best in Maintaining Air Quality.
Performs least in Protecting the Natural Environment.
- Crossing X-2/Plaza S-3: Performs best in Protecting Cultural Resources.
Performs least in Protecting the Natural Environment.
- Crossing X-2/Plaza S-4: Performs best in Protecting Cultural Resources.
Performs least in Protecting the Natural Environment.
- Crossing X-3/Plaza S-3: Performs best in Protecting Cultural Resources.
Performs least in Protecting the Natural Environment

Table 6-17
Detroit River International Crossing Study
Unweighted Performance Scores
Crossings on U.S. Side of River

Crossing	X-1		X-2		X-3		X-4	X-8	X-9	X-10	X-11	X-12	X-14		X-15
	S-1	S-2	S-3	S-4	S-3	S-4	S-5	C-2	C-2	C-3	C-4	II-4	II-2	II-3	N-1
Protect Community/Neighborhood	40.4	40.7	46.8	46.8	47.8	47.1	54.3	62.7	56.8	50.9	49.9	63.8	42.1	46.8	57.9
Consistency with Local Planning	43.5	37.5	69.5	48.8	68.5	50.5	42.0	70.5	69.5	44.8	44.7	86.4	48.9	49.1	47.1
Protect Cultural Resources	68.9	68.9	86.2	86.3	86.3	86.3	65.0	86.3	86.1	82.9	72.4	49.1	76.1	77.8	30.1
Protect Natural Environment	36.6	36.6	43.0	43.0	40.7	40.7	47.4	66.4	64.6	71.8	74.8	77.9	82.1	76.9	36.4
Improve Regional Mobility	53.7	53.8	56.0	57.5	58.7	59.7	61.8	84.6	84.8	86.2	88.4	79.8	82.4	82.8	57.2
Maintain Air Quality	74.3	74.3	81.3	81.8	81.3	81.4	81.9	80.7	80.8	73.1	63.4	43.3	67.0	66.6	42.8
Constructability	60.8	60.8	50.9	50.9	49.9	49.9	69.0	61.6	60.0	58.5	84.5	68.8	62.2	60.9	48.4

Source: The Corradino Group of Michigan, Inc.

Downriver Area (continued)

- Crossing X-3/Plaza S-4: Performs best in Protecting Cultural Resources.
Performs least in Protecting the Natural Environment
- Crossing X-4/Plaza S-5: Performs best in Maintaining Air Quality.
Performs least in Consistency with Local Planning.

Central Area

- Crossing X-8/Plaza C-2: Performs best in Protecting Cultural Resources.
Performs least in Constructability.
- Crossing X-9/Plaza C-2: Performs best in Protecting Cultural Resources.
Performs least in Protecting the Community/
Neighborhoods
- Crossing X-10/Plaza C-3: Performs best in Improving Regional Mobility.
Performs least in Consistency with Local Planning.
- Crossing X-11/Plaza C-4: Performs best in Improving Regional Mobility.
Performs least in Consistency with Local Planning

I-75/I-96 Area

- Crossing X-12/Plaza II-4: Performs best in Consistency with Local Planning.
Performs least in Maintaining Air Quality.
- Crossing X-14/Plaza II-2: Performs best in Improving Regional Mobility.
Performs least in Protecting the Community/
Neighborhoods.
- Crossing X-14/Plaza II-3: Performs best in Improving Regional Mobility.
Performs least in Consistency with Local Planning.

Belle Isle Area

- Crossing X-15/Plaza N-1: Performs best in Improving Regional Mobility.
Performs least in Protecting Cultural Resources.

When examining the scoring of the plazas by evaluation factor, the following are the best and least performers.

Protect the Community/Neighborhood:	Best Performers:	Crossing X-12/Plaza II-4 Crossing X-8/Plaza C-2
	Least Performers:	Crossing X-1/Plaza S-1 Crossing X-1/Plaza S-2 Crossing X-2/Plaza S-3 Crossing X-2/Plaza S-4 Crossing X-3/Plaza S-3 Crossing X-3/Plaza S-4 Crossing X-14/Plaza II-2 Crossing X-14/Plaza II-3 Crossing X-15/Plaza N-1

Consistency with Local Planning:	Best Performer:	Crossing X-12/Plaza II-4
	Least Performers:	Crossing X-1/Plaza S-1 Crossing X-1/Plaza S-2 Crossing X-2/Plaza S-4 Crossing X-4/Plaza S-5 Crossing X-10/Plaza C-3 Crossing X-11/Plaza C-4 Crossing X-14/Plaza II-2 Crossing X-14/Plaza II-3 Crossing X-15/Plaza N-1

Protect Cultural Resources:	Best Performers:	Crossing X-2/Plaza S-3 Crossing X-2/Plaza S-4 Crossing X-3/Plaza S-3 Crossing X-3/Plaza S-4 Crossing X-8/Plaza C-2 Crossing X-9/Plaza C-2 Crossing X-10/Plaza C-3
	Least Performers:	Crossing X-12/Plaza II-4 Crossing X-15/Plaza N-1

Protect the Natural Environment:	Best Performer:	Crossing X-14/Plaza II-2
	Least Performers:	Crossing X-1/Plaza S-1 Crossing X-1/Plaza S-2 Crossing X-2/Plaza S-3 Crossing X-2/Plaza S-4 Crossing X-3/Plaza S-3 Crossing X-3/Plaza S-4 Crossing X-4/Plaza S-5 Crossing X-15/Plaza N-1

<p>Improve Regional Mobility:</p>	<p>Best Performers: Crossing X-8/Plaza C-2 Crossing X-9/Plaza C-2 Crossing X-10/Plaza C-3 Crossing X-11/Plaza C-4 Crossing X-14/Plaza II-2 Crossing X-14/Plaza II-3</p> <p>Least Performers: Crossing X-1/Plaza S-1 Crossing X-1/Plaza S-2</p>
<p>Maintain Air Quality:</p>	<p>Best Performers: Crossing X-2/Plaza S-3 Crossing X-2/Plaza S-4 Crossing X-3/Plaza S-3 Crossing X-3/Plaza S-4 Crossing X-4/Plaza S-5 Crossing X-8/Plaza C-2 Crossing X-9/Plaza C-2</p> <p>Least Performers: Crossing X-12/Plaza II-4 Crossing X-15/Plaza N-1</p>
<p>Constructability:</p>	<p>Best Performer: Crossing X-11/Plaza C-4</p> <p>Least Performers: Crossing X-3/Plaza S-3 Crossing X-3/Plaza S-4 Crossing X-15/Plaza N-1</p>

These performances were then combined with the evaluation factor weights. When comparing the Citizens' and Technical Team's weighted scores (Table 6-18, it can be seen the two groups agree Crossings X-8/C-2, X-9/C-2, X-10/C-3, and X-12/II-4 are among the top five performers. All these crossings are also among the top scorers in the Regional Mobility area, which is a direct measure of the proposed alternative's ability to meet several of the project's needs.

These performances will be combined with the evaluation of the other components of the crossing system to help develop the decision on the Practical Alternatives.

Table 6-18
Detroit River International Crossing Study
Weighted Performance Score
Crossings on U.S. Side of River

Group \ Crossing	X-1/ S-1	X-1/ S-2	X-2/ S-3	X-2/ S-4	X-3/ S-3	X-3/ S-4	X-4/ S-5	X-8/ C-2	X-9/ C-2	X-10/ C-3	X-11/ C-4	X-12/ II-4	X-14/ II-2	X-14/ II-3	X-15/ N-1
Citizen Weight	53.54	52.69	63.52	60.59	63.31	60.53	59.68	73.28	71.60	65.99	64.51	64.78	64.39	64.57	44.49
Ranking (1 to 15)	13	14	8	10	9	11	12	①	②	③	6	④	7	⑤	15
Technical Team Weight	53.48	52.93	60.47	58.68	60.63	58.84	60.38	73.49	71.93	67.99	69.44	67.35	66.39	66.59	46.91
Ranking (1 to 15)	13	14	9	12	8	11	10	①	②	④	③	⑤	7	6	15

Source: The Corradino Group of Michigan, Inc.

7. EVALUATION DATA – ROUTE ALIGNMENTS

The third component of the river crossing system is the connection between the plaza and the freeway systems: I-75, I-94 and/or I-275. There are 27 connecting routes involved in this analysis (Figure 7-1) after accounting for the removal of Plaza C-1 and Crossings X-5, X-6, X-7 and X-13 (the DRTP proposal). As with the information on plazas and river crossings presented earlier, the presentation of connecting route evaluation data is subdivided by section of the study area dealing with: 1) the Downriver Area; 2) the Central Area; 3) the I-75/I-96 Area; and, 4) the Belle Isle Area.

7.1 Protect Community/Neighborhood Characteristics

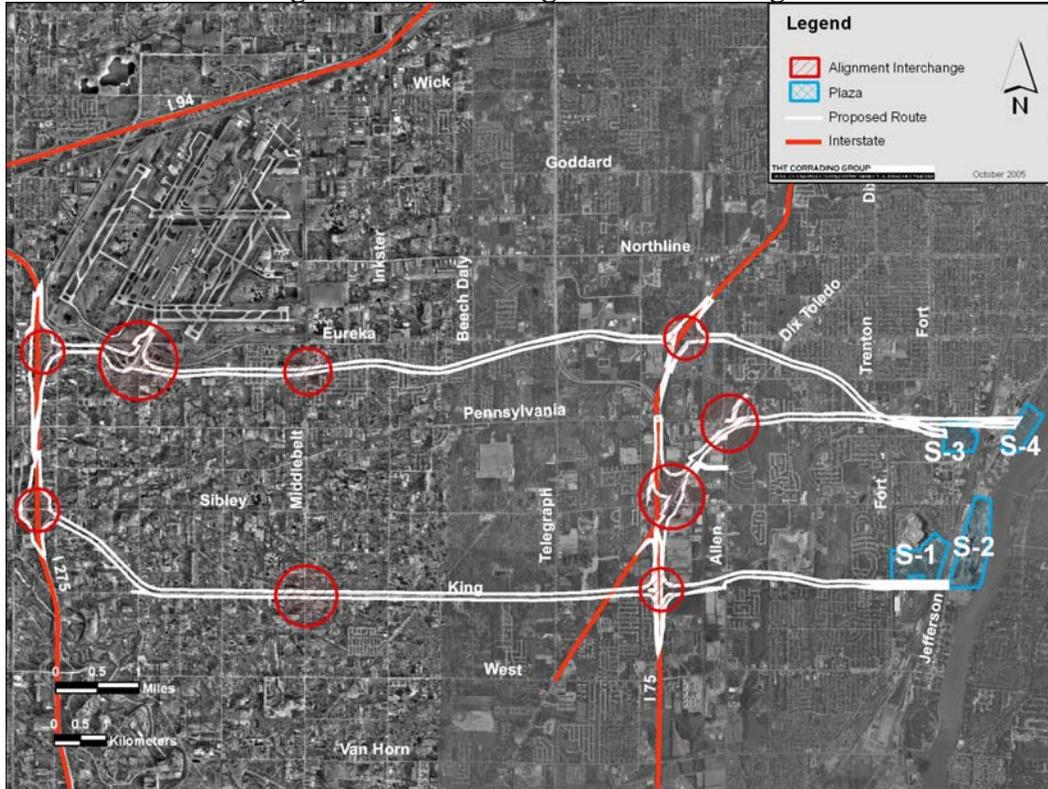
There are five performance categories in the evaluation of community effects of connecting routes: local traffic impacts, noise, community cohesion/character, property acquisition, and environmental justice/Title VI. Table 7-1 summarizes the issues examined. Specific details, including graphics, are included in Volume 3C of this series of reports. The discussion of these issues, provided below, is divided into connecting routes by area. Comparisons are only of those alternatives in that area. Overall, the comparison by the “community/neighborhood evaluation factor” for all connecting routes is provided at the end of this section of the report. Section 7.8 compares the overall performance of all crossing alternatives for all evaluation factors.

Downriver Area

Traffic Impacts – There are 15 connecting routes in the Downriver Area. Local traffic changes associated with them indicate that the international traffic will not cause a negative effect by mixing with local street traffic as most of the vehicles using the river crossing will continue to use freeways to reach their final destination (refer to Figures 5-1, 5-2 and 5-3).

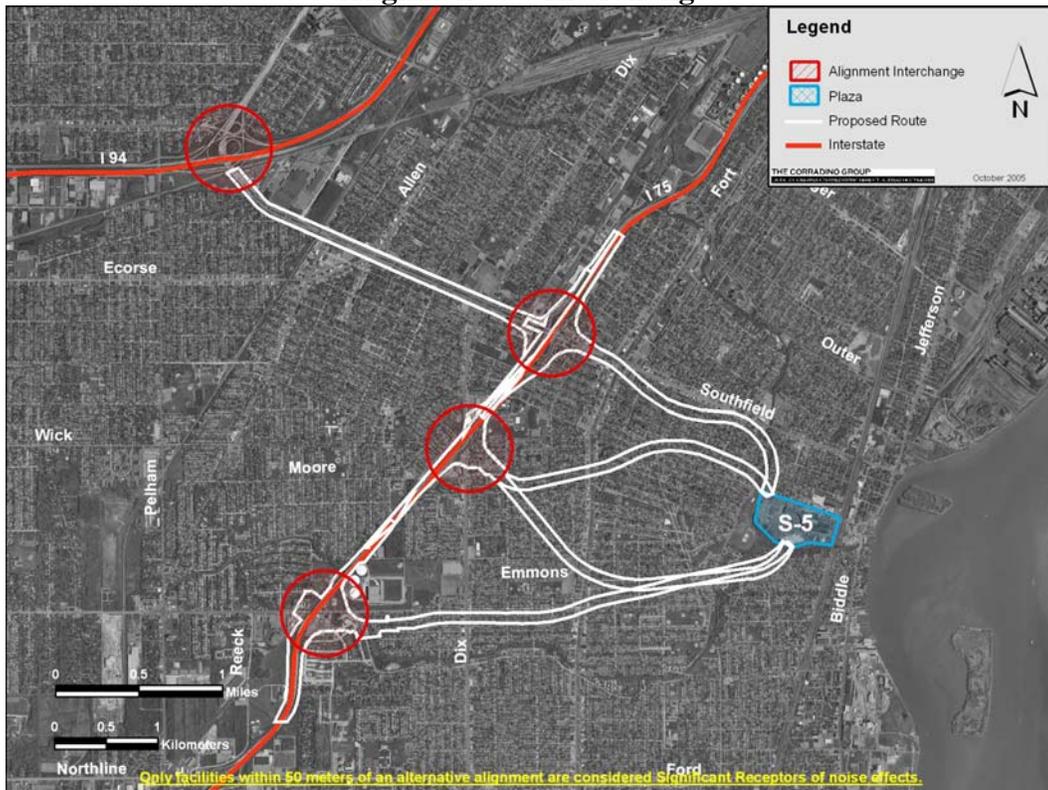
Most of the routes that go to I-75 would have no fewer than one interchange with the adjoining roadway system. However, the route from Plaza S-5 to Moran at I-75 has no intermediate interchange between the plaza and I-75. At the other end of the spectrum, the Eureka Road-to-I-75/I-275 routes would have either 7 or 8 interchanges depending on its connection to Plaza S-3 (7 interchanges in route to I-75) or S-4 (8 interchanges in route in extending to I-275). The route alignment that would connect Plaza S-5 to I-94 using Southfield Road (rather than I-75) would have five interchanges.

Figure 7-1a
Detroit River International Crossing Study
Alignments S-1 through S-4 Interchanges



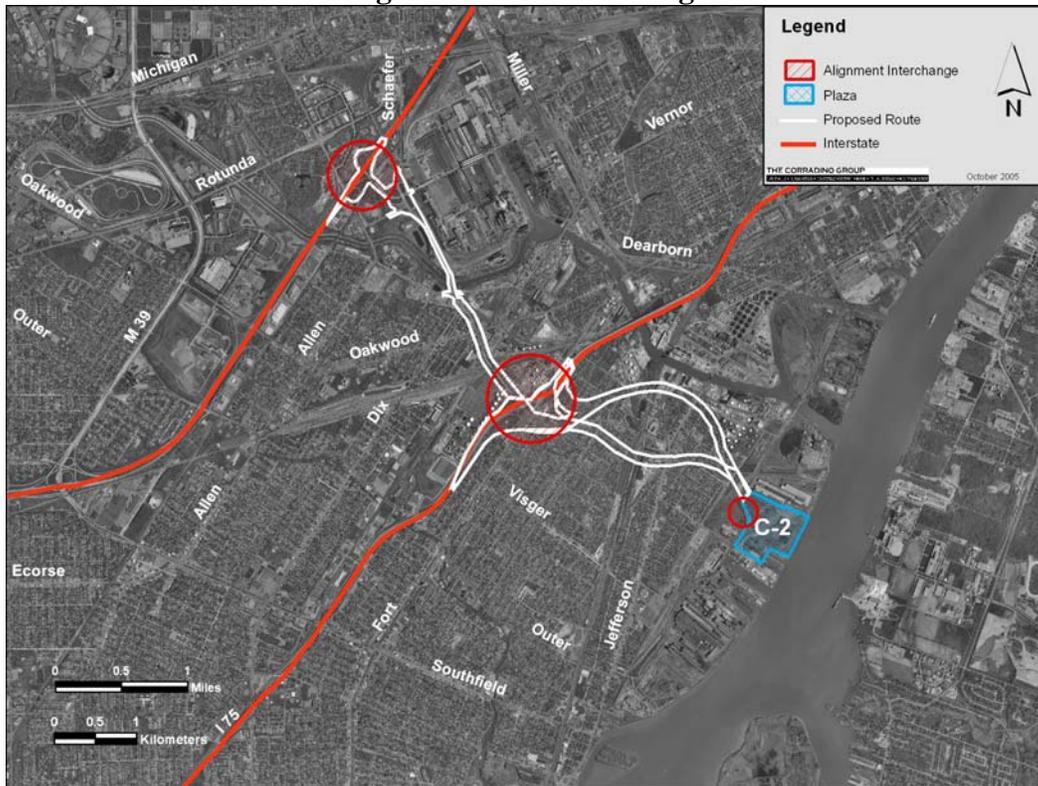
Source: The Corradino Group of Michigan, Inc.

Figure 7-1b
Detroit River International Crossing Study
Alignment S-5 Interchanges



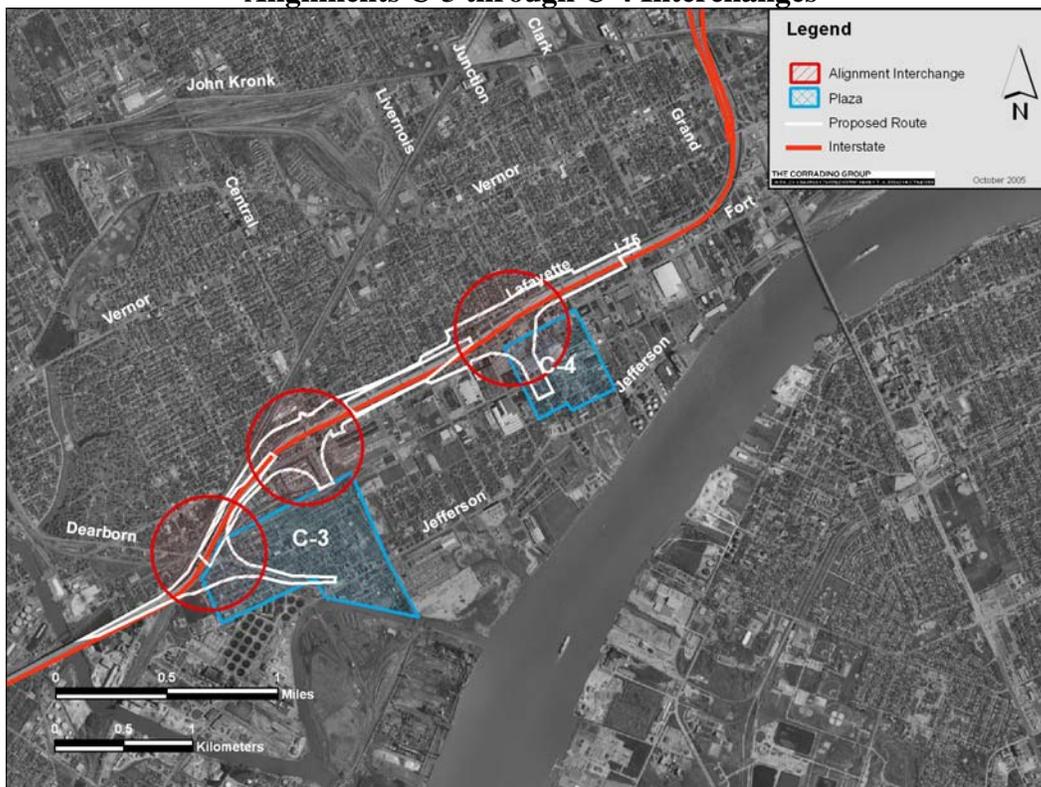
Source: The Corradino Group of Michigan, Inc.

Figure 7-1c
Detroit River International Crossing Study
Alignment C-2 Interchanges



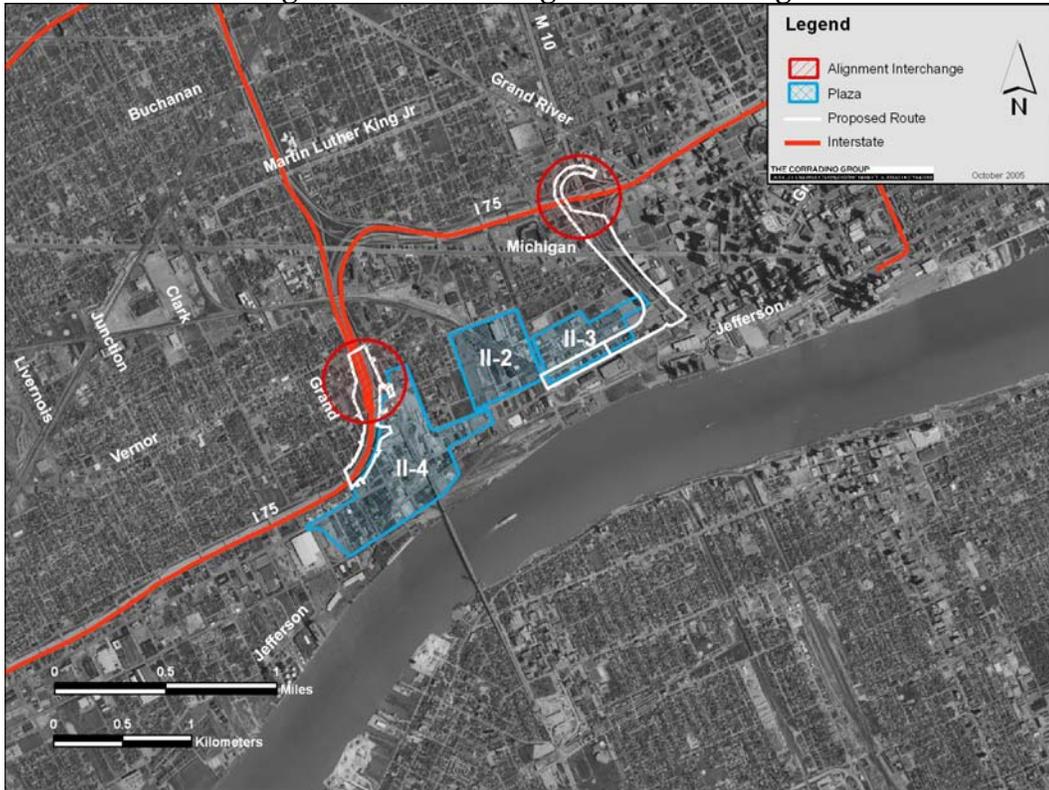
Source: The Corradino Group of Michigan, Inc.

Figure 7-1d
Detroit River International Crossing Study
Alignments C-3 through C-4 Interchanges



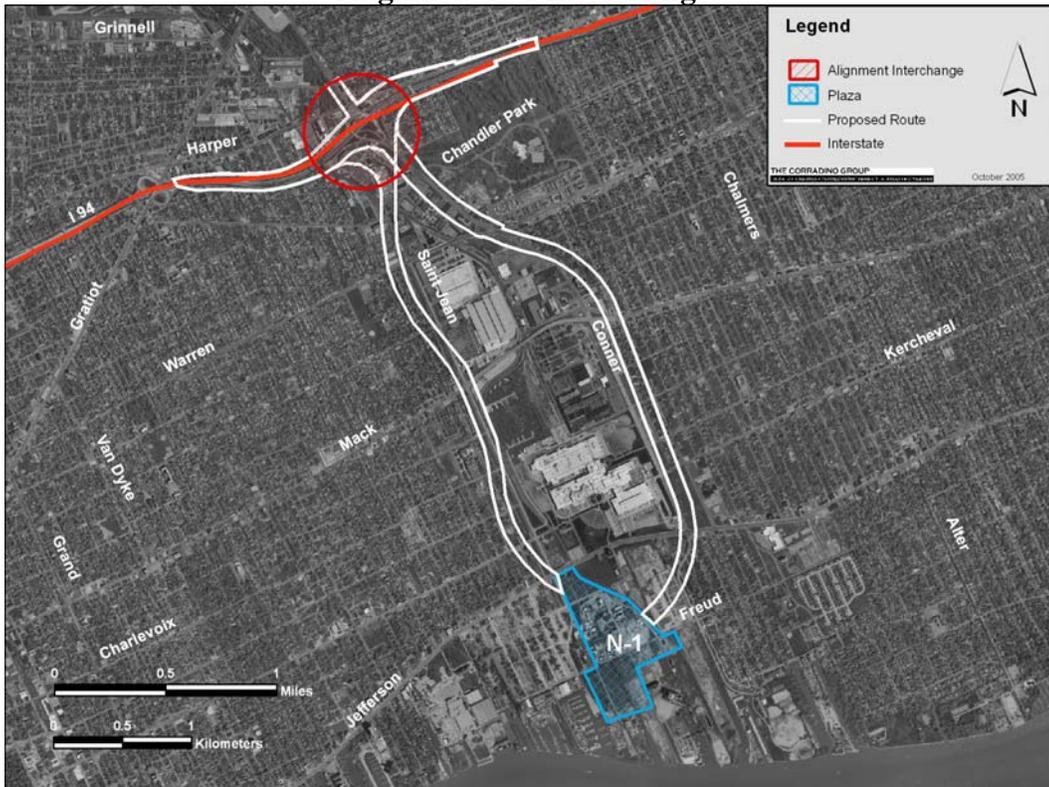
Source: The Corradino Group of Michigan, Inc.

Figure 7-1e
Detroit River International Crossing Study
Alignments II-2 through II-4 Interchanges



Source: The Corradino Group of Michigan, Inc.

Figure 7-1f
Detroit River International Crossing Study
Alignment N-1 Interchanges



Source: The Corradino Group of Michigan, Inc.

**Table 7-1
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Community/Neighborhood Characteristics
Supporting Data – Routes Only**

Evaluation Factor	Performance Measure Category	Description/Units	Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5	
			Route	King/1-75	King/1-275	King/1-75	King/1-275	Penn/1-75	Eureka/1-75	Eureka/1-275	Penn/1-75	Eureka/1-75	Eureka/1-275	Moran/1-75	Dix South/1-75	Dix North/1-75	Southfield/1-75	Southfield/1-94	
Protect Community / Neighborhood Characteristics	Traffic Impacts	Volume Change - Key Links		Refer to Figures 5-3 through 5-10.															
		Streets Closed (permanently)	Number	11	13	10	13	31	34	59	38	40	65	31	31	36	46	64	
		Streets Crossed	Number	6	16	5	18	9	7	16	10	10	19	7	7	6	4	7	
		Streets Rerouted	Number	1	3	2	4	2	1	3	3	2	4	1	0	0	1	2	
		Streets with Interchange	Number	1	2	1	2	2	1	3	3	1	2	1	1	1	1	1	
		Mainline Railines Crossed	Number	2	4	3	5	3	7	7	4	8	8	0	1	1	1	5	
	Noise	Frontline Exposure	Number of dwelling units exposed	72	142	79	149	124	205	593	162	241	629	475	314	333	228	355	
		Significant Receptors ¹ Exposures	Number /Specify ¹	0	0	0	0	3	3	7	2	4	6	3	4	4	3	8	
	Community Cohesion/ Character	Positive/Negative/Neutral	Positive/Negative/Neutral	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	
	Potential Acquisition	Residential Units	Occupied	328	617	336	625	256	583	1,316	250	577	1,310	791	782	679	376	416	
			Vacant	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	
		Residential Population	Number	850	1,610	827	1,547	668	1,492	3,427	673	1,523	3,473	1,898	1,894	1,650	955	1,054	
			Business Units	Active	29	44	28	43	46	57	256	51	61	260	28	13	8	72	153
		Vacant	Number	4	5	4	5	8	14	18	7	12	16	3	0	0	0	0	
			Estimated Range of Employees	Number	250-350	500-700	250-350	500-700	500-700	400-550	2100-2400	500-700	400-550	2100-2400	150-175	50-100	50-100	400-500	1000-1200
		Other Land Uses Affected	Schools	Number	0	0	0	0	2	1	2	3	1	3	0	2	2	2	2
			Senior Service Facilities	Number	0	0	0	0	1	1	1	1	1	0	0	0	0	1	1
			City/Government Facilities	Number	0	2	0	2	0	0	1	0	0	1	2	0	0	0	2
			Places of Worship	Number	0	1	0	1	2	1	3	2	1	3	0	0	0	1	5
			Medical Facilities	Number	0	1	0	1	0	0	2	1	0	1	0	0	0	0	7
			State/Federal Government Facilities	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Community Services		Number	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	
	Vacant	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3		
	Environmental Justice / Title VI	EJ Populations in affected Census Block Groups	EJ Population (non poverty)	36	712	36	712	759	1,113	6,214	947	1,153	6,254	573	451	362	238	798	
			Population Groups Affected	n/a	American Indian, Hispanic	n/a	American Indian, Hispanic	American Indian	American Indian, Hispanic	American Indian, Native Hawaiian, Hispanic	American Indian	American Indian, Hispanic	American Indian, Native Hawaiian, Hispanic	Hispanic	Hispanic	Hispanic	Hispanic	Hispanic	
% Households in Poverty / Above or Below 9.9% Regional Threshold ²		7.0%/Below	8.8%/Below	5.2%/Below	8.2%/Below	6.3%/Below	6.4%/Below	13.8%/Above	6.0%/Below	6.2%/Below	13.6%/Above	4.8%/Below	4.8%/Below	5.6%/Below	5.3%/Below	5.1%/Below			
Households in poverty		45	251	45	251	240	319	1,479	312	325	1,485	172	153	164	83	234			
Title VI Groups in Census Tracts	Presence of Regionally Prominent Ancestral Groups	English, French, German, Irish, Italian, Polish, Scottish	English, French, German, Irish, Italian, Polish	English, French, German, Irish, Italian, Polish	French, German, Irish, Polish	English, French, German, Irish, Italian, Polish	English, French, German, Irish, Italian, Polish	French, German, Irish, Polish	English, French, German, Irish, Italian, Polish, Scottish										

Evaluation Factor	Performance Measure Category	Description/Units	Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1	
			Route	Schaefer South/1-75	Schaefer South/1-94	Schaefer North/1-75	Schaefer North/1-94	Dearborn/1-75	Springwells/1-75	Dragon/1-75	Lafayette/M-10	Lafayette/M-10	Gateway/1-75	St.Jean/1-94	Conner/1-94	
Protect Community / Neighborhood Characteristics	Traffic Impacts	Volume Change - Key Links		Refer to Figures 5-3 through 5-10.												
		Streets Closed (permanently)	Number	51	52	57	58	20	20	33	0	18	0	39	44	
		Streets Crossed	Number	7	6	12	11	2	4	9	0	3	0	9	10	
		Streets Rerouted	Number	1	1	2	2	1	1	1	0	0	0	3	2	
		Streets with Interchange	Number	1	1	1	1	1	1	1	1	1	1	1	1	
		Mainline Railines Crossed	Number	2	5	3	6	4	1	0	0	0	0	6	3	
	Noise	Frontline Exposure	Number of dwelling units exposed	198	215	188	191	49	53	109	1	1	11	171	180	
		Significant Receptors ¹ Exposures	Number /Specify ¹	2	2	2	2	2	1	0	3	3	0	10	9	
	Community Cohesion/ Character	Positive/Negative/Neutral	Positive/Negative/Neutral	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Neutral	Negative	Negative	
	Potential Acquisition	Residential Units	Occupied	449	455	572	578	0	107	352	95	95	0	342	342	
			Vacant	3	3	5	5	0	1	7	1	1	0	12	11	
		Residential Population	Number	1,050	1,064	1,201	1,215	0	214	1,091	224	224	0	1,117	1,117	
			Business Units	Active	35	52	16	33	0	13	28	29	20	0	28	66
		Vacant	Number	5	7	6	8	0	8	21	7	3	0	22	19	
			Estimated Range of Employees	Number	500-600	600-800	500-600	600-800	0	25-75	90-130	400-500	100-150	0	500-700	500-700
		Other Land Uses Affected	Schools	Number	0	0	0	0	0	0	1	2	2	0	4	3
			Senior Service Facilities	Number	0	0	0	0	1	0	0	0	0	0	0	0
			City/Government Facilities	Number	0	0	1	1	0	0	0	1	1	0	3	2
			Places of Worship	Number	2	2	2	2	3	3	6	2	2	0	7	8
			Medical Facilities	Number	0	0	0	0	0	0	0	0	0	0	2	3
			State/Federal Government Facilities	Number	0	0	0	0	0	0	0	2	2	0	0	1
	Community Services		Number	2	3	1	2	0	0	2	0	0	0	0	0	
	Vacant	Number	0	0	0	0	0	0	0	0	0	0	0	0		
	Environmental Justice / Title VI	EJ Populations in affected Census Block Groups	EJ Population (non poverty)	2,208	2,631	1,419	1,842	237	499	3,793	3,886	3,157	1,266	2,592	4,103	
			Population Groups Affected	African American, American Indian, Hispanic	Hispanic	American Indian, Hispanic	Hispanic	African American, American Indian, Hispanic	African American, American Indian, Hispanic	American Indian, Native Hawaiian, Hispanic	African American, American Indian	African American				
% Households in Poverty / Above or Below 9.9% Regional Threshold ²		21.2%/Above	19.7%/Above	22.9%/Above	20.1%/Above	35.9%/Above	33.3%/Above	31.9%/Above	27.9%/Above	36.3%/Above	32.6%/Above	45.2%/Above	46.5%/Above			
Households in poverty		391	582	259	450	85	113	460	656	581	183	422	759			
Title VI Groups in Census Tracts	Presence of Regionally Prominent Ancestral Groups	None	None	None	None	None	None	None	None	None	None	None	None	None		

Notes:
1. Sensitive noise receptors are historic sites, medical facilities, parks, places of worship, schools, within fifty meters of an alignment, plaza, or crossing.
2. The poverty threshold for the SEMCOG region is 9.9%. Block groups with percentage of households living in poverty above 9.9% qualify as environmental justice communities.

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Source: The Corradino Group of Michigan, Inc.

In developing these routes, there will be a number of streets that will be closed permanently as the freeway connection will not allow access at frequent intervals. The fewest streets that will be closed are associated with the route alignments from Plazas S-1 and S-2 along King Road to I-75 or I-275. On the other hand, routes connecting Plazas S-3 or S-4 to I-75 by way of Pennsylvania or Eureka Roads would close 30 to 40 streets. Extending the Eureka Road-to-I-275 route will require an additional three dozen streets to be closed. The roadway's design will be such that local access will be redeveloped through frontage roads connecting streets which would remain open as they cross over or under the freeway connection from the plaza.

Noise – In the Downriver Area, the exposure to unwanted noise by dwelling units within 150 feet (50 meters) of the edge of the road is fewest (70 to 80 dwelling units) for the S-1 King Road connection to I-75, either using Plazas S-1 or S-2. Extending the S-1-to-King Road connector, or the S-2-to-King Road connector to I-275 will double the number of residential units along the connecting route affected by unwanted noise. Moving along Eureka Road to I-75, either from Plaza S-3 or S-4, will impact 200 to 250 dwelling units with unwanted noise. Extending those Eureka Road routes to I-275 would increase the number of impacted dwelling units to about 600.

Special receptors, other than dwelling units, will also be affected by unwanted noise along all Downriver routes, except for the King Road routes to Plazas S-1 or S-2 extending to I-75. For example, along Pennsylvania Road, the Gabriel Richard High School, St. Cyprian's Parish, Wyandotte Memorial Park or Vreeland Park will likely be affected by unwanted noise. The Southfield Road connection of Plaza S-5 to I-94 is expected to have a noise impact on eight nearby sensitive receptors including: Council Point Park, Lincoln Park High School and Dix United Methodist Church.

Community Cohesion/Character – In every case, the route connecting the plaza to the nearby freeway system (I-75/I-275 and/or I-94) in the Downriver Area is considered to have a negative effect on community cohesion/character.

Potential Acquisition – It is clear that the longer the route, the greater the number of residential units that will likely be acquired. That acquisition would involve about 300 dwelling units (King Road from either Plazas S-1 or S2 to I-75) to over 1,300 dwelling units (Eureka Road from Plaza S-3 to I-275).

The number of business units to be acquired and the effect on the employees who work there is most significant for the Eureka Road connection to I-275. That route would likely cause acquisition of over 250 businesses employing 2,100 to 2,400 employees. The Southfield Road

connection of Plaza S-5 to I-94 is also expected to have a significant effect with over 150 businesses employing 1,000 to 1,200 people.

Nonresidential acquisitions are most significant along the Eureka Road route connection, particularly as it extends from Plaza S-3 to I-275. In that case, 11 facilities such as schools, places of worship, and community service facilities will be impacted. Similarly, the connection of Plaza S-5 to I-94 along Southfield Road would likely involve acquisition of 20 special facilities.

Environmental Justice/Title VI – The impacts to those groups covered by the protections of the Environmental Justice Executive Order are most significant along Eureka Road. For example, the route connection from Plaza S-3 using Eureka Road and reaching I-275 could directly and indirectly affect over 6,000 people of minority origin. In most cases, the impacts in the Downriver Area on those protected by the Environmental Justice Executive Order are mostly Hispanic. The number of households with incomes below the poverty line is largest for the Eureka Road routes, particularly as they extend beyond I-75 to I-275.

In all cases, there are a number of key cultural groups (e.g., English, French, German), in addition to those covered by the EJ Executive Order, which would be affected directly or indirectly by any route in the Downriver Area.

Central Area

There are seven route connections between plazas and the interstate system in the Central Area. The traffic effects on local streets are not considered negative as most of the international traffic will continue to use the freeway system, not the local streets, in moving to their ultimate destinations (refer to Figures 5-4 and 5-5).

The route alignments connecting Plaza C-2 with I-75 by way of Schaefer Road would involve two or three interchanges. If these route alignments were extended beyond I-75 to I-94, the number of interchanges will total six.

Connection of Plaza C-2 to I-75 or I-94 by way of Schaefer Road will require over 50 streets to be permanently closed. Local access will be re-established through those streets, which will cross over or under the new freeway connector and the use of frontage drives. An important complication in the Central Area, particularly in connecting with Plazas C-2 and C-3 to the interstate system, is the need to cross at least one rail line.

Noise – The unwanted noise effects of connecting Plaza C-2 to either I-75 or I-94 will likely impact 200 dwelling units within 150 feet (50 meters) of the roadway’s edge. Two to five non-residential sensitive receptors will be affected by unwanted noise along those routes connecting Plaza C-2 to the nearby freeway system. Exposure to unwanted noise from the connection of Plaza C-3 to I-75 either at Dearborn or Springwells, is expected to total about four dozen dwelling units. It is expected that twice that number will be affected by unwanted noise in connecting Plaza C-4 to I-75 at Dragoon Street.

Community Cohesion/Character – All of the connecting routes in the Central Area will have a negative effect on the cohesion and character of the communities that they cut through.

Potential Acquisition – The C-2 plaza connection to I-75 or I-94 by way of Schaefer Road is likely to require acquisition of 450 to 600 dwelling units. The connection of Plaza C-3 to I-75 at Dearborn Avenue will require no residential acquisition as the plaza at 200+ acres is accounting for that impact. Connecting Plaza C-3 via Springwells will involve the acquisition of over 100 dwelling units. And, the connection of Plaza C-4 to I-75 in the vicinity of Dragoon Street will involve the acquisition of about 350 dwelling units.

The most extensive business impacts are expected to be associated with the connections of Plaza C-2 to I-75 or I-94 by way of Schaefer Road. These connections will impact between 15 and 50 businesses that employ from 500 to 800 people.

Acquisition of special, nonresidential entities will range from three to nine with the Central Area connectors.

Environmental Justice/Title VI – The groups that are covered by the EJ Executive Order are significantly in evidence in the Central Area. The connection of Plaza C-2 to I-75 or I-94 via Schaefer Road will impact, directly or indirectly, between 1,500 and 3,000 people of minority status, largely of African American and Hispanic origin. The impacts on EJ groups are more limited with the C-3-to-Dearborn connection, because the 200-acre plaza accounts for that impact in this evaluation area.

Not unlike the impact on individuals of minority status, the connection of Plaza C-2 to either I-75 or I-94 is expected to have the most significant effect on those households below the poverty level (300 to 600). The Central Area route connections have a limited effect on those non-minority cultural groups.

I-75/I-96 Area

There are three plaza-to-freeway connections in this area. In most cases, the local traffic impacts are limited except in connecting Plaza II-3 to the Lodge Freeway. In that case, 18 streets will be closed permanently.

Noise – Three special facilities, like senior services centers, schools, etc., are likely to be affected by unwanted noise for the connections of Plazas II-2 and II-3 to the Lodge Freeway.

Community Cohesion/Character – All route connections in the I-75/I-96 Area, but Plaza II-4 to I-75, will have a negative effect on the surrounding community. Because the area in question associated with the second span of the Ambassador Bridge is largely industrial and transportation-oriented, it is believed that there will be a neutral effect on community cohesion by connecting a second span to the interstate system.

Potential Acquisition – The I-75/I-96 Area route connections are relatively limited (fewer than 100 dwelling units) in their expected residential displacement impacts. On the other hand, there could be between 20 and 30 business establishments employing up to 500 people affected by connecting Plazas II-2 or II-3 to the Lodge Freeway in the vicinity of Lafayette Avenue.

Environmental Justice/Title VI – The most significant effects on the minority populations are associated with the connections of Plaza II-2 and II-3 to the Lodge Freeway. No fewer than 2,500 people of minority status will be affected directly or indirectly by the connecting routes in this area. Likewise, 380 to 650 households below the poverty level would be affected, directly or indirectly, by these route connections. In these instances, the affected population is largely of African American and Hispanic origin. No special, non-minority, cultural groups are likely to be impacted by the I-75/I-96 route connections.

Belle Isle Area

Traffic Impacts – The traffic impacts associated with either using St. Jean or Conner to connect the N-1 plaza to I-94 will be significant for such a short stretch of road. Approximately 40 streets would be closed and another 10 rerouted or crossed. Likewise, between three and six rail lines will have to be crossed by these connecting routes.

Noise – About 170 to 180 dwelling units will likely be affected by unwanted noise emanating from the Belle Isle Area connecting routes. The St. Jean route and the Conner route will affect between nine and ten special receptors, including multiple churches, schools, medical facilities and a park:

Community Cohesion/Character – In the Belle Isle Area, both routes will have a negative effect on the community cohesion and character of the areas that they penetrate.

Potential Acquisition – Both routes are likely to require about 340 dwelling units to be acquired. The Conner route will likely involve acquisition of over 60 businesses, more than double the impact of the St. Jean route. Nonetheless, in both instances, the number of employees in the establishments to be acquired is in the range of 500 to 700.

Sixteen special, nonresidential, land uses would be acquired by the St. Jean route, including such facilities as Detroit Station Service Center, Detroit East Mental Health and Wayne County Community College. The special facilities likely to be acquired by use of the Conner route is greater at two dozen. In this case, facilities like Samaritan Medical Center, Eastside Missionary Baptist Church and Wayne County Community College would likely be acquired.

Environmental Justice/Title VI – The area penetrated by the route connections along St. Jean and Conner to I-94 are largely in areas dominated by African Americans. The St. Jean route would directly and/or indirectly affect about 2,600 people. The Conner route would likely impact over 4,100 people. The St. Jean route is expected to affect more than 400 households, the residents of which have incomes below the poverty level. That number would almost double along the Conner route to I-94. No special cultural groups, other than those of minority status, are likely to be affected by these two routes.

7.1.1 Performance Evaluation

The performance evaluation in the area of protecting community/neighborhood characteristics indicates that all but six routes score poorly in this evaluation category (Table 7-2). The routes with the highest scores are:

- King Road-to-I-75 connected to Plaza S-2
- The Dearborn @ I-75 connection to Plaza C-3
- The Springwells @ I-75 connection to Plaza C-3
- The connections of Plazas II-2 and II-3 to the Lodge Freeway
- The connection of Plaza II-4 to I-75

7.2 Maintain Consistency with Local Planning

The performance measure categories in this evaluation area are: consistency with plans and environmental conditions (Table 7-3). Discussion of these issues, provided below, is divided into route connections by area. Comparisons are only of those alternatives in that area. An overall comparison of route connections by the “local planning” evaluation factor for all route connections is provided at the end of this section of the report. Section 7.8 then compares the overall performance of all crossing alternatives for all evaluation factors.

Downriver Area

Consistency with Plans – None of the route connections in the Downriver Area are consistent with the planning for the communities which they will penetrate.

Environmental Conditions – All of the route connections from plaza to interstate system, except King Road, from Plaza S-1 or S-2 to I-75, and Dix/North from Plaza S-5 to I-75, are associated with at least one environmental site of significance which will make implementing the proposed plans for the area a challenge.

Central Area

Consistency with Plans – None of the seven route connections in the Central Area, except the Dragoon connection between Plaza C-4 and I-75, are consistent with the plans for the local area. The plans for the area with the connection of Plaza C-4 at Dragoon/I-75 reflect a transition to industrial/transportation uses making the connection more compatible with those plans.

Environmental Conditions – Plans for the areas where the route connections between Central Area plazas to I-75 and I-94 will be challenged by the presence of major contamination sites that need to be remediated to implement those plans, except for Plaza C-3 at Dearborn.

I-75/I-96 Area

Only the II-4-to-I-75 connector in the I-75/I-96 Area is considered to be consistent with the plans for the local area.

Environmental Conditions – Plans for the areas with the connections between I-75 and Plaza II-4 will not be affected by sites with major contamination. On the other hand, the plans for the areas through which the connections between Plazas II-2 and II-3 and the Lodge Freeway will run are affected by areas of significant contamination.

Table 7-2
Detroit River International Crossing Study
Evaluation Factor: Protect Community/Neighborhood Characteristics
U.S. Routes

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Performance Score	49.4	35.7	50.1	35.9	43.7	35.9	20.6	43.2	38.7	20.4	40.3	44.0	44.7	43.3	38.1
Ranking (1 to 27)	7	24	5/6	22/23	11	22/23	26	13	17/18	27	15	10	8	12	19/20

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Route	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Performance Score	38.7	35.4	37.6	38.1	63.7	57.5	44.5	50.1	52.2	69.6	41.4	39.4
Ranking (1 to 27)	17/18	25	21	19/20	2	3	9	5/6	4	1	14	16

Source: The Corradino Group of Michigan, Inc.

**Table 7-3
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Consistency with Local Planning
Supporting Data – Routes Only**

		Plaza Route		S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	
Evaluation Factor	Performance Measure Category		Description/ Units	King/I-75	King/I-275	King/I-75	King/I-275	Penn/I-75	Eureka/I-75	Eureka/I-275	Penn/I-75	Eureka/I-75	Eureka/I-275	Moran/I-75	Dix South/I-75	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO	No	No	No	No	No	No	No	No	No	No	No	No	
	Other Plans	Consistency	YES/NO	No	No	No	No	No	No	No	No	No	No	No	No	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Undgrd. Stor. Tanks (100m)	Number		0	1	0	1	2	1	1	2	2	2	6	1
		EPA/DEQ Hazmat TSD Facility (200m)	Number		0	0	0	0	0	0	0	1	1	1	0	0
		National Priority List (Superfund) (200m)	Number		0	0	0	0	0	0	0	0	0	0	1	1
		RTK Cerclis (Superfund) (200m)	Number		0	0	0	0	1	0	0	2	1	1	0	0
Michigan Contaminated Site (200m)	Number		0	0	0	0	1	0	0	2	1	1	0	0		

		Plaza Route		S5	S5	S5	C2	C2	C2	C2	
Evaluation Factor	Performance Measure Category		Description/ Units	Dix North/I-75	Southfield/I-75	Southfield/I-94	Schaefer South/I-75	Schaefer South/I-94	Schaefer North/I-75	Schaefer North/I-94	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO	No	No	No	No	No	No	No	
	Other Plans	Consistency	YES/NO	No	No	No	No	No	No	No	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Undgrd. Stor. Tanks (100m)	Number		0	1	1	2	3	3	4
		EPA/DEQ Hazmat TSD Facility (200m)	Number		0	0	0	0	0	0	0
		National Priority List (Superfund) (200m)	Number		0	0	0	0	0	0	0
		RTK Cerclis (Superfund) (200m)	Number		0	1	1	1	2	1	2
Michigan Contaminated Site (200m)	Number		0	1	1	1	1	1	1		

		Plaza Route		C3	C3	C4	II2	II3	II4	N1	N1	
Evaluation Factor	Performance Measure Category		Description/ Units	Dearborn/I-75	Springwells/I-75	Dragoon/I-75	Lafayette/M-10	Lafayette/M-10	Gateway/I-75	St.Jean/I-94	Conner/I-94	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO	No	No	Yes	No	No	Yes	No	No	
	Other Plans	Consistency	YES/NO	No	No	NA	No	No	Yes	No	No	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Undgrd. Stor. Tanks (100m)	Number		0	3	3	3	1	2	2	2
		EPA/DEQ Hazmat TSD Facility (200m)	Number		0	1	1	2	1	0	0	0
		National Priority List (Superfund) (200m)	Number		0	0	0	0	0	0	0	0
		RTK Cerclis (Superfund) (200m)	Number		0	1	0	0	0	0	1	0
Michigan Contaminated Site (200m)	Number		0	0	0	0	0	0	0	1		

Source: The Corradino Group of Michigan, Inc.

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Belle Isle Area

Consistency with Plans – Placing a route connection between the N-1 plaza and I-94 is not consistent with local planning in the Belle Isle Area.

Environmental Conditions – The implementation of the plans for the Belle Isle Area will be challenged by the presence of one site is significant contamination.

7.2.1 Performance Evaluation

Of the 27 route connections, only two are judged to be consistent with local planning: the C-4 connection to I-75 at Dragoon and the II-4 plaza connection to I-75 associated with the second span of the Ambassador Bridge (Table 7-4). All other route connections are considered to have a negative impact on plans for the local areas they will cut through.

7.3 Protect Cultural Resources

There are four performance measure categories in this evaluation area: aboveground historic resources, archaeology, belowground historic resources, and public parkland. Table 7-5 summarizes the issues examined. Specific details, including graphics, are included in Volume 3C of this series of reports. Discussion of these issues, provided below, is divided into route connections. Comparisons are only for those alternatives in that area. An overall comparison by the “cultural resources” evaluation factor for all connecting routes is provided at the end of this section of the report. Section 7.8 then compares the overall performance of all alternatives for all evaluation factors.

Downriver Area

Aboveground Historic Resources – The most significant impacts to aboveground historic resources are associated with the Plaza S-5 connection to I-75 or I-94 by Southfield Road. Most other connecting routes are expected to have a limited impact in this evaluation area.

Archaeology – The potential for impacting a known archaeological site is most significant in the area along King Road, Pennsylvania Road, and Eureka Road between I-75 and I-275. No known archaeological sites are expected to be impacted by the route connections of Plaza S-5 to either I-75 or I-94 by way of Dix or Southfield Roads.

Belowground Resources – The potential to uncover archaeological sites of significance diminishes the farther upriver the connecting route is located in the Downriver Area.

**Table 7-4
 Detroit River International Crossing Study
 Evaluation Factor: Maintain Consistency with Local Planning
 U.S. Routes**

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Performance Score	31.8	33.1	32.8	33.1	42.2	35.6	35.6	44.2	41.7	41.7	41.1	40.2	31.8	42.1	42.7
Ranking (1 to 27)	26/27	23/24	25	23/24	13	20/21	20/21	5	15/16	15/16	17	19	26/27	14	12

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Route	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Performance Score	43.4	45.4	44.1	44.8	33.8	43.9	72.9	44.0	43.1	82.9	42.9	40.7
Ranking (1 to 27)	9	3	6	4	22	8	2	7	10	1	11	18

Source: The Corradino Group of Michigan, Inc.

**Table 7-5
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Cultural Resources
Supporting Data – Routes Only**

				Plaza Route											
Evaluation Factor	Performance Measure Category		Description/Units	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5
				King/I-75	King/I-275	King/I-75	King/I-275	Penn/I-75	Eureka/I-75	Eureka/I-275	Penn/I-75	Eureka/I-75	Eureka/I-275	Moran/I-75	Dix South/I-75
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number	0	0	0	0	0	0	0	0	0	0	0	0
		Listed NRHP Sites/Structures	Number	0	0	0	0	0	0	0	0	0	0	0	0
		Listed SHRS Sites/ Structures	Number	0	0	0	0	0	0	0	0	0	0	0	0
		Locally Listed Sites/Structures	Number	0	1	0	1	0	0	0	0	0	0	0	0
		Potentially Eligible Sites/Str.	Number	0	1	0	1	1	0	0	1	0	0	0	0
	Archaeology ¹	Prev. Recorded Sites	Number	1	3	1	3	2	1	3	2	1	3	1	0
	Below Ground Resources ¹	Potential to Find/Record	High/Med/Low	Low	Low/Med	Low	Low/Med	Low	Low	Low/Med	Low	Low	Low/Med	Low	Low
		All Public Parks	Number/ Acres	2/2.4	4/7.4	0/0	4/7.4	1/2.0	0/0.0	1/1.0	1/2.0	1/2.0	2/3.0	2/1.9	0/0
	Parkland	6(f) Parks	Number/Specify	0	0	0	0	0	0	0	0	0	0	0	0
		Coastal Zone Management	Number of Projects/Specify ²	0	0	0	0	0	0	0	0	0	0	0	0

				Plaza Route							
Evaluation Factor	Performance Measure Category		Description/Units	S5	S5	S5	C2	C2	C2	C2	C3
				Dix North/I-75	Southfield/I-75	Southfield/I-94	Schaefer South/I-75	Schaefer South/I-94	Schaefer North/I-75	Schaefer North/I-94	Dearborn/I-75
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number	0	1	1	0	0	0	0	0
		Listed NRHP Sites/Structures	Number	0	0	0	0	0	0	0	0
		Listed SHRS Sites/ Structures	Number	0	0	0	0	0	0	0	0
		Locally Listed Sites/Structures	Number	0	0	0	0	0	0	0	0
		Potentially Eligible Sites/Str.	Number	0	4	4	0	0	0	0	0
	Archaeology ¹	Prev. Recorded Sites	Number	0	0	0	1	1	1	1	1
	Below Ground Resources ¹	Potential to Find/Record	High/Med/Low	Low	Low	Low	Low	Low	Low	Low	Low
		All Public Parks	Number/ Acres	2/2.7	1/0.8	2/2.1	1/15.2	1/15.2	1/15.2	1/15.2	1/1.4
	Parkland	6(f) Parks	Number/Specify	0	0	0	0	0	0	0	0
		Coastal Zone Management	Number of Projects/Specify ²	0	0	0	0	0	0	0	0

				Plaza Route						
Evaluation Factor	Performance Measure Category		Description/Units	C3	C4	II2	II3	II4	N1	N1
				Springwells/I-75	Dragoon/I-75	Lafayette/M-10	Lafayette/M-10	Gateway/I-75	St.Jean/I-94	Conner/I-94
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number	0	0	1	1	0	0	0
		Listed NRHP Sites/Structures	Number	0	1	0	0	0	0	0
		Listed SHRS Sites/ Structures	Number	0	0	0	0	0	0	0
		Locally Listed Sites/Structures	Number	0	0	0	0	0	0	0
		Potentially Eligible Sites/Str.	Number	4	3	7	2	0	6	2
	Archaeology ¹	Prev. Recorded Sites	Number	0	0	7	2	0	7	9
	Below Ground Resources ¹	Potential to Find/Record	High/Med/Low	Low	Low	High	High	Low	Low	Low
		All Public Parks	Number/ Acres	0/0	1/0	0/0	0/0	0/0	1/4.5	3/9.9
	Parkland	6(f) Parks	Number/Specify	0	0	0	0	0	0	1/Chandler Park Golf Course
		Coastal Zone Management	Number of Projects/Specify ²	0	0	0	0	0	0	0

Notes:
1: See Volume 2 for identification of individual sites.
2: Coastal Zone Management Projects:
X4: Public River Access/Use
X12 and X14: River Corridor Walk
X15: Lake Sturgeon Habitat

Source: The Corradino Group of Michigan, Inc.

Public Parks – In the Downriver Area, all but three of the 15 routes affect a public park. Those that do not are: 1) the route connections of Plaza S-2 to I-75 via King Road; 2) the connection of Plaza S-3 to I-75 via Eureka Road; and, 3) the connection of Plaza S-5 to I-75 via Dix. Parkland impacts in the Downriver Area typically involve about two to seven acres. No 6(f) parks nor Coastal Zone Management projects are expected to be impacted by any route alternatives.

Central Area

Aboveground Historic Resources – In the Central Area, is the connection of Plaza C-2 via Schaefer Road, to either I-75 or I-94, and the connection of Plaza C-3, to I-75 in the Dearborn Avenue Area, are not expected to impact aboveground historic resources. Four historic resources (Dearborn Road Cemetery, All Saints Church Complex, Frank H. Beard School and Detroit Police Fort and Green Station) are likely to be impacted by the connection of Plaza C-3 to I-75 at Springwells and another four (Frank H. Beard School, Detroit Police Fort and Green Station, Hinsdale Village Site, and Michigan Central Railroad Station) at Plaza C-4 to I-75 at Dragoon Street.

Archaeology – Only the route connections of Plazas C-3 to I-75 at Springwells and C-4 to I-75 in the vicinity of Dragoon are expected to avoid impacting known archaeological sites. All other alternatives in the Central Area are likely to impact one known archaeological area.

Public Parks – The most significant effect on public parks is associated with the Schaefer Road connections of Plaza C-2 to either I-75 or I-94; where more than 15 acres of the Kemeny Park would be impacted. No public parkland is expected to be impacted by the connections of Plaza C-3 to I-75 at Springwells or Plaza C-4 to I-75 at Dragoon.

I-75/I-96 Area

Aboveground Historic Resources – The connection of Plaza II-2 or Plaza II-3 to the Lodge Freeway will impact the Corktown historic district. Additionally, connecting Plaza II-4 to I-75 will impact the Michigan Central Depot and Platform, which is a *National Register*-listed site. Connecting Plaza II-2 to the Lodge Freeway is also likely to impact seven aboveground resources that appear to be eligible for the *National Register of Historic Places*.

Archaeology – All route connections, except II-4 to I-75, are likely to impact at least one known archaeological site.

Belowground Resources – The connections of Plazas II-2 and II-3 to the Lodge Freeway have a high potential for uncovering additional belowground resources.

Public Parks – No public parks are expected to be affected by the route connections of plaza to freeway in the I-75/I-96 Area.

Belle Isle Area

Aboveground Historic Resources – The connections of Plaza N-1 to I-94 by either St. Jean or Conner are not expected to affect a listed historical site. But, there are two properties along Conner and six along St. Jean that are considered to be eligible for historical listing.

Archaeology – Seven (St. Jean) or nine (Conner) known archaeological sites would be affected by the routes connecting Plaza N-1 to I-94.

Public Parkland – Two parks (about five acres) would be impacted by the St. Jean route connecting Plaza N-1 and I-94. One park (Chandler Park Golf Course) with almost 10 acres would likely be affected by the Conner connector. This is a 6(f) park.

7.3.1 Performance Evaluation

The evaluation of the cultural resource characteristics of the route connections indicates that the most significant negative effect is associated with the following connectors (Table 7-6):

- King Road to I-275, connected to either Plaza S-1 or S-2;
- Southfield Road to I-75 or I-94, connected to Plaza S-5;
- Schaefer Road (north and south) to I-75 or I-94, connected to Plaza C-2;
- Dragoon at I-75 connected to Plaza C-4;
- Lodge Freeway connection to Plaza II-2 or II-3; and,
- St. Jean and Conner connections to I-94 of Plaza N-1.

The best performers in protecting historical resources are the Dix/South to I-75, connected with Plaza S-5; and, the connection of Plaza II-4 to I-75.

Table 7-6
Detroit River International Crossing Study
Evaluation Factor: Protect Cultural Resources
U.S. Routes

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Performance Score	54.8	48.4	75.7	48.8	50.7	72.5	54.6	52.6	56.1	51.4	57.8	87.0	57.7	47.1	38.4
Ranking (1 to 27)	10	16	3	15	14	4	11	12	8	13	6	2	7	17	22

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Route	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Performance Score	39.4	34.9	37.4	37.9	56.0	58.8	42.8	22.3	24.2	87.5	44.7	46.5
Ranking (1 to 27)	21	25	24	23	9	5	20	27	26	1	19	18

Source: The Corradino Group of Michigan, Inc.

7.4 Protect the Natural Environment

In this evaluation, there are five performance measure categories: surface water, significant habitat, prime/unique farmland, and mineral resources. Table 7-7 summarizes the issues examined. Specific details, including graphics, are included in Volume 3C of this series of reports. Discussion of these issues, provided below, is divided into crossings by geographical area. Comparisons are only for those alternatives in that area. An overall comparison by the “Natural Environment” evaluation factor for all routes is provided at the end of this section of the report. Section 7.8 then compares the overall performance of all crossings for all evaluation factors.

Downriver Area

Surface Water – Almost all alternatives in the Downriver Area will impact between 15 and 40 acres of floodplain community. The least floodplain impact is associated with the following alternatives: Eureka to I-75, connected to Plaza S-3; Eureka to I-75, connected to Plaza S-4; Moran to I-75, connected to Plaza S-5; Dix/South and Dix/North to I-75, connected to Plaza S-5; and, Southfield to I-75 or I-94, connected to Plaza S-5.

The route connections to Plaza S-5 will cross the Ecorse River, a primary stream, at least once. One secondary stream will be affected by the Moran to I-75 connection to Plaza S-5. All other routes will affect secondary streams and other water crossings such as the Frank and Poet Drain, Meisner Drain, Marsh Creek, Brownstown Drain, Smith Creek, Blakely Drain, or the Hale Drain.

Ground Water – No wells or water intakes are in the area covered by the Downriver routes.

Significant Habitat Communities – There will be significant wetland impacts associated with the Downriver Area routes that use King Road, Pennsylvania Road, or Eureka Road, if it extends beyond I-75 to I-275. Those alternatives that extend beyond I-75 to I-275 will impact the known habitat of over a dozen threatened and endangered species of plants or animals. And, in that area between I-75 and I-275, there is the potential to impact many more threatened and endangered species.

Prime/Unique Farmland – Extensions of the connecting routes in the Downriver Area that extend along King and Eureka Roads beyond I-75 to I-275 have the potential to impact active farms including those with prime soils. This is particularly the case along Eureka Road.

Table 7-7
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Natural Environment
Supporting Data – Routes Only

Evaluation Factor	Performance Measure Category	Description/Units	Plaza Route																														
			S1 King/1-75	S1 King/1-275	S2 King/1-75	S2 King/1-275	S3 Penn/1-75	S3 Eureka/1-75	S3 Eureka/1-275	S4 Penn/1-75	S4 Eureka/1-75	S4 Eureka/1-275	S5 Moran/1-75	S5 Dix South/1-75	S5 Dix North/1-75	S5 Southfield/1-75	S5 Southfield/1-94	S5 Schaefer South/1-75	S5 Schaefer South/1-94	S5 Schaefer North/1-75	S5 Schaefer North/1-94	C2 Dearborn/1-75	C2 Springwells/1-75	C2 Dragoon/1-75	C2 Lafayette/M-10	C2 Lafayette/M-10	C2 Gateway/1-75	C3 St.Jean/1-94	C3 Conner/1-94				
Protect The Natural Environment	Surface Water	Floodplain	2/13.8	5/41.01	2/13.8	5/41.01	2/23.5	1/3.1	1/24.05	2/37.9	1/8.1	1/29.05	1/3.82	1/3.89	1/1.00	1/2.12	1/2.12	0/0.0	1/2.4	0/0.0	1/2.4	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	0/0.0	0/0.0	0/0.0
		Surface Run Off	Acres	50.00	126.00	59.00	136.00	75.00	57.00	161.00	84.00	70.00	174.00	50.00	42.00	35.00	37.00	37.00	32.00	44.00	32.00	44.00	12.00	12.00	15.00	24.00	24.00	0.00	56.00	62.00	0.00	0.00	
		Primary Streams	Number/Specify	0	0	0	0	0	0	0	0	0	0	2/Ecorse River	1/Ecorse River	2/Ecorse River	1/Ecorse River	1/Ecorse River	0	1/Rouge River	0	1/Rouge River	0	0	0	0	0	0	0	0	0	0	0
		Secondary Streams	Number/Specify	2/Frank and Poet Drain and Marsh Creek,	4/Frank and Poet Drain and Marsh Creek, Brownstown Drain, Smith Creek	2/Frank and Poet Drain and Marsh Creek,	4/Frank and Poet Drain and Marsh Creek, Brownstown Drain, Smith Creek	3/Frank and Poet, Blakely Drain (2)	1/Frank and Poet Drain	1/Frank and Poet Drain	3/Frank and Poet, Blakely Drain (2)	1/Frank and Poet Drain	1/Frank and Poet Drain	1/ Intermittent (Sexton and Kilford Drain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Other Water-crossings	Number/Specify	1/Intermittent Stream (Clee Drain)	4/Hand Drain, Silver Creek, Hand Drain, Clee Drain	1/Intermittent Stream (Clee Drain)	4/Hand Drain, Silver Creek, Hand Drain, Clee Drain	0	0	3/Carter Drain (2), Hale Drain	0	0	3/Carter Drain (2), Hale Drain	0	0	0	0	0	0	0	1/ Intermittent Stream	0	1/ Intermittent Stream	0	0	0	0	0	0	0	0	0		
		Groundwater	Municipal Wells	Number	No Municipal Wells or Water In-takes in Area																												
	Significant Habitat	Wetlands	Acres	46.22	126.58	46.22	126.58	27.75	3.45	69.37	27.75	5.61	71.53	5.51	1.80	1.37	1.10	1.51	0.47	3.11	0.76	3.40	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.37		
		Fens / Bogs	Number/Acres	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	0/0	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	0/0	0/0	
		Endangered Species ³	Species Known/Potential	0/3	13/6	0/3	13/6	0/0	0/2	2/19	0/0	0/2	2/20	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	
		Listed Communities ⁵	Number/Acres	0/0	3/0	0/0	3/0	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	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
		Designated Wildlife Refuges ⁴	Number/Acres	0/0	0/0	1/25.00	1/25.00	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	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
	Farmland	Prime Farmland Soil	Number/Acres	0/0	1/2.25	0/0	1/2.25	0/0	0/0	18/47.43	0/0	0/0	18/47.43	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	0/0	0/0	0/0	0/0	0/0		
Active Farmland		Number/Acres	0/0	1/29.18	0/0	1/29.18	0/0	0/0	5/12.05	0/0	0/0	5/12.05	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	0/0	0/0	0/0	0/0	0/0			
Mineral Resources	Salt /Limestone	Type/Specify	Salt/ Limestone	Salt/ Limestone	Salt/ Limestone	Salt/ Limestone	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt	Salt			

Notes:
1: Primary Streams are classified as water courses with an average width greater than 50ft/15m.
2: Secondary streams are classified as water courses with an average width less than 50ft/15m.
3: See Volume 2, a separate report, for detailed inventory of species affected.
4: The Detroit River International Wildlife Refuge is the only known official wildlife refuge affected by alignments.
5: Listed Communities include Lakeplain Oak Openings, Lakeplain Wet Prairie, Lakeplain Wet-Mesic Prairie.

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Source: The Corradino Group of Michigan, Inc.

Mineral Resources – Each of the Downriver Area connecting routes will be over salt deposits. Extraction of the minerals is not expected to be limited by any route. The routes connecting to Plaza S-1 along King Road will have an impact on the limestone mining at the Sibley Limestone Quarry adjacent to the plaza site.

Central Area

Surface Water – Floodplain impacts are minimal for Central Area routes. The Schaefer/North and Schaefer/South connections to I-94 serving Plaza C-2 will cross the Rouge River. No other alternatives will affect a primary stream. And, there is no impact on secondary streams and limited to other water crossings from the Schaefer/South route to I-94 from Plaza C-2.

Ground Water – No wells or water intakes are in the Central Area covered by the routes.

Significant Habitat – There is a limited impact expected (fewer than four acres) on wetlands associated with the Central Area routes. There is no known habitat of an endangered species that is affected by any Central Area alternative. However, the Schaefer routes to I-75 or I-94 may potentially affect the habitat of the Peregrine Falcon.

Prime/Unique Farmland – None of the Central Area route alternatives would impact prime or unique farmlands.

Mineral Resources – All Central Area routes will be over salt deposits. Their extraction is not likely to be affected.

I-75/I-96 Area

Surface Water – There will be no floodplain impacts associated with the routes in the I-75/I-96 Area, nor are there any primary, secondary or other related water crossing impacts expected.

Ground Water – No wells or water intakes are in the I-75/I-96 Area to be affected by the connecting routes.

Significant Habitat Communities – The only wetlands that are likely to be affected are in connecting Plaza II-2 to the Lodge Freeway, which will impact about two-thirds of an acre. No impact is expected on known or expected habitats.

Prime/Unique Farmland – No farmland impacts are incurred in the I-75/I-96 Area. Salt deposits exist throughout the entire Detroit River area. No effect on their extraction is expected

because of placement of connections between plazas and the freeway system in the I-75/I-96 Area.

Belle Isle Area

Surface Water – No floodplain impacts are associated with the St. Jean or Conner routes to I-94. No primary or secondary streams or other water crossings are likely to be affected by either of these routes.

Ground Water – No wells or water intakes are in the Belle Isle Area to be affected by the connecting routes.

Significant Habitat Communities – The Conner route is likely to affect less than one-half an acre of wetland. No known habitat of an endangered species is likely to be impacted. But, the Conner route and the St. Jean route may have an impact on the habitat of the Peregrine Falcon.

Prime/Unique Farmland – No farmland impacts are incurred by the Belle Isle Area route alternatives.

Mineral Resources – No impact is expected to the extraction of mineral resources.

7.4.1 Performance Evaluation

The analysis by the evaluators indicates that the routes most compatible with “Protecting the Natural Environment” are all of those from the area of Plaza C-3 upriver to Plaza N-1 (Table 7-8). Those expected to have the most negative effect are from the area of Plaza S-4 down to Plaza S-1.

Table 7-8
Detroit River International Crossing Study
Evaluation Factor: Protect the Natural Environment
U.S. Routes

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Performance Score	39.2	15.5	38.5	14.3	45.3	50.6	24.4	43.4	49.9	24.3	62.5	67.8	67.5	68.7	68.0
Ranking (1 to 27)	22	26	23	27	20	18	24	21	19	25	17	14	15	12	13

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Alignment	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Performance Score	72.2	66.6	76.3	70.0	88.9	89.4	88.8	84.3	86.6	92.5	86.0	82.0
Ranking (1 to 27)	10	16	9	11	3	2	4	7	5	1	6	8

Source: The Corradino Group of Michigan, Inc.

7.5 Regional Mobility

This evaluation factor examines the effects on the regional transportation system plus a number of links on the interstate system. It is based on data of the end-to-end (Canada-to-U.S.) alternatives of which the connecting route is a key component. Table 7-9 provides the overall data for the regional effects while Table 5-10 and Figure 5-9, presented earlier, depict information on a more localized (link-by-link) basis.

The following discussion of regional mobility is by area. Comparisons are only of the alternatives in that area. A comparison of connecting routes by the “Regional Mobility” evaluation factor for all routes is presented at the end of this section of this report. Section 7.8 then compares the overall performance of all alternatives for all evaluation factors.

Downriver Area

Regional Analysis – Each Downriver crossing is associated with a savings in vehicle miles of travel in the year 2035 peak afternoon traffic hour compared to the No Action condition (where just the Ambassador Bridge and the Detroit-Windsor Tunnel are available crossings in the Detroit River area) (Table 7-9). Those reductions are typically less than one-half percent. On the other hand, peak vehicle hour savings range from 2.3 to 3 percent compared to the No Action condition. In terms of cost (not calculated here), vehicle hours will have a more significant effect on the overall efficiency of the transportation system for commerce and industry.

Another measure of regional travel change is the effect associated with the potential closure of the Ambassador Bridge while a new crossing is in operation. As can be seen from the data in Table 7-9, all routes in the Downriver Area connected to Plazas S-1, S-2, S-3 or S-4 will be associated with an increase of about 10,000 vehicle miles of international travel in the 2035 peak hour, or more, if the Ambassador Bridge were closed. Routes connected to Plaza S-5 will be associated with almost 6,000 additional vehicle miles of travel if the Ambassador Bridge were closed.

Link-by-Link Analysis – The analysis of those links listed on Table 5-10 and Figure 5-9, presented earlier, indicate the Downriver crossing systems help reduce the traffic on the Ambassador Bridge and the Detroit-Windsor Tunnel and thereby reduce the expected peak hour congestion on them. However, the data also indicate that the Downriver crossing systems would only carry one lane of traffic in each direction during the PM peak hour. The DRIC Study concept is for a six-lane connecting road facility (three in each direction) to accommodate traffic in the 30-year horizon and beyond.

**Table 7-9
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Regional Mobility
Supporting Data – Routes Only**

Evaluation Factor	Performance Measure Category	Description/Units	Plaza Route	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5						
			King/I-75 (X1)	King/I-275 (X1)	King/I-75 (X1)	King/I-275 (X1)	Penn/I-75 (X2, X3)	Eureka/I-75 (X2, X3)	Eureka/I-275 (X2, X3)	Penn/I-75 (X2, X3)	Eureka/I-75 (X2)	Eureka/I-275 (X2, X3)	Moran/I-75 (X4)	Dix South/I-75 (X4)	Dix North/I-75 (X4)	Southfield/I-75 (X4)	Southfield/I-194 (X4)							
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636					
			With New Crossing	1,086,266	1,086,489	1,086,271	1,086,502	1,083,738	1,084,774	1,084,565	1,085,504	1,084,428	1,085,365	1,083,739	1,084,650	1,084,324	1,085,195	1,084,152	1,085,082	1,084,061	1,083,958	1,083,966	1,084,374	1,084,337
			Difference from 2035 - No Action	-3,370	-3,147	-3,365	-3,134	-5,898	-4,862	-5,071	-4,132	-5,208	-4,271	-5,897	-4,986	-5,312	-4,441	-5,484	-4,554	-5,575	-5,678	-5,670	-5,262	-5,299
		Percent Difference	-0.31%	-0.29%	-0.31%	-0.29%	-0.54%	-0.45%	-0.47%	-0.38%	-0.48%	-0.39%	-0.54%	-0.46%	-0.49%	-0.41%	-0.50%	-0.42%	-0.51%	-0.52%	-0.52%	-0.48%	-0.49%	
		VHT (int'l traffic only, PM Peak Hour for 2035)	No Action	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113
			With New Crossing	21,633	21,533	21,621	21,529	21,554	21,584	21,574	21,608	21,484	21,522	21,548	21,568	21,566	21,597	21,477	21,504	21,541	21,516	21,516	21,514	21,457
			Difference from 2035 - No Action	-480	-580	-492	-492	-584	-559	-529	-539	-505	-629	-591	-565	-545	-547	-516	-636	-609	-572	-597	-597	-599
		Percent Difference	-2.17%	-2.62%	-2.22%	-2.24%	-2.53%	-2.39%	-2.44%	-2.28%	-2.28%	-2.85%	-2.67%	-2.55%	-2.47%	-2.47%	-2.33%	-2.88%	-2.75%	-2.59%	-2.70%	-2.70%	-2.71%	-2.97%
		V/C (total traffic)		Refer to Table 5-10.																				
		Diversion due to disruption at crossing	Difference of Int'l VMT with Amb Br. Closed and New Crossing Open	17,472	17,455	16,875	16,990	10,187	12,030	12,334	14,036	11,218	12,777	9,195	11,032	10,587	12,249	9,919	11,610	6,645	6,092	6,107	5,870	5,646
	Difference of Int'l VHT with Amb Br. Closed and New Crossing Open		758	559	737	532	366	436	379	433	212	288	332	407	325	399	179	257	95	45	50	-13	-107	
	Detour of Local Arterials	Number of SEMCOG Network Links Rerouted	1	3	2	4	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Alignment Performance	Primary Link: Plaza to I-75	Total Volume (PM Peak Hour, 2035)	1,604	2,333	1,546	2,100	1,683	1,728	1,606	1,648	2,112	2,169	1,806	1,849	1,622	1,665	2,116	2,176	1,628	1,966	1,965	3,066	3,707
			Int'l Volume (PM Peak Hour, 2035)	1,034	1,290	1,091	1,303	1,236	1,289	1,140	1,184	1,334	1,391	1,239	1,289	1,092	1,137	1,297	1,356	1,260	1,415	1,414	1,570	1,766
			Maximum V/C	0.29	0.38	0.30	0.37	0.33	0.34	0.31	0.32	0.38	0.40	0.34	0.35	0.31	0.32	0.38	0.39	0.32	0.36	0.36	0.47	0.57
Secondary Link: I-75		Total Volume (PM Peak Hour, 2035)	NA	3,970	NA	3,903	NA	NA	NA	NA	5,449	5,483	NA	NA	NA	NA	5,452	5,488	NA	NA	NA	NA	7,282	
		Int'l Volume (PM Peak Hour, 2035)	NA	630	NA	637	NA	NA	NA	NA	737	772	NA	NA	NA	NA	743	778	NA	NA	NA	NA	1,185	
		Maximum V/C	NA	0.39	NA	0.39	NA	NA	NA	NA	0.55	0.56	NA	NA	NA	NA	0.55	0.56	NA	NA	NA	NA	0.79	

Evaluation Factor	Performance Measure Category	Description/Units	Plaza Route	C2	C2	C2	C2	C3	C3	C4	I12	I13	I14	N1	N1				
			Schaefer South/I-75 (X8, X9)	Schaefer South/I-94 (X8, X9)	Schaefer North/I-75 (X8, X9)	Schaefer North/I-94 (X8, X9)	Dearborn/I-75 (X10)	Springwells/I-75 (X10)	Dragoon/I-75 (X11)	Lafayette/M-10 (X14)	Lafayette/M-10 (X14)	Gateway/I-75 (X12)	St.Jean/I-94 (X15)	Conner/I-94 (X15)					
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636	1,089,636				
			With New Crossing	1,084,651	1,085,257	1,085,500	1,085,734	1,084,980	1,085,532	1,085,823	1,085,936	1,087,503	1,088,365	1,089,045	1,088,719	1,089,075	1,091,580	1,091,683	1,091,674
			Difference from 2035 - No Action	-4,985	-4,379	-4,136	-3,902	-4,656	-4,104	-3,813	-3,700	-2,133	-1,271	-591	-917	-561	1,944	2,047	2,038
		Percent Difference	-0.46%	-0.40%	-0.38%	-0.36%	-0.43%	-0.38%	-0.35%	-0.34%	-0.20%	-0.12%	-0.05%	-0.08%	-0.05%	0.18%	0.19%	0.19%	
		VHT (int'l traffic only, PM Peak Hour for 2035)	No Action	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113	22,113
			With New Crossing	21,444	21,417	21,415	21,383	21,447	21,429	21,407	21,400	21,424	21,425	21,371	21,343	21,340	21,396	21,509	21,509
			Difference from 2035 - No Action	-669	-697	-698	-730	-666	-684	-706	-713	-689	-688	-742	-770	-773	-717	-604	-604
		Percent Difference	-3.03%	-3.15%	-3.16%	-3.30%	-3.01%	-3.09%	-3.19%	-3.23%	-3.11%	-3.11%	-3.36%	-3.48%	-3.50%	-3.24%	-2.73%	-2.73%	
		V/C (total traffic)		Refer to Table 5-10.															
		Diversion due to disruption at crossing	Difference of Int'l VMT with Amb Br. Closed and New Crossing Open	2,345	968	2,319	858	2,970	1,724	-209	858	1,416	1,339	-23	1,311	1,185	1,701	13,372	13,401
	Difference of Int'l VHT with Amb Br. Closed and New Crossing Open		-431	-436	-492	-486	-420	-416	-527	-486	-549	-557	-709	-663	-667	-712	-160	-154	
	Detour of Local Arterials	Number of SEMCOG Network Links Rerouted	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Alignment Performance	Primary Link: Plaza to I-75	Total Volume (PM Peak Hour, 2035)	3,803	4,109	4,174	4,486	3,571	3,872	3,982	4,258	2,453	2,335	3,783	3,101	3,495	6,118	3,131	2,996
			Int'l Volume (PM Peak Hour, 2035)	1,959	2,302	2,087	2,413	1,930	2,256	2,051	2,359	2,439	2,334	3,780	2,378	2,903	4,212	1,522	1,432
			Maximum V/C	0.57	0.61	0.64	0.69	0.54	0.58	0.62	0.66	0.47	0.44	0.71	0.53	0.57	0.83	0.38	0.35
Secondary Link: I-75		Total Volume (PM Peak Hour, 2035)	NA	NA	3,065	3,203	NA	NA	3,011	3,179	NA	NA	NA	NA	NA	NA	NA	NA	
		Int'l Volume (PM Peak Hour, 2035)	NA	NA	869	1,024	NA	NA	844	1,017	NA	NA	NA	NA	NA	NA	NA	NA	
		Maximum V/C	NA	NA	0.49	0.52	NA	NA	0.48	0.52	NA	NA	NA	NA	NA	NA	NA	NA	

Source: The Corradino Group of Michigan, Inc.

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Another important characteristic to examine is the traffic change at locations throughout the freeway system (Table 5-10 and Figure 5-9). The only significant difference from the No Action condition occurs at I-75 south of the Ambassador Bridge (Point 11). A new Downriver crossing will draw enough traffic to reduce the expected congestion in 2035 at that location from a volume-to-capacity ratio of over 90 percent to one of approximately 75 percent. This is caused largely by the shift in the international trucks to the south, most of which are less likely to have any business in Michigan.

Central Area

Regional Analysis – The seven routes in the Central Area have the ability to reduce vehicle miles of international travel by less than one-half percent compared to the No Action condition. However, they have the potential of reducing by 2.5 to 3.5 percent the vehicle hours of travel associated with 2035 afternoon peak hour international traffic. If the Ambassador Bridge were closed, between 100 and 700 vehicle hours of travel would be saved, if the new river crossing system were in the Central Area.

Link-by-Link Analysis – The data on Table 5-10 indicate that the river crossing systems in the Central Area will attract significant traffic from the existing river crossings and require at least two lanes in the peak direction in the 2035 peak hour. The system associated with the Dragoon-to-I-75 connection to Plaza C-4 connection will have the most significant effect of reducing traffic on the existing border crossing facilities.

All Central Area alternatives have the ability to reduce congestion in the area of I-75 south of the Ambassador Bridge by 14 to 20 percent. Another interesting effect with the Schaefer Road connecting route to I-94 is the ability to reduce traffic on the local Schaefer Road. In these instances, the concept of building the freeway connection from the plaza to I-75 and then on to I-94 leaves Schaefer Road freed up to accommodate non-international/local traffic like among the Ford Rouge Plan facilities/operations.

I-75/I-96 Area

Regional Analysis – The connection of Plazas II-2 and II-3 to the Lodge Freeway and II-4 to I-75 would experience savings of between 3.2 to 3.5 percent in vehicle hours of international travel in the 2035 peak hour. Route connections of Plazas II-2 and II-3 to the Lodge Freeway or the connection of Plaza II-4 to I-75 each would contribute to the savings of 600 to 700 vehicle hours of travel, if the Ambassador Bridge were closed.

Link-by-Link Analysis – All connecting routes in the I-75/I-96 Area will reduce congestion on the Ambassador Bridge and will have some positive effect on I-75 south of the Ambassador Bridge.

Belle Isle Area

Regional Analysis – The Belle Isle connecting routes will experience virtually no change in vehicle miles of travel for international traffic in the 2035 afternoon peak, compared to the No Action condition, whether a St. Jean or Conner connection is used. The savings will be about 2.7 percent in vehicle hours of travel which is among the lowest for all crossing systems analyzed. Under the condition that the Ambassador Bridge is shut for an extended period of time, the Belle Isle Area route connections would not effectively serve the diverted travel, as typified by an increase of over 13,000 VMT experienced by the diverted traffic.

Link-by-Link Analysis – The link-by-link data for the Belle Isle crossing system, including connecting route, indicate it will have a positive effect on relieving congestion on the Ambassador Bridge and the Detroit-Windsor Tunnel under normal conditions. However, it will have no significant effect on I-75 or other freeways in the area. I-94 in the vicinity of the new crossing, which is considered to be improved by 2035 from today’s conditions, will be not be significantly affected by the shift of the international traffic.

7.5.1 Performance Evaluation

Relatively low Regional Mobility performance scores are recorded for all river crossing systems in the Downriver and Belle Isle Areas (Table 7-10). The better performers are the crossing systems in the area from Plaza C-2 in the Central Area to the I-75/I-96 Area.

7.6 Maintain Air Quality

Air quality, along with regional mobility, is analyzed for the end-to-end (U.S.-to-Canada) crossing system. Two sets of data are provided: regional mobility burden and carbon monoxide concentrations at the right-of-way limit of the connecting route. Discussion of these issues, provided below, is divided by area. Comparisons are only for those alternatives in that area. An overall comparison by the “Air Quality” evaluation factor for all connecting routes is provided at the end of this section of the report. Section 7.8 then compares overall performance of all alternatives for all evaluation factors.

Table 7-10
Detroit River International Crossing Study
Evaluation Factor: Improve Regional Mobility
U.S. Routes

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Performance Score	51.7	53.6	52.1	54.1	55.5	54.4	56.3	55.9	54.9	56.5	60.4	60.3	60.1	61.6	63.2
Ranking (1 to 27)	27	25	26	24	21	23	19	20	22	18	14	15/16	17	12	11

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Route	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Performance Score	83.0	84.0	83.9	85.2	84.4	84.2	88.2	82.6	83.0	83.8	60.8	60.3
Ranking (1 to 27)	8/9	5	6	2	3	4	1	10	8/9	7	13	15/16

Source: The Corradino Group of Michigan, Inc.

Downriver Area

Each Downriver route connection would draw some traffic from the existing river crossings at the Ambassador Bridge and the Detroit-Windsor Tunnel. Therefore, they will change the vehicle miles of travel (VMT) and vehicle hours of travel (VHT) of international traffic on the regional roadway system (Table 7-11). The data indicate that among the Downriver alternatives, routes connected to Plazas S-3, S-4 and S-5, will have a greater reduction of air pollutants associated with regional travel. The routes connected to Plazas S-1 and S-2 in the Downriver Area will have a lesser effect on regional pollutant burden.

The carbon monoxide concentration expected to be generated in the 2035 peak hour by international travel using the Downriver connecting routes is forecast to be less than two parts per million along the right-of-way limit of the connecting roadway. The federal standard for carbon monoxide (CO) is 35 parts per million (ppm). The ambient (background) levels of CO in 2005 in Wayne County are between 2.5 and 3.7 parts per million. Therefore, the contributions from any crossing is a fraction of the ambient level and far below the federal standard.

Central Area

The Central Area connecting routes that are expected to have the least positive effect on regional air quality are those connecting to I-75 at Dearborn Avenue, Springwells Avenue and Dragoon Street. Those connected to Plaza C-2 will have a more positive effect on regional air quality.

The concentrations of carbon monoxide on the Central Area connecting routes are expected to be less than two parts per million and not cause the violation of federal standards.

I-75/I-96 Area

The connection of Crossing X-12/Plaza II-4 to I-75 is associated with a small increase in regional pollutant burden associated with the international traffic using the facility in 2035. This results because of a less-direct connection to the crossing in Canada as compared to other alternatives. The other connecting routes in the I-75/I-96 Area are associated with small reductions in regional pollutant burden.

Concentrations of carbon monoxide are expected to be less than two parts per million and cause no violation of the federal standard for CO.

Table 7-11
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Air Pollutants
Supporting Data – Routes Only

		Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5									
		Route	King I-75 (X1)	King I-275 (X1)	King I-75 (X1)	King I-275 (X1)	Penn I-75 (X2, X3)	Eureka I-75 (X2, X3)	Eureka I-275 (X2, X3)	Penn I-75 (X2, X3)	Eureka I-75 (X2)	Eureka I-275 (X2, X3)	Moran I-75 (X4)	Dix South I-75 (X4)	Dix North I-75 (X4)	Southfield I-75 (X4)	Southfield I-94 (X4)									
Evaluation Factor	Performance Measure Category	Description/Units																								
Maintain Air Quality	Regional Burden	Change from No Action Condition (pounds per peak hour)	VOC	VOC	-0.42	-0.39	-0.41	-0.39	-0.73	-0.60	-0.63	-0.51	-0.64	-0.53	-0.73	-0.61	-0.65	-0.55	-0.68	-0.56	-0.69	-0.70	-0.70	-0.65	-0.65	
			CO	CO	-12.44	-11.64	-12.42	-11.59	-21.78	-17.96	-18.73	-15.26	-19.26	-15.79	-21.78	-18.42	-19.62	-16.40	-20.28	-16.84	-20.60	-20.99	-20.95	-19.45	-19.61	
			NOX	NOX	-0.43	-0.40	-0.43	-0.40	-0.76	-0.62	-0.65	-0.53	-0.67	-0.55	-0.76	-0.64	-0.68	-0.57	-0.71	-0.59	-0.72	-0.73	-0.73	-0.68	-0.68	
			PM2.5	PM2.5	-0.02	-0.02	-0.02	-0.02	-0.04	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	
			PM10	PM10	-0.04	-0.04	-0.04	-0.04	-0.08	-0.06	-0.07	-0.05	-0.07	-0.05	-0.07	-0.05	-0.07	-0.06	-0.07	-0.06	-0.07	-0.06	-0.07	-0.07	-0.07	
			Benzene	Benzene	-0.0170	-0.0158	-0.0169	-0.0158	-0.0297	-0.0245	-0.0255	-0.0208	-0.0262	-0.0215	-0.0297	-0.0251	-0.0268	-0.0224	-0.0276	-0.0229	-0.0281	-0.0286	-0.0286	-0.0265	-0.0267	
			1,3 Butadiene	1,3 Butadiene	-0.0017	-0.0016	-0.0017	-0.0016	-0.0029	-0.0024	-0.0025	-0.0021	-0.0026	-0.0021	-0.0029	-0.0025	-0.0026	-0.0022	-0.0027	-0.0023	-0.0028	-0.0028	-0.0028	-0.0028	-0.0026	-0.0026
			Formaldehyde	Formaldehyde	-0.0052	-0.0049	-0.0052	-0.0049	-0.0092	-0.0076	-0.0079	-0.0064	-0.0081	-0.0066	-0.0092	-0.0078	-0.0083	-0.0069	-0.0085	-0.0071	-0.0087	-0.0088	-0.0088	-0.0082	-0.0082	
			Acetaldehyde	Acetaldehyde	-0.0024	-0.0022	-0.0024	-0.0022	-0.0042	-0.0035	-0.0036	-0.0030	-0.0037	-0.0031	-0.0042	-0.0036	-0.0038	-0.0032	-0.0039	-0.0033	-0.0040	-0.0041	-0.0041	-0.0038	-0.0038	
	Acrolein	Acrolein	-0.0003	-0.0002	-0.0003	-0.0002	-0.0005	-0.0004	-0.0004	-0.0003	-0.0004	-0.0003	-0.0005	-0.0004	-0.0004	-0.0003	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004			
	CO Hotspot on Plaza	PPM in peak hour	CALQ3HC	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2			

		Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1						
		Route	Schaefer South I-75 (X8, X9)	Schaefer South I-94 (X8, X9)	Schaefer North I-75 (X8, X9)	Schaefer North I-94 (X8, X9)	Dearborn I-75 (X10)	Springwells I-75 (X10)	Dragoon I-75 (X11)	Lafayette M-10 (X14)	Lafayette M-10 (X14)	Gateway I-75 (X12)	St. Jean I-94 (X15)	Conner I-94 (X15)						
Evaluation Factor	Performance Measure Category	Description/Units																		
Maintain Air Quality	Regional Burden	Change from No Action Condition (pounds per peak hour)	VOC	VOC	-0.61	-0.54	-0.51	-0.48	-0.57	-0.51	-0.47	-0.46	-0.26	-0.16	-0.07	-0.11	-0.07	0.24	0.25	0.25
			CO	CO	-18.45	-16.21	-15.32	-14.46	-17.23	-15.20	-14.12	-13.71	-7.90	-4.71	-2.19	-3.40	-2.08	7.22	7.58	7.55
			NOX	NOX	-0.64	-0.56	-0.53	-0.50	-0.60	-0.53	-0.49	-0.48	-0.28	-0.16	-0.08	-0.12	-0.07	0.25	0.26	0.26
			PM2.5	PM2.5	-0.03	-0.03	-0.03	-0.02	-0.03	-0.03	-0.02	-0.02	-0.01	-0.01	0.00	-0.01	0.00	0.01	0.01	0.01
			PM10	PM10	-0.06	-0.06	-0.05	-0.05	-0.06	-0.05	-0.05	-0.05	-0.03	-0.02	-0.01	-0.01	-0.01	0.02	0.03	0.03
			Benzene	Benzene	-0.0251	-0.0220	-0.0208	-0.0196	-0.0234	-0.0207	-0.0192	-0.0186	-0.0107	-0.0064	-0.0030	-0.0046	-0.0028	0.0098	0.0103	0.0103
			1,3 Butadiene	1,3 Butadiene	-0.0025	-0.0022	-0.0021	-0.0019	-0.0023	-0.0020	-0.0019	-0.0018	-0.0011	-0.0006	-0.0003	-0.0005	-0.0003	0.0010	0.0010	0.0010
			Formaldehyde	Formaldehyde	-0.0077	-0.0068	-0.0064	-0.0061	-0.0072	-0.0064	-0.0059	-0.0057	-0.0033	-0.0020	-0.0009	-0.0014	-0.0009	0.0030	0.0032	0.0032
			Acetaldehyde	Acetaldehyde	-0.0036	-0.0031	-0.0030	-0.0028	-0.0033	-0.0029	-0.0027	-0.0026	-0.0015	-0.0009	-0.0004	-0.0007	-0.0004	0.0014	0.0015	0.0015
	Acrolein	Acrolein	-0.0004	-0.0003	-0.0003	-0.0003	-0.0004	-0.0003	-0.0003	-0.0003	-0.0002	-0.0001	0.0000	-0.0001	0.0000	0.0002	0.0002	0.0002		
	CO Hotspot	PPM in peak hour	CALQ3HC	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		

Source: The Corradino Group of Michigan, Inc.

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Belle Isle Area

A route in this area as part of the river crossing system will increase the vehicle miles of travel on the regional roadway system. As a result, air pollutants at the regional level are expected to increase.

The concentration of carbon monoxide on the connecting route is expected to be less than two parts per million and not cause a violation of federal standards.

7.6.1 Performance Evaluation

The overall results of the evaluation are shown on Table 7-12 and indicate that the least positive performers are the connections of Plazas II-4 to I-75 and the Belle Isle Area routes. Other alternatives perform better in affecting regional air quality associated with international travel.

7.7 Assess How Project Can Be Built (Constructability)

This evaluation factor, also known as constructability, includes four performance measures: maintenance of traffic during construction; site constraints limiting access to the connecting route; geotechnical constraints; and, the relative risk of site conditions (Table 7-13). The discussion of these issues, provided below, is divided by area. Comparisons are only for those alternatives in that area. An overall comparison of connecting routes by the “constructability” evaluation factor for all connecting routes is provided at the end of this section of the report. Section 7.8 then compares overall performance of all alternatives for all evaluation factors.

Downriver Area

Maintenance of Traffic – During construction of all Downriver route connections of the river crossing system, dozens of streets will be either closed or crossed. The most significant effects are associated with the Eureka Road-to-I-275 connections with Plazas S-3 and S-4. The least impacts are associated with the King Road-to-I-75 route connection to Plaza S-1 or S-5. Importantly, the same routes will have the greatest effect on businesses and public-use facilities, more than other Downriver connecting routes. The routes with the fewest effects on businesses and schools/public-use facilities would be the King Road-to-I-75 routes connecting to Plazas S-1 and S-2, plus Moran-to-I-75 and the Dix-to-I-75 routes.

Site Constraints Limiting Access – The most significant effect by utilities and railroads on route construction is associated with the King Road and Eureka Road alternatives. All Downriver crossings will have some engagement with contaminated sites except the King Road routes, the Eureka routes associated with Plaza S-3 and the Dix-North route.

Table 7-12
Detroit River International Crossing Study
Evaluation Factor: Maintain Air Quality
U.S. Routes

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Performance Score	76.5	76.1	77.5	77.3	85.6	84.2	84.3	85.9	84.6	85.0	84.4	84.6	84.6	83.9	84.2
Ranking (1 to 27)	18	19	16	17	2	9/10	8	1	4/5/6	3	7	4/5/6	4/5/6	11	9/10

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Route	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Performance Score	82.0	80.0	80.5	78.1	71.7	70.2	63.1	66.8	62.9	39.4	38.6	38.7
Ranking (1 to 27)	12	14	13	15	20	21	23	22	24	25	27	26

Source: The Corradino Group of Michigan, Inc.

Table 7-13
Detroit River International Crossing Study
Evaluation of Illustrative Alternatives
Constructability
Supporting Data – Routes Only

			Plaza Route	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5	
Evaluation Factor	Performance Measure Category		Description/Units	King/1-75	King/1-275	King/1-75	King/1-275	Penn/1-75	Eureka/1-75	Eureka/1-275	Penn/1-75	Eureka/1-75	Eureka/1-275	Moran/1-75	Dix South/1-75	Dix North/1-75	Southfield/1-75	Southfield/1-94	
Assess How Project Can Be Built	Traffic Maintenance	Streets Crossed/Closed During Construction	Number	17	29	15	31	40	41	75	48	50	84	38	38	41	50	71	
		Businesses affected by construction ¹	Number w/i 328 ft/100 meters	29	44	28	43	46	57	256	51	61	260	28	13	8	72	153	
		Schools or public use facilities affected by construction	Number w/i 328 ft/100 meters	0	1	0	1	5	6	9	6	6	9	4	4	6	3	5	
		Existing Railroads Crossed	Number	2	4	3	5	3	7	7	4	8	8	0	1	1	1	5	
		Existing Utilities Crossed	Number	5	8	12	15	3	1	2	7	5	6	11	10	11	7	12	
		Contaminated Sites/Hazardous Materials within 500ft/150m (single sites may have multiple designations)	EPA/DEQ Hazmat TSD Facility		0	0	0	0	0	0	0	0	1	1	1	0	0	0	0
			National Priority List (Superfund)		0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
	RTK Cerclis (Superfund)			0	0	0	0	1	0	0	0	2	1	1	0	0	0	1	
	Michigan Contaminated Sites			0	0	0	0	1	0	0	2	1	1	0	0	0	0	1	
	Geotechnical constraints- identify any unusual geotechnical features/issues that may be problematic for construction	Proximity to solution mining areas	Number w/i 1,000 ft/300 meters	0	0	6	6	1	1	1	10+	10+	10+	0	0	0	0	0	
		Presence of poor soil conditions (e.g., compressible/expansive & organic)	Yes/No	No	No	No	No	No	No	No	No	No	Low	Low	Low	Low	Low	Low	
		Presence of noxious gasses (e.g., Hydrogen Sulfide and Methane)	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Medium	Medium	Medium	Medium	Medium	Medium	
		Presence of artesian groundwater	Yes/No	No	No	No	No	No	No	No	No	No	Low	Medium	Medium	Medium	Medium	Medium	
Relative complexity of known site conditions (environmental, geotechnical, other physical/construction methodologies)	Engineering Consideration	High/Medium/Low	Low	Low	Low	Low	Medium	Medium	Medium	Medium	Medium	Medium	Low	High	High	High	Very High		

			Plaza Route	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1	
Evaluation Factor	Performance Measure Category		Description/Units	Schaefer South/1-75	Schaefer South/1-94	Schaefer North/1-75	Schaefer North/1-94	Dearborn/1-75	Springwells/1-75	Dragoon/1-75	Lafayette/M-10	Lafayette/M-10	Gateway/1-75	St.Jean/1-94	Conner/1-94	
Assess How Project Can Be Built	Traffic Maintenance	Streets Crossed/Closed During Construction	Number	58	69	58	69	22	24	42	29	21	0	48	54	
		Businesses affected by construction	Number w/i 328 ft/100 meters	35	52	16	33	0	13	28	29	20	0	28	66	
		Adjacent schools or public use facilities affected by construction	Number w/i 328 ft/100 meters	7	7	2	2	5	2	2	0	0	2	10	6	
		Existing Railroads Crossed	Number	2	5	3	6	4	1	0	0	0	0	6	3	
		Existing Utilities Crossed	Number	1	5	25	29	3	0	0	0	0	0	4	0	
		Contaminated Sites/Hazardous Materials within 500ft/150m (single sites may have multiple designations)	EPA/DEQ Hazmat TSD Facility		0	0	0	0	0	1	1	2	1	0	0	0
			National Priority List (Superfund)		0	0	0	0	0	0	0	0	0	0	0	0
	RTK Cerclis (Superfund)			1	2	1	2	0	1	0	1	1	0	1	0	
	Michigan Contaminated Sites			1	1	1	1	0	0	0	0	0	0	0	1	
	Geotechnical constraints- identify any unusual geotechnical features/issues that may be problematic for construction	Proximity to solution mining areas	Number w/i 1,000 ft/300 meters	0	0	1	1	2±	0	0	0	0	0	0	0	
		Impact of poor soil conditions (e.g., compressible/expansive & organic)	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low	Low	Low	Hig	High	
		Impact of noxious gasses (e.g., Hydrogen Sulfide and Methane)	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Medium	Medium	Medium	Low	Low	
		Impact of artesian groundwater	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Medium	Medium	Medium	Low	Low	
Relative complexity of known site conditions (environmental, geotechnical, other physical/construction methodologies)	Engineering Consideration	High/Medium/Low	Medium	High	Medium	High	High	Medium	Medium	Medium	Medium	Low	High	High		

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Notes;

1. As reflected by the number of businesses to be acquired.

Source: The Corradino Group of Michigan, Inc.

Geotechnical Constraints – The King Road routes connected to Plaza S-2, the Pennsylvania Road connection to Plaza S-4, and the Eureka Road connection to Plaza S-4 will have significant exposure to known solution mining areas. However, because the structures that will be developed are not as massive as the crossing, this effect will be more limited. Therefore, the likely impact in the Downriver Area on geotechnical constraints is most limiting with the connecting routes along Southfield Road to I-94.

Relative Risk – The overall relative risk of constructing the project is highest with the Southfield connection to I-94 that is associated with Plaza S-5.

Central Area

Maintenance of Traffic – The most significant maintenance of traffic issues are associated with the Schaefer Road connections to I-75 or I-94 when connected with Plaza C-2. Almost 70 roads would be closed or crossed during construction. The Schaefer Road South to I-94 route would affect the most businesses and, together with Schaefer Road South to I-75, the most schools/public-use facilities.

Site Constraints Limiting Access – Two to three dozen railroads and utilities will affect construction of the Schaefer Road North connection to I-75 or I-94. All route connections in this area, except Dearborn, will have to address contaminated sites of some significance.

Geotechnical Constraints – All of the routes in the Central Area will have a high exposure to poor soil conditions, noxious gases and artesian water.

Relative Risk – The relative risk of developing a Central Area route is high for the Schaefer Road connections to I-94 and the connection of Plaza C-3 to I-75 at Dearborn Avenue. All other Central Area connections have a medium risk.

I-75/I-96 Area

Maintenance of Traffic – During construction of the routes to the Lodge Freeway, from Plaza II-3, 29 and 21 streets will be closed or crossed, respectively. The II-4 route in the I-75/I-96 Area will not cause closures of local streets during construction. Likewise, a number of businesses would be affected (20 to 30), except by II-4. Few public facilities would be affected by the II plazas and only by the connection to II-4.

Site Constraints Limiting Access – Interference by railroad lines or utilities will not be an issue with the routes connecting plazas to freeways in the I-75/I-96 Area. The connections to the

Lodge Freeway from Plazas II-2 or II-3 will be affected by at least two environmentally contaminated sites. That is not expected to be the case with the II-4 to I-75 connection.

Geotechnical Constraints – Known brine wells are not an issue on the U.S. side of the Detroit River in the I-75/I-96 Area. And, the effect of poor soil conditions is expected to be low. The presence of noxious gases and artesian groundwater will present a medium risk to completing the project within the time and budget for each of the route-to-plaza-to-freeway connections in this area.

Relative Risk – Based on the above factors, the relative risk to completing as planned the plaza-to-freeway connections in this area is “medium” for the connections to the Lodge Freeway and “low” for the II-4 to I-75 connection.

Belle Isle Area

Maintenance of Traffic – Either the St. Jean or the Conner route will involve closing or crossing about four dozen streets during construction. Likewise, numerous businesses and public facilities would be affected by construction.

Site Constraints Limiting Access – Construction of the St. Jean route will be affected by crossing up to ten utility or railroad lines. Constructing the Conner route will involve three railroad crossings. Both connecting routes will have exposure to at least one site of significant contamination.

Geotechnical Constraints – The limitation is high of poor soil conditions on the construction of either connecting route in the Belle Isle Area. However, the exposure to noxious gases and artesian groundwater is considered relatively low.

Relative Risk – The overall risk of constructing the connecting routes in the Belle Isle Area is considered high.

7.7.1 Performance Evaluation

All routes are constructible. The ones that will likely experience the greatest challenges to completion as planned are the Eureka Road connections to I-275 with either Plazas S-3 or S-4, and the Southfield Road connection between Plaza S-4 and I-94. The alternative presenting the least difficulty is the connection of Plaza II-4 to I-75 (Table 7-14).

Table 7-14
Detroit River International Crossing Study
Evaluation Factor: Assess How Project Can Be Built
U.S. Routes

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Performance Score	70.3	66.7	67.7	63.8	64.5	62.0	51.1	60.5	58.7	49.7	66.7	65.0	63.2	60.9	48.1
Ranking (1 to 27)	3	7/8	5	13	12	16	25	18	21	26	7/8	11	14	17	27

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Route	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Performance Score	60.3	55.4	57.1	52.8	65.8	67.5	66.3	74.8	68.0	87.4	62.9	60.4
Ranking (1 to 27)	20	23	22	24	10	6	9	2	4	1	15	19

Source: The Corradino Group of Michigan, Inc.

7.8 Overall Evaluation of U.S. Routes

The overall evaluation of this third component of the border crossing system – the routes connecting the plaza to a nearby interstate highway – indicates the following (Table 7-15).

<u>Downriver Area</u>	
• Route S-1/King Road/I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Consistency with Local Planning.
• Route S-1/King Road/I-275:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Natural Environment.
• Route S-2/King Road/I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Consistency with Local Planning.
• Route S-2/King Road/I-275:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Natural Environment.
• Route S-3/Pennsylvania Road/ I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Consistency with Local Planning.
• Route S-3/Eureka Road/I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Consistency with Local Planning.
• Route S-3/Eureka Road/I-275:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Natural Environment
• Route S-4/Pennsylvania Road/ I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Community/ Neighborhood Characteristics
• Route S-4/Eureka Road/I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Community/ Neighborhood Characteristics
• Route S-4/Eureka Road/I-275:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Community/ Neighborhood Characteristics
• Route S-5/Moran/I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Protecting the Community/ Neighborhood Characteristics
• Route S-5/Dix-South/I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Consistency with Local Planning
• Route S-5/Dix-North/I-75:	Performs <u>best</u> in Maintaining Air Quality. Performs <u>least</u> in Consistency with Local Planning

Table 7-15
Detroit River International Crossing Study
Unweighted Performance Scores
Routes on U.S. Side of River

Plaza	S1	S1	S2	S2	S3	S3	S3	S4	S4	S4	S5	S5	S5	S5	S5
Route	King/ I-75	King/ I-275	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75	Southfield/ I-94
Protect Community/ Neighborhood	49.40	35.70	50.10	35.90	43.70	35.90	20.60	43.20	38.70	20.40	40.30	44.00	44.70	43.30	38.10
Consistency with Local Planning	31.80	33.10	32.80	33.10	42.20	35.60	35.60	44.20	41.70	41.70	41.10	40.20	31.80	42.10	42.70
Protect Cultural Resources	54.80	48.40	75.70	48.80	50.70	72.50	54.60	52.60	56.10	51.40	57.80	87.00	57.70	47.10	38.40
Protect Natural Environment	39.20	15.50	38.50	14.30	45.30	50.60	24.40	43.40	49.90	24.30	62.50	67.80	67.50	68.70	68.00
Improve Regional Mobility	51.70	53.60	52.10	54.10	55.50	54.40	56.30	55.90	54.90	56.50	60.40	60.30	60.10	61.60	63.20
Maintain Air Quality	76.50	76.10	77.50	77.30	85.60	84.20	84.30	85.90	84.60	85.00	84.40	84.60	84.60	83.90	84.20
Constructability	70.30	66.70	67.70	63.80	64.50	62.00	51.10	60.50	58.70	49.70	66.70	65.00	63.20	60.90	48.10

Plaza	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
Route	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Protect Community/ Neighborhood	38.70	35.40	37.60	38.10	63.70	57.50	44.50	50.10	52.20	69.60	41.40	39.40
Consistency with Local Planning	43.40	45.40	44.10	44.80	33.80	43.90	72.90	44.00	43.10	82.90	42.90	40.70
Protect Cultural Resources	39.40	34.90	37.40	37.90	56.00	58.80	42.80	22.30	24.20	87.50	44.70	46.50
Protect Natural Environment	72.20	66.60	76.30	70.00	88.90	89.40	88.80	84.30	86.60	92.50	86.00	82.00
Improve Regional Mobility	83.00	84.00	83.90	85.20	84.40	84.20	88.20	82.60	83.00	83.80	60.80	60.30
Maintain Air Quality	82.00	80.00	80.50	78.10	71.70	70.20	63.10	66.80	62.90	39.40	38.60	38.70
Constructability	60.30	55.40	57.10	52.80	65.80	67.50	66.30	74.80	68.00	87.40	62.90	60.40

Source: The Corradino Group of Michigan, Inc.

Downriver Area (continued)

- Route S-5/Southfield/I-75: Performs best in Maintaining Air Quality.
Performs least in Consistency with Local Planning
- Route S-5/Southfield/I-94: Performs best in Maintaining Air Quality.
Performs least in Protecting the Community/
Neighborhood Characteristics

Central Area

- Route C-2/Schaefer Road-South/
I-75: Performs best in Improving Regional Mobility.
Performs least in Protecting Community/
Neighborhood Characteristics.
- Route C-2/Schaefer Road-South/
I-94: Performs best in Improving Regional Mobility.
Performs least in Protecting Cultural Resources.
- Route C-2/Schaefer Road-North/
I-75: Performs best in Improving Regional Mobility.
Performs least in Protecting Cultural Resources.
- Route C-2/Schaefer Road-North/
I-94: Performs best in Improving Regional Mobility.
Performs least in Protecting Cultural Resources.
- Route C-3/Dearborn/I-75: Performs best in Protecting Natural Environment.
Performs least in Consistency with Local Planning.
- Route C-3/Springwells/I-75: Performs best in Protecting Natural Environment.
Performs least in Consistency with Local Planning.
- Route C-4/Dragoon/I-75: Performs best in Protecting Natural Environment.
Performs least in Protecting Cultural Resources.

I-75/I-96 Area

- Route II-2/M-10: Performs best in Protecting Natural Environment.
Performs least in Protecting Cultural Resources.
- Route II-3/M-10: Performs best in Protecting Natural Environment.
Performs least in Protecting Cultural Resources.
- Route II-4/I-75: Performs best in Protecting Natural Environment.
Performs least in Maintaining Air Quality.

Belle Isle Area

- Route N-1/St. Jean/I-94: Performs best in Protecting Natural Environment.
Performs least in Maintaining Air Quality.
- Route N-1/Conner/I-94: Performs best in Protecting Natural Environment.
Performs least in Maintaining Air Quality.

When examining the scoring of the plazas by evaluation factor, the following are the best and least performers.

Protect the Community/Neighborhood:	Best Performers:	Route C-3/Dearborn/I-75 Route C-3/Springwells/I-75 Route II-4/I-75
	Least Performers:	All other routes

Consistency with Local Planning:	Best Performers:	Route C-4/Dragoon/I-75 Route II-4/I-75
	Least Performers:	All others

Protect Cultural Resources:	Best Performers:	Route S-5/Dix-South/I-75 Route II-4/I-75
	Least Performers:	Route S-1/King Road/I-275 Route S-2/King Road/I-275 Route S-5/Southfield Road/I-75 Route S-5/Southfield Road/I-94 Route C-2/Schaefer Road-South/I-75 Route C-2/Schaefer Road-South/I-94 Route C-2/Schaefer Road-North/I-75 Route C-2/Schaefer Road-North/I-94 Route C-4/Dragoon/I-75 Route II-2/M-10 Route II-3/M-10 Route N-1/St. Jean/I-94 Route N-1/Conner/I-94

Protect the Natural Environment:	Best Performers:	Route C-3/Dearborn/I-75 Route C-3/Springwells/I-75 Route C-4/Dragoon/I-75 Route II-2/M-10 Route II-3/M-10 Route II-4/I-75 Route N-1/St. Jean/I-94 Route N-1/Conner/I-94
	Least Performers:	Route S-1/King Road/I-75 Route S-1/King Road/I-275 Route S-2/King Road/I-75 Route S-2/King Road/I-275 Route S-3/Pennsylvania Road/I-75

Route S-3/Eureka Road/I-275
Route S-4/Pennsylvania Road/I-75
Route S-4/Eureka Road/I-75
Route S-4/Eureka Road/I-275

Improve Regional Mobility:

Best Performers: Route C-2/Schaefer Road-South/I-75
Route C-2/Schaefer Road-South/I-94
Route C-2/Schaefer Road-North/I-75
Route C-2/Schaefer Road-North/I-94
Route C-3/Dearborn/I-75
Route C-3/Springwells/I-75
Route C-4/Dragoon/I-75
Route II-2/M-10
Route II-3/M-10
Route II-4/I-75

Least Performers: Route S-1/King/I-75
Route S-1/King/I-275
Route S-2/King/I-75
Route S-2/King/I-275
Route S-3/Pennsylvania/I-75
Route S-3/Eureka/I-75
Route S-3/Eureka/I-275
Route S-4/Pennsylvania/I-75
Route S-4/Eureka/I-75
Route S-4/Eureka/I-275

Maintain Air Quality:

Best Performers: Route S-3/Pennsylvania Road/I-75
Route S-3/Eureka Road/I-75
Route S-3/Eureka Road/I-275
Route S-4/Pennsylvania Road/I-75
Route S-4/Eureka Road/I-75
Route S-4/Eureka Road/I-275
Route S-5/Moran/I-75
Route S-5/Dix-South/I-75
Route S-5/Dix-North/I-75
Route S-5/Southfield Road/I-75
Route S-5/Southfield Road/I-94
Route C-2/Schaefer Road-South/I-75
Route C-2/Schaefer Road-South/I-94
Route C-2/Schaefer Road-North/I-75

Least Performers: Route II-4/I-75
Route N-1/St. Jean/I-94
Route N-1/Conner/I-94

Constructability:

Best Performer: Route II-4/I-75

Least Performers: Route S-4/Eureka Road/I-275
Route S-5/Southfield Road/I-94

These performances were then combined with the evaluation factors (Table 7-16). When comparing the Citizens' and Technical Team's weighted scores, it can be seen the two groups agree the following routes are the top five performers:

- Route S-5/Dix-South/I-75
- Route C-3/Dearborn/I-75
- Route C-3/Springwells/I-75
- Route C-4/Dragoon/I-75
- Route II-4/I-75

All but the S-5/Dix-South/I-75 Route is among the top scorers in the Regional Mobility area, which is a direct measure of the proposed alternative's ability to meet several of the project's needs.

These performances will be combined with the evaluation of the other components of the crossing system to help develop the list of Practical Alternatives.

Table 7-16
Detroit River International Crossing Study
Weighted Performance Scores
Routes on U.S. Side of River

Plaza	S-1	S-1	S-2	S-2	S-3	S-3	S-3	S-4	S-4	S-4	S-5	S-5	S-5	S-5
Route	King/ I-75	King/ I-75	King/ I-75	King/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Penn/ I-75	Eureka/ I-75	Eureka/ I-275	Moran/ I-75	Dix South/ I-75	Dix North/ I-75	Southfield/ I-75
Group														
Citizen Weighted	52.46	44.78	56.13	44.76	54.94	56.47	45.60	54.98	55.00	46.00	58.50	64.72	58.56	58.14
Ranking (1 to 27)	21	26	15	27	20	13	25	19	18	24	7	4	6	8
Technical Team Weight	53.53	47.02	56.19	46.81	55.10	55.85	46.22	54.80	54.50	46.35	58.77	63.57	58.76	58.31
Ranking (1 to 27)	22	24	15	25	17	16	27	19	20	26	11	5	12	14

Plaza	S-5	C-2	C-2	C-2	C-2	C-3	C-3	C-4	II-2	II-3	II-4	N-1	N-1
Route	Southfield/ I-94	Schaefer South/ I-75	Schaefer South/ I-94	Schaefer North/ I-75	Schaefer North/ I-94	Dearborn/ I-75	Springwells/ I-75	Dragoon/ I-75	Lafayette/ M-10	Lafayette/ M-10	Gateway/ I-75	St. Jean/ I-94	Conner/ I-94
Group													
Citizen Weighted	55.06	57.91	55.27	57.75	56.33	65.29	66.01	64.06	57.41	57.25	74.90	51.98	50.70
Ranking (1 to 27)	17	9	16	10	14	3	2	5	11	12	1	22	23
Technical Team Weight	54.93	60.98	58.56	60.74	59.47	68.43	68.82	67.15	62.37	61.89	77.62	54.38	53.07
Ranking (1 to 27)	18	8	13	9	10	3	2	4	6	7	1	21	23

Source: The Corradino Group of Michigan, Inc.

8. RESULTS WITHOUT WEIGHTS AND WITH WEIGHTS

After starting with 51 crossing systems, then removing 14 that are affected by unique circumstances, the analysis of the Detroit River International Crossing Study led to the evaluation of the effectiveness of each of 37 river crossing systems in the U.S. – crossing, plaza and route. The results of that analysis are summarized below by: 1) the scores applied by the U.S. consultant; 2) those results weighted by Citizen and Technical Team input; and, 3) cost-effectiveness.

8.1 Effectiveness Results Without Weights

There are several steps that were taken to define the Practical Alternatives, i.e., a short list of end-to-end crossing systems. The first step was developing performance scores of the alternatives based on the analysis by the U.S. consultants of the data shown in Table 2-1 for each plaza, river crossing and connecting route. Those scores are presented in Attachment A. A summary of that performance is provided here by area in reaching the following conclusions (Tables 8-1 and 8-2).

Downriver Area/21 Crossing Systems

Table 8-1A
Detroit River International Crossing Study
Ranking of 21 Crossing Systems
in Downriver Area
Without Weights

Downriver Area	Total Crossing Systems in Area	Number Ranking in Top or Bottom													
		Comm/Neigh.		Local Planning		Cult. Res.		Nat. Env.		Reg. Mob.		Air Quality		Constructability	
		Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19
	21	10	11	7	14	16	5	5	16	4	17	17	4	7	14

Source: The Corradino Group of Michigan, Inc.

- 11 of 21 Downriver crossing systems are among the 19 alternatives in the bottom half of alternatives in Protecting the Community/Neighborhoods. Four Downriver alternatives are in the top five of the 37 crossing systems:
 - ✓ X-4/S-5 (Michigan Steel Works)/Moran/I-75
 - ✓ X-4/S-5 (Michigan Steel Works)/Dix-South/I-75
 - ✓ X-4/S-5 (Michigan Steel Works)/Dix-North/I-75
 - ✓ X-4/S-5 (Michigan Steel Works)/Southfield/I-75.

Table 8-2A
Detroit River International Crossing Study
Unweighted Performance Evaluation
21 Downriver Crossing Systems (Route + Plaza + Crossing)
U.S. Side of Border

All Alternatives Aggregate Unweighted Scores											
	Plaza	S1	S1	S2	S2	S3	S3	S3	S3	S3	S3
	Crossing	X1S1	X1S1	X1S2	X1S2	X2S3	X2S3	X2S3	X3S3	X3S3	X3S3
	Alignment	S1King/I-75	S1King/I-275	S2King/I-75	S2King/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275
Community Neighborhood Impacts		147.30	133.60	154.00	139.80	145.90	138.10	122.80	146.90	139.10	123.80
Consistency w/Local Planning		111.80	113.10	107.00	107.30	185.20	178.60	178.60	184.20	177.60	177.60
Cultural Resources		213.20	206.80	233.80	206.90	217.80	239.60	221.70	217.90	239.70	221.80
Natural Environment		136.60	112.90	154.60	130.40	142.20	147.50	121.30	139.90	145.20	119.00
Regional Mobility		159.10	161.00	160.00	162.00	168.10	167.00	168.90	170.80	169.70	171.60
Air Quality		228.50	228.10	229.40	229.20	252.50	251.10	251.20	252.50	251.10	251.20
Constructability		196.70	193.10	190.20	186.30	188.20	185.70	174.80	187.20	184.70	173.80

All Alternatives Aggregate Rank by Factor											
	Plaza	S1	S1	S2	S2	S3	S3	S3	S3	S3	S3
	Crossing	X1S1	X1S1	X1S2	X1S2	X2S3	X2S3	X2S3	X3S3	X3S3	X3S3
	Alignment	S1King/I-75	S1King/I-275	S2King/I-75	S2King/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275
Community Neighborhood Impacts		13	33	6	28	16	31	35	15	29	34
Consistency w/Local Planning		35	34	37	36	3	13	13	4	15	15
Cultural Resources		15	17	3	16	14	2	12	13	1	11
Natural Environment		29	36	22	32	25	23	33	26	24	34
Regional Mobility		37	35	36	34	32	33	31	28	30	26
Air Quality		28	29	26	27	4	14	11	4	14	11
Constructability		9	14	18	25	21	27	30	23	28	31

All Alternatives Aggregate Unweighted Scores												
	Plaza	S4	S4	S4	S4	S4	S4	S5	S5	S5	S5	
	Crossing	X2S4	X2S4	X2S4	X3S4	X3S4	X3S4	X4	X4	X4	X4	
	Alignment	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275	S5Moran/I-75	S5Dix South/I-75	S5Dix North/I-75	S5Southfield/I-75	S5Southfield/I-94
Community Neighborhood Impacts		145.10	140.60	122.30	145.40	140.90	122.60	155.10	158.80	159.50	158.10	152.90
Consistency w/Local Planning		142.10	139.60	139.60	143.80	141.30	141.30	128.00	127.10	118.70	129.00	129.60
Cultural Resources		228.30	231.80	227.10	228.30	231.80	227.10	194.30	223.50	194.20	183.60	174.90
Natural Environment		133.00	139.50	113.90	130.70	137.20	111.60	183.00	188.30	188.00	189.20	188.50
Regional Mobility		171.60	170.60	172.20	173.80	172.80	174.40	183.10	183.00	182.80	184.30	185.90
Air Quality		253.60	252.30	252.70	253.20	251.90	252.30	251.10	251.30	251.30	250.60	250.90
Constructability		169.50	167.70	158.70	168.50	166.70	157.70	203.30	201.60	199.80	197.50	184.70

All Alternatives Aggregate Rank by Factor												
	Plaza	S4	S4	S4	S4	S4	S4	S5	S5	S5	S5	
	Crossing	X2S4	X2S4	X2S4	X3S4	X3S4	X3S4	X4	X4	X4	X4	
	Alignment	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275	S5Moran/I-75	S5Dix South/I-75	S5Dix North/I-75	S5Southfield/I-75	S5Southfield/I-94
Community Neighborhood Impacts		20	26	37	18	25	36	5	3	2	4	7
Consistency w/Local Planning		19	22	22	18	20	20	30	31	33	29	28
Cultural Resources		6	4	8	6	4	8	18	10	19	30	32
Natural Environment		30	27	35	31	28	37	17	12	13	9	11
Regional Mobility		27	29	25	23	24	22	17	18	19	16	15
Air Quality		1	7	3	2	8	6	13	9	9	17	16
Constructability		32	34	36	33	35	37	5	6	7	8	28

Source: The Corradino Group of Michigan, Inc.

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Table 8-2B
Detroit River International Crossing Study
Unweighted Performance Evaluation
11 Central Area Crossing Systems (Route + Plaza + Crossing)
U.S. Side of Border

All Alternatives Aggregate Unweighted Scores

	Plaza	C2	C3	C3	C4							
	Crossing	X8	X8	X8	X8	X9	X9	X9	X9	X10	X10	X11
	Alignment	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	C3Dearborn/I 75	C3Springwells/ I-75	C4Dragoon/I 75
Community Neighborhood Impacts		151.70	148.40	150.60	151.10	145.80	142.50	144.70	145.20	150.50	144.30	134.30
Consistency w/Local Planning		180.60	182.60	181.30	182.00	179.60	181.60	180.30	181.00	124.00	134.10	188.90
Cultural Resources		188.90	184.40	186.90	187.40	188.70	184.20	186.70	187.20	181.10	183.90	187.20
Natural Environment		185.10	179.50	189.20	182.90	183.30	177.70	187.40	181.10	236.10	236.60	248.00
Regional Mobility		253.10	254.10	254.00	255.30	253.30	254.30	254.20	255.50	256.90	256.70	264.40
Air Quality		243.00	241.00	241.50	239.10	243.10	241.10	241.60	239.20	218.40	216.90	191.90
Constructability		196.00	191.10	192.80	188.50	194.40	189.50	191.20	186.90	185.90	187.60	232.90

All Alternatives Aggregate Rank by Factor

	Plaza	C2	C3	C3	C4							
	Crossing	X8	X8	X8	X8	X9	X9	X9	X9	X10	X10	X11
	Alignment	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	C3Dearborn/I 75	C3Springwells/ I-75	C4Dragoon/I 75
Community Neighborhood Impacts		8	12	10	9	17	23	21	19	11	22	32
Consistency w/Local Planning		10	5	8	6	12	7	11	9	32	26	2
Cultural Resources		20	27	25	22	21	28	26	23	31	29	24
Natural Environment		15	20	9	18	16	21	14	19	5	4	2
Regional Mobility		11	8	9	5	10	6	7	4	2	3	1
Air Quality		19	23	21	25	18	22	20	24	30	31	34
Constructability		10	17	15	20	12	19	16	24	26	22	1

Source: The Corradino Group of Michigan, Inc.

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Table 8-2C
Detroit River International Crossing Study
Unweighted Performance Evaluation
5 Crossing Systems (Route + Plaza + Crossing) in I-75/I-96 and Belle Isle Areas
U.S. Side of Border

All Alternatives Aggregate Unweighted Scores						
	Plaza	II2	II3	II4	N1	N1
		X14BII2	X14BII3	X12	X15B	X15B
	Crossing	II2Lafayette/ M-10	II3Lafayette/ M-10	II4Gateway/ I-75	N1 St. Jean/I- 94	N1 Conner/I- 94
Community Neighborhood Impacts		146.90	141.30	174.20	140.20	138.20
Consistency w/Local Planning		170.90	138.50	252.10	134.90	132.70
Cultural Resources		157.40	151.30	174.30	146.30	148.10
Natural Environment		228.60	240.60	253.50	206.00	202.00
Regional Mobility		247.30	248.40	243.70	175.20	174.70
Air Quality		202.70	194.50	121.90	120.60	120.70
Constructability		212.80	208.70	226.60	195.80	193.30

All Alternatives Aggregate Rank by Factor						
	Plaza	II2	II3	II4	N1	N1
		X14BII2	X14BII3	X12	X15B	X15B
	Crossing	II2Lafayette/ M-10	II3Lafayette/ M-10	II4Gateway/ I-75	N1 St. Jean/I- 94	N1 Conner/I- 94
Community Neighborhood Impacts		14	24	1	27	30
Consistency w/Local Planning		17	24	1	25	27
Cultural Resources		34	35	33	37	36
Natural Environment		6	3	1	7	8
Regional Mobility		13	12	14	20	21
Air Quality		32	33	35	37	36
Constructability		3	4	2	11	13

Source: The Corradino Group of Michigan, Inc.

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- 14 of 21 proposals are among the 19 alternatives in the bottom half in being Consistent with Local Planning. Two are in the top five of the 37 crossing systems:
 - ✓ X-2/S-3 (Atofina West)/Pennsylvania/I-75
 - ✓ X-3/S-3 (Atofina West)/Pennsylvania/I-75

- 16 of 21 proposals are among the 18 alternatives in the top half in Protecting Cultural Resources. Four are in the top five of the 37 crossing systems:
 - ✓ X-1/S-2 (McLouth Steel)/King/I-75
 - ✓ X-2/S-3 (Atofina West)/Pennsylvania/I-75
 - ✓ X-2/S-3 (Atofina West)/Eureka/I-75
 - ✓ X-3/S-3 (Atofina West)/Eureka/I-75

- 16 of 21 proposals are among the 19 alternatives in the bottom half in Protecting Natural Resources. No Downriver crossing system is in the top five of the 37 crossing systems.

- 17 of 21 proposals are among the 19 alternatives in the bottom half in Improving Regional Mobility. No Downriver crossing system is in the top five of the 37 crossing systems.

- 17 of 21 proposals are among the 18 alternatives in the top half in Maintaining Air Quality. The top five alternatives come from the Downriver Area:
 - ✓ X-2/S-3 (Atofina West)/Pennsylvania/I-75
 - ✓ X-3/S-3 (Atofina West)/Pennsylvania/I-75
 - ✓ X-2/S-4 (Atofina East)/Pennsylvania/I-75
 - ✓ X-2/S-4 (Atofina East)/Eureka/I-275
 - ✓ X-3/S-4 (Atofina East)/Pennsylvania/I-75

- 14 of 21 proposals are among the 19 alternatives in the bottom half of all alternatives in Constructability. One alternative is in the top five of the 37 crossing systems:
 - ✓ X-4/S-5 (Michigan Steel Works)/Moran/I-75

Central Area/11 Crossing Systems

Table 8-1B
Detroit River International Crossing Study
Ranking of 11 Crossing Systems
in Central Area
Without Weights

Central Area	Total Crossing Systems in Area	Number Ranking in Top or Bottom													
		Comm/Neigh.		Local Planning		Cult. Res.		Nat. Env.		Reg. Mob.		Air Quality		Constructability	
		Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19
	11	6	5	9	2	0	11	8	3	11	0	0	11	6	5

Source: The Corradino Group of Michigan, Inc.

- 6 of 11 Central Area crossing systems are among the 18 alternatives in the top half of all alternatives in Protecting the Community/Neighborhoods. No Central Area crossing system is in the top five.
- 9 of 11 proposals are among the 18 alternatives in the top half in being Consistent with Local Planning. Two alternatives are in the top five.
 - ✓ X-8/C-2 (U.S. Steel North)/Schaefer-South/I-94
- All 11 proposals are among the 19 alternatives in the bottom half in Protecting Cultural Resources. No alternative is in the top five.
- 8 of 11 proposals are among the 18 alternatives in the top half in Protecting the Natural Environment. Three alternatives are in the top five.
 - ✓ X-10/C-3 (Delray West)/Dearborn/I-75
 - ✓ X-10/C-3 (Delray West)/Springwells/I-75
 - ✓ X-11/C-4 (Delray East)/Dragoon/I-75
- All 11 of the Central Area crossing systems are among the 18 alternatives in the top half in Improving Regional Mobility. All five top performers are from the Central Area:
 - ✓ X-8/C-2 (U.S. Steel North)/Schaefer-North/I-94
 - ✓ X-9/C-2 (U.S. Steel North)/Schaefer-North/I-94
 - ✓ X-10/C-3 (Delray West)/Dearborn/I-75

- ✓ X-10/C-3 (Delray West)/Springwells/I-75
 - ✓ X-11/C-4 (Delray East)/Dragoon/I75
- All 11 of the Central Area crossing systems are among the 19 alternatives in the bottom half in Maintaining Air Quality. No alternative for the Central Area is in the top five.
 - 6 of 11 proposals are among the 18 alternatives in the top half of all alternatives in Constructability. One alternative is in the top five:
 - ✓ X-11/C-4 (Delray East)/Dragoon/I-75

I-75/I-96 Area/3 Crossing Systems

**Table 8-1C
Detroit River International Crossing Study
Ranking of 3 Crossing Systems
in I-75/I-96 Area
Without Weights**

I-75/I-96 Area	Total Crossing Systems in Area	Number Ranking in Top or Bottom													
		Comm/Neigh.		Local Planning		Cult. Res.		Nat. Env.		Reg. Mob.		Air Quality		Constructability	
		Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19
	3	2	1	2	1	0	3	3	0	3	0	0	3	3	0

Source: The Corradino Group of Michigan, Inc.

- 2 of 3 I-75/I-96 Area crossing systems are among the 18 alternatives in the top half of all alternatives in Protecting the Community/Neighborhoods. One alternative is in the top five.
 - ✓ X-12/II-4 (Expanded Ambassador Bridge Plaza)/I-75
- 2 of 3 proposals are among the 18 alternatives in the top half in being Consistent with Local Planning. One alternative is in the top five.
 - ✓ X-12/II-4 (Expanded Ambassador Bridge Plaza)/I-75
- All 3 of the I-75/I-96 Area alternatives are among the 19 in the bottom half in Protecting Cultural Resources.

- All 3 of the proposals are among the 18 alternatives in the top half in Protecting the Natural Environment. One alternative is in the top five.
 - ✓ X-12/II-4 (Expanded Ambassador Bridge Plaza)/I-75
- All 3 of the I-75/I-96 Area alternatives are among the 18 in the top half in Improving Regional Mobility. No I-75/I-96 Area crossing system is in the top five.
- All 3 proposals are among the 19 alternatives in the bottom half in Maintaining Air Quality.
- All 3 proposals in the I-75/I-96 Area are among the 18 alternatives in the top half of all alternatives in Constructability. All are in the top five:
 - ✓ X-14/II-2 (Rosa Parks/Bagley)/M-10
 - ✓ X-14/II-3 (Rosa Parks/Porter)/M-10
 - ✓ X-12/II-4 (Expanded Ambassador Bridge Plaza)/I-75

Belle Isle Area/2 Crossing Systems

**Table 8-1D
Detroit River International Crossing Study
Ranking of 2 Crossing Systems
in Belle Isle Area
Without Weights**

Belle Isle Area	Total Crossing Systems in Area	Number Ranking in Top or Bottom													
		Comm/Neigh.		Local Planning		Cult. Res.		Nat. Env.		Reg. Mob.		Air Quality		Constructability	
		Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19	Top 18	Bottom 19
	2	0	2	0	2	0	2	2	0	0	2	0	2	2	0

Source: The Corradino Group of Michigan, Inc.

- Both Belle Isle Area proposals are among the 19 alternatives in the bottom half of all alternatives in Protecting the Community/Neighborhoods. No alternative in the Belle Isle Area is in the top five.

8.2 Weighted Effectiveness

By combining the weights of the Citizens and Technical Teams with the consultant's performance scores, shown in Attachment A, the weighted performance of each of the 37 crossing systems was established (Table 8-3). An example of a typical calculation to create the weighted effectiveness value of a crossing system is as follows:

Performance Score for Protect Cultural Resources of Plaza S-1	=	53.7
<u>Protect Cultural Resources Citizens' Weight</u>	X	<u>16.53%</u>
Citizen-Weighted Cultural Resources Score	=	8.88

The Citizen-weighted scores were then totaled for every evaluation factor for each component of the crossing system. The results are shown in Table 8-3. Similarly, the MDOT Technical Team's weights were applied to the unweighted performance scores shown in Attachment A to arrive at final scores by evaluation factor for each plaza, crossing and connecting route. The MDOT Technical Team's results are also shown on Table 8-3.

The objective in using these data is to take the first step to define the list of alternatives to be eliminated from the U.S. perspective.

Using the MDOT Technical Team weights, no Downriver alternative is in the top five in the overall performance evaluation (Table 8-3) of the 37 crossing alternatives because of their impacts on neighborhoods, the natural environmental and their low performance in regional mobility. It is noteworthy that the Citizen and Technical Team rankings of alternatives do not differ by more than three places for 17 of the 21 alternatives.

In the Central Area, the Citizens' and Technical Team's weights place four alternatives among the top five performers because they penetrate areas that are largely industrial with relatively few natural environmental consequences. They also perform very well in regional mobility.

- X-8/C-2 (U.S. Steel North)/Schaefer-South/I-75
- X-8/C-2 (U.S. Steel North)/Schaefer-North/I-75
- X-8/C-2 (U.S. Steel North)/Schaefer-North/I-94
- X-11/C-4 (Delray East)/Dragoon/I-75

**Table 8-3
Weighted Performance Evaluation
37 Crossing Systems (Route + Plaza + Crossing)
U.S. Side of Border**

Weighted Scores													
Plaza	S1	S1	S2	S2	S3	S3	S3	S3	S3	S3	S4	S4	S4
Crossing	X1S1	X1S1	X1S2	X1S2	X2S3	X2S3	X2S3	X3S3	X3S3	X3S3	X2S4	X2S4	X2S4
Alignment	S1King/I-75	S1King/I-275	S2King/I-75	S2King/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275
Citizen Weighted Score	170.21	162.53	177.06	165.69	187.44	188.96	178.09	187.23	188.75	177.88	180.19	180.22	171.21
Rank	33	35	30	34	17	13	28	18	14	29	25	24	31
Technical Team Weight Score	169.80	163.29	175.04	165.66	182.34	183.09	173.46	182.50	183.24	173.62	176.15	175.85	167.70
Rank	31	35	28	34	22	20	30	21	19	29	25	27	33

Weighted Scores													
Plaza	S4	S4	S4	S5	S5	S5	S5	S5	C2	C2	C2	C2	
Crossing	X3S4	X3S4	X3S4	X4	X4	X4	X4	X4	X8	X8	X8	X8	
Alignment	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275	S5Moran/I-75	S5Dix South/I-75	S5Dix North/I-75	S5Southfield/I-75	S5Southfield/I-94	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	
Citizen Weighted Score	180.13	180.16	171.15	185.33	191.55	185.39	184.97	181.89	195.09	192.46	194.94	193.52	
Rank	27	26	32	20	10	19	21	22	3	8	4	5	
Technical Team Weight Score	176.30	176.01	167.85	185.34	190.14	185.32	184.87	181.50	201.46	199.03	201.21	199.94	
Rank	24	26	32	16	15	17	18	23	3	8	4	5	

Weighted Scores													
Plaza	C2	C2	C2	C2	C3	C3	C4	I12	I13	I14	N1	N1	
Crossing	X9	X9	X9	X9	X10	X10	X11	X14 I12	X14 I13	X12	X15	X15	
Alignment	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	C3Dearborn/I-75	C3Springwells/I-75	C4Dragoon/I-75	I12Lafayette/M-10	I13Lafayette/M-10	I14Gateway/I-75	N1St.Jean/I-94	N1Conner/I-94	
Citizen Weighted Score	193.41	190.78	193.26	191.84	188.69	189.41	196.98	187.97	180.34	197.89	153.89	152.61	
Rank	6	11	7	9	15	12	2	16	23	1	36	37	
Technical Team Weight Score	199.89	197.47	199.65	198.38	197.65	198.03	208.18	197.45	191.70	206.92	161.08	159.76	
Rank	6	12	7	9	11	10	1	13	14	2	36	37	

Source: The Corradino Group of Michigan, Inc.

In the I-75/I-96 Area, both Citizens' and Technical Team's weightings place crossing system X-12/II-4 (Expanded Ambassador Bridge Plaza)/I-75 in either first or second place due to relatively few impacts on neighborhoods and the natural environment. This is also a very high performing alternative in regional mobility. The two other alternatives in the I-75/I-96 Area rank in the teens or worse.

The Belle Isle alternatives occupy the last two positions overall (36th and 37th) according to both the Citizens' and Technical Team's weightings because of their impacts on neighborhoods, cultural resources and air quality. They also do not perform well in the regional mobility area.

In summary, the weighted effectiveness scores shown on Table 8-3 point to the area in green on Figure 8-1 as a focus for a new border crossing system.

8.3 Alternatives in Focused Analysis Area

8.3.1 Crossings X-8 and X-9/Plaza C-2 (U.S. Steel North)/Schaefer Road South

Plaza C2 U.S. Steel North

Location: East side of Marlon Avenue; City of Wyandotte

Plaza Size: Approximately 110 acres

This plaza site is part of the existing and operating U.S. Steel complex and is immediately north of the main plant. Its east property line fronts on the Detroit River. The west side of the site is bordered by rail and undeveloped land. To the north of the site is the U.S. Steel rolling mill. The river crossings (X-8 and X-9) tying into this plaza site will require the rolling mill to be relocated and replaced new by the project.

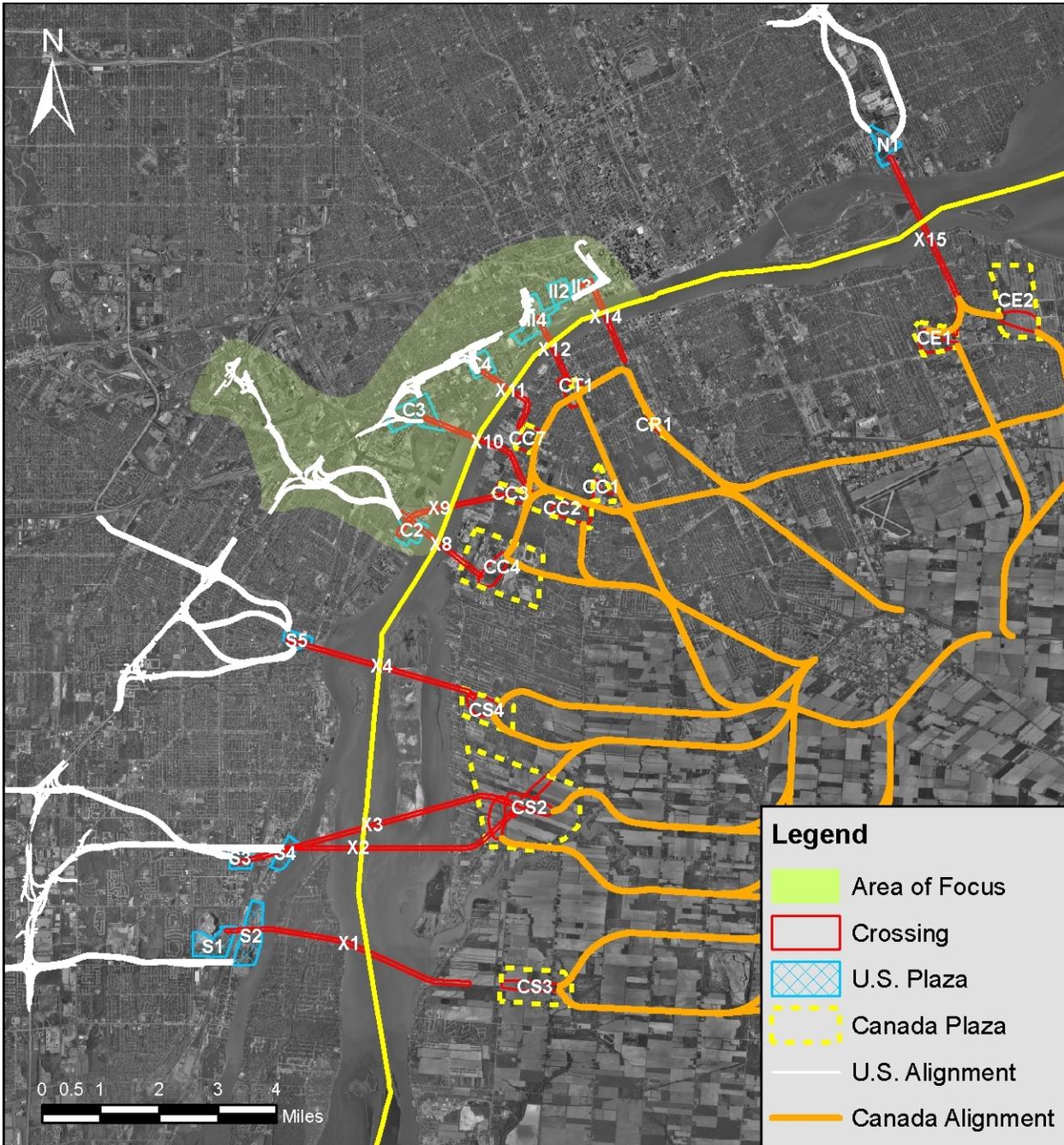


Route 1 – Schaefer Road South

This proposed route is about four miles long and provides a new alignment from the plaza near the Belanger Park entrance to the existing I-75/Schaefer Road interchange on the south side of Coolidge and Schaefer. The alignment could extend west from I-75 to I-94 connecting on the west side of the Rouge plant.

For the purposes of assessing travel demand, this route is being considered as two options: 1) from the plaza to I-75; and, 2) from the plaza to I-94.

Figure 8-1
Area of Focus Based on Weighted Performance Analysis



Source: The Corradino Group of Michigan, Inc.



This crossing system performs in the top ten of all crossings in Regional Mobility. At the other end of the spectrum is a low performance in regional Air Quality. Lower performance is also evident in the area of impacts on the Natural Environment, largely because of Plaza C-2's potential use of wetlands (21.3 acres) – this is the largest wetland impact of all plazas. The route connecting Plaza C-2 to the nearby freeway system also incurs major impacts in the areas of Protecting Neighborhoods, Consistency with Local Planning, Protecting Cultural Resources, and Protecting Natural Resources. Examples of the route impacts include: 1) the potential acquisition of 450 to 600 dwelling units and 35 to 50 businesses; 2) impacts to a known archaeological site and more than 15 acres of a public park; and, 3) impacts to a primary stream (Ecorse River), wetlands and the potential habitat of an endangered species. The crossings (X-8 and X-9) would have main structures that are among the longest (5,200 to 5,900 feet) of all the bridges over the Detroit River, which will affect their costs.

8.3.2 Crossings X-8 and X-9/Plaza C-2 (U.S. Steel North)/Schaefer Road North

Plaza C2 U.S. Steel North

Location: East side of Marlon Avenue; City of Wyandotte

Plaza Size: Approximately 110 acres

This plaza site is part of the existing and operating U.S. Steel complex and is immediately north of the main plant. Its east property line fronts on the Detroit River. The west side of the site is bordered by rail and vacant land. To the north of the site is the U.S. Steel rolling mill.

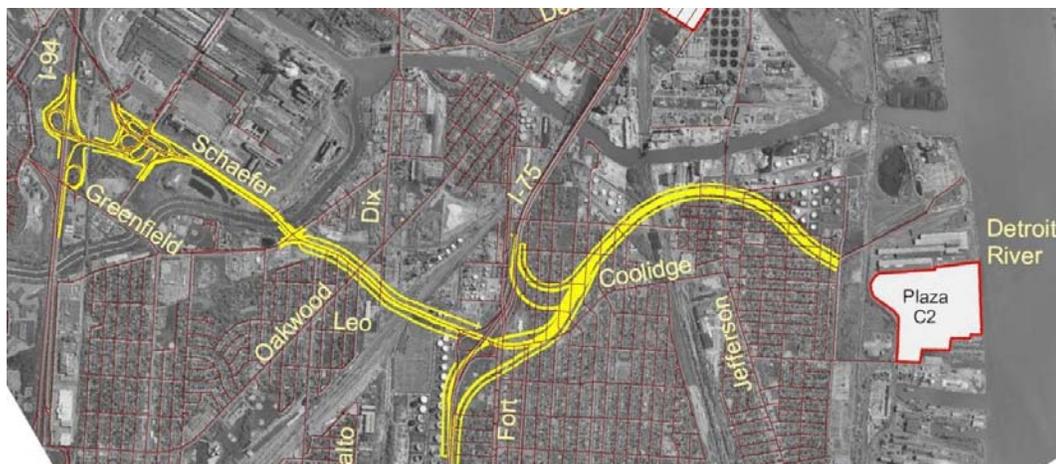


The river crossings (X-8 and X-9) connecting to this plaza site will require the rolling mill to be relocated and replaced new by the project.

Route 2 – Schaefer Road North

This proposal is about 4.5 miles long and moves in a semi-circular path north of Coolidge and Schaefer to minimize the residential property acquisitions. After the Schaefer Road interchange with I-75, it then follows Schaefer Road to its interchange with I-94.

For the purposes of assessing travel demand, this route is being considered as two options: 1) from the plaza to I-75; and, 2) from the plaza to I-94.



This crossing system also performs in the top ten of all alternatives in Regional Mobility. It performs in the bottom half of all alternatives in Air Quality because the regional travel characteristics (vehicle miles and vehicle hours of travel) do not produce the same reduction in air pollutants as other alternatives, particularly those in the Downriver Area. Plaza C-2 has the greatest wetland impacts among all plazas. The crossing route will likely cause: 1) acquisition of almost 600 houses and up to three dozen businesses; 2) impacts to a known archaeological site and about 15 acres of a public park; and, 3) impacts to a primary stream (Ecorse River), wetlands and the potential habitat of an endangered species. The crossings (X-8 and X-9) would have main structures that are among the longest (5,200 to 5,700 feet) of all bridges over the Detroit River, which would increase its cost.

8.3.3 Crossing X-10/Plaza C-3 (Delray West)/I-75 at Dearborn Avenue

Plaza C3 Delray West

Location: South of Rail Way Road, west of West End Street, east of Dearborn Street; City of Detroit

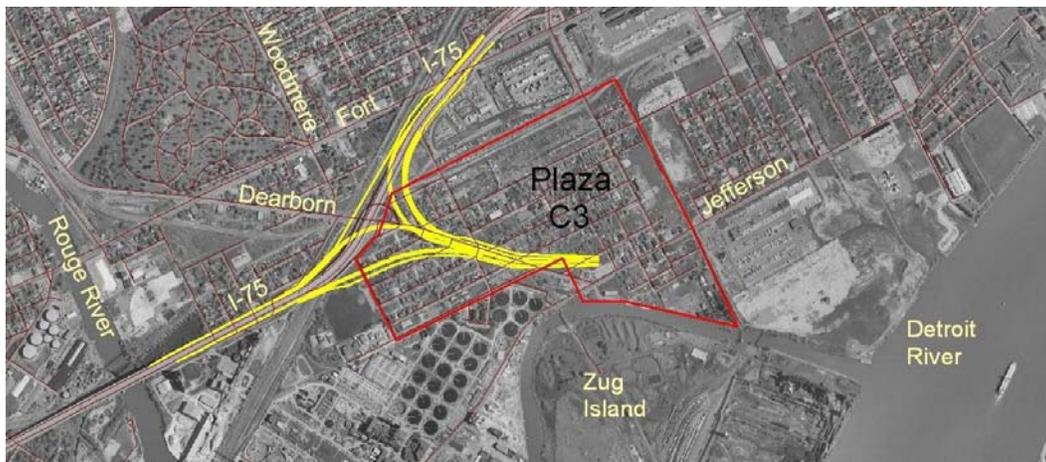
Plaza Size: Approximately 206 acres

This area contains primarily single-family homes on small residential lots. There are also a number of vacant lots. The area includes mixed uses consisting of small neighborhood commercial business. There is an active rail line that forms the northern edge of the potential plaza site. The river crossing to which the plaza would be connected is X-10.



Route – Plaza C-3 to I-75 at Dearborn

The plaza would be connected to I-75 at the existing Dearborn Road interchange, providing a full interchange with I-75.



This crossing system performs second of the 37 alternatives in Regional Mobility. It performs fifth in Protecting the Natural Environment. But, it performs almost last in Consistency with Local Planning as the area is proposed to be redeveloped for residential uses. It also scores almost last in regional Air Quality and Protecting Cultural Resources. The latter impact is associated with Plaza C-3's potential impact on one known *National Register* historic site; four sites that are considered potentially eligible for the *National Register*; and, two known

archaeologic sites. Plaza C-3 has the lowest performance of all plazas in Impacts on Neighborhoods/Communities.

Crossing X-10 connected to Plaza C-3 would have a main structure of about 5,650 feet. This is one of the longest proposed bridges over the Detroit River, which would increase its cost. But, it would have a virtual direct connection to I-75 from the plaza, which would lower this alternative's cost.

8.3.4 Crossing X-10/Plaza C-3 (Delray West)/I-75 at Springwells Avenue

Plaza C3 Delray West

Location: South of Rail Way Road, west of West End Street, east of Dearborn Street; City of Detroit

Plaza Size: Approximately 206 acres

This area contains primarily single-family homes on small residential lots. There are a number of vacant lots. The area includes mixed uses consisting of small neighborhood commercial business. There is an active rail line that forms the northern edge of the potential plaza site. The river crossing to which the plaza would be connected is X-10.



Route – Plaza C-3 to I-75 at Springwells

The plaza would be connected to I-75 at Springwells Avenue.



This crossing system performs third of the 37 alternatives in Regional Mobility. It performs fourth in Protecting the Natural Environment. But, it scores very low (26th out of 37 alternatives) in Consistency with Local Planning as the area is mostly residential and planned to continue that way. Its impacts on Cultural Resources are considered significant. They are mostly related to Plaza C-3’s potential impact on one known *National Register* historic site; four sites that are considered potentially eligible for the *National Register*; and, two known archaeological sites. And, Plaza C-3 has the lowest performance of all plazas in Impacts on Neighborhoods/Communities.

Crossing X-10 connected to Plaza C-3 would have a main structure of about 5,650 feet. This is one of the longest proposed bridges over the Detroit River, which would increase its cost. But, it would have a virtual direct connection to I-75 from the plaza, which lowers this alternative’s cost.

8.3.5 Crossing X-11/Plaza C-4 (Delray East)/I-75 at Dragon

Plaza C4 Delray East

Location: South of Fort Street, west of Junction Street, east of Livernois Avenue, north of West Jefferson Avenue; City of Detroit

Plaza Size: Approximately 84 acres

This area contains a limited number of single-family homes on small residential lots. There are vacant lots scattered throughout the area. An active rail line forms the northern boundary of the potential site. A number of businesses are in the area. Crossing X-11 would connect to the plaza.



Route – Plaza C-4 to I-75 at Dragon

The plaza would be connected with “flyovers” to I-75 east of Dragon.



This crossing system is connected to a bridge over the Detroit River (Crossing X-11) with the shortest main structure (about 3,100 feet) of all alternatives. This would lower its cost. It also would have a virtual direct connection to I-75, which would also contribute to a lower cost. This crossing system also ranks first in Regional Mobility and Constructability. It performs second in its Consistency with Local Planning, as the area is industrial and planned to continue as such. This crossing system is also ranked second in Protecting the Natural Environment. It performs very low in the areas of Air Quality and Community/Neighborhood Impacts. The latter impact is mostly associated with the connection of the plaza to I-75 which would cause the likely acquisition both north and south of I-75 of more than 300 houses and more than two dozen businesses.

8.3.6 Crossing X-14/Plaza II-2 (Rosa Parks/Bagley)/M-10 at Lafayette

Plaza II-2 Rosa Parks Boulevard/Bagley Street

Location: South of Rosa Parks Boulevard, east of Bagley Street, west of Lafayette Boulevard, north of 16th Street; City of Detroit

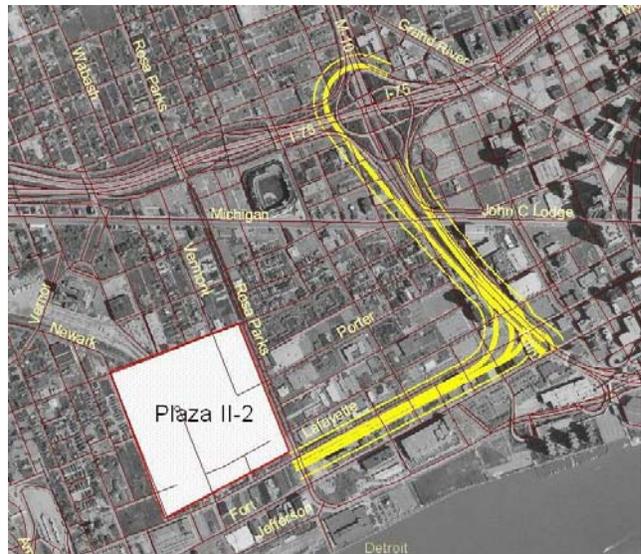
Plaza Size: Approximately 73 acres

This site consists of several vacant industrial structures and some active industrial buildings. The site is in the Corktown neighborhood with numerous renovated properties. West of Bagley Street is a United States Postal Facility and east of Lafayette Street is a building housing community mental health services. The plaza is connected to Crossing X-14.



Route – Plaza II-2 to M-10 at Lafayette

This alternative is connected by way of Crossing X-14, which is considered a bridge linking the DRTP-owned right-of-way on each side of the Detroit River. The crossing would have a main span of about 5,600 feet, one of the longest, which would affect its cost. Access is then provided from Plaza II-2 to M-10 by way of an alignment parallel to Lafayette Boulevard.



This crossing system has its highest performance (3rd out of 37 alternatives) in the area of Constructability as there are few, if any, impediments to its construction. It also performs well (6th) in Protecting the Natural Environment. Its lowest performances are in regional Air Quality and Protecting Cultural Resources. In the latter area, the connection from Plaza II-2 to M-10 is expected to impact seven known archaeological sites and one historic district. Seven properties that would likely be impacted are also considered eligible for the *National Register of Historic Places*.

8.3.7 Crossing X-14/Plaza II-3 (Rosa Parks/Porter)/M-10 at Lafayette

Plaza II-3 Rosa Parks Boulevard/Porter Street

Location: East of Rosa Parks Boulevard, north of Fort Street, south of Porter Street, west of U.S. 10; City of Detroit

Plaza Size: Approximately 63 acres

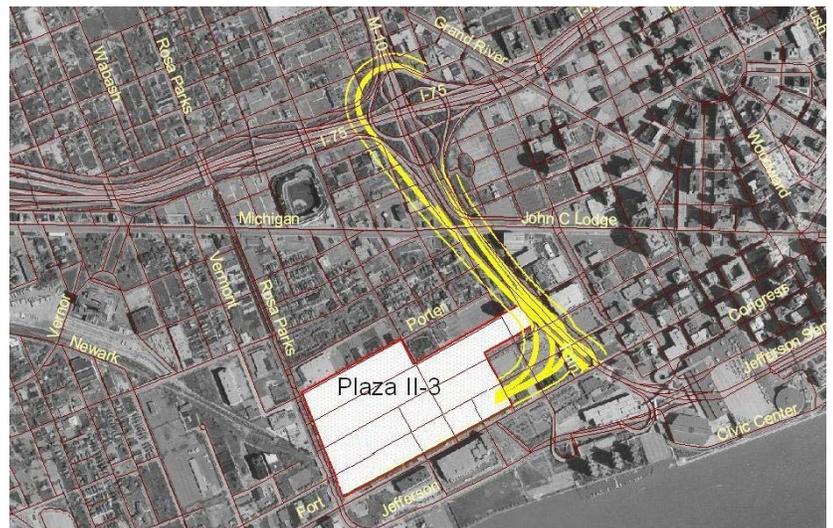
This site consists of several occupied government office and commercial buildings along with a number of vacant buildings. South of Fort Street is a United States Postal Facility and parking lots serving existing businesses. North of the site are additional occupied office and commercial buildings.



Route – Plaza II-3 to M-10 at Lafayette

This alternative is connected by way of Crossing X-14, which is considered a bridge linking the DRTP-owned right-of-way on each side of the Detroit River. Access is then provided to M-10 by way of an alignment parallel to Lafayette Boulevard.

This crossing system ranks third in Protecting the Natural Environment and fourth in Constructability. It is 12th in Regional Mobility. But, it performs very low in the regional Air



Quality and Protecting Cultural Resources evaluation categories. In the latter area, Plaza II-4 is likely to impact six known archaeological sites and five properties considered eligible for the *National Register of Historic Places*. The main structure of X-14 is likely to be about 5,600 feet, among the longest, which will affect its cost.

8.3.8 Crossing X-12/Plaza II-4 (Expanded Ambassador Bridge Plaza)/I-75

Plaza: II-4 - Expanded Ambassador Bridge Plaza

Location: East of I-75, south of Bagley Street, west of St. Anne Street to Fort Street, juts out to 16th Street at Fort Street and Jefferson Avenue, north of Jefferson Avenue, and east of Scottien Street.

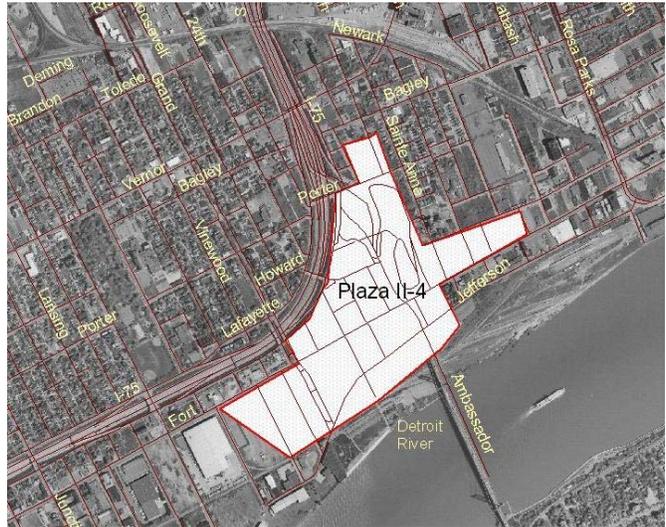
Plaza Size: Approximately 160 acres

This site consists of the existing U.S. Custom plaza for the Ambassador Bridge (about 30± acres), parkland, vacant industrial structures with some active industrial buildings. Adjacent to the south side of the site is an active rail line. The potential plaza abuts industrial to the north, residential and industrial to the east, railway and parkland to the south and I-75 freeway to the west. It is served by the proposed second span of the Ambassador Bridge.

Route – Plaza II-4 to I-75

This route is a direct connection of Plaza II-4 to I-75.

This crossing system ranks first in the following categories: Community/Neighborhood Impacts, Consistency with Local Planning, and Protecting the Natural Environment. It is the second highest performer in Constructability. But, it ranks 14th in Regional Mobility and almost last in the Air Quality and Protecting Cultural Resources areas. In the latter area, Plaza II-4 is likely to impact 18 known archaeological sites and eight properties considered eligible for the *National Register of Historic Places*. The crossing connection to Plaza II-4 is expected to have a main span of 4,300 feet, the second shortest in the focused area of analysis.



8.4 Cost-effectiveness Evaluation Process

Establishing the cost effectiveness of the border crossing systems requires the definition of property-related and construction-related costs. These were established as follows:

Property-related Costs – Wayne County’s tax records for parcels that may be acquired was the basis for the property value analysis. The tax value of residential properties that may be acquired was multiplied by eight to account for adjustments between tax and fair market value as well as the items related to: relocation, structure demolition, remediation (e.g., asbestos), plus contingency. The tax value of commercial properties per Wayne County records was multiplied by 12 to define the cost of acquiring the business property, relocating the business, demolishing the structures, remediation of the property, plus contingency. Special, non-residential properties, like churches, were considered to be replaced “new” in the cost analysis.

There are a number of instances where an inactive plant would have to be acquired, structures removed, and contamination remediated before construction begins. These include the Michigan Steel Works and the McLouth Steel Plant. To remove and remediate the property, a cost between \$115,000 and \$250,000 per acre was used. Where the combined sewer overflow plant exists on Plaza S-5, it was assumed that a \$150 million cost would be incurred to rebuild the plant before the plaza could be built. This estimate was based on the fact that the Twelve Towns CSO facility cost \$144 million and the Conner Creek CSO facility cost upwards of \$180 million.

It was noted earlier there are special costs associated with the crossings connected to Plaza C-2 where a replacement U.S. Steel rolling mill would be built at a cost of \$500 million, excluding land outside the current boundary of the U.S. Steel property that may be needed for the new rolling mill. The cost to acquire Fighting Island and address the liability of its contamination is more difficult to assess. It could equate to hundreds of millions of dollars in “liability exposure,” in addition to the cost of the property, including compensation for royalties due BASF for mining of salt under the island. But, no cost has been included here because of uncertainties, which would be addressed if Fighting Island were a Practical Alternative.

Construction-related Cost – The approach to costing each of the three components of the crossing system are described here.

Roadway – Roadway costs were developed given the known engineering and design information. Linear unit estimates were developed based on common roadway engineering practices and current MDOT prices. The overall estimate was intended to provide a relative comparison between the routes being evaluated.

The following items are key assumptions and unit costs used in the estimate.

1. All ramps were priced as two-lane ramps at a unit price of \$203/lineal ft. (\$617/lineal m).
2. The new connector routes were priced as a six-lane urban freeway system at-grade with median barrier at a unit price of \$1,063/lineal ft. (\$3,240/lineal m).
3. If a railroad was crossed, a bridge was assumed. The typical railroad bridge was estimated at \$232/ft.² (\$2,153m²).
4. Retaining walls were estimated at all the interchanges. The retaining walls were estimated at \$354/lineal ft. (\$1,077/lineal m).
5. A two-lane ramp bridge was estimated at \$290/ft.² (\$2,691/m²). A ramp bridge that was three levels was estimated at \$348/ft.² (\$3,229.1/m²).

Items not specifically calculated but covered by a contingency are:

1. Earthwork.
2. Costs for grade crossing of major arterials or local streets were not included, unless the proposed route layout was an existing roadway being realigned.
3. Utility relocation, demolition, site clean-up, etc. were not factored into the base construction cost.

An additional item for each roadway alternative connecting to I-75 or the Lodge Freeway is the cost associated with modifying the section of freeway one interchange in each direction from where the new crossing enters the freeway. For all areas but those connected to Plazas C-3, C-4 and the I-75/I-96 connections, \$80 million is the added cost. For the C-3 connection to I-75, \$250 million is added to account for the special need related to rebuilding the Rouge River Bridge. The cost of modifying I-75 at Plaza C-4 is placed at \$100 million. The cost to modify I-75 or the Lodge Freeway where Plazas II-2, II-3 or II-4 connection is placed at \$80 million.

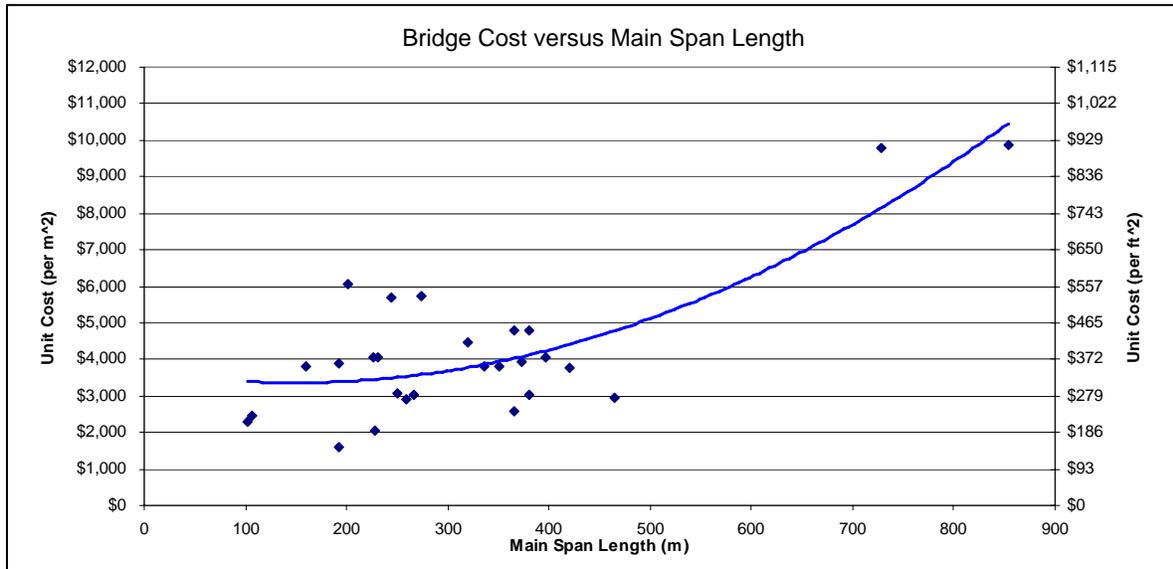
Plaza – At this stage of the project, general plazas space requirements of 80 to 100 acres have been developed in consultation with the border inspection agencies. The actual layout and functional requirements of the inspection plazas will be established later in the project.

An historical review of recent and planned plaza expansion projects in Ontario, New York, and Michigan were examined to estimate the plaza construction cost. These costs vary widely because some plazas include land costs and others include significant connecting roadway systems. Where possible, such costs were removed. The remaining costs were then adjusted for the year of construction or the year the plaza was planned and for geographic location in order to derive the estimated cost of \$150 million for an 80-acre plaza, before contingencies are added. Assuming that the facility construction from plaza to plaza would be similar in scope and cost, the only differences in cost would be related to site work, influenced by site constraints and risks. Therefore, the base cost was adjusted using the constructability score in the illustrative alternative evaluation process.

Bridge Crossing – The cost of each bridge was estimated based on the average cost per square foot (or square meter) for bridges of similar length. The bridges were divided into approach spans over land, approach spans over water, and the main bridge, which commonly consists of a main span and two anchor or tail spans.

In order to develop the average cost per square foot, a database was developed in cooperation with the Canadian consultant for long-span, suspended bridges (cable stay and suspension) built since 1981. Major bridges with main spans from 330 feet (100 m) to 2,800 feet (850 m) were considered. The construction costs were then adjusted for inflation and location using RS Means and Engineering News Record factors. Based on the adjusted costs, a regression analysis was performed to develop an equation of the cost of structures by main span length (Figure 8-2). That analysis indicates that very few structures in excess of 1,640 feet (500 m) have been constructed in the past 25 years. The proposed spans over the Detroit River range from 1,080 feet (330 m) to 2,560 feet (780 m), which puts the DRIC project at the end of the cost curve. For the approaches to the main structure, a common cost for spans in the river and for spans over land was also developed.

Figure 8-2
Detroit River International Crossing Study
Bridge Cost versus Main Span Length



Source: Parsons Transportation Group

As Figure 8-2 illustrates, a small increase in the main span length can have a significant impact on cost. For example, a 660-foot (200 m) increase in the main span length, say from 1,640 feet (500 m) to 2,300 feet (700 m), increases the total cost by 221 percent. For this reason, the total cost of much longer crossings in the southern corridor, with main spans in the range of 300 meters, are similar in cost to the central corridor bridges, where main spans of 700 meters to 800 meters would be needed.

It is noteworthy that a 30 percent contingency has been added to all construction costs.

The results of the cost analysis are displayed on Table 8-4. They indicate that property-related costs often represent one-quarter to one-half of the total cost – it is noted only one-half of the crossing construction cost is included in Table 8-4 as it is assumed the total construction cost will be equally allocated with the Canada partners. The most costly crossing systems are associated with the Eureka Road connection to I-75 or I-275 – each exceeds \$2 billion and those connected to I-275 exceed \$3 billion. The least costly is X-11/C-4/Dragon/I-75 because at this very narrow part of the river, the bridge is expected to cost \$430 million, including contingencies (data in Table 8-4 reflects half of

**Table 8-4
Total Estimated Cost of River Crossing Systems
U.S. Side of River
(millions of 2005 dollars)**

Plaza Crossing Alignment	Crossing System												
	S1	S1	S2	S2	S3	S3	S3	S3	S3	S3	S4	S4	S4
	X1S1	X1S1	X1S2	X1S2	X2S3	X2S3	X2S3	X3S3	X3S3	X3S3	X2S4	X2S4	X2S4
	S1King/I-75	S1King/I-275	S2King/I-75	S2King/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275	S3Penn/I-75	S3Eureka/I-75	S3Eureka/I-275	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275
Property Related	537.35	879.70	518.94	861.29	940.59	1077.66	2118.72	922.42	1059.50	2100.56	941.98	1062.46	2102.52
Construction Related	1004.29	1051.28	1033.93	1080.92	999.60	979.46	1166.01	954.10	933.96	1120.51	1041.98	1022.53	1209.08
Total	1541.64	1930.98	1552.87	1942.21	1940.18	2057.12	3284.73	1876.52	1993.46	3221.07	1983.95	2084.98	3311.59

Plaza Crossing Alignment	Crossing System											
	S4	S4	S4	S5	S5	S5	S5	S5	C2	C2	C2	C2
	X3S4	X3S4	X3S4	X4	X4	X4	X4	X4	X8	X8	X8	X8
	S4Penn/I-75	S4Eureka/I-75	S4Eureka/I-275	S5Moran/I-75	S5Dix South/I-75	S5Dix North/I-75	S5Southfield/I-75	S5Southfield/I-94	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94
Property Related	936.29	1056.77	2096.83	580.03	504.32	372.07	457.51	718.50	330.04	380.63	364.98	387.25
Construction Related	996.48	977.03	1163.58	1038.15	1022.93	1020.44	1020.44	1103.52	1271.34	1279.20	1287.30	1295.16
Total	1932.77	2033.80	3260.41	1618.18	1527.25	1392.50	1477.94	1822.02	1601.38	1659.83	1652.28	1682.42

Plaza Crossing Alignment	Crossing System											
	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
	X9	X9	X9	X9	X10	X10	X11	X14 II2	X14 II3	X12	X15	X15
	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	C3Dearborn/I-75	C3Springwells/I-75	C4Dragoon/I-75	II2Lafayette/M-10	II3Lafayette/M-10	II4Gateway/I-75	N1St.Jean/I-94	N1Conner/I-94
Property Related	330.04	380.63	364.98	387.25	217.07	250.11	180.57	615.24	572.31	469.61	397.29	392.42
Construction Related	1219.34	1227.20	1235.30	1243.16	1204.44	1205.56	668.60	949.00	919.50	624.00	914.36	912.43
Total	1549.38	1607.83	1600.28	1630.42	1421.51	1455.67	849.17	1564.24	1491.82	1093.61	1311.65	1304.85

Source: The Corradino Group of Michigan, Inc.

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that construction cost). That is not the case with the nearby X-12 and X-14 bridges which are estimated to cost \$590 million and \$1.1 billion, including contingencies, respectively (data in Table 8-4) reflects half of that construction cost. The larger costs are directly related to a larger main span with no piers in the Detroit River. Again, one-half of the crossing cost is to be borne by the U.S.

8.5 Cost-effectiveness Results

With the costs established for each component of the crossing system as well as the effectiveness/performance scores available, the cost effectiveness of each system can be determined to help shape the short list of Practical Alternatives. This is not an attempt to minimize cost. Instead, the objective is to ensure that the focus for further analysis is on those alternatives of value – i.e., performance is returned for investment. To develop the cost-effectiveness index, the crossing system's total performance score (Table 8-3) is divided by its cost in millions of dollars (Table 8-4) and the result multiplied by 100 to create an index greater than one. The results of the cost-effectiveness analysis are shown on Table 8-5. It is again noteworthy that this calculation considers all the impacts on the U.S. side of the border and, as such, considers all related costs. That means for the crossing itself, the cost is one-half of the construction cost as the impacts on the Canadian side are not included in the analysis.

8.6 Final Narrowing of the Illustrative Alternatives

Based on the examination of weighted effectiveness and cost effectiveness, it is possible to narrow the Illustrative Alternatives to those which should be analyzed further in the DRIC Study. The discussion below first covers those alternatives with the best overall performance from the U.S. perspective. Then, the conditions of those alternatives are summarized from the Canadian perspective. Finally, comments are presented on other alternatives in each of the Central, Downriver, Belle Isle and I-75/I-96 Areas.

8.6.1 Best Overall Performing Illustrative Alternatives

U.S. Perspective

The most cost-effective Illustrative Alternatives are X-11/C-4 (Delray East)/Dragoon/I-75 and X-12/II-4 (Expanded Ambassador Bridge Plaza)/I-75 which rank first and second, respectively, in terms of cost-effectiveness by both the Citizens' and Technical Team's weights. These alternatives are also the top two performers in effectiveness (Table 8-3) according to both the Citizens' and Technical Team's weights. These indices are very much apart from all other alternatives. And, these two crossing systems are among the best performers in Regional Mobility.

Table 8-5
Detroit River International Crossing Study
Cost Effectiveness Results
Crossing Systems (Route + Plaza + Crossing)

Plaza Crossing Alignment	Crossing System												
	S1	S1	S2	S2	S3	S3	S3	S3	S3	S3	S4	S4	S4
	X1S1	X1S1	X1S2	X1S2	X2S3	X2S3	X2S3	X3S3	X3S3	X3S3	X2S4	X2S4	X2S4
	S1King/ I-75	S1King/ I-275	S2King/ I-75	S2King/ I-275	S3Penn/ I-75	S3Eureka/ I-75	S3Eureka/ I-275	S3Penn/ I-75	S3Eureka/ I-75	S3Eureka/ I-275	S4Penn/ I-75	S4Eureka/ I-75	S4Eureka/ I-275
Citizen Cost Effectiveness Score	11.04	8.42	11.40	8.53	9.66	9.19	5.42	9.98	9.47	5.52	9.08	8.64	5.17
Rank	22	33	21	32	25	28	35	24	26	34	29	31	37
Technical Team Cost Effectiveness Score	11.01	8.46	11.27	8.53	9.40	8.90	5.28	9.73	9.19	5.39	8.88	8.43	5.06
Rank	22	32	21	31	25	28	35	24	26	34	29	33	37

Plaza Crossing Alignment	Crossing System											
	S4	S4	S4	S5	S5	S5	S5	S5	C2	C2	C2	C2
	X3S4	X3S4	X3S4	X4	X4	X4	X4	X4	X8	X8	X8	X8
	S4Penn/ I-75	S4Eureka/ I-75	S4Eureka/ I-275	S5Moran/ I-75	S5Dix South/ I-75	S5Dix North/ I-75	S5Southfield/ I-75	S5Southfield/ I-94	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94
Citizen Cost Effectiveness Score	9.32	8.86	5.25	11.45	12.54	13.31	12.52	9.98	12.18	11.60	11.80	11.50
Rank	27	30	36	20	6	3	7	23	9	18	14	19
Technical Team Cost Effectiveness Score	9.12	8.65	5.15	11.45	12.45	13.31	12.51	9.96	12.58	11.99	12.18	11.88
Rank	27	30	36	20	12	5	10	23	9	18	16	19

Plaza Crossing Alignment	Crossing System											
	C2	C2	C2	C2	C3	C3	C4	II2	II3	II4	N1	N1
	X9	X9	X9	X9	X10	X10	X11	X14 II2	X14 II3	X12	X15	X15
	C2Schaefer South/I-75	C2Schaefer South/I-94	C2Schaefer North/I-75	C2Schaefer North/I-94	C3Dearborn/ I-75	C3Springwells/ I-75	C4Dragoon/ I-75	II2Lafayette/ M-10	II3Lafayette/ M-10	II4Gateway/ I-75	N1St.Jean/ I-94	N1Conner/ I-94
Citizen Cost Effectiveness Score	12.48	11.87	12.08	11.77	13.27	13.01	23.20	12.02	12.09	18.10	11.73	11.70
Rank	8	13	11	15	4	5	1	12	10	2	16	17
Technical Team Cost Effectiveness Score	12.90	12.28	12.48	12.17	13.90	13.60	24.52	12.62	12.85	18.92	12.28	12.24
Rank	6	13	11	17	3	4	1	8	7	2	14	15

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Source: The Corradino Group of Michigan, Inc.

The third to fifth most cost-effective alternatives are X-10/C-3 (Delray West)/Dearborn/I-75 and X-11/C-3 (Delray East)/Springwells/I-75. They are ranked in effectiveness 12th and 15th, respectively, by the Citizens' weights and 10th and 11th, respectively, by the Technical Team weights. Based on a combination of these evaluations, Crossings X-10/C-3 (Delray East)/Dearborn/I-75 and X-10/C-3 (Delray East)/Springwells/I-75 are considered candidates for further analysis. They are among the best performers in Regional Mobility.

Canadian Perspective

On the Canadian side of the border, the proximity of Crossings X-10 and X-11 to the urban areas of Windsor and LaSalle allows them to better serve the "local" and "long-distance" international traffic than the Belle Isle and Downriver alternatives. And, of the possible plaza connections on the Canadian side of the border to Crossings X-10 and X-11, all have impacts but Plaza CC-3 (refer to Figure 8-1) is associated with the fewest impacts of the plaza sites (CC-1, CC-2, CC-3 and CC-7). It is west of the Ojibway Parkway, in an area designated by the City of Windsor for an industrial park. It is also identified in the *Schwartz Report*⁶ as a possible plaza site.

Therefore, after consideration of the Canadian evaluation within the focused area, Crossings X-10 and X-11 are considered, from the Canadian and U.S. perspectives, as candidates for continued analysis.

The X-12 crossing, plaza and roadway options in Canada have more impacts than those in the U.S. Specifically, the existing plaza in Canada at the Ambassador Bridge is approximately 20 acres. A suitable plaza size to meet the requirements of border agencies, accommodate all international truck and auto traffic and connections to a second span of the Ambassador Bridge is 120 acres. The existing plaza is bounded on the south by the Essex Terminal Rail right-of-way, and on the east by the University of Windsor campus. To avoid impacts to these areas, a proposal for the expansion of the existing plaza was developed to the west side of the existing structure (i.e., Plaza CT1). A 100-acre expansion of the existing plaza would displace approximately 216 residential units (including apartments) and two institutional uses (Early Years Center and Ontario Business College); a cemetery and playing field would be partially impacted by the plaza expansion. This area of Sandwich is densely populated and mature. Area businesses are forming an economic development corporation to promote new growth/development opportunities in the area. So, the Canadian evaluation indicates a new plaza to serve Crossing X-12 would be very disruptive on the residential and business fabric of this area. And, the plaza would have little opportunity for expansion.

⁶ Schwartz Report, by Sam Schwartz Engineering PLLC for City of Windsor, January 2005.

An alternative plaza site studied in the Canadian evaluation to connect with the X-12 crossing system is CT-2, situated along the east side of Huron Church Road. This site would displace a high school, and highly disrupt the university stadium and recreation center at the north end of the site, and a shopping center and high school at the south end. The significance of the impacts to the high school and stadium render it no better an alternative than Plaza CT-1.

Other alternatives in Canada for plazas to serve a second span of the Ambassador Bridge include the possibility of a remote plaza with a secure roadway connection to the bridge. This alternative was considered with plazas CC-1, CC-2, CC-3 and CC-7. Such a plaza road would follow the existing Essex Terminal Rail right-of-way. In this area there is a highly valued open space serving as a community recreation area/parkland. Placing a high-volume roadway in this area would have a high negative impact on the community cohesion and character.

While the plazas to serve a second span to the Ambassador Bridge would have major impacts in Canada, a freeway connection leading to a second span would have high benefits to regional mobility. By providing a free-flow connection through the elimination of the existing signalized intersections, the connecting roadway leading to the Ambassador Bridge would operate with good levels of service during daily peak travel periods. The benefits to the local road network of building a second span to the Ambassador Bridge are comparable to those provided by a new crossing in the Central Area (Crossings X-10, X-11). However, the Canadian evaluation notes a second span of the Ambassador Bridge would be an expansion of the existing crossing, not a new crossing of the river with new connections to the freeway systems in Ontario and Michigan.

So, on the Canadian side of the border, a second span of the Ambassador Bridge is not considered a candidate for further study as maintaining the existing crossing and connections in the border transportation network does not address redundancy needs and, regardless of the plaza site selected, it would cause high impacts to neighborhoods. Nonetheless, the U.S. plaza, and its freeway connection, are considered candidates for further analysis.

8.6.2 Central Area Plaza C-2 and Crossings X-8 and X-9

U.S. Perspective

The crossing systems including Plaza C-2 (U.S. Steel North) and Crossings X-8 and X-9 scored high in effectiveness (3rd to 12th), but lower in cost effectiveness (8th to 19th). And, with the needed time required to build the new rolling mill for U.S. Steel, its cost (which the DRIC analysis eventually indicated would not likely qualify for federal funding), plus the potential addition of millions of dollars in property cost to relocate the mill, Crossing Systems X-8/C-2

(U.S. Steel North) and X-9/C-2 (U.S. Steel North) are not considered practical alternatives from the U.S. perspective.

Canadian Perspective

On the Canadian side of the border, the systems connected to Crossings X-8 and X-9 perform at a high level. The preferred alternative leading to the plazas that could be connected to Crossings X-8 and X-9 is by way of the E.C. Row Expressway to Huron Church Road/Talbot Road. Upgrading this connection to a freeway was determined to have the least impacts on community cohesion and character because the current facility serves as the primary access route to the Ambassador Bridge. It can be connected to several plazas (CC1, CC2, CC3 and CC4) and then to Crossings X-8 and/or X-9.

While the proposed Canadian Plaza CC3 has impacts, it has the lowest impacts of the plaza sites considered in this area of the river. West of the Ojibway Parkway, it is an area designated by the City of Windsor for an industrial park. The site is adjacent to existing manufacturing plants and two major power generation plants. This plaza site was identified in the City of Windsor *Schwartz Report* as suitable for conversion to an inspection plaza for a new crossing in this area of the Detroit River. However, connecting this site to a crossing is dependent upon geotechnical conditions, as this area has historically been used for solution mining of salt. The size and location of the underground caverns (or brine wells) produced by these mining operations are not fully documented. These caverns create a constraint to siting bridge pier footings, as structural integrity of the rock above these caverns is not fully known. (In 1954, a large sinkhole resulting from the collapse of a cavern roof and gradual subsidence of the covering material destroyed a building. The sinkhole site is currently occupied by Essex Aggregates.)

Based on these characteristics, particularly those on the U.S. side of the border, plus the presence of solution mining areas on both sides of the river, Crossing Systems X-8/Plaza C-2 (U.S. Steel North) and X-9/Plaza C-2 (U.S. Steel North) are not proposed from the U.S. perspective as candidates for further analysis.

8.6.3 Downriver Alternatives

U.S. Perspective

All Downriver crossings are not considered for further analysis in the DRIC Study from a U.S. perspective as they are neither effective nor cost-effective. It is noteworthy that Crossing System S-5/X-4 (Atofina East/Dix-North/I-75) ranked in the top five in terms of cost-effectiveness by both the Citizens' and Technical Team's weightings but placed 17th to 19th in overall

effectiveness. The analysis of this alternative did not include the cost associated with acquisition, remediation and use of Fighting Island by a plaza and/or a bridge. That could be tens of millions to hundreds of millions of dollars of risk/investment. Therefore, Crossing System S-5/X-4 (Atofina East/Dix-North/I-75) is also not considered a practical alternative from the U.S. perspective.

Canadian Perspective

The Canadian evaluation indicates Canadian Plaza CS1 would be sited in the middle section of Fighting Island to serve Crossing X-4. This area of Fighting Island was used for disposal of alkaline waste in layers between about two feet (0.5 meters) and 35 feet (11 meters) thick. Constructing a plaza on Fighting Island would require removal/remediation of the waste material. Preliminary analysis indicates it is unlikely that any major waste removal would be permitted by the Ontario Ministry of the Environment for redevelopment or reuse of the Island. Construction of a plaza on Fighting Island, therefore, would require removal of the waste material to other parts of Fighting Island and importing materials suitable for construction. The constructability of a plaza, bridge pier(s) and/or connecting roadway in this manner has significant risks, because it is quite likely that the waste material was pumped directly onto the marshland peat layer. Therefore, use of BASF's Fighting Island is not considered practical from a Canadian perspective.

The Canadian analysis indicates that, while all other Downriver alternatives generally impact fewer features than alternatives upriver, the Downriver alternatives offer fewer benefits to the transportation network in the Windsor-Essex County region. Nonetheless, it is noted that the southernmost plazas in Canada, CS-2 and CS-3 are proposed in rural areas of the Towns of LaSalle and Amherstburg, respectively. The proposed plaza sites are primarily agricultural properties inland from the shoreline of the Detroit River. Plazas at these locations would result in displacement and/or disruption of agricultural operations, although no special operations (e.g. orchards) were identified. Providing adequate services (power, water, water treatment) to these plaza sites was identified as being a cost/timing issue for the construction at these sites.

The Canadian Downriver Plaza CS-4 would be situated within the designated future urban boundary of LaSalle on a site that is presently open field. Adjacent land uses are primarily residential, with some natural features (woodlots) and the Essex Golf and Country Club. A plaza site in this area is incompatible with the adjacent land uses, and the site offers little flexibility for future expansion. Shoreline impacts between the plaza and the Detroit River associated with connecting Canadian Plaza CS4 to Crossing X-4 include approximately 20 residences, two marinas, an arena and six small businesses.

The Canadian Downriver connecting routes from Highway 401 to these plaza sites generally traverse the highly-populated rural area of LaSalle and Amherstburg. The route connecting to Canadian Plaza CS-4 would intrude into the urban area of LaSalle near Victory Street, thereby displacing approximately 76 residential units (including rental apartments). The routes connecting to Crossings X-1, X-2 and X-3 would displace very few residences. Nonetheless, a residential subdivision is common to all Canadian Downriver routes would be disrupted (approximately 52 homes within about 800 feet [250 meters of the right-of-way]). It is adjacent to the existing Highway 401 right-of-way.

In Canada, Downriver Crossing X-2 has the greatest potential for impacts to marshes, affecting the shoreline area north of the Canard River and Turkey Island in the Detroit River. Crossings X-3 and X-4 would have some impact on the marshes, but not to the same extent as that of Crossing X-2. Crossing X-1 would not impact any shoreline marshes.

In summary, and based largely on the poor overall performance in Regional Mobility of the crossing systems on both sides of the river, plus the poor performance of the crossing system components on the U.S. side of the river, the Downriver alternatives are not considered candidates for continued analysis.

8.6.4 Belle Isle Alternatives

U.S. and Canadian Perspectives

Based on the analyses presented earlier in this report, the Belle Isle alternatives are neither effective (Table 8-3) nor cost-effective from a U.S. perspective (Table 8-5). This is supported by the Canadian analysis, which indicates transportation effects of the system connected to Crossing X-15 (Lauzon Parkway and Bonwell Road) would provide only limited benefits to the Windsor transportation network. And, the connecting roadways to the Ambassador Bridge and the Detroit-Windsor Tunnel, particularly Huron Church Road, would operate poorly with many sections at or over capacity.

The Canadian plaza site for Crossing X-15 would be located north of Tecumseh Road in an area currently occupied by “big box” commercial uses, including Wal-Mart, Home Depot, Rona and other ancillary retail. The plaza would displace eight businesses and another seven businesses would be disrupted. The crossing itself, which would extend about 2,600 feet (800 meters) inland through a densely populated residential area, would cause the displacement of approximately 700 households.

On the Canadian side of the border, the connecting roadway to Crossing X-15 would impact 100 residential units, six businesses and disrupt more than 1,500 residences and 70 businesses. Kiwanis Park at E.C. Row/Lauzon Parkway would also be disrupted by the new facility.

Therefore, both U.S. and Canadian evaluations of the system associated with Crossing X-15 at Belle Isle find that the crossing systems there are not candidates for the short list of Practical Alternatives from a U.S. perspective.

8.6.5 I-75/I-96 Area Alternatives

U.S. Perspective

In the I-75/I-96 Area, crossing systems X-14/II-2 (Rosa Parks/Bagley)/M-10 and X-14/II-3 (Rosa Parks/Porter)/M-10 place 7th to 12th in cost-effectiveness in the U.S. evaluation. They ranked poorer in effectiveness (13th to 23rd). As noted earlier in this report, the greatest concerns are impacts on neighborhoods, cultural resources and consistency with local planning.

Canadian Perspective

This situation is amplified by the Canadian evaluation. That assessment is based on a six-lane freeway design, the right-of-way of which would be 260 feet (80 meters), which is wider than the existing rail corridor south of E.C. Row (130 feet/40 meters). North of E.C. Row, the rail corridor is sufficiently wide to accommodate the freeway connection.

To elaborate on Canadian conditions, it is noted that two areas of the DRTP rail corridor that would incur substantial property impacts outside the rail property are: between E.C. Row and Highway 401, and north of College Street to the Detroit River. In these areas, Provincial Road parallels the rail corridor. On the lands between the rail corridor and Provincial Road, approximately 40 commercial, major industrial and retail uses would likely be displaced, including retail shopping centers, supermarkets, car dealerships, etc. and mid-size industrial operations. Also, adjacent to Provincial Road and the rail corridor are residential neighborhoods, which are continuing to develop. Approximately 550 residences are within about 650 feet (200 meters) of the right-of-way along this section of the new facility, and are assumed to be disrupted.

If the continued use of the rail corridor is recommended by a Rail Rationalization Study being undertaken by the City of Windsor, the alignment of the new freeway would have to be shifted onto Provincial Road and a new service road would be required to provide access to lands east of

Provincial Road. Under this condition, impacts on residential, commercial and industrial uses in this area would increase beyond the numbers identified above.

The Canadian evaluation indicates that constructing an interchange at E.C. Row would be complex due to the proximity of two existing, closely-spaced interchanges at this location: Dougall Avenue and Howard Avenue. The reconfiguration of these interchanges would result in additional displacements of properties around the interchange (primarily commercial and industrial uses) and impact the primary access to this important commercial center of Windsor.

Immediately north of E.C. Row Expressway is a large scrap yard, which would be disrupted by the proposed new freeway. This scrap yard is a contaminated area, and remediation of this site would have cost and schedule implications for this option.

Also, north of E.C. Row, the rail property widens sufficiently to accommodate the inspection plaza; the plaza would impact a rail yard that DRTP has determined is not essential to rail operations. The rail lands at the plaza site are of sufficient size to provide flexibility for expansion, if required.

North of the plaza, the rail corridor passes through a mix of mature residential housing stock and industrial uses. The new bridge crossing would touch down in this area, displacing approximately 200 households.

The Canadian analysis of travel demand in 2035 indicates that a new crossing constructed in the rail corridor as a multi-lane freeway would attract a high proportion of the international truck and auto traffic. The free-flow characteristics of this alternative would make it more attractive than the existing crossings, which are served by arterial roads with signalized intersections. This alternative would carry approximately 1,200 trucks and 2,500 autos of daily afternoon peak hour travel, and would result in a significant shift in travel patterns in Windsor. International traffic on Huron Church Road would be greatly reduced; “local” international traffic on E.C. Row may increase, as access to the new crossing would be available for local motorists (auto and truck) via the interchange at E.C. Row. With international traffic moving to these higher-order roads, the minor street system in the city would carry fewer international trips, providing some benefit to local access.

But, the above-described change in traffic patterns and the change in use of the rail corridor from low-volume rail to a high-volume roadway facility has a negative impact as well on community character and cohesion. A new highway corridor is perceived in the Canadian evaluation to be a

barrier between the residential neighborhoods and the retail areas in this corridor. Although the existing rail line acts somewhat as a barrier in the community already, at two to three trains per day, in effect, the rail line is more a part of the community landscape than a disruptive barrier.

This barrier effect would be felt to a greater degree in the area of the new crossing. Here, the rail line is not visible, as the existing crossing is a tunnel; the lands on the surface of the tunnel are used as a green space/recreation area connecting to the continuous waterfront park. In this area of the city, the neighborhoods are highly populated, mature and stable. A new freeway and major bridge structure through this area would markedly change the character and the central Windsor/University neighborhoods. A new structure would span the river, which is approximately 2,850 feet (850 meters) wide at this location, with piers on the shore of the river. The backspan of the bridge would extend approximately 1,300 feet (400 meters) inland.

Based on these analyses, particularly the impacts in Canada, the two X-14 crossing systems are not considered candidates for additional analysis.

9. SUMMARY AND RECOMMENDATION

The Detroit River International Crossing Study (DRIC) involved application of a structured process to evaluate Illustrative Alternatives. The evaluation was applied to more than a dozen plazas and river crossings and more than three dozen roadway connections (refer to Figure 1-3). It involved the community in weighting the evaluation factors along with those weights established by the MDOT Technical Team. The evaluation factors are: Protect Community/Neighborhood Characteristics; Maintain Consistency with Local Planning; Protect Cultural Resources; Protect the Natural Environment; Improve Regional Mobility; Maintain Air Quality; and, Constructability.

The first part of the analysis concluded that the Illustrative Alternatives in the Downriver Area (Crossings X-1, X-2, X-3 and X-4 on Figure 8-1) and the Belle Isle Area (Crossing X-15) were not candidates for further study because of significant problems in handling traffic and/or causing impacts to communities, the natural environment, etc. The analysis of the cost-effectiveness of these alternatives reinforces that conclusion. Also, eliminated was the proposal by the Detroit River Tunnel Partnership to convert two rail tunnels to truck use after building a new, single-track modern tunnel for rail vehicles. This proposal does not address the long-range capacity needs of the region. But, this position does not prevent DRTP from continuing its own environmental studies in accordance with the processes in the U.S. and Canada.

The analysis then focused on the practical feasibility, including cost-effectiveness, of the end-to-end alternatives of the systems between and including Crossings X-8 and X-14 (refer to Figure 8-1). Both the U.S. and Canadian analyses led to the elimination of Crossings X-8 and X-9 because of the impacts on the continued operation of the U.S. Steel plant and the inability to construct the new Detroit River crossing in a timely manner (i.e., completion by 2013). This crossing area is also affected by the presence of known brine wells and the fact that many brine wells remain unknown because complete records of solution mining were not kept for years.

That work also led to the elimination from further consideration of Crossing X-14, which uses the Canadian Pacific rail right-of-way on both sides of the Detroit River. The impacts to neighborhoods, and plans for their future, cultural resources and air quality led to this conclusion.

Finally, the study indicates the proposed U.S. plaza next to/downriver from the Ambassador Bridge, and its possible connections to I-75, should remain in the continuing analysis, but not as part of a second span of the Ambassador Bridge. That crossing alternative is eliminated because, in Canada, the plaza and freeway connection leading to a second span would have unacceptable

community impacts and the constructability of a six-lane freeway along Huron Church Road is doubtful in light of intensity of the surrounding development.

Therefore, the analyses of Illustrative Alternatives define an area upstream of Zug Island to the foot of the Ambassador Bridge in the U.S., and, in Canada, the area from Broadway Boulevard to the vicinity of Brock Street (Figure 9-1) in Canada, as the places where further analyses will be conducted to specify where the Practical Alternatives for bridges, plazas and highway route connectors should be placed. The components of the crossing systems previously analyzed will now be replaced by new ones developed through involvement of the local community, its elected representatives, the project's Local Advisory Council, the City of Detroit, and a host of stakeholders. The analyses to support defining the Practical Alternatives will include detailed examination of possible impacts to the community's people, the large and small businesses that exist there, and its resources, such as the historically-significant Fort Wayne and large and small businesses that exist there. Engineering examinations will be conducted of items such as the possible relocation of utilities or major rail lines, and how connections can best be made to I-75. The additional work will also include study of river-related issues ranging from navigation, to the presence of brine wells to possible impacts on sensitive biologic communities/habitats.

Therefore, the recommendation at the conclusion of the study of Illustrative Alternatives is to focus on the area on both sides of the Detroit River shown in Figure 9-1, over the period December 2005 to March 2006 to define the final components of the Practical Alternatives. The schedule is consistent with the DRIC Study Work Plan.

Figure 9-1
Detroit River International Crossing Study
Area of Continued Analyses



Source: The Corradino Group of Michigan, Inc.

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Attachment 1A

Plaza Evaluation Data Detroit River Tunnel Partnership Proposal

**Table 1A-1
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Plaza Only**

Evaluation Factor	Performance Measure Category		Description/Units	Plaza	II1		
Protect Community / Neighborhood Characteristics	Traffic Impacts	Volume Change - Key Links	See Attachment 1: Key Links		See Attachment 1: Key Links		
		Streets Closed (permanently)	Number		2		
		Streets Closed (temporarily)	Number		2		
		Streets Crossed	Number		0		
		Streets Rerouted	Number		0		
		Streets with Interchange	Number		NA		
		Mainline Railines Rerouted	Number		0		
	Noise	Frontline Exposure	Number of dwelling units exposed			4	
		Significant Receptors ¹ Exposures	Number /Specify ¹			1	
	Community Cohesion/ Character	Positive/Negative/Neutral				Neutral	
	Potential Acquisition	Residential Units	Occupied			2	
			Vacant			0	
		Residential Population	Number			0	
		Business Units	Active				7
			Vacant				3
		Estimated Employees in affected Census Blocks ²	Number			164	
		Other Land Uses Affected	Schools				0
			Senior Service Facilities				0
			City/Government Facilities				0
			Places of Worship				1
			Medical Facilities				1
			State/Federal Government Facilities				0
			Community Services				0
	Vacant					0	
	Environmental Justice / Title VI	EJ Populations in affected Census Block Groups	EJ Population (non poverty)			760	
			Population Groups Affected			African American, American Indian, Hispanic	
			% Households in Poverty / Above or Below 9.9% Regional Threshold ³			31.4%/Above	
		Title VI Groups in Census Tracts	Presence of Regionally Prominent Ancestral Groups				None
	Public Safety/ Security	Proximity to Industry	Number of heavy industry businesses w/i 1/2 mile			0	
			Number of medium industry businesses w/i 1/2 mile			7	
			Number of light industry/office businesses w/i 1000ft/300m			7	
		Proximity to Residential / Retail	Number of residences w/i 500ft/150m				0
Number of businesses w/l 500ft/150m						0	
Proximity to Hazardous Materials		Number of EPA/DEQ Hazmat TSD Facilities w/l 500ft/150m				0	
		Distance to nearest fire station (mi)				1.3	
		Distance to nearest police station (mi)				2.1	
Emergency Response	Number of streets closed (perm.)				2		
	Number of streets closed (temp.)				2		
		Mainline Railines Rerouted			0		

Source: The Corradino Group of Michigan, Inc.

**Table 1A-2
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Plaza Only**

Evaluation Factor	Performance Measure Category		Description/Units	Plaza	II1	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO		Yes	
	Other Plans	Consistency	YES/NO		NA	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)		Leaking Undgrd. Stor. Tanks	Number		2
			EPA/DEQ Hazmat TSD Facility	Number		0
			National Priority List (Superfund)	Number		0
			RTK Cerclis (Superfund)	Number		0
			Michigan Contaminated Site	Number		0

Source: The Corradino Group of Michigan, Inc.

**Table 1A-3
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Plaza Only**

Evaluation Factor	Performance Measure Category		Description/Units	Plaza	II1
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number		0
		Listed NRHP Sites/Structures	Number		0
		Listed SHRS Sites/ Structures	Number		0
		Locally Listed Sites/Structures	Number		0
		Potentially Eligible Sites/Str.	Number		1
	Archaeology ¹	Prev. Recorded Sites	Number		1
	Below Ground Resources ¹	Potential to Find/Record	High/Med/Low		Low
	Parkland	All Public Parks	Number/ Acres		0
		6(f) Parks	Number/Specify		0
		Coastal Zone Management	Number of Projects/Specify ²		0

Source: The Corradino Group of Michigan, Inc.

**Table 1A-4
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Plaza Only**

Evaluation Factor	Performance Measure Category		Description/Units	Plaza	II1
Protect The Natural Environment	Surface Water	Floodplain	Number/Acres		0/0
		Surface Run Off	Acres		15
		Primary Streams	Number/Specify		0
		Secondary Streams	Number/Specify		0
		Other Water-crossings	Number/Specify		0
	Groundwater	Municipal Wells	Number		0
		Water In-takes	Number/Specify		0
	Significant Habitat	Wetlands	Acres		0
		Fens / Bogs	Number/Acres		0
		Endangered Species ³	Potential Species		1
		Designated Wildlife Refuges	Number/Acres		0/0
	Prime/Unique Farmland	Farmland	Acres		0
	Mineral Resources	Salt /Limestone	Type/Specify		Salt

Source: The Corradino Group of Michigan, Inc.

Table 1A-5
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Plaza Only

Evaluation Factor	Performance Measure Category		Plaza		I11	
			Description/Units			
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action		1,089,636	
			With New Crossing		1,088,426	
			Difference from 2035 - No Action		-1,210	
			Percent Difference		-0.11%	
		VHT (int'l traffic only, PM Peak Hour for 2035)	No Action		22,113	
			With New Crossing		21,864	
	Difference from 2035 - No Action			-249		
	V/C (total traffic)	See Attachment 2 in this report.				
		Diversion due to disruption at crossing		Difference of Int'l VMT with Amb Br. Closed and New Crossing Open		-1,504
			Difference of Int'l VHT with Amb Br. Closed and New Crossing Open			9,073
			Detour of Local Arterials		Number of SEMCOG Network Links Rerouted	0

Source: The Corradino Group of Michigan, Inc.

Table 1A-6
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Plaza Only

Evaluation Factor	Performance Measure Category		Plaza		I11	
			Description/Units			
Maintain Air Quality	Regional Burden	Change from No Action Condition (pounds per peak hour)	VOC	VOC	-0.1	
			CO	CO	-4.5	
			NOX	NOX	-0.2	
				PM2.5	PM2.5	0.0
				PM10	PM10	0.0
				Benzene	Benzene	-0.00610
				1,3 Butadiene	1,3 Butadiene	-0.00060
				Formaldehyde	Formaldehyde	-0.00189
				Acetaldehyde	Acetaldehyde	-0.00087
				Acroline	Acroline	-0.00009
	CO Hotspot on Plaza	PPM in peak hour	CALQ3HC		<1	

Source: The Corradino Group of Michigan, Inc.

Table 1A-7
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Plaza Only

Evaluation Factor	Performance Measure Category		Description/Units	Plaza	I11		
Assess How Project Can Be Built	Traffic Maintenance	Streets Closed During Construction	number		2		
		Adjacent businesses affected by construction	Number w/i 500 ft/150 meters		0		
		Adjacent schools or public use facilities affected by construction	Number w/i 500 ft/150 meters		0		
	Site constraints limiting access to the plaza for the river crossing or the roadway connections.	Plaza proximity to bridge/tunnel landing	Distance (ft/m)			0ft/0m	
		Raillines adjacent to or through plaza site	Number			3	
		Utilities adjacent to or through plaza site	Number			1	
		Presence of heavy industry on plaza site	Number			0	
		Contaminated Sites/Hazardous Materials within 500ft/150m (single sites may have multiple designations)	EPA/DEQ Hazmat TSD Facility				0
			National Priority List (Superfund)				0
			RTK Cerclis (Superfund)				0
			Michigan Contaminated Sites				0
	Geotechnical constraints- identify any unusual geotechnical features/issues that may be problematic for construction	Proximity to solution mining areas	Number w/i 1,000 ft/300 meters			0	
		Presence of poor soil conditions (e.g., compressible/expansive & organic)	Yes/No			Y	
		Presence of noxious gasses (e.g., Hydrogen Sulfide and Methane)	Yes/No			Y	
		Presence of artesian groundwater	Yes/No			Y	
	Relative risk of known site conditions (environmental, geotechnical, other physical/construction methodologies)	Engineering Consideration	High/Medium/Low			Low	

Source: The Corradino Group of Michigan, Inc.

Attachment 1B

U.S. Crossing Evaluation Data Detroit River Tunnel Partnership Proposal

**Table 1B-1
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Crossing Only**

Evaluation Factor	Performance Measure Category		Crossing	X13
			Description/Units	II1
Protect Community / Neighborhood Characteristics	Traffic Impacts	Volume Change - Key Links	See Attachment 1: Key Links	See Attachment 1: Key Links
		Streets Closed (permanently)	Number	0
		Streets Closed (temporarily)	Number	2
		Streets Crossed	Number	2
		Streets Rerouted	Number	0
		Streets with Interchange	Number	NA
		Mainline Railines Crossed	Number	1
	Noise	Frontline Exposure	Number of dwelling units exposed	4
		Significant Receptors ¹ Exposures	Number /Specify ¹	0
	Community Cohesion/ Character	Positive/Negative/Neutral		Negative
	Potential Acquisition	Residential Units	Occupied	0
			Vacant	0
		Residential Population	Number	0
			Active	7
		Business Units	Vacant	9
			Estimated Employees in affected Census Blocks ²	Number
		Other Land Uses Affected	Schools	0
			Senior Service Facilities	0
			City/Government Facilities	0
			Places of Worship	0
			Medical Facilities	0
			State/Federal Government Facilities	1
			Community Services	0
	Vacant		0	
	Environmental Justice / Title VI	EJ Populations in affected Census Block Groups	EJ Population (non poverty)	1,378
			Population Groups Affected	African American, American Indian, Native Hawaiian, Hispanic
			% Households in Poverty / Above or Below 9.9% Regional Threshold ³	12.7% above
Households in poverty		120		
Title VI Groups in Census Tracts		Presence of Regionally Prominent Ancestral Groups	None	

Source: The Corradino Group of Michigan, Inc.

Table 1B-2
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Crossing Only

Evaluation Factor	Performance Measure Category		Crossing	X13	
			Description/Units	II1	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO	Yes	
	Other Plans	Consistency	YES/NO	No	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Undgrd. Stor. Tanks	Number		2
		EPA/DEQ Hazmat TSD Facility	Number		1
		National Priority List (Superfund)	Number		0
		RTK Cerclis (Superfund)	Number		0
		Michigan Contaminated Site	Number		0

Source: The Corradino Group of Michigan, Inc.

Table 1B-3
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Crossing Only

Evaluation Factor	Performance Measure Category		Crossing	X13
			Description/Units	II1
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number	0
		Listed NRHP Sites/Structures	Number	1
		Listed SHRS Sites/ Structures	Number	0
		Locally Listed Sites/Structures	Number	0
		Potentially Eligible Sites/Str.	Number	3
	Archaeology ¹	Prev. Recorded Sites	Number	3
	Below Ground Resources ¹	Potential to Find/Record	High/Med/Low	Medium
	Parkland	All Public Parks	Number/ Acres	0
		6(f) Parks	Number/Specify	0
		Coastal Zone Management	Number of Projects/Specify ²	1/5.7

Source: The Corradino Group of Michigan, Inc.

Table 1B-4
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Crossing Only

Evaluation Factor	Performance Measure Category		Crossing	X13
			Description/Units	II1
Protect The Natural Environment	Surface Water	Floodplain	Number/Acres	0.30
		Surface Run Off	Acres	
		Primary Streams	Number/Specify	1: Detroit R.
		Secondary Streams	Number/Specify	0
		Other Water-crossings	Number/Specify	0
	Groundwater	Municipal Wells	Number	
		Water In-takes	Number/Specify	
	Significant Habitat	Wetlands	Acres	0.00
		Fens / Bogs	Number/Acres	0/0
		Endangered Species ³	Special Known/Potential	0/4
		Designated Wildlife Refuges ⁴	Number/Acres	0/0
	Prime/Unique Farmland	Prime Farmland	Acres	0
	Mineral Resources	Salt /Limestone	Type/Specify	Salt

Source: The Corradino Group of Michigan, Inc.

**Table 1B-5
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Crossing Only**

Evaluation Factor	Performance Measure Category		Crossing		X14
			Description/Units		II3
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action		1,089,636
			With New Crossing		1,088,426
			Difference from 2035 - No Action		-1,210
			Percent Difference		-0.11%
		VHT (int'l traffic only, PM Peak Hour for 2035)	No Action		22,113
			With New Crossing		21,664
	Difference from 2035 - No Action		-249		
	Percent Difference		-1.13%		
	V/C (total traffic)	Refer to Table 5-10 and Figure 5-11		-	
	Diversion due to disruption at crossing	Difference of Int'l VMT with Amb Br. Closed and New Crossing Open		-1,504	
		Difference of Int'l VHT with Amb Br. Closed and New Crossing Open		9,073	
	Detour of Local Arterials	Number of SEMCOG Network Links Rerouted		0	

Source: The Corradino Group of Michigan, Inc.

**Table 1B-6
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Crossing Only**

Evaluation Factor	Performance Measure Category		Crossing		X13
			Description/Units		II1
Maintain Air Quality	Regional Burden	Change from No Action Condition (pounds per peak hour)	VOC	VOC	-0.1
			CO	CO	-4.5
			NOX	NOX	-0.2
			PM2.5	PM2.5	0.0
			PM10	PM10	0.0
			Benzene	Benzene	-0.0061
			1,3 Butadiene	1,3 Butadiene	-0.0006
			Formaldehyde	Formaldehyde	-0.0018
			Acetaldehyde	Acetaldehyde	-0.0009
	Acroline	Acroline	-0.0001		
	CO Hotspot on Plaza	PPM in peak hour	CALQ3HC	<1	

Source: The Corradino Group of Michigan, Inc.

**Table 1B-7
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Crossing Only**

Evaluation Factor	Performance Measure Category	Description/Units	Crossing	X13		
				III		
Assess How Project Can Be Built	Traffic Maintenance	Streets Closed During Construction	number	2		
		Businesses affected by construction	Number w/i 328 ft/100 meters	9		
		Schools or public use facilities affected by construction	Number w/i 328 ft/100 meters	1		
	Site constraints limiting access to the plaza for the river crossing or the roadway connections.	Plaza proximity to bridge/tunnel landing	Plaza proximity to bridge/tunnel landing	Distance (ft/m)	0	
			Raillines adjacent to or through plaza site	Number	1	
			Utilities adjacent to or through plaza site	Number	0	
			Presence of heavy industry on plaza site	Number	0	
			Contaminated Sites/Hazardous Materials within 500ft/150m (single sites may have multiple designations)	EPA/DEQ Hazmat TSD Facility		1
				National Priority List (Superfund)		0
				RTK Cerclis (Superfund)		0
				Michigan Contaminated Sites		0
			Amount of crossing over/on land**	Length (feet)	n/a	
			Total length of crossing	Length (feet)	17520	
			Total length of bridge	Length (feet)	8692	
			Length of main structure	Length (feet)	n/a	
			Piers in water**	Number	n/a	
	Piers in close proximity to navigation cha	Number w/i 200 ft	n/a			
	Geotechnical constraints- identify any unusual geotechnical features/issues that may be problematic for construction	Proximity to solution mining areas	Number w/i 1,000 ft/300 meters	0		
		Presence of poor soil conditions (e.g., compressible/expansive & organic)	Yes/No	N/A		
		Presence of noxious gasses (e.g., Hydrogen Sulfide and Methane)	Yes/No	N/A		
		Presence of artesian groundwater	Yes/No	N/A		
	Relative risk of known site conditions (environmental, geotechnical, other physical/construction methodologies)	Engineering Consideration	High/Medium/Low	low		

Source: The Corradino Group of Michigan, Inc.

Attachment 1C

**U.S. Connecting Route Evaluation Data
Detroit River Tunnel Partnership Proposal**

**Table 1C-1
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Alignment Only**

Evaluation Factor	Performance Measure Category	Description/Units	Plaza	II1	
			Alignment	Rail line/I-75	
Protect Community / Neighborhood Characteristics	Traffic Impacts	Volume Change - Key Links	See Attachment 1: Key Links		
		Streets Closed (permanently)	Number	0	
		Streets Crossed	Number	0	
		Streets Rerouted	Number	0	
		Streets with Interchange	Number	1	
		Mainline Raillines Crossed	Number	0	
	Noise	Frontline Exposure	Number of dwelling units exposed		5
		Significant Receptors ¹ Exposures	Number /Specify ¹		1
	Community Cohesion/ Character	Positive/Negative/Neutral	Positive/Negative/Neutral		Negative
	Potential Acquisition	Residential Units	Occupied		0
			Vacant		0
		Residential Population	Number		0
			Active		0
		Business Units	Vacant		0
			Estimated Range of Employees	Number	
		Other Land Uses Affected	Schools		0
			Senior Service Facilities		0
			City/Government Facilities		0
			Places of Worship		0
			Medical Facilities		0
			State/Federal Government Facilities		0
			Community Services		0
	Vacant			0	
Environmental Justice / Title VI	EJ Populations in affected Census Block Groups	EJ Population (non poverty)		1,697	
		Population Groups Affected		American Indian, Native Hawaiian, Hispanic	
	% Households in Poverty / Above or Below 9.9% Regional Threshold ²		30.0%/Above		
	Households in poverty		240		
	Title VI Groups in Census Tracts	Presence of Regionally Prominent		None	

Notes;

1. Sensitive noise receptors are historic sites, medical facilities, parks, places of worship, schools, within fifty meters of an alignment, plaza, or crossing.

2. The poverty threshold for the SEMCOG region is 9.9%. Block groups with percentage of households living in poverty above 9.9% qualify as environmental justice communities.

Source: The Corradino Group of Michigan, Inc.

**Table 1C-2
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Alignment Only**

Evaluation Factor	Performance Measure Category		Plaza Alignment	II1	
			Description/Units	Rail line/I-75	
Maintain Consistency w/Local Planning	Official Plans	Consistency	YES/NO	No	
	Other Plans	Consistency	YES/NO	No	
	Environmental Sites Affecting Plan Implementation (single sites may have multiple designations)	Leaking Undgrd. Stor. Tanks (100m)		Number	2
		EPA/DEQ Hazmat TSD Facility (200m)		Number	0
		National Priority List (Superfund) (200m)		Number	0
		RTK Cerclis (Superfund) (200m)		Number	0
Michigan Contaminated Site (200m)		Number	0		

Source: The Corradino Group of Michigan, Inc.

**Table 1C-3
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Alignment Only**

Evaluation Factor	Performance Measure Category		Plaza Alignment	II1	
			Description/Units	Rail line/I-75	
Protect Cultural Resources	Above Ground Historic Resources ¹	Historic Districts	Number	0	
		Listed NRHP Sites/Structures	Number	0	
		Listed SHRS Sites/ Structures	Number	0	
		Locally Listed Sites/Structures	Number	0	
		Potentially Eligible Sites/Str.	Number	0	
	Archaeology ¹	Prev. Recorded Sites	Number	1	
	Below Ground Resources ¹	Potential to Find/Record		High/Med/Low	Low
		All Public Parks		Number/ Acres	0/0
	Parkland	6(f) Parks		Number/Specify	0
		Coastal Zone Management		Number of Projects/Specify ²	0

Notes:

- 1: See Attached sheets for identification of individual sites.
- 2: Coastal Zone Management Projects:
 - X4: Public River Access/Use
 - X12, X13, X14: River Corridor Walk
 - X15: Lake Sturgeon Habitat

Source: The Corradino Group of Michigan, Inc.

Table 1C-4
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Alignment Only

Evaluation Factor	Performance Measure Category	Description/Units	Plaza	
			Alignment	
			II1	
			Rail line/I-75	
Protect The Natural Environment	Surface Water	Floodplain	Number/Acres	0/0.0
		Surface Run Off	Acres	0.00
		Primary Streams	Number/Specify	0
		Secondary Streams	Number/Specify	0
		Other Water-crossings	Number/Specify	0
	Significant Habitat	Wetlands	Acres	0.00
		Fens / Bogs	Number/Acres	0.00
		Endangered Species ³	Species Known/Potential	0/0
			Listed Communities ⁵	0
	Designated Wildlife Refuges ⁴	Number/Acres	0/0	
		Prime Farmland Soil	Number/Acres	0/0
	Farmland	Active Farmland	Number/Acres	0/0
		Mineral Resources	Salt /Limestone	Type/Specify

Notes:

- 1: Primary Streams are classified as water courses with an average width greater than 50ft/15m
- 2: Secondary streams are classified as water courses with an average width less than 50ft/15m.
- 3: See attached lists for detailed inventory of species affected.
- 4: The Detroit River International Wildlife Refuge is the only known official wildlife refuge affected by alignment.
- 5: Listed Communities include Lakeplain Oak Openings, Lakeplain Wet Prairie, Lakeplain Wet-Mesic Prairie.

Source: The Corradino Group of Michigan, Inc.

**Table 1C-5
 Detroit River International Crossing Study
 Evaluation of DRTP Proposal
 Alignment Only**

Evaluation Factor	Performance Measure Category	Description/Units	Plaza	II1
			Alignment (Crossing)	Rail line/I-75 (X13)
Improve Regional Mobility	Highway Network Effectiveness	VMT (int'l traffic only, PM Peak Hour for 2035)	No Action	1,089,636
			With New Crossing	1,088,426
			Difference from 2035 - No Action	-1,210
			Percent Difference	-0.11%
		VHT (int'l traffic only, PM Peak Hour for 2035)	No Action	22,113
			With New Crossing	21,864
			Difference from 2035 - No Action	-249
			Percent Difference	-1.13%
		V/C (total traffic)	See Attachment 1	
		Diversion due to disruption at crossing	Difference of Int'l VMT with Amb Br. Closed and New Crossing Open	-1,504
			Difference of Int'l VHT with Amb Br. Closed and New Crossing Open	9,074
		Detour of Local Arterials	Number of SEMCOG Network Links Rerouted	0
	Alignment Performance	Primary Link: Plaza to I-75	Total Volume (PM Peak Hour, 2035)	603
			Int'l Volume (Pm Peak Hour, 2035)	603
			Maximum V/C	0.57
Secondary Link: I-75		Total Volume (PM Peak Hour, 2035)	NA	
		Int'l Volume (Pm Peak Hour, 2035)	NA	
Maximum V/C	NA			

Source: The Corradino Group of Michigan, Inc.

Table 1C-6
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Alignment Only

				Plaza	II1
				Alignment (Crossing)	
Evaluation Factor	Performance Measure Category		Description/Units		Rail line/ I-75 (X13)
Maintain Air Quality	Regional Burden	Change from No Action Condition (pounds per peak hour)	VOC	VOC	-0.15
			CO	CO	-4.45
			NOX	NOX	-0.15
			PM2.5	PM2.5	-0.01
			PM10	PM10	-0.02
			Benzene	Benzene	-0.0061
			1,3 Butadiene	1,3 Butadiene	-0.0006
			Formaldehyde	Formaldehyde	-0.0019
			Acetaldehyde	Acetaldehyde	-0.0009
			Acroline	Acroline	-0.0001
	CO Hotspot	PPM in peak hour	CALQ3HC		<2

Source: The Corradino Group of Michigan, Inc.

Table 1C-7
Detroit River International Crossing Study
Evaluation of DRTP Proposal
Alignment Only

Evaluation Factor	Performance Measure Category	Description/Units	Plaza	II1
			Alignment	Rail line/I-75
Assess How Project Can Be Built	Traffic Maintenance	Streets Crossed/Closed During Construction	Number	0
		Businesses affected by construction ¹	Number w/i 328 ft/100 meters	0
		Schools or public use facilities affected by construction	Number w/i 328 ft/100 meters	1
		Existing Railroads Crossed	Number	0
		Existing Utilities Crossed	Number	0
		Contaminated Sites/Hazardous Materials within 500ft/150m (single sites may have multiple designations)	EPA/DEQ Hazmat TSD Facility	0
			National Priority List (Superfund)	0
	RTK Cerclis (Superfund)		0	
	Michigan Contaminated Sites		0	
	Geotechnical constraints- identify any unusual geotechnical features/issues that may be problematic for construction	Proximity to solution mining areas	Number w/i 1,000 ft/300 meters	0
		Presence of poor soil conditions (e.g., compressible/expansive & organic)	Yes/No	No
		Presence of noxious gasses (e.g., Hydrogen Sulfide and Methane)	Yes/No	Yes
		Presence of artesian groundwater	Yes/No	Yes
Relative complexity of known site conditions (environmental, geotechnical, other physical/construction methodologies)	Engineering Consideration	High/Medium/Low	Medium	

Source: The Corradino Group of Michigan, Inc.

Attachment 1D

Canadian Evaluation Data Detroit River Tunnel Partnership Proposal

Attachment 2

**Detroit River International Crossing Study
Evaluation of Illustrative Alternatives: Plazas
Protect Community/Neighborhood Characteristics Attachment 2:
Increase or Decrease in Cars, Local Trucks and International Trucks
for Local Traffic Links**

Detroit River International Crossing Study
Evaluation of Illustrative Alternatives: Plazas
Protect Community/Neighborhood Characteristics Attachment 2:
Increase or Decrease in Cars, Local Trucks and International Trucks for Local Traffic Links

2035 PM Peak Hour Differences		S1 (A1)	S2 (A2)	S3 (A7)	S4 (A8)	S5 (A14)	C2 (A20a)	C3 (A24)	C4 (A26)	II2 (A30)	II3 (A31)	II4 (A27)	N1 (A32)
Sibley east of I-275	Cars	-240	-243	-261	-261	2	4	7	7	4	4	0	1
	Local Trucks	-17	-17	-29	-28	0	0	0	1	0	0	0	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Middlebelt north of King	Cars	659	657	-22	-26	-8	4	6	7	4	2	3	2
	Local Trucks	28	28	-3	-3	0	1	1	1	0	0	0	0
	Intl Trucks	0	1	-1	-1	0	0	0	0	0	0	0	0
King west of Fort	Cars	-120	-167	-78	-67	28	16	4	8	0	3	-1	0
	Local Trucks	-15	-14	-7	-7	0	1	0	0	0	0	0	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Fort south of King	Cars	-51	56	48	85	74	58	14	2	24	15	2	8
	Local Trucks	-7	-1	1	3	5	5	1	-1	2	1	0	1
	Intl Trucks	-51	-42	10	0	-22	-30	1	2	16	2	2	1
Jefferson south of King	Cars	23	78	18	39	24	23	0	0	17	1	-1	0
	Local Trucks	1	3	1	0	1	1	0	0	1	0	0	0
	Intl Trucks	0	19	1	47	18	18	0	0	15	0	0	0
Sibley west of Fort	Cars	6	-36	-75	-79	-10	3	-1	1	4	1	4	1
	Local Trucks	1	-3	-4	-4	-1	0	0	0	0	0	0	0
	Intl Trucks	3	3	0	0	0	0	0	0	0	0	0	0
Dix Toledo north of I-75	Cars	-227	-137	3	-20	-37	6	12	0	1	6	4	0
	Local Trucks	-10	-6	-1	-2	-2	0	0	0	0	0	0	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Fort north of Sibley	Cars	112	-116	-19	-9	67	87	17	5	12	15	-1	7
	Local Trucks	3	-8	-3	-1	3	8	1	-1	0	1	-1	1
	Intl Trucks	-77	-78	11	-65	-55	-65	2	3	-13	2	3	1
Jefferson south of Pennsylvania	Cars	8	156	47	89	74	42	5	9	11	4	-3	3
	Local Trucks	0	9	4	4	5	2	1	1	1	0	0	0
	Intl Trucks	0	0	1	107	64	71	0	0	15	0	0	0
Pennsylvania west of Fort	Cars	-303	-140	-174	-139	11	12	0	-6	-11	2	-7	1
	Local Trucks	-17	-9	-11	-8	1	1	0	0	-1	0	0	0
	Intl Trucks	0	0	3	3	2	0	0	0	0	0	0	0
Pennsylvania west of Jefferson	Cars	-23	-52	76	-142	-59	15	5	4	3	1	0	1
	Local Trucks	-2	-3	2	-7	-4	1	0	0	0	0	0	0
	Intl Trucks	0	0	80	3	0	0	0	0	0	0	0	0
Fort south of Eureka	Cars	-83	-129	-129	-88	151	105	14	18	16	14	2	5
	Local Trucks	-7	-9	-8	-5	10	9	1	0	0	1	-1	1
	Intl Trucks	-78	-78	-65	-66	-53	-65	2	3	-13	2	3	1
Eureka east of I-275	Cars	-523	-498	-2676	-2675	6	25	15	12	4	3	6	1
	Local Trucks	-52	-50	-159	-159	-1	2	2	1	0	0	0	0
	Intl Trucks	6	6	5	5	0	0	0	0	0	0	0	0
Middlebelt north of Eureka	Cars	79	77	1006	1006	5	-1	4	5	0	2	-1	0
	Local Trucks	3	3	62	62	0	0	0	0	0	0	0	0
	Intl Trucks	4	5	4	4	0	0	0	0	0	0	0	0
Eureka east of I-75	Cars	-381	-340	-159	-149	-169	-33	2	-27	-10	-18	1	-2
	Local Trucks	-27	-23	-6	-5	-10	-1	0	-2	0	-2	0	0
	Intl Trucks	-1	-1	-1	-1	-1	-1	0	-1	-1	0	0	-1
Biddle north of Pennsylvania	Cars	-55	14	-63	-5	211	33	2	3	6	4	-5	4
	Local Trucks	-4	0	-4	-3	14	1	0	1	1	0	0	0
	Intl Trucks	0	0	2	4	64	71	0	0	15	0	0	0
Dix south of I-75	Cars	-167	-167	-124	-123	-48	-10	-26	-46	-4	13	-15	8
	Local Trucks	-9	-9	-7	-7	-1	0	-1	-2	0	1	-1	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Fort south of Southfield	Cars	-85	-80	-24	-21	27	110	-12	-42	34	14	-16	10
	Local Trucks	-9	-8	-2	-1	2	12	-1	-5	1	2	-3	1
	Intl Trucks	-79	-80	-67	-67	-57	-66	2	2	-13	3	3	1
Biddle south of Southfield	Cars	-133	-142	-209	-220	604	64	7	12	-11	6	-10	4
	Local Trucks	-7	-8	-13	-15	30	1	1	1	0	0	0	0
	Intl Trucks	0	0	2	4	67	72	0	0	15	0	0	0
Southfield west of Jefferson	Cars	-153	-165	-113	-112	-200	-26	-16	-29	-37	5	-2	-5
	Local Trucks	-10	-12	-7	-7	-14	-1	-1	-2	-2	0	0	-1
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Dix north of Southfield	Cars	-277	-286	-234	-230	-109	-9	163	110	16	-8	12	0
	Local Trucks	-20	-21	-17	-17	-2	1	11	7	1	0	0	0
	Intl Trucks	0	0	0	0	1	0	0	0	0	0	0	0
Fort north of Southfield	Cars	41	64	-19	-23	-222	109	51	9	20	20	13	8
	Local Trucks	6	8	2	3	-10	11	2	-2	0	2	-1	1
	Intl Trucks	-59	-60	-67	-67	-57	-66	2	2	-13	3	3	1
Jefferson north of Southfield	Cars	-160	-183	-185	-194	-1088	134	38	42	-17	0	-7	-4
	Local Trucks	-12	-14	-11	-13	-64	4	2	2	-1	0	0	0
	Intl Trucks	0	0	2	4	2	72	0	0	15	0	0	0
Outer east of I-75	Cars	-63	-70	-183	-183	-835	-56	79	68	-7	-8	63	-11
	Local Trucks	-6	-6	-13	-13	-47	-8	1	1	-1	-1	0	-1
	Intl Trucks	0	0	1	1	0	5	10	8	0	0	5	0

Detroit River International Crossing Study
Evaluation of Illustrative Alternatives: Plazas
Protect Community/Neighborhood Characteristics Attachment 2:
Increase or Decrease in Cars, Local Trucks and International Trucks for Local Traffic Links
CONTINUED

Fort north of Westend	Cars	-53	-54	-52	-52	-6	-53	4	379	-17	-23	-19	-5
	Local Trucks	-3	-3	-2	-2	-1	-3	0	18	-1	-2	-1	0
	Intl Trucks	0	0	0	0	0	0	0	77	0	0	0	0
Livernois southeast of Fort	Cars	-9	-8	-15	-25	-104	-180	-6	-50	20	37	14	6
	Local Trucks	0	0	-1	-2	-6	-11	0	-3	3	3	1	1
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Dragoon southeast of Fort	Cars	-213	-213	-223	-224	-338	-376	-166	33	-113	-121	76	-64
	Local Trucks	-15	-15	-16	-16	-24	-26	-12	2	-8	-8	6	-4
	Intl Trucks	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	0	-1
Junction southeast of Fort	Cars	0	0	0	0	0	3	0	0	0	0	0	0
	Local Trucks	0	0	0	0	0	0	0	0	0	0	0	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Fort northeast of Junction	Cars	-125	-126	-123	-125	-85	-129	-75	228	-26	-21	-198	-15
	Local Trucks	-6	-6	-6	-6	-5	-6	-4	8	-1	0	-10	-1
	Intl Trucks	0	0	0	0	0	0	1	29	36	16	0	0
Jefferson southwest of Grand	Cars	-41	-40	-38	-36	-85	-129	-27	11	-51	-43	-9	-24
	Local Trucks	-4	-4	-4	-4	-7	-9	-4	1	-6	-6	0	-4
	Intl Trucks	-2	-2	-2	-2	-2	-1	-2	-2	19	5	-2	-1
Grand north of Fort	Cars	37	43	38	36	-66	-107	-246	-91	196	206	616	-47
	Local Trucks	16	17	21	21	9	14	5	-1	22	21	19	6
	Intl Trucks	-463	-471	-483	-486	-484	-558	-524	-493	-472	-472	36	-94
Grand north of Vernor	Cars	-22	-21	-27	-28	-35	-56	-29	-30	-56	-33	23	-23
	Local Trucks	-4	-4	-5	-5	-5	-6	-4	-4	-4	-4	-3	-4
	Intl Trucks	1	1	1	1	1	-1	-1	4	-3	-3	12	-2
Fort northeast of the Amb Bridge	Cars	-4	-5	6	3	163	4	-55	-3	-191	-394	471	74
	Local Trucks	0	0	0	0	8	3	-3	-5	-30	-31	11	-1
	Intl Trucks	-2	-2	-2	-2	-2	5	6	34	418	423	36	7
Bagley west of 14th St.	Cars	-3	-3	-3	-3	-5	-4	-1	-1	8	-3	0	-9
	Local Trucks	0	0	0	0	0	0	0	0	1	-1	0	-1
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Vernor south of Michigan	Cars	-17	-16	-15	-16	-25	-28	-28	-4	-33	-32	-1	-20
	Local Trucks	0	0	0	0	-1	-1	-1	0	0	-1	0	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Michigan west of 14th st.	Cars	-64	-60	-120	-118	-197	18	-87	-114	291	617	-161	128
	Local Trucks	-2	-2	-5	-5	-9	4	-5	-9	7	34	-13	7
	Intl Trucks	8	8	8	8	7	7	5	-16	62	-4	-17	15
Bagley northeast of Rosa Parks	Cars	-1	-1	-1	0	0	-7	3	25	-2	26	67	1
	Local Trucks	0	0	0	0	0	0	0	1	0	1	2	0
	Intl Trucks	0	0	0	0	0	0	0	0	8	8	1	0
14th St. north of Bagley	Cars	-3	-3	-3	-3	-3	-4	2	5	12	4	9	-2
	Local Trucks	0	0	-1	-1	0	-1	0	1	2	1	1	0
	Intl Trucks	0	0	0	0	0	0	0	-23	-18	-20	-23	0
Rosa Parks north of Lafayette	Cars	6	6	7	8	-2	-2	12	27	123	48	56	-1
	Local Trucks	1	1	1	1	0	0	1	1	-10	1	0	0
	Intl Trucks	0	0	0	0	0	0	0	0	199	12	1	0
Fort east of Rosa Parks	Cars	-10	-10	-10	-12	90	-14	-34	37	-808	-23	256	73
	Local Trucks	-2	-2	-2	-3	2	-1	-4	-2	-40	-6	-1	1
	Intl Trucks	-2	-2	-2	-2	-2	0	2	7	-14	456	-9	5
Trumball south of Bagley	Cars	-2	-2	-2	-2	-10	1	1	-2	24	78	-10	3
	Local Trucks	0	0	0	0	0	0	0	0	0	0	0	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Lafayette east of Trumball	Cars	-14	-14	-1	-2	4	-13	-11	24	-99	-99	185	-14
	Local Trucks	0	0	0	0	0	0	0	2	-9	-9	10	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	13	0
Fort east of M-10	Cars	14	12	25	24	78	-4	-20	15	-385	-337	254	15
	Local Trucks	0	0	0	0	1	0	-1	0	-10	-9	5	0
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0
Jefferson west of St. Jean	Cars	-6	-5	-5	-5	-8	-1	1	9	-9	-9	30	316
	Local Trucks	0	0	0	0	0	0	0	1	0	-1	3	5
	Intl Trucks	-3	-3	-3	-3	-3	-2	-2	-3	3	3	-1	98
Jefferson east of Conner	Cars	-4	-5	-2	-1	1	-1	-1	6	-2	-8	9	174
	Local Trucks	0	0	0	0	0	0	0	0	0	-1	1	9
	Intl Trucks	0	1	1	1	1	1	1	1	0	0	0	1
St. Jean south of Mack	Cars	-2	-1	0	0	-6	-1	-2	-2	16	6	-1	-350
	Local Trucks	0	0	0	0	-1	0	0	0	1	0	0	-27
	Intl Trucks	0	0	0	0	0	0	0	0	-1	-1	0	1
Mack east of St. Jean	Cars	-17	-16	-19	-19	-22	-21	-24	-33	-19	-4	-40	-40
	Local Trucks	0	0	0	0	-1	0	0	1	0	0	1	-18
	Intl Trucks	0	-1	-1	-1	-1	-1	-1	-1	1	1	1	-1
Conner south of Mack	Cars	0	-3	-1	0	3	-1	-3	-4	-4	2	-9	-333
	Local Trucks	0	0	0	0	0	0	0	0	-1	0	-1	-15
	Intl Trucks	0	0	0	0	0	0	0	-1	-1	-1	-1	-1
Warren west of Conner	Cars	-22	-22	-32	-32	-37	-26	-23	-21	-13	-13	-8	93
	Local Trucks	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	3
	Intl Trucks	0	0	0	0	0	0	0	0	0	0	0	0

Notes: I: Plazas are connected to specific alignment alternatives: (final interchange via crossing)
S1 - A1: to I-275/King via X1
S2 - A2: to I-275/King via X1
S3 - A7: to I-275/Eureka via X2
S4 - A8: to I-275/Eureka via X2
S5 - A14: I-94 Southfield via X4
C2 - A20a: I-94/Schaefer South via X8
C3 - A24: I-75/Dearborn via X10
C4 - A26: I-75/Dragoon via X11
II2 - A30: M-10/Lafayette via X14
II3 - A31: M-10/Lafayette via X14
II4 - A27: I-75/Gateway via X12
N1 - A32: I-94/St.Jean via X15

Source: The Corradino Group of Michigan, Inc.