3. The Environment: What's There Now and What are the Impacts?

This Chapter of the DEIS describes the affected environment and the potential effects of the DRIC Practical Alternatives on the United States side of the border crossing. The sections within this chapter are arranged to provide an understanding of the community most directly affected and the potential impacts. The first section describes the community characteristics and impacts while the second section described the economy and Jobs within the study area. The other sections describe the existing and proposed land uses, traffic conditions, potential noise and air quality impacts, potential impacts to the natural environment (wildlife and wetlands), cultural resources, parkland, and finally indirect and cumulative impacts. Because of the bi-national nature of the project, transboundary effects, i.e., those effects in Canada caused by the project are covered in the "Indirect and Cumulative Impacts section. The transboundary effects will also be documented in the Canadian Environmental Assessment. Separate, detailed technical reports support the information presented in this chapter. Table S-8 summarizes the impacts discussed in this chapter of the DEIS.

What are Potential Effects?

Potential effects are impacts or changes that could occur as a result of the project. The effects may be on people, the built environment, or the natural environment. Examples include relocating people, affecting historic sites or impacting wetlands.

This DEIS and supporting Technical Reports are available for review on the project Web site (www.partnershipborderstudy.com) and at the locations listed in the Preface of this DEIS.

What is a Technical Report?

A technical report focuses on a single concern in greater detail. For a list of technical reports prepared for this project, see page v.

3.1 Social/Community Characteristics and Impacts

This section describes the social and community characteristics of the area that would be directly affected by the proposed border crossing. It addresses impacts on the people and community facilities in the "host" community of Delray.

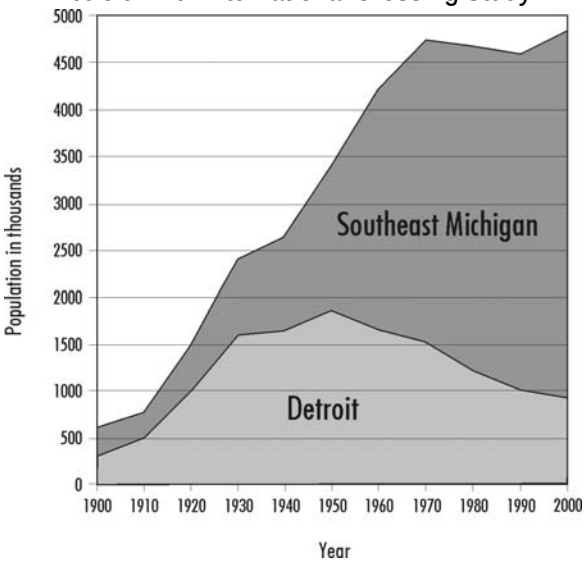
The bridge for the border crossing and the impacts to the social fabric from the proposed project will "land" in Delray, a Detroit neighborhood. It is bounded by the Rouge River, I-75, the Detroit River, and West Grand Boulevard. It is part of a larger area referred to as Southwest Detroit. Detroit is in Wayne County, which is part of the seven-county SEMCOG region in southeast Michigan. The presentation of

social/community impacts begins with a discussion of the region and the City of Detroit, then the study area, then three neighborhoods – Delray, Springwells and Vernor-Junction. This information is drawn from the *Community Inventory Technical Report*[1] and the *Indirect and Cumulative Impact Analysis Technical Report*.[2]

3.1.1 Historic Trends of Region and Study Area

3.1.1.1 Population

Figure 3-1
Population Trends in Southeast Michigan
Detroit River International Crossing Study



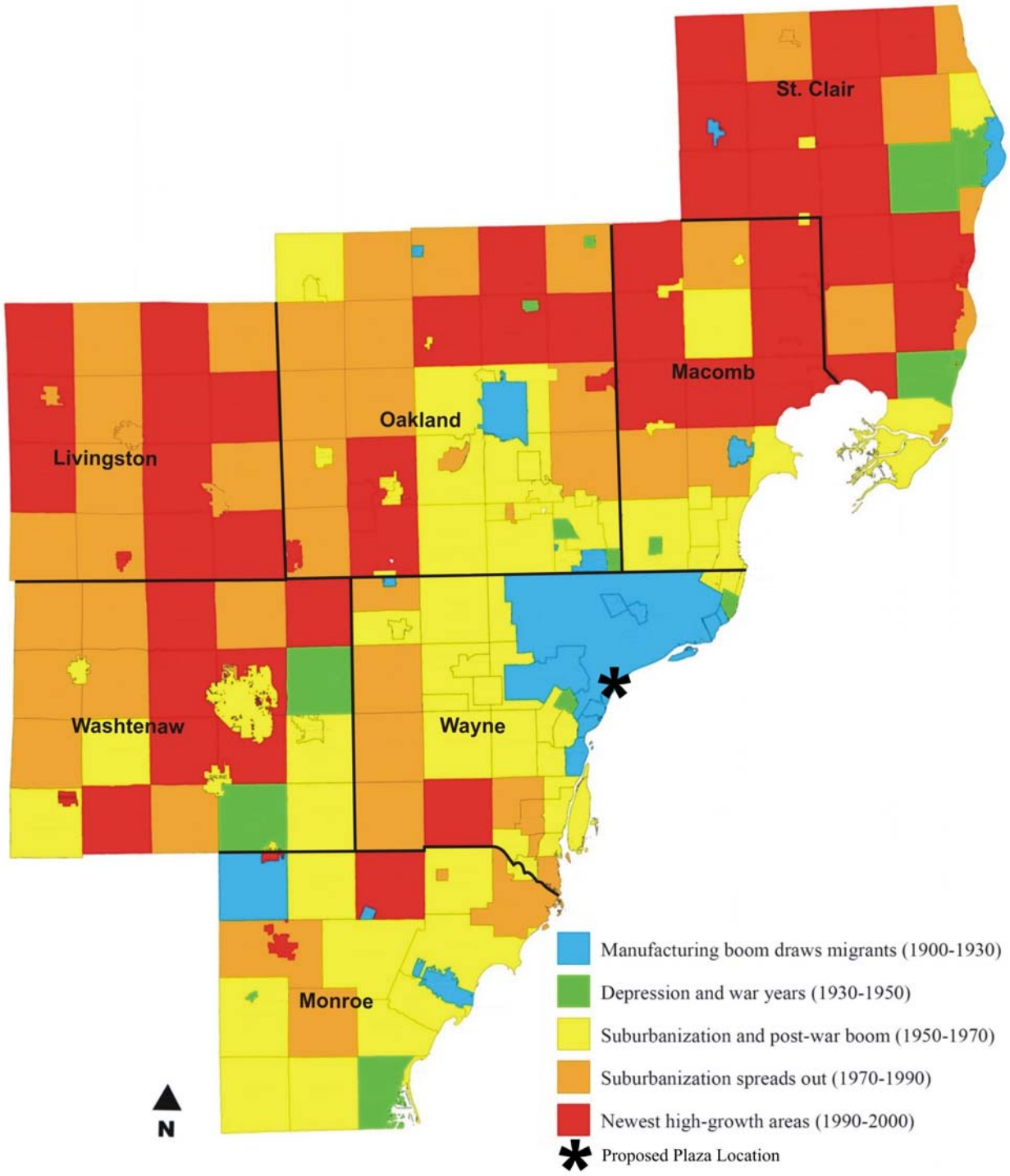
Source: SEMCOG

At the beginning of the 20th century, Southeast Michigan attracted many rural residents and international immigrants (Figure 3-1). The attraction was the opportunity for higher income in industrial jobs. After the Depression of the 1930s, growth in the region resumed first because of the industrial efforts required by World War II and, then, as a result of increased economic prosperity, expanding family size, and increased mobility. Between 1900 and 2000, Southeast Michigan added about 4.3 million people (Figure 3-1) with increased movement to the suburbs from 1950 to 2000 (Figure 3-2).

Wayne County was the manufacturing center of Michigan in the 1800s. By 1900, shipping was its largest industry and Wayne County was exporting Michigan's natural resources of iron ore, copper, and farm products through its ports. The auto industry brought people to Wayne County. Each of the "Big Three" American car companies was founded there: General Motors in Detroit; Ford in Dearborn; and, Chrysler in Highland Park. From 1900 to 1930, Wayne County's population grew from just over 340,000 to almost 1.9 million people. As suburbanization spread throughout the region after World War II, Wayne County's population decreased.

[1] The Corradino Group of Michigan, Inc., Detroit River International Crossing Study, *Community Inventory Technical Report*, November 2007.
[2] The Corradino Group of Michigan, Inc., *Detroit River International Crossing Study, Indirect and Cumulative Impact Analysis Technical Report*, January 2008.

Figure 3-2
Peak Growth by Community in Southeast Michigan
1900-2000
Detroit International River Crossing Study



Source: SEMCOG

Detroit also began to lose population after 1950, declining to fewer than one million in 2000. Other cities touched by the 27-square-mile DRIC study area – Allen Park, Ecorse, Melvindale and River Rouge (Figure 3-3) – have all declined in population since peaks were reached between 1950 and 1970 (Table 3-1). Dearborn's population has remained stable since 1980.

Table 3-1
Population Peaks
Wayne County and Study Area Communities
Detroit River International Crossing Study

Place	Peak Population Year	Peak Population	2000 Population
United States Total	2000	281,421,906	281,421,906
Wayne County Total	1970	2,670,368	2,061,162
Detroit	1950	1,849,568	951,270
Allen Park	1970	40,747	29,376
Dearborn	1960	112,007	92,775
Ecorse	1950	17,948	11,229
Melvindale	1970	13,862	10,735
River Rouge	1950	20,549	9,917
SEMCOG Region Total	2000	4,833,493	4,833,493
State of Michigan Total	2000	9,938,444	9,938,444

Source: SEMCOG Historical Population 1900-2000 and U.S. Census

3.1.1.2 Employment

Employment trends in the SEMCOG region in the last 30 years primarily reflect the growth of large employment centers. In 1970, five of the ten largest employment centers were in Wayne County. By 2000, the ten largest employment centers had more than 60,000 workers each; all but three were outside Wayne County. It is noteworthy that during the period 1970 to 2000, the number of business establishments in Wayne County held constant at about 36,000, but in Detroit they dropped by two-thirds to approximately 8,300. Employment in Detroit declined by almost 400,000 (from 735,000 to 345,000) (Table 3-2). Dearborn employment has held steady since 1970. Allen Park employment has held steady since 1980. Employment in Ecorse, Melvindale and River Rouge has steadily declined from the 1970s, with Ecorse and River Rouge being particularly hard hit by the changes in the United States' steel industry.

Table 3-2
Employment Trends in Wayne County and Study Area Communities
Detroit River International Crossing Study

Place	1970	1980	1990	2000
SEMCOG Regional Total	1,938,512	2,105,879	2,350,238	2,673,180
State of Michigan Total	3,558,467	4,039,438	4,826,388	5,654,522
United States Total	91,281,600	114,231,200	139,426,900	167,465,300
Oakland County Total	332,973	509,086	681,037	910,441
Wayne County Total	1,211,174	1,077,723	976,191	970,531
Detroit	735,104	562,120	412,490	345,424
Allen Park	11,210	15,041	16,543	15,718
Dearborn	105,532	113,040	101,443	108,418
Ecorse	31,464	13,229	5,898	5,093
Melvindale	5,968	5,091	3,874	3,326
River Rouge	7,393	5,721	2,618	2,653

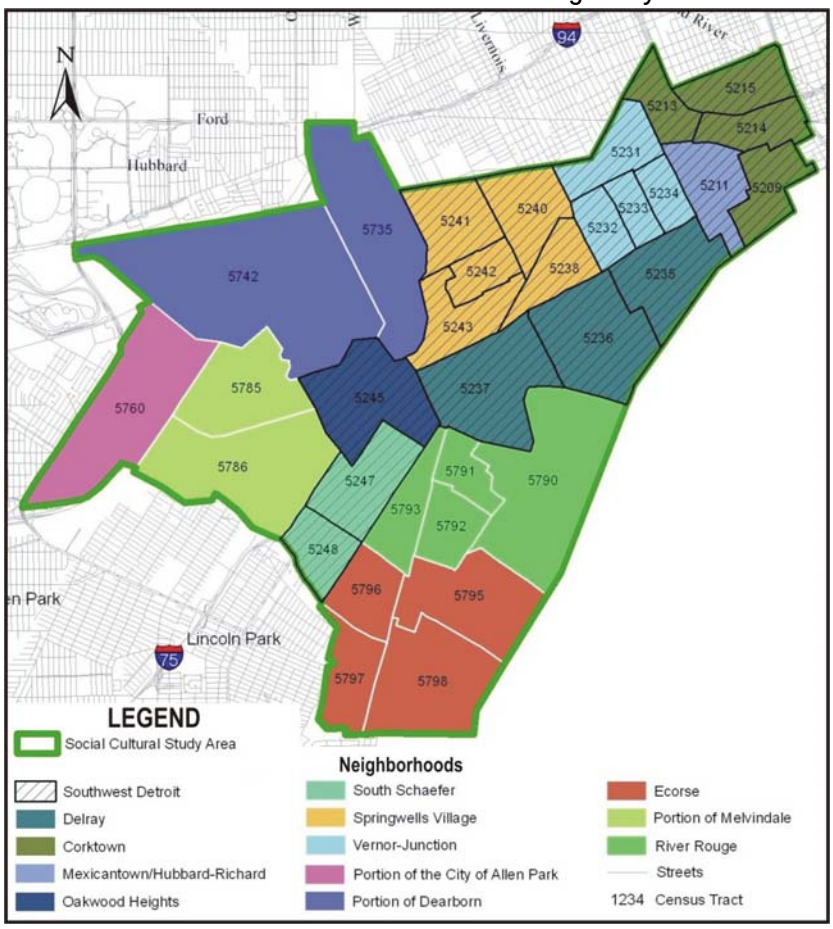
Source: SEMCOG Historical Employment 1970-2000 and U.S. Census

Figure 3-3
Study Area
Detroit River International Crossing Study

Source: The Corradino Group of Michigan, Inc.

3.1.2 Community/Neighborhood Characteristics

Figure 3-4
Neighborhoods/Communities in the Study Area
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Southwest Detroit is composed of seven neighborhoods (Delray, South Schaefer, Oakwood Heights, Springwells Village, Vernor-Junction, Mexicantown/Hubbard-Richard, and Corktown), and is two miles west of downtown Detroit (Figure 3-4). It is bounded by Michigan Avenue to the north, the Detroit River to the south, the north fork of the Ecorse River to the west, and the Lodge Freeway (M-10) to the east. The area is a mixture of heavy industrial, residential, and commercial/retail uses. It is Southeast Michigan's transportation center, with the concentration of interstate highways, railroads, international crossings and river shipping. Historically, Southwest Detroit has been ethnically diverse and densely populated.

While the City of Detroit has faced considerable population loss over the past 30 years, Southwest Detroit has rebounded. Census data show Southwest Detroit has experienced a shift from White and African American households to Hispanic households. The presence of the Hispanic community is evidenced by investments in new and revitalized businesses and housing, especially along and around West Vernor Highway, which is about midway between I-75 and I-94.

The discussion now turns to the Delray Study Area which is composed of three neighborhoods –Delray which would have the most direct effects from the proposed crossing, Vernor-Junction, and Springwells Village. A complete discussion of the other four neighborhoods is found in the *Community Inventory Technical Report*.

3.1.2.1 Delray Neighborhood History

At the turn of the 20th century, Delray was a predominately lower-middle-income community receiving waves of Polish, Hungarian, German, and Armenian immigrants. Delray's population of 5,000 in 1900 increased to 8,000 by 1905, as heavy industry provided more jobs there. Delray was annexed by the City of Detroit in 1906, but continued to maintain its identity well into the 20th century. At its height, one never had to leave Delray; people worked, lived and shopped there, often internal to their ethnic community. They worked at one of the many industries lining the Detroit River or at one of the auto and steel factories located nearby. They rented a residence (until they saved enough money to purchase it), and either walked or took the streetcar to work. They shopped at the grocery stores on Jefferson Avenue, Dearborn Street, and West End Avenue, and frequented the local theaters, bars, restaurants, bakeries, and meat markets that provided native specialties. They went to their place of worship there, often helping to build it so they could hear services in their native language. They sent their children to one of the local schools.

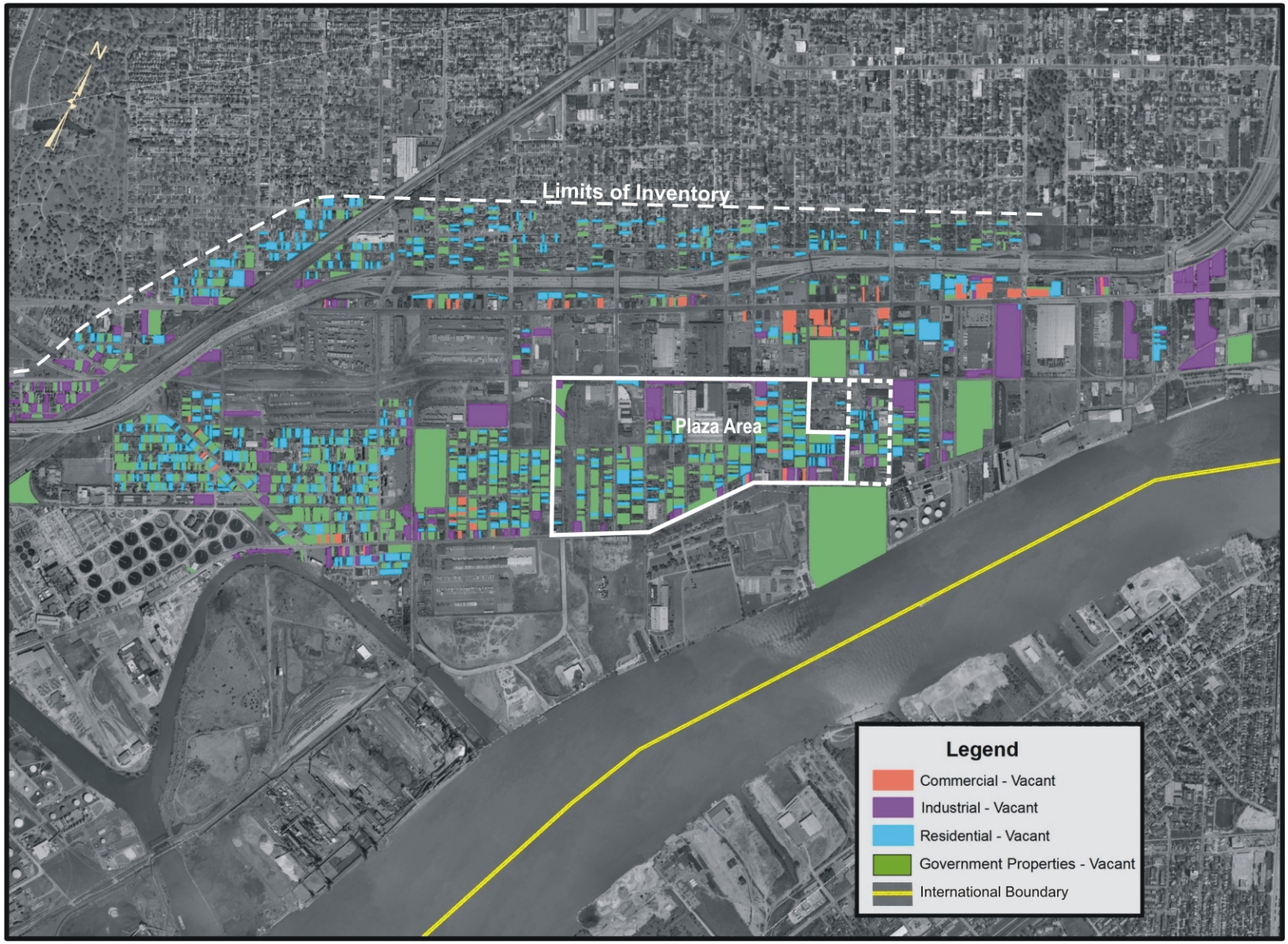
The population of Delray peaked in the 1930s at about 24,000 people. By the 1950s, the population had dropped to about 18,000. The attraction of jobs and relatively inexpensive housing elsewhere, together with concerns about the quality of schools and other urban issues, made the suburbs increasingly attractive after the 1950s. In the 1960s and early 1970s, I-75 skimmed the northern edge of Delray, reducing its connection to the rest of Southwest Detroit and displacing homes and businesses. By the 1970s, only about 9,800 people called Delray home. The decline continued as the Detroit Water Board expanded the wastewater treatment plant, with great impact on the Polish community.

Some 1,700 parcels in Delray are vacant (out of 3,000 parcels). Fifty-four percent of the vacant parcels are owned by the City of Detroit (Figure 3-5). A great number of the homes that remain in Delray are in need of major repairs. The largest concentration of occupied dwelling units is in west Delray (Figure 3-6). Today, little remains of old Delray.

Delray Neighborhood Today

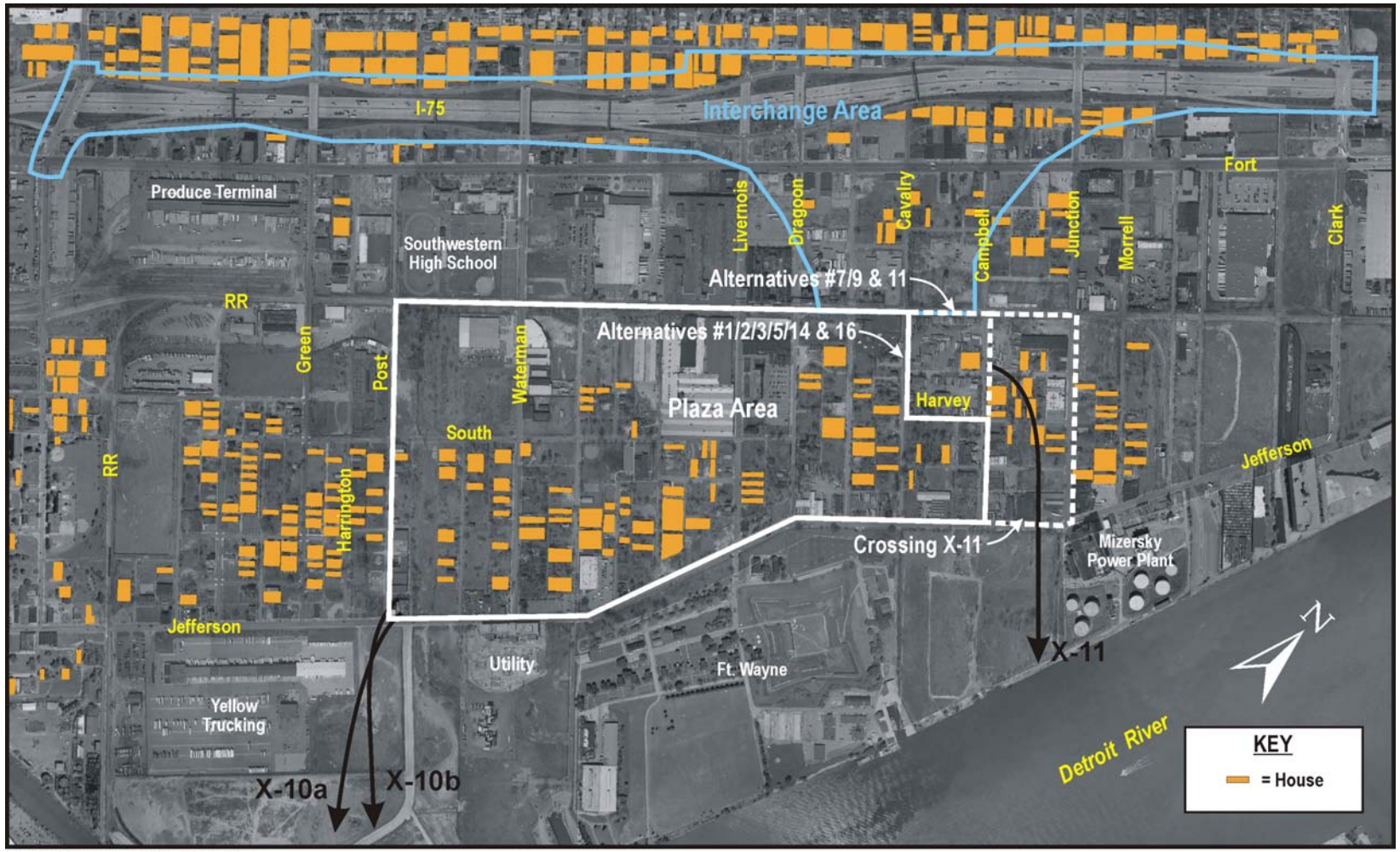
The Delray neighborhood is located in census tracts 5235, 5236 and 5237 (Figure 3-6A). Data from the 2000 Census indicate that Delray's ethnic composition is African American (32.3%), Caucasian (32.4%) and Hispanic (Mexican & Puerto Rican) (30.2%) (Table 3-2A). The Hungarian community, once dominant in Delray, now has a very small presence after declining over the last 30 years.

Figure 3-5
Vacant Parcels in the Delray Study Area
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Figure 3-6
Occupied Dwelling Units in the Delray Study Area
(September 2007)
Detroit River International Crossing Study

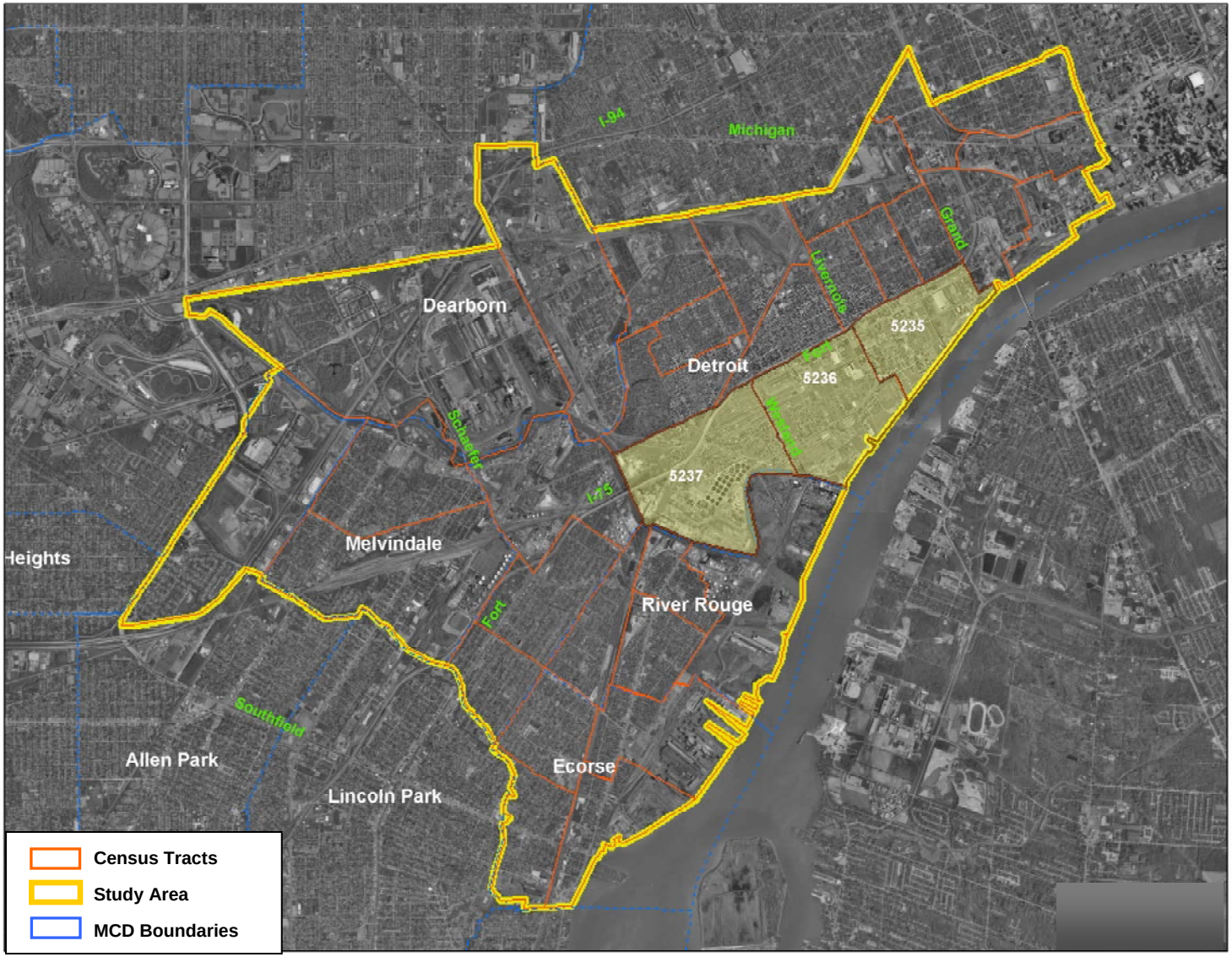


I:Projects/3600/Graphics/ReportGraphics/DEIS/Housing.cdr

Source: The Corradino Group of Michigan, Inc.

DRAFT

Figure 3-6A
Delray Neighborhood in Southwest Detroit
(Census Tracts are Numbered)
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Table 3-2A
Demographics
Delray Neighborhood
(Census Tracts 5235, 5236 and 5237)
Detroit River International Crossing Study

Race	Total	Percent
White alone	1,351	32.4%
Black or African American alone	1,347	32.3%
American Indian and Alaska Native alone	17	0.4%
Asian alone	4	0.1%
Native Hawaiian and Other Pacific Islander alone	0	0.0%
Some other race alone	52	1.2%
Two or more races	141	3.4%
Hispanic or Latino:	1,253	30.2%
Total Population	4,164	100.0%

Source: U.S. Census

In the Delray neighborhood there are 1,420 Households and 922 families. About a quarter of the Delray households are reported in the 2000 Census as having no access to an automobile, compared to just eight percent in the SEMCOG region. Approximately 39 percent of Delray's families live as a Married-Couple Family, while approximately 61 percent live as an Other-Family type. The most-common type of Other-Family reported in the 2000 Census is "Female Householder/No Husband Present," which constituted about 51 percent of total families. Slightly more than 40 percent of the Delray households live below the poverty level.

The educational attainment for the Delray population over the age of 25 is as follows: 2.5 percent of the population has completed no schooling; 19.8 percent has received an 8th grade education; 34.3 percent has received a 12th grade education but without a high school diploma; and, 25.6 percent has a high school diploma or has passed a high school equivalency exam. Those living in Delray with a college education represent three percent of the total population.

The leading employment categories for men are: manufacturing, 19 percent; professional/scientific/management/administrative/waste management services, 17 percent; and, retail trade, 15 percent. For women the leading employment categories are: education, health and social services, 25 percent; health care and social assistance, 17 percent; and, manufacturing, 16 percent. The unemployment rate in Delray according to the 2000 Census was about 11 percent. The comparable statistic for the SEMCOG region in the 2000 Census was six percent.

The fabric of the Delray community is defined through two distinct groups – long-time residents and an emerging Hispanic community. The ethnic composition of Hispanics is primarily Mexican and Puerto Rican. Hispanics are moving into Delray for a variety of reasons, particularly, the affordability of housing. A house in need of repair can be purchased for as little as $15,000. Information gained in a number of interviews indicates fixing the house is accomplished through the "sweat equity" of immediate and extended family members who are often skilled tradesmen.

Neighborhood convenience stores in fuel service stations are the only place in Delray to purchase basic food-group items, such as milk, bread and eggs. Residents understand prices may be higher in this circumstance, but, travel to a more-distant location to shop is not a convenient option for some. Only about 70 percent of the Delray housing units have access to an automobile, compared to 91 percent in the region.

Springwells Village Neighborhood

Springwells Village is located in census tracts 5238, 5240, 5241, 5242, and 5243 (Figure 3-6B). The Springwells Village neighborhood connects to the Vernor-Junction and Mexicantown neighborhoods through the commercial thoroughfare of Vernor Avenue. Within the last 15 years, this neighborhood has undergone strong revitalization.

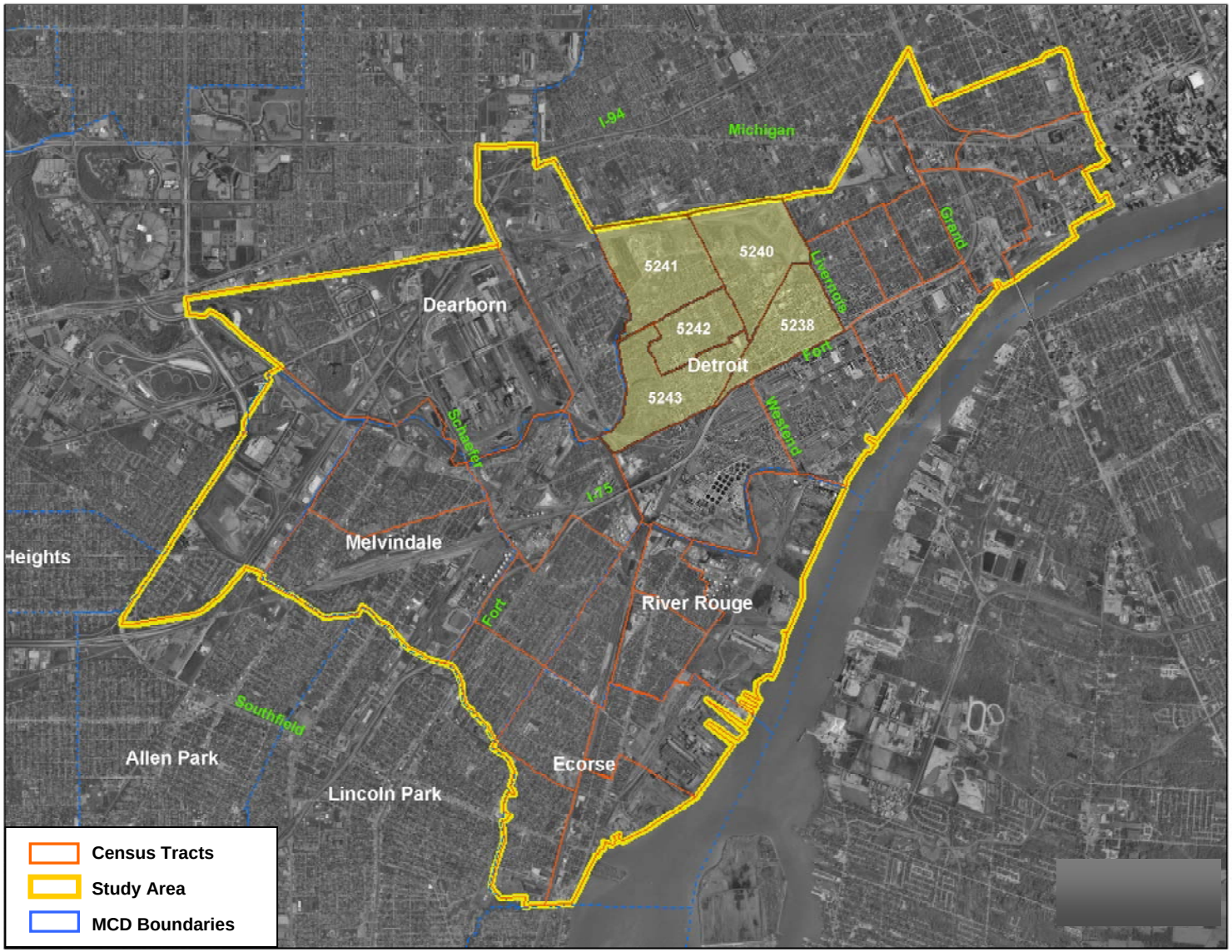
Data from the 2000 Census indicate this Detroit neighborhood has approximately 22,800 residents living in 7,755 dwelling units (Table 3-2B). The largest cultural group is Hispanic at 57 percent of the population. The second largest population is White at 32 percent, with other groups following in much lower percentages.

Table 3-2B
Demographics
Springwells Village Neighborhood
(Census Tracts 5238, 5240, 5241, 5242 and 5243)
Detroit River International Crossing Study

Race	Total	Percentage
White alone	7,345	32.2%
Black or African American alone	1,327	5.8%
American Indian and Alaska Native alone	330	1.4%
Asian alone	94	0.4%
Native Hawaiian and Other Pacific Islander alone	28	0.1%
Some other race alone	45	0.2%
Two or more races	564	2.5%
Hispanic or Latino:	13,088	57.4%
Total:	22,821	100.0%

Source: 2000 U.S. Census

Figure 3-6B
Springwells Village Neighborhood in Southwest Detroit
(Census Tracts are Numbered)
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

In the Springwells Village neighborhood there are 4,865 families. About 25 percent of the area's households are reported in the 2000 Census to have no access to an automobile. Approximately 56 percent live as a Married-Couple Family, while 29 percent are families classified as Female Householder/No Husband Present. Thirty-one percent of households had incomes below the poverty level.

The majority of the Springwells Village neighborhood residents have obtained a high school diploma or GED-equivalent. Data indicate that residents also attempt to obtain post-secondary education; however, educational attainment drops significantly after two years of higher education.

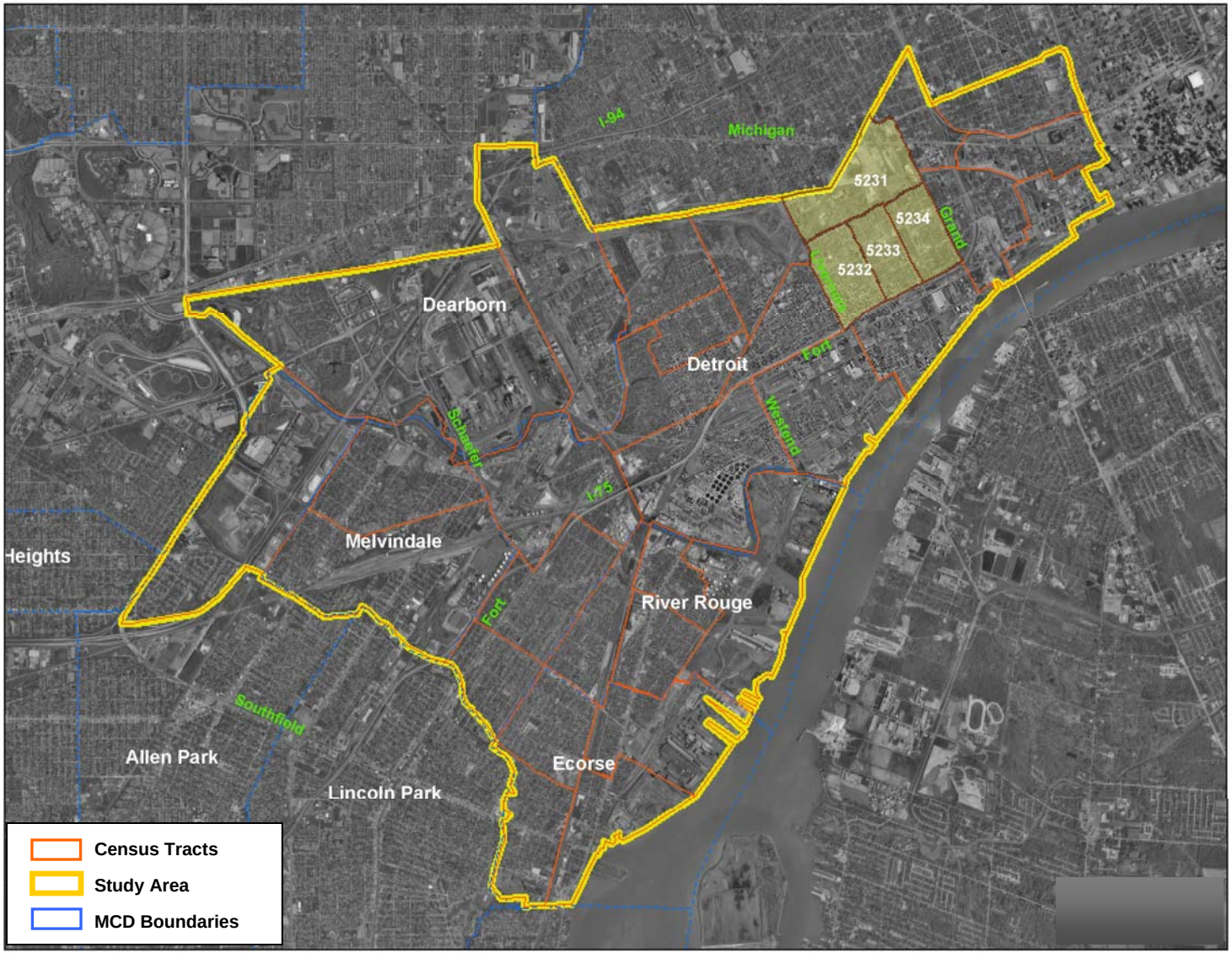
Approximately 64 percent of the men in the labor force are likely to hold jobs in construction, manufacturing, or transportation/warehousing-related fields, while 44 percent of the women in the labor force hold positions in manufacturing and the education and health and social services-related fields. Also, women tend to hold positions in the food-service industry. The unemployment rate in the Springwells Village neighborhood according to the 2000 Census was 13.7 percent.

Vernor-Junction Neighborhood

The Vernor-Junction neighborhood is located in census tracts 5231, 5232, 5233, and 5234 (Figure 3-6C). This neighborhood is at the core of the Hispanic community in Detroit. The residential area is served by Vernor as the main commercial thoroughfare. The West Vernor commercial thoroughfare most notably demonstrates the entrepreneurial efforts that led the revitalization that started in the mid-1990s.

Census data indicate that this Detroit neighborhood has approximately 13,500 residents. Hispanics make up 69 percent of the population, while Whites are about 20 percent of the neighborhood population (Table 3-2C).

Figure 3-6C
Vernor-Junction Neighborhood in Southwest Detroit
(Census Tracts are Numbered)
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Table 3-2C
Demographics
Vernor-Junction Neighborhood
(Census Tracts 5231, 5232, 5233 and 5234)
Detroit River International Crossing Study

Race	Total	Percentage
White alone	2,626	19.5%
Black or African American alone	1,073	8.0%
American Indian and Alaska Native alone	95	0.7%
Asian alone	39	0.2%
Native Hawaiian and Other Pacific Islander alone	0	0.0%
Some other race alone	51	0.4%
Two or more races	342	2.5%
Hispanic or Latino:	9,224	68.7%
Total:	13,450	100.0%

Source: 2000 U.S. Census

In the Vernor-Junction neighborhood there are 2,862 families. About 11 percent of the households in the area are reported in the 2000 Census to have no access to an automobile. Approximately 62 percent live as a Married-Couple Family, while 25 percent live in families classified in the Census as Female Householder/No Husband Present. Thirty percent of households report incomes below the poverty level.

The majority of residents have obtained a high school diploma or GED-equivalent. Data also indicate that residents attempt to obtain post-secondary education; however, educational attainment drops significantly after two years of higher education.

Approximately 68 percent of the men in the labor force are likely to hold positions in the construction, manufacturing, or transportation/warehousing-related fields, while 53 percent of the women in the labor force tend to hold positions in manufacturing and the education/health/social services-related fields. The unemployment rate in the Vernor-Junction neighborhood according to the 2000 Census was 12.4 percent.

3.1.3 Community Services, Facilities and Major Employers

Community facilities of significance serving the Delray Study Area which includes Delray, Springwells Village and Vernor-Junction neighborhoods shown on Figure 3-7. More than 50 schools and 30 parks and recreation centers serve the study area communities. Social service organizations include Latino Family Services, the Arab Community Center for Economic and Social Services, and the Delray United Action Council, to name a few.

Figure 3-7
Community Facilities in Study Area
Detroit River International Crossing Study

Source: Hamilton Anderson and The Corradino Group of Michigan, Inc.

There are four principal places of worship in Delray (First Latin American Baptist Church; Jehovah Jireh Temple (non-denominational); Holy Cross Hungarian Catholic Church; and, St. John Cantius Catholic Church [closed in October 2007]); one primary-care clinic (CHASS – Community Health and Social Service Center); four recreation areas (Historic Fort Wayne, City of Detroit parks at the South Rademacher Center (closed in 2006) and little-used pocket parks at Post-Jefferson Streets and Harvey-Junction Streets). There is also a boat launch on the Detroit River west of Fort Wayne owned by Detroit Edison Company. Two fire stations serve Delray – one on each side of the rail line that cuts through the area from Dearborn Street past the Ambassador Bridge. A major fire/police/public safety service center is located at Fort and Campbell Streets. Another serves both the Springwells Village and Vernor-Junction neighborhoods. It is located on Central near Dix. Finally, there is a fire station in Vernor-Junction north of I-75.

The Delray Community Center is the only institution in Delray that provides organized physical activity and after-school programming/mentoring for children. Activities for senior citizens are also offered there. The Center is operated by a local, non-profit agency, Peoples Community Services, which has received grants from a number of sources, the largest being from Chrysler Corporation.

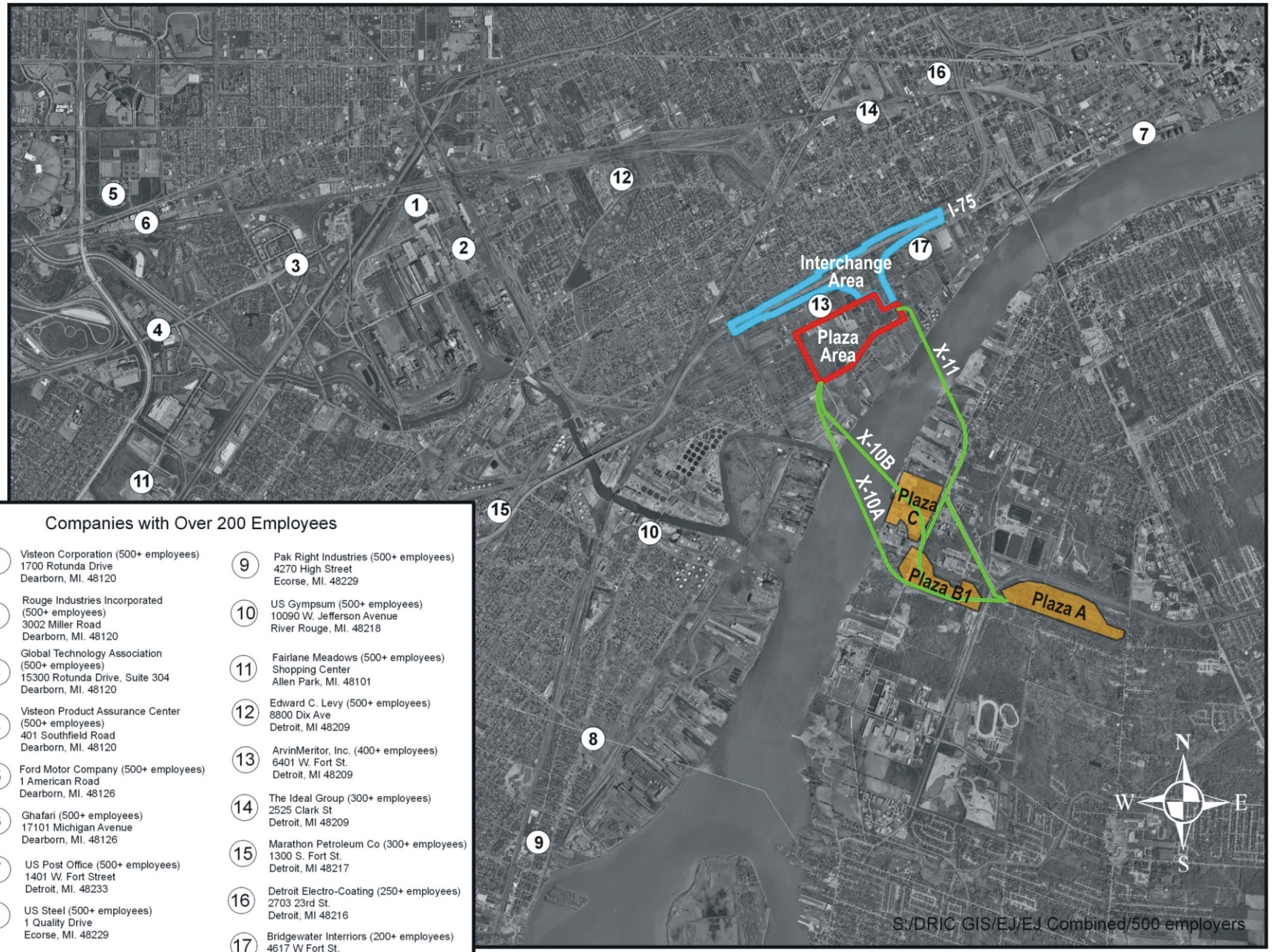
The only educational institution in the Delray area is Southwestern High School on Fort Street. The McMillan Elementary School on West End Avenue was closed in 2002. Students from McMillan were reassigned to schools in the South Schaeffer neighborhood or to the newly-built Clemente Elementary School on the north side of I-75 on Beard Street. The Beard Early Childhood Center serves the area. It is also on the north side of I-75 (840 Waterman Street).

There are 17 major employers (200+ jobs) in the study area (Figure 3-8); seven are in the Detroit portion of the study area. Of these, two are in Delray on Fort Street – Arvin Meritor (about 400 employees) and Bridgewater Industries (about 200 employees).

3.1.3.1 How Will the Alternatives Affect Community Services, Facilities and Major Employers

The Community Health and Social Services (CHASS) Center would be relocated with every Build Alternative but Alternative #14. It serves the needy, low-income population of the area, many of whom are without access to an automobile. Additionally, all of the Build Alternatives would impact the Clark Street interchange and all but Alternative #16 would impact the Springwells interchange. This will affect access of major employers to I-75. This is particularly important to Arvin Meritor and Bridgewater Industries, both located on Fort Street. Other, smaller businesses, like Renaissance Logistics, would be similarly affected.

Figure 3-8
Major Employers in Study Area
Detroit River International Crossing Study



Companies with Over 200 Employees

1. Visteon Corporation (500+ employees)
1700 Rotunda Drive
Dearborn, MI. 48120

2. Rouge Industries Incorporated
(500+ employees)
3002 Miller Road
Dearborn, MI. 48120

3. Global Technology Association
(500+ employees)
15300 Rotunda Drive, Suite 304
Dearborn, MI. 48120

4. Visteon Product Assurance Center
(500+ employees)
401 Southfield Road
Dearborn, MI. 48120

5. Ford Motor Company (500+ employees)
1 American Road
Dearborn, MI. 48126

6. Ghafari (500+ employees)
17101 Michigan Avenue
Dearborn, MI. 48126

7. US Post Office (500+ employees)
1401 W. Fort Street
Detroit, MI. 48233

8. US Steel (500+ employees)
1 Quality Drive
Ecorse, MI. 48229

9. Pak Right Industries (500+ employees)
4270 High Street
Ecorse, MI. 48229

10. US Gympsum (500+ employees)
10090 W. Jefferson Avenue
River Rouge, MI. 48218

11. Fairlane Meadows (500+ employees)
Shopping Center
Allen Park, MI. 48101

12. Edward C. Levy (500+ employees)
8800 Dix Ave
Detroit, MI 48209

13. ArvinMeritor, Inc. (400+ employees)
6401 W. Fort St.
Detroit, MI 48209

14. The Ideal Group (300+ employees)
2525 Clark St
Detroit, MI 48209

15. Marathon Petroleum Co (300+ employees)
1300 S. Fort St.
Detroit, MI 48217

16. Detroit Electro-Coating (250+ employees)
2703 23rd St.
Detroit, MI 48216

17. Bridgewater Interriors (200+ employees)
4617 W Fort St.
Detroit, MI 48209

Source: The Corradino Group of Michigan, Inc.

Police and fire services will have to find new patterns to respond to incidents in Delray. But, this should not be a negative factor as the plaza would place a 150-acre area in direct control of the federal government, lessening the direct responsibility of local police and fire services.

One park and playlot would be eliminated by the plaza. The playlot is not used. The park is lightly used. The recreational needs are being met by the Delray Community Center which will not be negatively affected by the DRIC. It may even be positively impacted, if redevelopment occurs concentrating users closer to the Center.

3.1.4 Who Will Have to Move and When?

No Build Alternative

No relocations of residential units, business units or other land uses, such as schools and places of worship, will be associated with the No Build condition. On the other hand, the trend of the housing loss in the Delray Study Area will likely continue. In the time since the DRIC Study started (January 2005) 34 houses have been destroyed by fire. That trend has accelerated, rather than abated, as time has passed, as evidenced by the fact that 25 houses burned in 2007 alone. Also, the Rademacher Center closed in December 2006 and Saint John Cantius Catholic Church closed in October 2007.

Build Alternatives

What is a Dwelling Unit?

A place of residence such as a single-family home or one unit in a multi-family building, such as an apartment.

It is anticipated that, if approved and funded, property purchases for the DRIC would begin in 2009. Table 3-3 summarizes the people and jobs affected by the Build Alternatives, if the project were constructed. These figures include impacts of the crossing, plaza, and interchange, as well as the Gateway Boulevard and the proposed railroad curve to move trains more directly to Zug Island (Figure 3-9). Overall, between 324 to 414 dwelling units would be acquired and the occupants relocated, depending on the alternative examined. This includes the two apartment buildings (one north of I-75 and one south) that together total 100 dwelling units. There are also a number of duplexes/triplexes in the area.

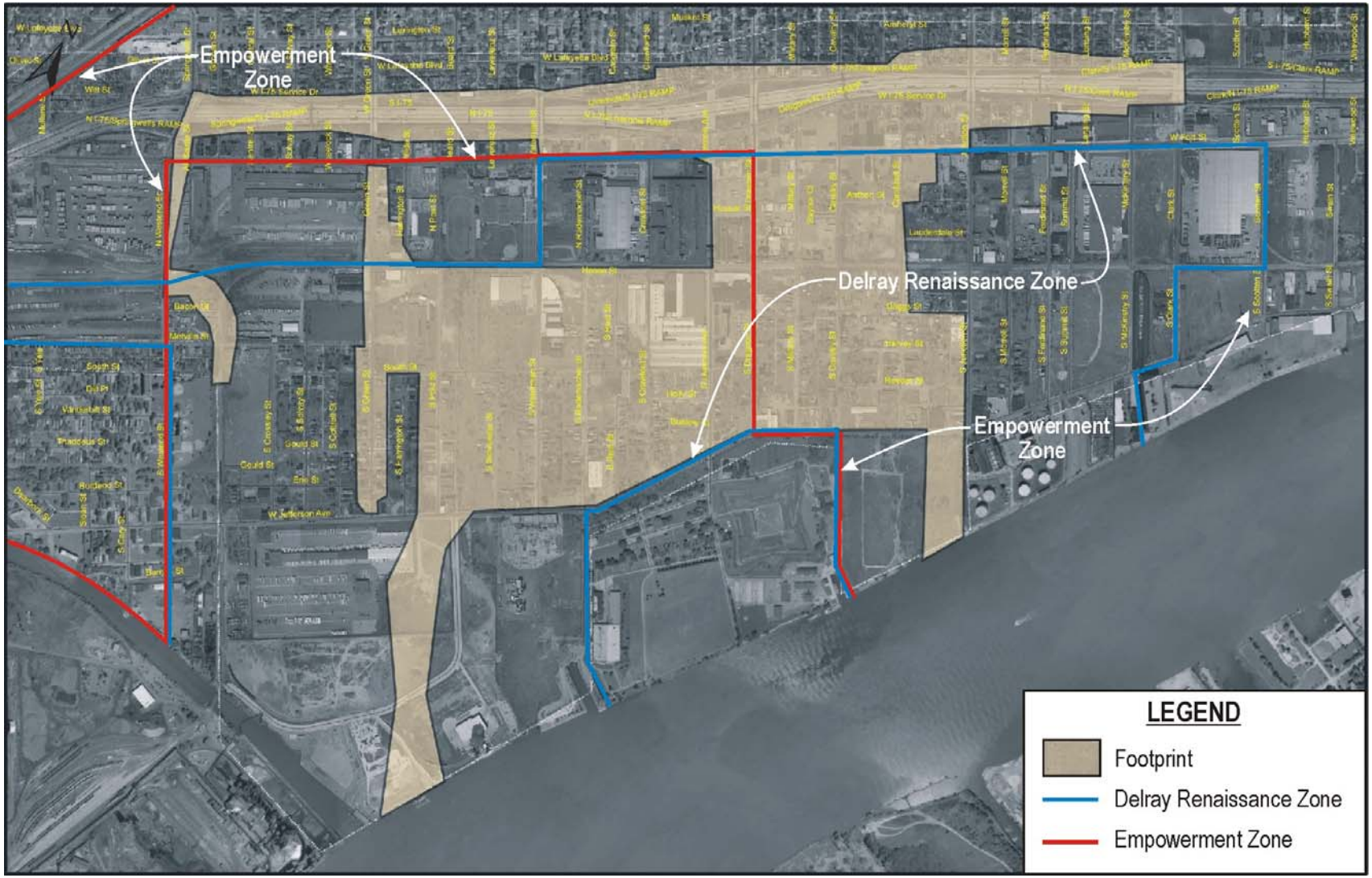
Table 3-3
Potential Relocations
Detroit River International Crossing Study

	Description of Item	Build Alternatives								
		#1	#2	#3	#5	#7	#9	#11	#14	#16
Residential Units	Occupied	349	353	324	414	365	369	340	338	356
	Vacant	6	5	5	6	19	18	18	4	6
Residential Population[a]	Number	855	865	794	1,014	894	904	833	828	872
Business Units	Active	43	44	49	51	50	51	56	41	45
	Vacant	25	25	30	30	24	24	29	27	25
Estimated Employees	Number	685	690	740	790	865	870	920	685	690
Other Land Uses Affected	Schools	0	0	0	0	0	0	0	0	0
	Senior Service Facilities	0	0	0	0	0	0	0	0	0
	City/Government Facilities	3	3	3	4	3	3	3	2	3
	Places of Worship	6	7	7	5	6	7	7	6	6
	Medical Facilities	1	1	1	1	1	1	1	0	1
	State/Federal Government Facilities	2	2	2	2	2	2	2	1	2

[a] Calculated using average population per dwelling unit in Delray from the 2000 U.S. Census for Tracts 5235, 5236 and 5237.
Source: The Corradino Group of Michigan, Inc.

Interviews were held with about half of the residential property owners and tenants in the footprint of the project (Figure 3-9). One hundred and forty-nine property owners/tenants participated to learn about the relocation program. Some indicated their general relocation preference, if required to move. The results indicate about 28 percent are interested in remaining in the Delray area; 25 percent of those interviewed prefer relocating within the City of Detroit; and, another 13 percent are undecided.

Figure 3-9
Crossing System Footprint
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Between 41 and 56 active businesses could be relocated depending on the DRIC alternative (Table 3-3). They provide an estimated 685 to 920 jobs, based on information gained in interviews. Most of the businesses will remain in existence and 43 out of 50 interviewed prefer to be relocated in or near Delray. For those who relocate outside Delray, an inventory of local brownfield sites indicates there are over 1,000 acres available within five minutes drive of Delray to accept business relocations in the industrial, transportation and logistics sectors. A number of businesses indicated they chose their current location because it fell within the Detroit Empowerment Zone and/or Renaissance Zone (Figure 3-9). With the majority of businesses wanting to stay in or near Delray, efforts will be made to modify and extend these zones to accommodate them.

Other notable relocations of community facilities include: up to seven churches; the Detroit Water and Sewer Department (DWSD) offices on Livernois Avenue (all Build Alternatives); and, the CHASS Medical Clinic (all Build Alternatives but #14). It is critical to relocate CHASS in the area to serve the needy, low-income population with little access to an automobile. Discussions are underway on relocation possibilities of the DWSD facility. The Conceptual Stage Relocation Plan is found in Appendix A.

The following standard procedure related to relocation will be followed:

> *Compliance with State and Federal Laws* – Acquisition and relocation assistance and services will be provided by MDOT in accordance and compliance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; Act 87, Michigan P.A. 1980, as amended; Act 367, Michigan P.A. 2006; Act 439, Michigan P.A. 2006; and, the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended. MDOT will inform individuals, businesses and non-profit organizations of the impact, if any, of the project on their property. Every effort will be made, through relocation assistance, to lessen the impact when it occurs.

What is a Renaissance Zone?

A Renaissance Zone is a region designated by the state to be tax free for any business or resident currently in or moving into these regions.

By law, Renaissance Zones fully waive these state and local taxes until the year 2009 and partially until 2012:

- Michigan Single Business Tax
- Michigan Personal Income Tax
- Local Personal Property Tax
- Local Real Property Tax
- Local Income Tax

What is an Empowerment Zone?

This is a federal grant and employer tax credit program for distressed areas. It expires in 2009 unless Congress extends it.

What is a Conceptual Stage Relocation Plan?

This Plan outlines the expected displacements of residences, businesses and non-profit organizations, and reports on the ability to provide for the orderly, timely and efficient relocation of all eligible displaced persons under state and federal guidelines.

3.1.5 Characteristics of EJ/Title VI Population Groups

This section covers protections from discrimination under Title VI of the 1964 Civil Rights Act. It analyzes the potential adverse environmental impacts the proposed project may have on low-income and minority communities protected by Executive Order 12898 on Environmental Justice.

Title VI of the 1964 Civil Rights Act prohibits discrimination on the basis of race, color, sex, and national origin in programs and activities receiving federal financial assistance. In the past, a number of federally-funded projects affected minority and low-income populations more than other groups. Project development now addresses Environmental Justice (EJ) in an attempt to prevent such disproportionate impacts. The EJ policy stated in Executive Order 12898 has three major parts:

- Avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects of the project, on minority populations and low-income populations.
- Ensure the full and fair participation by all potentially-affected communities in the decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Title VI of the 1964 Civil Rights Act:

Prohibits discrimination on the basis of race, color, sex and national origin in programs and activities receiving federal financial assistance.

What does Executive Order 12898 Cover?

The order states:

"…each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Low-income Populations Are:

Those households listed in the 2000 U.S. Census with annual incomes at or below the U.S. Department of Health and Human Services poverty guidelines of $18,850 for a family of four.

3.1.5.1 Groups Included in EJ/Title VI Analysis

In order to determine if a minority population group or low-income population group is present in the study area, MDOT reviewed census tracts from the 2000 Census. MDOT also reached out to community leaders and groups, tribal governments, and local officials by conducting public information meetings and workshops (Section 6 of the DEIS), which helped identify Environmental Justice population groups and individuals who may be limited in English proficiency (LEP) in the study area. According to the census data (2000) for the City of Detroit, approximately 80,180 individuals speak a language other than English at home. Based on this information, MDOT determined that there was a need for translation services in Spanish and Arabic at each of their public meetings and workshops. As part of the community outreach effort, MDOT has provided Spanish and Arabic translators at all of

their public meetings to provide a complete opportunity to participate at the various meetings and workshops.

Delray Study Area

In the Environmental Justice and Title VI analyses, minority persons are defined as Black, Hispanic, Asian American, American Indian, or Alaskan Native. Low-income populations are those, regardless of ethnicity, who are in households with annual incomes at or below the U.S. Department of Health and Human Services poverty level of $18,850 for a family of four, according to 2000 U.S. Census data. Whether or not they fit the definition of groups protected by the EJ regulations, all groups and individuals have the right to access and participate in the decision-making process as provided by Title VI of the Civil Rights Act.

The Delray Study Area encompassed 40,435 people in 2000, 69 percent of whom were minority. In 2000, the SEMCOG Region encompassed 4.83 million people with approximately 28 percent being minority, while the City of Detroit had a population of 950,000 people, with 87 percent being minority (Table 3-4).[3] The minority population in the SEMCOG Region and the City of Detroit increased by more than 12 percent and nine percent, respectively, between 1990 and 2000, while the overall Delray Study Area minority population rose from 43 to 69 percent of the total population between 1990 and 2000. The Hispanic community almost doubled in those ten years to about 58 percent of the study area's total population. The African American population is about 9.3 percent of the study area total, virtually unchanged since 1990.

Almost 32 percent of the households in the study area have annual incomes below the poverty level, per the 2000 Census, which is virtually unchanged from 1990.

Apart from minorities covered by Environmental Justice, there are ethnic groups protected by Title VI Federal Regulations. A significant ethnic group in Detroit and Dearborn is the Arab population, who represented about one percent of the Delray Study Area's total people in 2000 (Table 3-5). The prominent non-minority ethnic groups in the study area are persons who are German or Irish. But their presence is much smaller than in the City of Detroit or the SEMCOG Region. Those latter groups' presence in the study area has declined substantially since 1990.

[3] Minority population is calculated based on groups protected under *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, December 2, 1998.

Table 3-4
2000 Population and Total Households for Groups
Covered by Environmental Justice Regulations
Detroit River International Crossing Study

2000 Population Category	SEMCOG Region		Detroit		Delray Study Area	
	Number	Percent	Number	Percent	Number	Percent
Black or African American	1,052,090	21.8	770,728	81.0	3,747	9.3
American Indian & Alaskan Native	17,379	0.4	2,864	0.3	442	1.1
Asian	123,477	2.6	9,339	1.0	137	0.3
Native Hawaiian & Other Pacific Islander	1,165	0.0	153	0.0	28	0.1
Hispanic/Latino	136,359	2.8	47,257	5.0	23,565	58.3
Total Minority	1,330,470	27.6	830,341	87.3	27,919	69.0
White	3,408,124	70.5	100,371	10.6	11,322	28.0
Other[a]	94,899	1.9	20,558	2.2	1,194	3.0
Total Population	4,833,493	100.0	951,270	100.0	40,435	100.0
Total Households	1,846,352	100.0	336,482	100.0	12,447	100.0
Households w/Income < Poverty Level	183,181	9.9	81,789	24.3	3,943	31.7

[a] Other includes all other races not specifically listed.

Source: U.S. Census 2000

Table 3-5
2000 Population for Groups
Covered by Title VI Federal Regulations
Detroit River International Crossing Study

2000 Population Ethnic Category[a]	SEMCOG Region		Detroit		Delray Study Area	
	Number	Percent	Number	Percent	Number	Percent
Total Population	4,833,493	100.0	951,270	100.0	40,435	100.0
Arab	98,500	2.0	8,300	20.5	437	1.1
English	402,479	8.3	7,188	17.8	676	1.7
French (except Basque)	213,367	4.4	5,130	12.7	642	1.6
German	842,459	17.4	16,891	41.8	1,602	4.0
Irish	510,609	10.6	14,421	35.7	2,022	5.0
Italian	304,981	6.3	7,443	18.4	597	1.5
Polish	510,988	10.6	18,992	47.0	961	2.4
Scottish	113,901	2.4	2,274	5.6	145	0.4

[a] The U.S. Census asks individuals to state their ethnic background. The Census tallies up to two ethnicities per individual. So, when data are summed, the total can be more than 100 percent.

Source: U.S. Census 2000

Data from the 2000 Census indicate that the Delray Study Area has a diversified population. The population demographics for this area is White (28.0%), African American (9.3%), and Hispanic (Mexican and Puerto Rican) (58.3%) (Table 3-6).

Table 3-6
Delray Study Area Demographics
Detroit River International Crossing Study

Race	Total	Percentage
White	11,322	28.0
Black or African American	3,747	9.3
American Indian and Alaska Native	442	1.1
Asian alone	137	0.3
Native Hawaiian and Other Pacific Islander	28	0.1
Other	1,194	3.0
Total Minority	27,919	69.0
Ethnicity		
Hispanic/Latino	23,565	58.3
Total Population	40,435	100.0

Source: U.S. Census 2000

In 2000, the Census recorded 12,447 households in Delray Study Area. People in about 32 percent of them live below the poverty level.

Comparisons of the Delray Study Area, the City of Detroit and the SEMCOG region indicate (Table 3-6A):

- The median age of the residents in the Delray Study Area is eight years younger than residents in the SEMCOG region and three years younger than residents of the city because more people in Delray are under 18 years of age. Delray also has a smaller share of the population in the 65 years and older age bracket compared to the SEMCOG region and the City of Detroit.

- The Delray Study Area has a substantially greater number of large households in the 6+ person category.

- The Delray Study Area has a higher percentage of renters than in the SEMCOG region and the City of Detroit.

- The Delray Study Area has a very high rate of housing units without a vehicle available. Therefore, workers in Delray carpool or take public transportation to work at a much higher rate than workers in the SEMCOG region and the City of Detroit.

Table 3-6A
Delray Study Area Demographics Compared to SEMCOG Region
Detroit River International Crossing Study

	SEMCOG		City of Detroit		Study Area	
	Number	Percent	Number	Percent	Number	Percent
Total Population	4,833,493	100.0	951,270	100.0	40,435	100.0
Male	2,351,824	48.7	448,215	47.1	21,445	53.0
Female	2,481,669	51.3	503,055	52.9	18,990	47.0
Under 18 years	1,266,307	26.2	295,549	31.1	13,142	32.5
18 to 39 years	1,525,315	31.6	303,276	31.9	15,651	38.7
40 to 64 years	1,474,510	30.5	252,787	26.6	8,723	21.6
65 years and over	567,391	11.7	99,658	10.5	2,919	7.2
Median age	35	-	30	-	27	-
EJ Minority	1,330,470	27.6	830,341	87.3	27,919	69.0
White	3,408,124	70.5	100,371	10.6	11,322	28.0
Other	94,899	2.0	20,558	2.2	1,194	3.0
Total Households	1,846,352	100.0	336,482	100.0	12,447	100.0
Six-or-more-person household	75,799	4.1	27,475	8.2	1,722	13.8
Average Household Income	$53,154	-	40,843	-	36,371	-
Income Below Poverty Level	183,181	9.9	81,789	24.3	3,943	31.7
Total Housing Units	1,951,993	100.0	375,096	100.0	13,945	100.0
Occupied	1,845,313	94.5	336,428	89.7	12,412	89.0
Owner-occupied	1,324,614	71.8	184,672	54.9	5,679	45.8
No vehicle available	165,676	9.0	73,682	21.9	2,882	23.2
Workers 16 and Over	2,208,906	100.0	319,449	100.0	13,024	100.0
Drove Alone	1,859,550	84.2	219,118	68.6	6,636	51.0
Carpooled	200,713	9.1	54,537	17.1	4,723	36.3
Public Transportation	42,557	1.9	27,634	8.7	557	4.3
Other Means	106,086	4.8	18,160	5.7	1,108	8.5

Source: U.S. Census 2000

3.1.5.2 Analysis Approach

The methodology that was used to conduct an Environmental Justice analysis of the study area followed MDOT and FHWA guidelines (U.S. DOT Order 6640.23). The methodology has several steps that need to be followed along with a series of questions that need to be asked and answered in order to determine if there will be

disproportionately high and adverse effects on minority population groups or low-income population groups in the study area. The methodology can be found in Appendix D.

Consistent with the methodology, five major activities were undertaken. The first involved consultation with the community in public meetings, workshops and small groups/one-on-one interviews. This created a full understanding of community identity, community cohesiveness, social/cultural resources, economic conditions, and jobs. Key elements of this community consultant process included the Social/Cultural public meetings of March 9 and 10, 2006; the monthly Local Advisory Council meetings, which were open to the public and heavily attended; and the DRIC Study Field Office at the Delray Community Center, which was staffed Monday, Wednesday and Friday afternoons from January 2005 on.

The second activity in the process was to verify the anecdotal information gathered in the first step through a field verification of key physical features/organization (parks, churches, schools, historic properties, community facilities, etc.) that make up the community fabric. The 2000 Census (Census Tracts 5235, 5236, 5237, 5238, 5240, 5241, 5242, 5343, 5231, 5232, 5233 and 5234) for the study area were studied. The census data indicated the Delray Study Area is made up of 69 percent minorities (Table 3-6A) with about 32 percent of households in poverty.

The third activity was to conduct analyses of key issues and their impact on the community. These included potential relocations (Section 3.1.4) traffic (Section 3.5), Air Quality (Section 3.6), noise (Section 3.7), non-motorized users and transit services (Section 3.5.6), cultural resources (Section 3.9) and parks/recreational resources (Section 3.10), to name a few. These potential impacts were discussed with the public in a number of informal meetings. The summary of potential impacts to EJ/Title VI Population Groups for both the No Build Alternative and the Build Alternatives are summarized as follows:

No Build Alternative

The No Build Alternative would see past trends continue in the Delray Study Area which indicate an increase in the minority and low-income populations. Industrial/commercial uses will continue to be mixed with residential uses. Communities are expected to be challenged as the continued slump in the Michigan economy will likely cause homes to be left vacant if jobs and related income are lost.

Build Alternatives

The Build Alternatives would have an adverse effect on EJ and Title VI population groups. These potential impacts would include the following.

- Between 324 and 414 households would be relocated (Section 3.1.4, Table 3-3).

- Between 685 and 920 jobs may be relocated from the Delray area. Some are held by minorities and low-income people (Section 3.1.4, Table 3-3). This is particularly the case because those businesses taking advantage of the Empowerment Zone tax credits must employ local residents to gain those credits.

- Three cultural resources which are eligible for listing on the *National Register of Historic Places*, such as the Berwalt Manor apartment building, would be lost (Section 3.9.2).

- Up to seven places of worship would be lost (Section 3.1.4, Table 3-3).

- The CHASS (Community Health and Social Services) Center would be relocated by the project. It serves the needy, low-income population, many of whom have no access to an automobile.

- The Rademacher Recreation Center, although now closed, would be eliminated. So, would Rademacher Park and one small playlot (Section 3.10.1).

- Normal traffic patterns would be disrupted and travel made more difficult because interchanges with I-75 will be closed/modified and a number of streets crossing I-75 would be closed (Section 3.5.3).

- Three bus lines would be rerouted so they can still serve the people of the area. This is particularly important because the population affected has relatively low access to an automobile (Section 3.5.6).

- Between two and four of five pedestrian crossings of I-75 would be removed (Section 3.5.6). MDOT will work with the community to re-establish pedestrian access in the area.

After determining the potential impacts, the fourth activity is to determine if these impacts would have a disproportionately high and adverse effect on minority populations or low-income populations within the Delray Study Area. Based on the census data, interviews with property owners/tenants who may be displaced, public involvement and the analysis of key resources, it was determined that there would be adverse impacts to both minority and non-minority population groups in the Delray Study Area. The Delray Study Area is one of the most diverse communities in the City of Detroit. The overall minority population in the City of Detroit is 89 percent, while, the minority population in the Delray Study Area is 69 percent, with nine percent of the

population being African American, 58 percent being Hispanic, and one percent being American Indian. The non-minority population for this area is approximately 28 percent. However, the neighborhood most impacted by the proposed DRIC project is the Delray neighborhood. The minority population in the Delray Neighborhood is approximately 65 percent with 32 percent of the population being African American and the other 30 percent being Hispanic. The non-minority population for this area is approximately 32 percent. Because the minority population group is larger than the non-minority population group in the study area, potential impacts such as displacements would impact a larger number of minority groups being displaced as compared to non-minority groups. However, the impacts would not be disproportionately high and adverse to minority population groups; and the overall adverse impacts would not be predominantly borne by minority population groups. The impacts to minority population groups are not appreciably more severe than the impacts that would be experienced by non-minority population groups in the study area.

As the Practical Alternatives are further evaluated, there may be disproportionately high and adverse effects on low-income population groups in the Delray Study Area. Such impacts may include, but are not limited to, disruptions to community cohesion, possible isolation, and loss of economic vitality. These impacts will be further evaluated after MDOT has completed its interviews with the property owners and tenants who may be displaced, and after the public comment period has ended. If additional impacts are identified, the impacts and mitigation measures will be addressed in the FEIS.

The final activity is to identify mitigation measures and/or potential offsetting benefits that may occur as a result of the proposed crossing. MDOT along with other agencies and the community have developed mitigation measures that would avoid, minimize and/or mitigate for any adverse impacts. Proposed mitigation measures and a Project Mitigation Summary "Green Sheet," which identifies proposed mitigation, is discussed in Section 4.

3.2 Jobs and the Economy

3.2.1 Expected Future Development

In this section, local and regional projects/economic development issues are discussed first. Then, changes that would result from DRIC alternatives are identified.

3.2.1.1 Upcoming Development Projects in Study Area

Development projects now foreseen that affect the study area are listed in Table 3-7. The study area is largely built-out. Brownfields represent much of the land available for development/redevelopment. Much new development/ redevelopment focuses along the Detroit River in the City of Detroit. Plans call for reclaiming brownfield sites for such varied projects as condominiums, reuse of abandoned storage tanks, and continued expansion of the Springwells Industrial Park for businesses, particularly those requiring waterfront access. Upcoming developments in Allen Park and Ecorse also focus on the riverfront. The most substantial non-transportation project in the study area is the proposed upgrade of the Marathon Oil Refinery at a cost of $1.5 billion. It is forecast to generate 1,200 construction jobs and 135 permanent refinery jobs.

What is a Brownfield?

A brownfield is an industrial or commercial property that is abandoned or underused and environmentally contaminated.

3.2.1.2 Upcoming Transportation Projects in Study Area

Six important transportation projects that affect the study area include a possible replacement span of the Ambassador Bridge; new rail and, possibly, truck tunnels between Detroit and Windsor; enhancing the intermodal (truck/rail) terminal at the Livernois-Junction Yard; a new interchange (the Ambassador Gateway Project) directly connecting the Ambassador Bridge into the freeway system; and, reconstruction of M-85 including the Bascule Bridge. The Ambassador Gateway project will be in place in 2009 before construction of the DRIC project is started, if the DRIC is approved. The effects of these projects on the proposed DRIC crossing are documented in the *Traffic Analysis Technical Report* (as well as Section 3.14.3 of this DEIS).

3.2.1.3 Regional Trends

SEMCOG, in a report issued in April 2007 titled *A Region in Turbulence and Transition*, states the following:

> *"Southeast Michigan's economy is in the midst of a fundamental restructuring that has serious consequences for the region's long-term future. This turbulence and transition is due to the shrinkage of the domestic auto industry, where the Big Three have seen their share of U.S. light-vehicle sales (cars, SUVs, vans, pickup trucks) decline from 73 percent in 1995 to 53 percent in 2006.*

Table 3-7
Expected Developments in Study Area
Detroit River International Crossing Study

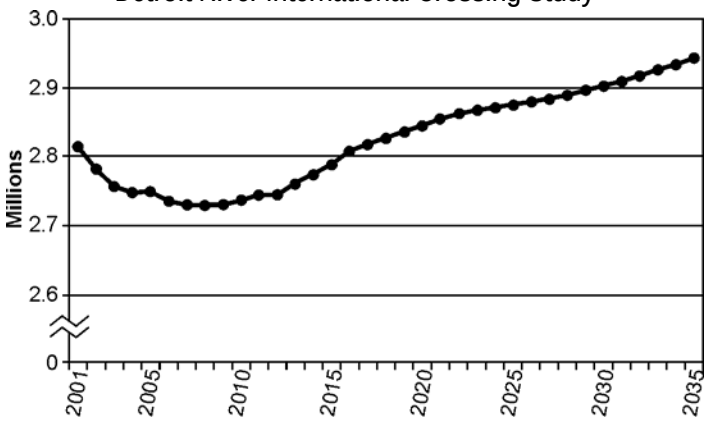
Southwest Detroit	Allen Park	Dearborn	Ecorse	Melvindale	River Rouge
• Ambassador Gateway Project • Mercado/Welcome Center • The Detroit River Tunnel Project • West Riverfront Greenway Initiative • Bagley Housing Condominium Development • Reuse of the Tiger Stadium area • Housing along Michigan Avenue, east of West Grand Blvd. • Combined sewage overflow facility at Patton Park • Combined sewer overflow facility at the Revere Cooper property • "Greenway" at Romanowski Park • Bowtie area (Vernor/ Livernois) redevelopment • Stabilization of housing conditions due to code enforcement and similar activities • Continued expansion of Springwells Industrial Park • Condominiums on the Revere Cooper site • Reuse of the tanks on the Mistersky site • Detroit Intermodal Freight Terminal Project • M-85 bascule bridge • Fort Street reconstruction (Schaeffer to Clark)	• Veteran Memorial Park • Veterans Hospital Site Development • Allen Park Ford Clay Mine Development • Greenway's Link	• Truck City expansion to area bounded by Michigan, Southern, Wyoming and Stecker • Housing development in east Dearborn east of Wyoming served by Roberts Street • Hotel on Michigan Avenue • Montgomery Ward conversion to mixed-use redevelopment • West Village Commons • Industrial investments – Ford: $240 million – Severstal: $600 million	• John Dingell Park Riverwalk	• Marathon Oil Refinery - $1.5 billion upgrade • New and renovated apartment building along Raupp Road • Proposed hotel on Dix Road • Proposed hotel on Oakwood Road @ Dix • Residential (multi-family) expansion on Raupp Road	• Greenway • Downtown revitalization • Jefferson Avenue streetscape

Source: The Corradino Group of Michigan, Inc.

"The consequences of the changes in the auto industry are profound. Losses of jobs in the region's core industry are rippling through the economy and will be felt across many sectors, from retail to construction.

"Southeast Michigan has lost 128,000 jobs since 2000 and will not begin to gain total jobs until 2010. By 2035, the region's employment will have grown seven percent over 2005 levels (Figure 3-10).

Figure 3-10
Total Employment
Southeast Michigan, 2001-2035
Detroit River International Crossing Study

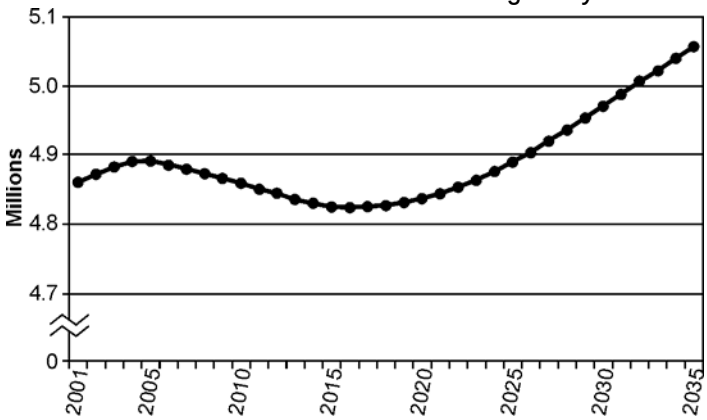


Source: SEMCOG

"The other major factor that will affect the region in the long-term is the aging of the population. By 2035 Southeast Michigan will have 651,000 more people 65 or older and 296,000 fewer people of prime working age 25-64. This is a trend that will also be felt in the U.S. as a whole where, as in Southeast Michigan, the percentage of population 65 or older will increase dramatically. For the region, the percentage 65 or older will increase from 12 to 24 percent by 2035, and for the U.S. it will go from 12 to 20 percent.

"Combined with more deaths in an aging population, increased out-migration is now causing Southeast Michigan's population to decline. The region will only recover enough, beginning after 2015, to add about three percent to the population over 30 years (Figure 3-11). Southeast Michigan's population will be 5.1 million in 2035."

Figure 3-11
Total Population
Southeast Michigan, 2001-2035
Detroit River International Crossing Study



Source: SEMCOG

With these observations as background, SEMCOG reduced its 2005-2030 forecasts of growth in population (Table 3-8) and employment (Table 3-9). The changes still reflect positive, albeit, small growth. These changes have been distributed to the county level, but not to a smaller geographical unit.

The county-level changes in growth provide an understanding of the dynamics of the region. From a population perspective (Table 3-8), the changes in the revised growth forecasts indicate that the greatest slowdown is expected in Livingston County. The smallest slowdown in population growth is expected in Oakland County.

Table 3-8
2030 Revised Population Forecast by SEMCOG
Detroit River International Crossing Study

County	Year 2000 (1)	Previous Forecast 2030 (2)	Current Forecast 2030 (3)	Change in Forecast Growth (Columns 2 versus 3)
Livingston	156,951	282,405	210,359	-25.5%
Macomb	788,149	926,347	914,685	-1.3%
Monroe	145,945	191,500	159,797	-16.6%
Oakland	1,194,156	1,346,185	1,303,674	-3.2%
St. Clair	164,235	203,552	189,274	-7.0%
Washtenaw	322,895	433,205	369,474	-14.7%
Wayne	2,061,162	2,018,091	1,824,112	-9.6%
Total	4,833,493	5,401,285	4,971,375	-8.0%

Source: SEMCOG

The two SEMCOG employment forecasts are not directly comparable because the new forecast uses the employment definition of the Bureau of Economic Analysis and the previous forecast used the Bureau of Labor Statistics database. Nonetheless, trends can be observed. The revised projections of employment growth by 2030 in the SEMCOG region are down by about seven percent compared to the earlier forecast (Table 3-9). The greatest change in growth impact will be felt in Monroe County. The least change in employment growth is expected in Washtenaw County, which is the only county the growth of which stays positive.

Table 3-9
2030 Revised Employment Forecast by SEMCOG
Detroit River International Crossing Study

County	Year 2000 (1)	Previous Forecast 2030 (2)	Current Forecast 2030 (3)	Change in Forecast Growth (Columns 2 versus 3)
Livingston	59,186	102,378	95,274	-6.9%
Macomb	383,308	441,126	427,658	-3.1%
Monroe	54,375	74,268	63,278	-14.8%
Oakland	910,441	1,100,545	1,001,198	-9.0%
St. Clair	64,531	80,857	78,780	-2.6%
Washtenaw	230,212	285,543	289,059	1.2%
Wayne	971,127	1,024,905	943,826	-7.9%
Total	2,673,180	3,109,622	2,899,073	-6.8%

Source: SEMCOG

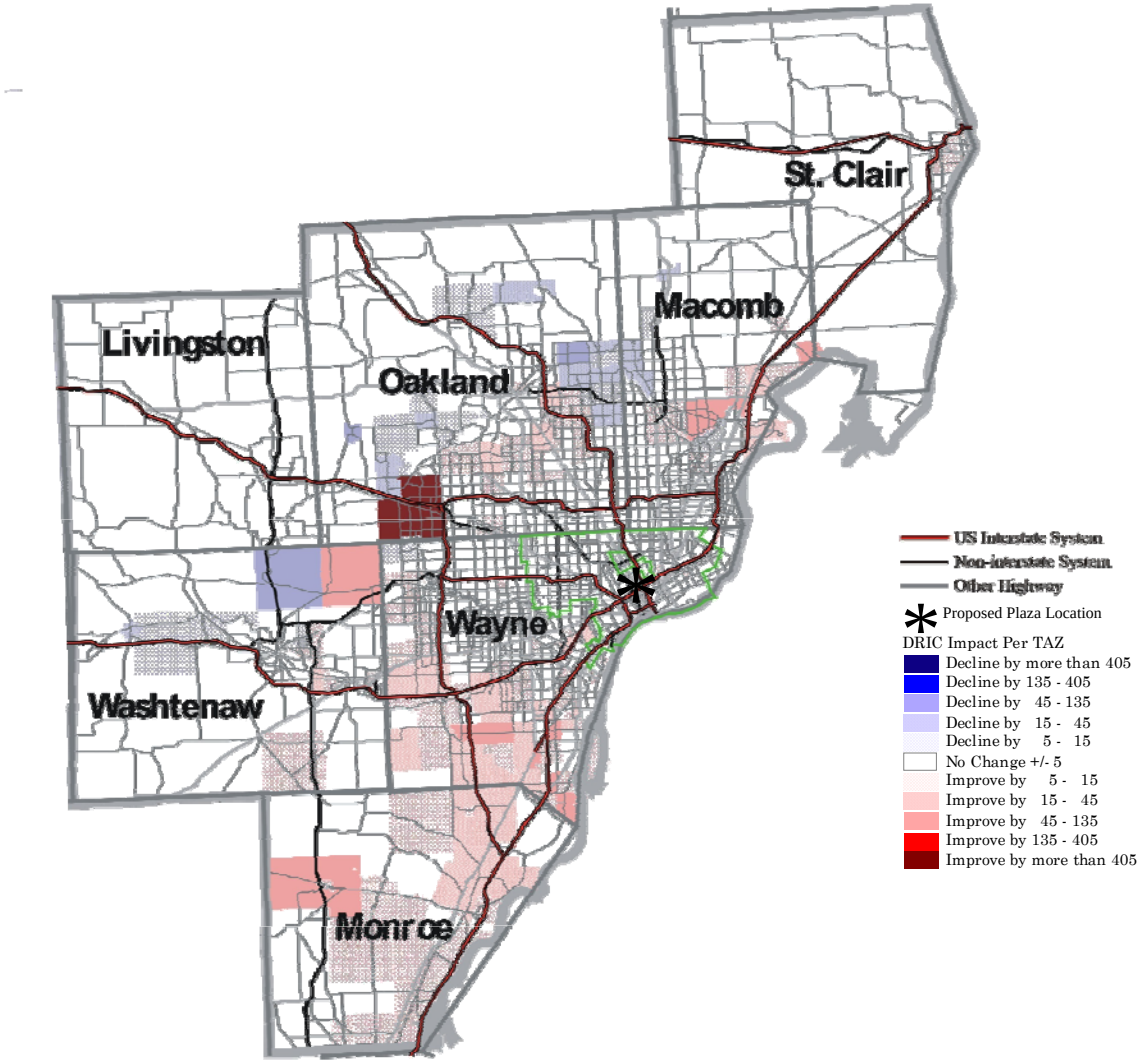
3.2.2 State and Regional Job Impacts

The economic analysis done as part of the DRIC Study determined that without more border-crossing capacity the opportunity to attract 25,000 jobs to the State of Michigan in 2035 would be lost. Ontario would not attract 16,500 jobs. Almost all of these jobs would be in manufacturing and related sectors.[4] To the State of Michigan this represents a potential income tax loss of about $500 million in 2035 alone. At the same time, the introduction of a new crossing would change the accessibility of the area and slightly impact population and employment growth. The DRIC induced-demand analysis[5] examined the shifts in growth associated with building a new river crossing between Detroit and Windsor.

Figure 3-12 and Table 3-10 present the accessibility-induced employment impact of the proposed new border crossing expressed as a net employment change. Concentrations of net positive changes are located along I-275 and I-75 in Wayne County. The latter route is part of an interstate "auto alley" serving the North American auto industry through the United States to southern states such as Kentucky, Tennessee and Georgia. The area at the I-94 interchange with Wyoming Avenue, near the Livernois-Junction Yard intermodal (truck/rail) terminal, is expected to see a small increase in employment because of the accessibility change.

[4] HLB, *Detroit River International Crossing Study Regional and National Economic Impact of Increasing Delay and Delay-Related Costs at the Detroit River Crossings Draft Report,* August 9, 2006.
[5] The Corradino Group of Michigan, Inc., *Detroit River International Crossing Study Induced Demand Analysis Technical Report*, January 2008.

Figure 3-12
Employment Redistribution
Net Impact by Traffic Analysis Zone
Detroit River International Crossing Study



Source: The al Chalabi Group in association with The Corradino Group of Michigan, Inc.

Table 3-10
Impact of DRIC on Redistribution
of 2005-2035 Employment Forecasts
Detroit River International Crossing Study

County	2005 Base Year Empl.	2035 Baseline Empl. Forecast	2005 - 2035 Baseline Empl. Change	Net Empl. Impact of New Border Crossing
City of Detroit	330,282	305,203	-25,079	106
Balance of Wayne Co.	660,699	744,134	83,435	1,726
Livingston County	70,537	111,116	40,579	0
Macomb County	393,675	447,577	53,902	132
Monroe County	57,903	80,234	22,331	364
Oakland County	955,886	1,144,257	188,371	886
St. Clair County	66,995	85,504	18,509	60
Washtenaw County	244,185	302,707	58,522	78
Wayne County	990,981	1,049,337	58,356	1,832
SEMCOG Region	2,780,162	3,220,732	440,570	3,352

Source: The al Chalabi Group

At a broader level than Wayne County, in the U.S., changes in accessibility along with the proposed new border crossing are forecast to shift 3,350 jobs into the SEMCOG Region, all from outside Michigan.

The analysis of the effect of improved accessibility on job shifts is based on a bi-national road network. Improved accessibility is expected to be most significant in the Windsor area (i.e., Essex and Chatham-Kent Counties) (Figure 3-13) largely due to extending Highway 401 to the new bridge.

3.2.3 Construction Jobs Created

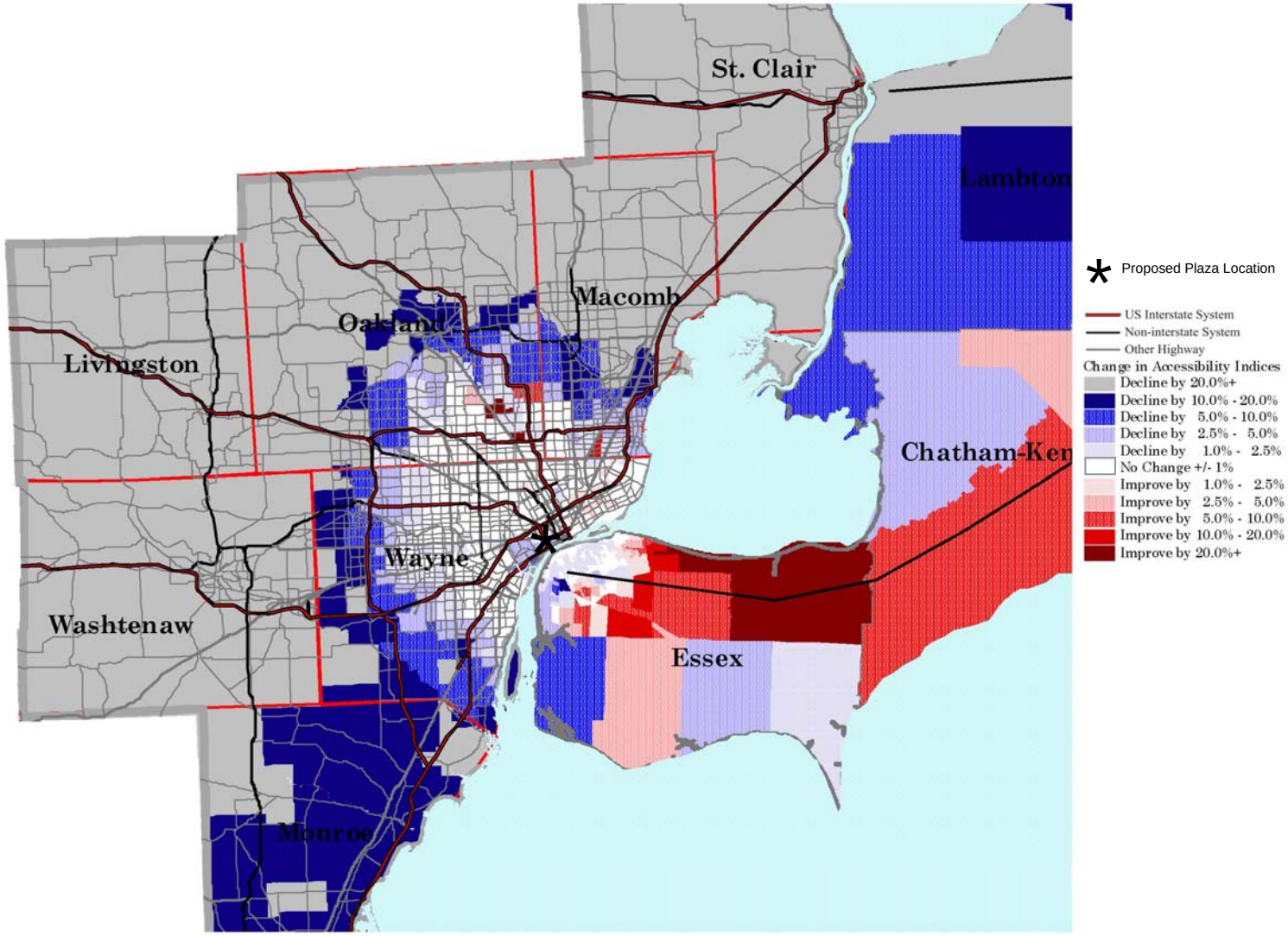
Building the DRIC project would result in spending $1.28 to $1.49 billion (labor, materials, etc.) on the U.S. side of the border causing a positive ripple effect in the local economy. Data available from the FHWA indicate seven full-time equivalent jobs[6] are generated for every million dollars of construction spending per year (Year 2000 dollars)[7]. A recent study of MDOT's Detroit Intermodal Freight Terminal Project found a similar multiplier. The FHWA analysis also found that 18 indirect jobs would be supported per million dollars of construction spending per year. So, the DRIC alternatives are

What are Ripple Effects?

Major projects, such as the DRIC, are financed in large part by federal dollars that might not otherwise come to the region. The construction workers spend their earnings on goods and services, starting the "ripple" effect of DRIC dollars moving through the local economy.

[6] Full-time equivalents are used because many construction workers are not on the job full-time for a year. So, a blend of workers from different trades over the course of a year produces a full-time equivalent construction job.
[7] http://www.ops.fhwa.dot.gov/freight/freight-analyis/highway-ops/hiway-ops2.htm

Figure 3-13
Changes in Accessibility Indices
2005-2035 Build Scenario
Detroit River International Crossing Study



Source: The al Chalabi Group in association with The Corradino Group of Michigan, Inc.

expected to generate 8,939 to 10,416 direct jobs and 22,986 to 26,784 indirect jobs over the period 2010 to 2013 from construction spending on the U.S. side of the border.

3.2.4 Bridge and Plaza Operations

Bridge operations would support a permanent staff of approximately 775 estimated as follows: 400 at Customs and Border Protection; 200 brokers; 70 at tolls; 20 at maintenance; 75 at duty free; and 10 in administration. This estimate is based on comparable operations at the Blue Water Bridge and at the Peace Bridge in Buffalo, N.Y.

3.2.5 Tax Base Impacts

It is expected that conversion of Delray property for the DRIC from private to government control will eliminate $500,000 to $600,000 in property taxes per year to the City of Detroit. This permanent loss of property taxes generated in Delray could be offset by those who choose to relocate to other areas within Detroit. Construction expenditures and direct and indirect construction jobs will produce revenue for local governments, as well as the state.

3.2.6 Summary of Job/Economic Impacts

<u>No Build Alternative</u>

It is forecast without a new border crossing, Michigan would not attract in 2035 25,000 jobs. Those jobs could produce about $500 million in taxes to the State. Additionally, restructuring of the auto industry will mean a loss of jobs and tax revenues for the next eight to ten years. Arvin Meritor is the biggest employer (400+ jobs) in the Delray Study Area. It, too, is experiencing difficulties because of changes in the auto industry.

Construction Will Create Jobs

Source: The Corradino Group of Michigan, Inc.

<u>Build Alternatives</u>

The DRIC alternatives would require relocation of 41 to 56 businesses and approximately 685 to 920 jobs. Forty-three of 50 business owners interviewed indicated they prefer to remain within the study area; some businesses may close or move elsewhere. In the short term, such job losses in the Delray area would be offset by jobs generated and money spent directly for construction of the project. But, it is uncertain which local community members would lose their jobs due to the DRIC project and who may be employed in constructing the project.

An economic analysis done as part of the DRIC Study determined that, if more border crossing capacity is not built over the next 20 years, Michigan would not attract in 2035 25,000 jobs, almost all in manufacturing and related sectors.[8] On the other hand, the improved accessibility associated with a new border crossing would attract 3,350 jobs into the SEMCOG region from areas outside Michigan (Ohio, Kentucky, places south). About 1,800 of these jobs would locate in Wayne County and approximately 900 in Oakland County. A few of the Wayne County jobs would be drawn to the DRIC study area in the vicinity of I-94 at Wyoming Avenue near the Livernois Junction Yard intermodal (truck/rail) terminal.

Temporary construction jobs are projected to range between 8,939 and 10,416 depending on the Build Alternative. Bridge/plaza operations jobs are forecast at 775 in 2035.

3.3 Do the Practical Alternatives Follow Planning and Zoning Requirements?

The Practical Alternatives are consistent with planning and zoning requirements. The proposed project has been discussed with SEMCOG, the Metropolitan Planning Organization (MPO), and is scheduled for inclusion in their Regional Transportation Plan in June 2008. They have the potential to reinforce the compatibility of residential and industrial areas of Delray. Possible land use changes were developed in cooperation with the City of Detroit planning/economic development agencies and the public.

3.3.1 Existing Land Use and Zoning

The City of Detroit's Master Plan of Policies is being updated and is the source of information for the neighborhoods in the city included here. For all practical purposes, the proposed master land use plans, and the one that is now in force, are essentially the same.

While the Ecorse Master Plan is not available, Master Plans for River Rouge (2002), Dearborn (1997), and Allen Park (1978) were also reviewed as they affect existing and future developments in the study area. All these plans focus on protecting residential areas while recognizing the incompatible mix of residential and industrial uses that have evolved over time.

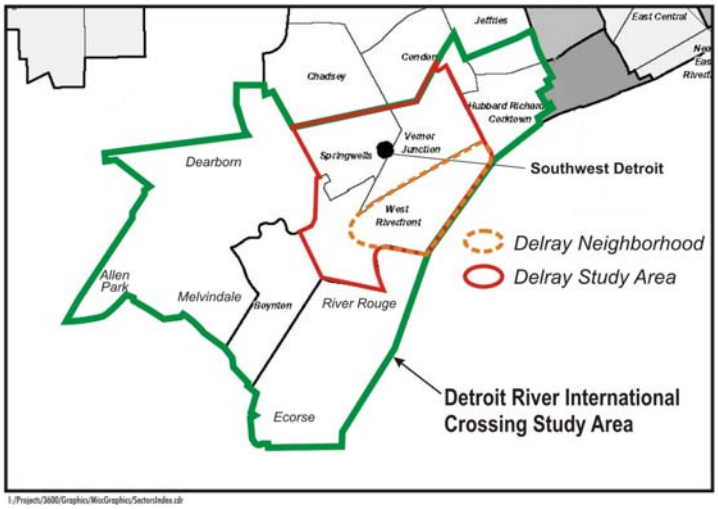
[8] HLB, *Detroit River International Crossing Study Regional and National Economic Impact of Increasing Delay and Delay-Related Costs at the Detroit River Crossings Draft Report*, August 9, 2006.

3.3.1.1 Detroit

The DRIC study area was overlaid on the Sectors and Subsectors found in the City of Detroit's Master Plan of Policies (Figure 3-14). Subsectors most directly affected are: West Riverfront, Boynton, Springwells, Vernor-Junction and Hubbard-Richard/ Corktown; all are in the Southwest Sector of Detroit.

The following summary of planning issues is drawn from the draft City of Detroit Master Plan of Policies, as of June 2004 (scheduled to be adopted soon) as it relates to Southwest Detroit and Delray. Again, the existing and updated plans are essentially the same for these areas.

Figure 3-14
Relation of Detroit Master Plan of Policies and the Study Area
Detroit River International Crossing Study



Source: City of Detroit Master Plan of Policies Sectors and Subsectors Index and The Corradino Group of Michigan, Inc.

3.3.1.2 Southwest Sector of City of Detroit

Southwest Detroit has two outstanding economic characteristics: an exceptional concentration of very heavy industry, and a unique convergence of freight transportation modes. Weaknesses of the Sector relate to economic obsolescence in industrial and commercial plants. Strengths include the Detroit River as a unique attraction, the fixed nature of the transport infrastructure, the availability of many sound industrial buildings, and the shopping habits of many local residents favoring neighborhood stores.

Detroit's major concentration of ports, rail facilities, truck terminals, pipelines, and international crossings (and associated or support facilities and organizations) occurs in the Southwest Sector. This remains unchanged despite the serious and continuing erosion of the Sector's manufacturing base. Only to a limited extent can changing technology, changing corporate ownership patterns, or other evolutionary factors disperse Southwest Detroit's highly significant concentration of freight facilities. In fact, prevailing economic forces favor continued concentration.

The Southwest Sector, therefore, will remain an area of primary economic importance and industrial activities, within the limits of sound planning and environmental protection.

Land use planning issues in Southwest Detroit Subsectors are contained in the *Community Inventory Technical Report*. Below is a summary of the Subsector in which Delray is located.

3.3.1.3 West Riverfront Subsector (Delray)

The West Riverfront Subsector includes Delray. It is a major industrial and transportation zone. It is forecast to be the location for many of Detroit's reindustrialization activities. Vacant industrial plants and land are available for expansion of industries.

The Port of Detroit is a Foreign Trade Zone (FTZ). Large-scale expansion of berthing space is not needed unless current trends completely reverse. However, the Foreign Trade Zone and container barge operations at the Port create a need for warehouse, outdoor storage, and container-handling spaces; in other words, logistics support functions.

One very important planning issue is the future of Delray as a residential community. The City of Detroit advocates retention of housing, schools, churches, and commercial and retail services.

Fort Wayne is recognized as a key asset in this area, with the objective of preserving its buildings, connecting it with greenways to surrounding areas and making it a regional destination.

What is a Foreign Trade Zone?

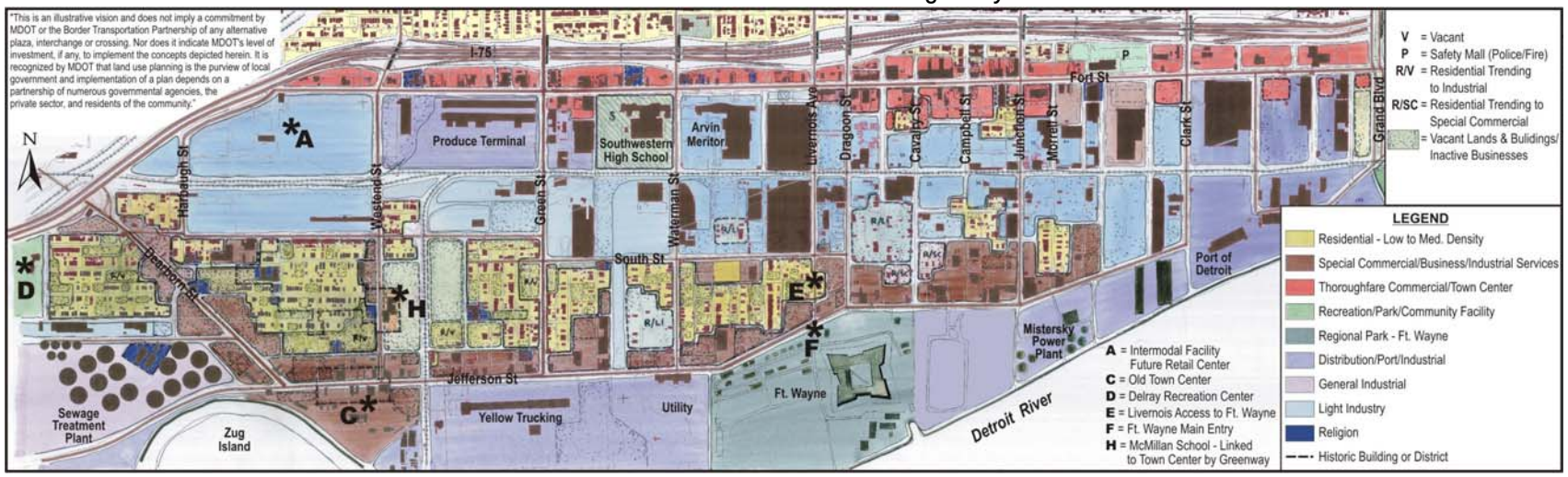
U.S. Foreign Trade Zones (FTZs) were created to provide special customs procedures to U.S. businesses engaged in international trade-related activities. Items processed in FTZs are considered duty-free. Duty payment is deferred until the items are brought out of the FTZ for sale in the U.S. market. This helps to offset customs advantages available to overseas producers who compete with domestic industries.

3.3.2 Summary of Land Use Impacts

No Build Alternative

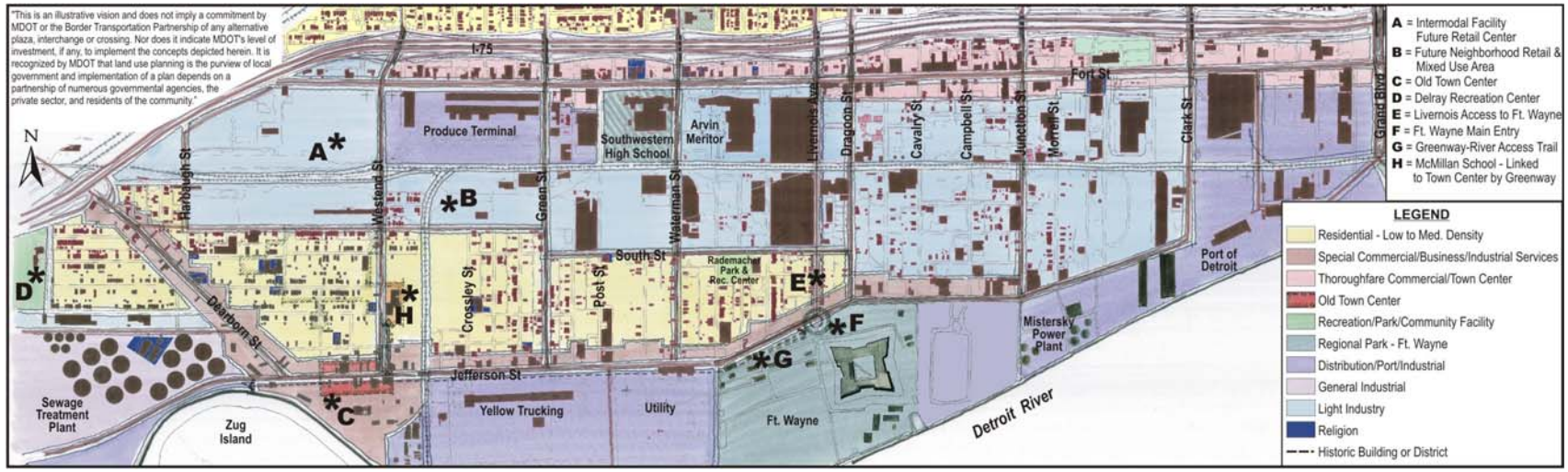
With the No Build Alternative, trends indicate continued industrialization of the Delray area will occur at the cost of the residential area that now exists (Figure 3-15). Figure 3-16 depicts the community's view of the future, also without a new crossing. It differs from Figure 3-15 in that revitalization of West Delray is emphasized, not incremental conversion to industry. Existing land use patterns are expected to continue with little change in the remainder of the study area and the region. However, forecasts by SEMCOG indicate losses in population and jobs in Wayne County and Detroit that could lead to abandonment of some currently-active land uses.

Figure 3-15
Continuing-Trends Land Use Pattern without a New River Crossing
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Figure 3-16
Community-based Delray Land Use Pattern without a New River Crossing
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Build Alternatives

If the DRIC crossing is built, positive land use changes are possible. Figures 3-17A and B illustrate the desire of the community with a DRIC crossing in place. The vision is to create a better place to live, with a new crossing system as its neighbor.

Realizing this vision will require redeveloping/strengthening residential areas in West Delray, the creation of buffers between those residential areas and the industrial and transportation areas that might remain. Neighborhood-scale commercial development will need to be encouraged to locate in West Delray to serve the residents. The Fort Street retail businesses that would be relocated by a Build Alternative might find this newly-developed commercial area a suitable place for relocation.

East Delray, located between the proposed new bridge and the Ambassador Bridge, might be an attractive location for logistics/industrial uses to complement the transportation function of the area. The 150-acre plaza could be the separator of neighborhood uses to the west and logistics/industrial uses to the east.

A number of households and businesses will be displaced if the DRIC project is constructed. If any of them choose to relocate in the Delray area that would help move the vision closer to reality.

MDOT, in partnership with FHWA is exploring a number of concepts by which enhancements may be made to the Delray area as it becomes the “host community” for the DRIC project. These concepts include partnering with the private sector and with other government agencies in areas such as job training, small business development, improving and replacing housing stock, and other community enhancing amenities. Depending on comments from stakeholders and community leaders, these concepts may continue to be studied and refined as the DRIC Study moves toward the selection of the Preferred Alternative, which will be addressed in the FEIS. The plan shown in Figures 3-17A and B are based on such an arrangement.

Figure 3-17A
Community-based Delray Land Use Pattern with a New DRIC Crossing
Detroit River International Crossing Study

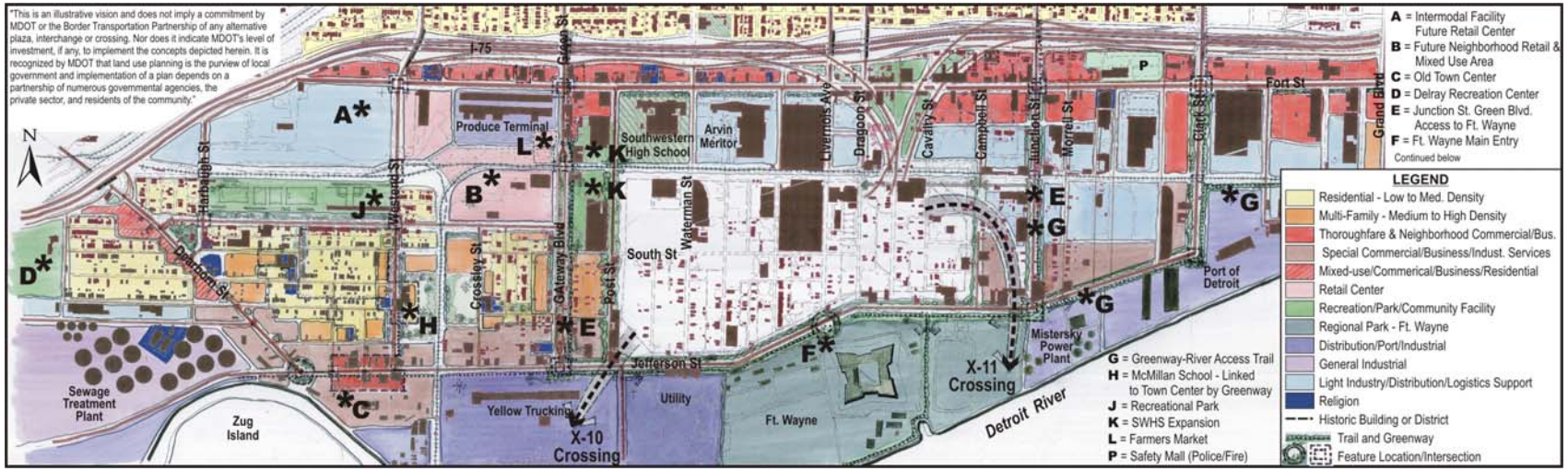
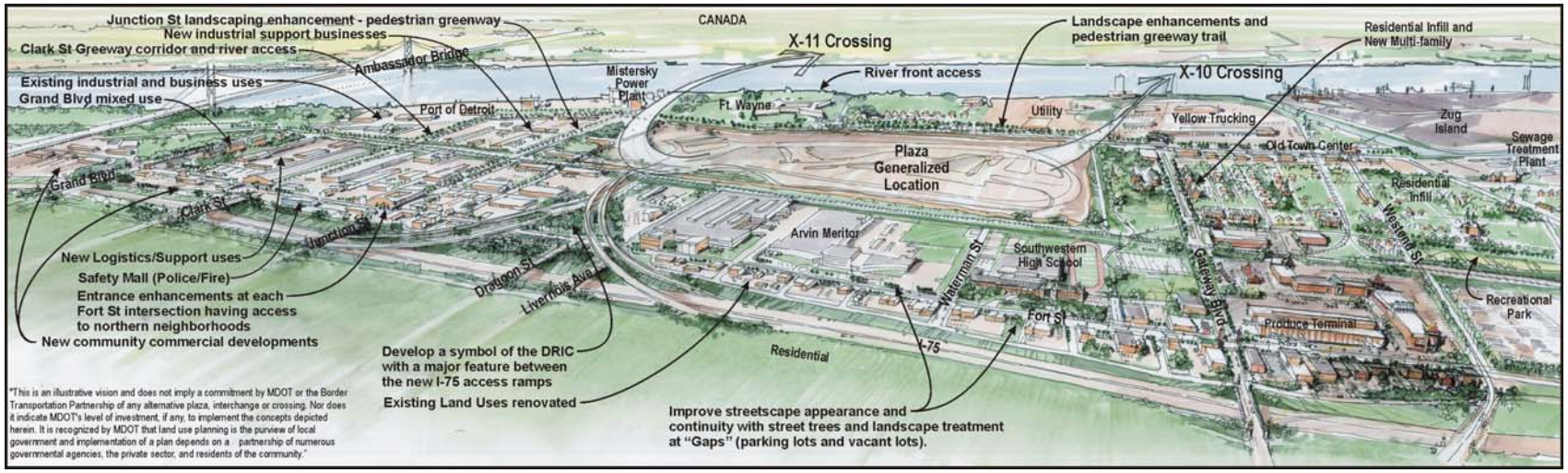


Figure 3-17B
Conceptual Depiction of Community-based Delray Land Use Pattern with a New DRIC Crossing
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

3.3.3 Community Vision

The DRIC public outreach program involved numerous formal public meetings and workshops. A key component of the program has been working with the community and City of Detroit agencies to meld Detroit's planning policies with the realities of existing Delray land uses. "Vision Statements" were first prepared by the community for conditions with and without a new bridge. These guided development of future land use concepts.

Vision Statement WITHOUT a New River Crossing

The participants of the Detroit River International Crossing workshops envision the future WITHOUT a new river crossing as follows:

The area between Zug Island and the foot of the Ambassador Bridge along the Detroit River is experiencing an ever-improving quality of life for a number of reasons, including the area is clean and safe, with neighbors breathing clean air. New residential development is flourishing with families continuing to return. Programs, like the Neighborhood Enterprise Zone (NEZ) control the taxes of those who have remained in, and others who have moved to, the area. Historic structures are preserved, particularly the churches and Fort Wayne, which has become an international tourist attraction.

Developments in and around the area provide jobs with good wages for local residents. The City of Detroit supports this growth and development in a number of ways, including providing significant police and fire protection. Designated and policed truck routes further protect the neighborhoods in the area by directing heavy truck traffic around them.

Vision Statement WITH a New River Crossing

The vision for the community WITH a new river crossing system is seen as follows:

The area between Zug Island and the foot of the Ambassador Bridge, known as the "host community" of a new river crossing, is experiencing an ever-improving quality of life.

The West Delray neighborhood is intact with no relocations because of the new river crossing, which is publicly owned and operated. Free housing has been provided to those few who were relocated. Improvements to housing and small businesses in the area are financed through a special fund designed to benefit the "host community" of the new river crossing. And, programs like the Neighborhood Enterprise Zone (NEZ) control the taxes of those who have remained in, and others who moved to, the area. Development that occurs in and around the new crossing supports good paying jobs for the local residents. The City of Detroit supports this growth in a number of ways, including providing significant police and fire protection. Further support of the area, including its air quality and the health of its residents, is caused by routing heavy trucks around the area over designated routes that are built to last.

3.4 Protected Farmland and Forests

No protected farm or forest lands exist in the highly urbanized study area.

3.5 Traffic

This section covers how traffic was predicted for the new bridge and how the nearby freeways and major local roads would operate with the traffic changes. Reference is made to the two-volume set of *Traffic Analysis Technical Reports* for details.[9]

3.5.1 Travel Demand Model and Results

3.5.1.1 Overview

The travel demand model that was created specifically for the DRIC project is a composite of detailed roadway networks and trip tables representing the SEMCOG region, the State of Michigan, Windsor, and Ontario. The model also covers all of Canada and the U.S. with less-detailed networks than in the Detroit-Windsor region. The travel demand model treated all crossings equally in terms of tolls and the time consumed in paying tolls and Customs processing. All travel model applications used the same Canadian approach road to the plaza at the new crossing.

What is a Travel Demand Model?

A computer program used to estimate traffic over large areas. The model uses data on population and employment to determine how many trips will be made. When a new roadway link is analyzed, like a new bridge, the model reports on traffic changes in the transportation system.

A number of travel demand modeling analyses were performed for the DRIC. The highest traffic volumes in a range of forecasts are used in this DEIS. This is consistent with MDOT's approach to the NEPA process, which is to examine maximum-impact scenarios during preliminary analyses and, then, modify the analyses in the FEIS as the specifics of the project become better defined.

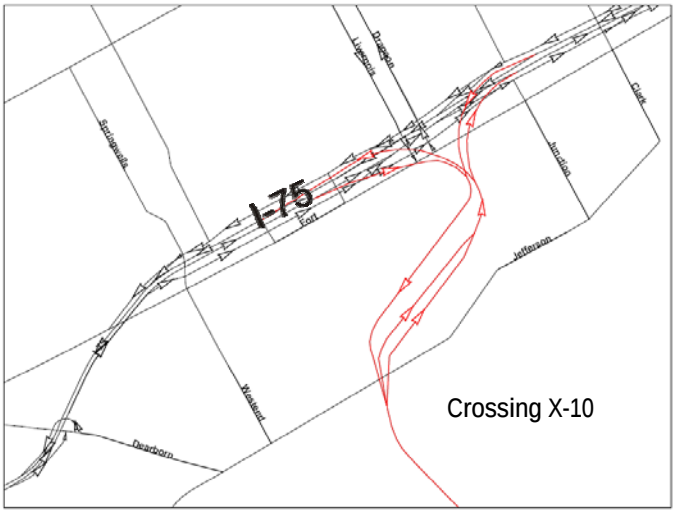
Providing a new border crossing would cause travel shifts over a wide area. For example, a new Detroit-Windsor crossing could attract travelers from the Blue Water Bridge at Port Huron, Michigan. At the same time, the proposed border crossing would reduce traffic on the Ambassador Bridge and in the Detroit-Windsor Tunnel.

Because of their similarity, Practical Alternatives #1, #2, #3, #14 and #16 are represented by a single set of travel demand model applications. They include an X-10 crossing, Plaza P-a, and a similar trumpet-type interchange at I-75. Alternative #5, also with an X-10 crossing and including Plaza P-a, has a trumpet-type interchange shifted far enough east (i.e., upstream on I-75) that a separate set of traffic data was produced. Alternatives #7, #9 and #11 are represented by a single set of travel demand model applications as they are variations of an X-11 crossing with Plaza P-c.

[9] The Corradino Group of Michigan, Inc. and Parsons Transportation Group, *Detroit River International Crossing Study Level 2 Traffic Analysis Report, Part 1: Travel Demand Model* and *Part 2: Highway Capacity Analysis and Microsimulation Modeling Results*, February 2008.

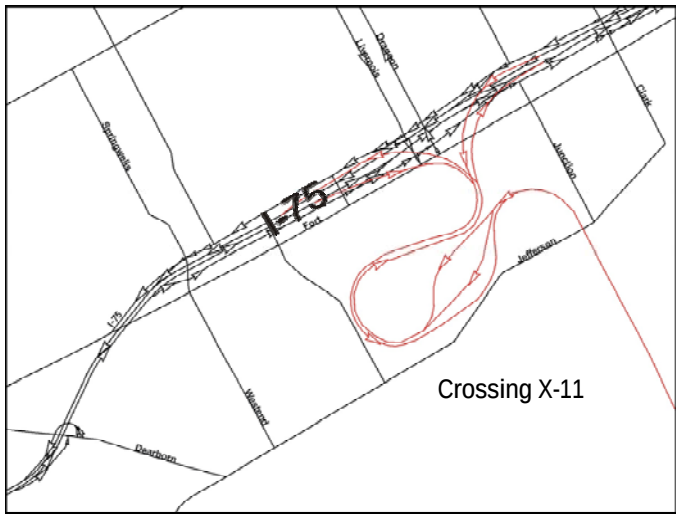
The key to these groupings is their overall plaza layout. Alternative Set #1/2/3/14/16 provides a relatively direct connection to I-75 through Plaza P-a (Figure 3-18). This means less time to cross the river and connect to I-75. Alternative #5 follows this same general pattern. Alternative Set #7/9/11 has a routing within Plaza P-c that causes traffic to double back on itself causing more time and distance to be traveled to reach I-75 (Figure 3-19).

Figure 3-18
Model Network for Alternatives #1, #2, #3, #14 and #16
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Figure 3-19
Model Network for Alternatives #7, #9 and #11
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

3.5.1.2 Volumes

The travel demand analyses are designed to provide traffic data for the AM peak hour, the highest-traveled midday hour, and the PM peak hour in 2004 (the base year of the analysis for which complete data are available), 2015, and 2035. Alternative Set #1/2/3/14/16 and Alternative #5 show similar volumes (Table 3-11A). This is expected considering both groups use crossing X-10, have the same plaza configuration, and the length and travel time distinction between these groups is measured at 0.1 miles and fewer than 12 seconds. Alternative Set #7/9/11 is different, because it has a much longer route that results in travel times between 90 seconds and two minutes longer than the other alternatives. Therefore, it would be expected to carry less traffic.

What is a Peak Hour?

A peak hour is the busiest single hour in the morning, afternoon or in the middle of the day. Analyzing peak hour traffic provides an understanding of how the roadway system works under stress conditions to be encountered on a regular basis.

Table 3-11A
Maximum Two-way Crossing Volumes: Proposed DRIC Crossing
Detroit River International Crossing Study

	Alternative Group	AM		MD		PM	
		2015	2035	2015	2035	2015	2035
Cars	#1/2/3/14/16	845	1,104	559	596	1,225	1,405
	#5	848	1,090	590	605	1,262	1,462
	#7/9/11	473	611	294	376	807	1,124
Trucks	#1/2/3/14/16	602	964	746	1,138	734	1,092
	#5	604	948	718	1,153	740	1,120
	#7/9/11	395	729	322	699	512	846
Total	#1/2/3/14/16	1,447	2,068	1,305	1,734	1,959	2,497
	#5	1,452	2,038	1,308	1,758	2,002	2,582
	#7/9/11	868	1,340	616	1,075	1,319	1,970
PCEs[a]	#1/2/3/14/16	2,350	3,514	2,424	3,441	3,060	4,135
	#5	2,358	3,460	2,385	3,488	3,112	4,262
	#7/9/11	1,461	2,434	1,099	2,124	2,087	3,239

Table 3-11B provides further definition of how traffic on the DRIC alternatives is drawn from other border crossings in the Port Huron/Sarnia and Detroit River areas in the 2035 PM peak hour. It illustrates the following:

- A seven percent decline (○ red oval) in overall auto traffic on the Blue Water Bridge and a 16 to 18 percent decline in overall truck traffic with the introduction of a proposed DRIC crossing in the 2035 PM peak hour (○ blue oval). The decline is expected to be greater in the peak U.S.-to-Canada direction than the Canada-to-U.S. direction.

- The Detroit-Windsor Tunnel would register a 20 to 26 percent decline in total traffic (○ green oval), with the most significant reduction expected to occur in auto traffic in the U.S.-to-Canada peak direction.

- With Alternative Set #1/2/3/14/16 and Alternative #5, the Ambassador Bridge would realize a 37 to 39 percent reduction in car traffic (□ red squares). Also, with Alternative Set #1/2/3/14/16 and Alternative #5, the Ambassador Bridge is expected to realize a reduction of 75 percent of its truck traffic (□ green squares).

- With Alternative Set #7/9/11, the Ambassador Bridge is expected to realize a reduction of only 30 percent of its car traffic (□ blue square) and a reduction of 54 percent of its truck traffic (□ black square). The increased travel time of Alternative Set #7/9/11 compared to the other DRIC alternatives causes retention of car traffic at the Ambassador Bridge.

Table 3-11B
PM 2035 Peak Hour Volumes
Detroit River International Crossing Study[a]

	Network	U.S.-to-Canada (Peak Direction)					Canada-to-U.S.					Two-Way Traffic				
		BWB	DWT	AMB	NEW	Total[b]	BWB	DWT	AMB	NEW	Total[b]	BWB	DWT	AMB	NEW	Total[b]
Cars	No Build	458 13%	1,328 37%	1,852 51%	n/a	3,638 100%	490 31%	429 27%	664 42%	n/a	1,583 100%	948 18%	1,757 34%	2,516 48%	n/a	5,221 100%
	#1, #2, #3, #14, #16	414 11%	997 27%	1,072 29%	1,155 32%	3,638 100%	466 29%	367 23%	502 32%	250 16%	1,585 100%	880 17%	1,364 26%	1,574 30%	1,405 27%	5,223 100%
	#5	413 11%	982 27%	1,028 28%	1,215 33%	3,638 100%	466 29%	369 23%	501 32%	247 16%	1,583 100%	879 17%	1,351 26%	1,529 29%	1,462 28%	5,221 100%
	#7, #9, #11	417 11%	1,080 30%	1,221 34%	920 25%	3,638 100%	471 30%	378 24%	532 34%	204 13%	1,585 100%	888 17%	1,458 28%	1,753 34%	1,124 22%	5,223 100%
Trucks	No Build	493 36%	120 9%	761 55%	n/a	1,374 100%	390 50%	6 1%	391 50%	n/a	787 100%	883 41%	126 6%	1,152 53%	n/a	2,161 100%
	#1, #2, #3, #14, #16	368 27%	44 3%	229 17%	734 53%	1,375 100%	357 45%	1 0%	70 9%	358 46%	786 100%	725 34%	45 2%	299 14%	1,092 51%	2,161 100%
	#5	364 26%	47 3%	209 15%	756 55%	1,376 100%	358 46%	1 0%	63 8%	364 46%	786 100%	722 33%	48 2%	272 13%	1,120 52%	2,162 100%
	#7, #9, #11	379 28%	46 3%	364 26%	585 43%	1,374 100%	364 46%	1 0%	161 20%	261 33%	787 100%	743 34%	47 2%	525 24%	846 39%	2,161 100%
Total	No Build	951 19%	1,448 29%	2,613 52%	n/a	5,012 100%	880 37%	435 18%	1,055 45%	n/a	2,370 100%	1,831 25%	1,883 26%	3,668 50%	n/a	7,382 100%
	#1, #2, #3, #14, #16	782 16%	1,041 21%	1,301 26%	1,889 38%	5,013 100%	823 35%	368 16%	572 24%	608 26%	2,371 100%	1,605 22%	1,409 19%	1,873 25%	2,497 34%	7,384 100%
	#5	777 15%	1,029 21%	1,237 25%	1,971 39%	5,014 100%	824 35%	370 16%	564 24%	611 26%	2,369 100%	1,601 22%	1,399 19%	1,801 24%	2,582 35%	7,383 100%
	#7, #9, #11	796 16%	1,126 22%	1,585 32%	1,505 30%	5,012 100%	835 35%	379 16%	693 29%	465 20%	2,372 100%	1,631 22%	1,505 20%	2,278 31%	1,970 27%	7,384 100%
PCEs[c]	No Build	1,691 24%	1,628 23%	3,755 53%	n/a	7,073 100%	1,465 41%	444 13%	1,642 46%	n/a	3,551 100%	3,156 30%	2,072 20%	5,396 51%	n/a	10,624 100%
	#1, #2, #3, #14, #16	1,334 19%	1,107 16%	1,645 23%	2,990 42%	7,076 100%	1,359 38%	370 10%	677 19%	1,145 32%	3,550 100%	2,693 25%	1,477 14%	2,322 22%	4,135 39%	10,626 100%
	#5	1,323 19%	1,100 16%	1,551 22%	3,105 44%	7,078 100%	1,361 38%	372 10%	659 19%	1,157 33%	3,548 100%	2,684 25%	1,471 14%	2,209 21%	4,262 40%	10,626 100%
	#7, #9, #11	1,365 19%	1,195 17%	2,131 30%	2,383 34%	7,073 100%	1,381 39%	381 11%	935 26%	857 24%	3,553 100%	2,746 26%	1,576 15%	3,066 29%	3,239 30%	10,626 100%

[a] Shapes (△) are tied to text on preceding and following pages.

[b] Slight difference in totals among alternatives is the result of rounding real numbers into integers.

[c] Passenger car equivalents. One truck equals 2.5 cars.

Source: The Corradino Group of Michigan, Inc.

- With Alternative Set #1/2/3/14/16 and Alternative #5, the proposed DRIC crossing is forecast to carry approximately 43 percent of all international Passenger Car Equivalents (PCEs) in the peak U.S.-to-Canada direction (△ red pyramid). In the non-peak, Canada-to-U.S. direction, the proposed DRIC crossings would carry 33 percent of all PCEs (△ green pyramid). Overall, Alternative Set #1/2/3/14/16 and Alternative #5 would carry 40 percent of all PCEs (▽ green wedge).

- The extra travel time associated with Alternative Set #7/9/11 would lower its share to 34 percent of all PCEs in the peak U.S.-to-Canada direction (△ blue pyramid). With this alternative set, the proposed DRIC crossing would carry 24 percent of all PCEs in the Canada-to-U.S. (non-peak) direction (△ black pyramid) and 30 percent of total PCEs (▽ black wedge).

The traffic volume assignments for the Ambassador Bridge and proposed DRIC crossings are highly sensitive to travel time differences. A proposed DRIC crossing could carry as much as 80 percent of the truck traffic handled by the two bridges and about 60 percent of all traffic, depending on the alternative (Table 3-12A).

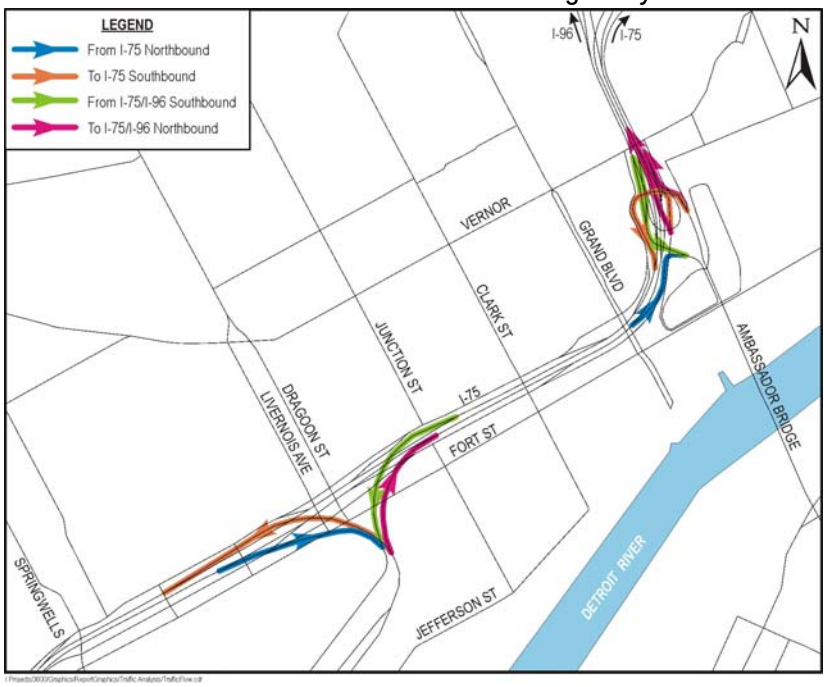
Table 3-12A
Maximum Two-way Crossing Volumes
Proposed DRIC Crossing and Ambassador Bridge
Detroit River International Crossing Study

	Alternative	AM				Midday				PM			
		2015		2035		2015		2035		2015		2035	
		AMB	NEW	AMB	NEW	AMB	NEW	AMB	NEW	AMB	NEW	AMB	NEW
Cars	No Build	1,682	n/a	1,982	n/a	1,118	n/a	1,386	n/a	2,165	n/a	2,516	n/a
	#1, #2, #3, #14, #16	1,098	845	1,229	1,104	713	559	875	596	1,302	1,225	1,574	1,405
	#5	1,094	848	1,242	1,090	685	590	870	605	1,264	1,262	1,529	1,462
	#7, #9, #11	1,394	473	1,613	611	932	294	1,016	376	1,638	807	1,753	1,124
Trucks	No Build	605	n/a	919	n/a	862	n/a	1,242	n/a	782	n/a	1,152	n/a
	#1, #2, #3, #14, #16	80	602	128	964	211	746	409	1,138	144	734	299	1,092
	#5	71	604	141	948	205	718	397	1,153	133	740	272	1,120
	#7, #9, #11	274	395	339	729	613	322	799	699	347	512	525	846
Total	No Build	2,287	n/a	2,901	n/a	1,980	n/a	2,628	n/a	2,947	n/a	3,668	n/a
	#1, #2, #3, #14, #16	1,178	1,447	1,357	2,068	924	1,305	1,284	1,734	1,446	1,959	1,873	2,497
	#5	1,165	1,452	1,383	2,038	890	1,308	1,267	1,758	1,397	2,002	1,801	2,582
	#7, #9, #11	1,668	868	1,952	1,340	1,545	616	1,815	1,075	1,985	1,319	2,278	1,970
PCEs[a]	No Build	3,195	n/a	4,280	n/a	3,273	n/a	4,491	n/a	4,120	n/a	5,396	n/a
	#1, #2, #3, #14, #16	1,298	2,350	1,549	3,514	1,241	2,424	1,898	3,441	1,662	3,060	2,322	4,135
	#5	1,272	2,358	1,595	3,460	1,198	2,385	1,863	3,488	1,597	3,112	2,209	4,262
	#7, #9, #11	2,079	1,461	2,461	2,434	2,465	1,099	3,014	2,124	2,506	2,087	3,066	3,239

[a] Passenger Car Equivalents. One truck equals 2.5 cars.
Source: The Corradino Group of Michigan, Inc.

Table 3-12B shows the 2035 PM peak hour directional volumes of the Ambassador Bridge and the new crossing. Figure 3-20 depicts these movements.

Figure 3-20
Direction of Traffic Flows to/from I-75
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

- For the U.S.-to-Canada Direction

  – From I-75 Northbound: All DRIC alternatives would serve the majority of the car, truck and, therefore, total traffic (○ red oval).

  – From the I-75/I-96 Split:

    ✓ Alternative Set #1/2/3/14/16 and Alternative #5 would serve the predominant amount of car traffic and about half the truck traffic (○ blue circles).

    In reviewing this data it is important to recognize that while the Ambassador Bridge is closer to the I-96/I-75 interchange, and the route between the interchange to Highway 401/Provincial Road using the Ambassador Bridge is 1.5 miles shorter, the new Canadian route using Alternative #5 is a half-minute shorter due to its direct freeway connection versus using Huron Church Road.

    ✓ Alternative Set #7/9/11 would serve only 38 percent of the cars and just 16 percent of the trucks (○ green ovals)

Table 3-12B
2035 PM Peak Hour Directional Comparison
Detroit River International Crossing Study[a]

	Network	U.S.-to-Canada (Peak Direction)						Canada-to-U.S.						Total	
		from I-75 Northbound		from I-75/I-96		Total		to I-75 Southbound		to I-75/I-96		Total		2-Way	
		AMB	NEW	AMB	NEW	AMB	NEW	AMB	NEW	AMB	NEW	AMB	NEW	AMB	NEW
Cars	#1, #2, #3, #14, #16	305 45%	379 55%	767 50%	776 50%	1,072 48%	1,155 52%	101 31%	224 69%	401 94%	26 6%	502 67%	250 33%	1,574 53%	1,405 47%
	#5	279 42%	379 58%	749 47%	836 53%	1,028 46%	1,215 54%	100 31%	220 69%	401 94%	27 6%	501 67%	247 33%	1,529 51%	1,462 49%
	#7, #9, #11	302 46%	360 54%	919 62%	560 38%	1,221 57%	920 43%	111 35%	204 65%	421 100%	0 0%	532 72%	204 28%	1,753 61%	1,124 39%
Trucks	#1, #2, #3, #14, #16	61 10%	577 90%	168 52%	157 48%	229 24%	734 76%	41 15%	239 85%	29 20%	119 80%	70 16%	358 84%	299 21%	1,092 79%
	#5	59 9%	569 91%	150 45%	187 55%	209 22%	756 78%	43 16%	233 84%	20 13%	131 87%	63 15%	364 85%	272 20%	1,120 80%
	#7, #9, #11	77 13%	532 87%	287 84%	53 16%	364 38%	585 62%	46 19%	200 81%	115 65%	61 35%	161 38%	261 62%	525 38%	846 62%
Total	#1, #2, #3, #14, #16	366 28%	956 72%	935 50%	933 50%	1,301 41%	1,889 59%	142 23%	463 77%	430 75%	145 25%	572 48%	608 52%	1,873 43%	2,497 57%
	#5	338 26%	948 74%	899 47%	1,023 53%	1,237 39%	1,971 61%	143 24%	453 76%	421 73%	158 27%	564 48%	611 52%	1,801 41%	2,582 59%
	#7, #9, #11	379 30%	892 70%	1,206 66%	613 34%	1,585 51%	1,505 49%	157 28%	404 72%	536 90%	61 10%	693 60%	465 40%	2,278 54%	1,970 46%
PCEs[b]	#1, #2, #3, #14, #16	458 20%	1,822 80%	1,187 50%	1,169 50%	1,645 35%	2,990 65%	204 20%	822 80%	474 59%	324 41%	677 37%	1,145 63%	2,322 36%	4,135 64%
	#5	427 19%	1,802 81%	1,124 46%	1,304 54%	1,551 33%	3,105 67%	208 21%	803 79%	451 56%	355 44%	659 36%	1,157 64%	2,209 34%	4,262 66%
	#7, #9, #11	495 23%	1,690 77%	1,637 70%	693 30%	2,131 47%	2,383 53%	226 24%	704 76%	709 82%	153 18%	935 52%	857 48%	3,066 49%	3,239 51%

[a] Shapes (△) are tied to text on the preceding and following pages.

[b] Passenger car equivalents. One truck equals 2.5 cars.

Source: The Corradino Group of Michigan, Inc.

- For the Canada-to-U.S. Direction

  - To I-75 Southbound: All DRIC alternatives would serve the predominant amount of the traffic (☐ red box).

  - To I-75/I-96 Split: All DRIC alternatives would serve six percent or less of the car traffic. Most of these trips have a destination upstream from the new crossing (☐ blue square).

    ✓ Alternative Set #1/2/3/14/16 and Alternative #5 would serve about 83 percent of the long distance truck trips (△ green pyramid). But Alternative Set #7/9/11, with its more time-consuming plaza configuration, would serve only 35 percent of these trucks (▽ black wedge).

3.5.1.3 Vehicle Miles and Vehicle Hours of Travel

Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) define the relative efficiency of one route versus another by illustrating whether an alternative decreases the amount of miles and hours traveled within a specific zone to make the same set of trips. Table 3-13 presents the VMT and VHT for each alternative for international trips. For this specific analysis, the roadway network was categorized into three areas (Figure 3-21):

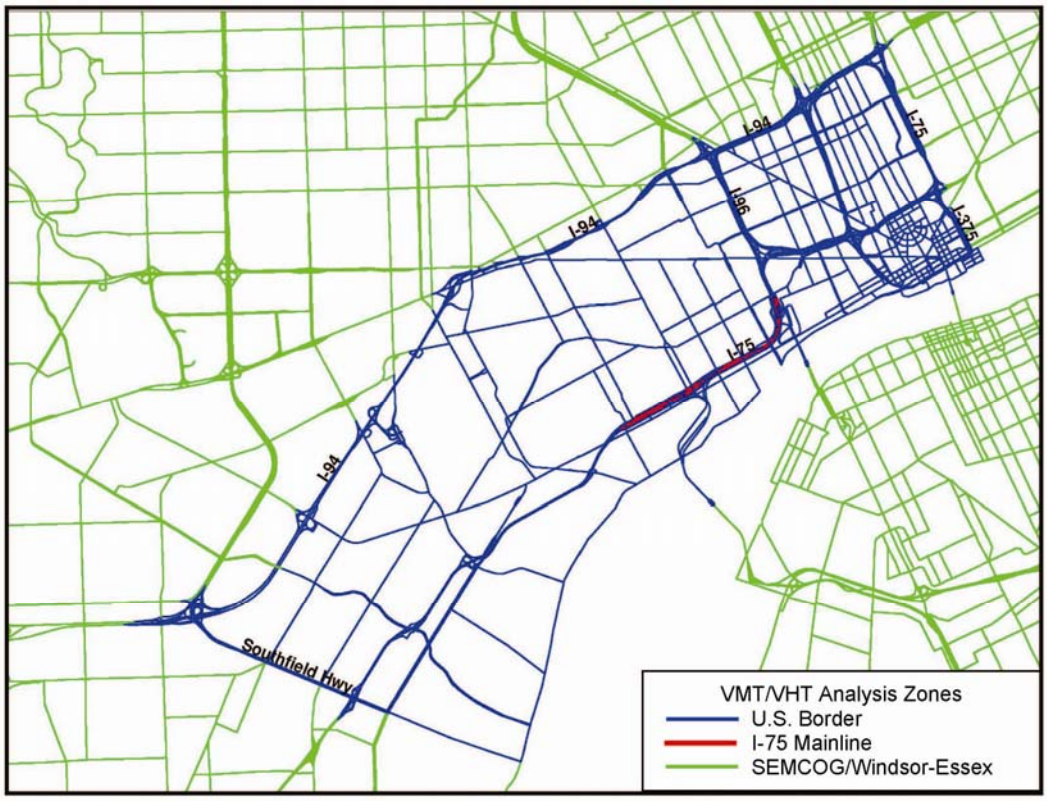
1) The I-75 mainline which runs from the I-75/I-96 split to the Dearborn Street interchange. The intention of this zone is to determine the actual effect of the new crossing on VMT/VHT within the core section of I-75 that bears the greatest traffic burden from the international connections.

2) The general U.S. border area, incorporating the core zone that all international traffic crossing in Detroit must pass through. This zone extends from the Detroit River to I-375 on the northeast side of the central business district, to I-94 on the west, to the Southfield Highway on the south.

3) The SEMCOG/Windsor-Essex Region which encompasses the seven counties in SEMCOG and Essex County in Ontario.

It is noted that, while Figure 3-21 depicts these three zones, the boundaries of the bi-national region extend beyond the graphic's limits.

Figure 3-21
VMT/VHT Analysis Area
Detroit River International Crossing Study



Note: The SEMCOG-Windsor/Essex County Region extends beyond this graphic to the official borders of the seven Michigan counties comprising SEMCOG and Essex County, Ontario.

Source: The Corradino Group of Michigan, Inc.

Within the I-75 mainline zone, total international VMT and VHT would drop with the introduction of the proposed DRIC crossing due to truck traffic from the south diverting to the proposed DRIC crossing. However, within the border area, VMT and VHT would rise as the introduction of the proposed DRIC crossing attracts trips that would have otherwise crossed the Blue Water Bridge.

Overall, within the SEMCOG region, the proposed Build Alternatives would be associated, in the 2035 PM peak hour, with an increase in VMT of two percent for cars and three percent for trucks (Table 3-13). The overall increase is about two percent as more traffic is attracted to the region. On the other hand, regional VHT would decline faster than VMT would increase – by a 3:1 ratio. So, introducing a new river crossing would reduce regional congestion. More practically speaking, under No Build conditions the average speed of international traffic on the regional network in the 2035 PM peak hour would be 34.5 mph. With every Build Alternative, the average speed would be closer to 38 mph.

Table 3-13
2035 PM Peak Hour Vehicle Miles Traveled and Vehicle Hours Traveled
International Traffic Only
Detroit River International Crossing Study

	Cars											
	I-75		Border Area		SEMCOG/ Windsor-Essex Co. Region		I-75		Border Area		SEMCOG/ Windsor-Essex Co. Region	
	VMT	% Diff	VMT	% Diff	VMT	% Diff	VHT	% Diff	VHT	% Diff	VHT	% Diff
No Build	1,953	n/a	22,583	n/a	177,536	n/a	37	n/a	648	n/a	6,339	n/a
Alt #1/2/3/14/16	2,026	4%	24,785	10%	180,332	2%	41	11%	646	0%	5,900	-7%
Alt #5	2,095	7%	24,963	11%	180,611	2%	41	12%	640	-1%	5,894	-7%
Alt #7/9/11	1,996	2%	25,584	13%	181,392	2%	38	3%	660	2%	5,945	-6%
	Trucks											
	VMT	% Diff	VMT	% Diff	VMT	% Diff	VHT	% Diff	VHT	% Diff	VHT	% Diff
No Build	2,115	n/a	13,721	n/a	149,008	n/a	40	n/a	323	n/a	3,117	n/a
Alt #1/2/3/14/16	1,650	-22%	14,363	5%	152,988	3%	31	-23%	356	10%	2,942	-6%
Alt #5	1,782	-16%	14,535	6%	153,348	3%	33	-19%	354	9%	2,942	-6%
Alt #7/9/11	1,487	-30%	14,947	9%	153,302	3%	27	-32%	356	10%	2,951	-5%
	Total											
	VMT	% Diff	VMT	% Diff	VMT	% Diff	VHT	% Diff	VHT	% Diff	VHT	% Diff
No Build	4,069	n/a	36,304	n/a	326,544	n/a	77	n/a	971	n/a	9,456	n/a
Alt #1/2/3/14/16	3,676	-10%	39,148	8%	333,320	2%	71	-7%	1,002	3%	8,842	-6%
Alt #5	3,876	-5%	39,498	9%	333,959	2%	74	-4%	994	2%	8,836	-7%
Alt #7/9/11	3,482	-14%	40,531	12%	334,694	2%	65	-15%	1,016	5%	8,896	-6%

Source: The Corradino Group of Michigan, Inc.

3.5.1.4 Sensitivity Analysis

A sensitivity analysis was conducted to see the effects on travel of recent reductions by SEMCOG to its forecasts of 2005-to-2030 growth, which are elaborated upon in Section 3.2. The sensitivity analysis indicates that the international trips decrease slightly, but not significantly (Table 3-14). For example, of the 2,161 (○ red oval) international truck trips crossing the border in the 2035 PM peak hour, 1,609 trips had no trip end in the SEMCOG area. This means 552 local truck trips could be affected by the downward revision of the trip tables. But, the reduction is just 51 truck trips (2,161 – 2,010 (○ blue oval on Table 3-14)) or a nine percent change of trips with local trip ends (51 ÷ 552).

The adjustment to account for reduced SEMCOG demographic growth projections causes 2035 peak period traffic to decline no more than three percent for international truck trips (□ red boxes) and two to seven percent in car trips (△ green pyramids) on all crossings of the border in the SEMCOG region. These effects do not materially change the overall border crossing assignment pattern between the previous SEMCOG forecast of demographics and the most recent projections.

Table 3-14
Revised Total Trips by Vehicle Class
Detroit River International Crossing Study[a]

	2035 AM Peak Hour		
	Original	Revised	% Change
U.S. Domestic Passenger Cars	777,831	713,725	-8.2
U.S. Domestic Light Trucks	32,822	29,967	-8.7
U.S. Domestic Medium Trucks	10,781	9,849	-8.6
U.S. Domestic Heavy Trucks	15,956	14,645	-8.2
International Cars	3,804	3,751	-1.4
International Trucks	1,611	1,562	-3.0
	2035 Midday Peak Hour		
	Original	Revised	% Change
U.S. Domestic Passenger Cars	601,111	549,660	-8.6
U.S. Domestic Light Trucks	54,427	49,691	-8.7
U.S. Domestic Medium Trucks	14,264	13,031	-8.6
U.S. Domestic Heavy Trucks	19,543	17,918	-8.3
International Cars	3,125	2,950	-5.6
International Trucks	2,370	2,300	-3.0
	2035 PM Peak Hour		
	Original	Revised	% Change
U.S. Domestic Passenger Cars	1,047,692	985,814	-5.9
U.S. Domestic Light Trucks	33,601	30,677	-8.7
U.S. Domestic Medium Trucks	8,350	7,627	-8.7
U.S. Domestic Heavy Trucks	12,380	11,355	-8.3
International Cars	5,223	4,854	-7.1
International Trucks	2,161	2,110	-2.4

[a] Shapes (△) are tied to text on the preceding page.
Source: The Corradino Group of Michigan, Inc.

Table 3-15 demonstrates the latter point. It presents a comparison of crossing volumes using the original and revised trip tables. The network used for the comparison is connected to the X-10 crossing. This change has been accounted for by developing the range of forecasts shown on Figure 1-3. It indicates, even with low projections of cross-border traffic, the border-crossing capacity (bridge and tunnel, combined) will be reached by 2035. In light of the significant lead time to gain approval for and build a new crossing, the time to plan is now.

Table 3-15
Original and Revised Trip Tables
Detroit River International Crossing Study

2035 AM Peak Hour: Alternatives #1, 2, 3, 14, 16						
	Trip Table	Two-way Traffic				
		BWB	DWT	AMB	NEW	Total
Cars	Original	348	1,123	1,229	1,104	3,804
	Revised	333	1,014	1,171	993	3,511
Trucks	Original	477	42	128	964	1,611
	Revised	441	41	131	949	1,562
Total	Original	825	1,365	1,357	2,068	5,415
	Revised	774	1,055	1,302	1,942	5,073
PCEs[a]	Original	1,541	1,228	1,549	3,514	7,832
	Revised	1,436	1,117	1,499	3,366	7,416
2035 Midday Peak Hour: Alternatives #1, 2, 3, 14, 16						
	Trip Table	Two-way Traffic				
		BWB	DWT	AMB	NEW	Total
Cars	Original	733	921	875	596	3,125
	Revised	696	860	802	572	2,930
Trucks	Original	709	114	409	1,138	2,370
	Revised	692	103	393	1,112	2,300
Total	Original	1,442	1,035	1,284	1,734	5,495
	Revised	1,388	963	1,195	1,684	5,230
PCEs[a]	Original	2,506	1,206	1,898	3,441	9,050
	Revised	2,426	1,118	1,785	3,352	8,680
2035 PM Peak Hour: Alternatives #1, 2, 3, 14, 16						
	Trip Table	Two-way Traffic				
		BWB	DWT	AMB	NEW	Total
Cars	Original	880	1,364	1,574	1,405	5,223
	Revised	837	1,275	1,372	1,370	4,854
Trucks	Original	725	45	299	1,092	2,161
	Revised	735	43	249	1,083	2,110
Total	Original	1,605	1,409	1,873	2,497	7,384
	Revised	1,572	1,318	1,621	2,453	6,964
PCEs[a]	Original	2,693	1,477	2,322	4,135	10,626
	Revised	2,675	1,383	1,995	4,078	10,129

[a] Passenger car equivalents. One truck equals 2.5 trucks.

Source: The Corradino Group of Michigan, Inc.

3.5.2 Microsimulation Model and Results

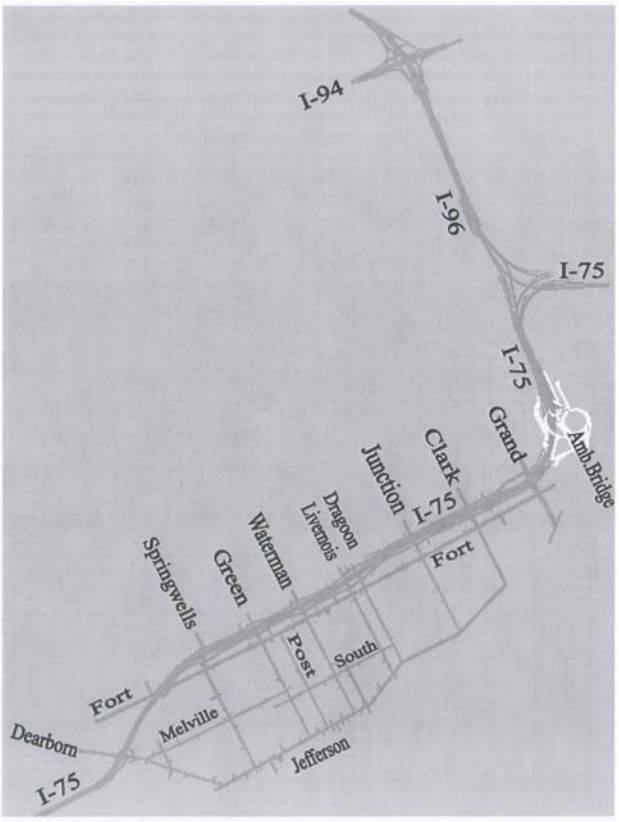
What is Traffic Microsimulation?

Traffic microsimulation uses observed behavior of vehicle movements, such as lane changing, to model individual vehicles in an animated presentation. It points to locations in a network where congestion occurs.

The travel demand model provides important information about cross-border traffic and how a new bridge would affect travel on major roads, particularly I-75. But, greater sensitivity is needed to determine the proposed DRIC's effects on local traffic and the operations of I-75. To do this, a microsimulation model, called VISSIM, was used. The VISSIM work is also detailed in the *Traffic Analysis Report, Part 2*.

The VISSIM network includes I-75 from Dearborn Street to its interchange with I-96. VISSIM uses a simplified street network and critical surface streets. Non-freeway roads in the model are located mostly within Delray, in the area bounded by I-75, Dearborn Street, the Detroit River, and West Grand Boulevard (Figure 3-22). The layout of the Gateway Plaza at the Ambassador Bridge, to be completed by 2009, is shown in white in Figure 3-18.

Figure 3-22
VISSIM Model
Detroit River International Crossing Study



Source: Parsons Transportation Group

Volumes on I-75, apart from international traffic, are expected to change little between today and 2035, reflecting the long-term forecasts of population and employment in the region. Likewise, traffic on local roads in Southwest Detroit, and the smaller Delray area, is expected to remain stable.

When focusing on the local road system (all roads except I-75), the only congestion evident today is along Fort Street, which is caused by trucks exiting the Ambassador Bridge from Canada to access I-75 (northbound and southbound) via Clark Street. This condition will be eliminated when the Ambassador Gateway Project is completed in 2009 because direct ramp connections will be provided between the Ambassador Bridge and I-75. The Ambassador Gateway Project will reduce international truck traffic on local streets through the eastern portion of the study area. That project will also provide for greater storage of vehicles on the plaza for outbound traffic to Canada lessening the need for trucks to queue on northbound I-75.

Congestion is measured in terms of Levels of Service (LOS), which are like grades in school – A through F. A is very good; F is failing; D is considered "passing" as it represents the minimum acceptable Level of Service in an urban environment.

What is Level of Service (LOS)?

LOS is a way of measuring congestion based on delay and freedom of movement in a traffic stream.

The VISSIM analysis finds that all intersections on the local roadway system would operate at LOS C or better, with or without the proposed DRIC project in 2035. There is abundant capacity throughout the local road system.

To analyze traffic flow on the interstate highway, the Highway Capacity Manual software was used to ensure that the interstate system will function properly with the proposed DRIC project. For each Build Alternative, mainline I-75 and the ramp merges and diverges in the study area have been found to operate at LOS D or better during the AM, Midday and PM peak hours in 2035 (Figure 3-23 – using Alternative #14 and the afternoon peak hour as an example).

What is the Highway Capacity Manual?

A professional organization, called the Transportation Research Board, sets the standard of analysis to determine highway capacity and Level of Service in a manual it authors.

In the AM peak hour, northbound I-75 would operate at LOS C from Dearborn Avenue to the interchange with I-96, and two segments at LOS D (Dearborn-to-Springwells and Junction-to-Clark). Also, in the AM peak hour, southbound I-75 would operate at LOS A or B, depending on the segment.

In the midday peak hour, both directions of I-75 would operate at LOS A or B.

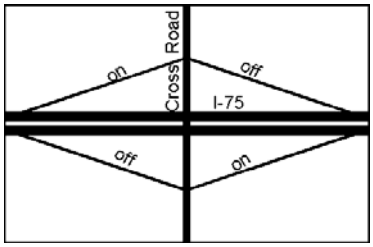
In the PM peak hour, northbound I-75 would operate at LOS A or B, except between Dearborn and Springwells (LOS C). Southbound I-75 would operate at LOS D, with a couple segments operating at LOS C (between the Ambassador Bridge and Grand and from Junction to Livernois).

3.5.3 What Will Happen to Local Traffic?

While freeway and local congestion will not be issues, local access patterns would change with the DRIC alternatives.

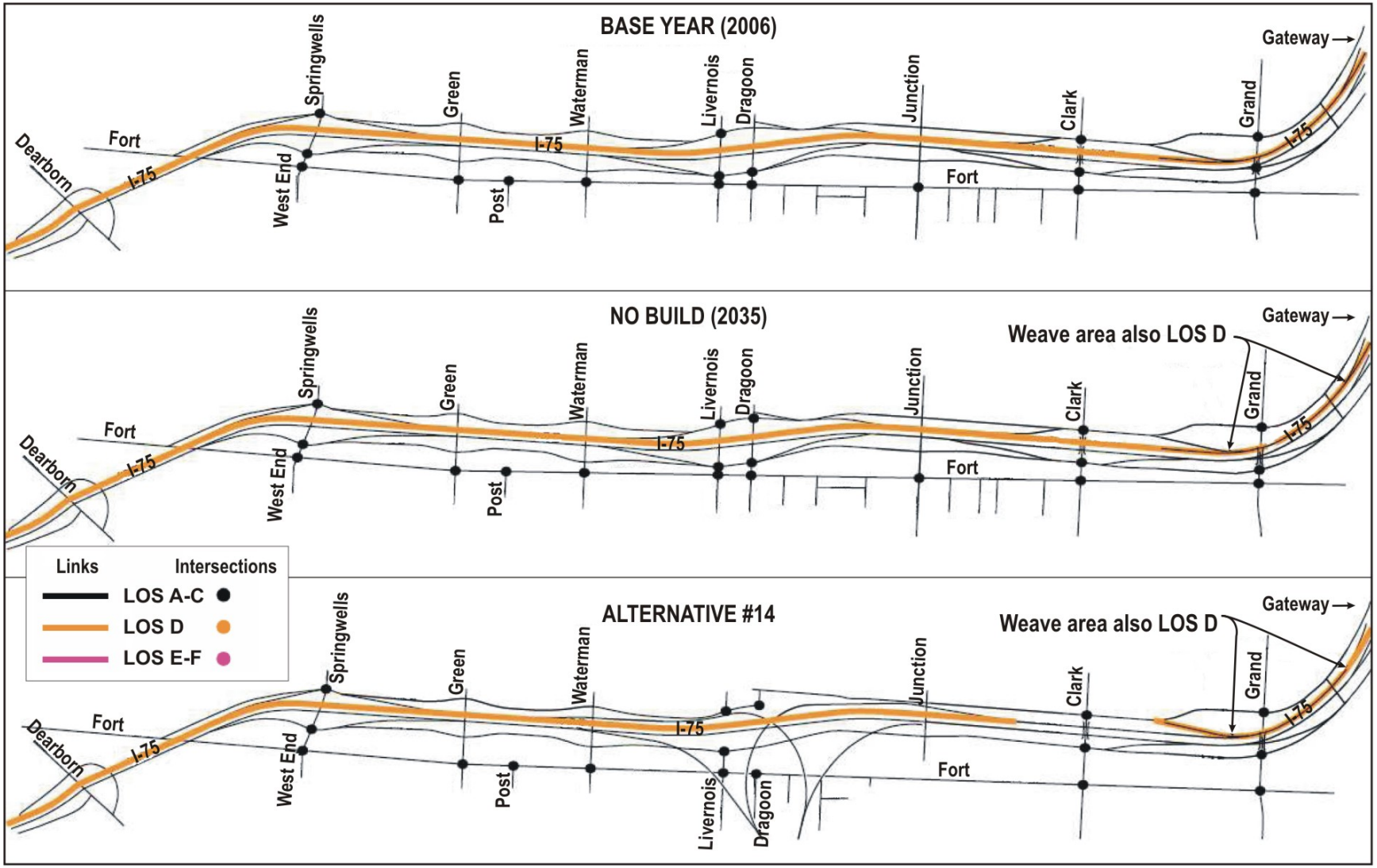
Presently there are diamond interchanges along a two-mile segment of I-75 at Springwells Street, Livernois/Dragoon (operating as a one-way pair) and Clark Street. Generally speaking, urban interchanges are to be spaced at least one mile apart. Adding the proposed DRIC interchange to the three interchanges already along I-75 means something now in place must be removed.

What is a Diamond Interchange?



A diamond interchange has off-ramps that angle slightly away from a freeway and end at a crossroad. On-ramps are usually aligned with the ends of the off-ramps.

Figure 3-23
PM Peak Hour Levels of Service
Using Highway Capacity Manual Analyses
I-75 between Dearborn Avenue and the Ambassador Gateway Project Ramps
Detroit River International Crossing Study



Source: Parsons Transportation Group

Figure 3-24 and Table 3-16 show existing ramps and roads across I-75 and how this pattern would change with each DRIC alternative.

A summary of local access implications is as follows.

All Alternatives – Green Street would remain open and possibly reconfigured as a local boulevard.

Alternatives #1 and #7 – Livernois Street would be made two-way with the elimination of Dragoon Street. Waterman Street and Junction Street would be closed.

Alternatives #2 and #9 – The Livernois/Dragoon one-way pair would be maintained. Waterman Street and Junction Street would be closed.

Alternatives #3 and #11 – I-75 would be realigned. Waterman Street would remain open, but Livernois, Dragoon and Junction would be closed.

Alternative #5 – Livernois, Dragoon and Junction would be closed. The interchange connecting the plaza to I-75 would be shifted closer to Clark Street. Waterman would remain open.

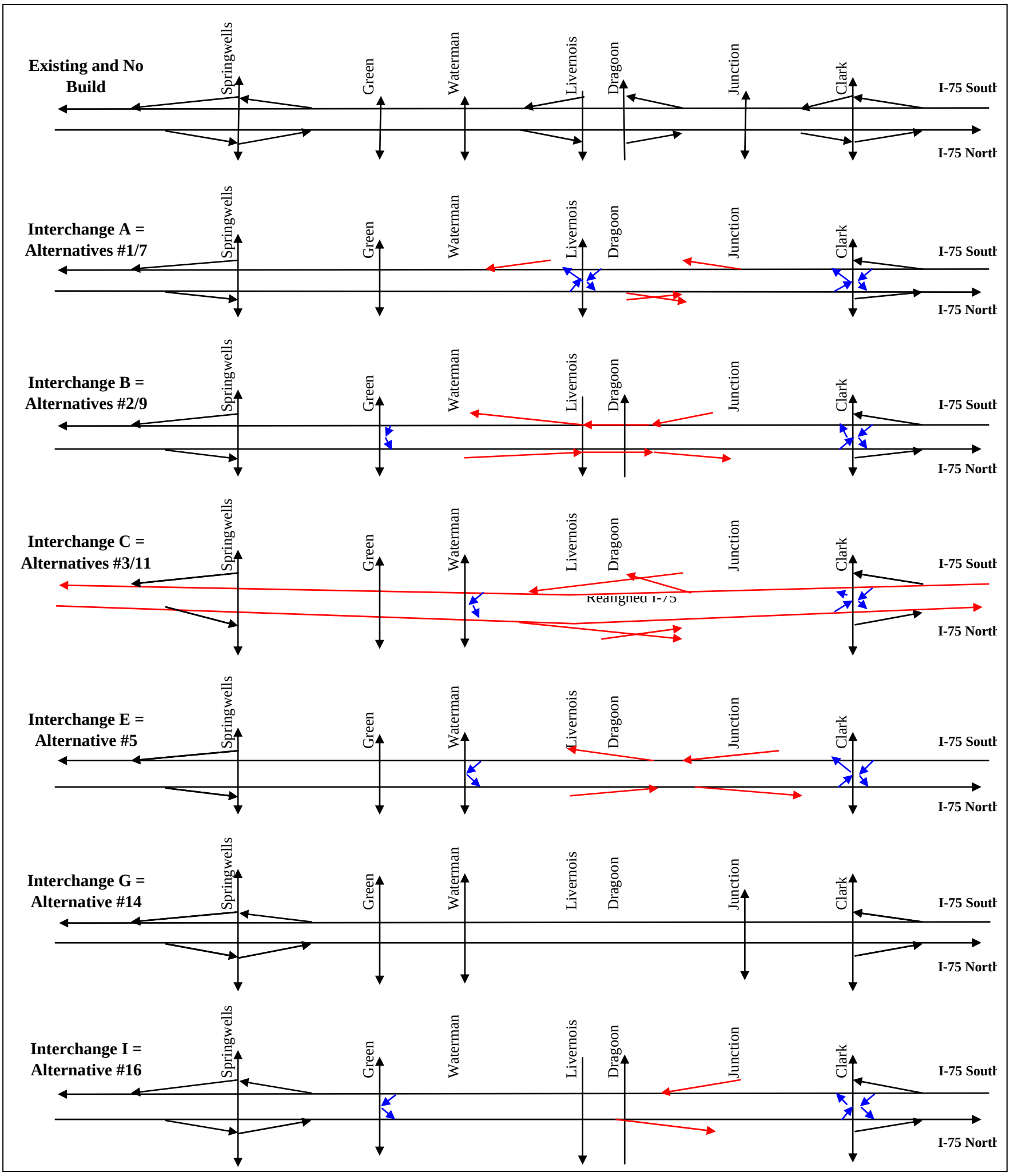
Alternative #14 – All I-75 access would be removed between Springwells and Clark. This is the only alternative that keeps Junction Street open across I-75.

Alternative #16 – A full interchange would be maintained at Springwells Street and a split-diamond interchange at Clark. Livernois and Dragoon would remain open across I-75.

The local community north and south of I-75, will experience both positive and negative effects as a result of the DRIC.

Clark Street now provides access to Maybury Elementary School, Webster Elementary School, Clippert Academy, Earhart Middle School and Western International High School. It also serves Clark Park. Clark Street with the DRIC would likely draw more neighborhood traffic because it will be the only east-side connector to I-75. But, access directly to and from southbound I-75 will be eliminated in all DRIC alternatives but #16. On the other hand, Clark Street will experience a significant reduction of international truck traffic with the completion of the Ambassador Gateway Project.

Figure 3-24
Local Road and Ramp Closures and Additions
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Table 3-16
Local Access Considerations
Detroit River International Crossing Study

Alt.	Interchange	Access Considerations
No Build	Access from SB I-75	Exits to Clark, Dragoon and Springwells would remain open.
	Access to SB I-75	Entrances from Clark, Dragoon and Springwells would remain open.
	Access from NB I-75	Exits to Springwells, Livernois and Clark would remain open.
	Access to NB I-75	Entrances from Springwells, Livernois and Clark would remain open.
#1/#7	Interchange A	
	Access from SB I-75	Springwells exit would be closed. Traffic would exit at Dragoon and use the Service Drive.
	Access to SB I-75	Clark entrance would be closed. Traffic would use the Service Drive to get on at Livernois.
	Access from NB I-75	Exits to Livernois and Clark would be closed. Traffic would exit near Dragoon and turn at Clark to go north.
	Access to NB I-75	Springwells entrance would be closed. Traffic would then proceed to Dragoon area on-ramp.
#2/#9	Interchange B	
	Access from SB I-75	Off ramp to Dragoon would be shifted past Livernois, so traffic would get off earlier at Clark. Springwells exit would be closed so traffic would exit earlier at new Livernois area exit.
	Access to SB I-75	Clark entrance would be closed. Traffic would use the Service Drive to get on near Junction.
	Access from NB I-75	Livernois exit would be shifted to past Dragoon so traffic would exit at Springwells and use the Service Drive. Clark exit would be closed so traffic would exit early past Dragoon.
	Access to NB I-75	Springwells entrance would be closed. Traffic would proceed to Waterman area on-ramp. Dragoon entrance would be closed. Traffic would proceed to Clark on-ramp.
#3/#11	Interchange C	
	Access from SB I-75	Springwells exit would be closed. Traffic would exit early at Dragoon and use the Service Drive.
	Access to SB I-75	Clark entrance would be closed. Traffic would use the Service Drive to get on near Junction.
	Access from NB I-75	Livernois exit would be shifted to past Dragoon so traffic would exit at Springwells and use the Service Drive. Clark exit would be closed so traffic would exit early past Dragoon.
	Access to NB I-75	Springwells entrance would be closed. Traffic would proceed to Dragoon on-ramp.
#5	Interchange E	
	Access from SB I-75	Clark and Springwells exits would be closed. Traffic would exit at Dragoon and use the Service Drive and double back to Clark area, if that is the destination.
	Access to SB I-75	Clark entrance would be closed. Traffic would use the Service Drive to get on at Junction. Livernois entrance would be closed. Traffic would use the Service Drive to Springwells entrance.
	Access from NB I-75	Livernois exit would be shifted to Junction area so traffic would exit at Springwells and use the Service Drive. Clark exit would be closed so traffic would exit early.
	Access to NB I-75	Clark entrance would be closed so traffic would take circuitous route to Livernois area entrance due to road closures across I-75.
#14	Interchange G	
	Access from SB I-75	Livernois exit would be closed. Traffic would exit at Clark and use the Service Drive.
	Access to SB I-75	Springwells would remain as the only entrance, so traffic would use the Service Drive to get there.
	Access from NB I-75	Springwells would remain as the only exit, so traffic would use the Service Drive to destinations now served by Livernois and Clark exits.
	Access to NB I-75	Dragoon entrance would be closed, so traffic would use the Service Drive and Clark entrance.
#16	Interchange I	
	Access from SB I-75	Dragoon exit would be closed. Traffic would exit at Clark and use the Service Drive.
	Access to SB I-75	Clark entrance would be closed. Traffic would use the Service Drive to get on near Junction.
	Access from NB I-75	Livernois exit would be shifted to past Dragoon so traffic would exit at Springwells. Clark exit would be closed so traffic would exit early past Dragoon.
	Access to NB I-75	Dragoon entrance would be closed, so traffic would use the Service Drive and Clark entrance.

Source: The Corradino Group of Michigan, Inc.

Junction Street now borders a dense residential area with significant investment in refurbished homes. Holy Redeemer Elementary School and Church are located at Junction and Vernor (about ten blocks north of I-75). Access across I-75 would be eliminated with all DRIC alternatives but one (Alternative #14). Access to northbound I-75 would remain by way of Clark Street. Southbound access would be via the I-75 service drive. In some alternatives, motorists would be required to travel more than a mile to Springwells Street to gain access to southbound I-75.

Livernois and Dragoon now border dense residential uses (much of it near I-75 is in poorer condition than farther north). They also provide direct access to the Livernois-Junction Yard Intermodal (truck/rail) terminal north of Vernor. Reduction of truck traffic on these two streets has long been an issue of the community north of I-75. For all DRIC alternatives, the Livernois/Dragoon interchange with I-75 would be eliminated. Traffic to the Livernois-Junction Yard would mainly use I-94 to exit at Wyoming Avenue on the west side of the terminal or Livernois Avenue/north on the east side of the terminal. For Build Alternatives #3, #5, #11 and #14, both Livernois and Dragoon would not cross I-75 as they do today. This would cause traffic to be redirected to as far east as Clark Street or as far west as Green to cross I-75.

What does Intermodal Mean?

Intermodal means a transportation system using different modes of transportation, commonly containers. At the Livernois-Junction Yard containers are moved between trucks and rail cars.

Waterman is another street that serves dense residential development. It also provides a direct connection to the CSX entry gate of the Livernois-Junction Yard. The community objects to this gate because it causes heavy trucks to use a narrow residential street. The Detroit Intermodal Freight Terminal Project, if implemented, will close that gate. Access across I-75 via Waterman would be eliminated by Build Alternatives #1, #2, #7, #9 and #16. These alternatives would cause travel over I-75 to be redirected to Green, immediately to the west.

Green carries less traffic than any other of the crossings of I-75 in the area (fewer than 100 vehicles per hour). It would remain open under all alternatives and traffic diverted by other alternatives could use it. However, traffic volumes would remain low.

Springwells now borders commercial uses for several blocks north of I-75, then it passes through a mix of commercial and residential uses as it meets the Vernor Avenue commercial corridor. As with Livernois and Dragoon, the community along Springwells has long requested the reduction of truck traffic in this area. This would likely occur as all DRIC alternatives, except #14 and #16, would eliminate direct I-75 access to and from the north. Trucks serving the commercial properties would need to find other routes.

3.5.4 How Will Traffic Work During Construction?

Traffic during construction will be guided by the "Maintenance of Traffic" (MOT) plan prepared for the project during its design. The MOT plan considers how construction will be sequenced to ensure safe and convenient travel during construction.

The DRIC project would involve several kinds of construction – plaza, interchange, roads and the bridge across the Detroit River. The new bridge over the Detroit River would be constructed from staging areas on vacant land near the river. There would be no work done from the river. Much of the building material for the bridge would be delivered by water to docks such as McCoig, the Port of Detroit or Renaissance Logistics. The bridge over the Detroit River would continue over Jefferson Avenue to the plaza for both the X-10 and X-11 crossings. Temporary detours would be enforced on some streets during construction.

Plaza construction involves substantial clearing activity. Haul trucks would be assigned specific routes to/from I-75 to bring material and remove debris. Local roads within the plaza area would be permanently closed, including Livernois Avenue and Dragoon Street.

Each DRIC alternative would require individual bridges to connect the plaza by four ramps to/from I-75. These will span Fort Street. Temporary detours may be required as these bridges over Fort Street are built.

The most complex roadway construction involves building the ramps over I-75 and connecting them into the freeway. It is likely that two lanes of traffic would be maintained on I-75 during construction.

3.5.5 Summary of Vehicular Traffic Impacts

No Build Alternative

The No Build Alternative would not meet the project's purpose and need because an alternative facility would not be provided for national and economic security. The additional capacity needed to meet cross border travel demand would not be provided.

Build Alternatives

The Build Alternatives would meet the project's purpose and need.

Travel demand modeling shows a new bridge would cause travel shifts over a broad area, including drawing traffic from the Blue Water Bridge at Port Huron/Sarnia. Its greatest effect would be on Ambassador Bridge traffic.

Considering the Ambassador Bridge together with a new bridge, a proposed DRIC crossing could carry as much as 80 percent of the truck traffic and 60 percent of all traffic in the 2035 afternoon peak hour.

Within the SEMCOG region, the proposed Build Alternatives would be associated with an overall increase of about two percent in VMT as more traffic is attracted to the region. On the other hand, regional VHT would decline faster than VMT would increase – by a 3:1 ratio. So, introducing a new river crossing would reduce regional congestion. More practically speaking, under No Build conditions the average speed of international traffic on the regional network in the 2035 PM peak hour would be 34.5 mph. With every Build Alternative, the average speed would be closer to 38 mph.

The microsimulation modeling did not reveal any substantial capacity issues on DRIC study area roadways compared to No Build conditions. This is logical because non-international traffic in the Southwest Detroit area is forecast to grow minimally and international traffic is a relatively small addition to traffic on the regional roadways.

Local access would change with the project. A number of streets that now cross I-75 would be permanently closed. Access to and from I-75 would also change, affecting both residents and businesses. Alternative #14 would provide the least freeway access and Alternative #16 the most.

Coordination occurred with SEMCOG regarding its Congestion Management Process. No issues were raised at this Practical Alternatives level, as SEMCOG recognizes the I-75 and the local road system will operate at an acceptable Level of Service. Inclusion on the Regional Transportation Plan requires an air quality transportation conformity review. SEMCOG will make model network changes for conformity purposes in coordination with the MDOT modeling process. At this time there will likewise be a more detailed review on SEMCOG's part with respect to congestion management.

3.5.6 How Will Pedestrians, Bicyclists and Transit Users be Affected?

All bridges for motorized traffic that remain over I-75 (or that are rebuilt) would have sidewalks to accommodate pedestrians and bicyclists. Replacement pedestrian/bicycle-only bridges would be constructed in those locations where they would not conflict with the proposed ramps to and from I-75. All replacement facilities would meet Americans with Disabilities Act guidelines. Transit routes would only need small modifications, if any, to continue service to the study area community.

Most streets in Delray have sidewalks, although the sidewalk and street pavements are often in poor condition. There is pedestrian and bicycle activity especially in West Delray where the population is concentrated.

What is the Americans with Disabilities Act (ADA) Supposed to do?

It is intended to make America more accessible to people with disabilities. To do so, guidelines are provided on buildings, sidewalks, street crossings, and the like. Curb cuts for wheelchairs and limits to how steep sidewalks can be are two examples.

When I-75 was built as a depressed freeway along the edge of Delray, pedestrian bridges were built midway between the streets crossing I-75. Due to the low rate of auto ownership in the area, pedestrian (and bicycle) traffic continues across I-75, even with Delray's reduced population. While the study area's population is mostly north of I-75, Southwestern High School and the main bus lines serving Delray are on Fort Street south of I-75.

Table 3-17 and Figure 3-25 show seven streets crossing I-75. All have sidewalks on both sides. The five pedestrian/bicycle-only bridges over I-75 do not cross the service drives, except for the north end of the Cavalry Street bridge. This means pedestrians/bicyclists have to wait for a gap in traffic to cross the service drives.

Counts of pedestrians and bicyclists using these I-75 crossings were conducted over two-hour periods at the beginning and end of the school day, the most-active periods for at least seven days. The results show pedestrian and bicycle use of all bridges except Solvay. The latter condition is logical as the Produce Terminal blocks access to points past Fort Street for those who would use the Solvay pedestrian bridge.

The last column of Table 3-17 shows how far pedestrians/bicyclists would have to go to get across I-75 when bridges are closed. Alternatives #3 and #5 would cause the greatest increase in distance and Alternative #14 the least.

Alternative #14 would close the fewest (two of five) pedestrian/bicycle crossings of I-75. Alternatives #1, #2, #7, #9 and #16 would close four of five (Table 3-17).

Table 3-17
Pedestrian Crossings, Use and Impacts
Detroit River International Crossing Study

Pedestrian Access Across I-75 at:	Characteristics of Crossing	Use During Two-hour AM and PM Periods	Build Alternatives that would Close the Crossing and Added Travel Distance
Springwells Avenue	Sidewalks along east and west sides of Springwells with crosswalks at signalized service drives.	AM - 23 pedestrians/two bicyclists PM - 31 pedestrians/four bicyclists	None
Solvay Pedestrian Bridge between Springwells and Green	Unsignalized crosswalks at Solvay Street across service drives.	AM - No activity PM - No activity	None
Green Street	Sidewalks along east and west sides of Green with crosswalks at stop-sign-controlled service drives.	AM - 31 pedestrians/one bicyclist PM - 20 pedestrians/one bicyclist	None
Beard Pedestrian Bridge between Green and Waterman	Unsignalized crosswalks at Beard Street across service drives.	AM - 10 pedestrians/no bicyclists PM - 34 pedestrians/three bicyclists	Alts #1, 2, 7, 9, 16 1,700' via Green
Waterman Street	Sidewalks along east and west sides of Waterman with crosswalks at stop-sign-controlled service drives.	AM - 33 pedestrians/one bicyclist PM - 32 pedestrians/five bicyclists	Alts #1, 2, 7, 9, 16 2,700' via Green
Casgrain Pedestrian Bridge between Waterman and Livernois	Unsignalized crosswalks at Casgrain Street across service drives.	AM - 5 pedestrians/one bicyclist PM - 8 pedestrians/no bicyclists	All alternatives 1,800' via Livernois for #1, 2, 7, 9, 16 1,200' via Waterman for #3, 5, 11, 14
Livernois Avenue	Sidewalks along east and west sides of Livernois with crosswalks at signalized service drives.	AM - 10 pedestrians/no bicyclists PM - 33 pedestrians/one bicyclist	Alts #3, 5, 11, 14 3,000' via Waterman for Alts #3, 5, 11, 14
Dragoon Street	Sidewalks along east and west sides of Dragoon with crosswalks at signalized service drives.	AM - 22 pedestrians/three bicyclists PM - 33 pedestrians/15 bicyclists	Alts #1, 3, 5, 7, 11, 14 700' via Livernois for Alt #1, 7 3,700' via Waterman for Alts #3, 5, 11 3,700' via Junction for Alt #14
Cavalry Pedestrian Bridge between Dragoon and Junction	Unsignalized crosswalks at Cavalry Street across northbound service drive. Southbound service drive and I-75 exit to Dragoon are crossed by pedestrian bridge.	AM -7 pedestrians/one bicyclist PM -9 pedestrians/three bicyclists	All alternatives 2,400' via Livernois for Alt #1, 7 1,500' via Dragoon for Alts. #2, 9, 16 5,400' via Waterman for Alts #3, 5, 11 2,300' via Junction for Alt #14
Junction Street	Sidewalks along east and west sides of Junction with crosswalks at stop-sign-controlled service drives.	AM - 19 pedestrians/two bicyclists PM - 15 pedestrians/nine bicyclists	Alts #1, 2, 3, 5, 7, 9, 11, 16 3,800' via Clark for Alts #1, 2, 3, 5 & 16
Ferdinand Pedestrian Bridge between Junction and Clark	Unsignalized crosswalks at Ferdinand Street across service drives.	AM - No activity PM -3 pedestrians/no bicyclists	Alts #1, 2, 3, 5, 7, 9, 11, 16 2,400' via Clark for Alts #1, 2, 3, 5, 7, 9, 11, 16
Clark Street	Sidewalks along east and west sides of Clark Street with crosswalks at signalized service drives.	AM - 18 pedestrians/no bicyclists PM - 15 pedestrians/three bicyclists	None

Bridge only for non-motorized travelers.

Source: The Corradino Group of Michigan, Inc.

Figure 3-25
Pedestrian Crossings
Detroit River International Crossing Study

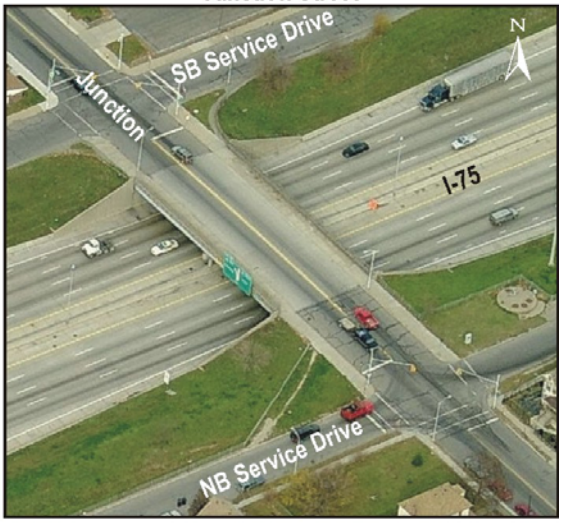
Source: The Corradino Group of Michigan, Inc.

Figure 3-25 (continued)
Pedestrian Crossings
Detroit River International Crossing Study

Livernois Avenue and Dragoon Street

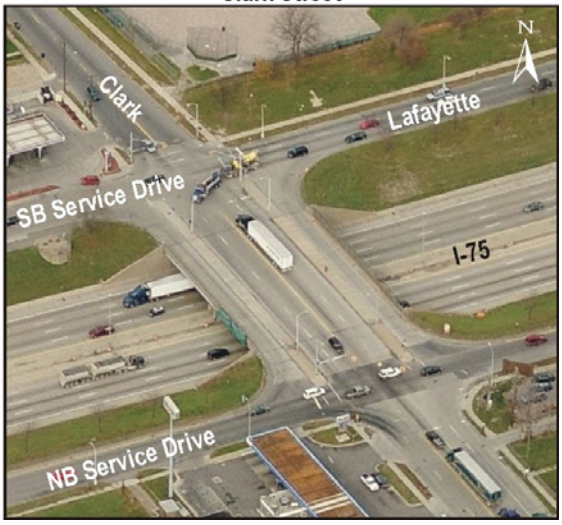
Cavalry Street

Junction Street



Ferdinand Street

Clark Street



Source: The Corradino Group of Michigan, Inc.

The size of the proposed DRIC plaza would limit north-south pedestrian flow through the Delray area. Land use planning associated with the DRIC calls for a "Gateway Boulevard" that would provide for an enhanced north-south pedestrian linkage west of the plaza (refer to Figure 3-17B). Access to Fort Wayne would be enhanced along Campbell and/or Junction Streets, depending on the final DRIC alternative selected.

The Rouge River Gateway Master Plan Trail shown on Figure 3-26 follows Jefferson Avenue through the area with a spur into Fort Wayne. The proposed West Riverfront Walkway would approach Delray from the east. Those walkways would be continued with every DRIC alternative.

What is the Rouge River Gateway?

It is a public-private partnership working to establish a greenway system along the Rouge River extending to the Detroit River.

What is West Riverfront Walkway?

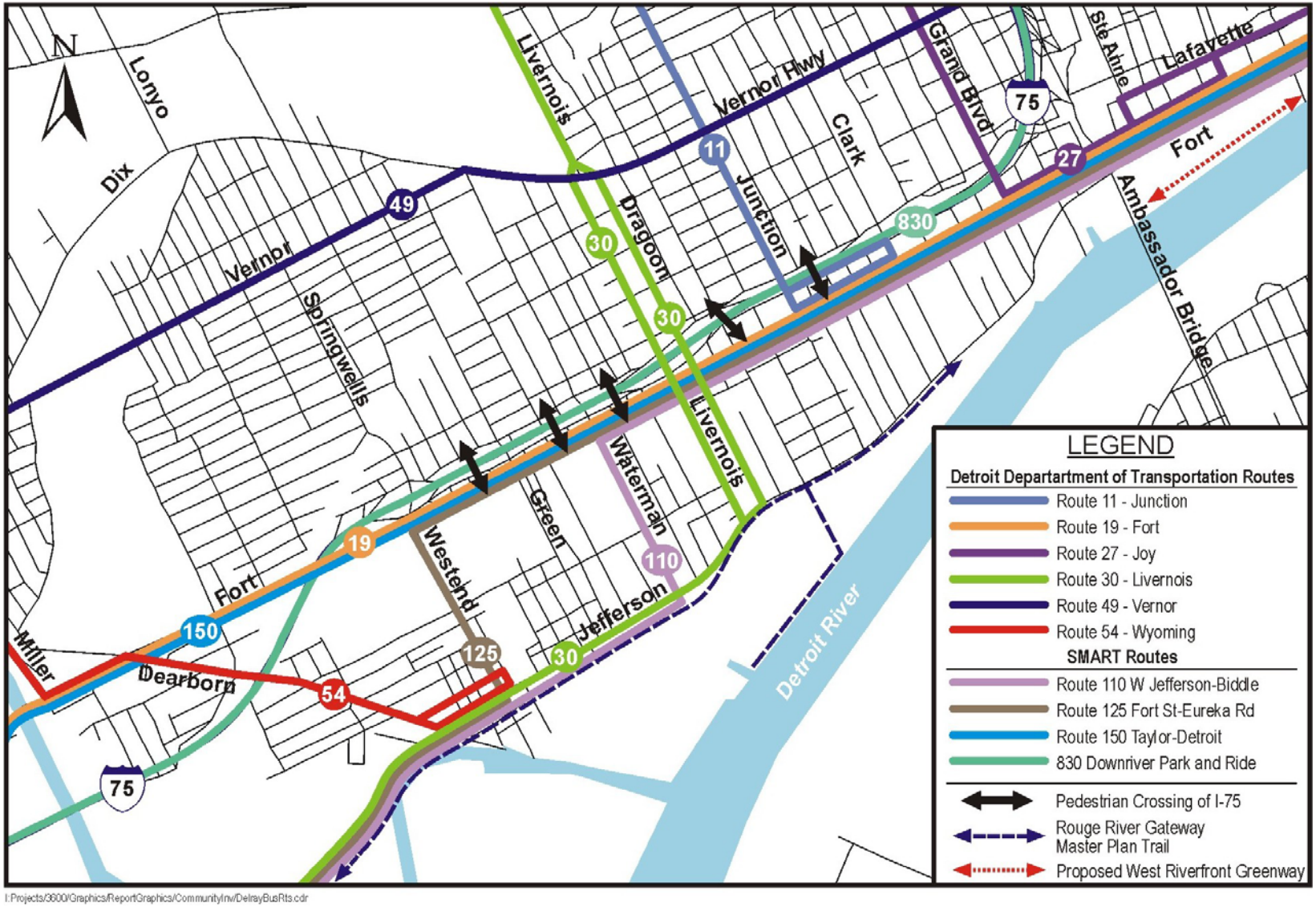
Congress has provided funding to the Detroit Riverfront Conservancy for a riverfront walkway that extends from downtown to the Ambassador Bridge as part of a larger plan.

As noted earlier, only about 70 percent of housing units in Delray reported having access to an automobile in the 2000 Census. This means more people than usual in the SEMCOG region need bus service for motorized transportation (refer to Table 3-6A).

Transit service is provided by the Detroit Department of Transportation (DDOT) on bus routes: 11, 19, 27, 30, 49 and 54 (Figure 3-26). The DDOT routes run throughout the day with the time between buses at 30-40 minutes. The Suburban Mobility Authority for Regional Transportation (SMART) bus routes that serve the area are: 110, 125, 150 and 830 (express). The SMART routes provide peak hour service to jobs, especially in downtown Detroit.

For those DRIC alternatives that eliminate Junction Street from crossing I-75 (all but Alternative #14), DDOT Route 11/Junction could be rerouted via Vernor and Clark to a turnaround south of Fort. This would allow transfers to the Fort Street routes. DDOT Route 30/Livernois and SMART Route 110 would be rerouted around the plaza. Final resolution of any reroutings will have to be agreed upon by DDOT and SMART once a Preferred Alternative is chosen.

Figure 3-26
Bus Routes and Pedestrian Links
Detroit River International Crossing Study



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Source: The Corradino Group of Michigan, Inc., Hamilton Anderson Associates

3.5.6.1 Summary of Impacts on Non-motorized Transportation and Bus Service

No Build Alternative

The No Build Alternative would not affect current pedestrian or bicycle routes or bus service.

Build Alternatives

All streets that remain over I-75 would have sidewalks. Replacement pedestrian/bicycle bridges would be constructed where they would not conflict with the ramps of the proposed DRIC alternatives. The Solvay pedestrian/bicycle bridge may not be replaced because it is not used. Options will be examined during the project design phase to determine which mid-block locations would warrant replacement bridges and whether such bridges could meet design criteria. At this point Alternatives #3 and #5 would cause the greatest increase in walking/riding distances when bridges are closed and Alternative #14 the least. Any replacement facilities will meet Americans with Disabilities Act guidelines to ensure persons with disabilities are provided access.

For those DRIC alternatives that eliminate Junction Street from crossing I-75 (all but Alternative #14), DDOT Route 11/Junction could be rerouted via Vernor and Clark to a turnaround south of Fort. This would allow transfers to the Fort Street routes. DDOT Route 30/Livernois and SMART Route 110 would be rerouted around the plaza on a path yet to be determined. Final resolution of any reroutings will have to be agreed upon by DDOT and SMART once a Preferred Alternative is chosen.

3.6 Air Quality

The purpose of the air quality analysis is to determine if the project conforms to Michigan's State Implementation Plan (SIP). That document contains the regulations and other materials for meeting clean air standards and associated federal Clean Air Act requirements. This section summarizes information included in the *Air Quality Impact Analysis Technical Report*.[10]

[10] The Corradino Group, *Detroit River International Crossing Study Air Quality Analysis Technical Report*, February 2008.

3.6.1 Analysis Approach

The DRIC air quality analysis followed current guidance from FHWA and MDOT. Also consulted were SEMCOG, the U.S. Environmental Protection Agency (EPA) Region 5, and the Michigan Department of Environmental Quality (MDEQ). Consultation resulted in the *DRIC Air Quality Analysis Protocol*,[11] which provided a framework for the analysis. It called for:

1. An explanation of recent steps to improve air quality and past and future trend data;
2. A comparative analysis of the air quality effects of the Practical Alternatives in the DEIS, consistent with the National Environmental Policy Act;
3. A quantitative analysis of Mobile Source Air Toxics (MSATs);
4. A discussion of the SEMCOG region's attainment status and conformity with respect to air quality standards:
   - General conformity (as applicable); and,
   - Transportation conformity. Project-level conformity determinations must meet several criteria (see 40 CFR 93.109(b)), including:
     - Regional analysis: ozone, carbon monoxide (CO), and particulate matter ($PM_{2.5}$ and PM_{10})[12] as demonstrated by the project coming from a currently conforming transportation plan and Transportation Improvement Program (TIP); and,
     - Hot-spot analysis:
       - ✓ CO (quantitative)
       - ✓ $PM_{2.5}$ (qualitative)
       - ✓ PM_{10} (qualitative)
5. Construction impacts.

What is Transportation Conformity?

Transportation conformity is required to ensure that federal funding and approval are given to projects that are consistent with ("conform to") the air quality goals established by a state air quality implementation plan (SIP), so they will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards.

What is a TIP?

A Transportation Improvement Program lists the transportation projects to be built in the next four years.

[11] The Corradino Group, *Detroit River International Crossing Study Air Quality Protocol*, May 31, 2007.

[12] $PM_{2.5}$ refers to particulate matter that is 2.5 micrometers or smaller in size. Sources of $PM_{2.5}$ include fuel combustion from automobiles, power plants, wood burning, industrial processes, and diesel-powered vehicles such as buses and trucks. These fine particles are also formed in the atmosphere when gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds (all of which are also products of fuel combustion) are transformed in the air by chemical reactions. Fine particles are of concern because they are so small they are able to penetrate to the deepest parts of the lungs, where the body has difficulty expelling them. PM_{10} refers to particulate matter that is up to 10 micrometers in size and includes roadway dust.

3.6.2 NAAQS, Recent EPA Actions and Pollutant Trends

This section presents information about air quality trends in National Ambient Air Quality Standards (NAAQS) for pollutants which are presented below (Table 3-18).

Table 3-18
National Ambient Air Quality Standards
Detroit River International Crossing Study

Pollutants	Averaging Time	Primary Standard [a]	Secondary Standard [b]
Carbon Monoxide	1-hr	35 ppm (40mg/m^3)	No Secondary Standard
	8-hr	9 ppm (10mg/m^3)	No Secondary Standard
Lead	Quarter	1.5 µg/m^3	Same as Primary
Nitrogen Dioxide	Annual	0.053 ppm (100µg /m^3)	Same as Primary
Ozone	1-hr	0.12 ppm (235µg/m^3)	Same as Primary
	8-hr	0.08 ppm (157µg/m^3)	Same as Primary
Respirable Particulate Matter (10 microns or less) (PM_{10})	24-hr	150 µg/m^3	Same as Primary
	Annual	Revoked[c]	Same as Primary
Respirable Particulate Matter (2.5 microns or less) ($PM_{2.5}$)	24-hr	35 µg/m^3 [d]	Same as Primary
	Annual	15.0 µg/m^3	Same as Primary
Sulfur Dioxide	3-hr	–	0.5 ppm (1300µg/m^3)
	24-hr	0.14 ppm (365µg/ m^3)	–
	Annual	0.03 ppm (235µg/ m^3)	–

Note: ppm is parts per million; mg is milligrams (thousandths of a gram); µg is micrograms (millionths of a gram).
[a] Primary NAAQS: the levels of air quality that the EPA judges necessary, with an adequate margin of safety, to protect the public health.
[b] Secondary NAAQS: the levels of air quality that the EPA judges necessary to protect the public welfare from any known or anticipated adverse effects.
[c] Due to lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM_{10} standard effective December 17, 2006.
[d] EPA reduced the 24-hour standard from 65 to 35 µg/m^3 effective December 17, 2006. However, project conformity must be measured against the 65 µg/m^3 standard that was in effect when the non-attainment designation was made.

Source: Code of Federal Regulations, Title 40, Part 50.

The EPA is required by the Clean Air Act to set standards for the criteria pollutants which are listed in the NAAQS. The EPA designates non-attainment and maintenance areas that do not meet the NAAQS. The DRIC project area is in non-attainment for 8-hour ozone and $PM_{2.5}$. It is in maintenance for CO and PM_{10}.

Carbon monoxide (CO): CO is a colorless and odorless gas, which is the product of incomplete combustion. It is the major pollutant from gasoline-fueled motor vehicles. It interferes with oxygen delivery to the body's organs and tissues, particularly affecting those with heart and respiratory diseases. CO emissions are greatest from engines

operating at low speeds and prior to warming up (within eight minutes of starting). Congested urban intersections tend to have the highest concentrations of CO.

Ozone (O_3): In the upper atmosphere, ozone protects life from the harmful effects of ultraviolet radiation (the "ozone layer"). Near the ground, it is an irritant to those with lung and respiratory problems, such as asthma. Ozone forms when tailpipe emissions and pollutants from industrial sources mix in the atmosphere in the presence of sunlight. Precursors (building blocks) that lead to ozone formation are: NO_x and volatile organic compounds (VOCs). The term VOC encompasses thousands of compounds, including petroleum constituents, industrial thinners, solvents and similar materials. Ozone precursors can be transported by wind for long distances from where they are emitted. Ozone is more a regional concern than a local issue.

What is NOx? Where does It Come From?

Nitrogen oxides, or NOx, are reactive gases containing nitrogen and oxygen formed when fuel is burned at high temperatures. Ozone forms when NOx and volatile organic compounds (VOCs) react in the presence of heat and sunlight.

What are VOCs?

Volatile organic compounds (VOCs) are gases that evaporate readily from certain solids or liquids. VOCs include thousands of chemicals. Some have adverse health effects.

Particulate Matter (PM_{10} and $PM_{2.5}$): Particulate matter (PM) is the term for solid or liquid particles suspended in the air. Some particles are large and/or dark enough to be seen as soot or smoke. Fine particulate matter is not visible to the naked eye. Two types of PM are of concern: PM_{10} (ten microns or smaller) and $PM_{2.5}$ (2.5 microns or smaller). PM_{10} is typified by windblown dust from fields and unpaved roads. $PM_{2.5}$ covers finer particles generally emitted from combustion, including vehicle exhaust. $PM_{2.5}$ is a health concern because it can reach the deepest part of the lungs. Prolonged exposures may impair pulmonary function and could produce symptoms such as coughing, phlegm, and chronic bronchitis.

3.6.2.1 EPA Measures to Improve Air Quality and Air Quality Trends

EPA has issued many motor vehicle and fuel regulations, including:

1) Tailpipe emission standards for cars, SUVs, mini-vans, pickup trucks and heavy trucks and buses;
2) Standards for cleaner-burning gasoline;
3) A national low-emission vehicle program; and,
4) Standards for low-sulfur gasoline and ultra-low sulfur diesel fuel.

The seven-county SEMCOG region, plus Lenawee County, is subject to 7.0 low-vapor-pressure gasoline (which doesn't evaporate as quickly as gasoline with a higher vapor pressure) to help control ozone formation. This became effective in the summer of 2007. This fuel is expected to substantially reduce emissions.

EPA issued a regulation in May 2004 to control emissions from diesel-powered, non-road engines, such as construction equipment and railroad locomotives. EPA also provides assistance in identifying and implementing voluntary programs, such as diesel retrofits, to achieve additional reductions.

What is MOBILE6.2?

MOBILE6.2 is the most recent version of an EPA-approved computer model. It calculates how much air pollution comes from vehicles. The model's emission factors vary by vehicle type (car, truck, etc.), year of manufacture, speed, and a number of other technical considerations.

The EPA-approved MOBILE6.2 computer model incorporates future emission factors for the NAAQS pollutants associated with cars and trucks, i.e., mobile sources. The model accounts for the recent EPA regulatory changes noted above. Emission factors vary by speed and type of vehicle. By focusing on representative vehicle types and speeds, future emission factors can be related to trends over time to the year of project opening of 2013 and the horizon year 2030. SEMCOG's *Regional Transportation Plan* currently extends to 2030. SEMCOG will perform the conformity analysis for the DRIC project. Therefore, data for 2030 are discussed in the air quality analysis.

Figure 3-27 depicts trends for the following example conditions (using SEMCOG-based data assumptions):

- Passenger vehicles and NAAQS pollutants at 30 and 50 mph; and,
- Trucks and NAAQS pollutants at 30 and 50 mph.

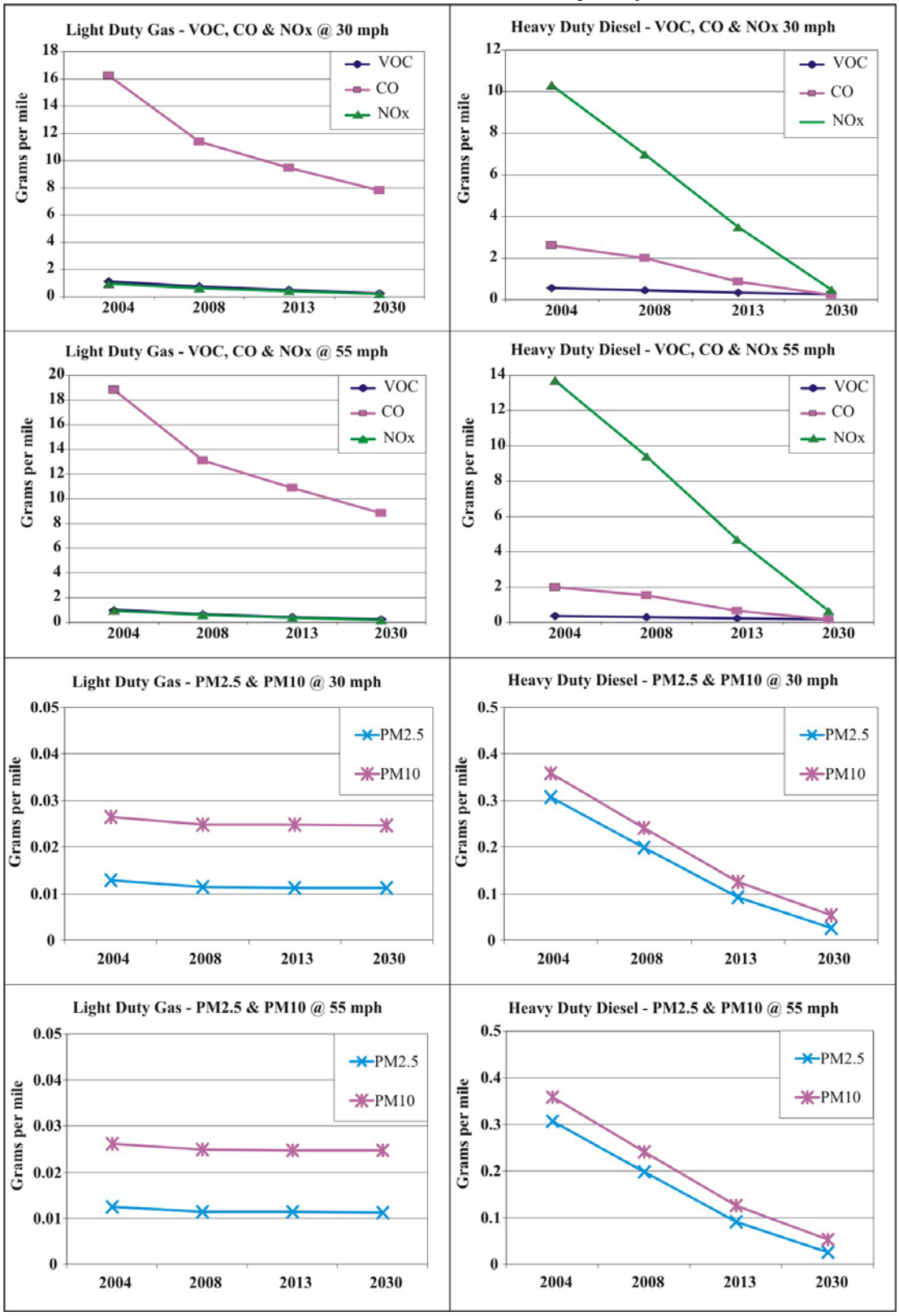
Substantial emission factor reductions are shown for passenger vehicles and trucks. A positive influence on emission factor trends is that the future vehicle mix will include an increasing proportion of very-low-polluting vehicles, such as hybrids. This appears more likely in light of the April 2, 2007, Supreme Court ruling that EPA can regulate CO_2 as an air pollutant and action on the part of the U.S. Congress to raise mileage standards. These are expected to influence the move away from hydrocarbon-based fuels. The MOBILE6.2 emission factors used here are conservative in that they continue to assume a contemporary fleet mix.

3.6.2.2 Monitoring Station Data – CO, NO_2, O_3, and $PM_{2.5}$

Air pollution is recorded at permanent monitoring stations throughout Southeast Michigan. Different pollutants are measured at different locations. Monitoring stations nearest to the project for CO, NO_2, and O_3 are:

- West Lafayette (Station 26-163-0039 at 2000 West Lafayette) – CO; and,
- Linwood (Station 26-163-0016 at 6050 Linwood) – CO, NO_2, and O_3.

Figure 3-27
MOBILE6.2 Emission Factor Trends
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc. using MOBILE6.2 with SEMCOG inputs.

The trend in CO is clearly down at West Lafayette and Linwood and has been for some time. Recorded values are well under the one- and eight-hour standards.

The measurement of NO_2 at the Linwood monitor has been about half the annual standard for years. The trend continues downward.

The eight-hour ozone standard is now in effect. Eight-hour average values have been flat over the last several years and very near the standard. This is true at Linwood, the ozone monitor closest to the project, and the other monitors in the region. Attainment is based on a three-year average of the 4th highest measurements.

Where are the Nearest Monitors that Measure Air Pollution?

$PM_{2.5}$ is measured at:

- Wyoming Avenue (Station 26-163-0032 at 2842 Wyoming Avenue);
- Fort Street (Station 26-163-0015 at 6921 West Fort Street); and,
- West Lafayette (Station 26-163-0039 at 2000 West Lafayette).

The trend in $PM_{2.5}$, both in terms of the 24-hour and annual measurements, is slightly down, but still above standards. The discussion of $PM_{2.5}$ is in Section 3.6.4.1.

3.6.3 Air Quality Analysis Findings

The air quality analysis was guided by an Air Quality Protocol (see www.borderpartnershipstudy.com) established by interagency consultation among FHWA, MDOT, EPA, MDEQ and SEMCOG. Alternatives are compared, information is presented on Mobile Source Air Toxics, and conformity with the Clean Air Act is analyzed.

3.6.3.1 General Air Quality Conditions

Examining each alternative's VMT and VHT offers a way of comparing how much air pollution is produced by each alternative. Because of their similarity of design, in terms of their crossing, plaza, and connections to I-75, Alternatives #1, #2, #3, #14 and #16 are analyzed as a single set of alternatives. Similarities among Alternatives #7, #9 and #11 combine them into a single set. Reference is made to Section 3.5 for more detail

on these groupings. The Air Quality Protocol calls for an examination of peak and off-peak conditions, therefore, data from the travel demand model for the midday hour and the PM peak hour are presented (Table 3-19). These data, unlike those in the traffic section are for 2013, the year projected to have the most pollution before all the benefits of EPA's regulations have their full effect. Calculations for 2035 are included in the *Air Quality Analysis Technical Report* and show a similar pattern but there would be substantially less pollution as the EPA regulations take full effect.

1. While a shift in traffic from the Blue Water Bridge to the Detroit-Windsor crossing area is expected, there would be virtually no difference in VMT and VHT in the SEMCOG region from one DRIC alternative to another in the midday peak or between them and the No Build Alternative (Table 3-19). There would be a uniform decrease in truck VMT in the 2013 PM peak of all Build Alternatives over No Build. And VHT would be the same for all alternatives.

2. With respect to the border crossing area, Alternative Set #1/2/3/14/16 and Alternative #5 would carry substantially more traffic across a new bridge than Alternative Set #7/9/11. But, the longer movements on the plaza of Alternative Set #7/9/11 increase its VMT and VHT characteristics such that it falls between the No Build Alternative and other Build Alternatives. Because all Build Alternatives draw traffic from the Blue Water Bridge, each would slightly increase VMT and VHT in the border crossing area during the 2013 midday and PM peaks. Therefore, pollution in the border crossing area would slightly increase, compared to the No Build Alternative. However, it is recognized that stricter vehicle emission controls and fuel standards being put into place will result in future mobile source (vehicular) pollution being less than it is in 2008.

3. Along I-75, all Build Alternatives except #5 would have lower VMT and VHT than the No Build Alternative in the 2013 midday and PM peaks.

   The VMT and VHT data also lead to the conclusion that within the area of Southwest Detroit along I-75, there is no substantial difference expected among the DRIC alternatives compared to the No Build condition with respect to sensitive receptors. The area of predominant, albeit sparse, residential development in Delray is west of the proposed plaza area where homes are spread over several blocks, with more vacant lots than homes. The densest population area is north of I-75.

Table 3-19
Vehicle Miles and Hours of Travel (VMT and VHT) Comparison – 2013
Detroit River International Crossing Study

Build Alternative has fewer VMT or VHT than No Build

MID-DAY PEAK HOUR	2004		2013							
			No Build		Alt 1/2/3/14/16		Alt 5		Alt 7/9/11	
2-way New Bridge Daily Vol.										
Auto	NA		NA		13215		13744		7479	
Truck	NA		NA		13325		12979		6529	
SEMCOG Region	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	52,723	964	77,251	1,416	77,497	1,423	77,652	1,425	77,521	1,423
Truck	46,612	763	63,321	1,035	62,954	1,034	63,116	1,038	63,226	1,035
Total	99,335	1,727	140,572	2,451	140,451	2,457	140,768	2,462	140,747	2,459
Border Crossing Area [a]	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	7,877	178	10,808	242	11,663	258	11,819	260	11,552	256
Truck	5,463	111	7,584	155	8,785	178	8,851	180	8,074	164
Total	13,340	289	18,392	397	20,447	435	20,670	440	19,626	420
I-75 Mainline [b]	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	656	11	1,051	18	893	15	993	17	889	15
Truck	786	13	1,165	19	1,010	17	1,100	19	778	13
Total	1,442	24	2,215	37	1,903	32	2,093	35	1,666	28
United States	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	94,550	1,610	128,391	2,205	128,091	2,204	128,269	2,206	128,266	2,207
Truck	151,150	2,400	204,372	3,245	202,590	3,223	202,843	3,228	203,391	3,232
Total	245,700	4,010	332,763	5,450	330,681	5,427	331,113	5,434	331,657	5,439
PM PEAK HOUR										
SEMCOG Region	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	76,566	2,553	108,691	3,292	109,834	3,298	110,129	3,293	109,932	3,302
Truck	47,096	824	64,234	1,136	63,151	1,129	63,343	1,130	63,726	1,135
Total	123,662	3,377	172,925	4,428	172,985	4,427	173,472	4,423	173,657	4,437
Border Crossing Area [a]	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	14,045	359	19,262	516	21,248	527	21,543	526	21,369	532
Truck	5,354	117	7,666	165	8,623	195	8,747	194	8,575	189
Total	19,399	476	26,929	682	29,871	722	30,290	721	29,944	722
I-75 Mainline [b]	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	1,145	20	1,721	31	1,772	34	1,921	36	1,607	29
Truck	852	15	1,265	23	960	17	1,080	19	783	14
Total	1,997	36	2,986	53	2,732	51	3,000	56	2,391	42
United States	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT	VMT	VHT
Auto	119,377	3,231	157,094	4,069	157,154	4,061	157,491	4,056	157,495	4,068
Truck	161,738	2,636	219,475	3,595	215,441	3,549	215,736	3,551	216,671	3,563
Total	281,115	5,867	376,569	7,664	372,595	7,610	373,227	7,607	374,166	7,631

[a] An area bounded by the Southfield Freeway (M39), I-94, I-375, and the Detroit River

[b] Between Dearborn Street (Exit 44) and the I-96/I-75 interchange (Exit 48).

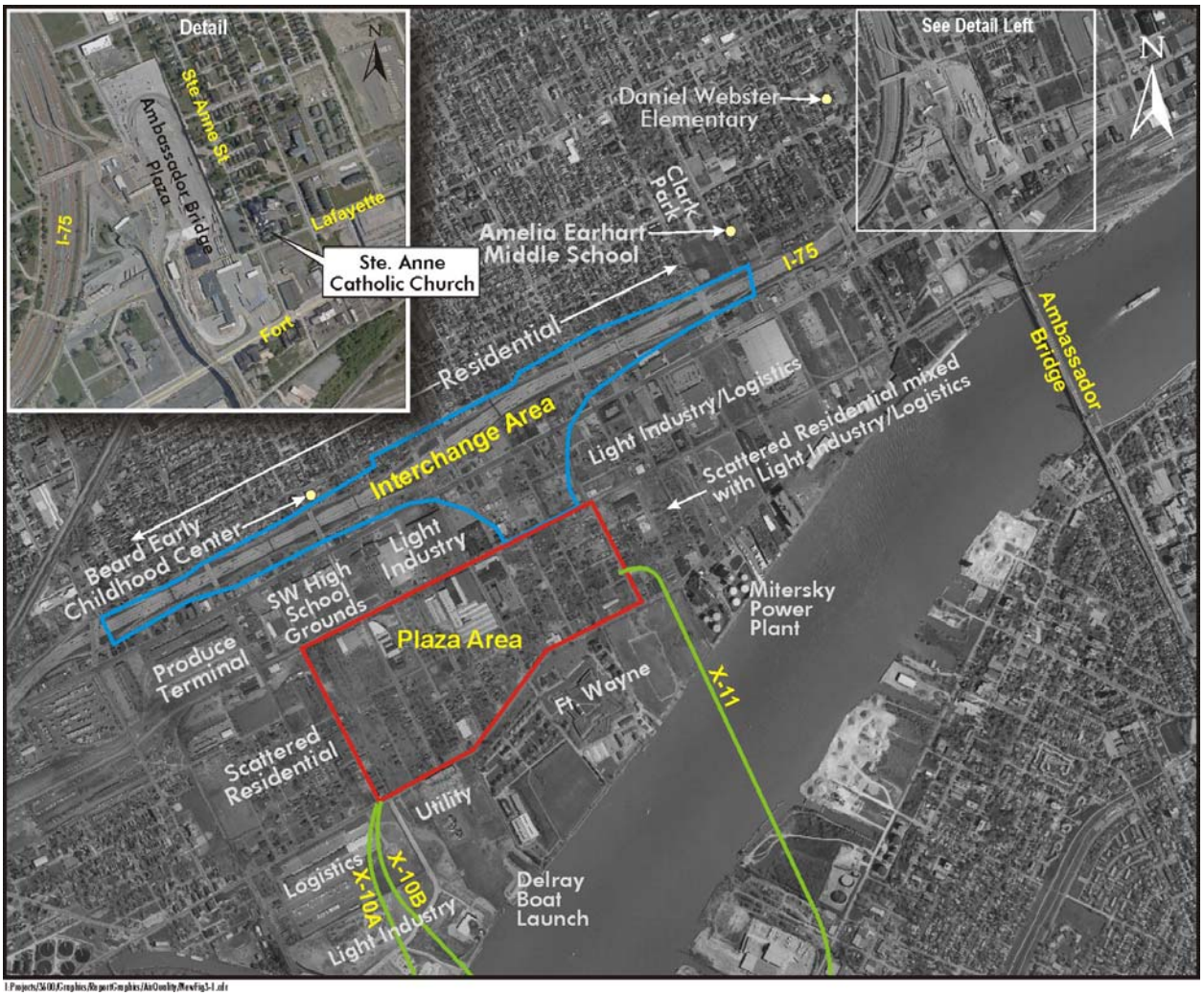
Source: The Corradino Group of Michigan, Inc.

Sensitive receptors include Southwestern High School, located on Fort Street (M-85), a state trunkline highway to the west of the proposed plaza area (Figure 3-28). The school fronts directly onto Fort Street. It would be separated from the project's plaza by ball fields, tennis courts, a railroad track, and a buffer zone around the plaza. Between the proposed project and the Ambassador Bridge on the north side of I-75 are the Amelia Earhart Middle School and Daniel Webster Elementary School. Farther west at Waterman is the Beard Early Education Center. There is little difference among the DRIC alternatives, from one another, or between them and the No Build condition with respect to sensitive receptors in the area of I-75 and south in Delray.

What is a Sensitive Receptor?

A facility that houses or attracts children, the elderly, people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals and schools are examples of sensitive receptors.

Figure 3-28
Sensitive Air Quality Receptors
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

North of I-75 there is an opportunity to reduce truck traffic on the Livernois/Dragoon one-way pair that serves a dense residential area north to Vernor Avenue and beyond to Michigan Avenue. These streets carry substantial volumes of truck traffic and serve the Livernois-Junction Yard intermodal terminal north of Vernor Avenue. This intermodal terminal is where freight containers are exchanged between truck and rail. A proposed MDOT project would reorient the entrances to this intermodal yard to reduce the truck use of the Livernois/Dragoon one-way pair. With the DRIC alternatives, direct access by heavy-duty diesel trucks via Livernois/Dragoon to this intermodal terminal would be significantly reduced by modifying the ramp system on I-75. This would improve air quality conditions in a section of Southwest Detroit.

The Ambassador Bridge plaza has a cluster of relatively dense residential units immediately to its east. This area around Ste. Anne's Catholic Church, has seen strong redevelopment and infill housing in the past decade (Figure 3-28). The DRIC would also divert traffic from this area, reducing pollution concentrations. The opening of the Ambassador Gateway Project in 2009 would channel traffic away from this sensitive area and directly onto I-75. This will improve the air quality of the area.

3.6.3.2 Mobile Source Air Toxics (MSATS)

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. This analysis is based on the *Interim Guidance on Air Toxics in NEPA Documents* (FHWA, February 3, 2006). The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

For 2013, the year of opening of the DRIC project, Alternative Set #1/2/3/14/16 and Alternative #5 show higher MSATs for the ramp connections between the plaza and I-75 than Alternative Set #7/9/11, because Alternative Set #1/2/3/14/16 and Alternative #5 would attract more traffic from the Ambassador Bridge and the Blue Water Bridge (Table 3-20). Alternative Set #1/2/3/14/16 would carry a slightly higher proportion of trucks

Which Air Toxics Coming from Vehicles are of Most Concern?

Six air toxics have been called out as "priority toxins:"

Benzene is characterized as a known human carcinogen.

Acrolein's carcinogenicity has not been determined due to inadequate data on oral or inhalation exposure.

Formaldehyde is a probable human carcinogen, based on limited evidence in humans and sufficient evidence in animals.

1,3-butadiene is characterized as carcinogenic to humans by inhalation.

Acetaldehyde is a probable human carcinogen based on tumors in laboratory rats and hamsters after inhalation exposure.

Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation. DE is the combination of diesel particulate matter and diesel exhaust organic gases. DE is also likely associated with chronic respiratory and pulmonary problems.

Table 3-20
MSAT Alternative Comparison
2013 and 2030 Daily Pollutant Burden Emissions (grams)
Detroit River International Crossing Study

2013 Daily	Alt #1/2/3/14/16		Alt #5		Alt #7/9/11	
	Ramps	Plazas and Crossing	Ramps	Plazas and Crossing	Ramps	Plazas and Crossing
Auto						
Benzene	124	423	124	463	70	366
Acrolein	11	34	11	38	6	30
Formaldehyde	24	77	24	85	14	68
1,3-butadiene	12	40	12	43	7	35
Acetaldehyde	1	4	1	5	1	4
Diesel exhaust	0	0	0	0	0	0
Truck						
Benzene	25	117	22	125	13	89
Acrolein	14	68	13	73	7	51
Formaldehyde	182	871	167	931	94	660
1,3-butadiene	67	321	61	343	35	243
Acetaldehyde	8	39	7	42	4	30
Diesel exhaust	724	1,842	662	2,029	372	1,493
Daily 2-way Bridge Traffic						
Auto	13215		13744		7479	
Truck	13325		12979		6529	
Total	26541		26723		14008	
Daily 2-way Bridge VMT						
Auto	27601		29906		22651	
Truck	27747		27892		20004	
Total	55349		57798		42655	

2030 Daily	Ramps	Plazas and Crossing	Ramps	Plazas and Crossing	Ramps	Plazas and Crossing
Auto						
Benzene	92	321	91	345	59	308
Acrolein	8	26	8	28	5	25
Formaldehyde	18	60	18	64	12	58
1,3-butadiene	9	31	9	33	6	30
Acetaldehyde	1	3	1	3	1	3
Diesel exhaust	0	0	0	0	0	0
Truck						
Benzene	27	128	25	141	17	124
Acrolein	16	74	15	82	10	72
Formaldehyde	200	954	188	1,047	130	920
1,3-butadiene	74	351	69	386	48	339
Acetaldehyde	9	43	8	47	6	41
Diesel exhaust	177	451	167	512	116	467
Daily 2-way Bridge Traffic						
Auto	14740		15071		9607	
Truck	19655		19760		12502	
Total	34395		34831		22109	
Daily 2-way Bridge VMT						
Auto	30829		32839		28556	
Truck	40917		42428		37554	
Total	71746		75266		66110	

Source: The Corradino Group of Michigan, Inc.

than Alternative #5 due to its relative directness to southern destinations favored by trucks. The overall MSAT burden for Alternative Set #7/9/11 is lower than Alternative Set #1/2/3/14/16 and Alternative #5.

For 2030, the same patterns hold. For benzene and acrolein, the increase in VMT is offset by the lower emission factors of the future. While the total vehicle MSAT values for formaldehyde, 1,3-butadiene, and acetaldehyde would increase slightly in 2030, as compared to 2013, diesel exhaust would be significantly reduced.

MSATs in the local Southwest Detroit area near the proposed new river crossing system would be offset by a corresponding decrease in MSATs at the Ambassador Bridge compared to the No Build Alternative.

3.6.4 Conformity Requirements under the Clean Air Act

EPA is responsible under the Clean Air Act for establishing national air quality standards. The SEMCOG region is not in "attainment" of some standards and there are other standards which the region did not meet previously but now does. The proposed DRIC project must be added to the SEMCOG long-range *Regional Transportation Plan* (RTP) to determine if the DRIC would cause problems in attaining or maintaining air quality standards. This conformity test will occur after a Preferred Alternative is identified. It will be reported on in the Final Environmental Impact Statement. The conformity determination is also dependent on the results of hot-spot analysis.

3.6.4.1 Hot-spot Analyses

Hot-spot analysis is part of the project level conformity requirements (see Section 5.3.2 of the *Air Quality Technical Report*). Hot-spot analyses are designed to evaluate whether there are air quality impacts on a smaller scale than an entire area. The hot-spot analyses apply to carbon monoxide (CO) and particulate matter ($PM_{2.5}$ and PM_{10}). Analysis must demonstrate that a project will not worsen existing violations or delay the timely attainment of the NAAQS to demonstrate it conforms to the Clean Air Act.

The CO hot-spot analysis is done on a quantitative basis, to determine whether "with-project" concentrations of CO exceed the established one-hour and/or eight-hour standards. Hot-spot analysis for $PM_{2.5}$ and PM_{10} is done on a qualitative basis until appropriate methods and modeling guidance are available for quantitative analysis.

CO Hot-spot Quantitative Analysis

CO hot-spots were considered to be at (Figure 3-29): Southwestern High School (Receptor No. 1), residences east of the proposed plazas (varies by alternative) (Receptors No. 2 and No. 3), Fort Wayne (Receptor No. 4), and a residence west of the proposed plazas (Receptor No. 5). North of I-75, a house on the east side of Campbell Street was tested as a "worst-case" receptor condition (Receptor No. 6). At that location, the ramps to the new bridge and a relocated service drive would be very close to the residence.

What are Quantitative and Qualitative Analyses?

Quantitative analysis involves a process that allows calculation of numeric values. Sometimes such precision is not possible because adequate data are not available or there is not enough research to predict outcomes mathematically. A qualitative analysis involves judgments, not the use of mathematical models, to develop conclusions.

The highest one-hour CO concentrations are found at the residence on Campbell Street along the north side of I-75 (Table 3-21). Forecasts of one-hour CO concentrations for 2013, 2025 and 2030 are 2.9, 3.6, and 3.8 ppm, respectively. These values compare to the standard of 35 ppm. Conditions at all other intersections in all years under every scenario would have lower CO concentrations. A comparison to the CO eight-hour standard is not needed because the one-hour values are less than that eight-hour standard (see page 24 of FHWA Technical Advisory T6640.8A, October 30, 1987).

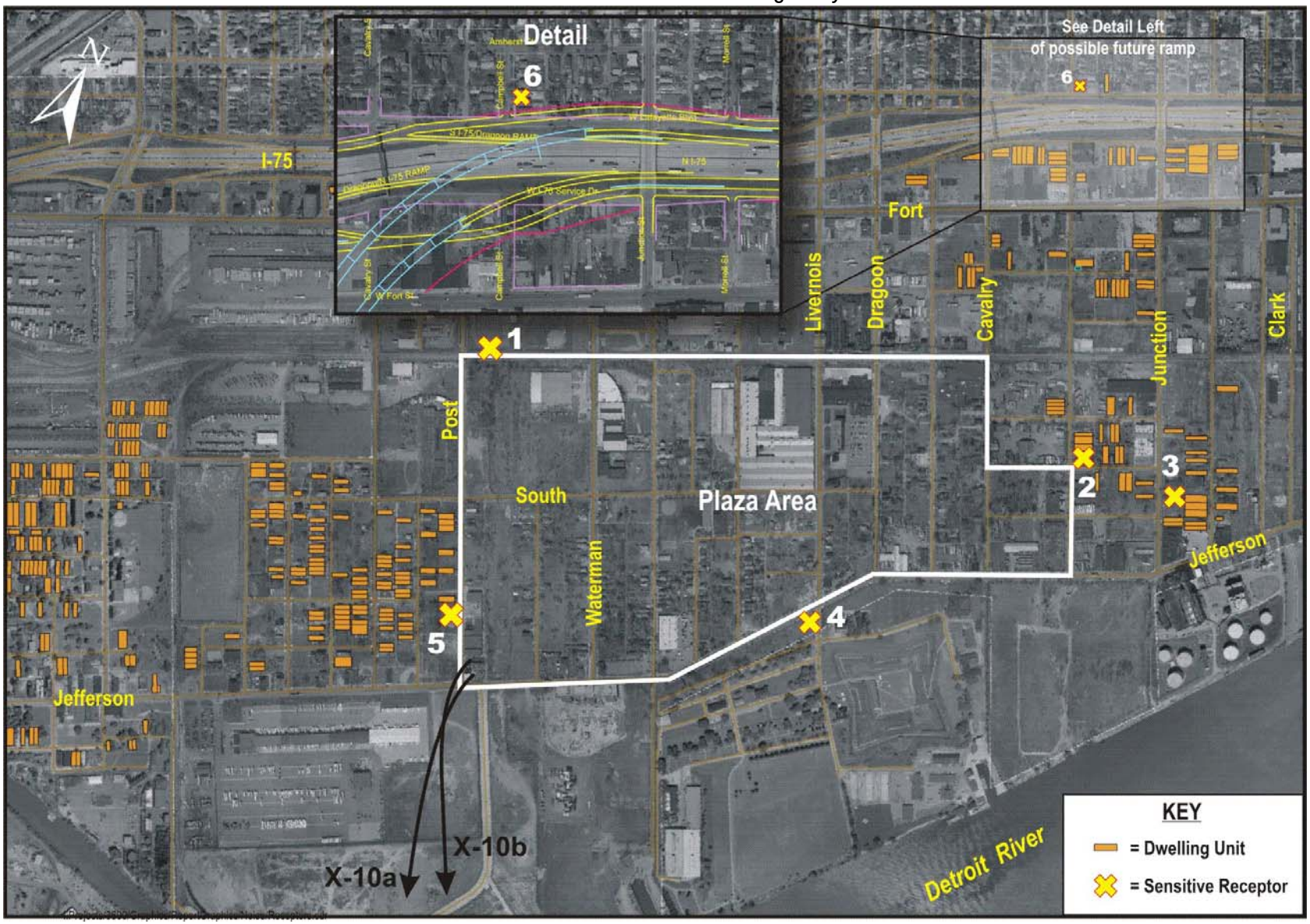
Table 3-21
CAL3QHC CO Analysis Results
(1-hr standard = 35 ppm)
Detroit River International Crossing Study

Plaza Perimeter	2006[a] 1-hr Background	2013 w/Background 1-hr	2025 w/Background 1-hr	2030 w/Background 1-hr
Alternative Set #1/2/3/5/14/16				
1 SW High School	1.3	1.5	1.7	1.7
2 East Plaza perimeter	1.3	1.7	1.6	1.6
4 Ft. Wayne (south of plaza)	1.3	1.7	1.7	1.7
5 Post Street residential (west of plaza)	1.3	2.1	2.1	2.1
Alternative Set #7/9/11				
1 SW High School	1.3	1.4	1.4	1.4
3 East Plaza perimeter	1.3	1.4	1.4	1.4
4 Ft. Wayne (south of plaza)	1.3	1.4	1.5	1.5
5 Post Street residential (west of plaza)	1.3	1.5	1.5	1.5
North Side of I-75 – Residence (worst case)				
Alternative Set #1/2/3/5/14/16	1.3	2.9	3.6	3.8

[a] Background values drawn from 2006 2nd max readings at the West Lafayette (26-1630039) monitoring station.
Note: ppm = parts per million

Source: The Corradino Group of Michigan, Inc.

Figure 3-29
CO Hot-spots
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

$PM_{2.5}$ and PM_{10} Hot-spot Qualitative Analysis

This analysis was done following the joint FHWA/EPA *Transportation Conformity Guidance for Qualitative Hot-spot Analysis in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance* Areas, March 29, 2006. Method B of this guidance was followed.

The conclusion of the qualitative $PM_{2.5}$ and PM_{10} hot-spot analyses is that the proposed project will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. This applies to both the 24-hour and annual standards. It is based on the following:

- SEMCOG and MDEQ have been moving aggressively to address air quality concerns, in general, and $PM_{2.5}$, specifically.
  - This includes programs such as diesel locomotive retrofits, and
  - Controls on consumer products.
- EPA is addressing the non-local component of $PM_{2.5}$ pollution through programs such as the Clean Air Interstate Rule, stricter controls on vehicle emissions, and the low-sulfur fuel introduced in 2007.
- A number of major polluters that were believed to be significant contributors to the PM emission problem have closed. Mandated enforcement controls are being applied at other local industries such as Severstal Steel, Marathon Oil and U.S. Steel.
- Available Information from Livonia demonstrates that vehicular activity in Southeast Michigan can occur without violation of standards. Specifically, the Livonia monitor is in close proximity to some of the heaviest truck movements in the region and does not violate the $PM_{2.5}$ standards. This is occurring before the 2007 elimination of sulfur from fuels and more stringent diesel engine requirements.
- Efficiencies can be expected from increased enrollment in the NEXUS and FAST programs when a clear lane through the border area becomes available with the DRIC project.
- With a new DRIC plaza the number of Gamma Ray Inspection Technology (GRIT) lanes at the Detroit-Windsor border will increase, reducing queuing and idling. GRIT is part of the non-intrusive inspection of trucks coming into the U.S.

What is the Clean Air Interstate Rule?

This rule targets power plant pollution to reduce $PM_{2.5}$, SO_2 and NOx, which also helps reduce ozone formation.

- U.S. Customs and Border Protection has instituted a policy requiring trucks to turn off their engines when they pull into the secondary inspection area.

3.6.4.2 Air Quality During Construction

Construction Equipment at Work

Source: The Corradino Group of Michigan, Inc.

Construction for the DRIC will represent a series of projects spread over time – interchange ramps, roads, plaza, and bridge. The plaza will be constructed incrementally; not all the booths will be developed initially. It is anticipated that most construction related to ground disturbance will occur in one year.

The estimates of dust assume 150 acres of plaza area to be cleared of major buildings/structures and graded flat. Emission factors for earthmovers and/or graders were drawn from EPA guidance.[13] The resulting estimates of construction particulate emissions of 11 tons of PM_{10} and 0.6 tons for $PM_{2.5}$ are well below the threshold levels governing general conformity.

Construction techniques to control dust include strategies that reduce engine activity or reduce emissions per unit of operating time. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits. For example, agreements that stress work activity outside normal hours of an adjacent school campus would be operations-oriented mitigation. Also, technological adjustments to construction equipment could be an appropriate strategy. These technological fixes could include particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions. The use of ultra-low sulfur diesel fuel will be in effect for non-road vehicles in 2010, so it is reasonable to advance this schedule for all construction vehicles to the beginning of construction.

3.6.5 Summary of Air Quality Impacts

No Build Alternative

The measures taken by EPA have and will continue to substantially improve air quality. This is true of mobile source air toxics (MSATs) and the criteria pollutants for which there are national standards. National air quality trend data assume that vehicle miles of travel will continue to grow at current rates. In spite of such travel increases, air

[13] *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Stationary Point and Area Sources*, revised November 2006.

pollution emissions will fall. They will more than fall in Detroit where background traffic levels are expected to grow less. The SEMCOG forecast of a loss of jobs and population through 2015 in the region will result in minimal traffic growth. Further, national projections assume the basic vehicle fleet mix will not change. But, it is likely that the fleet mix will change to more fuel-efficient and less-polluting vehicles, such as hybrids, further improving conditions. At the local level, air quality in Mexicantown near the Ambassador Bridge will improve with completion of the Ambassador Gateway Project in 2009. International truck traffic will be eliminated from this local area by the direct connection of the Ambassador Bridge with I-75.

Build Alternatives

The DRIC alternatives have been compared to the No Build Alternative with respect to changes in vehicle miles (VMT) and vehicle hours (VHT) of travel. Because there is little difference among the DRIC alternatives in VMT and VHT, there is little difference in air pollutant emissions.

The DRIC alternatives would bring new traffic into Delray at the new plaza, but traffic would be diverted from the Ambassador Bridge, which has expanding residential development to its east. Residential land uses that remain in West Delray are clustered blocks away from the proposed plaza area. It is expected new development will be purposefully located to avoid negative air quality effects. Southwestern High School would get more exposure from I-75 and Fort Street than it would from a new plaza.

North of I-75 in Southwest Detroit, the DRIC alternatives offer the opportunity to reduce truck traffic on the one-way pair of Livernois Avenue and Dragoon Street by modifying the ramp system that now serves the one-way pair. Heavy-duty truck traffic would be significantly reduced along the densely residential Livernois/Dragoon pair south of Vernor Avenue.

The potential for MSATs on the new system of crossing, ramps and plaza was compared quantitatively for the alternatives. Alternative Set #7/9/11 would generate less MSATs in Delray than Alternative Set #1/2/3/14/16 and Alternative #5 because of the lower traffic volumes attracted to a new bridge by that alternative set. While Alternative Set #7/9/11 would have lower MSAT totals in Delray, the area around the Ambassador Bridge would have higher MSATs totals, as less traffic is diverted from that bridge.

The Clean Air Act requires that the regions which do not meet air quality standards must show, within a specified time period how they will meet standards. Moreover, the regions must show how they will continue to meet standards for pollutants that have been exceeded in the past. Southeast Michigan does not meet the standards for 8-

hour ozone and $PM_{2.5}$ and it must demonstrate how, over time, it will meet the standards. In addition, it must demonstrate how it will continue to meet CO and PM_{10} standards. A set of hot-spot analyses was performed that leads to the conclusion CO, $PM_{2.5}$, and PM_{10} standards would not be exceeded. The project will be the subject of further conformity review in the FEIS following SEMCOG testing of the DRIC Preferred Alternative, together with other projects, in its *Regional Transportation Plan.*

MDOT has established rules to control air quality impacts during construction. Mitigation strategies include: minimizing engine operation; restricting construction activities around certain more sensitive receptors, like Southwestern High School (when in session); using particulate matter traps and oxidation catalysts on engines; and, using ultra-low sulfur diesel fuel in advance of the schedule called for in EPA regulations (see Sections 4.6 and 4.7).

3.7 Will There be Noise Impacts? Where? Can They be Mitigated?

Traffic noise is a concern for any transportation project. FHWA has regulations (23 CFR 772) requiring that noise mitigation (control and/or reduction) be considered, if noise approaches or exceeds specifically-defined levels. Each state has developed noise policies to address these regulations. Michigan's is in the State Transportation Commission Policy, dated July 31, 2003 (see Appendix A of the *Noise Study Technical Report*).

Noise levels were measured at key locations. The Transportation Noise Model (Version TNM2.5) was then used to predict future noise conditions. Abatement is considered where noise levels are projected to exceed certain defined levels. For the DRIC alternatives, this is done within the TNM by modeling with 12-foot-high walls along roadways. Ten- to 12-foot-high walls around plazas were used in the analysis.

What is TNM2.5?

The Transportation Noise Model was developed for FHWA to predict future noise levels. Data on vehicle types and speeds and the three dimensional geometry of the site is entered into a computer model. The noise level at any point along a new or existing road can then be predicted. The model determines how much noise can be reduced by noise walls or earth berms.

3.7.1 How was the Analysis Done?

The focus of the noise analysis is to differentiate among DRIC alternatives with respect to how many houses (and other sensitive receivers translated to "equivalent dwelling units") can be reasonably protected from excessive noise levels. The alternatives vary because the location of ramps and roads that cross over I-75 vary and these dictate where walls can be placed and how effective they can be. Also, Alternatives #3 and

#11 would shift the mainline of I-75 away from the residential area on the north side of I-75, which is expected to reduce noise impacts.

The noise unit used here is the decibel (dB). The sound spectrum is expressed for human hearing in terms of an A weighting, so the unit is called dBA. A 10-dBA increase is a ten-fold increase in sound energy, but is perceived as a doubling of loudness. A 3-dBA increase is a two-fold increase in sound energy (such as a doubling of existing traffic) and is barely perceptible. For the most part, the DRIC project's effect on mainline I-75 would not result in perceptible noise changes. That is not the case along the southbound service drive because with some alternatives traffic on the service drive would increase. Many homes face the service drive or side streets that connect to the service drive.

What is a Decibel?

The decibel is a unit that expresses a level of sound. For humans 0 is near the threshold for hearing. Sounds at 120 and above cause pain. Normal conversation is at a sound level in the mid-60s decibels range.

FHWA has developed Noise Abatement Criteria (NAC), which have been incorporated into MDOT's Noise Policy (Table 3-22). Federal regulations and MDOT policy focus on exterior areas, except where there are noise levels of 80 dBA (which would not occur with the DRIC). The NAC refer to Leq(1h), which is an equivalent (average) sound level over a one-hour period.

Table 3-22
FHWA - Noise Abatement Criteria
(Hourly A-Weighted Sound Level-decibels [dBA])
Detroit River International Crossing Study

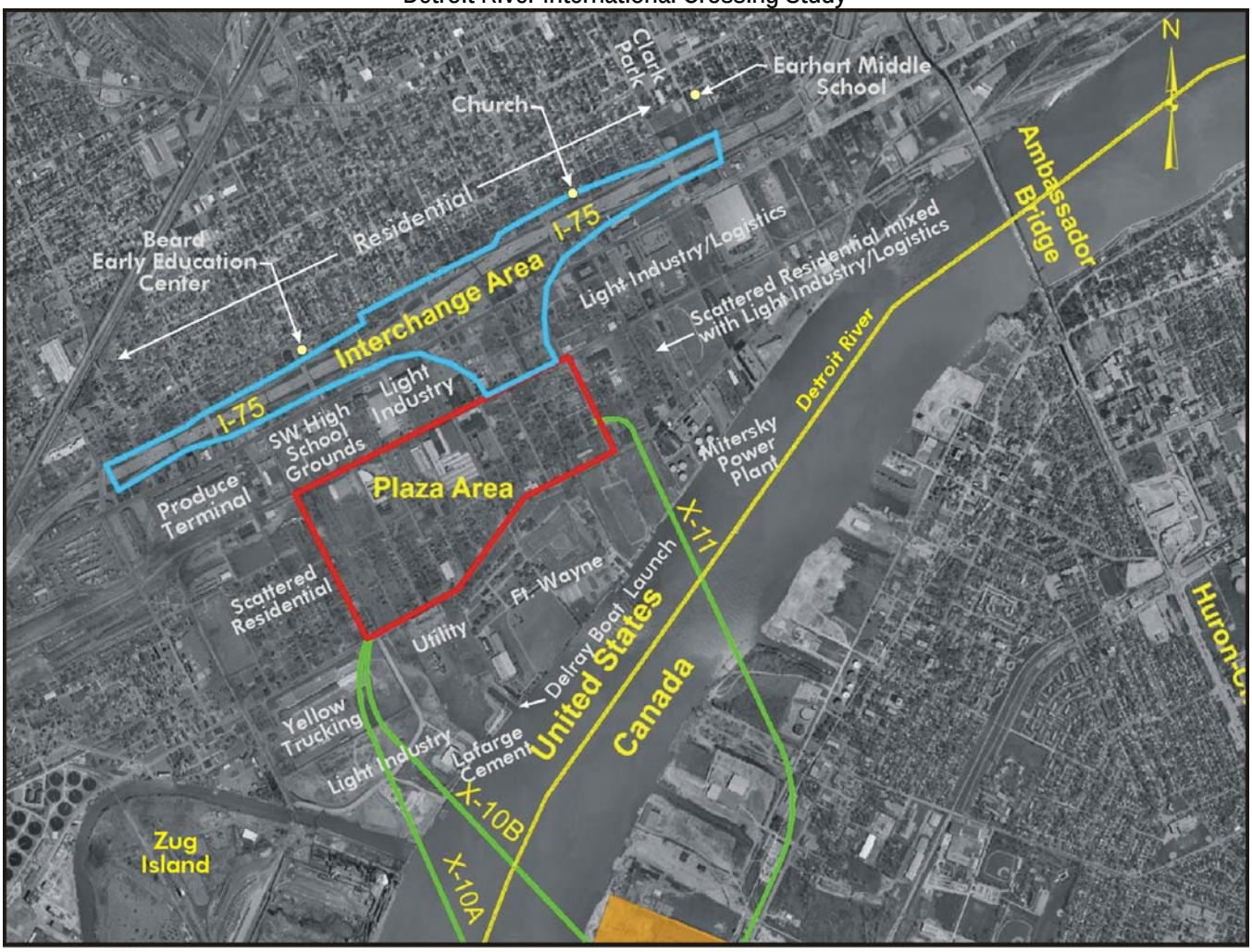
Activity Category	Description of Activity Category	Leq(1h)	
A	Lands on which serenity and quiet are of extraordinary significance and where the preservation of those qualities is essential, if the area is to continue to service its intended purpose.	57 (Exterior)	
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 (Exterior)	
C	Developed lands, commercial properties, or activities not included in Categories A and B above.	72 (Exterior)	
D	Undeveloped lands.	--	
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.	52 (Interior)	

Note: Leq(1h) is used in this analysis
Source: State Transportation Commission Policy 10136 – Noise Abatement, Appendix A

A significant impact is defined in the MDOT noise policy as predicted future noise that is 10 dBA above existing traffic noise levels, or predicted future noise that approaches the NAC standard. MDOT policy defines "approach" as 1 dBA of the NAC standard; for example, for NAC Category B (residences, churches, hospitals, parks, and libraries), which has a NAC standard of 67 dBA, MDOT considers 66 dBA to be a significant impact. The NAC Category B is of greatest concern in determining noise impacts. The DRIC noise analysis did not identify any predicted noise level increases of 10 dBA or greater.

A residential area, early-childhood education center, and church are located along the north side of the I-75 service drive (Figure 3-30). These are sensitive receivers which are included in the noise analysis that follows.

Figure 3-30
Project Area and Noise Sensitive Receivers
Detroit River International Crossing Study

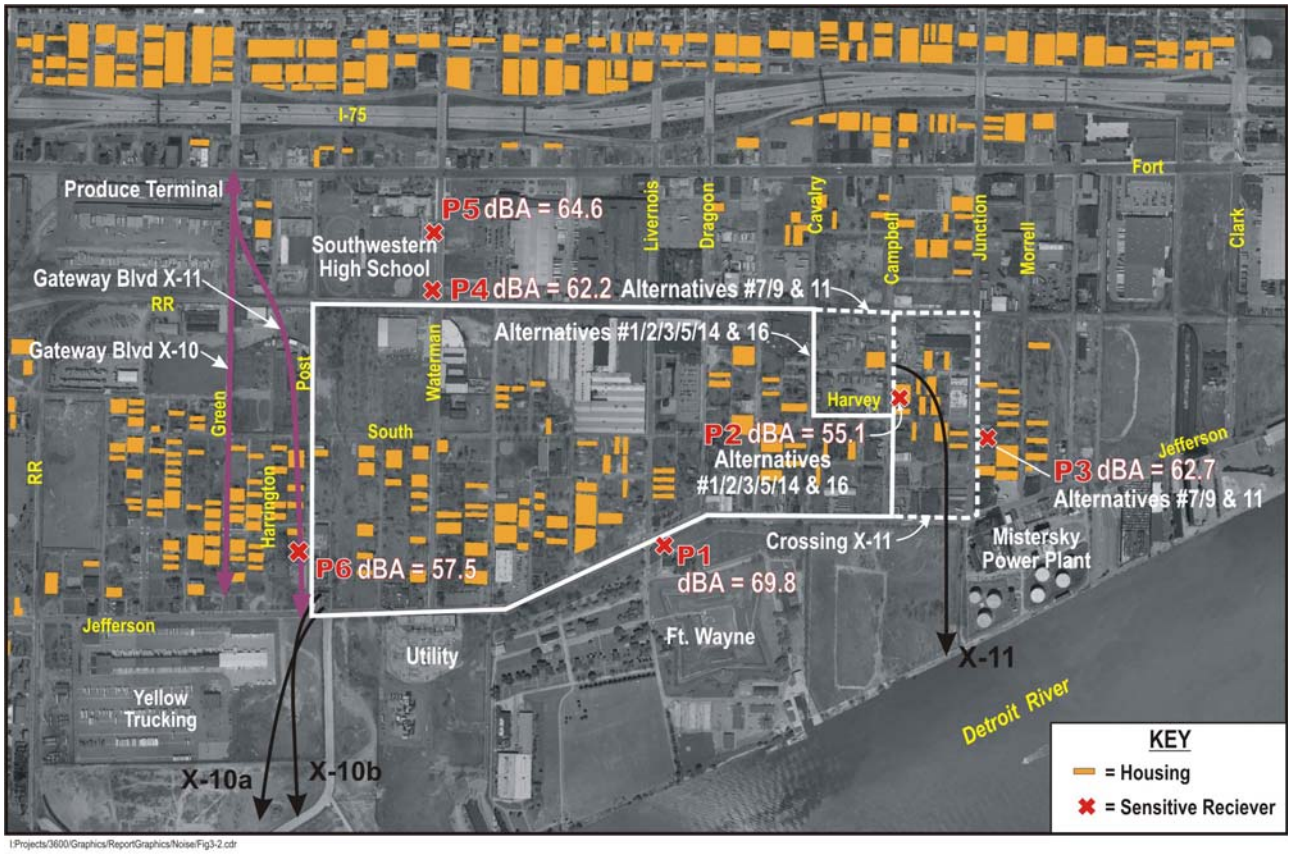


Source: The Corradino Group of Michigan, Inc.

3.7.2 Existing Noise Levels

Existing noise was measured around the plaza area (Figure 3-31) and along I-75 (Figure 3-32). Measurements along I-75 confirmed that existing noise levels exceed criteria. Elsewhere in Delray, noise levels are much lower and do not exceed criteria.

Figure 3-31
Existing Noise in Plaza Area
Detroit River International Crossing Study



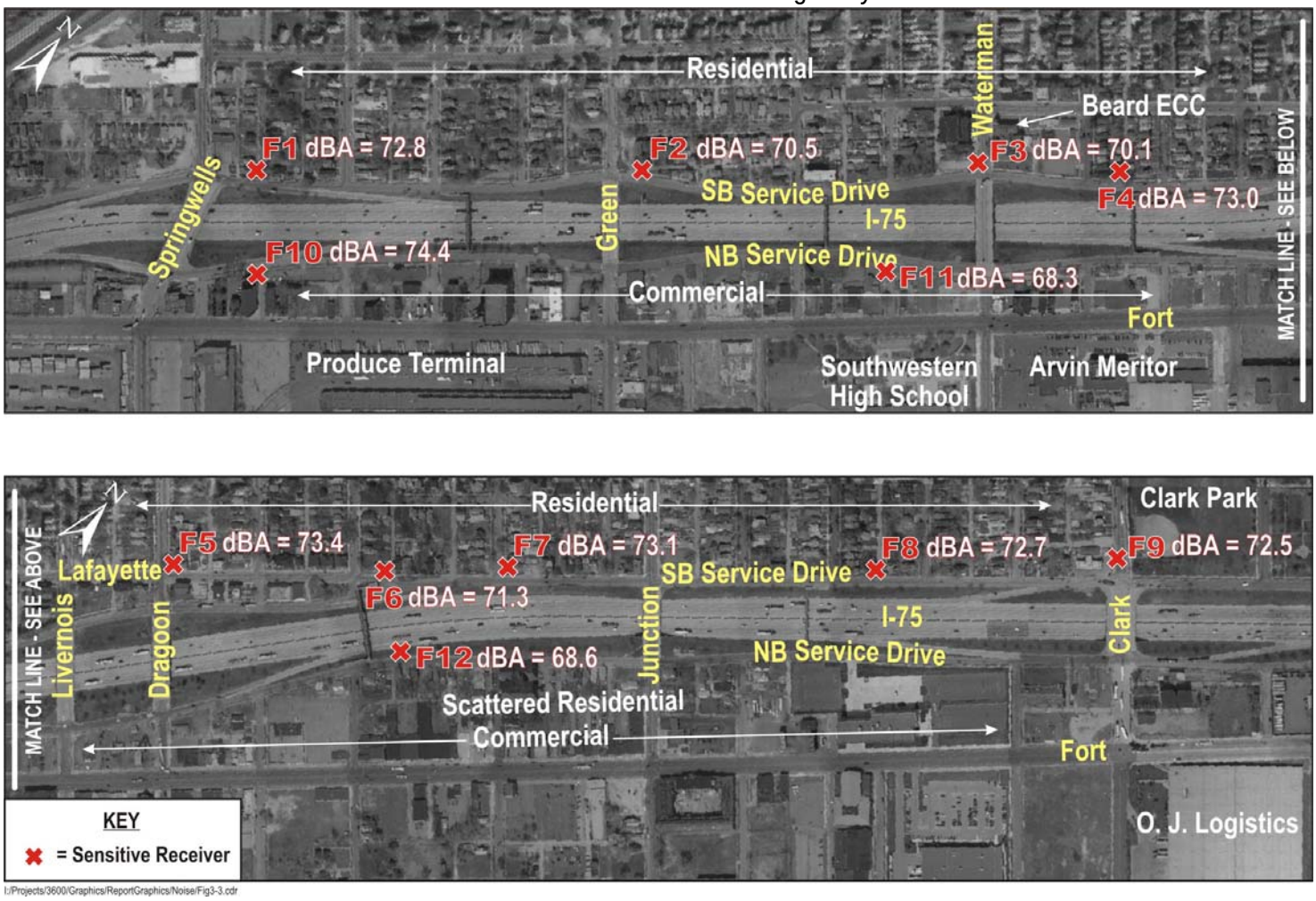
I:Projects/3600/Graphics/ReportGraphics/Noise/Fig3-2.cdr

Source: The Corradino Group of Michigan, Inc.

3.7.3 Future Noise Levels at Crossings and Plazas

In the absence of the DRIC project, there is little to suggest any substantial noise changes in Delray. Local noise levels would be a function of development that might occur in the vicinity of the proposed DRIC bridge and/or plaza. Because Fort and/or Jefferson Streets would not experience a doubling or halving of traffic in the future, no noticeable change in noise is expected along either.

Figure 3-32
Existing Noise along I-75
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

With the DRIC project, an X-10 crossing is expected to generate a maximum noise level of 58 dBA at its nearest approach to Fort Wayne (400 yards). An X-11 crossing would be closer, 300 yards away from Fort Wayne, which could be expected to generate a higher noise level – 62 dBA. These relatively low noise levels are partly attributable to the relationship of vehicular noise to speed. As speed decreases, noise decreases. Traffic on the bridge and plaza would operate at relatively low speeds.

Around the proposed plaza, noise levels would also be relatively low (Table 3-23). It is noted that Alternatives #1, #2, #3, #5, #14 and #16, were modeled with no noise walls around Plaza P-a and 42-inch-high safety barriers on the bridge structure itself. These are the common safety barriers used on interstate highways to keep vehicles from leaving the road. They also reduce tire/pavement noise. Even with no other barriers than these, noise levels would not have a negative impact on the closest receivers to the bridge or plaza boundaries. The layout of Plaza P-a has traffic spread over a larger area than Plaza P-c, which concentrates traffic on roads near the plaza edges.

Table 3-23
Plaza Area Noise Levels (Leq(1h))
Detroit River International Crossing Study

Rec.	Receiver Location	Existing Measured	No Action	Alts #1/2/3/ 5/14/16	Alts #9/7/11
P1	Fort Wayne near Entrance	70	70	64	65
P2	East Side Campbell Street	55	55	57	NA
P3	East Side Junction Street	63	63	NA	63
P4	Southwestern High School near Fort Street	65	65	60	62
P5	Southwestern High School near Railroad	62	62	58	64
P6	Post Street	58	58	65	NA
P7	Harrington Street	NA	NA	59	62

Source: The Corradino Group of Michigan, Inc.

Plaza P-c, used by Alternatives #7, #9, and #11, was modeled with safety barriers on the bridge structure itself and noise walls along Jefferson Avenue and the railroad tracks. Traffic with these alternatives would be close enough to Fort Wayne and the Southwestern High School grounds that noise levels would warrant consideration of walls, if they were not already part of the plaza's construction. So, modeling indicates the security walls (ten to 12 feet high) that would be built with Plaza P-c would reduce noise outside the plaza below the noise criterion of 66 dBA and no further abatement would be needed.

3.7.4 I-75 and Interchange Future Noise Levels

Modeling of noise along I-75 is considerably more complex than modeling noise around the plaza area. The mainline of I-75 has low points where it passes beneath cross streets. Between these points, I-75's roadbed rises to a level closer to the surrounding ground elevation so ramps connect more easily to local streets. Receivers near the higher sections of I-75 are exposed to more noise, because the noise propagates more directly from roadway to receiver. Noise modeling is further complicated by the presence of service drives and streets crossing I-75, which contribute noise to adjacent receivers. But, analysis indicates, project changes generally would not subject new or different dwelling units to noise from mainline I-75, as traffic would change so little.

The factors that differentiate DRIC alternatives are:

- How an alternative affects traffic on the southbound I-75 service drive;
- The number of dwelling units possibly subject to acquisition; and,
- The effects of the flyover ramps to and from the plaza.

When a cross street or ramp is closed, and traffic takes a new route using the southbound service drive, the potential exists to increase noise levels for some receivers. If an alternative requires acquisition of dwelling units, they are no longer included in the noise analysis. The position of flyover ramps to and from the plaza affects how receivers are shielded from I-75 noise.

The TNM was applied taking all the above into consideration, and adding the three-dimensional roadway geometry and associated traffic. The results are a determination of the ranges of noise along I-75 and the number of sensitive receivers experiencing noise levels at or above the 66-dBA criterion, today and in the future (Table 3-24).

Table 3-24
Existing and Future (2035) Alternative Noise Conditions – No Mitigation
L_{eq}(1h) Noise Levels
Detroit River International Crossing Study

Key Data Elements \ I-75 Segment		Springwells to Green	Green to Waterman	Waterman to Livernois	Dragoon to Junction	Junction to Clark	Total
Modeled Receivers [a]		23	29	21	64	48	185
# Dwelling Units Represented		26	61	23	94	51	255
Schools/Churches		NA	NA	Beard EEC	Military Avenue Church	NA	NA
Modeled Noise Levels	Existing (2006)	67-76	65-72	68-76	64-74	65-77	NA
	No Build (2035)	67-76	65-72	68-76	64-74	65-77	NA
	Alts #1/#7	68-74	66-73	68-77	63-72	64-78	NA
	Alts #2/#9	68-74	66-72	66-71	64-73	64-78	NA
	Alts #3/#11	67-74	66-71	69-74	61-67	63-77	NA
	Alt #5	69-76	66-69	71-75	63-70	65-78	NA
	Alt #14	67-75	66-71	68-78	63-74	66-78	NA
	Alt #16	67-76	65-72	66-71	64-73	65-77	Na
# Dwelling Units over 66 dBA	Existing (2006)	26	49	33 [b]	70 [c]	46	224[b,c]
	No Build (2035)	26	49	33 [b]	70 [c]	46	224[b,c]
	Alts #1/#7	25	43	21	62	47	198
	Alts #2/#9	25	35	18	72	48	198
	Alts #3/#11[d]	25	43	32	23	38	161
	Alt #5	25	40	17	45	41	168
	Alt #14	25	52	32	66	47	227
	Alt #16	25	35	18	72	48	198

[a] Build Alternatives have somewhat fewer modeled receivers and Dwelling Units represented, as some receivers would be acquired by the project.

[b] Counting the Beard Early Child Center as 10 Dwelling Units, per MDOT's *Noise Policy*.

[c] Counting the Military Avenue Church as 10 Dwelling Units, per MDOT's *Noise Policy*.

[d] Given the shift in the I-75 alignment, there are considerably fewer impacted receivers between Dragoon and Junction and a portion of the segment between Junction and Clark.

Source: The Corradino Group of Michigan, Inc.

With existing and No Build conditions, the analysis found that approximately 224 dwelling units between Springwells Street and Clark Street along the north side of I-75 would be exposed to noise levels exceeding the 66-dBA criterion. This figure counts the Beard Early Education Center (EEC) and Military Avenue Church as the equivalent of ten dwelling units each, consistent with MDOT's *Noise Policy*. Alternative #14 would result in the greatest noise exposure (227 dwelling units, prior to mitigation). Alternative #3 and #11 are forecast to have the fewest dwelling units exposed to noise above 66-dBA (161 dwelling units) prior to mitigation because they would shift I-75 away from the area of concentrated receivers.

3.7.5 Noise Mitigation Considerations

The test of whether mitigation should be pursued under MDOT's *Noise Policy* rests on whether such mitigation is feasible and reasonable. The "feasible" test relates to whether mitigation is physically or institutionally possible and can achieve the desired noise reduction of at least five decibels. The feasibility of installing a noise wall is affected by items such as: 1) engineering limitations of height, especially on bridges; 2) the fact that some noise sources cannot be controlled with a noise wall, or noise may be pervasive from several roadway sources; and, 3) noise walls, for safety reasons, must be kept clear of intersections and driveways and not be positioned in ramp merge areas so that motorists have a clear field of view.

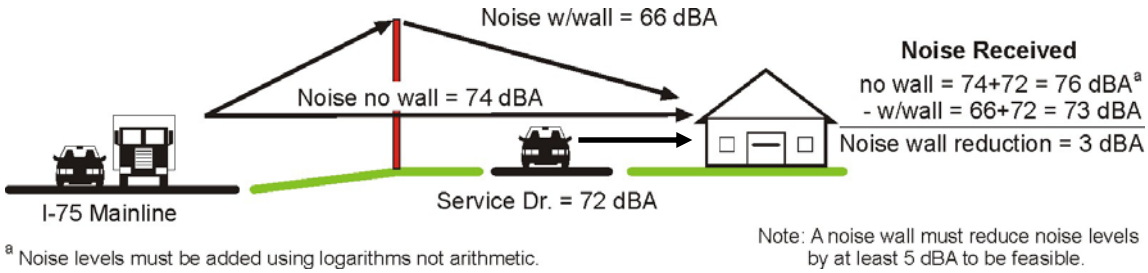
Representative Michigan Noise Wall

Source: The Corradino Group of Michigan, Inc.

The "reasonable" test addresses whether noise mitigation is cost-effective. This involves determining how many sensitive receivers can benefit per dollar invested in building the wall. The current inflation-adjusted value allowed per benefiting dwelling unit is $38,060 (2007 dollars). This applies to those units that would experience at least a 5-dBA reduction in the loudest hour. The current cost to construct a noise wall is $25.00 per square foot. An additional cost of $250.00 per linear foot is added for the wall foundation, drainage, and other considerations. So, for example, a ten-foot high wall would cost, in total, $500 per liner foot and a twelve-foot wall would cost $550 per linear foot for a typical installation.

A challenge to achieving successful noise abatement along I-75 is the potential increase in traffic on the southbound service drive of I-75 caused by the DRIC project. Traffic here would reduce the effectiveness of noise walls placed in their preferred location between the I-75 mainline lanes and the service drive. The schematic provided in Figure 3-33 illustrates this point. Even though the wall would cut I-75 noise by 8-dBA, noise from the service drive is not reduced. Overall, the noise at the receiver is reduced by only 3-dBA. For a wall to be feasible, it must reduce noise 5-dBA.

Figure 3-33
Why Noise Walls Are Not Always Feasible
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Walls are rarely placed between the service drive and homes because they place a wall in residents' front or side yards; or may require closing side streets, driveways and alleys. This can require construction of cul-de-sacs for emergency vehicles, causing an increase in the removal of structures. Gaps for streets and driveways that remain open result in less effective noise abatement. Maintenance and ownership issues between MDOT and the local jurisdiction must be resolved before the walls can be constructed.

3.7.6 Summary of Noise Impacts

No Build Alternative

Without the DRIC project, it is very unlikely noise walls would be built along I-75. Some improvement in noise levels is expected in Mexicantown with completion of the Ambassador Gateway Project in 2009.

Build Alternatives

Sensitive receivers around the proposed DRIC plazas would not experience noise levels exceeding the established noise abatement criteria. The proposed DRIC bridges are far enough removed from any sensitive receivers that no noise mitigation is warranted for them.

The feasibility and reasonableness of 12-foot noise walls were tested along the north side of I-75 for each of the DRIC alternatives. These alternatives depend upon six unique interchange configurations. Each of these was examined from the standpoint of its three-dimensional geometry, traffic, and receivers that would remain after an alternative is built. The general conclusions reached in performing the noise analysis along I-75 are:

- The ramps to and from the plaza shield areas north of I-75 to various degrees such that, in a number of situations, adding a noise wall to provide further mitigation is not feasible. This means it could not achieve a further 5-dBA noise reduction. For several alternatives, the Beard Early Education Center could not be protected by a wall considered to be "feasible."

- Alternatives #3 and #11 would shift the mainline lanes of I-75 away from the residential area to the north of I-75 so fewer receivers would be affected by noise levels above the 66-dBA criterion. The effect would be most significant between Dragoon and a point east of Junction. With Alternatives #3 and #11, noise levels north of I-75, where the sensitive receivers are located, would actually be lower than experienced today.

- Building noise walls at a reasonable cost would be more difficult in the segments at either end of I-75 (west of Green and east of Junction). These segments have houses oriented parallel, rather than perpendicular, to the I-75 service drive and so are more spread out than in other segments.

- When the Preferred Alternative is chosen, the effectiveness of a noise wall built between I-75 and the service drives will need to be modeled separately from the impacts of mainline I-75. That information will then be combined with the results of the mainline "with" a noise wall. This would be included as part of the FEIS, if such an alternative is chosen. In this case, the feasibility of the noise walls for the mainline could increase if taller noise walls are modeled. Another option to reduce noise from the service drives would be to repair and repave the service drives and use an absorptive surface on the residential side of the wall. Among the alternatives, Build Alternative #14 causes the least increase in traffic (and hence noise) on the service drive, making it the best prospect for feasible and reasonable noise wall justification because the noise reduction from walls along I-75 would not be interfered with by noise from the service drive.

The simulation performed here used a 12-foot wall to test the differences among the alternatives. Table 3-25 indicates the walls that, when tested, proved to be feasible and reasonable at the Practical Alternatives stage. With Alternatives #3 and #11 approximately 1,400 feet of wall could be built between Springwells and Green Streets. Alternative #5 could see walls between Springwells and Green and also Waterman to Livernois. Alternative #14 could have walls along most of the length of I-75 on its north side. Alternative #16 could have two walls (separated by an off-ramp), both between Springwells and Green.

Table 3-25
Practical Alternatives – Feasible and Reasonable Noise Walls
Detroit River International Crossing Study

	Location/Designation	Length (Feet)	Cost	Benefiting Receivers	Cost per Ben. Rec.
Alternatives #3 Interchange C	Springwells to Green Wall 1 – Along Service Drive	1400	$777,000	23	$33,800
Alternative #5 Interchange E	Springwells to Green Wall 1 – Along Service Drive	1400	$777,000	23	$33,800
	Waterman to Livernois Wall 1 – Along Service Drive to Crawford	830	$457,000	15[a]	$30,500
Alternative #14 Interchange G	Springwells to Green Wall 1 – Btwn Service Drive and I-75 off-ramp Wall 2 – Along Service Drive to Green	330 840	$184,000 $462,000	25[b]	$25,800
	Green to Waterman Wall 1 – Along Service Drive	1310	$724,000	23	$31,500
	Waterman to Livernois Wall 1 – Along Service Drive to Crawford	1340	$745,000	32[a]	$23,300
	Dragoon to Junction Wall 1 – Along Service Drive Calvary to Junction	1110	$615,000	16	$38,400[c]
	Junction to Clark Wall 1 –Along Service Drive to Clark	1600	$885,000	44	$20,100
Alternative #16 Interchange I	Springwells to Green Wall 1 – Btwn Service Drive and I-75 off-ramp Wall 2 – Along Service Drive to Green	330 840	$184,000 $462,000	25[b]	$25,800

[a] Counting Beard EEC as ten benefiting receivers.
[b] Calculation combines Walls 1 and 2.
[c] This wall was included because, with a minor adjustment, it would meet the MDOT's per benefiting unit criterion of $38,060.
Source: The Corradino Group of Michigan, Inc.

Work for the Preferred Alternative will optimize wall heights, lengths and locations. Each benefiting receiver will be re-examined for the Preferred Alternative and again during the design phase to ensure that mitigation provides at least a 5-dBA reduction.

3.8 Effects on Wildlife and Wetlands

This section summarizes the work covered in the *Wetland, Threatened and Endangered Species and Coastal Zone Management Technical Report*. That report also provides analysis of fish, migratory birds, and water quality impacts.

3.8.1 Analysis Approach

The following procedures were followed in collecting and analyzing the resources covered in this section.

3.8.1.1 Wetlands

Wetlands information/mapping was gathered from the Michigan Department of Natural Resources (MDNR), United States Fish and Wildlife Service (USFWS), the U.S. Army Corps of Engineers (USACE), the Michigan Department of Environmental Quality (MDEQ), the U. S. Department of Agriculture (USDA) and the Wayne County Department of the Environment.

Preliminary field assessments were conducted during the 2006 growing season. The study area was assessed by car, boat, and on foot to confirm:

1) The presence or absence of wetlands;
2) The types of wetlands, if present;
3) Sources of wetland hydrology; and,
4) Any other information that could be obtained and used as an indicator of wetland quality.

All wetland boundaries were delineated in the spring of 2007. Delineation methodology was based on: statutory language and rules found in Part 303, Wetland Protection, of the Natural Resource and Environmental Protection Act 1994 PA 451, as amended (NREPA); and, guidance manuals and procedures set forth by the MDEQ for delineating wetlands in Michigan (Michigan Department of Environmental Quality, 2000). Visual signs of wetland hydrology and a predominance of wetland vegetation were the primary wetland indicators used during the delineations. Wetland functions and values were assessed using a descriptive approach developed by the U.S. Army Corps of Engineers, New England District. Wetland impacts are noted in Section 3.8.2.

3.8.1.2 Threatened and Endangered Species

Prior to conducting field investigations, target species and target habitats were identified based on literature reviews and information from Michigan Natural Features Inventory (MNFI), MDNR and USFWS on threatened and endangered species, and species of special concern.

Remotely Operated Vehicle

The majority of target species identified were mussels known to inhabit the Detroit River. Assessments for protected mussels focused on areas where the project would involve placing bridge support piers and riprap protection in the river. The mussel survey was completed in the summer of 2006. Since that time it

has been determined there would be no construction in the Detroit River and, therefore, there will be no impact on mussels.

Two target fish species were identified, lake sturgeon (*Acipenser fulvescens*) and northern madtom (*Noturus stigmosus*). Habitat assessments for these species were completed using a remotely operated vehicle (ROV) with an underwater camera and by reviewing video obtained during hard hat diving for mussels.

All of the target species are aquatic and have been documented in the Detroit River. However, additional land surveys within the study area were conducted by car, boat and on foot to characterize the study area and determine if habitats for other threatened, endangered, or special concern plant and animal species were present.

3.8.1.3 Coastal Zone Management (CZM) and CZM Projects

The project falls within the Coastal Zone Management Boundary that follows the Great Lake and connecting rivers.

A list of all approved CZM projects was obtained from the Coastal Management Program, Environmental Science and Services Division of the MDEQ. Each individual or entity that received project approval was contacted by phone to obtain information on project location, project scope, and current status of the project. No CZM projects are present in the DRIC footprint, so the DRIC would be consistent with the Program.

3.8.1.4 Wildlife and Migratory Birds

Bird strikes of the proposed new bridge were identified as a potential impact. Birds identified during field surveys for wetlands and threatened and endangered species were recorded. Impacts and methods for minimizing impacts were identified based on literature reviews and consultation with the USFWS. The bridge lighting design must take into consideration migrating birds in the Detroit River corridor. This concern is addressed in Section 3.5.2 of the *Wetland, Threatened and Endangered Species and Coastal Zone Management Technical Report*, where best management practices of the U.S. Fish and Wildlife Service are listed. Best management practices will be reviewed in consultation with the USFWS as design of the bridge advances. During design, contact with USFWS will determine which recommendations are appropriate, or if additional recommendations or methods are available to minimize avian mortality.

What is a Bird Strike?

Birds flying, particularly at night, can hit the bridge and be injured or killed.

Due to the urbanized nature of the project area, no other wildlife impacts are expected.

3.8.1.5 Water Quality/Secondary Impacts

The DRIC alternatives would have minimal to no impacts on the quality of surface or groundwater (water beneath the ground surface). Areas that flood are limited to the riverbank area. There are no streams or stream-related vegetation. Much of the area to be covered by the project is paved or has buildings on it. The rain falling on these areas drains into sewers. These sewers carry "combined" flow, meaning what goes down the drain at homes and businesses is combined with the water flowing off roads and off roofs. During periods of heavy rain, the huge volume of rainwater can overflow the capacity of the system, so that it cannot all be properly treated before going into the Detroit River. This is called a Combined Sewer Overflow. The DRIC project must design its stormwater system so that drainage from the project does not worsen the overflow problem. Calculations indicate the DRIC project (bridge or plaza) would result in an increase in green space that would soak up rainfall. This means there would be less runoff (water that does not soak into the ground) than happens today. Storage of runoff will be provided by the project in any event.

Water quality and secondary impact assessments focused on review of proposed construction methods, plans for stormwater management, and other proposed activities that could result in discharge of sediment or other contaminants into the Detroit River and other tributary streams in the project area. Best management practices were identified to minimize or eliminate negative impacts. Details would be worked out during the design phase through the permitting process. The project runoff would be directed to an on-site collection system using basins or oversized pipes in the ground to store water during storms. This storage would reduce solids in the discharge flow. The water would be released to the combined sewer system later at a slow rate, when it could be properly treated.

3.8.2 Summary of Wetland and Related Impacts

No Build Alternative

The No Build Alternative would not affect any wetlands.

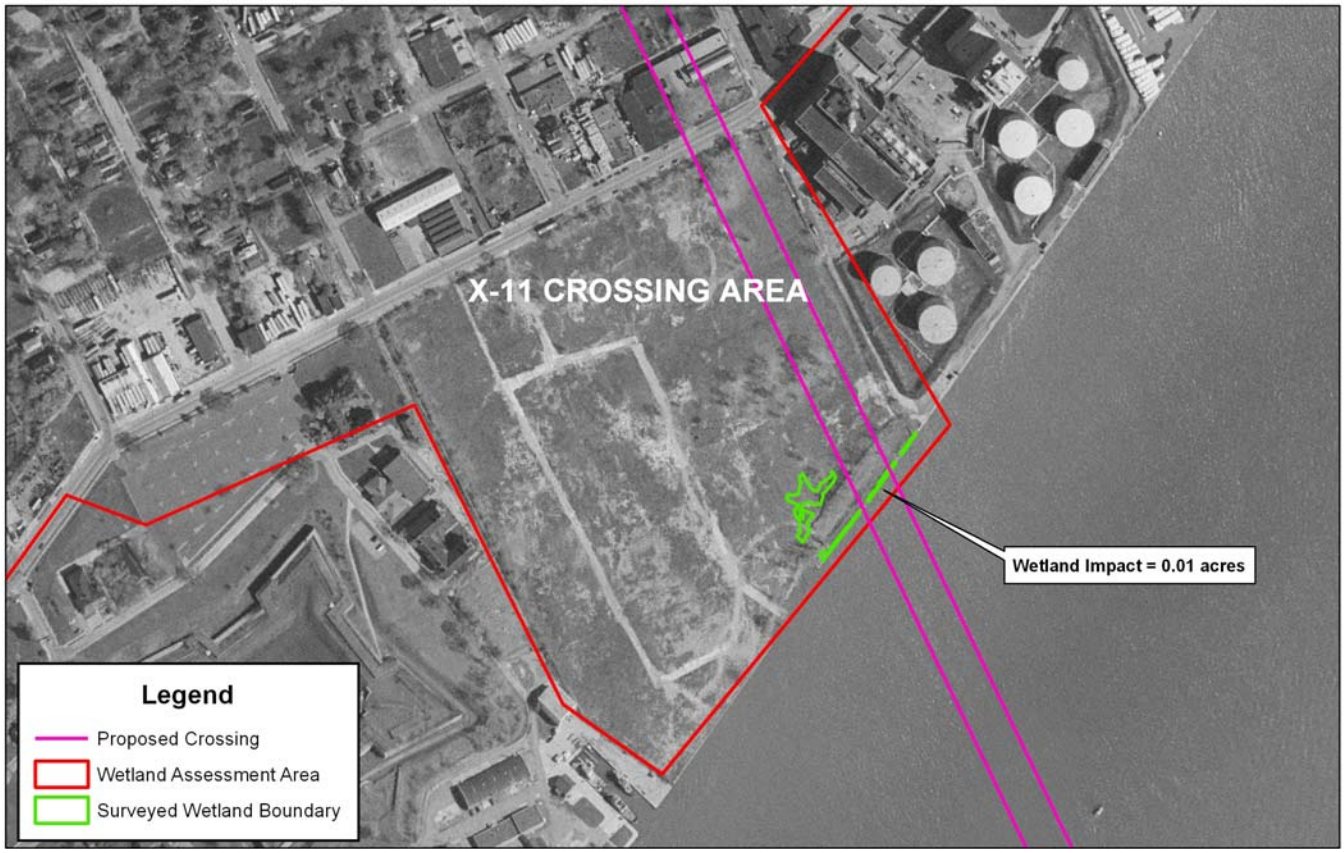
Build Alternatives

Crossing X-11 would impact a total of 0.01 acre of low-quality wetland at the edge of the Detroit River (Figure 3-34). Loss of this wetland will result in minimal impacts to wetland function and value. Because the wetland is in close proximity to the Detroit River, it is regulated by both the MDEQ and USACE.

Wetland Area Affected – Corridor X-11

Source: The Corradino Group of Michigan, Inc.

Figure 3-34
Wetland Delineation – Crossing X-11
Detroit River International Crossing Study



Source: Wetland & Coastal Resources, Inc.

Results of field assessments on land showed that no threatened, endangered, or special concern plant or animal species or their preferred habitats are present. Results of surveys for native mussels within the Detroit River showed that no live mussels are present within the areas assessed. Piers in the Detroit River, once under study, were dropped as an option to avoid navigational problems for waterborne transport. Even so, investigation found placement of piers for crossings X-10A and X-10B were not expected to harm or otherwise adversely affect native mussels, particularly the northern riffleshell mussel, or listed fish species.

Best construction practices will be specified to avoid impacts by the Preferred Alternative. Construction techniques will be defined, including use of the river to deliver materials for project construction. No construction activities are expected to be performed from the Detroit River. Each steel section would be delivered by water and hoisted into place. No temporary works would need to be constructed in the river.

Impacts to water quality during and after construction would be minimized through proper stormwater management and onsite construction techniques. Best management practices will be included as part of project's design to remove sediments and other pollutants from stormwater. Soil erosion and sedimentation control plans will be implemented to avoid sediment discharge to surface waters.

Alternatives that include minimal impacts to natural resources and designs that address secondary impacts, such as stormwater runoff and water quality, are consistent with requirements of the Coastal Zone Management Program. And, while the project will not be funded with CZM Program funds, permits from the MDEQ and USACE will be obtained prior to initiation of any regulated activity. If the permits are granted, the project is automatically considered consistent with the CZM requirements, without any additional reviews, applications or authorizations.

3.9 Historic and Archaeological Resources

This section discusses the potential effects the project would have on historic buildings, historic sites, and archaeological sites. Collectively these sites and the structures, or artifacts they contain, are called cultural resources.

As part of Section 106 of the National Historic Preservation Act (NHPA) and Section 4(f) of the Department of Transportation Act, MDOT contacted the Michigan State Historic Preservation Office (SHPO) for assistance in identifying project area historic and archaeological sites (see Section 5 of this DEIS for more information on Section 4(f) impacts). The SHPO recommended that MDOT conduct historic and archaeological surveys to locate sites eligible for listing on the *National Register of Historic Places*. MDOT began cultural resource surveys by delineating an Area of Potential Effect (APE) for the project. The APE represents the maximum area potentially affected, both directly and indirectly, by the project and was approved at the outset of the analysis by the State Historic Preservation Office (SHPO) (see correspondence in Appendix E). The SHPO agreed the APE would have three tiers, with Tier 1 being the maximum direct acquisition area; Tier 2 being immediately adjacent to Tier 1 and taking into consideration possible indirect impacts, such as visual and noise impacts; and, Tier 3 being the West Delray area which may see new development in the future.

What is the National Historic Preservation Act (NHPA)?

Legislation passed in 1966 establishing the federal government's policy on historic preservation and the national historic preservation program through which that policy is implemented.

What is the Area of Potential Effect (APE)?

The APE is the area within which a project may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

What is the National Register of Historic Places (NRHP)?

The NRHP, established under the NHPA of 1966, is the official list of cultural resources worthy of preservation maintained by the National Park Service. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture.

Study Team historians conducted an analysis to identify potential historic properties within the study area that potentially meet the minimum criteria of eligibility for listing on the NRHP. The NRHP has established criteria for determining historic significance. These criteria require a property to have integrity of location, design, setting, materials, workmanship, feeling, and association. To be eligible, properties typically must be at least 50 years old, remain fairly unaltered, and meet one or more of the *National Register* criteria for significance:

A) Property is associated with events that have made a significant contribution to the broad patterns of our history.

B) Property is associated with the lives of persons significant in our past.

C) Property represents the distinctive characteristics of a type, period, or method of construction; or represents the works of a master; or possesses high artistic values; or represents a significant and distinguishable entity whose components lack individual distinction.

D) Ability to yield information important in prehistory or history (usually archaeological sites).

Surveys of historic and archaeological resources took place within the APE in 2006 and 2007. The survey results, project impacts, and mitigation measures are described in two reports.[14] Figure 3-35 identifies the recommended historic aboveground sites eligible for the *National Register* within the APE. The SHPO, in a letter dated December 11, 2007 (see correspondence in Appendix E), commented on the sites that appear to meet the criteria for listing in the *National Register*. Archaeological sites are not shown on Figure 3-35 to prevent looting/destruction/desecration.

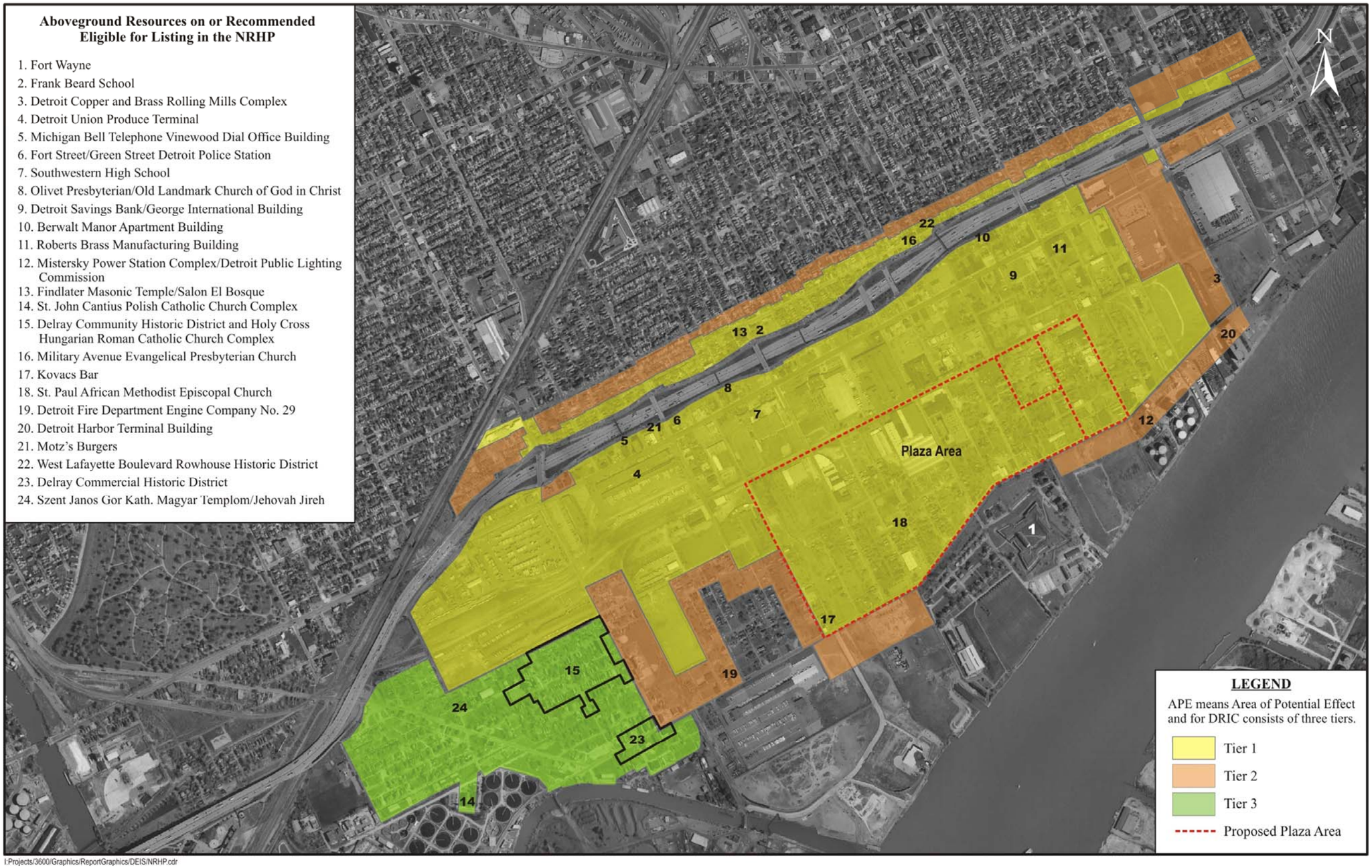
3.9.1 Archaeological Resources Impacts

3.9.1.1 No Build Alternative

Under the No Build Alternative, there would be no government-sponsored effect on any archaeological resources.

[14] Commonwealth Cultural Resources Group, Inc., *Archaeological Phase I and Phase II Investigations of the Detroit River International Crossing (DRIC) Project Detroit, Wayne County, Michigan*, October 2007; Commonwealth Cultural Resources Group, Inc., *Aboveground Resources Survey for the Detroit River International Crossing (DRIC) Study Detroit, Wayne County, Michigan*, January 2008.

Figure 3-35
Aboveground Resources on or Recommended Eligible for Listing in the National Register of Historic Places (NRHP)
Detroit River International Crossing Study



I:Projects/3600/Graphics/ReportGraphics/DEIS/NRHP.cdr

Note: Tier 1 is the maximum direct acquisition area. Tier 2 is immediately adjacent to Tier 1 and takes into consideration possible indirect impacts such as visual and noise impacts. Tier 3 is the West Delray area which may see new development in the future.

Source: Commonwealth Cultural Resources Group, Inc. and The Corradino Group of Michigan, Inc.

3.9.1.2 Build Alternatives

Numerous areas examined during the archaeological field study exhibited heavy degrees of disturbance. Most locations produced little or nothing of archaeological value, being generally limited to post-World War II discard or recent demolition activities. No evidence of prehistoric or historic Native American land use was observed.

Research and field review found two recommended *National Register* eligible archaeological sites (Sites 20WN1132 and 20WN1133) for all of the DRIC alternatives. A third recommended site (20WN1134) outside all of the DRIC alternatives was also discovered. The sites are historic and contain items such as glass and ceramic shards from the 1885-to-1900 era. It was determined that no prehistoric archaeological resources are affected by any of the DRIC alternatives. After extensive archaeological investigations, there was no field verification of the previously-reported sites (20WN3 and 20WN6); and, the extensive soil disturbance reflects a very low potential preservation of these sites. It was determined, in consultation with the SHPO, that the two newly-discovered historic *National Register*-eligible archaeological sites (20WN1132 and 20WN1133) would sustain an adverse effect by DRIC implementation. It was further determined that these sites were significant for the information they could yield and not for preservation in place and are, therefore, not subject to Section 4(f). Because there are adverse effects to these archaeological sites, a Memorandum of Agreement (MOA) shall be executed with the State Historic Preservation Office stipulating the mitigation required through archaeological data recovery. It will be included as an attachment to the FEIS. A draft MOA is included in Appendix E. The archaeological collections from these sites will be catalogued and delivered to an archival facility approved by the State of Michigan.

What is Section 4(f)?

Section 4(f) of the Department of Transportation Act of 1966 states that no transportation project should be approved which requires the "use" of any publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, or historic site unless there is no feasible or prudent alternative to use of such land.

What are Prehistoric Archaeology and Historic Archaeology?

Prehistoric archaeology is the study of the past before historical records began. It deals with ancient cultures that did not have writing of any kind.

Historic archaeology is the study of the recent past, for which written documentation is available.

3.9.2 Aboveground Resources Impacts

3.9.2.1 No Build Alternative

Under the No Build Alternative, there would be no government-sponsored effect on any aboveground historical resources. Some older structures will likely be abandoned and may be lost, like the McMillan School in Delray, if past trends continue.

3.9.2.2 Build Alternatives

The following are in, or partially in, the footprint of all DRIC alternatives (refer to Figure 3-9). Reference is made to Section 5 of this document for more information on these Section 4(f) properties.

- The Berwalt Manor apartment building at 760 Campbell Street is recommended eligible for the *National Register*. Every Build Alternative will require the removal of this property resulting in an adverse effect.

- Kovacs Bar at 6892 West Jefferson Avenue is recommended eligible for the *National Register*. Every Build Alternative will require the removal of this property resulting in an adverse effect.

- St. Paul African Methodist Episcopal Church at 585 South Rademacher Street is recommended eligible for the *National Register*. Every Build Alternative will require the removal of this property resulting in an adverse effect.

The following are in, or partially in, the footprint of some of the DRIC alternatives, as defined below. Reference is made to Section 5 of this document for more information on these Section 4(f) properties.

- The Frank Beard School, at 840 Waterman Street is already on the *National Register*. DRIC Alternatives #1, #2, #5, #7, #9, and #16 would use between 0.1 and 0.2 acres of school property. The area needed is parking and a small piece of lawn. Alternatives #3, #11 and #14 would not require use of school land.

- Detroit Savings Bank/George International Building at 5705 West Fort Street is recommended eligible for the *National Register*. DRIC Alternative #5 would require the demolition of buildings resulting in an adverse effect. The demolition is considered a "use" under Section 4(f). The other DRIC alternatives would have no effect on this site.

What is *Use* of a Section 4(f) Property?

Use means: 1) permanent incorporation into a transportation facility; or, 2) proximity impacts so severe that the activities, features or attributes that qualify the property are substantially impaired (visual impacts are not normally considered a use).

For the properties cited above that have an adverse effect (i.e., the Berwalt Manor, Kovacs Bar, St. Paul AME Church, Frank Beard School and Detroit Savings Bank/George International Building), a Memorandum of Agreement (draft MOA, found in Appendix E) will be necessary and will be included in the FEIS. It will stipulate conditions that mitigate impacts to the properties adversely affected.

The following are recommended eligible for the *National Register* and within the APE but outside of the project footprint. No property from these sites would be used. Implementing any of the DRIC alternatives is expected to have no effect or no adverse effect on these sites. Because there is no use of these sites they are not discussed in Section 5 of this document, but they are documented in the *Above Ground Resources Technical Report*.

- Mistersky Power Station Complex/Detroit Public Lighting Commission at 5425 West Jefferson Avenue.
- Military Avenue Evangelical Presbyterian Church at 1000 North Military Street.
- The West Lafayette Boulevard Rowhouse Historic District along West Lafayette Boulevard from Military Avenue to Cavalry Street.
- Fort Wayne at 6053 West Jefferson Avenue.
- The Detroit Copper and Brass Rolling Mills Complex at 174 South Clark Street.
- The Detroit Union Produce Terminal at 7210 West Fort Street.
- The Michigan Bell Telephone Building at 7420 West Fort Street.
- The Fort Street/Green Street Detroit Police Station at 7140 West Fort Street.
- Southwestern High School at 6921 West Fort Street.
- Olivet Presbyterian/Old Landmark Church of God in Christ at 6908 West Fort Street.
- Roberts Brass Manufacturing Building at 5436 West Fort Street.
- Findlater Masonic Temple/Salon El Bosque at 6701 West Lafayette Boulevard.
- St. John Cantius Polish Catholic Church Complex at 844 South Harbaugh Street.
- Delray Community Historic District generally bounded by West End Street to the east, Melville Street to the south, Leigh Street to the west, and Thaddeus Street to the south (includes the Holy Cross Hungarian Roman Catholic Church Complex at 8423 South Street which is also eligible for the *National Register* as an individual resource).
- The Detroit Fire Department Engine Company No. 29 at 7600 West Jefferson Avenue.
- The Detroit Harbor Terminal Building at 4468 West Jefferson Avenue.
- Motz's Burgers at 7208 West Fort Street.
- Delray Commercial Historic District generally along West Jefferson Avenue between West End Street and Sloan Street.
- Szent Janos Gor Kath. Magyar Templom/Jehovah Jireh at 441 South Harbaugh Street.

3.9.3 Traditional Cultural Properties

Traditional cultural properties are most frequently associated with Native American sacred places. They are defined as being eligible for listing on the *National Register* because of the association with the traditional practices or beliefs of a living community. Those beliefs are rooted in that community's history. They are important to maintaining the continuing cultural identity in that community.

Early coordination letters were sent to the 12 federally-recognized Tribes of Michigan. They were invited to Section 106 consultation on the undertaking and any potential impacts to their respective Traditional Cultural Properties. Three Tribes responded including the Match-E-Be-Nash-She-Wish Band of Potawatomi Indians (Gun Lake Tribe), the Pokagon Band of Potawatomi and the Hannahville Indian Community. None of these Tribes identified any known Traditional Cultural Properties within the Area of Potential Effect for this undertaking (see correspondence in Appendix F).

The Pokagon Tribe sought to consult regarding treaty rights for open border crossings by Native Americans and Canadian First Nations people. FHWA deferred to the Department of Homeland Security and U.S. Customs Agency regarding consultation on this subject as it was deemed to be outside the boundaries of the DRIC undertaking. FHWA indicated its limits of authority had been reached with the Pokagon Band on rights to open border crossings.

Both the Hannahville Indian Community and the Gun Lake Tribe asked to be consulted should any Native American historic sites or burials be discovered. No prehistoric or historic Native American sites were discovered during the archaeological surveys. Therefore, there are no known Tribal-owned properties or Traditional Cultural Resources impacted by this undertaking and Section 106 consultation has been completed.

It is agreed, however, in the event of accidental discovery of Native American human remains during construction, that these two Tribes will be contacted for consultation in accordance with the appropriate federal and state laws, rules and regulations regarding such finds.

An "unanticipated finds" plan will be developed to provide detailed procedures to deal with significant historic resources which may be identified during project implementation. This plan will establish procedures to evaluate and treat these resources. The procedures include stopping work, examining findings, determining eligibility and documenting results.

3.9.4 Summary of Cultural Resources Impacts

No Build Alternative

A continuation of past trends is expected. This includes older structures being abandoned. The DRIC analysis has identified some historic resources that may be potentially eligible for the *National Register*. These would now have a better opportunity for grants and loan program for stabilization/restoration. Specifically, if the proposed historic district is recognized by the City of Detroit and included in its historic district ordinance, it would be eligible for federal and/or state historic preservation tax credits. Other historic resources identified can be nominated to the NRHP and, if accepted, may be eligible for certain grant and/or loan programs.

Build Alternatives

A project results in an adverse effect on an historic property when it diminishes those characteristics that make it historically significant. Activities that may result in an adverse effect include removal, landscape changes, isolation of a property from its setting, and the introduction of visual, audible or atmospheric elements out of keeping with the character of the property.

Table 3-26 lists the effects on recommended eligible *National Register* properties by DRIC alternative. Each of the DRIC alternatives would have an adverse effect on some resources recommended eligible for the *National Register of Historic Places*. All of the DRIC alternatives would remove the Berwalt Manor Apartment Building, Kovacs Bar, and the St. Paul African Methodist Episcopal Church. DRIC Alternative #5 would also remove the Detroit Savings Bank/George International Building and property from the Beard School. (DRIC Alternatives #1, #2, #7, #9 and #16 would also require some property from the Beard School.)

Each of the DRIC alternatives would have an adverse effect on two archaeological sites (Sites 20WN1132 and 20WN1133). These sites are historic and contain items such as glass and ceramic shards from the 1885-to-1900 era. It was determined that the two historic archaeological sites were more significant for the information they could yield and not for preservation in place and are, therefore, not subject to Section 4(f). It was further determined no prehistoric archaeological resources are affected by any of the DRIC alternatives.

Table 3-26
Summary of Project Effects on Recommended
National Register Eligible Cultural Resources
Detroit River International Crossing Study

	Site[a] \ Alternative	#1	#2	#3	#5	#7	#9	#11	#14	#16
1	Fort Wayne	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
2	Frank Beard School	Adverse effect: 0.2 acres from site needed	Adverse effect: 0.2 acres from site needed	No adverse effect	Adverse effect: 0.1 acres from site needed	Adverse effect: 0.2 acres from site needed	Adverse effect: 0.2 acres from site needed	No adverse effect	No adverse effect	Adverse effect: 0.2 acres from site needed
3	Detroit Copper and Brass Rolling Mills Complex	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
4	Detroit Union Produce Terminal	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
5	The Michigan Bell Telephone Vinewood Dial Office Building	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
6	Fort Street/Green Street Detroit Police Station	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
7	Southwestern High School	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
8	Olivet Presbyterian/Old Landmark Church of God in Christ	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
9	Detroit Savings Bank/George International Building	No adverse effect	No adverse effect	No adverse effect	Adverse effect: removal	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
10	Berwalt Manor Apartment Building	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal
11	Roberts Brass Manufacturing Building	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
12	Mistersky Power Station Complex/ Detroit Public Lighting Commission	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
13	Findlater Masonic Temple/Salon El Bosque	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
14	St. John Cantius Polish Catholic Church Complex	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
15	Delray Community Historic District and Holy Cross Hungarian Roman Catholic Church Complex	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
16	Military Avenue Evangelical Presbyterian Church	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
17	Kovacs Bar	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal
18	St. Paul African Methodist Episcopal Church	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal	Adverse effect: removal
19	Detroit Fire Department Engine Company No. 29	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
20	Detroit Harbor Terminal Building	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
21	Motz's Burgers	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
22	West Lafayette Boulevard Rowhouse Historic District	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect	No adverse effect
23	Delray Commercial Historic District	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
24	Szent Janos Gor Kath. Magyar Templom/Jehovah Jireh	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
	20WN1132	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery
	20WN1133	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery	Adverse Effect: Mitigation through archaeological data recovery

[a]Refer to Figure 3-35 for site location.

Sites with shading have an adverse effect

Sites in red and bold are likely a Section 4(f) use under at least 1 alternative (see Section 5 of this report)

Source: Commonwealth Cultural Resources Group, Inc. and The Corradino Group of Michigan, Inc.

Use of historic resources is avoided when prudent and feasible. When they cannot be avoided, impacts are minimized and/or mitigated. Because every DRIC alternative would use an historic property, mitigation measures must be developed, should any of these alternatives be advanced after the public hearing. These measures are to be developed in consultation with the SHPO, the community, and the federal Advisory Council on Historic Preservation. Information, which covers impacts to Section 4(f) properties, is presented in Section 5 of this document.

3.10 Parkland and Public Recreation Land

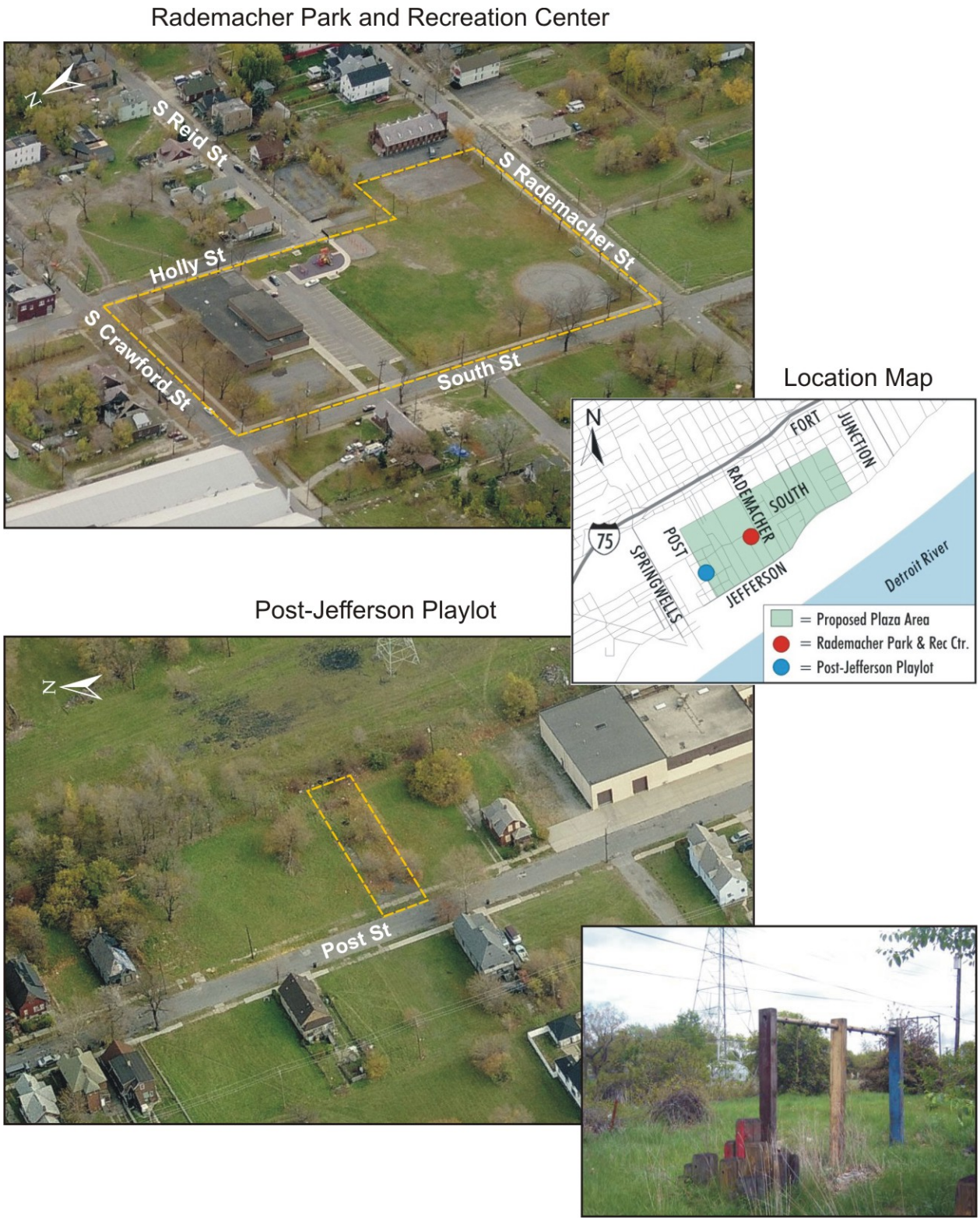
This section reviews impacts to parks and recreation facilities directly affected by the DRIC alternatives.

3.10.1 Existing Parks and Recreation Resources

Two parks and one recreation center fall within the footprint (acquisition area) of the project (Figure 3-36). The South Rademacher Playground and the South Rademacher Community Recreation Center are proposed for complete removal (use) with every DRIC alternative, as they fall within the plaza area. (Note that Section 5 of this DEIS covers impacts to Section 4(f) properties, including parks, and the proposed measures to minimize harm.) The Post-Jefferson Playlot, falls within the west edge of the plazas and is proposed for complete removal. These parks are under the control of the Detroit Recreation Department. Descriptions from the Recreation Department's *Strategic Master Plan* are summarized below.

- The South Rademacher Recreation Center's main facilities include an arts and crafts room, games room, kitchen, weight room and small gymnasium. It was one of nine recreation centers closed in Detroit, January 2, 2006. The surrounding park is 3.6 acres. It has a new play structure and swings, a small picnic area, and a large, open field with a softball diamond. There is ample room on this site for additional facilities for picnicking and court games such as volleyball and horseshoes. The basketball court is in very poor condition. Weekly field observations indicate the park is little used, particularly since the opening of the nearby Delray Recreation Center with indoor basketball, outdoor play equipment and other recreational equipment/facilities.

Figure 3-36
Affected Parks
Detroit River International Crossing Study



Source: City of Detroit and The Corradino Group of Michigan, Inc.

- The Post-Jefferson Playlot is a tiny, overgrown playlot in a neighborhood of many vacant lots. It appears to be abandoned. It has a few remnants of its facilities, which dates its likely period of development to the 1970s-80s.

Clark Park is near the east limit of probable project construction. The Clark Street intersection with the southbound service drive along I-75 (Lafayette) would be reconstructed, but preliminary engineering indicates this can be done with no effect to Clark Park. Access to the park would not be affected.

Fort Wayne is a historic site. Its fields are used for soccer. There would be no use of these lands by a DRIC alternative, so it would not suffer any impacts as parkland.

The Delray Boat Ramp provides river access for a fee. It is owned by Detroit Edison. It is not publicly-owned parkland and is not protected by Section 4(f). Recently the Department of Homeland Security closed river access at Riverside Park near the Ambassador Bridge. It is not yet known whether similar action would apply to the Delray Boat Ramp.

It is noted there are no properties affected by any DRIC alternative that are funded by the Land and Water Conservation Fund, referred to as Section 6(f) lands.

3.10.2 Summary of Parkland Impacts

No Build Alternative

Past trends will continue with the No Build Alternative. This will include the degradation or loss of existing park/recreational facilities, such as the Rademacher Center.

Build Alternatives

With the DRIC alternatives, the effects would be:

- South Rademacher Playground at 6501 South Street is located in the plaza area of every DRIC alternative. It would be removed (used) by the plaza.

- South Rademacher Community Recreation Center at 6501 South Street is located in the plaza area of every DRIC alternative. It would be removed (used) by the plaza.

- Post-Jefferson Playlot at 577 South Post is located in the plaza area of every DRIC alternative. It would be removed (used) by the plaza. Its significance is under discussion with the Detroit Recreation Department and FHWA to determine whether it is protected by Section 4(f).

3.11 Visual Conditions

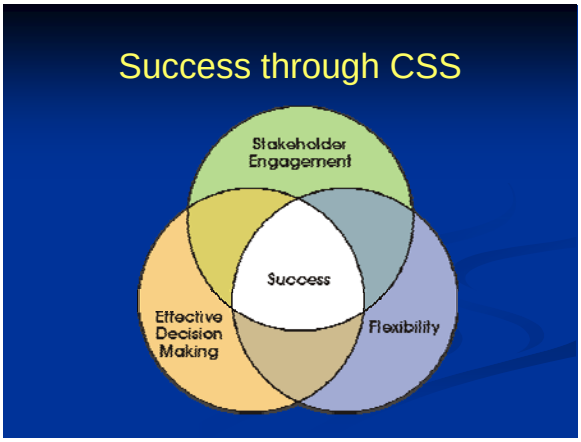
A new bridge would present a significant new element of the visual landscape. Other components of the project would also result in fundamental changes. Each day over 100,000 people driving on I-75 would see the ramps to a plaza and the reconstructed bridges across I-75.

When the Practical Alternatives were narrowed to corridors north and south of Fort Wayne, other historic sites near a major bridge were examined. The Presidio at the foot of the Golden Gate Bridge in California, and Fort Michilmackinac at the foot the Mackinac Bridge in Michigan, demonstrate compatibility of an historic fort with a large bridge. As in those situations, DRIC Study Team historians have judged there would be "no adverse visual effects" on Fort Wayne.

3.11.1 Analysis Approach

Consistent with the Context Sensitive Solutions (CSS) approach to the project, workshops were conducted beginning with topics such as land use in Delray, and how the community envisioned its future. Then, workshops were held on visual themes, and how they could be integrated into engineering elements. The workshops with the public explored the types of visual and urban design treatments that could enhance their environment as they see it evolving.

Context Sensitive Solutions Process



Source: Michigan Department of Transportation

At the writing of the DEIS, the stakeholder engagement workshops on bridge aesthetics, including work by the Canadian DRIC team, resulted in the bridge concepts illustrated in Figures 3-37 and 3-38. Likewise, the effects on the land use/urban design of the area are shown in Figures 3-17A and 3-17B as well as Figures 3-39 through 3-42. Based on public input, implementation of this proposed plan could have a positive impact on other parts of Detroit and nearby communities that are outside Detroit because a revitalized Delray would help address the long-term neglect of the area that has caused a number of "inner-city" ills, such as declining property values, crime, arson and the like.

Figure 3-37
Cable-stay Bridge Concept Developed through Stakeholder Engagement Workshops
Views from U.S. Looking Towards Detroit River
Detroit River International Crossing Study

Crossing X-10B

Crossing X-11

Source: Parsons Transportation Group

Figure 3-38
Suspension Bridge Concept Developed through Stakeholder Engagement Workshops
Views from U.S. Looking Towards Detroit River
Detroit River International Crossing Study

Crossings X-10A & B

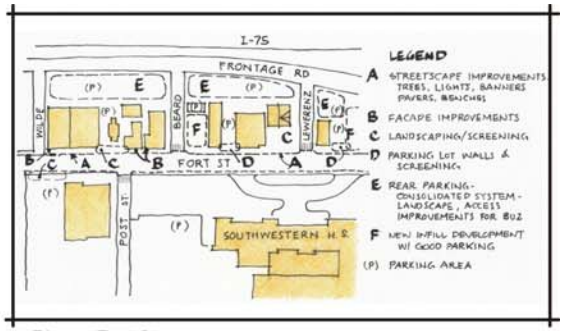
Crossing X-11

Source: Parsons Transportation Group

Figure 3-39
Urban Design Treatments along Fort Street near Southwestern High School
Detroit River International Crossing Study

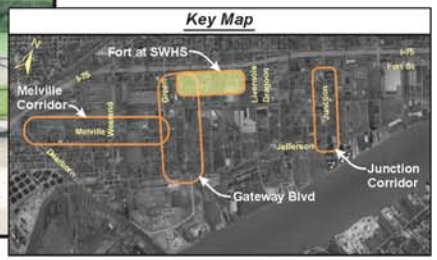
Public Improvements

Private Investment



Plan ~ Fort St.

Fort Street at Southwestern H.S. ~ Looking Easterly

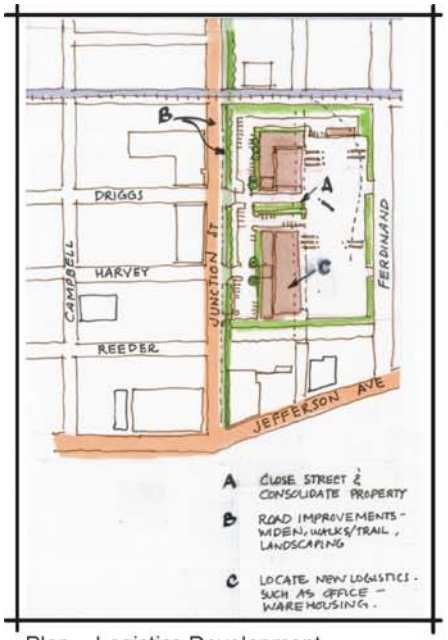


Source: The Corradino Group of Michigan, Inc.

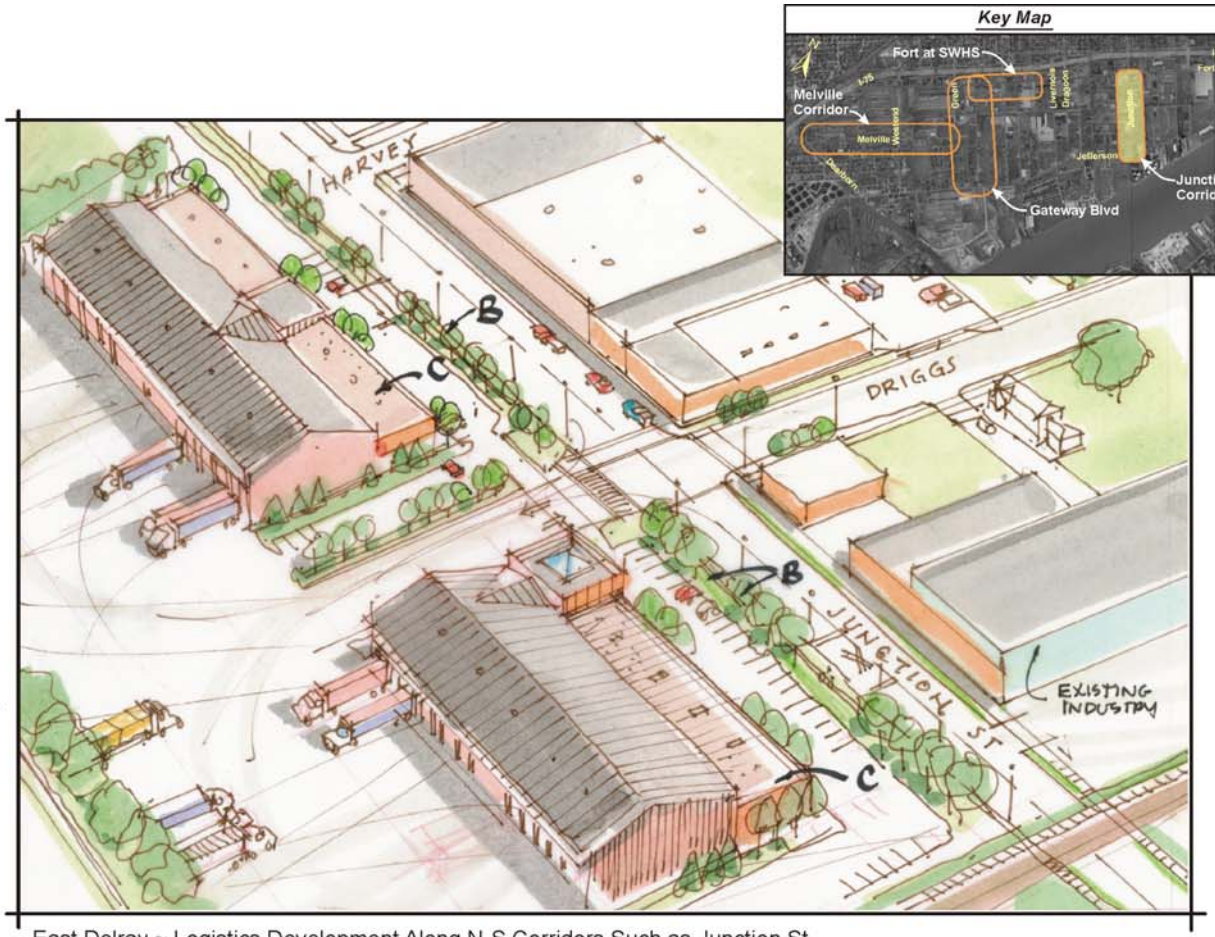
Figure 3-40
Urban Design Treatments along the Proposed Gateway Boulevard South of Fort Street
Detroit River International Crossing Study

Source: The Corradino Group of Michigan, Inc.

Figure 3-41
Urban Design Treatments along Junction near the Delray Rail Line
Detroit River International Crossing Study



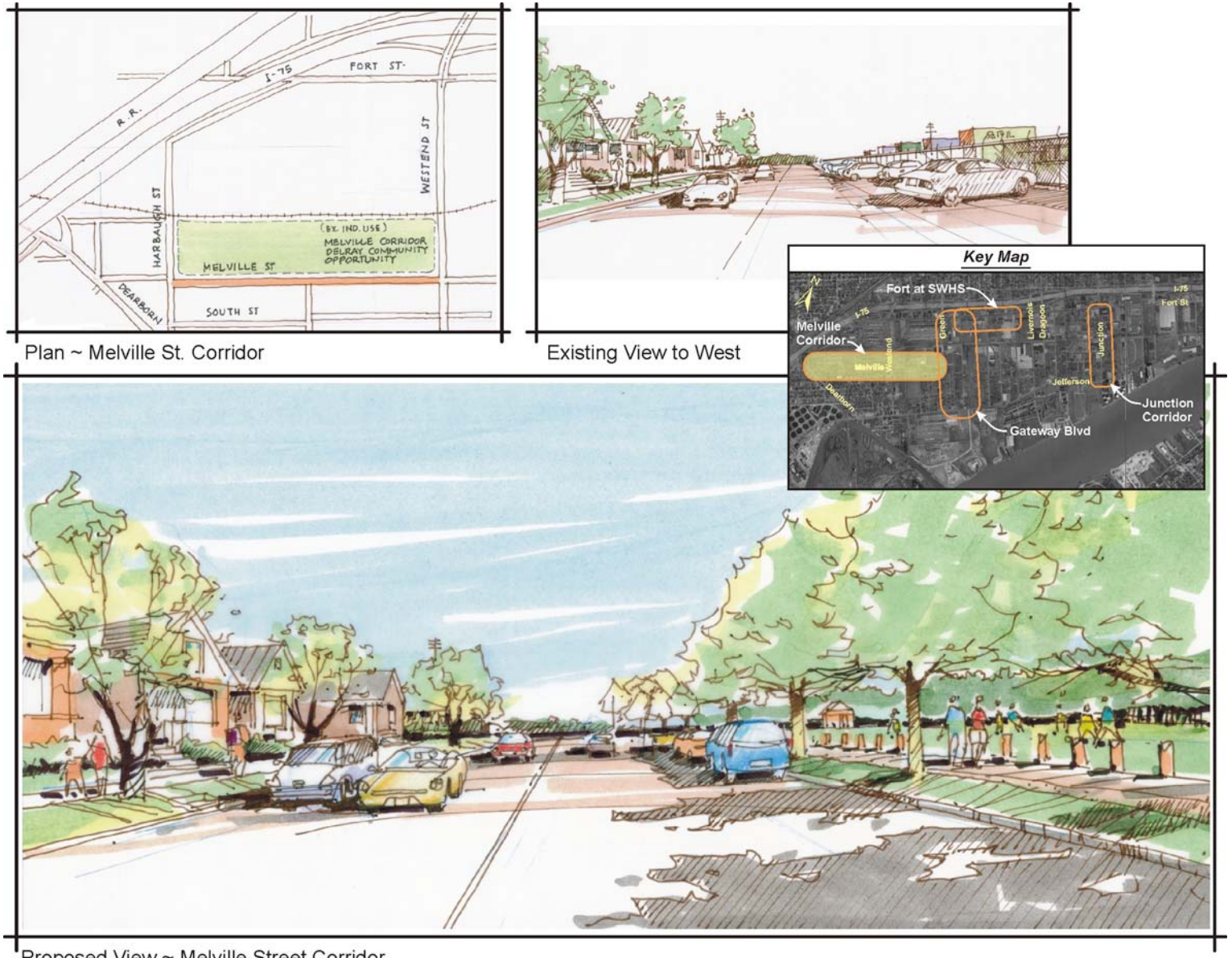
Plan ~ Logistics Development
East Delray - Along Junction St.



East Delray ~ Logistics Development Along N-S Corridors Such as Junction St.

Source: The Corradino Group of Michigan, Inc.

Figure 3-42
Urban Design Treatments along Melville near Westend Street
Detroit River International Crossing Study



Source: The Corradino Group of Michigan, Inc.

Three topics that will continue to be discussed as the work goes forward are the area in the middle of the trumpet interchange and the buffer zone around the plaza. The first offers the opportunity to express the design theme identified by the community in the large area along Fort Street that the new interchange would occupy. The second is a point of further discussion with U.S. Customs and Border Protection. It is not yet known the extent to which trees or screening vegetation would be allowed in the landscape buffer around the plaza. The clear spaces exterior to the plaza are needed for security. The third subject to be given more attention is the visual relationship of the new crossing to Fort Wayne.

Fort Street Area

Source: The Corradino Group of Michigan, Inc.

3.11.2 Summary of Visual Impacts

No Build Alternative

It is assumed that if the Ambassador Bridge Enhancement Project is built, there will be a visual impact on the existing 75-year-old bridge. If the project is not built, no change in or stimulus to change the visual landscape is foreseen with the No Build Alternative.

Build Alternatives

With every DRIC alternative there would be a change in the visual landscape of Fort Wayne. The visual exposure of Fort Wayne from the proposed new bridge is expected to be positive by creating more awareness and allowing easier access thereby stimulating attendance.

All DRIC alternatives would change the visual landscape within Delray. There is little to differentiate among DRIC alternatives, as the two candidate plazas are very similar, and would be buffered from the surrounding community in similar ways. Likewise, the CSS efforts apply to all the DRIC proposals and will continue into project design and implementation.

3.12 Lighting

Lighting of a new bridge and plaza are important from several standpoints: safety, light pollution, energy use, bird migration and aesthetics. These considerations must be balanced to ensure safety, quality of life, and ecological sustainability.

What is Lighting and Light Pollution?

Appropriate lighting enhances safety and can offer a dramatic visual effect and increased safety. Light pollution creates adverse effects, including glare, light clutter, and decreased visibility.

3.12.1 Lighting Considerations

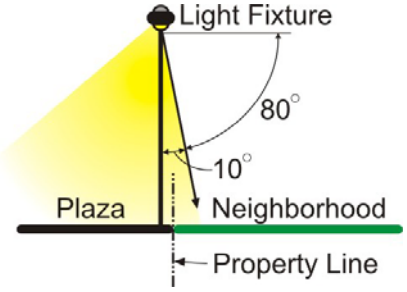
Standard roadway and highway bridge design specifications define how bright lighting must be for safe vehicle operation. These specifications would guide design along I-75 and the ramps to the plaza, as well as on the new bridge to Canada.

On the plaza there would be additional requirements. The General Services Administration has guidelines for their facilities found in GSA document P100, "Facilities Standards for the Public Buildings Service" as follows:

- *Placement of lights should consider glare and contrast to allow for better night vision. Illumination must not allow light to "trespass" off of building property. GSA recommends a minimum 80-degree cutoff of light fixtures to achieve this.*

- *Lighting levels need to consider surveillance technology, to avoid areas that are too bright or are in shadows. Lower levels of light in specific locations may be desirable for safety reasons or to accommodate certain types of camera technology.*

What is an 80-degree Cutoff?



More specific to the plaza is the "U.S. Land Port of Entry Design Guide," (March 15, 2006, GSA), which notes:

- *High contrast between dark areas and the bright booth area is a problem for inspectors, so approaches to Primary Inspection must be brightly lit. Lighting must be adequate to make the booths and lanes visible at night. Lighting at the traffic approach areas must have low cut-off angles to reduce glare into the officer's face. Light levels must be graduated, rather than sudden changes in levels.*

- *For the critical inspection areas, especially vehicle primary and secondary, it is essential that lighting be adequate and provide accurate color rendition, since officers must be able to identify a variety of substances and materials. The booth must have dimmable interior lights to allow the officer to adjust light levels in each booth. A light must be placed in front of each booth pointing at the rear of the vehicle to illuminate the vehicle license plates. Additional spotlights must be provided angled into the vehicle to illuminate the passengers and vehicle contents. Lights must also illuminate the underside of the vehicle. Lights must illuminate vehicles in a license plate reader zone.*

- *To minimize shadows, light must come from two or more directions.*

It is anticipated where these publications are not in full agreement, the U.S. Land Port of Entry Design Guide would prevail.

The new bridge to Canada is also subject to special considerations. Both cable-stay and suspension bridges present a dramatic profile that can be highlighted at night. New lighting technologies offer opportunities to create visual effects at relatively low light levels. Light-emitting diodes are also very energy efficient and maintenance free.

Source: The Corradino Group of Michigan, Inc.

Source: The Corradino Group of Michigan, Inc.

The new bridge towers would be tall enough that they must have aircraft warning lights following Federal Aviation Administration guidelines.

While noting that bridge lighting is not the only feature related to concerns about migratory birds, the bridge lighting design must take into consideration migrating birds in the Detroit River corridor. This concern is addressed in Section 3.5.2 of the *Wetland, Threatened and Endangered Species and Coastal Zone Management Technical Report,* where best management practices of the U.S. Fish & Wildlife Service are listed. Best management practices will be reviewed in consultation with the USFWS as design of the bridge advances. During design, contact with USFWS will determine which recommendations are appropriate, or if additional recommendations or methods are available to minimize avian mortality.

What Does Lighting Have to do with Bird Migration?

Research has found that birds can be attracted to or disoriented by lighting, especially on tall structures, and bird "strikes" including fatalities can result.

3.12.2 Summary of Lighting Impacts

No Build Alternative

A continuation of past trends is expected with the No Build Alternative. They include night lighting from the Ambassador Bridge. A proposed second span of the bridge, if approved, would alter the existing night light pattern. On the other hand, street lighting in Delray is often in poor condition because of low maintenance. No change is expected.

Build Alternatives

Artificial lighting can have a number of effects on the surrounding area. While fixtures are generally designed to direct light to cover only the areas that need illumination, light is often directed laterally or upwards (either intentionally or unintentionally), contributing to "light pollution." Light pollution may:

- Affect the natural responses of plants and animals to light. Light pollution can disrupt feeding, migration, or defensive behaviors of birds, mammals, fish, invertebrates, reptiles and amphibians.

- Disturb sleep patterns in humans, thereby influencing quality of life. Some researchers believe that light pollution also may have other health effects.

- Interfere with the observation of the nighttime sky. Stars, planets, and other elements of the night sky are less visible in areas where artificial lighting is directed skyward.

There is no known light-sensitive land use that would be affected by any DRIC alternative, and no known difference among alternatives. The entire area along I-75 and Fort Street is now illuminated by streetlights; that would not change, with or without the DRIC project.

The two plaza options vary in one way. Plaza P-c (Alternatives #7, #9, and #11) would extend one block further east than Plaza P-a. The river crossing alignment (X-11) that ties into Plaza P-c on its east side would require relocations along Campbell Street. The nearest dwelling units remaining would be on the east side of Junction Street. Those houses would experience light impacts primarily from the bridge as it comes down to grade at the plaza.

The light from Plaza P-a (Alternatives #1, #2, #3, #5, #14, and #16 with Crossings X-10A or X-10B) is expected to penetrate into the residential area remaining on the east

side of Campbell Street. It is anticipated that project lighting levels here are expected to be higher than they are now.

Both plazas would end at Post Street on their west side. Houses may remain in the block to the west and could be affected by light pollution.

The light falling on Fort Wayne comes from Jefferson Avenue. It is not now broadly illuminated at night. It is anticipated that, even with the planned buffering of the nearby plaza, there would be an increase in night lighting within Fort Wayne with every DRIC alternative. The proposed X-11 crossing is closer to Fort Wayne than the proposed X-10A or X-10B crossings.

A consultation process related to bridge lighting will be necessary during project design to balance the safety and navigational lighting needs of the Federal Aviation Administration and U.S. Coast Guard (river navigation) with other concerns, such as aesthetics. Best management practices to protect migrating birds would be reviewed with the U.S. Fish & Wildlife Service.

3.13 Contaminated Sites

This section summarizes an *Initial Site Assessment and Preliminary Site Investigation Technical Report*.[15] This describes phases of the investigation of sites potentially contaminated with pollutants. The assessment for potential contamination focuses on properties that could pose a health or safety risk to workers engaged in constructing the project and could otherwise delay project construction due to encountering contamination and costly remediation. Properties assessed are those that could be acquired for the project that have known or suspected contamination.

What is an Initial Site Assessment (ISA)?

An ISA is a procedure involving historical research and searches of databases (EPA and MDEQ), followed by site visits, interviews and sometimes soil testing. The purpose is to determine if environmental contamination exists

What is a Preliminary Site Investigation (PSI)?

A PSI applies to sites that require further investigation because of indications in the Initial Site Assessment that contamination may be present. A PSI is usually performed after a Preferred Alternative is identified.

3.13.1 Background

The purpose of an Initial Site Assessment (ISA) is to investigate parcels of property for the presence of environmental contamination. This investigation leads to a determination of whether further investigation and/or remediation are needed. For the DRIC, each parcel was rated low, medium, or high with respect to contamination:

[15] The Corradino Group of Michigan, Inc, *Detroit River International Crossing Study, Initial Site Assessment and Preliminary Site Investigation Technical Report*, November 2007.

- Low (L) – These sites represent a low potential for environmental contamination. They include known current or former hazardous or petroleum handlers that have completed remediation activities. These sites do not need further investigation or remediation per the regulatory agency. Examples of this category are gas stations that have been designated "closed LUST" sites and businesses that handle hazardous materials or petroleum but are currently in compliance with applicable regulations.

- Medium (M) – Available information on the sites in this category indicated whether known soil and/or water contamination is being remediated or continued monitoring is required. Potential sites where former underground storage tanks may still be located are given this rating. So are petroleum storage facilities where there is contamination likely to be present. A facility with a LUST site that has not been closed is an example of a medium-rated site.

- High (H) – Information on the sites in this category indicate potential for contamination problems. In most cases, further assessment will be required to determine the actual presence and/or levels of contamination and the need for remedial action. This category includes "brownfield" sites that have not been assessed or remediated. It also includes current and former contaminated sites that have been characterized and/or remediated but restrict future uses, such as residential development or schools. An example of the latter is the former Detroit Coke Corporation property (downriver from Fort Wayne).

What is a LUST site?

LUST means a Leaking Underground Storage Tank. Tanks are now manufactured in such a way to prevent leaks or make them immediately detectable. Formerly, tanks had a single wall that could corrode or be punctured and contents sometimes leaked into the ground. If a LUST site is "closed" the regulatory agency has agreed that it has been cleaned up and no further work is needed.

What is a Brownfield?

A brownfield is an industrial or commercial property that is abandoned or underused and environmentally contaminated.

Parcels rated Medium and High require further investigation. They are examined through field sampling and laboratory testing of the materials to determine the type and degree of contamination, i.e., Preliminary Site Investigation (PSI).

3.13.2 Summary of Impacts Related to Contaminated Sites

No Build Alternative

The No Build Alternative would not involve disturbing contaminated properties or environmental cleanup.

Build Alternatives

Build Alternative Set #7/9/11 and Alternative #16 would impact 21 contaminated sites. Build Alternatives #1/2/3/14 would impact 19 sites. Build Alternative #5 would impact 17 contaminated sites.

The Initial Site Assessment examined more than 100 commercial, industrial and vacant sites for contamination impacts. Field reconnaissance and owner/occupant interviews were conducted. Environmental and historical land use maps/records were examined. The findings were used to rate the sites for their contamination impacts: Low, medium or high. Low rated sites do not need further examination.

What is Remediation?

Remediation means cleaning up environmental contamination to protect human health and the environment. Many kinds of remediation are possible, from soil removal, to groundwater cleanup, to putting a cap over the contamination - depending on the type of contamination and planned use.

Twenty-six sites that could be acquired for the project were identified (Figure 3-43 and Table 3-27). The Minergy and Yellow Freight sites are part of the former Detroit Coke Corporation manufactured-gas plant property Site Identification (SID) No. 90 and 90A. These sites have been characterized through EPA and Michigan Department of Environmental Quality (MDEQ) actions. Remediation is ongoing at the Detroit Coke site. Likewise, some remediation has been conducted at the Revere Copper & Brass site (upriver from Fort Wayne and labeled as SID No. 2 on Table 3-27), although some contamination remains.

Several of the medium- and high-rated sites have been in industrial use since the early 1900s, or before. These include relatively small metal fabrication/processing facilities, sites with LUSTs, and sites that historically handled hazardous materials and have not been investigated for contamination. The most common impacts associated with metal fabrication are metals and oils. Contaminated fill is a concern for the project area, particularly given the area's history of metal cast foundries.

Recommendations include Preliminary Site Investigation for most of the medium- and high-rated sites. Further assessment of the regulatory status and site conditions of other sites is also recommended. A PSI has been completed on two properties to which access was granted. Results are included in the technical report referenced earlier. Other PSIs will be completed once a Preferred Alternative has been selected and access can be obtained by provisions in Michigan law.

Figure 3-43
Medium- and High-rated Sites for Contamination
Initial Site Assessment[a]
Detroit River International Crossing Study

[a] Numbers represent sites identified by address in Table 3-28.

Source: The Corradino Group of Michigan, Inc.

Table 3-27
Contamination Summary – Medium- and High-rated Sites
Detroit River International Crossing Study

SID No.	Site Name	Address	Records/ Observations						Project Alternative#
			CERCLIS/NPL	MI Contam. Sites	LUST	UST	RCRIS (Haz. Waste)	Other	
2	Former Revere Copper & Brass Site	5851 W Jefferson	X	X			X	X	7/9/11
30	Metal Prep Technology	5650 W Jefferson				X		X	7/9/11
36	City of Detroit Recycling Center	127 S Campbell			X-C	X		X	7/9/11
38	L. Thomas Leasing	100 S Campbell						X	7/9/11
39	State Metal Co. (Bresler-Gordon Metals)	444 S Campbell						X	1/2/3/5/7/9/11/14/16
40	Wayne Scrap Iron & Metal	5824 W Jefferson						X	1/2/3/5/7/9/11/14/16
41	Edward Duffy & Sons Steel Tubing	5840 W Jefferson						X	1/2/3/5/7/9/11/14/16
44	Best Truck Driving School	151 Military	X					X	1/2/3/7/9/11/14/16
45	Peerless Metals/ Iron Metal Products	131 S Military				X		X	1/2/3/5/7/9/11/14/16
56	Former Sybill, Inc.	111 S Military	X				X	X	1/2/3/7/9/11/14/16
63	Parking Lot	6201 Hussar						X	1/2/3/7/9/11/14/16
65	Flor-Dri Supply Co. Warehouse	131 S Livernois					X	X	1/2/3/5/7/9/11/14/16
70	J&L Specialty Steel	300 S Livernois					X	X	1/2/3/5/7/9/11/14/16
73	International Specialty Tube, LLC	260 Crawford			X-O	X	X		1/2/3/5/7/9/11/14/16
78	Stan Sax Corporation	101 S Waterman					X		1/2/3/5/7/9/11/14/16
79	Universal Refrigeration	155 S Waterman						X	1/2/3/5/7/9/11/14/16
80	Former Cross Chemicals/Dytex Co.	205 S Waterman						X	1/2/3/5/7/9/11/14/16
82	Angeles Tire Repair	6666 W Jefferson				X		X	1/2/3/5/7/9/11/14/16
82A	Vacant Lots	711 S Waterman						X	1/2/3/5/7/9/11/14/16
88	Casino Towing	6734 W Jefferson					X	X	1/2/3/5/7/9/11/14/16
90	Minergy Detroit, LLC	7819 W Jefferson	X	X	X-O	X	X-T	X	1/2/3/5/14/16
90A	Yellow Freight	7701 W Jefferson	X	X	X-O	X	X-T	X	1/2/3/5/14/16
109	Dragoon Fort Service	6230 W Fort			X-O	X			1/2/3/5/7/9/11/14/16
113	City of Detroit Police Dept, Precinct #4	7140 W Fort			X-O	X	X		5
114	West Fort BP	7900 W Fort				X			16
115	Marathon Station	7960 W Fort			X-O	X			16

CERCLIS- Comprehensive Environmental Response, Compensation and Liability Information System.
NPL - National Priority List.
RCRIS- Resource Conservation and Recovery Information System; X denotes hazardous waste generator and T denotes waste treatment, storage or disposal facility (TSDF).
LUST - Leaking underground storage tank; X-C = Closed case; X-O = Open case.
UST - Underground storage tank.
Other - Other potential contaminated sites identified by reconnaissance and/or records.
Source: The Corradino Group of Michigan, Inc.

It is anticipated that some of the sites with limited surface-soil impacts from petroleum, metals, etc., can be remediated by limited soil removal. Sites with large areas of soil contamination may be amenable to capping to prevent exposure, especially if the contaminants are not volatile nor mobile. Contamination areas would be marked on all construction plans.

Appropriate procedures should be followed to locate and contain contaminated groundwater that may be encountered during water main, utility, or storm sewer work in the vicinity of contaminated sites. This includes: 1) determining the depth of shallow groundwater; 2) appropriately abandoning all groundwater monitoring wells; 3) properly evaluating any new utility cuts through contaminated areas (use appropriate backfill where shallow contaminated groundwater will be intercepted); and, 4) properly disposing of any contaminated media generated during construction (soil and groundwater). Standard mitigation should also include development of a risk management plan which includes a worker health and safety component.

3.14 Indirect and Cumulative Impacts – U.S. and Transboundary

Indirect impacts are caused by the project and are later in time or farther removed in distance than direct impacts, but are still "reasonably foreseeable."

Cumulative impacts result from the incremental impact of the project when added to other past, present, and reasonably foreseeable future projects regardless of what agency (federal or non-federal) or person undertakes such other actions.

3.14.1 Methodology

Figure 3-3 depicts the "zone of influence" in which the neighborhood/community relationships to the proposed DRIC crossing and transportation facilities serving them would be felt directly and indirectly. This area was established based on transportation/land use, community facilities and services interactions. It was reviewed with the Local Advisory Council and Local Agency Group of the Detroit River International Crossing Study, then revised and finalized based on that input.

The issues by which indirect/cumulative effects can be measured in this area include:

- Traffic changes associated with creating the DRIC
- Economic Impacts – Jobs
- Community Effects
  - Conversion of land uses
  - Number of residential units and business properties potentially affected

  - Effects on community cohesion
  - Potential environmental justice issues
  - Change in aesthetics
- Air Quality
  - Regional air quality effect
  - Study area carbon monoxide and particulate matter emissions
- Noise
  - Noise exposure of sensitive receivers (e.g., schools, places of worship, residential properties)
- Cultural Resources
  - Change in historic/archaeologic resources
  - Change in parklands
- Water
  - Water quality
  - Quantity of wetlands affected

The indirect effects are cited immediately below and summarized in Table 3-28. Cumulative impacts are reviewed later in this section. Impacts on each side of the border are presented in each section. On the Canadian side, they reflect the impacts of the crossing and plaza because at this point, the Canadian analysis of the Practical Alternatives for the access road is not complete. Nonetheless, work to date does not support further analysis of two alternatives for the access road: an end-to-end at-grade roadway or tunnel. Although an at-grade solution was found to be the least costly solution and carried fewer constructability risks, this alternative offers fewer benefits in terms of protecting community and neighborhood characteristics in comparison to the other alternatives. Similarly, the analysis did not support further investigation of an end-to-end tunnel. The limited additional benefits of an end-to-end tunnel solution do not justify the associated additional cost, when other solutions are available that offer similar benefits at less cost and with less risks during construction. This conclusion is based on the results of the analysis of Practical Alternatives, including:

- All of the access road alternatives will address the future transportation and mobility needs of the region, which was one of the primary objectives for the project. Providing a freeway will separate international and local traffic, reduce the likelihood of international traffic infiltrating other local roads to access the border and eliminate the need for the international truck traffic to stop and start up at the many traffic signals. This will greatly improve operations and safety for all motorists in this area.

Table 3-28
Summary of U.S. Indirect Impacts
The No Build Condition Versus the Build Condition
Detroit River International Crossing Study

Category	No Build	All DRIC Build Alternatives
Traffic	Domestic traffic increases are expected to be relatively small. Positive effects will be experienced in Mexicantown and along Fort Street (M-85) with completion of Ambassador Gateway Project.	Domestic traffic increases are expected to be relatively small. Positive effects will be experienced in Mexicantown and along Fort Street (M-85) with completion of Ambassador Gateway Project. The community north and south of I-75 will experience negative and positive indirect effects. Negative: More difficult for traffic to gain access to I-75 and move across it. Positive: Fewer trucks penetrating the area would reduce noise levels and improve air quality.
Economic Impacts	A continued jobs loss is expected in the SEMCOG region until about 2015 with relatively small net growth by 2030 compared to current conditions. In Wayne County and Detroit, a net loss in jobs can be expected, not just a loss of job growth.	A continued jobs loss is expected in the SEMCOG region until about 2015 with relatively small net growth by 2030 compared to current conditions. In Wayne County and Detroit, a net loss in jobs can be expected, not just a loss of job growth. The change in accessibility associated with a new bridge would create 1,800 new jobs in Wayne County, with a small number of these locating in Southwest Detroit near the I-94/Wyoming Avenue interchange in the vicinity of the Livernois-Junction Yard intermodal (truck/rail) terminal. Oakland County could stand to gain 900 jobs near Novi. The SEMCOG region could gain 3,350 jobs (including those noted above). All these jobs would come from outside Michigan.
Land Use	Existing land use patterns are expected to continue with little change in the region. Expected losses of population and jobs in Wayne County and Detroit could lead to abandonment of some current land uses.	Existing land use patterns are expected to continue with little change in the region. Expected losses of population and jobs in Wayne County and Detroit could lead to abandonment of some current land uses. Slightly offsetting this trend could be development associated with new jobs, noted above. They would require about 120 acres of land. There is enough brownfield space in Wayne County to accommodate the development. Other locations that could see additional jobs, like the I-96/I-696/I-275 interchange area in Oakland County, could absorb the development with no negative consequences foreseen. The possibility that a "Welcome Center" will be part of this project has been mentioned at several public meetings. At this time a decision as to whether a "Welcome Center" will be included has not been made, and is subject to further study. If a Welcome Center is to be included, it will be addressed as part of the FEIS.
Air Quality	Pollution from mobile sources is expected to decrease because of cleaner engines and fuels. The forecast loss of jobs may close some polluting industries.	Pollution from mobile sources is expected to decrease because of cleaner engines and fuels. The forecast loss of jobs may close some polluting industries. Sensitive receptors in the study area are not expected to be negatively impacted if development is properly located consistent with planning/zoning rules. Additional areas, particularly north of I-75 and near the Ambassador Bridge at Mexicantown, would benefit because of less truck traffic there.
Community Effects	Some housing rehabilitation can be expected to continue. Industrial/commercial uses will continue to be mixed with residential uses. Both uses may degrade as forecast loss in jobs and population over the next eight to ten years can be expected to result in property abandonment in spots.	Some housing rehabilitation can be expected to continue. Industrial/commercial uses will continue to be mixed with residential uses. Both uses may degrade as forecast loss in jobs and population over the next eight to ten years can be expected to result in property abandonment in spots. Other indirect community effects of the proposed DRIC alternatives are discussed throughout this table.
Noises/ Vibrations	No perceptible increases in noise and vibrations are expected overall. Some improvement is expected in Mexicantown with completion of Ambassador Gateway Project in 2009. Blasts from nearby room-and-pillar salt mining will continue to cause vibrations at annoyance levels in the area.	No perceptible increases in noise and vibrations are expected overall. Some improvement is expected in Mexicantown with completion of Ambassador Gateway Project in 2009. Blasts from nearby room-and-pillar salt mining will continue to cause vibrations at annoyance levels in the area, but the expansion potential towards Delray is reduced. The introduction of noise-attenuating walls along I-75, where none exist now, would benefit the nearby community. No vibrations from the project would affect the area.
Cultural Resources	Continuation of past trends expected with some older structures being abandoned. Potential exists in West Delray and in the area north of I-75 to protect the area's historical integrity and open an avenue to grant/loan programs for improving properties in historic districts identified in those two locations.	Continuation of past trends expected with some older structures being abandoned. Potential exists in West Delray and in the area north of I-75 to protect the area's historical integrity and open an avenue to grant/loan programs for improving properties in historic districts identified in those two locations. A positive and, at the same time, possibly negative indirect effect is possible on aboveground cultural resource sites in the study area that are on or recommended eligible for listing on the National Register of Historic Places. While several of these would not be directly impacted by the DRIC, care must be taken that "ripple-wave" development in the area not create a negative indirect impact on them. The FEIS will document the analysis and proposed mitigation for the Preferred Alternative.
Water Quality, Wetlands, Threatened and Endangered Species	Status quo is expected to be maintained, while recognizing some additional wetlands may form due to human activities at abandoned sites.	Recognizing no negative indirect effects are anticipated on wetlands, nor threatened and endangered species, some additional wetlands may form due to human activities. Further, government approvals of development that could be stimulated by building a new border crossing would avoid water quality impacts, ensuring proper treatment of water runoff/wastewater. Surface water runoff would decrease as there would be less total roofed/paved area.

Source: The Corradino Group of Michigan, Inc.

- The end-to-end tunnel alternative was found to offer no real advantages in terms of reducing impacts to properties, land use, natural features or cultural features.

- While an end-to-end tunnel alternative offers some advantages to air quality in the immediate corridor through lower particulate concentrations compared to the do-nothing alternative, through improvements to fuels and technology all the alternatives provide this same benefit to some degree.

- The benefits offered by an end-to-end tunnel in reducing particulate concentrations are offset somewhat by increases in concentrations of gaseous pollutants emitted over a larger area beyond the access road corridor from the ventilation buildings and these cannot be captured with current pollution control technology.

- The cost of the end-to-end tunnel was found to be three to six times more expensive than the other alternatives under consideration, representing a difference of between $2.5 and $3 billion. These costs are reflective of both the increased effort and materials needed to construct an end-to-end tunnel as well as the increased construction risks and complexities.

As a result, a “parkway” alternative, with a number of short tunnels, has been developed to reflect the Canadian analyses to date and agency/public input. The Canadian study team will complete the technical and environmental studies of the access road in the spring of 2008. The results of the technical and environmental studies, together with input from ministries, agencies, municipalities and stakeholders, as well as the general public, will be incorporated in the evaluation of the Practical Alternatives. This information will be included in selecting the end-to-end Preferred Alternative and documented in the FEIS. The Transboundary impacts of the access road will also be reported upon in the FEIS.

3.14.1.1 Traffic Changes

U.S.

The community north and south of I-75 would experience both positive and negative indirect effects as a result of the DRIC. The direct effects of traffic changes are described in Section 3.5.3 of this DEIS. The indirect effects in the DRIC study area are more circuitous traffic patterns to gain access to I-75 and move across it. At the same time, there would be fewer trucks penetrating the area north of I-75, which has long been a goal of the community. Related air quality effects in this area are discussed later in this section.

Canada

Analyses of the transboundary traffic impacts in Canada indicate every DRIC alternative would significantly improve overall traffic operations and meet overall road transportation system needs. The alternatives would also serve to improve or maintain existing levels of service at most intersections for the area around Huron Church Road. All users of the roadway would be able to move more efficiently and effectively through the corridor. Most international traffic would use the new mainline facility, either to the new crossing or rejoining Huron Church Road in the vicinity of the E.C. Row Expressway. The new crossing will provide commercial operators with another route to and from the United States, reducing the proportion of international truck traffic in the Huron Church corridor by almost 30 percent north of the E.C. Row Expressway. This will result in significant reductions in congestion and delay without the need for local infrastructure improvements. The details of the analyses supporting these impacts can be found in the report entitled, *Practical Alternatives, Evaluation Working Paper, Level 2 Traffic Operations Analysis*, prepared by URS Canada, in January 2007 and available on the project Web site (www.partnershipborderstudy.com).

3.14.2 Indirect Impacts – U.S. and Transboundary

3.14.2.1 Economic Impacts

U.S.

The direct economic effects of the DRIC are presented in Section 3.2 of this DEIS. The indirect effects are the result of accessibility changes associated with the proposed new border crossing. Those accessibility changes, discussed in Section 3.2.2, would shift about 3,350 jobs into the SEMCOG region, all from outside Michigan. Most of these jobs (1,800) would go to Wayne County, along the I-75 corridor that comes out of Ohio, Kentucky, and points south. Another 900 jobs would develop in Oakland County near the confluence of I-96/I-275/I-696.

Canada

The U.S. induced demand analysis is based on a bi-national network which allows an understanding of the change in accessibility on both sides of the border. Figure 3-13 presents changes in accessibility between 2005 and 2035 assuming a new border crossing. The improvement in accessibility is most significant in the Windsor area (i.e., Essex and Chatham-Kent Counties). This is largely due to extending Highway 401 to the new bridge. Currently direct access to the Detroit River crossings is via arterial streets, as noted earlier. This accessibility change would influence development in the Windsor area, as guided by local governing bodies.

3.14.2.2 Land Use Changes

U.S.

The direct land use changes that could occur with the DRIC alternatives are covered in Section 3.3.2 of the DEIS.

As noted in Section 3.2.2, building more border crossing capacity in Southeast Michigan would change accessibility in the bi-national metropolitan area. Those accessibility changes alone would create about 1,800 jobs in Wayne County. If all of those were to locate in the study area, about 120 acres would be required to accommodate them. An inventory of vacant/brownfield space in the study area indicates more than 1,000 acres are available for redevelopment. An additional 900 jobs can be expected to be induced in Oakland County due to improved accessibility associated with the DRIC project. Oakland County can absorb these jobs, as they are only two percent of its forecast employment growth. Unemployment in the Detroit-Dearborn-Livernois area was nine percent in December 2007.

The Michigan Department of Transportation recognizes the importance of orienting visitors to the attractions and destinations in the community (such as Historic Fort Wayne), the city, and the region, and that each crossing point offers a unique opportunity to assist travelers. MDOT also recognizes an opportunity to assist Canada-bound travelers in identifying attractions and destinations in Historic Sandwich Towne, Windsor and Ontario. Therefore, MDOT will explore the potential to establish an International Welcome Center proximate to the U.S. Customs plaza.

Canada

Accessibility improvements are projected to be more significant in Windsor/Essex County than in the SEMCOG part of the bi-national metropolitan area (refer to Figure 3-13). This could lead to increased development including more jobs, if local governing bodies so choose. From a trade perspective, it is estimated that the Windsor-Essex region accounts for more than three percent, or $7.5 billion, of Ontario's international export GDP. Any improvement to the speed and efficiency of goods and services crossing the border would have a major positive impact on the economy of the Windsor-Essex region as well as the economy of the Province of Ontario. This expected improvement in trade would benefit numerous industrial businesses, improving gross revenues and increasing employment. Furthermore, there would be much greater opportunity for future industrial development along the Highway 401 corridor.

The benefits would also be positive for commercial and tourism-related businesses. The new border crossing and highway connection would increase the speed and ease of travel, increasing the number of people traveling through the Windsor-Essex region and southern Ontario. This would enhance existing businesses and future opportunities for numerous commercial and tourism-related businesses in these areas, especially along Highway 401. The improved movement of goods would also positively affect these businesses, as supplies would be transported more quickly and efficiently.

3.14.2.3 Air Quality

U.S.

The direct air quality effects of the proposed DRIC alternatives are included in Section 3.6 of this DEIS. Indirect effects focus on sensitive receptors, like Southwestern High School, which fronts directly onto Fort Street (M-85). Between the building and the plaza are ball fields, tennis courts, and a railroad track. A buffer zone would be built around the plaza. The Amelia Earhart Middle School and Daniel Webster Elementary School are located between the proposed project and the Ambassador Bridge on the north side of I-75. Farther west at Waterman is the Beard Early Childhood Center. There is little difference among the DRIC alternatives, from one another, or between them and the No Build Alternative with respect to sensitive receptors along I-75 and in Delray.

North of I-75 there is an opportunity to reduce truck traffic on the Livernois/Dragoon one-way pair that serves a dense residential area. These streets carry a substantial volume of trucks and serve the Livernois/Junction Yard intermodal terminal one mile to the north. A proposed MDOT project, called the Detroit Intermodal Freight Terminal Study, would restrict use by intermodal trucks of Livernois Avenue and Dragoon Street south of Vernor Avenue by reorienting the entrance to the terminal. Every DRIC alternative offers the opportunity to further reduce direct access by heavy-duty diesel trucks via Livernois Avenue and Dragoon Street to this intermodal terminal. This would benefit the residential area south of it with improved air quality.

The Ambassador Bridge plaza has a cluster of dense residential development around Ste. Anne's Catholic Church. It has seen strong redevelopment and infill housing in the last decade. The DRIC would divert traffic from this area, thereby reducing pollution concentrations in another area of Southwest Detroit.

There is virtually no congestion today along local streets in Delray at which people are exposed to pollution and the project would not cause congestion. Changes proposed will shift traffic in a way that the levels of traffic will not be lower than Level of Service (LOS) C. Levels of service are like grades in school. A is excellent; F is failing; D is

acceptable. Under these conditions, carbon monoxide concentrations at sensitive receptors are not forecast to violate federal standards.

For example, the highest forecasted one-hour CO concentrations are found at the residence on Campbell Street along the north side of I-75. Forecasts of one-hour CO concentrations for 2013, 2025, and 2030 are 2.9, 3.5, and 3.8 ppm, respectively. The standard is 35 ppm. The residence on Campbell Street is the dwelling unit closest to the ramp from the DRIC plaza with the highest traffic volume. Conditions there, and at all other sensitive receptors in all years under all scenarios, would not exceed CO standards.

Analysis indicates that, while the total vehicle MSAT values for formaldehyde; 1, 3-butadiene; and, acetaldehyde would increase slightly in 2030 as compared to 2013, diesel exhaust would be significantly reduced. Further, the data reflect MSATs in the local Southwest Detroit area near the proposed new river crossing would be offset by a corresponding decrease at the Ambassador Bridge, compared to the No Build Alternative.

The conclusion of qualitative $PM_{2.5}$ and PM_{10} hot-spot analyses for the study area is that the proposed project will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. This applies to both the 24-hour and annual standards.

Canada

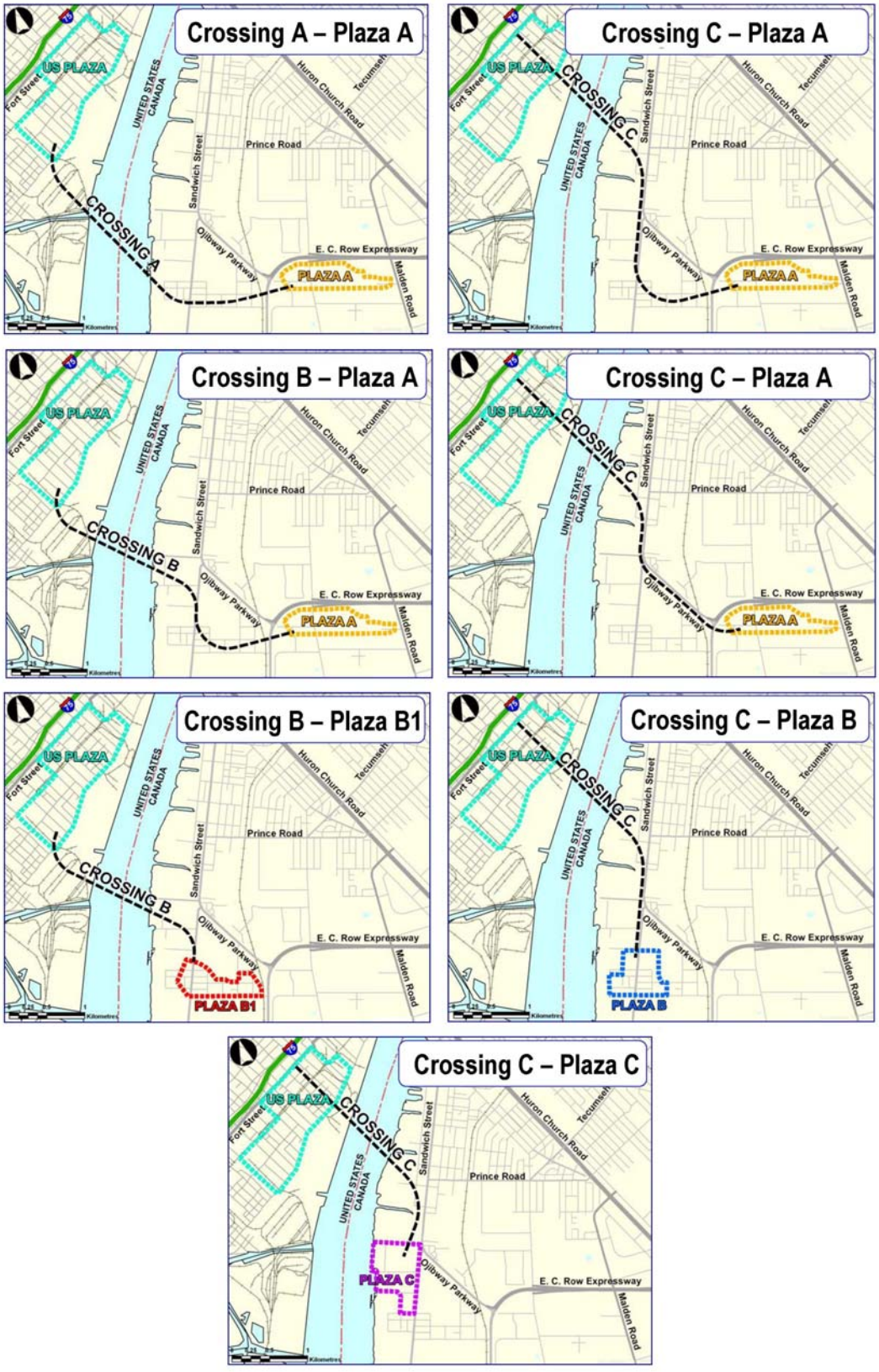
The transboundary impacts in Canada are cited as follows based upon analysis included in the report *Practical Alternatives Evaluation Working Paper, Air Quality Impact Assessment* prepared for URS Canada in August 2007.

- Analysis indicates increases in the predicted maximum $PM_{2.5}$ and NO_x concentrations in the vicinity of all proposed plazas (Figure 3-44). These increases would be experienced up to 800 feet away from the property boundaries of each plaza.

- None of the plaza options would result in a discernible difference in the maximum predicted concentrations of $PM_{2.5}$ and NO_x for the residential area of Sandwich Towne.

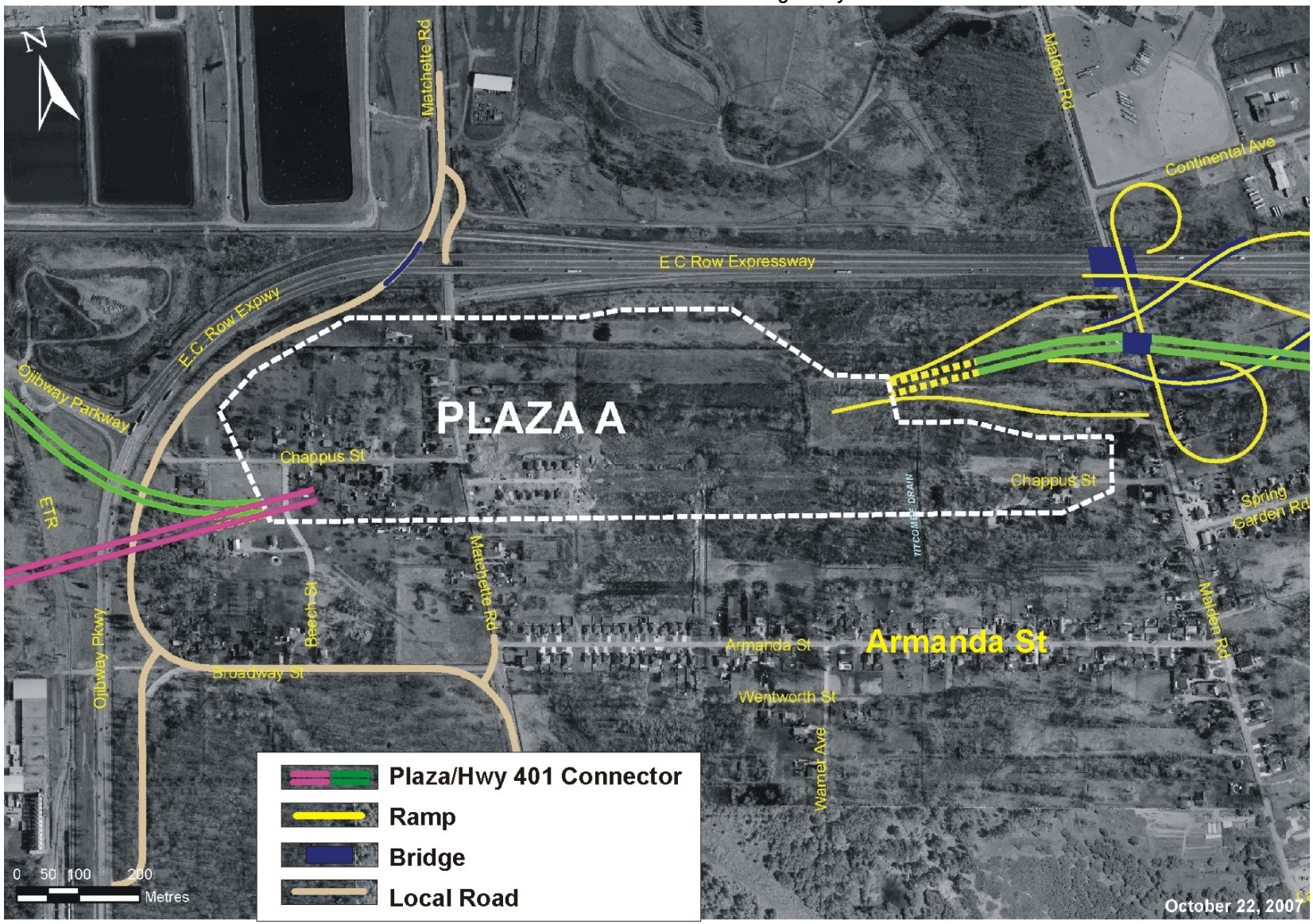
- All alternatives would result in an increase in concentrations over the No Build alternative for the Armanda Street area (Figures 3-45A, 3-45B and 3-45C, showing Plazas A and B1, respectively). The potential to mitigate these changes would need to be further examined.

Figure 3-44
Canadian Crossings and Plazas
Detroit River International Crossing Study



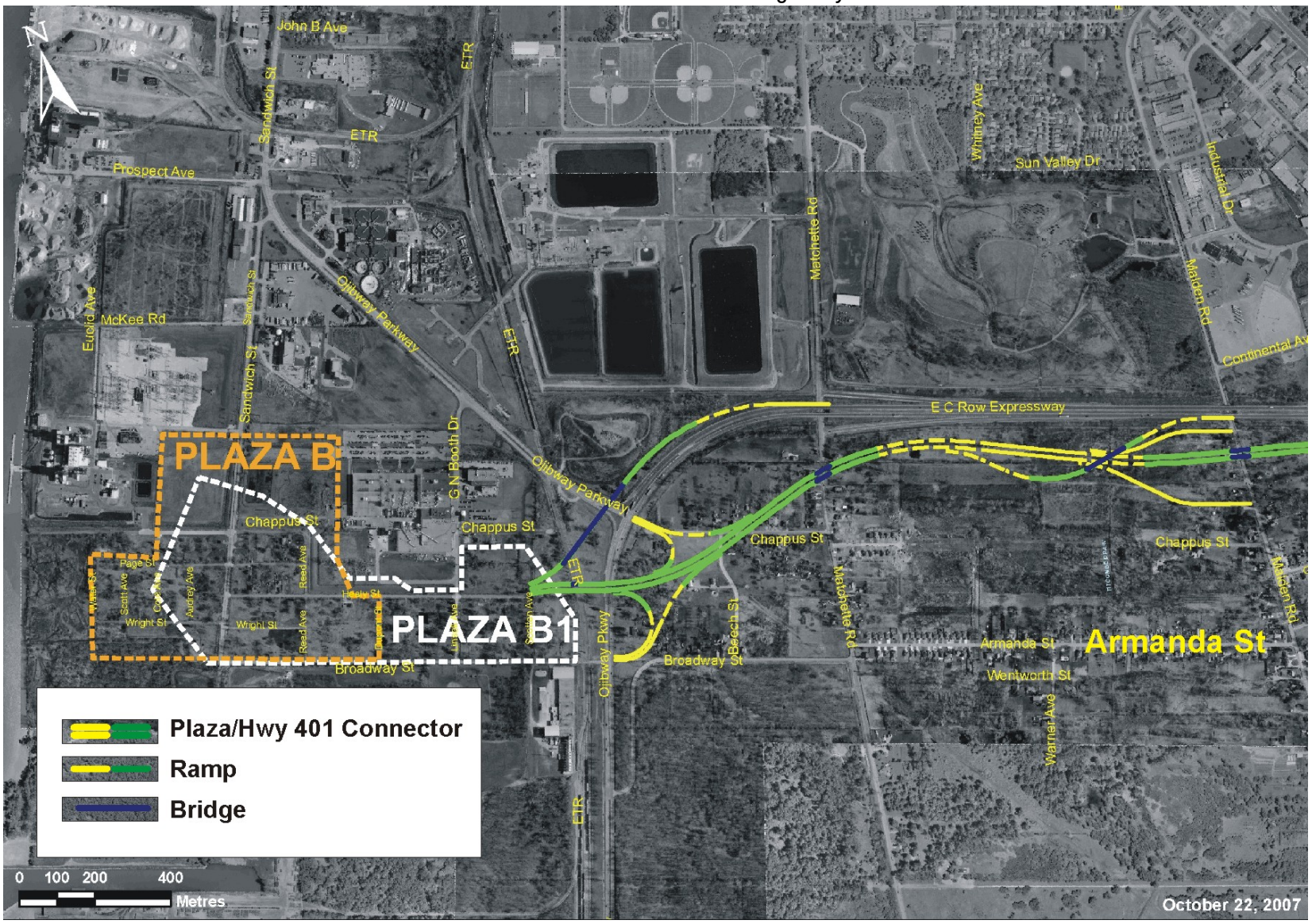
Source: URS Canada

Figure 3-45A
Armanda Street Area of Windsor
Plaza A and Access Roads
Detroit River International Crossing Study



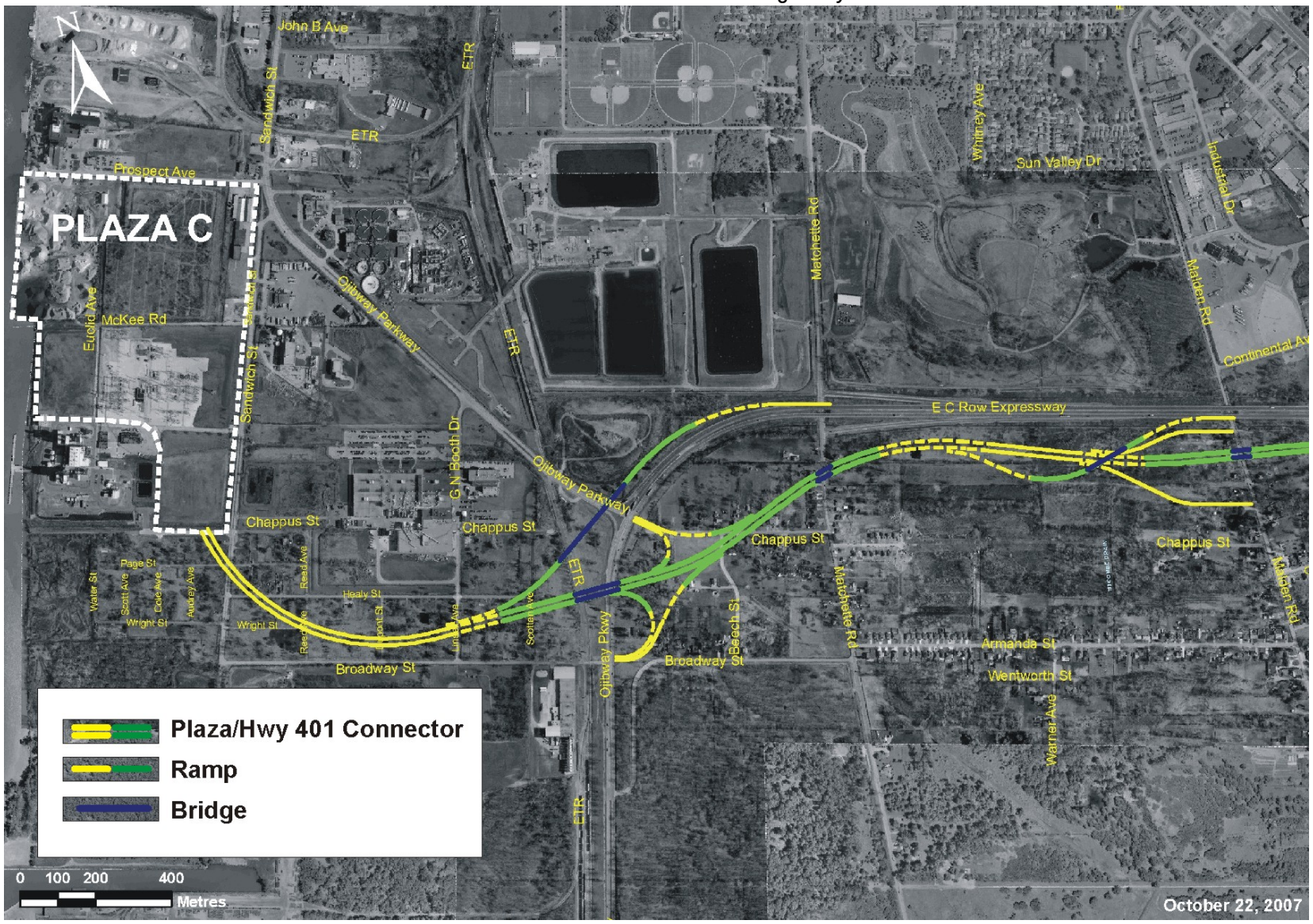
Source: URS Canada

Figure 3-45B
Armanda Street Area of Windsor
Plaza B, B1 and Access Roads
Detroit River International Crossing Study



Source: URS Canada

Figure 3-45C
Armanda Street Area of Windsor
Plaza C and Access Roads
Detroit River International Crossing Study



Source: URS Corporation

- Plaza A results in marginally higher concentrations under certain conditions for Armanda Street than Plaza B1 due to the alignment of the connecting access road.

3.14.2.4 Community Effects

U.S.

The Delray community's cohesion will likely be restored if the land use concepts shown in Figures 3-17A and 3-17B are implemented because new housing would be developed and infill of now vacant areas would occur. But, building the new border crossing system will remove 324 to 414 dwelling units (i.e., a single-family home or an apartment unit). This includes 100 units in two apartment buildings, one on the north side of I-75 with 36 units and the other on the south side with 64 units. If the relocatees choose other parts of Southwest Detroit to find their replacement homes, it could place upward pressure on the price of housing because the supply of decent, safe and sanitary housing there is limited and in high demand. Southwest Detroit is the only area of Detroit that is growing. Much of that growth is attributable to the attraction of the area to the Hispanic population. A large number of Hispanics would be relocated for the DRIC project.

The community north of I-75 will experience both positive and negative indirect effects as a result of the DRIC. These changes in access, air quality and other related issues are discussed earlier in this DEIS.

Canada

The Canadian analysis is documented in the report *Practical Alternatives Evaluation Working Paper, Social Impact Assessment*, prepared by URS Canada in August 2007, and is available on the project Web site (www.partnershipborderstudy.com). It indicates the following transboundary impacts (refer to Figure 3-44):

- Plaza A, located within the Spring Garden Planning Area, an area with residential and natural open space uses, is not consistent with existing and planned land uses. It has the potential to conflict with the neighborhood characteristics of the area and may disrupt the manner in which this area functions.

- Plazas B, B1 and C and Crossings X-10A and X-10B are situated primarily in the industrial and related areas of west Windsor and is considered to be more consistent with existing and planned land uses.

- Plaza C and Crossing X-11 are located closest to the Sandwich residential community. Recently, the City of Windsor adopted the *Olde Sandwich Town Community Planning Study Report*, which provides direction for residents and business owners to actively participate in the plan-making and priority-setting process for the community. According to the study, Crossing X-11 would be located on lands designated for waterfront industrial uses. Crossing X-11 would disrupt a water-dependent use (marine fueling station) by going over it, requiring modifications in operator procedures to ensure safety of the DRIC crossing and the plant.

3.14.2.5 Noise and Vibrations

U.S.

Today, there is no noise mitigation along I-75 in the study area. The detailed DRIC noise study analysis indicates walls would be recommended to mitigate traffic-related noise. Walls around plazas would be related to security of U.S. Customs and Border Protection operations. The walls would reduce noise levels at nearby sensitive receivers so that they are below MDOT noise abatement thresholds. But, noise from nearby industry, which affects the area 24 hours a day, would remain.

Vibration analysis indicates the activity associated with the DRIC would not create a significant difference compared to the 2035 No Build Alternative. Independent room-and-pillar salt mining occurs west of the plaza area and generates annoying vibrations, on a regular basis, as salt is blasted loose below ground. The DRIC project will neither affect nor be affected by the salt mining but portions of the study area will continue to receive perceptible vibrations from this mining and the mining could expand farther into Delray under No Build conditions.

Canada

The transboundary noise impacts in Canada, are documented in the report titled *Practical Alternatives Evaluation Working Paper, Noise and Vibration Assessment*, prepared by URS Canada in July 2007, and available on the project Web site. The report indicates:

- The noise generated from all plazas is not expected to cause high noise impacts for areas closest to the plazas. In most cases, homes are more than 165 feet away from the plazas.

- With Crossing X-11 alternatives, more than 100 households are predicted to have a change in noise levels greater than 5-dBA. Noise level changes of 3-dBA

are barely discernible. The cost-effectiveness of a barrier to reduce the change in noise levels for these households, and other mitigation measures, requires further study.

3.14.2.6 Cultural Resources

U.S.

A positive and, at the same time, potentially negative indirect effect is possible on the 25 aboveground cultural resources (22 individual sites and three historic districts) in the study area that are on or recommended eligible for listing on the *National Register of Historic Places* (as presented in Section 3.9 of this DEIS). While several of these would not be directly impacted by the DRIC, care must be taken that "ripple-wave" development in the area not create a negative indirect impact on them. The proposed land use plan shown on Figure 3-17A would minimize such consequences by incorporating some structures into Delray's possible redevelopment.

Another by-product of the DRIC is the identification of two potential historic districts in West Delray and another north of I-75. The recognition of the districts will help protect the area's historical integrity and open an avenue to grant/loan programs for improving properties in them.

Canada

The Canadian analysis indicates there are no significant differences among the options in terms of impacts to historical and archaeological features. Nonetheless it is known there are no provincially designated features impacted by any of the crossing and plaza alternatives. Two cultural landscapes are potentially impacted: the Brighton Beach area (Crossing X-10A, Plazas B and B1 and Plaza A/Crossing X-10C via Brighton Beach). An area of high archaeological potential (Petit Cote French Settlement) would potentially be disrupted by Plazas B and B1.

3.14.2.7 Water Quality, Wetlands, Threatened and Endangered Species

U.S.

The direct effects of the DRIC alternatives on water quality are documented in Section 3.8 of this DEIS. Development indirectly stimulated by the project is not likely to affect wetlands in Delray as the entire footprint, for the combination of all alternatives, was examined for wetlands. There would be an effect only on 0.01 acres. Likewise, a search for wetlands on another MDOT project north of I-75 (the Detroit Intermodal Freight Terminal Study) found no wetlands. So, indirect impacts in the study area are

not expected. On the other hand, induced development in downriver Wayne County or in Monroe County along the I-75/auto alley, as cited in Section 3.2.2, could affect wetlands. Any wetland loss must be mitigated.

Canada

The transboundary impacts in Canada are presented in the report titled *Practical Alternatives Evaluation Working Paper, Natural Heritage Assessment*, prepared by URS Canada in July 2007, and available on the project Web site. It indicates that:

- Crossing X-10A/Plaza A (refer to Figure 3-45A) is considered to have the potential to displace more provincially rare vegetation communities and species at risk in the Brighton Beach area and the area north of Chappus Street.

- Crossing X-10B/Plaza A (refer to Figure 3-45A) would affect the area north of Chappus Street.

- Crossing X-10B/Plaza B1 (refer to Figure 3-45B) is considered to have a relatively moderate impact compared to other alternatives when considering the extent of terrestrial and aquatic communities impacted, including provincially-rare vegetation communities and the number of specimens/categories of species at risk that could be affected.

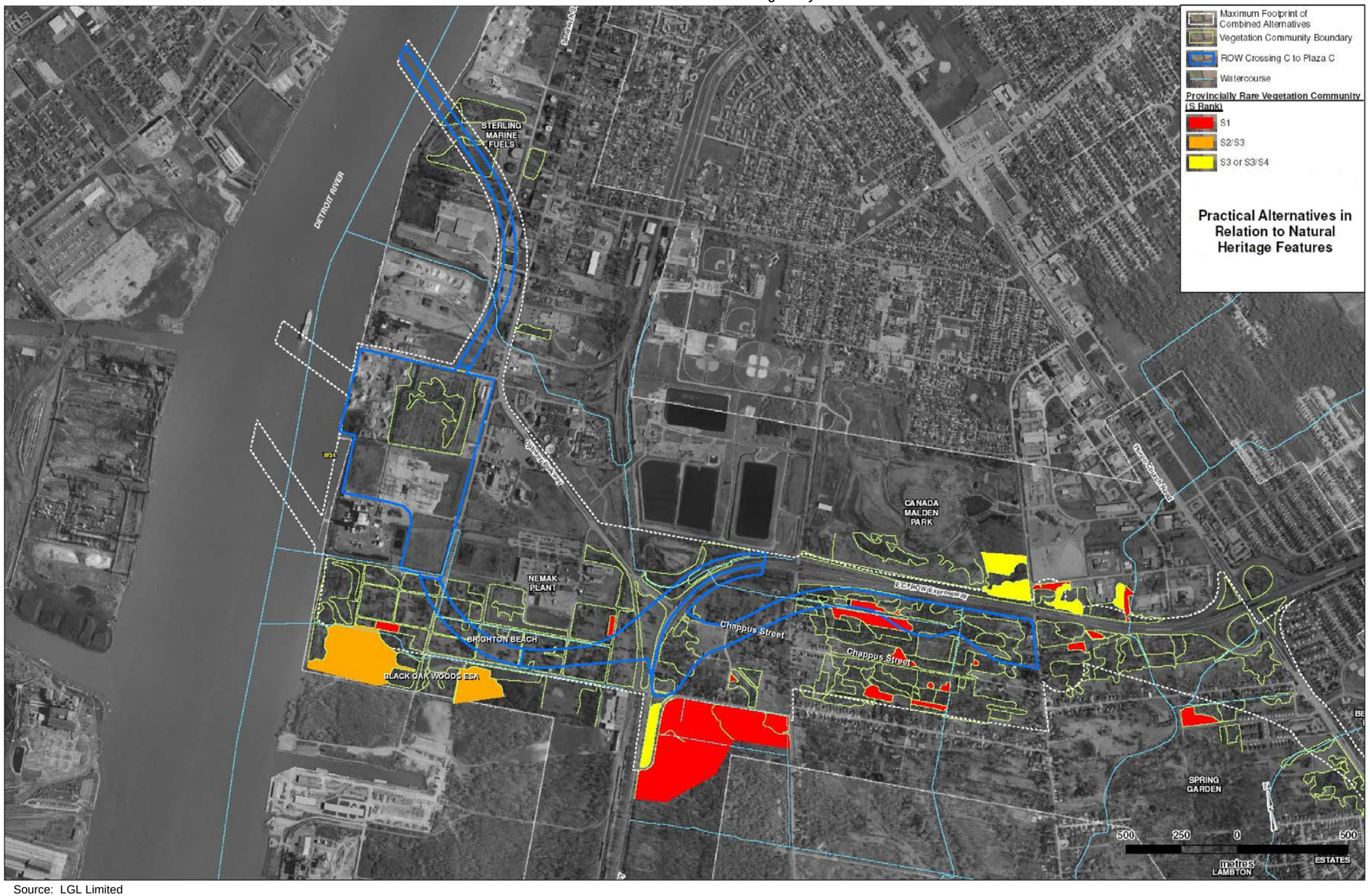
- Plaza C/Crossing X-11 is considered to have a relatively low impact because this combination avoids the natural heritage features associated with the Brighton Beach area and the area north of Chappus Road (Figure 3-46).

- Plaza B1/Crossing X-10B (Figure 3-47A), Plaza B/Crossing X-11 (Figure 3-47B), and Plaza A/Crossing X-11 via Ojibway Parkway (Figure 3-47C) are considered to have a relatively moderate impact. Crossing X-10A and Plazas B and B1 encroach on the Ojibway Black Oak Woods, an environmentally sensitive area.

- Plaza A/Crossing X-11 via Brighton Beach (Figure 3-48A), Plaza A/Crossing X-11 (Figure 3-48B), and Plaza A/Crossing 10-A (Figure 3-48C) are considered to have the potential to displace more provincially rare vegetation communities and species at risk in the Brighton Beach area and the area north of Chappus Road.

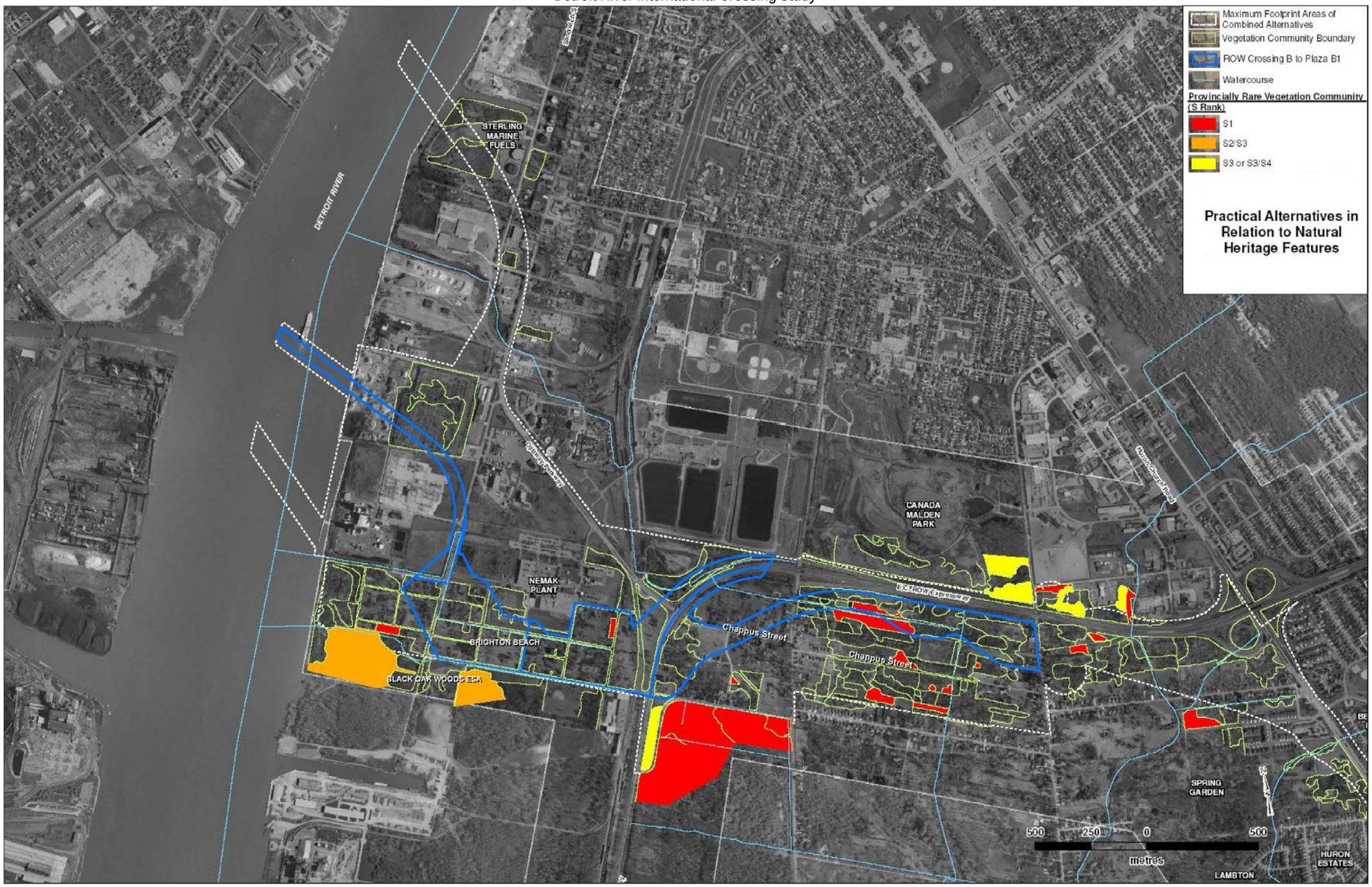
- Plaza A/Crossing X-11 via Ojibway Parkway (Figure 3-49A) has fewer impacts to natural features than Plaza A/Crossing X-11 via Brighton Beach (Figure 3-49B).

Figure 3-46
Natural Features Impacts of Plaza C/Crossing X-11
in Canada
Detroit River International Crossing Study



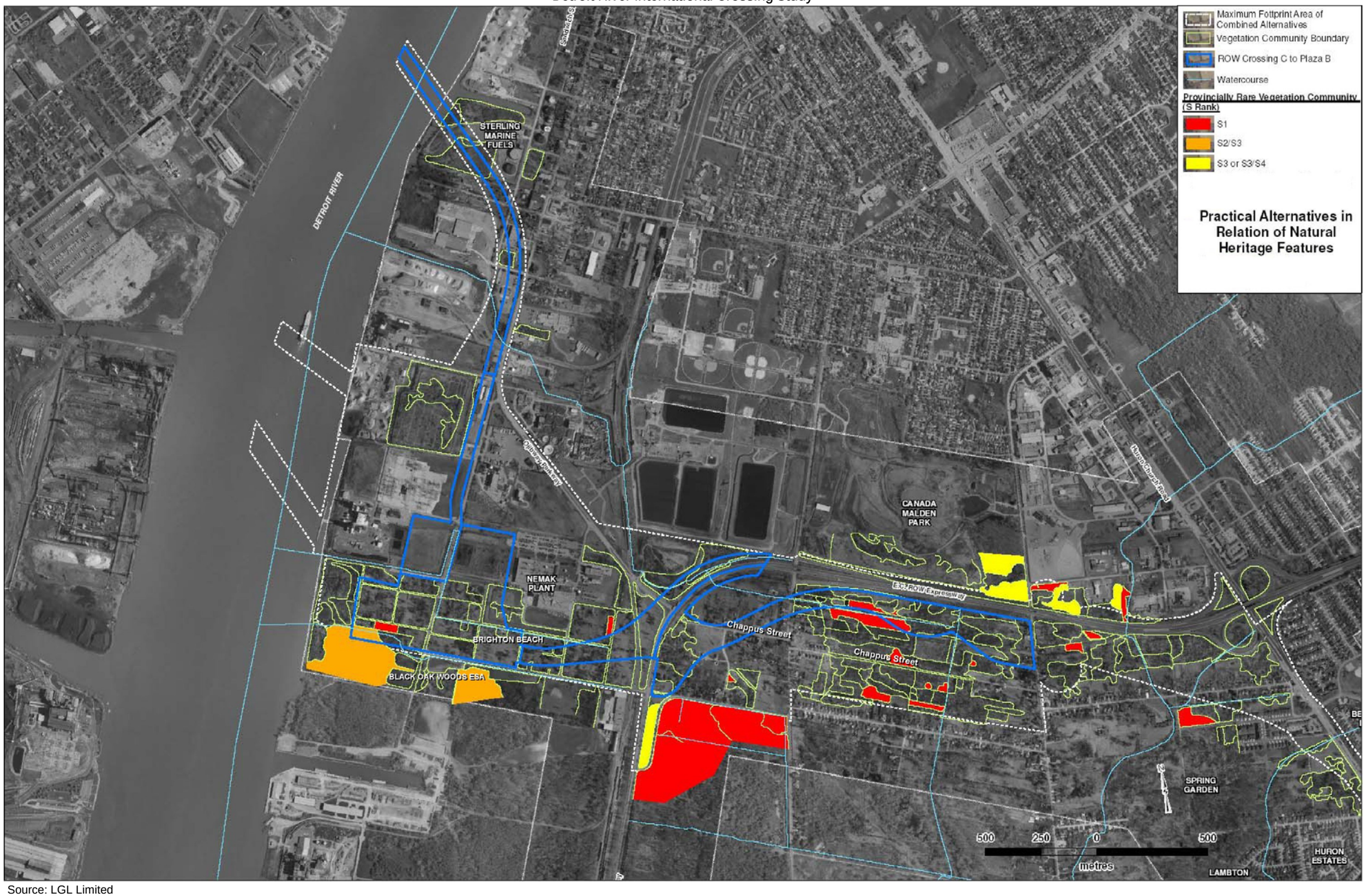
Source: LGL Limited

Figure 3-47A
Natural Features Impacts of Plaza B1/Crossing X-10B
in Canada
Detroit River International Crossing Study



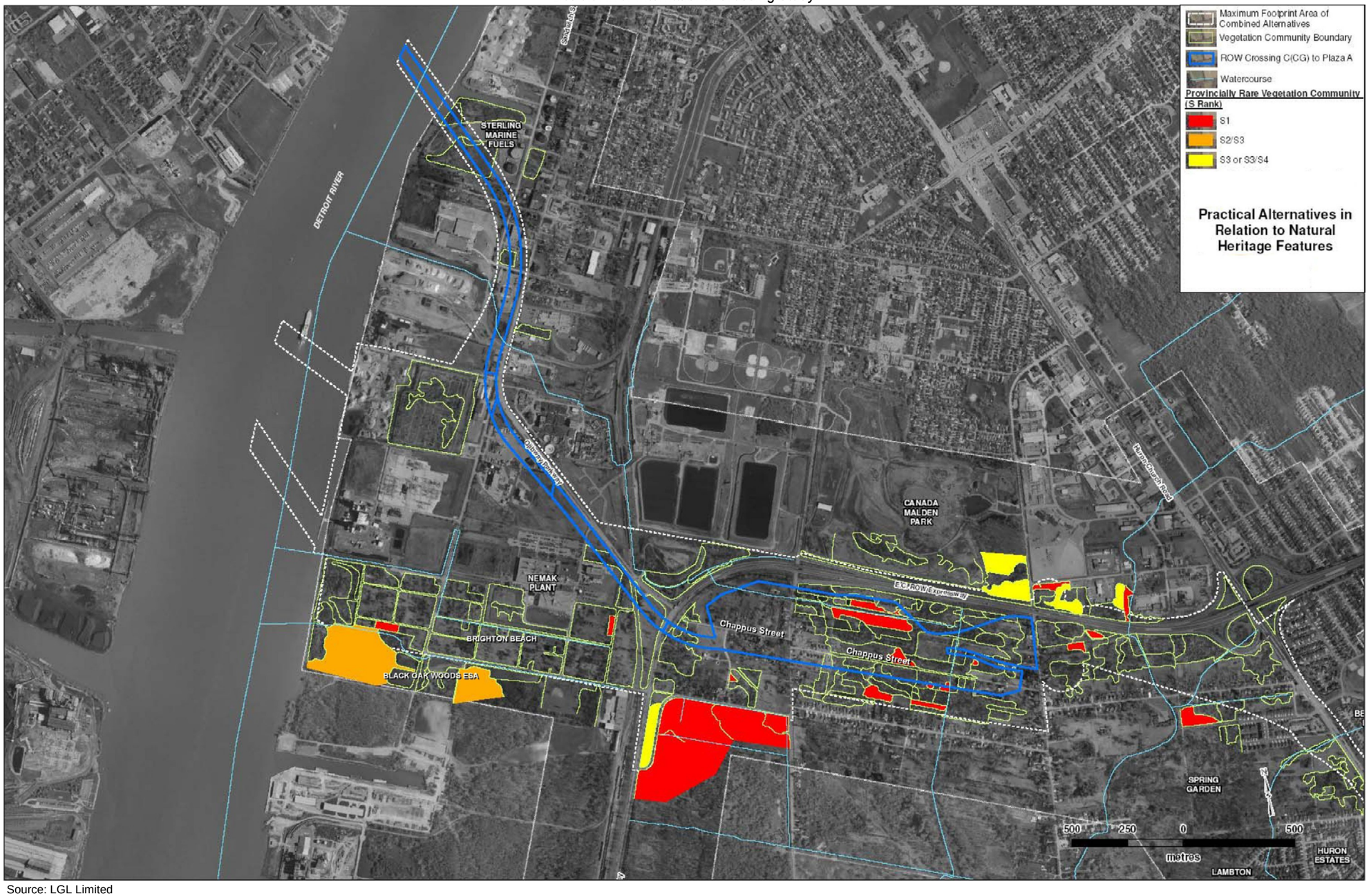
Source: LGL Limited

Figure 3-47B
Natural Features Impacts of Plaza B/Crossing X-11
in Canada
Detroit River International Crossing Study



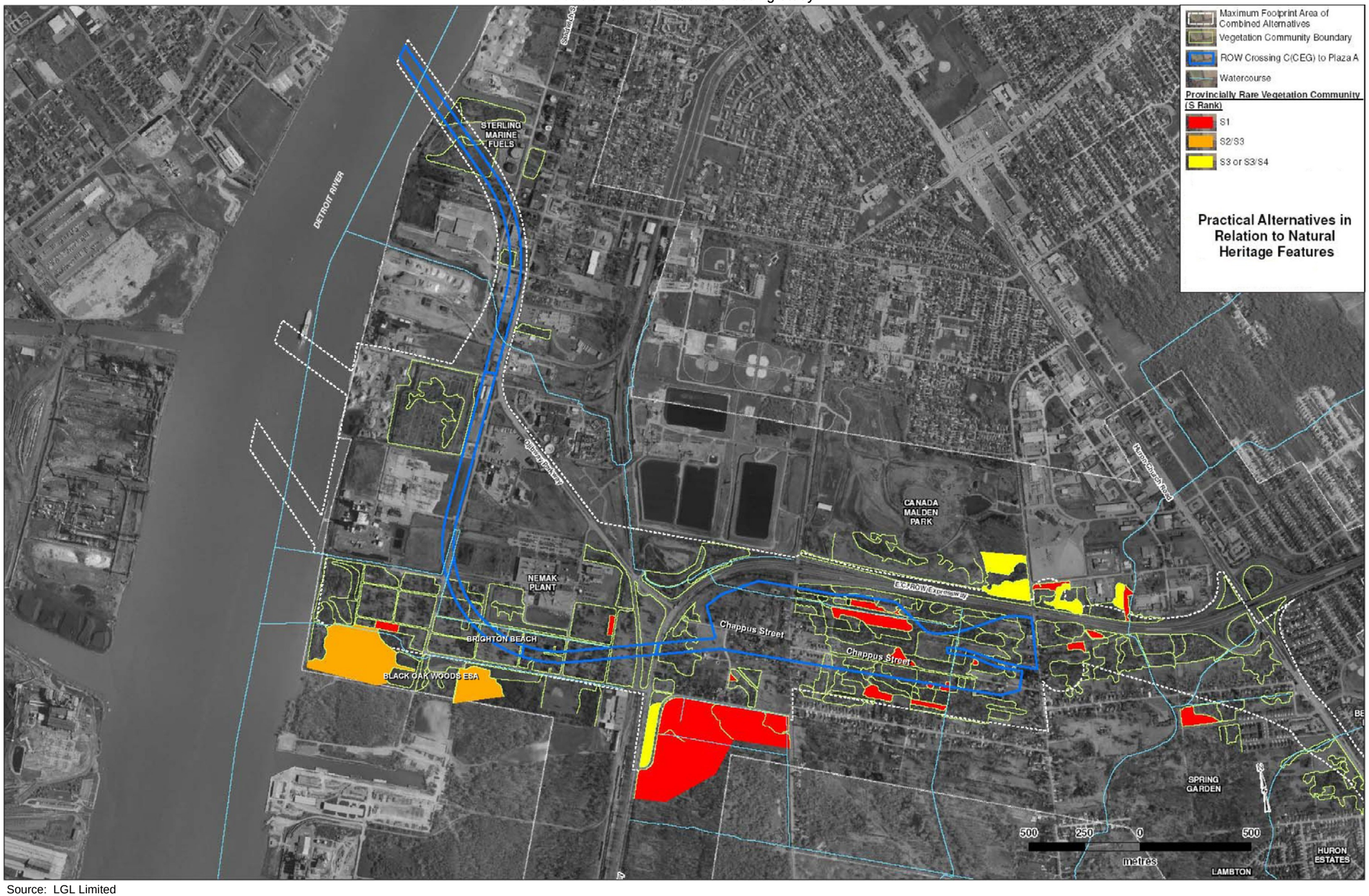
Source: LGL Limited

Figure 3-47C
Natural Features Impacts of Plaza A/Crossing X-11 via Ojibway Parkway
in Canada
Detroit River International Crossing Study



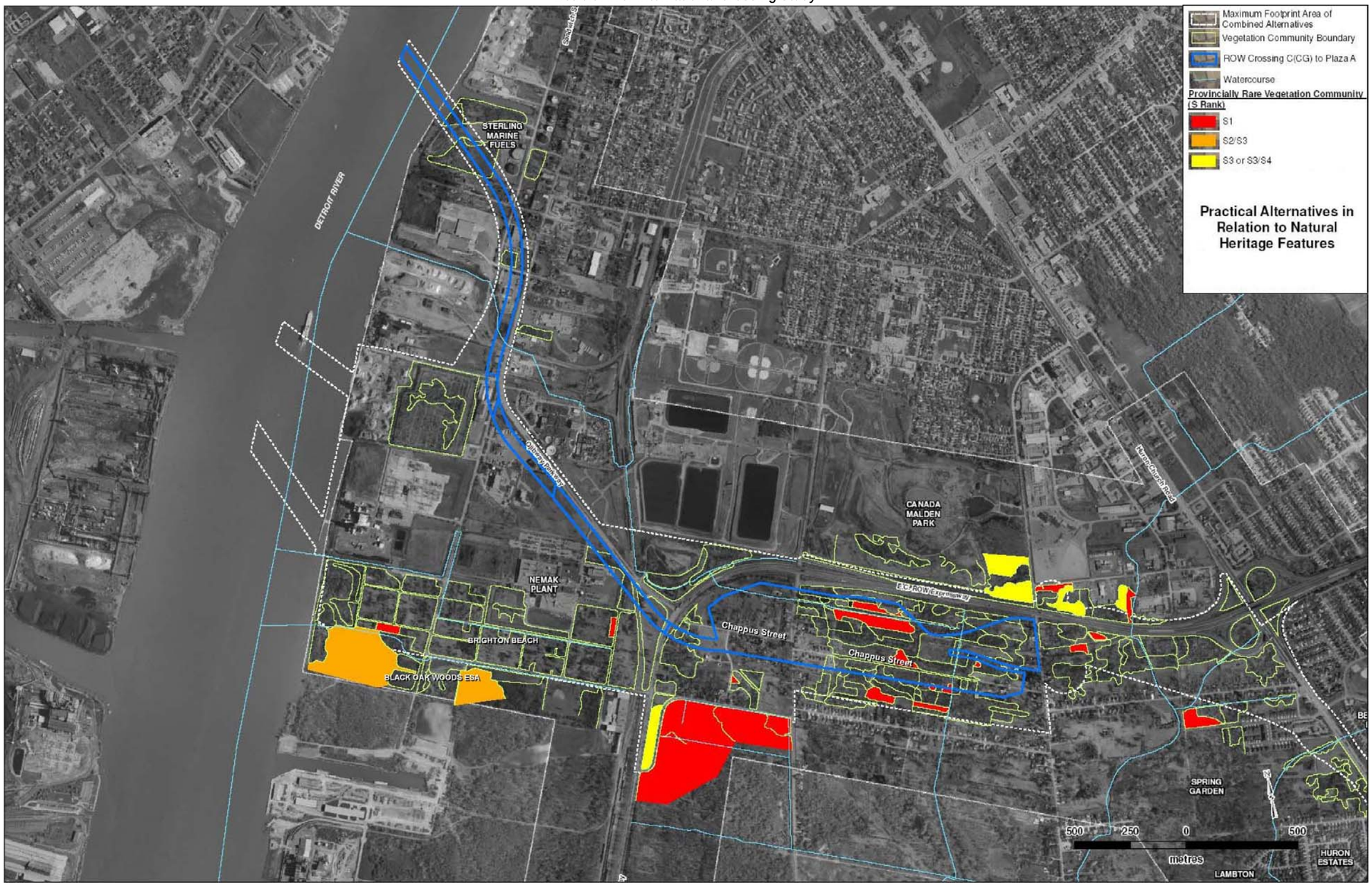
Source: LGL Limited

Figure 3-48A
Natural Features Impacts of Plaza A/Crossing X-11, via Brighton Beach
in Canada
Detroit River International Crossing Study



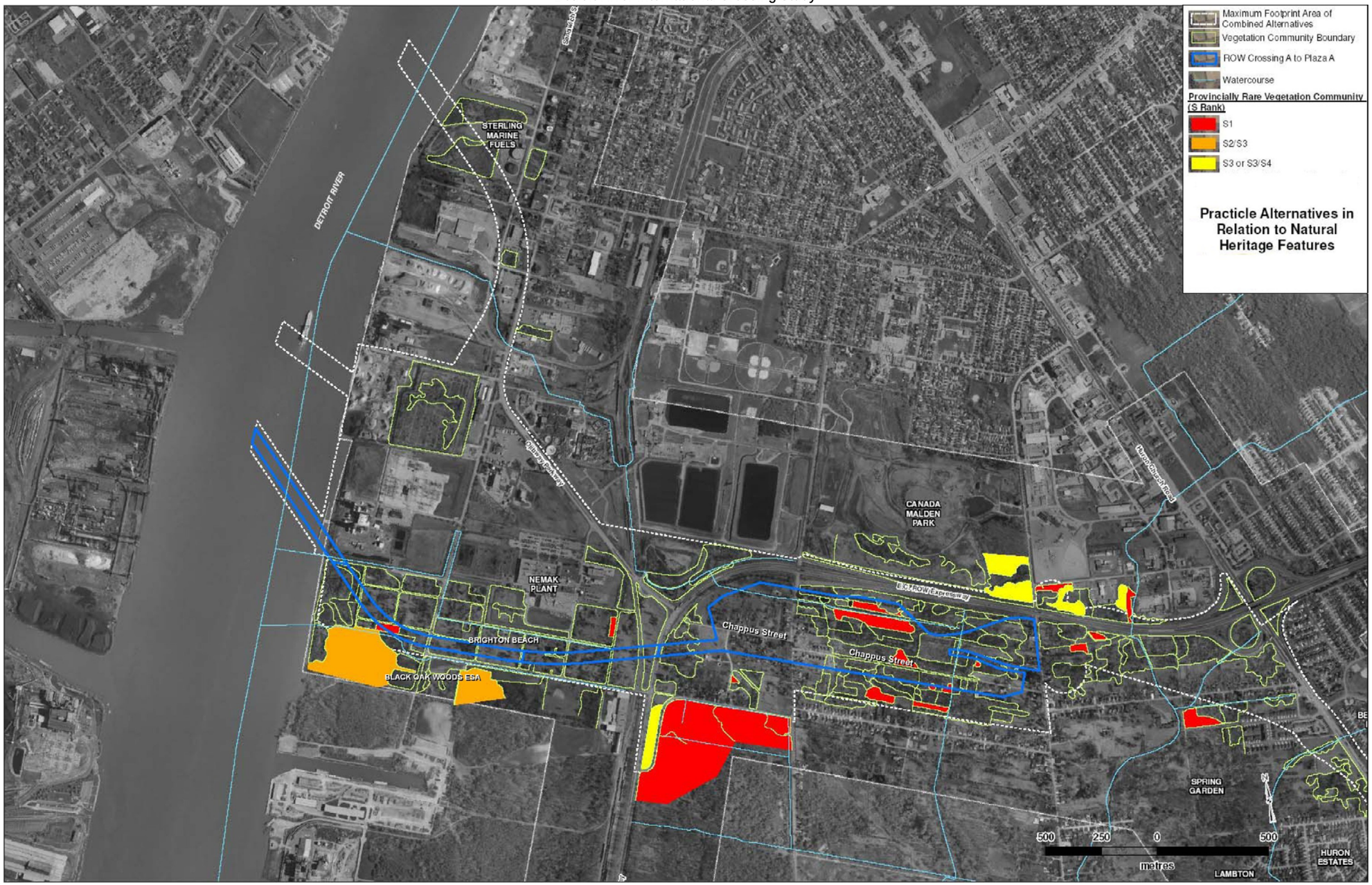
Source: LGL Limited

Figure 3-48B
Natural Features Impacts of Plaza A/Crossing X-11
in Canada
Detroit River International Crossing Study



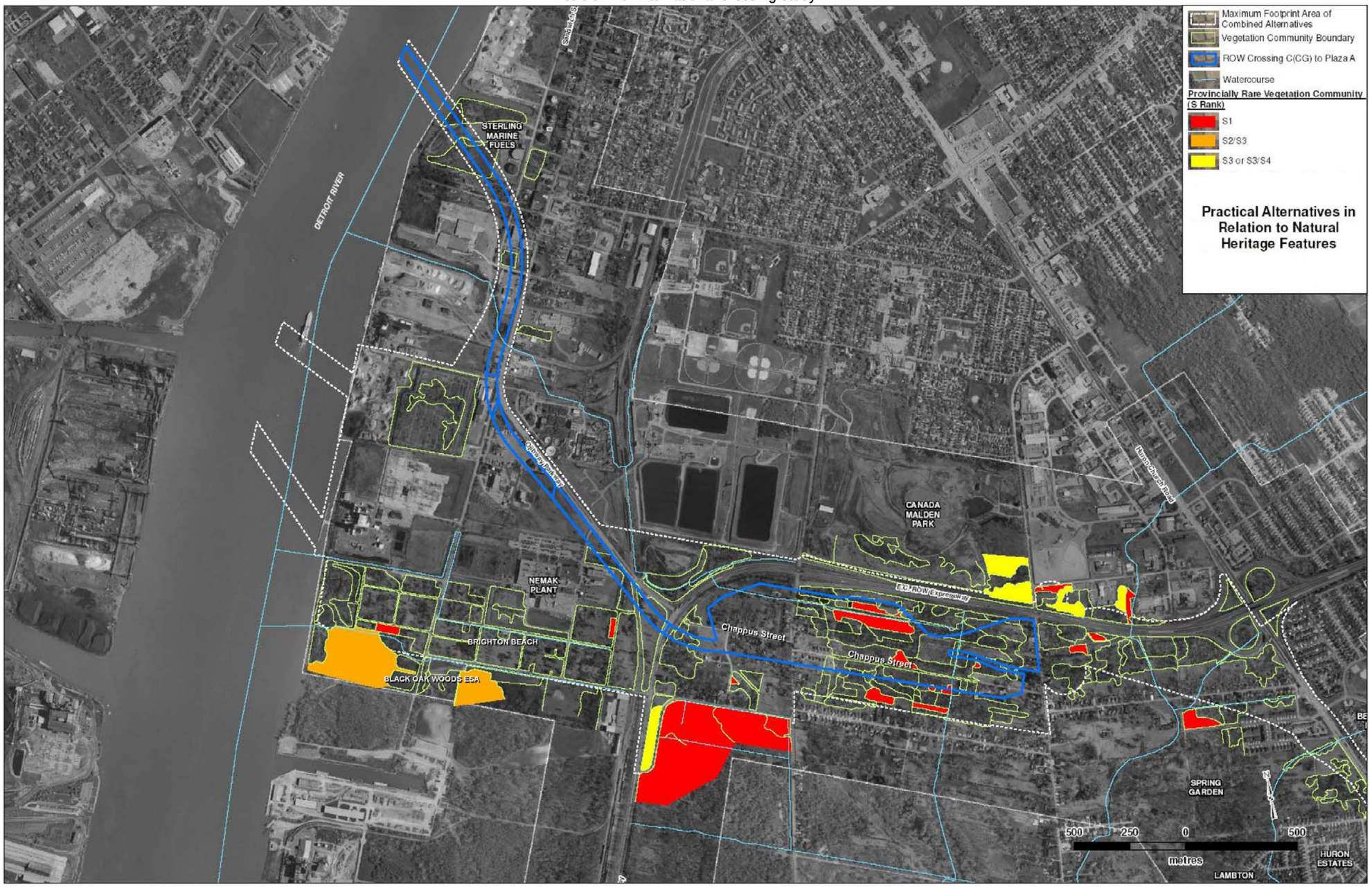
Source: LGL Limited

Figure 3-48C
Natural Features Impacts of Plaza A/Crossing X-10-A
in Canada
Detroit River International Crossing Study



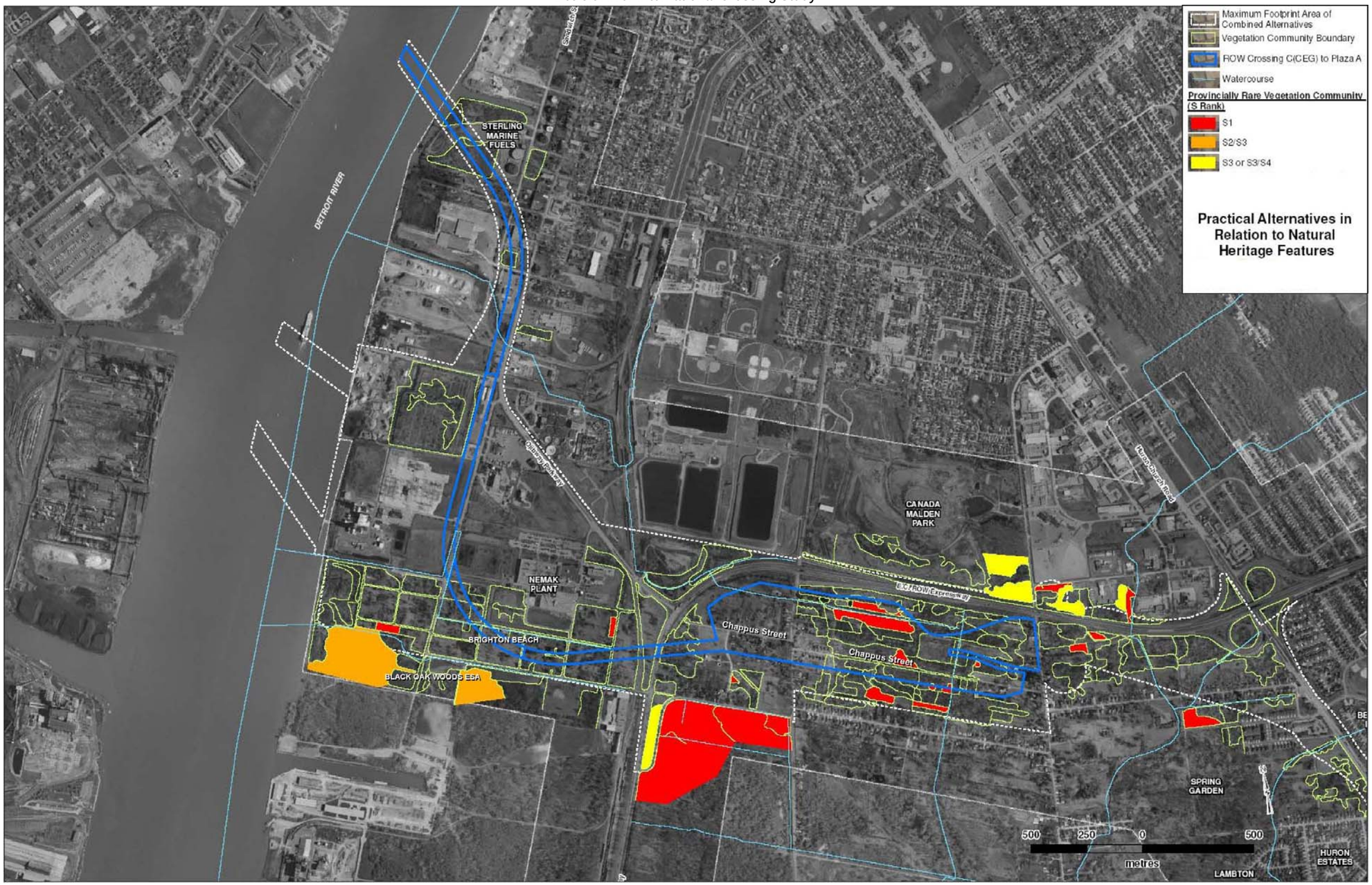
Source: LGL Limited

Figure 3-49A
Natural Features Impacts of
Plaza A/Crossing X-11 via Ojibway Parkway
in Canada
Detroit River International Crossing Study



Source: LGL Limited

Figure 3-49B
Natural Features Impacts of
Plaza A/Crossing X-11 via Brighton Beach
in Canada
Detroit River International Crossing Study



Source: LGL Limited

3.14.3 Cumulative Effects – U.S. and Transboundary[16]

What is a Transboundary Impact?

The U.S. Council on Environmental Quality has provided guidance that the National Environmental Policy Act covers reasonably foreseeable effects that occur across a border from actions within the United States.

The most significant past, present and reasonably foreseeable future impacts that affect areas related to the proposed DRIC alternatives are presented here. As a matter of background, it is noted that historic (past) urbanization of the study area is directly linked to the opening of Michigan's northern mineral ranges beginning in the 1850s. Transportation developments reinforced this urbanization, first with an elaborate (by 19th Century standards) railroad system. The railroad tunnel to Windsor was built in 1909. Highways followed. The Ambassador Bridge was opened in 1929. The Detroit-Windsor Tunnel opened in 1930. Construction of I-75 began in 1962 and was completed in 1972. It cuts through the study area. I-94, built in the 1950s, lies on the north edge of the study area. M-10 (the Lodge Freeway) and M-39 (the Southfield Freeway) are along the east and west edges of the area, respectively. The sections of these freeways affecting the study area, when built in the 1960s, and still today, are considered intrusions on otherwise tightly-knit neighborhoods.

A primary factor in the development of the study area was the creation of Ford Motor Company's Rouge Plant in 1918/1919. Housing development in the study area is dated primarily between 1900 and 1929. But, since its heyday, this part of Southeast Michigan has been affected by out-migration of corporations, then people. Notable exceptions are Ford Motor Company's $2 billion investment in re-engineering its Rouge Plant and Arvin Meritor's facility at Fort and Waterman Streets. But, Ford, GM and Chrysler are all retooling in order to return to their former competitiveness, which affects all of Michigan. Companies that support the auto industry, including Arvin Meritor, are also struggling. This downturn in economic fortunes has led to the recently-revised projection of population and employment growth in the SEMCOG region discussed in Section 3.2.1.3 of this document.

The study area, particularly the Delray community, has faced many challenges in trying to preserve a reasonable quality of life for its residents. The history of Delray was presented in Section 3.1.2.1. It reflects an aging industrial area that has lost many of its commercial businesses and, now, its population. Non-compatible land uses continue to intrude into residential areas. From a cumulative effects standpoint, it has had to deal with a government-sponsored wastewater treatment plant, a private-sector developed

[16] U.S. case law interpreting NEPA has reinforced the need to analyze impacts regardless of geographic boundaries within the United States, and has also assumed that NEPA requires analysis of major federal actions that take place entirely outside of the United States but could have environmental effects within the Untied States." – *from Council on Environmental Quality "Guidance on NEPA Analyses for Transboundary Impacts" July 1, 1997.*

composting facility and incompatible industrial uses. Add to that the impact of I-75 and the Delray community has been in a 40-year struggle to survive.

Nonetheless, ongoing (present) revitalization in the study area includes:

- West Riverfront Greenway Development/Romanowski Park;
- Bagley Housing Condominium Development;
- Re-use of Tiger Stadium property;
- Housing along Michigan Avenue, east of West Grant Boulevard;
- Continued redevelopment along Vernor Highway, including the Bowtie area at the Vernor/Livernois Avenue intersection;
- Continued housing stabilization due to code enforcement and related activities;
- Housing development in east Dearborn east of Wyoming served by Roberts Street;
- A new Museum of Arab Culture opposite the Dearborn City Hall;
- Expansion of Truck City in an area bounded by Michigan, Southern, Wyoming and Stecker;
- A combined sewage overflow facility at Patton Park; and,
- A direct connection between the Ambassador Bridge's plaza and the interstate highway system, known as the Ambassador Gateway Project.

Future developments include those listed on Table 3-7 with particular note of the following key transportation proposals:

- Possible new border crossings;
- Rehabilitating I-94, from east of the I-94/I-96 interchange to west of Conner Avenue in Detroit;
- Passenger rail service between Detroit and Ann Arbor as well as Metro Airport proposed to pass through the Livernois-Junction Yard area;
- Commuter rail, light rail or busway transit in almost one dozen corridors, including along Michigan Avenue and Fort Street;
- A proposed conversion by a private venture of the Detroit-Windsor Railroad tunnels to truck tunnels and construction of a new rail tunnel; and,
- Enhancement of the Livernois-Junction Yard intermodal terminal.

Of particular note here are the two proposals for new border crossings other than the Detroit River International Crossing Study. They are: 1) the Detroit River Tunnel Partnership's (DRTP) Jobs Tunnel;[17] and, 2) the Ambassador Bridge Enhancement Project. The DRTP project is proposed as a truck tunnel with one lane in each direction. It would use the DRTP-controlled railroad right-of-way on each side of the Detroit River. Based on analysis of international travel in the 2035 afternoon peak hour,

[17] The DRTP Truck Tunnel proposal has been withdrawn by the proponents.

the DRTP truck-only tunnel proposal, when added to the existing Ambassador Bridge, the Detroit-Windsor tunnel, and a new DRIC crossing, would carry less than three percent of all Detroit River international traffic (Table 3-29). The viability of the DRIC proposed crossing is not affected by the DRTP proposal.

Table 3-29
Analysis of DRTP Truck-only Tunnel with DRIC X-10 Crossing
+ Ambassador Bridge + Detroit-Windsor Tunnel
2035 PM Peak Hour Traffic
Detroit River International Crossing Study

New Crossing at X-10		DRIC	DRTP	AMB @ Four Lanes	DW Tunnel
U.S.-Canada	Cars	1,213	0	1,038	975
	Trucks	650	154	166	41
Canada-U.S.	Cars	257	0	503	360
	Trucks	343	15	70	1
Both Directions	Cars	1,470	0	1,541	1,335
	Trucks	993	169	236	42
Total		2,463	169	1,777	1,377

Source: The Corradino Group of Michigan, Inc.

The Ambassador Bridge Enhancement Project is defined by its private owners – The Detroit International Bridge Company – as a six-lane cable-stay bridge over the Detroit River, just west of the existing Ambassador Bridge. The new bridge will connect directly into existing plazas in both Detroit and Windsor. The plazas are being expanded. If the new structure were completed, the Environmental Assessment submitted by the Bridge Company for the U.S. Coast Guard[18] states the existing Ambassador Bridge would be taken out of service to effect repairs that are deemed necessary. Once any necessary repairs are completed, the existing structure will be used to provide for bridge internal operational needs and also to provide for pedestrian and bicyclist amenities. Table 3-30 illustrates the change in traffic between a new DRIC crossing and a six-lane Ambassador Bridge replacement structure, as compared to previous analyses that assumed a four-lane Ambassador Bridge that now exists. Traffic on the new crossing would change little. So, the cumulative effects of the proposed six-lane replacement span on the viability of the DRIC proposal is considered negligible.

[18] Detroit International Bridge Company/Canadian Transit Company, *Draft Environmental Assessment*, submitted to U.S. Coast Guard, April 2007.

Table 3-30
Analysis of DRIC Crossing Traffic
with Ambassador Bridge at Four Lanes and Six Lanes
2035 PM Peak Hour Traffic
Detroit River International Crossing Study

New Crossing @ X-10		DRIC Crossing		Ambassador Bridge	
		AMB @ Four-lane	AMB @ Six-lane	Four-lane	Six-lane
U.S. – Canada	Cars	1,155	1,133	1,072	1,105
	Trucks	734	738	229	230
Canada – U.S.	Cars	250	250	502	500
	Trucks	358	358	70	70
Both Directions	Cars	1,405	1,383	1,574	1,605
	Trucks	1,092	1,096	299	300
TOTAL		2,497	2,479	1,873	1,905

Source: The Corradino Group of Michigan, Inc.

Other foreseen cumulative effects, if the DRIC were implemented, are discussed next (Tables 3-31A and 3-31B).

- **Mobility**

  - U.S.: There may be an increase in traffic due to additional development stimulated by the new border crossing. But, negative congestion effects are not expected either on major arteries or local neighborhood streets in the study area. Analyses that were part of the DRIC Study and the Detroit Intermodal Freight Terminal Study covered all of Southwest Detroit and East Dearborn. The results indicate there is virtually no congestion now nor expected in the 25-year future. Roads built to serve this area in the first half of the 20th Century accommodated more traffic, by far, when industry in the area was providing full employment and neighborhoods were fully populated. Developments outside the study area will be guided by local regulations aimed at mitigating negative traffic impacts.

Table 3-31A
Summary of U.S. Cumulative Impacts
The No Build Condition Versus the Build Condition
Detroit River International Crossing Study

Category	No Build	All DRIC Build Alternatives
Mobility	Completion of the Ambassador Gateway Project, which will directly connect the Ambassador Bridge to I-75, will favorably alter circulation patterns in a large portion of the study area.	Completion of the Ambassador Gateway Project, which will directly connect the Ambassador Bridge to I-75, will favorably alter circulation patterns in a large portion of the study area. Negative effects could occur if induced development is not guided by proper government approvals. If properly guided, a mix of compatible uses and no congestion is foreseen.
Land Use	A continuation of past trends is expected, at best. Potential for population and employment decline in Detroit and Wayne County may lead to continued abandonment of land uses.	A continuation of past trends is expected, at best. Potential for population and employment decline in Detroit and Wayne County may lead to continued abandonment of land uses. Land use change associated with "ripple-wave" development of the DRIC will likely be minimized by applying planning principles that exist in all communities to ensure they are compatible with neighborhood uses.
Air Quality	Pollution from mobile sources is expected to decrease. Continued loss of jobs and population throughout region over next eight to ten years could lead to closing of polluting industries.	Pollution from mobile sources is expected to decrease. Continued loss of jobs and population throughout region over next eight to ten years could lead to closing of polluting industries. Proper location of new development, consistent with existing planning/zoning rules, would also help control pollution as a cumulative effect of the DRIC project.
Cultural Resources	A continuation of past trends is expected with some older structures being abandoned.	A continuation of past trends is expected with some older structures being abandoned. Adverse impacts with new development stimulated by the DRIC will likely be prevented by applying local controls and proper planning.
Community Effects	Communities are expected to be challenged as the continued slump in the economy will likely cause businesses and homes to be left vacant as jobs and related income are lost. Even so, some housing rehabilitation can be expected to continue.	Communities are expected to be challenged as the continued slump in the economy will likely cause businesses and homes to be left vacant as jobs and related income are lost. Even so, some housing rehabilitation can be expected to continue. A new crossing can be expected to stimulate some development. There are large and small tracts of land throughout the study area in locations compatible with industrial, logistics and transportation-related land uses. This re-use would minimize, if not totally avoid, negative impacts on community cohesion of such development. Housing rehabilitation would likely continue.
Noise	No perceptible increases are expected, overall. Some change could occur in spots if the downturn in the economy causes continued abandonment of noise-generating industrial/commercial uses.	Traffic volumes and noise levels would increase if economic development conditions improve with a new crossing. Negative community impacts can be avoided with care by the developer/builder and government agencies in locating this development away from sensitive uses.
Water Quality, Wetlands, Threatened and Endangered Species	A continuation of past trends is expected. Some wetlands may develop incidental to human activity on abandoned sites.	A continuation of past trends is expected. Some wetlands may develop incidental to human activity on abandoned sites. Nonetheless, no negative wetlands and/or water quality impacts are foreseen. Some positive effects could occur if brownfield sites are remediated for new development.

Source: The Corradino Group of Michigan, Inc.

Table 3-31B

Summary of U.S. Transboundary/Canadian Impacts

The No Build Versus Build Condition

Detroit River International Crossing Study

Category	No Build	DRIC in Canada
Mobility	Acceleration of negative consequences is expected as congestion in the Huron Church Road corridor causes spillover traffic to disrupt surrounding communities.	All alternatives would improve overall traffic operations for Huron Church Road and the surrounding area without need for local infrastructure improvements. The new crossing would reduce by almost 30 percent the amount of international truck traffic in the Huron Church Road corridor north of E.C. Row Expressway.
Economic Impacts	A continuation of past trends due to the economic downturn of auto and related industries is expected.	Changes in accessibility would benefit the Windsor/Essex County area. These changes would influence development as guided by local governing bodies.
Land Use	A continuation of past trends is expected but with acceleration of negative consequences as congestion in the Huron Church Road corridor causes spillover traffic to disrupt surrounding communities.	Land use conversion to respond to increased economic development would be expected with improved accessibility in Windsor/Essex County. Local municipalities will determine the nature and extent of such development.
Air Quality	Changes in engines and fuels are expected to, at least, partially offset possible air pollution increases in communities surrounding Huron Church Road that will realize increased spillover traffic from a congested corridor to the Ambassador Bridge.	Increases in particulate matter are forecast in the vicinity of all proposed plazas. But, all DRIC alternatives would likely have no discernible difference in air quality among them in residential areas of Sandwich Towne.
Cultural Resources	No impacts to designated heritage features. Possible future development in Brighton Beach Industrial Park could impact (displace or disrupt) one cultural landscape.	No impact to designated heritage features. Potential impact to the area of high archaeological potential (Petit Cote French Settlement) and potential of displacement/disruption to cultural landscapes (Brighton Beach and Sandwich Towne).
Community Effects	Pedestrian movements along/across Huron Church Road, where schools, senior housing, shopping and a host of other community attractions exist, will be impacted by the increased traffic/congestion. Noise increases are expected in sensitive areas as spillover traffic from Huron Church Road infiltrates surrounding communities.	Plaza traffic is not expected to cause high noise impacts. Homes are usually 600 feet or more from all plazas. Crossing X-11 will impact 100 households with increased noise. Mitigation will be defined once a Preferred Alternative is chosen. The areas of south and west Windsor and LaSalle would benefit from having international traffic removed from local streets. The new access road would have an aesthetic impact on the surrounding community. Plaza A and Crossing X-11 are expected to have the greatest effect on neighborhoods.
Water Quality, Wetlands, Threatened and Endangered Species	Continuation of past trends is expected, including positive efforts to protect wetlands and threatened and endangered species. Also, unwanted and often unexpected pollution impacts on water bodies as associated with industrial operations are to be expected.	Continuation of past trends is expected, including positive efforts to protect wetlands and threatened and endangered species. Also, unwanted and often unexpected pollution impacts on water bodies as associated with industrial operations are to be expected. Plaza C/Crossing X-11 is expected to have a relatively low impact. Plaza B1/Crossing X-10B, Plaza A/Crossing X-10A and Plaza B and B1 via Ojibway Parkway are expected to have a moderate impact. Crossing X-10 and Plazas B and B1 would encroach on the Ojibway Black Woods Environmentally Sensitive Area. Plaza A/Crossing X-11 via Brighton Beach, Plaza A/Crossing X-11 and Plaza A/Crossing X-10A are expected to displace more provincially rare vegetation communities and species. Plaza A/Crossing X-11 via Ojibway Parkway would have fewer impacts to natural features than Plaza A/Crossing X-11 via Brighton Beach.
Geotechnical	Brine well development in the crossing corridors stopped years ago and is not expected to resume.	Crossing X-10B is cleared from risks of deep brine wells. The approach to the bridge of Crossing X-11 cannot be cleared without additional investigations. Even if they are undertaken, they may still be insufficient to consider the risk to be acceptable because the approach to the Crossing X-11 bridge in Canada passes over the eastern end of the former solution mining brine well field and a subsurface anomaly that appears to be a brine-filled cavity, rubble zone and disturbed rock mass.

Source: The Corradino Group of Michigan, Inc.

- Canada: Analyses of the transboundary traffic impacts in Canada indicate every DRIC alternative would significantly improve overall traffic operations and meet overall road transportation system needs. The DRIC alternatives would also serve to improve or maintain existing levels of service at most intersections for the area around Huron Church Road. All users of the roadway would be able to move more efficiently and effectively through the corridor. Most international traffic would use the new six-lane freeway to travel to the new crossing or to rejoin Huron Church Road in the vicinity of the E.C. Row Expressway. The new crossing would provide commercial operators with another route to and from the United States, reducing the proportion of international truck traffic in the corridor by almost 30 percent north of the E.C. Row Expressway. This would result in significant reductions in congestion and delay without the need for local infrastructure improvements. The details of the analyses supporting these impacts can be found in the report entitled, *Practical Alternatives, Evaluation Working Paper, Level 2 Traffic Operations Analysis* (URS Canada, January 2007) available on the project Web site (www.partnershipborderstudy.com).

- **Economic Impacts**

  - U.S. and Canada: It is expected that local businesses may develop or expand in several sectors related to a new border crossing. Such change would be associated with an increase in local jobs. This would then help the local tax base grow. But, it is recognized that much of the cross-border trade in the Detroit-Windsor area is tied to the auto industry. While American auto companies are struggling now, the U.S. demand in 2035 for new automotive vehicles is forecast at 26 million.[19] This is a 53 percent increase from the 16 to 17 million current annual U.S. consumption of autos/trucks. This growth is similar to that which occurred over the last 20 years, when 15 new auto plants were built in North America, eight of which were built in "northern" locations (e.g., Ohio, Indiana, and Ontario, Canada). The implication is that another dozen auto manufacturing plants will be built in the U.S. and Canada in the next 20 to 30 years. With a new border crossing, Michigan and Ontario will be in a position to gain 25,000 to 35,000 new jobs. A sketch planning analysis that is the basis of this forecast is included in the *DRIC Induced Demand Technical Report*.

[19] Center for Automotive Research, *Economic Contribution of the Automotive Industry to the U.S. Economy: An Update* and *The Contribution of the International Auto Sector to the U.S. Economy: An Update*, 2003.

- **Land Use Changes**

  - U.S.: Land use changes can be expected to be accelerated with a new border crossing. Such growth could be associated with the mixing of land use types that are unwanted, i.e., industrial/commercial with residential. This can be avoided by applying land use/zoning principles like those in the City of Detroit's Master Plan of Policies, the land use concepts defined in Figures 3-17A and 3-17B and Figures 3-39 through 3-42 and the master plans of Allen Park, Dearborn, Melvindale and River Rouge.

  - Canada: The induced demand analysis indicates improved accessibility would be realized in the Canadian portion of the study area (refer to Figure 3-13). With this would come increased pressure to create land uses that accommodate jobs. Such development can be positive, if properly handled by adhering to land use planning and zoning regulations. If not, unwanted mixes of land uses would occur.

- **Air Quality**

  - U.S.: The preferred DRIC alternatives must be included in SEMCOG's Regional Transportation Plan to gain approval and advance to implementation. The DRIC will be tested, together with all other Plan elements, to ensure that they collectively do not cause a worsening of air quality or a delay in the region's timely attainment of National Air Quality Standards. Nonetheless, increased development stimulated by a new border crossing may increase local pollution. But, results of the analysis of air quality impacts indicate that such increases should not cause standards to be violated, if the development is properly located and given federal controls on vehicle engines and fuels, as well as on industry.

  - Canada: Increases in particulate matter are forecast in the vicinity of all proposed plazas. But, all DRIC alternatives would likely have no discernible difference in air quality among them in Sandwich Towne. Only Crossing X-11 has the potential for slight increases in air pollutant concentrations for portions of Sandwich Towne compared to the No Build condition.

- **Cultural Resources**

  - U.S.: Historic districts/properties would experience adverse effects from development associated with a new border crossing that could occur adjacent to their boundaries. If already-existing local controls and proper planning principles are applied, compatible development would occur.

- Canada: No nationally or provincially designated cultural features are impacted. The Brighton Beach area is a cultural landscape that is presently zoned industrial; this landscape could be negatively impacted by future development in this industrial park or by several plaza/crossing combinations. Historic Sandwich Towne is another cultural landscape which could be disrupted by Crossing X-11C. An area of high archaeological potential is potentially impacted by the Plaza B/B1 alternatives.

- **Community Cohesion**

  - U.S.: Development stimulated by a new border crossing may create opportunities for positive reuse of underused residential parcels (the City of Detroit owns thousands of such parcels as a result of tax delinquencies). This development could lead to unwanted mixing of land uses, if controls in the master plans of various cities are not implemented. For example, tracts large enough to hold logistics businesses could locate at numerous places in residential areas that were once occupied by industry. The increased truck activity associated with such development could have a negative effect on the nearby neighborhoods. With proper planning and land use controls this could be abated.

  - Canada: The areas of south and west Windsor and LaSalle will benefit from having international traffic removed from local streets and separated from local traffic. The displacement of businesses along the proposed access road would have limited overall economic impact. Despite the immediate loss of revenue and employment, the loss of businesses would be offset by gains in other businesses, or the displaced businesses would relocate to other suitable areas. The new access road would have an aesthetic impact on the residential area between Matchette Road and Ojibway Parkway. Plaza A would have the greatest potential effect on community/neighborhood features due to the displacement of residences and proximity to the adjacent Armanda Street area. Similarly, Crossing X-11 would have the greatest potential for effects on community and neighborhood features, due to its proximity to Sandwich Towne. Plaza B1 and Crossing X-10B are expected to have the fewest overall impacts to the community, including displacement of residents and businesses, in comparison to the other alternatives.

- **Noise**

  - U.S.: Traffic volumes and ambient noise levels would increase as economic conditions improve with a new border crossing and could exceed annoyance levels at sensitive uses, like residential areas or institutions (e.g., churches/schools). But, negative effects can be avoided by the

developer/builder and local permitting agencies working to locate this increased development away from sensitive receivers. Under federal and state noise policies, local communities are discouraged from allowing new sensitive noise receivers near highways.

- Canada: The communities that would be most affected by the plazas and crossings are the southern portion of Sandwich Towne and the residential communities near Matchette Road and E.C. Row Expressway. The noise generated solely from the plaza locations would not be expected to cause a major impact. In most cases, homes are more than 165 feet away from the plazas. Among the crossings, Alternative #11 is the only option expected to have a potentially significant impact.

- **Water Quality and Wetlands**

  - U.S.: Increased development could lead to more impervious surface runoff and pollutant load, if local jurisdictions and Drain Commissions do not apply appropriate controls on development to prevent sedimentation, changes in stream hydrology and geomorphology, and potential impacts to aquatic species. Reclaiming properties now affected by hazardous materials to accommodate increased economic activity is very possible. Thousands of such properties exist, are abandoned, and have not been remediated. Use of the property by DRIC-stimulated activities should cause remediation which will improve the quality of the runoff into surface and subsurface drainage infrastructure compared to the No Build Alternative.

    No cumulative impacts on wetlands are anticipated as the study area is highly built up. However, if development were to move down I-75 into Monroe County, wetlands impacts could be possible. They would have to be mitigated consistent with laws and regulations.

  - Canada: Plaza A/Crossing X-11 is expected to have a relatively low impact. Plaza B1/Crossing X-11, Plaza B/Crossing X-11 and Plaza A/Crossing X-11 via Ojibway Parkway are expected to have a moderate impact. Crossing X-10 and Plazas B and B1 would encroach on the Ojibway Black Oak Woods ESA.

    Plaza A/Crossing X-11 via Brighton Beach, Plaza A/Crossing X-11 and Plaza A/Crossing X-10, are expected to displace more provincially rare vegetation communities and species.

    Plaza A/Crossing X-11 via Ojibway Parkway would have fewer impacts to natural features than Plaza A/Crossing X-11 via Brighton Beach.

3.14.4 Summary of Indirect and Cumulative Impacts – U.S. and Transboundary

No Build Alternative

The No Build Alternative indirect, cumulative and transboundary effects discussed in this report are summarized in Tables 3-28 and 3-31, respectively.

Build Alternatives

The indirect, cumulative and transboundary effects discussed in this report are those expected in the area around the host community of Delray. Precise quantity and location of broader regional effects are virtually impossible to define. Nonetheless, it is important to recognize what effects may occur in one key regional area: wealth distribution/redistribution, which is associated with shifts in population, employment and tax base discussed earlier.

For both the Build and No Build Alternatives, it is noted that market-driven actions and supporting public policy decisions underlie the dynamics of the wealth distribution pattern in the Detroit-centered region. All these decisions operate separately from the DRIC alternatives. These dynamics include, as cited by SEMCOG in a report entitled *Land Use Changes in Southeast Michigan, Causes and Consequences*, "…residential segregation by race and income, federal tax subsidies for home mortgage interest and property taxes, school funding and quality, crime and public safety, societal ideals of lifestyle and urban design, constitutional protections of private property rights, infrastructure financing policies, and extent of personal vehicle ownership and use."

By helping to build partnerships among federal, state and local agencies and the private sector, the ability to influence this pattern in a positive manner is enhanced. In this regard, the Build Alternatives have significant potential to: build on the transportation and industrial strength of the study area; make improvements to push unwanted truck traffic out of residential areas; create public/private partnerships to advance a "doable" revitalization effort in Delray; create some jobs which can be directed to people in the local areas around the project; and, prepare/train community residents to be able to take those jobs. This revitalization can occur regardless of the proposed six-lane replacement of the Ambassador Bridge or by the construction of the Detroit River Tunnel Partnership proposed truck-only tunnel. If either or both are implemented, neither project would measurably diminish the traffic on the proposed DRIC crossing and neither is associated with a program to enhance the community which hosts the crossing.

3.15 Safety and Security

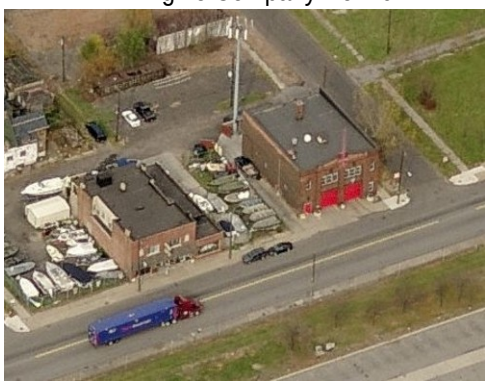
This section discusses the current fire, law enforcement, and emergency medical services in the Delray area, and how these might be affected by the presence of a new river crossing and plaza. It also discusses security on the plaza.

Southwestern Public Safety Mall

Source: The Corradino Group of Michigan, Inc.

A Public Safety Mall for the Southwestern District of the Detroit Police Department opened in 2006 at 4700 Fort Street. It also houses Fire Company 27, Ladder 8. A second firehouse, Engine Company No. 29 is located at 7600 West Jefferson Avenue. Emergency medical services (EMS) are provided through the Fire Department. The nearest EMS unit is stationed with Engine Company No. 29. The reason for two firehouses in such close proximity is to respond in a timely manner to an emergency in the event trains are blocking crossings of the rail line that cuts through Delray.

Engine Company No. 29



Source: The Corradino Group of Michigan, Inc.

The DRIC alternatives would not affect these existing facilities. If the project is constructed, approximately 163 to 223 residential structures would be removed.

Special homeland security provisions apply to the proposed DRIC plaza. The plaza layout (Figures 2-9A through 2-9D) provides for security measures to be taken in response to a heightened threat. This includes communications and electronics systems; lighting; security barriers, monitoring points and perimeter control; facilities to support temporary staff; and, the ability to temporarily suspend or shield operations in exposed areas.

Specific features that are the subject of final design are:

- Perimeter site fencing to enclose the plaza site.
- Fence separation of non-commercial and commercial parking areas, kennels, warehousing, physical plant facilities, and impoundment lots.
- Clear identification of all restricted access areas.

- Clear sight lines between inspection areas. Buffers and barriers must not hinder lines of sight. Landscaping may be used to prevent public viewing into secure areas; however, it must not block required views.

- Separation of vulnerable spaces from public view. Violator areas and seizure areas must not be located where the public can observe them.

- Relocation of utilities to corridors outside of the occupied plaza area.

It is noted that the plaza will be designed to allow law enforcement to maintain control of the general public and any criminals encountered during the normal inspection process. It is noted the Michigan State Police would be allocated space on the plaza. Agreements will be made among U.S. CBP/GSA, the State Police and the Detroit Police, Fire and EMS units to coordinate emergency response.

3.15.1 Summary of Safety and Security Impacts

No Build Alternative

No change to the status quo is expected with the No Build Alternative. The Delray area is subject to significant public safety/security protections because of the facilities in the area (like the City's Wastewater Treatment Plant) and the Mistersky Power Plant. It also receives attention because of the location of the Police Southwestern District Office on Fort Street at Campbell in Delray.

Build Alternatives

There is no difference among DRIC alternatives. No change is expected in response time by emergency services once the project is completed. Coordination would be continuous during project design and construction to minimize any negative effects.

All DRIC alternatives would require that agreements be made with the Detroit Police and Fire Departments and EMS units for emergency response to incidents at the plaza/crossing. The City of Detroit Police Department has a Homeland Security Coordinator. That group has been involved in consultation through the project scoping and Local Advisory council activities (see Section 6). Once a Preferred Alternative is selected, specific security measures would be defined for the crossing system and the surrounding area. The design features required for Ports of Entry would be worked out in consultation with U.S. Customs and Border Protection and the General Services Administration.

3.16 Soils/Geological Resources Impacts

The following findings resulted from the U.S. and Canadian conduct of the brine well cavity investigation programs. They were reviewed and accepted by the Geotechnical Advisory Group (Appendix G). In doing so, the Group noted that the scope of the programs, methods of data collection, interpretations and analyses are sound and reflect the state-of-the-art or practice in engineering and scientific fields used to reach such conclusions. The Geotechnical Advisory Group also noted that, notwithstanding this assessment, the responsibility for the accuracy and completeness of the investigations, analyses, conclusions and recommendations resides with the consultants and that ultimate decision-making responsibility rests with the Partnership and its individual members (TC, FHWA, MTO and MDOT) based on recommendations received from its consulting teams.

3.16.1 Soil/Geotechnical Conditions

Shallow soil borings were made using a geoprobe to determine if the ground is suitable for construction. This is a normal part of preliminary engineering. The analysis focused on the plaza area to date. Further work would be done once a Preferred Alternative is selected.

Forty-five holes were bored to an approximate depth of ten feet on a grid through the plaza area. Most holes were bored in public right-of-way.

Geoprobe Vehicle

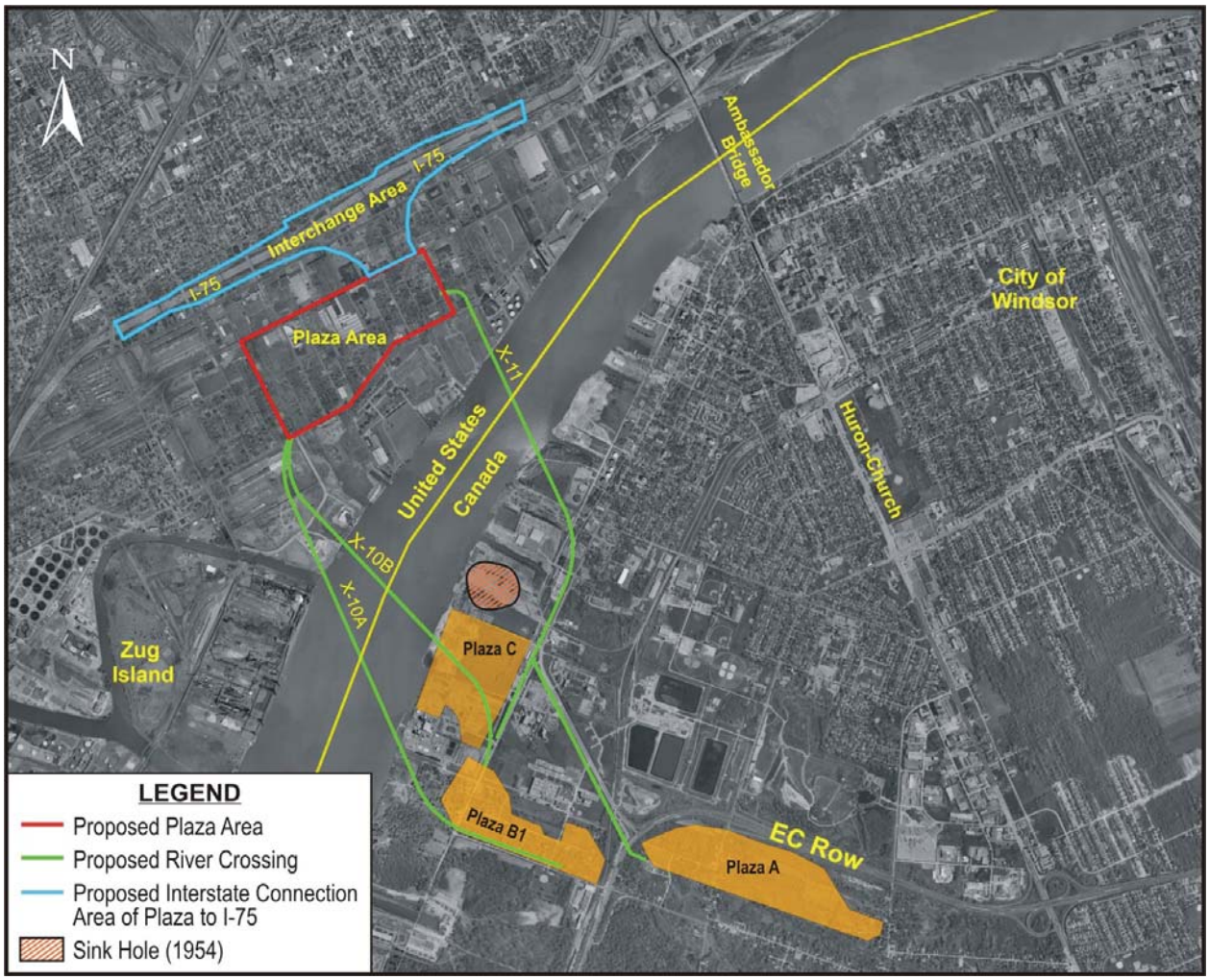
Source: The Corradino Group of Michigan, Inc.

The first stratum encountered was, usually, pavement. The next layer was typically fill materials of clay, silt, sand and gravel. Historically, the area was of low elevation and swampy, so fill was brought in as the area developed. Brick layers were found in several holes. Layers of clayey silt or sandy silt were found beneath the fill soils and clay was usually the lowest layer encountered. Nothing unusual was found. The analysis resulted in technical recommendations for how construction should occur for all DRIC alternatives. The DRIC alternatives would not have any impacts on groundwater. They will affect the extraction of minerals in a broad area as mining will be prohibited within the immediate vicinity of the DRIC to protect the plaza and crossing. No extraction is underway within a half mile of the plaza or crossing.

3.16.2 Geological Resources

Salt has been mined historically through solution mining in the general area of the DRIC footprint. The salt extraction was conducted at depths ranging from 900 to 1,600 feet below the ground surface. Water was injected into the ground, where salt was dissolved and the resulting brine was brought to the surface and dried. This created underground cavities. Much of the solution mining occurred in an uncontrolled method before standardized records were kept. On the Canadian side of the river, a solution mining cavity caused a sinkhole in 1954 (Figure 3-50).

Figure 3-50
Canadian Sinkhole
Detroit River International Crossing Study



Source: URS Canada

After consideration of the available data, an investigation program was developed to delineate the size, shape, and geometry of potential brine well cavities in the X-10 and X-11 crossing corridors. Similar programs were conducted on both sides of the border. The U.S. program combined geophysical and geotechnical methods, including drilling of 13 borings to depths of 1,500 to 1,750 feet (Figures 3-51A, 3-51B and 3-52). Crosswell seismic imaging (Figure 3-53) and other sophisticated geophysical techniques were part of the program. This section summarizes the data obtained to date. More will be provided as the program moves to its conclusion. The Canadians did similar explorations on their side of the border.

3.16.2.1 Geotechnical Analysis Overview

A panel of international experts, known as the Geotechnical Advisory Group, was assembled to review the U.S. and Canadian programs' results. Members of the Advisory Group, listed alphabetically, are:

Jerry DiMaggio, U.S. Federal Highway Administration
Chantale Doucet, Natural Resources Canada
Dave Dundas, Ontario Ministry of Transport
Dick Endres, Michigan Department of Transportation[20]
Peter Gerabek, Public Works and Government Services Canada
Khamis Haramy, U.S. Federal Highway Administration
Dave Juntunen, Michigan Department of Transportation
Tae C. Kim, Ontario Ministry of Transport
Stephen McKinnon, Queens University
Richard Miller, University of Kansas
Pat O'Rourke, Michigan Department of Transportation[20]
Leo Rothenburg, University of Waterloo
Richard Woods, University of Michigan

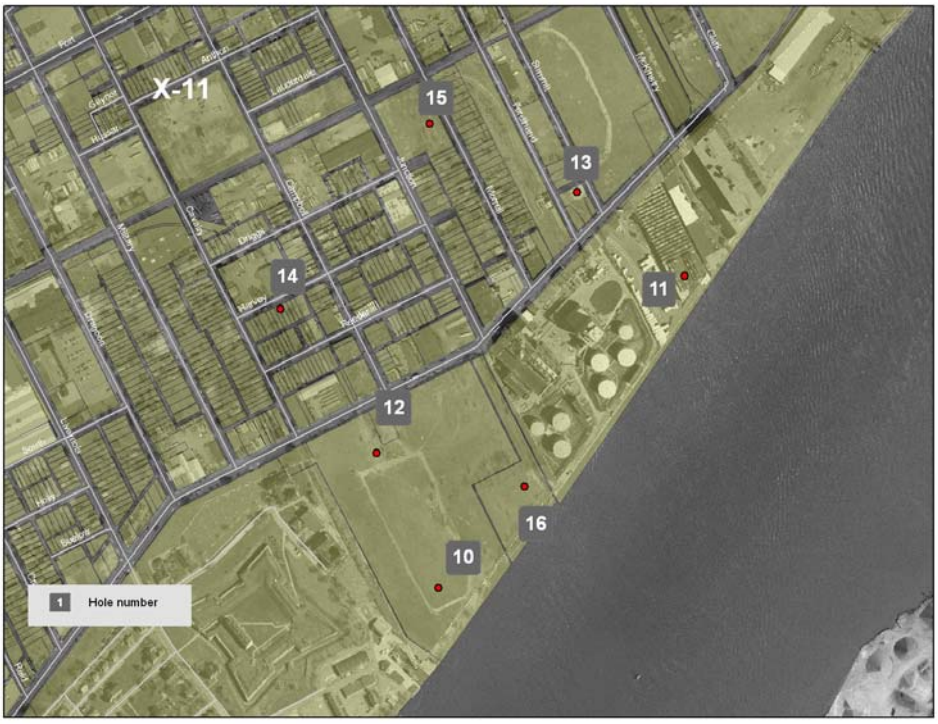
The Group met four times in the Detroit-Windsor area and five times by teleconference between June 2006 and March 2008. The Geotechnical Advisory Group's responsibility has been solely to advise the consultants, and in turn the Partnership, as they have proceeded through the Brine Well Cavity Investigation Program.

[20] In 2007, Pat O'Rourke retired. He was replaced by Dick Endres.

Figure 3-51A
Test Boring Location Plan – Site X-10
Detroit River International Crossing Study

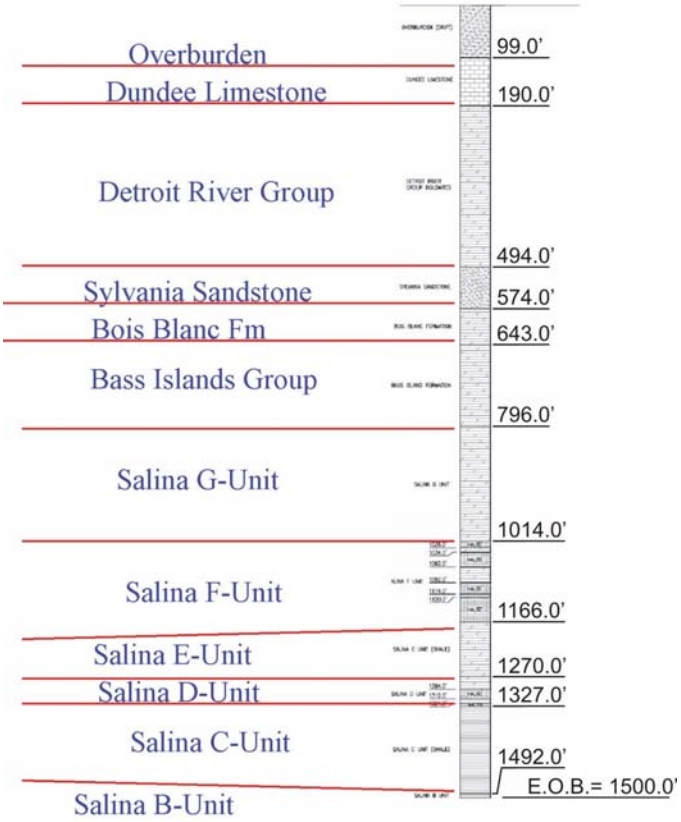
Source: NTH Consultants, Ltd.

Figure 3-51B
Test Boring Location Plan – Site X-11
Detroit River International Crossing Study



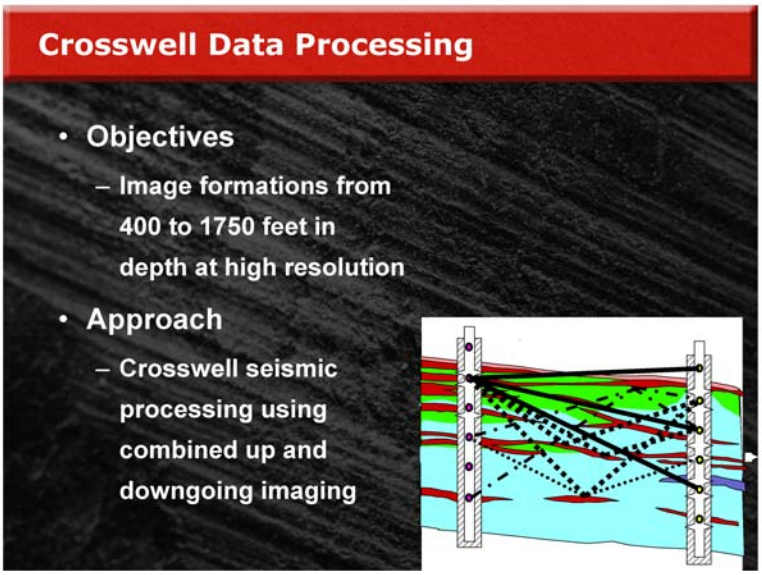
Source: NTH Consultants, Ltd.

Figure 3-52
Example of Rock Strata in Drilled Holes
Detroit River International Crossing Study



Source: NTH Consultants, Ltd.

Figure 3-53
Crosswell Concept
Detroit River International Crossing Study



Source: NTH Consultants, Ltd.

3.16.2.2 U.S. Project Criteria

The proposed bridge in each corridor, X-10 and X-11, requires: 1) foundations to be located outside of the influence of any rock cavities that could have impact on the foundations, including those produced by solution mining activities; and, 2) that the foundation must be built on competent bedrock.

3.16.2.3 U.S. Results

A total of 12 crosswell profiles were performed in the X-10 corridor and 16 profiles were performed in the X-11 corridor. The images are excellent with horizontal and vertical resolution of approximately 20 to 25 feet in the X-10 corridor and 30 to 35 feet in the X-11 corridor.

What is an Anomaly?

An anomaly is a rock condition which is noticeably distinct from general conditions. It can be naturally-occurring or man-made.

All crosswell seismic profiles have undergone an iterative process of data reduction and compilation into an image, followed by interpretation. Based on the data gathered and analyzed, there are two anomalies of interest on the U.S. side of the border. Canadian results are still being formulated. Neither U.S. anomaly is of significant concern (Figure 3-54). There is also no evidence of larger features nor evidence of potential instability of the rock mass within the crossing corridors. Even for the larger of the anomalies, and assuming an unfilled cavern, the anomaly is stable, and will not progress upward any significant distance. The analysis shows that the observed anomalies have probably been filled by one of several natural mechanisms.

3.16.3 Summary of Soils/Geological Resources Impacts

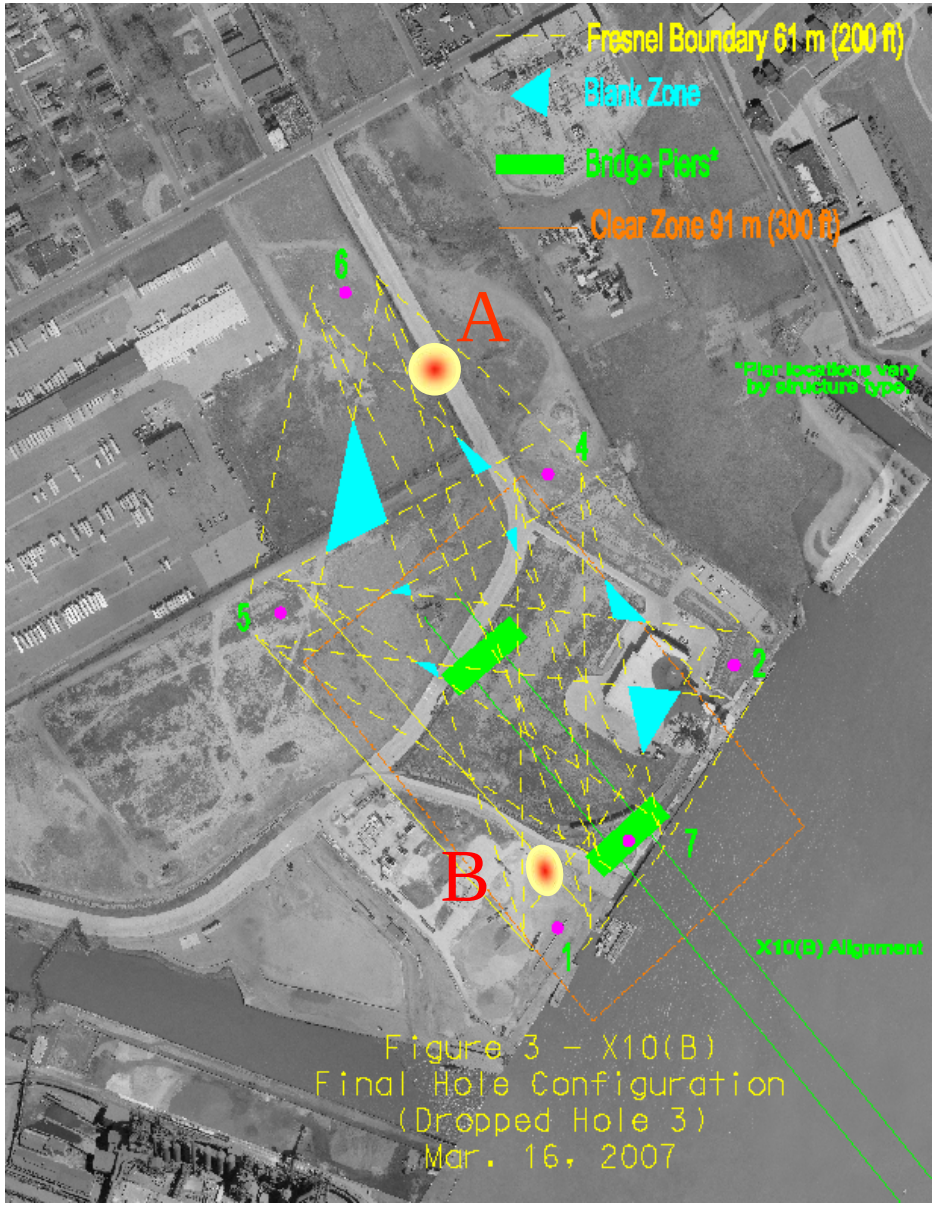
No Build Alternative

The No Build Alternative could see expansion of room-and-pillar salt mining along the western edge of Delray.

Build Alternative

The following findings resulted from the U.S. and Canadian conduct of the brine well investigation program which the Geotechnical Advisory Group reviewed and accepted (Appendix G), noting that the scope of the programs, methods of data collection, interpretations and analyses are sound and reflect the state-of-the-art or practice in engineering and scientific fields used to reach such conclusions. The Geotechnical Advisory Group also noted that, notwithstanding this assessment, the

Figure 3-54
Apparent Anomalies
Detroit River International Crossing Study



Source: NTH Consultants, Ltd.

Anomaly "A":

- Size: About 20 to 25 feet high, about 125 ft diameter.
- Depth: Centered at about 1100 feet BGS.
- Shape: Round in Plan, "Morning Glory" in profile.
- Probably fully or partially "bulked-up," or in-filled with silt, or recrystallized.

Anomaly "B":

- Size: About 20 to 25 feet high, about 120 by 170 feet in diameter.
- Depth: Centered at about 1410 feet BGS.
- Shape: Elliptical in Plan, Hockey Puck in profile.
- Most likely fully or partially "bulked up", or in-filled with silt, or recrystallized.

Note: This summary is based on preliminary evaluations of crosswell panels and borehole gravity information, and may be modified based on ongoing analysis.

responsibility for the accuracy and completeness of the investigations, analyses, conclusions and recommendations resides with the consultants and that ultimate decision-making responsibility rests with the Partnership and its individual members (TC, FHWA, MTO and MDOT) based on recommendations received from its consulting teams.

- Both crossings, X-10B and X-11) in the U.S. are clear of risk of sinkholes forming. The Border Transportation Partnership would take steps, in cooperation with other agencies, to limit extraction of mineral resources in a prescribed area around the bridge and plaza to protect them.

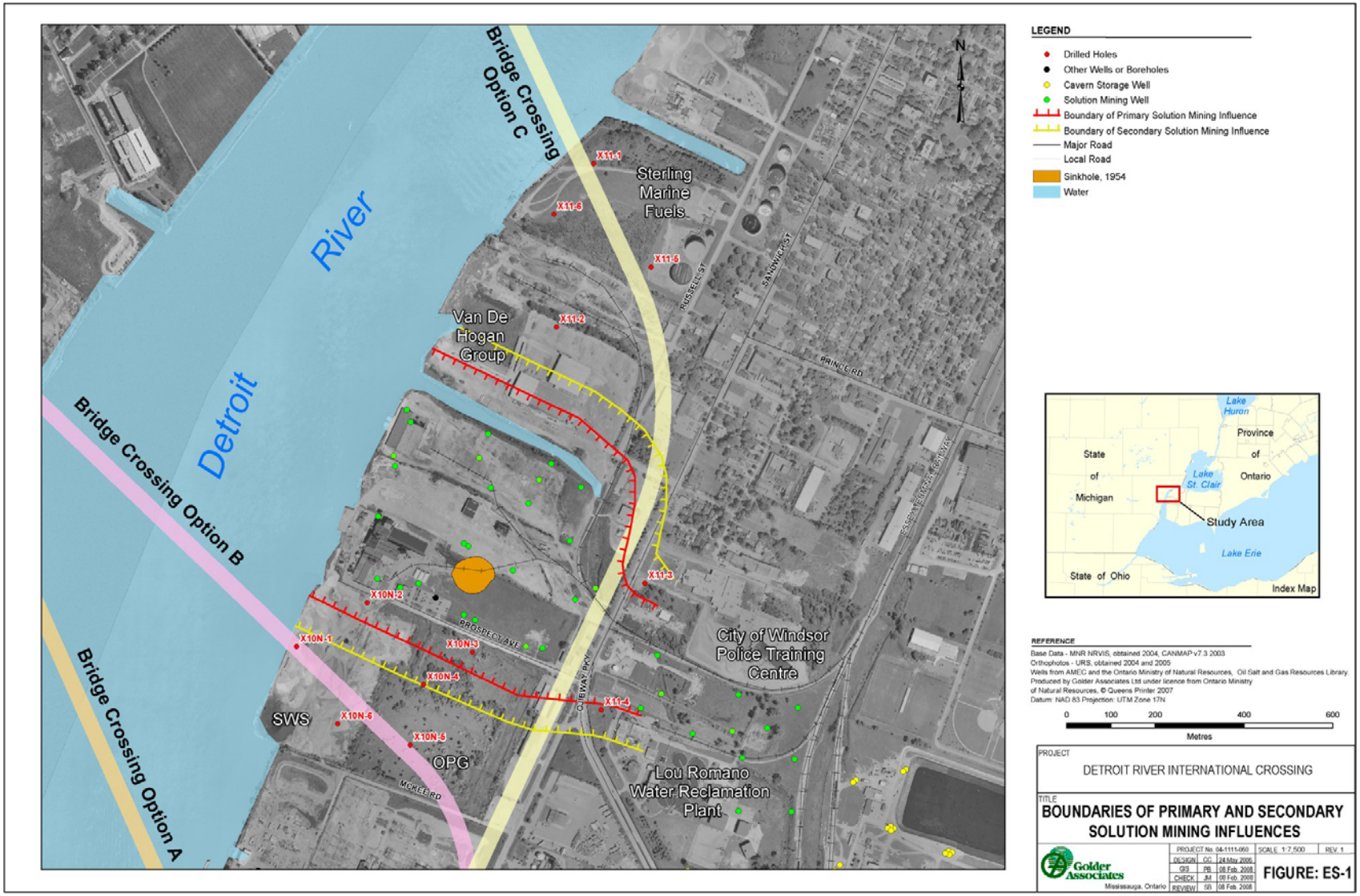
- There are no subsurface features or conditions on the Canadian side of the river associated with solution mining that might adversely affect the bridge foundations for the locations shown at Crossing X-10B (Crossing B in the Canadian nomenclature) provided that the foundations remain outside of the Limit of Secondary Influence (Figure 3-55).[21]

- There are no subsurface features or conditions associated with solution mining that might adversely affect the main span bridge foundations for the locations on the Canadian side of the river shown at Crossing X-11 (Crossing C in the Canadian nomenclature) in Canada. However, the proposed approach alignment to Crossing X-11 passes over the eastern end of the former solution mining well field and a subsurface anomaly that appears to be a brine-filled cavity, rubble zone, and disturbed rock mass. Should this crossing alignment be considered further, additional study will be required on the Canadian side of the river to refine the range of risks and orders of magnitude of future settlement that should be accommodated by design. The level of effort (investigation, testing, and analysis) that may be required to further refine these issues relative to the Crossing C alignment may be prohibitive.

The Canadian consultant further elaborated that, should these additional investigations be undertaken, that they "… may still be insufficient to consider this section of the approach to the Crossing C bridge (Crossing X-11 in U.S. nomenclature) to be at an acceptable level of risk."

[21] Golder Associates, *Draft Preliminary Foundation Investigation and Design Report - Evaluation of Alternative Bridge Sites*, January 2008.

Figure 3-55
Extent of Solution Mining Influences in Canada
Detroit River International Crossing Study



Source: Golder Associates

3.17 Permits

No Build Alternative

Permits would not be needed under the No Build Alternative except that implementation of the Ambassador Bridge second span would require permit approval.

Build Alternatives

The approvals to advance the project from the DEIS to FEIS phases and, then, to the Record of Decision (ROD) are listed on Table 3-32. Once the ROD is executed, a multitude of permits at the local, state and federal levels must be secured. These include a Presidential Permit which is issued by the U.S. State Department, and permission to cross the Detroit River, which is issued by the U.S. Coast Guard after the Presidential Permit is received.

3.18 Energy

No Build Alternative

The No Build Alternative would not require the energy and materials necessary to build the project. At the point that border crossing capacity is reached, delay and idling at the border would increase and worsen over time if a new crossing is not built. Congestion means increased energy use. If a second span of the Ambassador Bridge is built, a large amount of energy will be used.

Build Alternative

Energy use associated with the project depends on the efficiencies of the travel network provided by the alternatives, the amount of delay/idling at the border, and the nature of the facilities to be constructed.

There would be no difference in energy use to construct each of the DRIC alternatives; a large amount would be used in each case. Each would be built to meet the requirements of the General Services Administration and the needs of the multiple agencies housed on the plaza, especially U.S. Customs and Border Protection. Opportunities do exist to minimize long-term energy use. GSA is pursuing innovative design for its facilities from the standpoint of energy use and aesthetics.

Table 3-32
Permitting and Other Major Agency Actions
Detroit River International Crossing Study

Action	Agency	Comments
Circulation of DEIS/Draft 4(f) Evaluation/FEIS and Record of Decision	MDOT/FHWA	Follows FHWA approval and signature
Coordination on Part 77	Federal Aviation Administration	Notification not officially required until 60 days prior to construction
Coordination on Tall Structures Act	Michigan Aeronautics Commission	Coordinate on structures over 200 feet tall
Public Hearing	MDOT/FHWA	Follows distribution of DEIS
Selection of the Preferred Alternative	The Border Partnership	Federal cooperating agencies concurrence
Inclusion on Cost-Constrained Plan/ Conformity Determination	SEMCOG	Must precede signing of FEIS
Coastal Zone Consistency	MDEQ	Needed for inclusion in FEIS
Section 106 Final MOA	FHWA, MDOT and SHPO	Needed for inclusion in FEIS
Preparation and Circulation of FEIS/Final Section 4(f) Evaluation	MDOT/FHWA	FEIS based on Preferred Alternative
Wetland Finding	FHWA	Needed for inclusion in Record of Decision
Record of Decision (ROD)	FHWA	Serves as location/design approval.
Interchange Access Justification Report	MDOT/FHWA	Cannot be signed before ROD
Presidential Permit	U.S. State Department	After all NEPA requirements are met.
Coast Guard Permit	U.S. Coast Guard	After requirements have been met and Presidential Permit has been issued.
Section 401 Water Quality Certification	MDEQ	All the below permitting occurs after ROD when sufficient engineering has been done to complete the permit applications
Section 402 / Part 31 – National Pollutant Discharge Elimination System (NPDES) Coverage	MDEQ	Covers stormwater runoff.
Part 31 Floodplain Permit	MDEQ	Any occupation of floodplain. Combined with 301 permit.
Section 404 / Part 303	MDEQ administers except in Detroit River (US Army Corps of Engineers)	At appropriate point during design.
Section 9 Rivers and Harbors Act of 1899	U.S. Coast Guard	At appropriate point during design.
Section 10 Rivers and Harbors Act of 1899	U.S. Army Corps of Engineers	At appropriate point during design.
Part 301 Inland Lakes and Streams Permit	MDEQ	Construction on or over bottomlands of streams. Combined with Part 303 permit.
Air Quality Permit	MDOT/Contractor	PA 451, Part 55 Air Quality Permit for any portable concrete and bituminous plants

Source: The Corradino Group of Michigan, Inc.

Delay and idling at the border depends on: 1) the policies in place regarding inspection; 2) the staffing of the toll and Customs booths; and, 3) the participation in the FAST and NEXUS programs. The DRIC alternatives do not differ in this regard. CBP now requires that trucks sent to secondary inspection turn off their engines, controlling air pollution and reducing energy use.

Each of the DRIC alternatives would alleviate the forecast congestion and reduce energy use compared to the No Build Alternative. The opening of a new bridge is expected to increase participation in the FAST and NEXUS programs, reducing delay and energy use by participating vehicles.

3.18.1 Summary of Energy Impacts

In summary, there is no difference among alternatives on the basis of energy, in the near term. In the long term, when border capacity is reached, a new crossing would eliminate congestion due to the lack of capacity, which would result from the No Build Alternative.

3.19 Costs

No Build Alternative

Selection of the No Build Alternative would be limited to the cost of preparing the DEIS, FEIS and ROD at $31 million.

Build Alternatives

The U.S. cost of the combined bridge, plaza, interchange and associated property and utilities ranges from $1.277 billion for Crossing X-14 with a cable-stay bridge to $1.488 billion for Crossing X-16 with a suspension bridge (Table 3-33). The two crossing costs can be divided as follows.

These costs will be updated once the Preferred Alternative is chosen. At that time, costs will be provided in the terms of the year in which they will occur, meaning the costs will be inflated to each year of construction. At this time, a “contingencies” allocation for inflation is rolled into the overall costs of each component of the crossing system.

Table 3-33
Estimate of Construction and Related Costs
(Base Cost in Millions of 2007 U.S. Dollars with Inflation Then Added)[a]
Detroit River International Crossing Study

	Lowest Cost (millions) Crossing X-10, Alternative #14 with Cable-stay Bridge	Highest Cost (millions) Crossing X-10, Alternative #16 with Suspension Bridge
Bridge (U.S. Cost Only)	$282	$344
Plaza	150	150
Interchange	167	204
Utilities	145	183
Subtotal	$744	$881
Property	$171	$183
Subtotal	$915	$1,064
Fees (Management, final design and permits, construction engineering)	$149	$176
Inflation[a]	$213	$248
Total[b]	*$1,277*	*$1,488*

[a] To be spread to each construction phase for Preferred Alternative to translate total costs to year of expenditure.

[b] Cost to limit extraction of minerals to protect the DRIC crossing/plaza is not now known. It will be included in the FEIS. Such costs are associated with all Build Alternatives.

Source: The Corradino Group of Michigan, Inc.

3.20 Governance

Key to the construction and operation of the DRIC project is determining a suitable governance structure to manage and implement the project. The Partnership is committed to maintaining public oversight of the crossing and has established that it will be governed by one of several models:

- Government owned and operated (similar to the U.S. half of the Blue Water Bridge);
- Public-private partnership – concession with government ownership;
- Bi-national Authority (similar to the International Bridge at Sault Ste. Marie, Mich.) with government ownership; or,
- Private-sector owned and operated with government oversight.

Each model is being evaluated against a set of objectives which are to:

- Provide a safe and secure crossing;
- Ensure the efficient and integrated cross-border movement of people, goods and services;

- Minimize the use of public funds to the greatest extent possible;
- Provide public transparency and accountability; and,
- Protect the public interest.

This evaluation is being combined with legislative efforts to allow Michigan to enter into an agreement with Canada to implement the project and to provide authority for Public Private Partnerships. While these topics are currently under discussion, it is expected resolution of all issues will coincide with issuance of the Record of Decision.

Government Owned and Operated Model

A government owned and operated crossing is entirely owned and managed by state, provincial, and/or federal transportation agencies. In the absence of an operating agreement, each country operates half of the crossing, causing services to be unnecessarily duplicated on the U.S. side and the Canadian side of the crossing. Ownership of the crossing by public agencies ensures the highest level of public accountability and will guarantee full compliance with federal, state, and provincial environmental, safety, hazardous materials, and national security laws, regulations, and best practices. Public agencies also have access to lower cost financing options which reduces life-cycle facility costs, though public crossings may take significantly longer to build due to federal planning, environmental, and construction oversight requirements. Government agencies determine toll rates, ensure affordability to users, determine revenue uses, and make investment decisions. Investment and operational decisions are based on public interest needs, not on the need to generate profits, as is the case of a private sector owned and operated crossing. Political pressures may prevent appropriate toll setting levels to provide revenue for long-term maintenance and major capital projects. Finally, although user tolls offset the cost of the crossing, there is sometimes a perception that the tax payers are responsible for the entire cost of the crossing.

Public-Private Partnership – Concession with Government Ownership Model

The transportation industry is always looking for alternative ways to finance the construction, operation, and maintenance of infrastructure. One of the newer and more innovative methods is through a partnership between the public sector owner of the infrastructure and the private partner, who in this case finances the traditional public sector activities (design, construction, operation, and maintenance) in exchange for the revenue generated by the asset or a payment from the public sector, usually for a set period of time. This approach works for highways (roads and bridges), airports, public transit systems, and any other transportation system components traditionally owned by the public sector.

Public Private Partnerships offer the possibility of lower cost public financing with construction and operational efficiencies that may be available in the private sector. Agreements between the public and private partners ensures the facilities are properly maintained and secured, addresses the needs of the users and stakeholders, and provides the required level of accountability and transparency. Government ownership of the crossing guarantees full compliance with federal, state, and provincial environmental, safety, and national security laws, regulations, and best practices. It also enables public agencies to have oversight of tolls, profits, and revenues, while the crossing operations are buffered from the politics of state, provincial, and federal governments, therefore, appropriate toll setting can be achieved by the private sector to provide revenues for long-term maintenance of the facility. The private sector is also able to deliver the project sooner than if the crossing was designed, constructed, and operated by government.

Bi-national Authority with Government Ownership Model

Bi-national authorities are generally entities formed by legislation and agreements between two countries. Government has the opportunity to retain public oversight through membership in the organization, ownership of the facility, and/or agreements with the authority to fulfill specific functions. Government has the ability to ensure policy goals are met through a combination of legislation and regulation. Government ownership guarantees full compliance with federal, state, and provincial environmental, safety, and national security laws, regulations, and best practices. It also provides access to lower cost financing options, reducing life-cycle costs, though public funds may be necessary to subsidize the construction, maintenance, and/or operation. Operational decisions are not based on making a profit, but can be highly influenced by the politics of member jurisdictions.

Private Sector Owned and Operated with Government Oversight Model

A privately-owned and operated model is entirely owned and managed by a private sector corporation with little-to-no government involvement in financing and a very limited ability to regulate the crossing. A private owner/operator would generate a significant amount of local and state business taxes, and income and property taxes, but private financing is more costly than public financing and likely will result in higher life-cycle costs (i.e., higher tolls). A private owner or board will set tolls, make all investment decisions, and distribute revenues based on profit/investor needs, which may or may not be in the best interest of the public, since private ownership does not require financial transparency. Construction for such a crossing might begin later than under a publicly-owned and operated model, since the private sector would not begin until profitability is assured. Once this decision has been made, the private sector should be able to deliver the project in a shorter time frame than a government owned

and operated crossing. The private ownership model has some risk that cooperation and coordination among border entities may not be as easily accomplished due to competitive pressures and the limited ability of government to regulate private business. This is a significant concern when connected to a high-volume international border crossing and crucial trade corridor. Proponents of privately-owned crossings counter that a private sector crossing could be built and operated more quickly and cheaply than a publicly-owned facility.

Build Alternatives

Every DRIC alternative will be accompanied by the same governance structure. The exact nature of it will be known by the time the Record of Decision is to be signed. However, at this time, a Public Private Partnership is seen as a likely and viable alternative as it will foster competition in the private sector to provide governments and the public with the best value while ensuring the appropriate levels of transparency and accountability are met.

No Build Alternative

State government will continue pursuing the legislative agenda as determined by The Partnership even if there is no DRIC project. This is essential if it is to take advantage of creative ways to implement many other transportation projects.

3.21 The Relationship between Local Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

No Build Alternative

The No Build Alternative without a second span of the Ambassador Bridge will not involve direct use of resources. Past trends of residential and commercial decline and industrial encroachment throughout the area would be expected. If the second span were constructed, there would be some trade-offs between short-term benefits and long-term impacts. The main trade-offs and commitments for the short-term benefits include a potential for some additional bird losses through collisions with the bridge, commitment of additional land for transportation uses and consumption of some mineral and petroleum resources during construction. The short-term and long-term effects of the proposed second span of the Ambassador Bridge are considered consistent with the maintenance and enhancement of the long-term productivity of the local and regional area.

Build Alternative

This DRIC project is a result of local, regional, statewide, and national comprehensive planning. Present and future border crossing needs are reflected in the DRIC alternatives that address the proposed project's purpose and need. As with building a second span of the Ambassador Bridge, short-term impacts and use of resources by the Build Alternatives would be consistent with the maintenance and enhancement of long-term productivity for the local area (Southeast Michigan), the State of Michigan, the United States and Canada.

3.22 Irreversible and Irretrievable Commitments of Resources

The No Build Alternative would result in MDOT's spending $31 million to prepare the DRIC DEIS, FEIS and ROD.

Implementation of each Build Alternative would involve the commitment of a range of natural, physical, human, and fiscal resources. Land that would be used for expansion/construction of the proposed new border crossing system is an irreversible commitment.

Considerable amounts of fossil fuels, labor, and construction materials would be used for this project. Large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. Their availability is not limited; their use would not have an adverse effect upon the supply.

Construction of each Build Alternative would require a substantial expenditure of state, federal, local and private funds. The commitment of these resources would result in an improved border crossing system redundancy, providing improved efficiency, safety, and time savings. These are expected to outweigh the commitment of these resources.

3.23 Community Enhancements

No Build Alternative

The public engagement process helped the community craft a cohesive vision of the area. The concepts generated could be used to influence the City of Detroit's Master Plan and future development of the area.

Build Alternatives

MDOT, in partnership with FHWA, is exploring a number of concepts by which enhancements may be made to the Delray area as it becomes the “host community” for the DRIC project. These concepts include partnering with the private sector and with other government agencies in areas such as job training, small business development, improving and replacing housing stock, and other community enhancing amenities. Depending on comments from stakeholders and community leaders, these concepts may continue to be studied and refined as the DRIC process moves toward the selection of the Preferred Alternative, which will be addressed in the FEIS.