MDOT
Michigan Department of Transportation

Blue Water Bridge

Plaza Study

St. Clair County, Michigan

Draft Environmental Impact Statement

Draft Section 4(f) Evaluation

Prepared by the Michigan Department of Transportation in cooperation with the Federal Highway Administration

This document has been published by authorization of the Director of the State of Michigan's Department of Transportation in keeping with the intent of the *National Environmental Policy Act of 1969*, and subsequent implementing regulations and policies including *Title VI of the Civil Rights Act of 1964*, that direct agencies to provide the public and other agencies an opportunity to review and comment on proposed projects and alternatives so that potential impacts of the project can be considered and taken into account during the decision-making process.

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Blue Water Bridge Plaza Study
St. Clair County, Michigan

Draft Environmental Impact Statement and Draft Section 4(f) Evaluation

Submitted Pursuant to 42 U.S.C. 4332(2)(c) and 49 U.S.C. 303

By the

U.S. Department of Transportation
Federal Highway Administration

and

Michigan Department of Transportation

Cooperating Agencies
U.S. Environmental Protection Agency
U.S. Customs and Border Protection
U.S. General Services Administration
U.S. Army Corps of Engineers
U.S. Coast Guard

August 10, 2007
Date of Approval

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This Draft Environmental Impact Statement (DEIS) documents the social, economic, and environmental consequences and mitigation measures for improving the United States Inspection Plaza at the Blue Water Bridge located in St. Clair County, Michigan. This project is commonly referred to as the Blue Water Bridge Plaza Study. No-Build and Build Alternatives

are evaluated in this document. This DEIS identifies Practical Alternatives for the Study Area that include expanding the existing plaza and relocating the major functions of the plaza approximately 1.5 miles from the existing plaza, with a secured corridor connecting the existing plaza to the new portion of the plaza. The City East, City West, and Township Alternatives were evaluated in detail and will accommodate projected year 2030 plaza traffic growth; provide space for future plaza facility additions and new inspection technologies; reduce traffic backups on I-94/I-69, the Blue Water Bridge, and Highway 402 in Canada; improve safety on the Blue Water Bridge; and minimize impacts of plaza traffic on local roads. The City West Alternative has been identified as the Preferred Alternative in this document. Important issues and concerns related to the effects of the Practical Alternatives on the natural, human, and built environment include neighborhood and community cohesion, visual character, noise, air quality, and land use patterns. This DEIS fulfills the requirements of the National Environmental Policy Act (NEPA) guidelines, and requirements of the Council on Environmental Quality, and the Federal Highway Administration.

Comments on this DEIS are due within 60 days of publication of the Notice of Availability in the Federal Register. Comments should be submitted to Mr. Bob Parsons, Public Hearings Officer, Michigan Department of Transportation, P.O. Box 30050, Lansing, Michigan 48909.

PREFACE

This Draft Environmental Impact Statement (DEIS) has been prepared in compliance with the National Environmental Policy Act (NEPA) federal regulations on procedures for preparing environmental documents, Section 4(f) of the U.S. Department of Transportation (DOT) Act, and Michigan and federal environmental laws and regulations.

NEPA, enacted in 1969, requires that an Environmental Impact Statement (EIS) be prepared for all major actions significantly affecting the quality of the human environment. The EIS must address the environmental effects of alternatives for the proposed federal action it describes. Such actions include federal projects, state and local programs funded by federal assistance, and private development authorized by federal permits.

Part 771 of 23 Code of Federal Regulations (Highways) states that alternative courses of action must be evaluated and decisions should be made in the best overall public interest. The decisions should be based upon a balanced consideration of the need for safe and efficient transportation, social, economic, and environmental impacts of the proposed transportation improvement, and national, state, and local environmental protection goals. In addition, the alternatives should connect logical termini and be of sufficient length to address environmental matters on a broad scope. Technical Advisory T 6640.8A of the Federal Highway Administration (FHWA) states that all reasonable alternatives under consideration must be developed to a comparable level of detail so that their comparative merits may be evaluated. The Blue Water Bridge Plaza Study DEIS complies with these requirements.

In addition, in keeping with FHWA regulations and guidelines, an extensive public involvement program was developed and implemented for this project. Early coordination and scoping activities have informed the public and appropriate agencies about the proposed Blue Water Bridge Plaza Study. The public involvement program continues and affords the public and agencies opportunities for further review and comment.

FORMAT OF THIS DRAFT ENVIRONMENTAL IMPACT STATEMENT

Reader Friendly Format

The Blue Water Bridge Plaza Study Draft Environmental Impact Statement (DEIS) was created in a reader friendly format. This format differs significantly from the traditional EIS format and is based partly on the Reader-Friendly Document Tool Kit published by Washington State Department of Transportation.

The reader friendly format attempts to meet the needs of professionals, decision makers and the public by engaging the reader through the use of question and answer headings, defined terms, and visuals in an easy to follow format. This format saves time and effort by reducing confusion and allowing the reader to focus on the project and its key issues. Text and graphics are placed on the same page to make the document interesting and understandable to readers. Additional technical information is available in the various technical memoranda prepared for the project. Following the National Environmental Policy Act guidelines, this document is concise, clear and to the point. It thoroughly summarizes the Blue Water Bridge Plaza Study and references supporting technical details. The example below compares traditional EIS headings and reader friendly EIS headings.

Traditional EIS	**Reader-Friendly EIS**
Purpose and Need	Why are Improvements Needed?
Design Criteria	What Design Criteria were used in Developing the Practical Alternatives?
Affected Environment	The Environment: What's There Now and Project Effects
Existing Regional Land Cover	What Are the Land Uses in the Study Area?
Land Use Planning and Zoning	Are Practical Alternatives Consistent with Local Zoning and Ordinances?
Noise Impacts	How Will the Practical Alternatives Affect Noise Levels?
Agency Coordination	How Did the Study Team Coordinate with Federal and State Agencies?

Separate Appendix E Volume

This DEIS comes with a separate volume of exhibits labeled **Appendix E**. All of the 11 inch by 17 inch exhibits for the DEIS are contained in the separate Appendix E volume including exhibits of the alternatives considered. All of these exhibits are referred to in the DEIS text and the reader is encouraged to review these exhibits while reading the DEIS.

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EXECUTIVE SUMMARY

The Study Team prepared this Draft Environmental Impact Statement (DEIS) to discuss and compare alternatives for improving the United States Inspection Facility at the Blue Water Bridge Plaza and the I-94/I-69 corridor in St. Clair County, Michigan. This project is commonly referred to as the Blue Water Bridge Plaza Study.

Who is the Study Team?

The people who have been working on this project including specialists from the Federal Highway Administration (FHWA) and the Michigan Department of Transportation (MDOT) are referred to as the Study Team throughout this Draft Environmental Impact Statement.

What is the United States Plaza at the Blue Water Bridge?

The United States Plaza, which is owned by MDOT, is the inspection facility for vehicles entering the United States. The Blue Water Bridge is a major border crossing for cars and trucks between the United States and Canada. The Blue Water Bridge consists of two bridge spans over the St. Clair River, one for traffic to Canada and one for traffic to the United States. The bridges are jointly owned by the Michigan Department of Transportation (MDOT) and the Canadian Blue Water Bridge Authority (BWBA). Federal agencies operating on the plaza include the Bureau of Customs and Border Protection (CBP), the United States Department of Agriculture (USDA), and the United States Food and Drug Administration (FDA). These agencies are responsible for inspecting vehicles, goods, and people entering the United States. The inspection agencies rent facilities on the United States Plaza from MDOT through the General Services Administration (GSA), which provides buildings for the federal government.

Existing United States Blue Water Bridge Plaza

MDOT collects tolls on the plaza from vehicles leaving the United States for Canada and the Michigan State Police operate a truck weigh scale on the plaza.

The existing Blue Water Bridge Plaza is approximately 18 acres including inspection facilities and parking. The existing plaza is elevated approximately 24 feet above street level to accommodate Pine Grove Avenue, which runs underneath.

Location of Blue Water Bridge Plaza

Where is the Blue Water Bridge Plaza Located?

The Blue Water Bridge Plaza Study Area is located in the City of Port Huron and Port Huron Township, in St. Clair County, Michigan. The Study Area begins at the western end of the Blue Water Bridge and ends at the I-94/I-69 interchange approximately 2.2 miles to the west. The Blue Water Bridge provides access to destinations across Michigan, 47 other states, Mexico, and Canada.

The Study Area encompasses approximately 30 blocks (195 acres) of residential, commercial, and recreational uses that surround the existing plaza and extends west along I-94/I-69. **Figure E.1**, located in the separate **Appendix E** volume, provides a map of the Study Area. The Study Area includes the Black River Bridge, the Water Street/Lapeer Connector Interchange, the existing plaza area, and a potential location for a relocated welcome center and a plaza alternative in Port Huron Township. Neighboring communities potentially affected by the Blue Water Bridge Plaza expansion are Fort Gratiot Township and Kimball Township.

What is the History of the Blue Water Bridge and Plaza?

The original Blue Water Bridge span opened in 1938. In 1992 an international task force concluded that the existing bridge was operating in excess of its capacity. Based on the results of that study, an additional bridge was constructed and opened to traffic in 1997. During this same time period, the original bridge was rehabilitated. The existing bridges currently provide six lanes, three lanes in each direction of crossing capacity.

The original Blue Water Bridge on the left was built in 1938. The second bridge was built in 1997

The United States Plaza has also undergone capacity expansion projects in the 1950s, 1980s, and 1990s. In 1999, MDOT completed a study that proposed numerous short-term improvements to improve plaza operations, such as relocating MDOT's bridge maintenance facility off-site. That study also recommended the development of a long-term plaza expansion plan. That recommendation resulted in this study that is being completed as part of this EIS decision-making process.

What Improvements are Needed on the United States Plaza?

Improvements are needed on the Blue Water Bridge Plaza (for the foreseeable future) to:

- Provide safe, efficient and secure movement of people and goods across the Canadian-U.S. border in the Port Huron area to support the economies of Michigan, Ontario, Canada, and the United States

- Support the mobility and security needs associated with national and civil defense.

The following is the list of reasons for improvements developed with the assistance of the Advisory Committee

- Improve operations and processing capability by accommodating the latest inspection technologies and procedures
- Provide flexibility to accommodate future unknown inspection technologies and procedures
- Improve security
- Provide facilities that ensure cars and trucks do not leave the plaza without being inspected
- Improve safety on the bridge, plaza, and the I-94/I-69 corridor including the elimination of traffic weaves
- Accommodate projected 2030 traffic growth and potential future facility needs
- Minimize backups on I-94/I-69 and on Highway 402 in Canada
- Reduce vehicle and pedestrian conflicts on the plaza
- Improve access to the plaza and local roadways from the freeway system
- Minimize routing of commercial traffic to local roads during maintenance operations
- Improve infrastructure conditions along the I-94/I-69 corridor including the aging Black River Bridge
- To create a more visible and accessible Welcome Center

The selected alternative must provide additional space for inspection booths, offices, docks to inspect and unload cargo, new security measures, and parking for cars and trucks

What is the Advisory Committee?

The Advisory Committee provides expertise and input on pertinent issues related to the plaza study. The Advisory Committee consists of a core group of stakeholders representing plaza inspection agencies, local and state officials, Canadian officials, private firms and key representatives from the local community.

Existing United States Plaza Looking West

needing inspection. The need for additional space and facilities is supported by several key issues including:

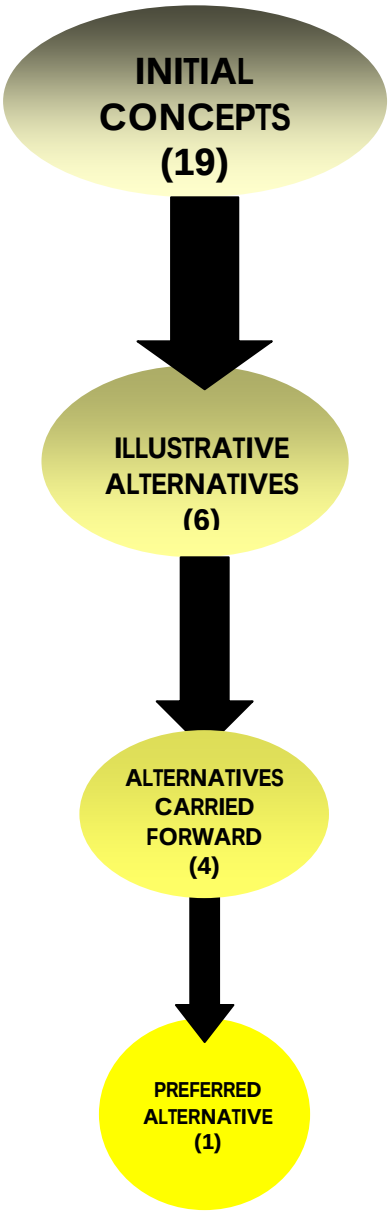
- Security issues
- The introduction of new inspection technologies, procedures, and policies
- Limited existing space to accommodate increased number of border inspection agents
- Traffic conflicts and crash history
- Access between the plaza and adjacent circulatory local roads
- Traffic growth
- Traffic backups
- Existing infrastructure conditions of the I-94/I-69 corridor
- Upgrading the International Welcome Center

Further details on the reasons for improvements are contained in **Chapter 1 Why Are Improvements Needed?**

Improvements to the two Blue Water Bridge spans over the St. Clair River are not a part of this project.

Although improvements to facilities on the Canadian side of the bridge are not part of this study, the Blue Water Bridge Authority (BWBA) is currently in the process of making improvements to their plaza facilities. These include:

- fixing the westbound mid-bridge weave,
- minimizing traffic backups on Canadian facilities,
- accommodating future traffic growth, and
- expanding the Canadian plaza facilities to address their own long-term space needs as a result of the growth in cross-border traffic.



Alternatives Development Process

What Alternatives Did the Study Team Consider for Improving the Plaza?

The alternatives development process included several steps. First, the Study Team developed initial concepts for a new plaza. These initial concepts were further developed into 19 Illustrative Alternatives Concepts. The Illustrative Alternative Concepts included:

- Expanding the existing elevated plaza in different directions
- Bringing the plaza down to street level and rerouting local roads around it
- Using electronic tracking technology to send trucks to an off-site inspection facility
- Relocating the plaza into Port Huron Township and using a secure roadway to take traffic between the Blue Water Bridge and the new plaza
- Low-cost improvements of the existing plaza
- Transit and multi-modal alternatives such as trains
- Relocating all plaza facilities to Canada

Based on engineering analysis and coordination with stakeholders, the Illustrative Alternatives Concepts were refined into six Illustrative Alternatives that were presented to the public. The six Illustrative Alternatives presented to the public included:

- Three alternatives that expanded the existing elevated plaza
- Two alternatives that brought the plaza down to street level and relocated local roads
- One alternative that relocated the plaza to Port Huron Township and used a secure roadway to take traffic between the Blue Water Bridge and the new plaza

The Blue Water Bridge

The Study Team then evaluated and modified the Illustrative Alternatives based on public and agency comments. Two of the Illustrative Alternatives were eliminated as they did not adequately address the purpose and need for improvements to the plaza. The remaining Updated Alternatives were presented for further public and agency comments. The Updated Alternatives included:

- Alternative 1, which expanded the existing elevated plaza
- Alternative 2, which brought the plaza down to street level and relocated Pine Grove Avenue to the east of the plaza and combined it with 10th Avenue
- Alternative 3, which relocated most plaza functions to a site 1.5 miles west in Port Huron Township and used a secured roadway to take traffic between the Blue Water Bridge and the new plaza

The No-Build Alternative has always been an option in case the benefits of improvements to the plaza do not outweigh the environmental impacts.

- Alternative 4, which brought the plaza down to street level and relocated Pine Grove Avenue to the west of the plaza. This alternative was added after the others based on suggestions from CBP and was reviewed at an additional public meeting

Details on the process of developing and analyzing alternatives are contained in **Section 2.1 Alternatives Development.**

What are the Alternatives Carried Forward?

The Alternatives Carried Forward are refined versions of Illustrative Alternatives that have undergone increased engineering, traffic, social, environmental, and economic analysis. These alternatives have been selected based on their ability to address the objectives of the project.

Based on further analysis, local stakeholder and public comment, the Study Team reduced the list of alternatives down to three Build Alternatives, referred to as the City East Alternative (formerly Practical Alternative 2), the City West (Preferred) Alternative (formerly Practical Alternative 4), and the Township Alternative (formerly Practical Alternative 3), along with the No-Build Alternative. Alternative 1 was dropped from further consideration as it did not adequately address the purpose and need for improvements to the plaza, especially in terms of flexibility for future improvements and technology. These final alternatives are described in detail in **Section 2.2 Alternatives Carried Forward** and are discussed throughout this Draft Environmental Impact Statement. **Appendix E** (separate volume) contains exhibits of the Alternatives Carried Forward that can be accessed for easy review while reading this DEIS. The following is a brief summary of the alternatives.

No-Build Alternative

No-Build Alternative: The No-Build Alternative would not make any changes to the existing plaza configuration or ramps. MDOT and CBP would continue to maintain the existing plaza facilities and new technology and procedures would be introduced on the existing plaza footprint as space allows. The existing welcome center will remain in its current location.

City East Alternative: The City East Alternative would require 133 acres for an expanded plaza and improvements along the I-94/I-69 corridor including the Welcome Center which includes 67 acres for the plaza. This alternative would require the relocation of Pine Grove Avenue to the east along 10th Avenue and would bring most of the plaza down to street level. Pine Grove Avenue would be re–routed to the east of

the existing plaza, between Hancock Street and Scott Avenue. Pine Grove Avenue and 10th Avenue would merge for a joint five-lane road between Scott Avenue and Elmwood Street. The City East Alternative uses the block between Hancock Street and the existing plaza, west of Pine Grove Avenue for an expanded truck inspection area. The Black River Bridge Water Street Interchange would be rebuilt and the Lapeer Connector Interchange would be expanded to include access in all directions. A new MDOT Welcome Center would be constructed north of I-94/I-69 in Port Huron Township, replacing the existing Welcome Center at Water Street.

Figure 1 City East Alternative

<u>*City West (Preferred) Alternative:*</u> The City West Alternative includes 131 acres for an expanded plaza and improvements along the I-94-I-69 corridor including the Welcome Center which includes 65 acres for the plaza. The City West Alternative would require the relocation of Pine Grove Avenue to the west of the plaza. The relocated Pine Grove Avenue would wrap around the south and west sides of the new plaza. Near Hancock Street, the relocated Pine Grove Avenue would split into separate northbound and southbound lanes. The northbound lanes would turn back east and connect to existing Pine Grove Avenue at Riverview Street. The southbound lanes would follow the existing M-25

Connector. The City West Alternative would use the block bounded by 10th Avenue, Hancock Street, the M-25 Connector, and the existing plaza for expanded inspection and plaza facilities. The City West Alternative would also rebuild the Black River Bridge from a four-lane bridge to nine lanes and reconstruct the Water Street Interchange. The Lapeer Connector Interchange would be expanded to include access in all directions. A new MDOT Welcome Center would be constructed north of I-94/I-69 in Port Huron Township, replacing the existing Welcome Center at Water Street.

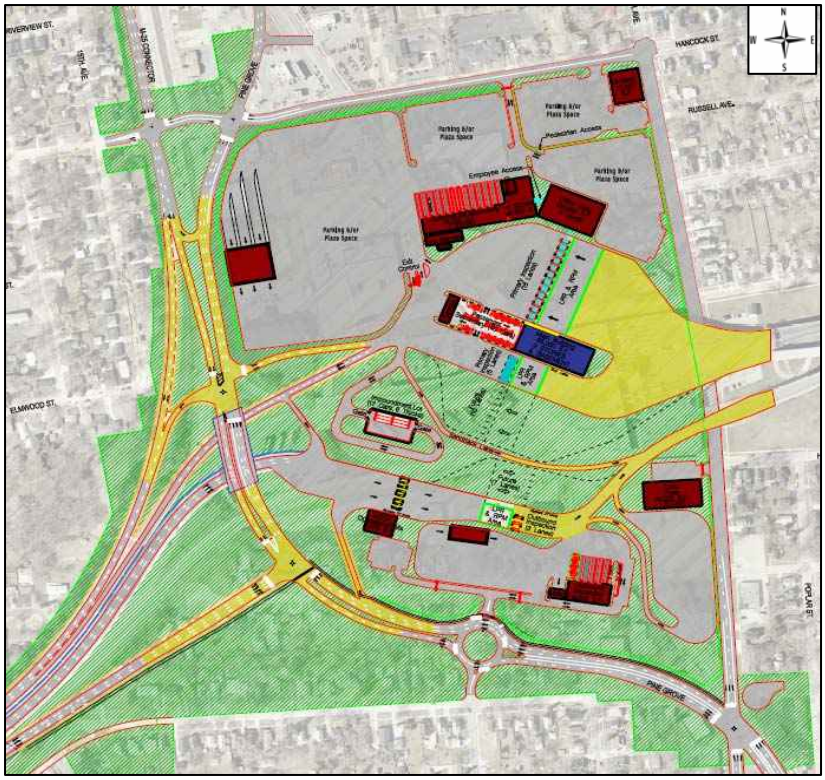


Figure 2 City West (Preferred) Alternative

Township Alternative: The Township Alternative involves the relocation of major plaza functions to Port Huron Township, 1.5 miles west of the current facility, on currently undeveloped land. This site also would include a new MDOT Welcome Center.

Existing I-94/I-69 lanes west of the plaza would be converted to a walled, secure route to take vehicles between the new plaza and the Blue Water Bridge. The M–25 Connector would be extended to provide a local access road parallel to the

existing I-94/I-69 with full access to Water Street and the Lapeer Connector. The Black River Bridge in the Township Alternative would be replaced and expanded from four lanes to ten lanes.

While the current plaza footprint would remain the same, local traffic would no longer be able to exit at the existing plaza or use Pine Grove Avenue to access the plaza. All inspections would occur at the new plaza in the Township. The Township Alternative would also include traffic related improvements such as additional lanes and turn lanes for key local roads surrounding the existing plaza

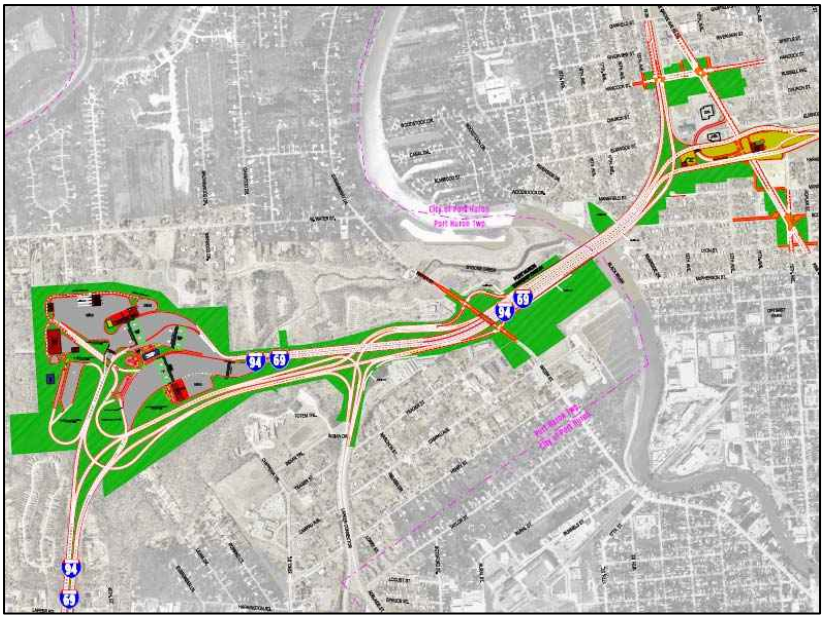


Figure 3 Township Alternative

How Has the Study Team Evaluated the Alternatives?

The Study Team evaluated the alternatives based on how well they address the reasons for improving the plaza and their social, economic, and environmental impacts. The Study Team developed a series of criteria for evaluating the alternatives in consultation with stakeholders. Details of this evaluation are contained in **Section 2.3 Evaluation of Alternatives**. The Study Team concluded that the No-Build Alternative does not address the purpose of improvements identified above. The Township Alternative also has problems in addressing key items in the purpose of improvements

Trucks queue at the plaza

including substantial flaws in providing a safe and secure border crossing and concerns with local access. Although the City East Alternative meets most of the criteria for a new plaza, there are problems with security and emergency response concerns due to the presence of the combined Pine Grove Avenue/10th Avenue running underneath the location where the plaza meets the Blue Water Bridge spans. The City West Alternative adequately meets all parts of the purpose and need for improvements.

Chapter 3 The Environment: What's There Now and Project Effects fully discusses the social, economic, and need for environmental impacts of the Alternatives Carried Forward. The following paragraphs contain a brief summary of the impacts. The **Summary of Impacts Matrix,** at the end of this chapter, summarizes some of the key impacts for each alternative.

What is the Preferred Alternative?

What is a Preferred Alternative?

A Preferred Alternative is selected from the Alternatives Carried Forward after extensive engineering, social, economic, and environmental analysis. The Preferred Alternative best addresses the purpose for improvements while minimizing effects on the natural and human environment to the extent possible.

The Study Team has identified the City West Alternative as the Preferred Alternative for the Blue Water Bridge Plaza Study. The designation as the Preferred Alternative does not mean that the City West Alternative has been formally selected as the final alternative for design and construction. Selection of the final alternative will not occur until after a Public Hearing has been held to review this DEIS, a Final EIS is published addressing comments on the DEIS and a Record of Decision is issued by the Federal Highway Administration. The designation of a Preferred Alternative means that at this time the Study team believes that the City West Alternative best addresses the reasons that plaza improvements are needed while minimizing impacts to the human and natural environment to the extent feasible. Comments on this DEIS may lead to further alternative changes, reductions in environmental impacts and/or new measures to mitigate for the impacts of the project. The Study Team's identification of the City West as the Preferred Alternative was based upon the evaluation contained in **Section 2.3 Evaluation of Alternatives** and the social, economic, and environmental effects analysis contained in **Chapter 3 The Environment: What's There Now and Project Effects**.

There were no parts of the purpose and need for improvements that the City West Alternative does not adequately address. It also has specific advantages in terms of safety, emergency access, and security for the border crossing over all of the other alternatives. The City West Alternative is also superior to the Township Alternative in terms of local access to the border crossing. In addition, the City West Alternative relocates fewer homes and has the lower tax base impacts of the two City Alternatives. Although the Township Alternative has fewer relocations and community impacts in the City of Port Huron, these do not outweigh its concerns in terms of safety and security.

How Will the Project Affect the Human Environment?

Existing Blue Water Gateway Business District

Land Use: Land uses within the Study Area include single family residential, multiple family residential, commercial, public facilities, and open space.

The No-Build Alternative would have few impacts on land use policies and decisions within the Study Area. Existing land uses would not be impacted because the plaza would maintain its current footprint and would not encroach upon the adjacent development. Commercial land uses around the Water Street Interchange would be unaffected by a No-Build Alternative unless congestion of vehicles waiting to access the plaza increases to the point that it is impossible to access the interchange from I-94/I-69 on a regular basis.

The City East Alternative would impact existing residential and commercial development in the City of Port Huron. Residential areas both north and south of the existing plaza would be impacted. The majority of the Blue Water Gateway Business Area would be replaced by the plaza expansion resulting in the displacement of existing businesses.

The City West Alternative would impact existing residential and commercial development in the City of Port Huron in a similar manner as the City East Alternative. Residential areas both north and south of the existing plaza would be impacted along with the majority of the Blue Water Gateway Business Area. Businesses may be interested in relocating as close as possible to the new plaza for either of the City East or City

West Alternatives which would potentially cause the conversion of homes immediately surrounding the plaza to business sites.

The Township Alternative would not be consistent with current and planned land use practices within the Study Area.

Homes in the Neighborhood Surrounding the Existing Plaza

Communities and Neighborhoods: The City East Alternative would substantially affect neighborhoods surrounding the existing plaza by relocating approximately 1/3 of the neighborhood south of the existing plaza and 13 homes in the neighborhood northeast of the plaza.

The City West Preferred Alternative would also affect the neighborhoods surrounding the plaza. The effect on the neighborhood south of the existing plaza would be lower for the City West Preferred Alternative due to fewer relocations. The Preferred Alternative would have a similar effect on the neighborhood northeast of the existing plaza as the City East Alternative. The City East Alternative will relocate a total of 155 residences and the City West (Preferred) Alternative will relocate a total of 129 residences. The City East and City West Preferred Alternatives would also increase the perception of the plaza as a barrier dividing the community from north to south.

The Township Alternative would remove a small neighborhood at the end of Maywood Drive in Port Huron Township and would relocate a total of 56 residences on the edges of the neighborhoods surrounding the existing plaza. The secured corridor between the Blue Water Bridge and the potential new plaza would increase the perception of a barrier between the north and south sides of Port Huron Township.

The Alternatives Carried Forward would not relocate any publicly owned community facilities. All Build Alternatives would require property from the Port Huron Area School District adjacent to the Lapeer Connector but would not affect school buildings or facilities. The City East and City West Alternatives would both relocate the First Free Methodist Church next to the existing plaza. Relocated properties are discussed in more detail in **Section 3.6 Relocations**.

Environmental Justice: Upon completing the environmental justice analysis, the Study Team determined there are no disproportionately high and adverse human health or environmental impacts on minorities and/or low-income populations with any of the Alternatives Carried Forward. Impacts from any alternative would be similar for all groups regardless of demographic or socioeconomic characteristics of the community.

Businesses, Taxes, Trade, and Jobs: Continued border congestion caused by the No-Build Alternative will cost the economies of Michigan, Ontario, Canada, and the United States up to $3.9 billion by 2030. The Build Alternatives would substantially reduce these losses.

How Important is the Blue Water Bridge?

More than $100 million of goods cross the Blue Water Bridge every day.

The Build Alternatives will require some existing businesses to be displaced and will remove land from the tax base of both the City of Port Huron and Port Huron Township. The total annual tax base loss will be 1.5 percent or less of the total tax base for the communities affected depending on the alternative. The relocation of businesses could lead to the potential relocation of jobs outside of the community.

The Township Alternative would cause border crossers to bypass businesses near the existing plaza and at Water Street as no local access would be provided under this alternative. Businesses that cater to interstate traffic located at the Range Road exit on I-94 and the Wadhams Road exit on I-69 would likely see an increase in sales, as they would now be located at the first local access interchange after the border crossing.

Public Safety: The City East Alternative will provide two controlled access points for emergency service personnel. One access will occur on the north side of the plaza, and the other on the south side of the plaza. Emergency service access to the plaza from the west will be similar to the existing plaza access via I-94/I-69. Eight-foot high security fencing would be located along the perimeter.

Port Huron Fire Department

The City East Alternative would have little effect on emergency service response times to the plaza or surrounding neighborhoods. However, response time to surrounding neighborhoods could be impacted if an incident occurs on the

relocated portion of Pine Grove Avenue that would block traffic.

The City West Alternative will also provide two controlled access points for emergency service personnel on the north and south sides of the plaza. It will also have eight foot high security fencing located along the perimeter. The City West Alternative would have little or no effect on emergency service response times.

The Township Alternative substantially expands the length of the border crossing and creates three distinct areas that will need security and emergency service access. They are: (1) the existing plaza area, (2) the secure roadway between the existing plaza and the new plaza, and (3) the new plaza. The secure corridor would only be accessible from the new plaza in Port Huron Township or from the Canadian side of the Blue Water Bridge. This would create substantial challenges for providing emergency vehicle services to the corridor and the bridge.

Depending on the emergency service provider, there could be longer response times in reaching an incident on the new plaza in Port Huron Township or in the secure corridor. The City of Port Huron Fire and Police Department would have better response times to incidents on the existing plaza, and the Port Huron Township Fire Department and St. Clair County Sheriff's Office would have better response times to incidents on the new plaza located in the Township.

The emergency response provider most affected by Township Alternative is Tri-Hospital EMS, an ambulance service provider. The estimated response time doubles when responding to an incident at the new plaza located in Port Huron Township as compared to incidents on the existing plaza. However, the estimated response time of ten minutes would be within acceptable standards. Response times inside the secure corridor could be up to 13 minutes.

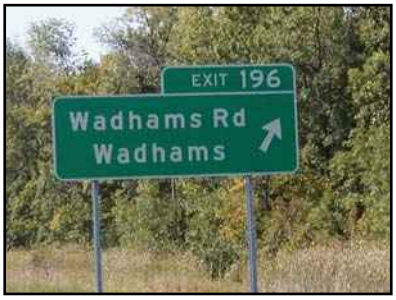
Relocations: All of the Build Alternatives would require the relocation of homes and businesses within the Study Area. The residential relocations for each alternative consist of single family homes and multi-family units.

The City East Alternative will require the relocation of 155 homes, 34 businesses, and one church. The City West Alternative will require the relocation of 129 homes, 30 businesses, and one church. The Township Alternative will require 56 home and 29 business relocations. MDOT will compensate homeowners that are relocated and assist with the relocation process. Replacement housing must be similar both in type and price range. No relocations will occur until it is shown that comparable housing is available.

Indirect and Cumulative Impacts: The Study Team identified potential indirect effects on land use, farmlands, traffic patterns, transboundary and wetlands. There are no significant indirect impacts on these elements from any of the Alternatives Carried Forward.

The City East and City West Alternatives may encourage redevelopment of land north of Hancock Street as new or relocated businesses seek sites to serve both border crossing and local customers. This land has been previously developed.

The Township Alternative has the potential for inducing highway oriented commercial growth at the Range Road and I-94 Interchange, and the Wadhams Road and I-69 Interchange. The Township Alternative may indirectly affect potential wetlands located near the Range Road and I-94 Interchange, by encouraging new commercial development in the area.



Wadhams Road Interchange on I-69

There are cumulative impacts for the Build Alternatives associated with past, present, and future plaza development projects. The impacts are from residential and business relocations and the effect on neighborhood stability in the vicinity of the existing plaza.

Aesthetic and Visual: The Study Team analyzed the effects of the walls, buffers, landscaping, and lighting of the Alternatives Carried Forward from the perspective of viewers of the new plaza and corridor and viewers from the old plaza/corridor. For the City East and City West Alternatives, the plaza would remain the dominant visual feature of the

area surrounding the plaza. There would be increased awareness of plaza operations as a result of the street level location. For the Township Alternative, there are greater opportunities to provide buffers between the new plaza and local residents. The Township Alternative's largest visual impact would be the secure corridor, which would stand out for drivers and residents in the area. The secure corridor would also give a tunnel-like feel to the entrance to the United States for border crossers.

Front View E.C. Williams House

Sign for Port Huron Township Park #1

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 the use of such land.

Cultural Resources: There is one structure located within the Study Area that is eligible for the National Register of Historic Places. It is located north of the existing plaza at 2511 10th Avenue and is known as the E.C. Williams House. The City East Alternative will require land adjacent to the E.C. Williams House property. No adverse effect to this property is expected as a result of the City East Alternative. The City West Alternative will require the relocation of this historic house to a new site. The Study Team has coordinated with the State Historic Preservation Officer (SHPO) regarding the relocation of the house. Further discussion on the relocation is contained in **Section 3.15 Cultural Resources** and in **Chapter 4 Section 4(f) and 6(f) Evaluation**. The Township Alternative will not affect the E.C. Williams House.

Study Team Archaeologists conducted field surveys of the Black River crossing and key vacant areas of the proposed plaza location site for the Township Alternative. The Archaeologists found no artifacts and concluded that there is a low probability of the project impacting archaeological resources.

Public Parks: There are three public parks located within or adjacent to the Study Area.

Port Huron Township Park #1 is an 11-acre park located next to I-94/I-69 on the northeast side of Water Street. Port Huron Township Park #2 and RV Park is a 36-acre park located on the south side of Water Street across from Port Huron Township Park #1. The Riverside Boat Ramp is a 5.7-acre site located along Riverside Drive, north of the Black River Bridge on the east side of the Black River and is adjacent to the Study Area.

Both Township Park No. 2 (the campground) and Riverside Park will not be impacted by the proposed project. Some minor property acquisition and impacts are anticipated with Township Park No. 1 for the construction of the proposed corridor improvements and interchange at Water Street under all three of the Build Alternatives.

MDOT coordinated with Port Huron Township officials and with the Township Parks and Recreation Commission regarding the potential impacts to Township Park No. 1. Meetings were held with the Township Supervisor and Parks and Recreation Commission to discuss the potential impacts to the park. The Township has concurred that the proposed project will have minimal effects on Township Park No. 1, and as a result, the potential impacts to Port Huron Township Park No. 1 have been determined by FHWA to be *de minimis* under Section 4(f). The No-Build Alternative will have no effect on Port Huron Township Park No. 1.

How Will the Project Affect the Natural Environment?

Air Quality: The project has the potential to improve air quality at a regional level, since the objective is to reduce backups and idling caused by existing delays for both in-bound U.S. and out-bound traffic at the current plaza. St. Clair County is currently classified as being in non-attainment for particulates smaller than 2.5 microns in size ($PM_{2.5}$) and the eight-hour ozone standard. At a regional level, it is expected that the improvements to the plaza will be in conformity with the State Implementation Plan (SIP) for ozone and particulates and, in conformity with the regional Transportation Improvement Plan (TIP). At a microscale level, the worst-case signalized intersection in the Study Area (M-25 and Hancock Street) was modeled for Carbon Monoxide (CO) concentrations. For all alternatives including No-Build, that intersection was modeled to be within federal standards for CO concentrations.

What is Non-Attainment?

Locations that do not meet national air quality standards are designated by the United States Environmental Protection Agency (EPA) as "non-attainment" areas for each pollutant that does not meet the standards.

Noise: The Study Team measured existing noise levels in areas potentially affected by noise from a new plaza and used the FHWA's Traffic Noise Model to forecast future noise levels for the alternatives. The Study Team compared the forecast future noise levels to the FHWA's noise abatement criteria to

determine locations where noise mitigation, such as noise walls, may be needed.

The No-Build Alternative would have traffic noise levels that approach or exceed the noise abatement criteria at 101 residences, six businesses, and in one township park. The City East Alternative would have traffic noise levels that approach or exceed the noise abatement criteria at 73 residences, four businesses, and in Township Park No. 1. The City West Alternative would have traffic noise levels that approach or exceed the noise abatement criteria at 45 residences, four businesses and in Township Park No. 1. The Township Alternative would have traffic noise levels that approach or exceed the noise abatement criteria at 66 residences, two businesses, and at locations at two township parks.

The Study Team investigated potential mitigation for locations that exceed the noise abatement criteria. A discussion of potential noise mitigation is included in **Chapter 5 Mitigation**.

Groundwater, Drainage and Surface Water Quality: No impacts are anticipated to groundwater resources. The Study Area does not contain any Sole Source Aquifers or Critical Aquifer Protection Areas.

All Build Alternatives would increase the amount of storm water drainage within the Study Area. Storm water detention basins will be constructed to control the amount of water discharged to match the existing discharge quantities and preserve surface water quality. All storm water runoff will be directed through buffer areas prior to discharging into any of the surrounding surface water features. This will help filter any sediments or pollutants contained in the storm water runoff.

Floodplains: All of the Build Alternatives would involve construction within the 100-year floodplain. Efforts have been made to develop the alternatives to ensure that there will be no impacts to the floodplain which would cause additional flooding to properties in the surrounding area. Any impact to the 100-year floodplain will be offset by providing additional storage capacity for flood waters. To ensure that all environmental and hydraulic impacts associated with the

floodplain crossings of the project are minimized, further evaluation of crossing options will be conducted during the design phase.

Wetlands: None of the alternatives would have wetland impacts that would be considered significant.

The City East and City West Alternatives would impact approximately four acres of wetlands while the Township Alternative would impact approximately ten acres of wetland. The majority of the wetlands that would be impacted are small and are not classified as high quality wetlands.

Scrub-shrub/forested Wetland

Where wetland impacts cannot be avoided, MDOT will restore previously existing wetlands or create new wetlands to replace those that would be impacted. Current policy dictates that forested wetlands will be replaced at a ratio of 10:1, while emergent, scrub/shrub, and open water wetlands will be replaced at a ratio of 2:1.

Plants, Wildlife, and Threatened and Endangered Species: The Study Area does not offer any pristine or unique habitat for wildlife and no state or federal threatened, endangered or special concern plant or animal species were found within the Study Area. Wildlife species that exist within the Study Area are tolerant of human activities and if disturbed could find comparable habitat in areas adjacent to the Study Area.

No significant impacts to the plant and wildlife communities present within the Study Area are anticipated.

Contaminated Sites: The Study Team identified 20 potentially contaminated sites that would be impacted by the City East and City West Alternatives and ten that would be impacted by the Township Alternative. These sites included gas stations, service centers, dry cleaners, and former industrial and railroad sites. Significant impacts from potential contaminated sites are not expected.

Farmland: The Study Area includes a rural/suburban area of Port Huron Township that was once agricultural. Although farmland exists within Port Huron Township this land is not actively farmed and has been rezoned residential. The Study

Area contains no prime or unique farmlands or farmland that is of statewide or local importance per the Important Farmlands Map of St. Clair County. This project will have no significant impact on farmland.

Wild and Scenic Rivers, Coastal Zone, Coastal Barriers & Critical Dunes: There are no federal Wild or Scenic River systems in the Study Area.

The project is located within a designated Michigan Coastal Zone Management Area. This project involves the expansion of the Blue Water Bridge plaza in areas that have been disturbed and are not in any direct or indirect contact with the coastal resources. No significant impacts to the coastal zone are anticipated with any of the Alternatives Carried Forward.

The Study Area contains no federally designated coastal barriers or state designated critical dunes, as defined in Part 353, Sand Dune Protection and Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451.

How will the Study Team Mitigate or Reduce the Impacts to the Built and Natural Environments?

Public meeting

The Study Team will seek to eliminate, reduce, or control the negative effects of the project. This will include the development of measures to compensate for environmental damage through replacement or restoration of resources where possible. **Chapter 5 Mitigation** discusses the potential ways that MDOT and FHWA will mitigate for the social, economic, and environmental affects of the final alternative selected for design and construction. Further mitigation measures will be developed and refined after the Public Hearing on this DEIS and will be included in the Final Environmental Impact Statement (FEIS).

How Did the Study Team Coordinate with the Public and Stakeholders?

The Study Team conducted an extensive process of public and stakeholder coordination to obtain input, identify local concerns, revise proposed alternatives, and better understand the impacts of the alternatives on the natural and built

environment. The Study Team has held six public meetings, three public workshops and over 40 local stakeholder meetings. Newspapers, a project website, a toll free phone number, an e-mail list-serve, and newsletters were also used to provide information about the study and receive public input. The Study Team used public and stakeholder comments to assist in the development and refinement of alternatives. Additionally, since March 2, 2007, the Study Team has held office hours in Port Huron on the first and third Friday of each month to address concerns and questions and provide answers on the project. Public and stakeholder comments are expected to be key parts of the selection of an alternative for design and construction.

Five federal agencies are serving as cooperating agencies for this project and assisted the Study Team in the development and analysis of the alternatives. These agencies include: Customs and Border Protection (CBP), General Services Administration (GSA), the United States Army Corps of Engineers (USACE), the Environmental Protection Agency (EPA), and the United States Coast Guard (USCG). The Study Team also has worked with the Canadian Blue Water Bridge Authority, who own and operate the Canadian side of the Blue Water Bridge, and other Canadian stakeholders in the development and evaluation of the alternatives.

What is a Cooperative Agency?

An Agency that has special authority or expertise over the construction of a project. There is enhanced communication and cooperation between cooperating agencies and the agency proposing the project.

What Are the Next Steps For the Blue Water Bridge Plaza Study?

A public comment period of no less than 60 days will follow the publication of this DEIS. During the comment period, the Study Team will hold a formal Public Hearing in the Study Area. The public and stakeholders can send comments on the Alternatives Carried Forward, the identification of the Preferred Alternative, and the DEIS to the addresses listed on the first page of this document or submit them at the Public Hearing.

Following the comment period, the Study Team will use the input provided by the public, stakeholders, and agencies involved in the project to help refine the Preferred Alternative for design and construction. The Study Team will produce a FEIS that updates the Preferred Alternative, discusses

potential impacts in more detail, and allows additional time for comments. The FEIS also will discuss potential mitigation measures to avoid, minimize, or compensate for the impacts of the Preferred Alternative, in detail. The Federal Highway Administration will then issue a Record of Decision formally selecting an alternative for design and construction.

Summary of Impacts

		No-Build	City East Alternative	City West Alternative (Preferred Alternative)	Township Alternative
Potential Impacts:					
Social	Public Recreational Land Impacts	None	1	1	0
	Neighborhoods / Subdivision Impacts	0	3	3	3
	Community Facilities (Churches, Schools etc.) (#)	0	1 Church, requires property from school district	1 Church, requires property from school district	Requires property from school district
Relocations	Estimated Residential Relocations (#)	0	155	129	56
	Estimated Commercial Relocations (#)	0	34	30	29
	Existing DTE Substation	No	Yes	Yes	No
River/Stream/Drain Crossings (#)		0	2	2	3
Ecological Resources	Total Wetland Impacts (acres)	0	4.36	4.36	10.16
	Threatened and Endangered Species Impacts	0	0	0	0
Cultural Resources	Historic Buildings/Site Impacts (#)	0	0	1	0
	Archaeological Site Impacts (#)	0	0	0	0
Noise	Residences Impacted by noise levels that exceed noise abatement criteria	101	73	45	66
Potential Contaminated Site Impacts (# of Sites Impacted)		0	20	20	10
Traffic Movement	Grade Separations (#)	8	9	8	15
	New or Modified Signalized Intersections/Roundabouts (#)	0	9	8	6
	Local Road Closures, Rerouting, or Cul de Sacs (#)	0	13	11	6
Right-of-Way	CBP plaza space (including exisiting plaza re-use) (acres)	18	67	65	103
	Total new right-of-way required (acres)	0	133	131	195
Cost	Construction Cost ($2007 Millions)	$0	$237	$232	$244
	Right-of-Way Cost ($2007 Millions)	$0	$150	$158	$150
	Total Construction and Right-of-Way Cost ($2007 Millions)	$0	$387	$390	$394
	Contingencies Cost ($2007 Millions)	$0	$44	$43	$47
	Total Estimated Cost ($2007 Millions)	$0	$431	$433	$441

Blue Water Bridge Plaza Study

U.S. Department of Transportation
Federal Highway Administration

MDOT
Michigan Department of Transportation

Based on the best information available as of 8-8-07

CHAPTER 1

WHY ARE IMPROVEMENTS NEEDED?

The Purpose of the Blue Water Bridge Plaza Project for the foreseeable future is to:

- Provide safe, efficient and secure movement of people and goods across the Canadian-U.S. border in the Port Huron area to support the economies of Michigan, Ontario, Canada and the United States.

- Support the mobility and security associated with needs of national and civil defense.

Existing United States Plaza Looking West

Several federal agencies and the Michigan State Police inspect trucks, cars, passengers, and cargo on the plaza, which is owned and operated by the Michigan Department of Transportation (MDOT). To assist in defining the reasons for the proposed improvements, MDOT, the Federal Highway Administration (FHWA), and two of the six cooperating agencies, the Bureau of Customs and Border Protection (CBP), and the General Services Administration (GSA) created an Advisory Committee comprised of representatives from the United States and Canadian Plaza Agencies as well as local, state, and federal officials.

The following is the list of reasons for improvements developed with assistance from the Advisory Committee. This is called the purpose of and need for the project.

- Improve operations and processing capability by accommodating the latest inspection technologies and procedures
- Provide flexibility to accommodate future unknown inspection technologies and procedures
- Improve security
- Provide facilities that ensure cars and trucks do not leave the plaza without being inspected
- Improve safety on the bridge, plaza, and the I-94/I-69 corridor, including the elimination of the traffic weaves
- Accommodate projected 2030 traffic growth and future facility needs

- Minimize backups on Highway 402 in Canada and I-94/I-69
- Reduce vehicle and pedestrian conflicts on the plaza
- Improve access to the plaza and to the local road network
- Minimize routing of commercial traffic to local roads during maintenance operations
- Create a more visible and accessible Welcome Center
- Improve freeway infrastructure conditions along the I-94/I-69 corridor including the aging Black River Bridge

These reasons form the basis for the purpose of the study, which is detailed in the sections below.

Missaukee County
Roscommon County
Ogemaw County
Iosco County
Lake Huron
Clare County
Gladwin County
Arenac County
Saginaw Bay
Huron County
Isabella County
Midland County
Bay County
Bay City
Tuscola County
Location of the Blue Water Bridge Plaza Study Port Huron, Michigan
Saginaw
Saginaw County
Montcalm County
Gratiot County
Sanilac County
Genesee County
Lapeer County
St. Clair County
Ionia County
Clinton County
Shiawassee County
Flint
Port Huron
Sarnia
Macomb County
Eaton County
Livingston County
Oakland County
Detroit
Lansing
Ingham County
South Lyon
Howell
Brighton
Lake St. Clair
Jackson County
Jackson
Ann Arbor
Wayne County
Windsor
Washtenaw County
Ontario
Monroe County
Monroe
Hillsdale County
Lenawee County
Toledo
Lake Erie
Blue Water Bridge Plaza Study
Location Map
MDOT
Michigan Department of Transportation
Legend
Interstate Highways
Expressway
US Highways
County Boundaries
Major Lake
Urbanized Area
Urban Cluster
Michigan
Ontario
N
W
E
S
0 5 10 20
Mile

Figure 1.1

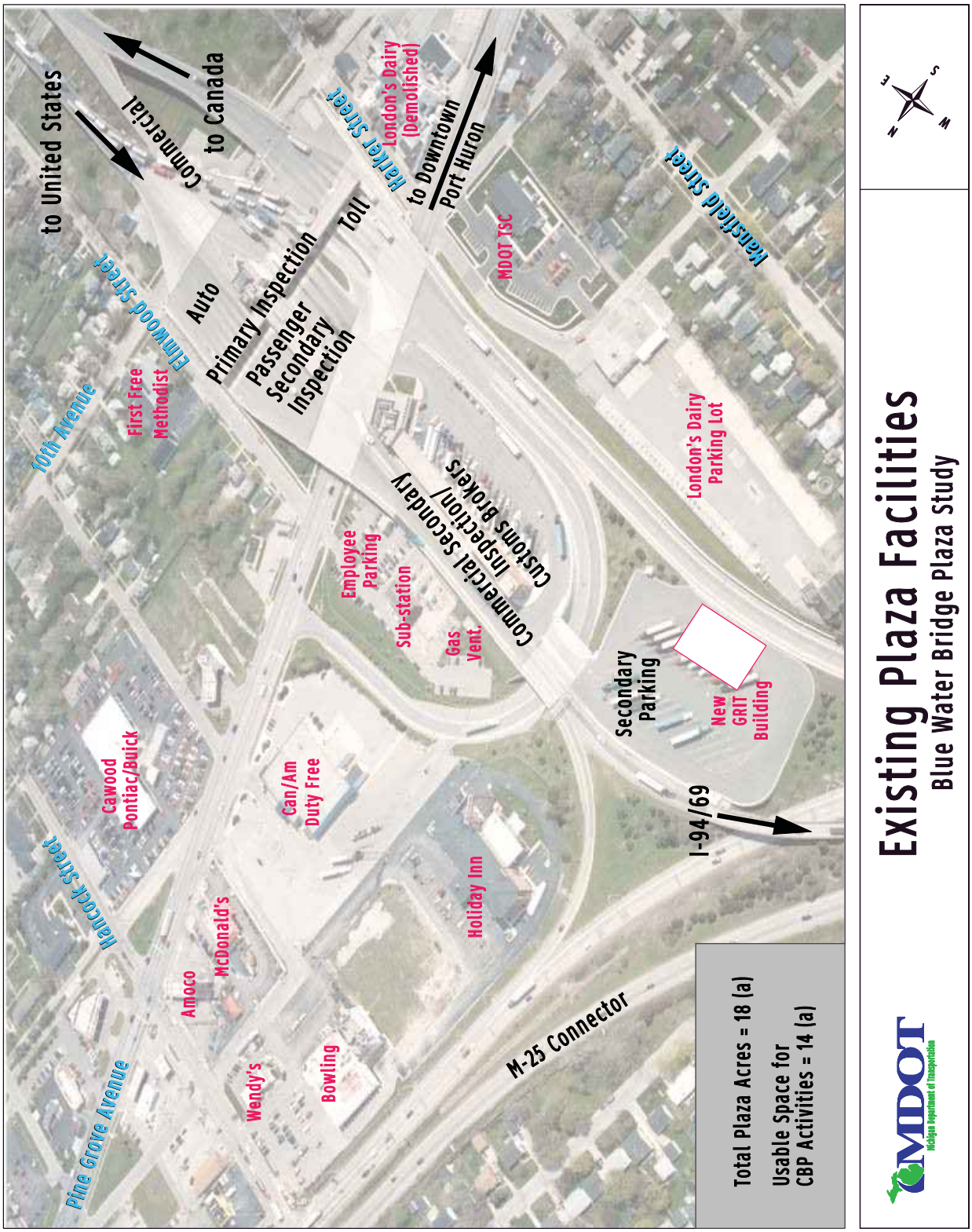

to United States
Commercial
to Canada
Harker Street
London's Dairy (Demolished)
to Downtown Port Huron
Toll
Auto
Primary Inspection
Passenger Secondary Inspection
Elmwood Street
10th Avenue
First Free Methodist
MDOT TSC
Hanlifield Street
London's Dairy Parking Lot
Commercial Secondary Inspection/ Customs Brokers
Employee Parking
Sub-station
Gas Vent
Secondary Parking
New GRIT Building
Cawood Pontiac/Buick
Can/Am Duty Free
I-94/69
Hancock Street
Holiday Inn
Amoco
McDonald's
Wendy's
Bowling
M-25 Connector
Pine Grove Avenue
Total Plaza Acres = 18 (a)
Usable Space for CBP Activities = 14 (a)
MDOT
Michigan Department of Transportation
Existing Plaza Facilities
Blue Water Bridge Plaza Study
N
E
S
W

Figure 1.2

The Study Location: The Study Area begins at the western end of the twin Blue Water Bridge spans and ends at the I-94/I-69 Interchange, approximately three miles to the west. These connections will provide highway/freeway access to destinations across Michigan, 47 other states, Mexico, and Canada as illustrated in **Figures 1.1** and **Figure E.1** in the separate **Appendix E** volume.

The need for improvements to the United States Plaza and the I-94/I-69 Corridor leading up to the Blue Water Bridge is supported by several key issues including:

- Security issues
- The introduction of new inspection technologies, procedures, and policies
- Limited existing space on the plaza
- Traffic conflicts and crash history
- Access between the plaza and adjacent circulatory local roads
- Traffic growth
- Traffic backups
- Existing infrastructure conditions of the I-94/I-69 Corridor
- Upgrading the international Welcome Center

Toll Booths on the Existing Plaza

What Business is Conducted on the United States Plaza?

Federal agencies operating on the plaza include CBP, the United States Department of Agriculture (USDA), and the United States Food and Drug Administration (FDA). These agencies are responsible for inspecting vehicles, goods, and people entering the United States. The inspection agencies rent facilities on the United States Plaza from MDOT through the GSA, which provides buildings for the federal government. CBP's primary mission is to secure the border while facilitating legitimate trade and travel.

MDOT collects tolls on the plaza from vehicles leaving the United States for Canada, and the Michigan State Police have a truck weigh scale on the existing plaza.

United States Department of Agriculture operates on Wdhams Road

Primary Inspection: Primary inspection is the first point of contact between CBP inspection officers and passengers, vehicles, and cargo entering the United States. Cars, buses,

and trucks that require no further questioning or inspection and have their paper work in order are allowed to exit the plaza following primary inspection.

Primary Inspection Lanes

Passenger Secondary Inspection: Passengers in cars requiring additional paperwork or questioning are sent to passenger secondary inspection for a follow-up interview conducted by CBP, USDA, or the FDA.

Commercial Secondary Inspection: Commercial shipments requiring further paperwork, processing, and/or inspection by CBP, USDA, or FDA are sent to the commercial secondary inspection facilities. At commercial secondary inspection, trucks must park and individuals must go inside for further questioning and to process paperwork. Cargo may also be inspected. If the paperwork for the cargo is incomplete, the truck driver will visit a customs broker to complete the necessary paperwork required by CBP. Customs brokers are private firms with office space in the inspection building. Animal inspections are conducted by USDA at an off-site location on Wadhams Road.

What is the History of the Blue Water Bridge and Plaza Improvements?

The original Blue Water Bridge on the left was built in 1938. The second bridge was built in 1997.

The original Blue Water Bridge was opened on October 10, 1938 and was operated by the Michigan State Bridge Commission. In 1965, operation of the bridge and plaza was transferred to MDOT, then called the Department of State Highways.

The United States Plaza at the Blue Water Bridge was first expanded in the 1950s and a ramp was added over M-25 (Pine Grove Avenue) to connect with the Port Huron bypass (now I-94/I-69), which was under construction at the time. Prior to this expansion, the entire plaza was located between Pine Grove Avenue and 10th Avenue. In 1983, MDOT completed Draft and Final Environmental Impact Statements, which recommended improvements to the United States Plaza and the construction of a second bridge. In 1991, the final link of I-69 was built, completing a second freeway connection (Toronto to Chicago) via the bridge. During the 1980's and early 1990's, the plaza was expanded to include 13 primary

inspection booths for inbound traffic from Canada. Five outbound toll lanes and the secondary inspection facilities that exist on the elevated plaza today were also added as a part of the expansion.

In 1992, an international task force studying the Blue Water Bridge crossing concluded that the existing bridge did not have enough capacity for all vehicles wanting to cross, and the existing bridge needed long-term maintenance; therefore a new bridge should be constructed. An environmental document that served as a Re-evaluation Document for the 1983 FEIS and met the requirements of both the U.S. and Canadian environmental processes was completed in 1994. Construction on the second Blue Water Bridge span began in 1995 and was opened to traffic in July 1997. Each bridge has three lanes of traffic with the original bridge carrying traffic from Canada to the United States and the new bridge carrying traffic from the United States to Canada.

Elevated Plaza at Pine Grove

Rapid increases in the growth of truck traffic and international trade called for additional improvements. In 1999, MDOT completed a Toll and Plaza Operations Study to identify short-term operational improvements and to propose potential long-term plaza improvements. As a result of this study, several short-term operational improvements were made including the conversion of MDOT's maintenance facility to additional truck parking and the expansion of space for customs brokers.

Additionally, the events of September 11, 2001 have forever changed the way security measures are implemented at our nations' borders. The physical security of the border crossing itself and the border crossing facilities and processes must be protected from interruptions due to man-made or natural calamities. These may include threats of terrorism or sabotage, aging or failing infrastructure, or other natural disasters. Assuring homeland security requires the border be protected from disruptions caused by terrorist actions.

Security at the border is of critical importance. It entails 1) providing a reasonable assurance that cross-border movements and trade will not be disrupted; and, 2) providing adequate facilities for the processing and screening of people

and goods passing between Canada and the United States. Increased scrutiny of people and goods has the collateral effect of improving the security of those who live and work in the Port Huron area while increasing processing time, which reduces the effective capacity of border operations. The latter issue manifests itself in the need for expanded physical facilities for agencies responsible for border security.

The Canadian side of the Blue Water Bridge and Canadian Plaza are operated by the Blue Water Bridge Authority (BWBA).

In September 2002, MDOT began the current study.

New Inspection Technologies and Procedures Require More Space

Improvements to the United States Plaza at the Blue Water Bridge must provide enough space for new procedures and technologies required by the Department of Homeland Security to ensure the safety and security of the border. The plaza must have space for current technological and procedural requirements and have flexibility to accommodate unknown future inspection technologies and security requirements.

The space to put new or updated inspection technologies and procedures required by inspection agencies is severely limited on the existing 18 acre plaza. The following are among the new technologies and procedures either recently introduced or soon to be required at the United States Plaza.

Radiation Detection Portals

Radiation Detection Portals: Radiation Detection Portals monitor radiation levels to ensure no one brings radioactive material into the United States. Radiation Detection Portals have been installed in advance of all inspection booths at major border crossings including the Blue Water Bridge. A designated Radiation Detection Portal and containment area in secondary inspection is also required. For future primary inspection, 20 Radiation Detection Portals (with future expansion to 30) are needed and it is estimated that secondary inspection will need one Radiation Detection Portal. The existing plaza has a secondary Radiation Detection Portal but no space for a designated containment area.

GRIT: Gamma-Ray Inspection Technology is used to scan freight contained on and in trucks, cargo containers, and cars.

This equipment is now required at United States/Canada border crossings. A temporary enclosed GRIT unit has been introduced at the Blue Water Bridge and has reduced the available space for secondary inspections. A permanent building to house GRIT equipment requires more than one-half acre of land. A new plaza which processes the volume of commercial traffic of the Blue Water Bridge will have three GRIT units.

GRIT Building on Existing Plaza

Indoor Cargo Docks/Warehouse Space: Most major commercial border crossing plazas between the United States and Canada feature indoor cargo unloading docks and warehouse space. Unloading of vehicles for inspection at the Blue Water Bridge Plaza must currently be done at off-site locations. Inspection officials propose that a border crossing like the Blue Water Bridge should have at least 12 indoor unloading bays and adequate warehouse space to store cargo.

Export Control/Outbound Inspection: Outbound inspection booths and facilities will also be required to allow CBP to enforce export control regulations and to allow the inspection of certain individuals leaving the country. Currently CBP conducts random exit control interviews by flagging down outbound vehicles after they pass through the toll plaza. These inspections can cause backups on I-94/I-69 and congestion on the outbound part of the plaza.

FAST: Free and Secure Trade (FAST) is a program between the United States and Canada. FAST aims to process low risk cargo as quickly as possible. The FAST program includes reducing CBP and Canada Border Services Agency paperwork, dedicating lanes at major crossings to FAST participants, using common technology, and physically examining cargo transported by low risk individuals and companies at the lowest levels possible. The implementation of FAST at the Blue Water Bridge began in December 2002.

NEXUS: NEXUS is a program that allows pre-approved low risk travelers to enjoy a simplified border crossing process. NEXUS-pass holders can use dedicated lanes at border crossing, thereby reducing their waiting time.

Automated License Plate Readers

Automated License Plate Readers: Cameras photograph the license plates of all vehicles prior to entering the primary inspection booths. A computer matches the license plate photograph to a variety of databases and provides any relevant information to the inspection officer during the inspection process. These license plate readers have been installed at all booths on the plaza and require extra waiting space for vehicles to ensure accurate pictures are taken.

Canine Facility: CBP officials have requested permanent space for a canine inspection team facility. A canine facility has recently been retrofitted into the existing commercial secondary inspection facilities.

Future Technologies and Procedures: The new technologies and procedures described above are all current or short-term foreseeable requirements. However, inspection technology and processes are constantly evolving. There is a need for any plaza improvements to be adaptable in terms of space and layout to account for unknown changes that may be required by 2030 and beyond.

Improvements must be Flexible for the Future

Improvements to the United States Plaza must have flexibility for future, and unknown inspection needs and must be able to be built in stages. Approximately $103 million dollars in commercial goods cross the border at the Blue Water Bridge on an average day (2006, Bureau of Transportation Statistics). As the second busiest commercial border crossing between the United States and Canada, the Blue Water Bridge cannot completely shut down for plaza improvements without having a significant negative impact on trade between the two countries. The proposed project is to develop a 2030 plan of improvements, which can be implemented in phases as traffic grows, and changes in technology and procedures occur.

Improving Security

Plaza facilities at the Blue Water Bridge must fulfill CBP's primary mission which is to secure the border while facilitating legitimate trade and travel. The key security elements for CBP include:

- Interdiction and containment of hazardous materials, contraband, and unauthorized people from entering the country including terrorists and their instruments
- Vulnerabilities to terrorist attacks
- Location and distribution of inspection staff and resources
- Personal safety and security for inspection agents, plaza staff, and plaza users

The following are security related improvements needed at the Blue Water Bridge to accommodate new security requirements.

Currently there are no gates or checkpoints at the exit from the plaza. There is a need for exit control from commercial secondary inspection so CBP can ensure that vehicles sent to secondary inspection have completed the necessary paperwork and/or inspection before leaving the facilities.

For the overall security of the crossing itself, provide clear improvement by reducing the number of overpasses (the plaza is currently built over Pine Grove Avenue) that would be vulnerable to an attack from below.

Clear sightlines between primary and secondary inspection areas are essential to ensure vehicles sent to secondary inspection actually go there. The current plaza secondary inspection area entrance is adjacent to the freeway exit which makes it difficult for CBP to monitor.

The existing plaza facilities lack adequate secure parking for employees, impounded vehicles, and specific parking spaces to quarantine suspicious vehicles. Due to the limited amount of office space on the plaza, enforcement functions of CBP are forced to share space with public enrollment in border crossing programs (e.g. FAST). Due to evolving security concerns, representatives from CBP have requested more space. Emergency vehicle access to the existing plaza is limited due to the elevated situation of the plaza.

Enhancements to the overall security of the Blue Water Bridge and Plaza Facilities are also part of the purpose of the project.

Limited Existing Space on the Plaza

Over the past three years, the federal inspection agencies have been dedicating more personnel to the Canadian border, partially as a result of the September 11, 2001 terrorist attacks and increased border security measures. Approximately 485 individuals including 227 federal inspection agents, 38 MDOT employees, and approximately 220 customs brokers staff, work on the United States Plaza, which is open 24-hours a day, seven days a week. The existing facilities do not have enough space to accommodate new inspection requirements and procedures, and the increased number of newly trained agents. Among the issues of concern is a lack of space in the secondary inspection area along with limited locker and desk space for new agents, lack of public counter space, and a lack of adequate secure parking.

How Much is Traffic Going to Grow on the Blue Water Bridge?

Proposed improvements must provide large enough plaza facilities to accommodate projected 2030 traffic levels in terms of inspection and toll booths, parking facilities, space for waiting traffic, and access ramps. The State of Michigan's Long Range Plan (LRP) recognizes the Blue Water Bridge as a vital part of Michigan's infrastructure and economy, thus it must accommodate current and forecasted traffic levels. Expanding the existing Blue Water Bridge was not identified as a need as part of MDOT's LRP, as both bridge spans are forecast to have adequate traffic capacity beyond 2030.

Historic Traffic Growth: The number of trucks entering the United States via the Blue Water Bridge increased by approximately 132 percent between 1990 and 2000. Outbound trucks heading for Canada via the bridge increased by 139 percent over the same ten-year time period. The September 11 terrorist attacks in 2001 contributed to a decline in the growth rate of truck traffic through 2005 to ten percent, however Canada bound truck traffic grew at a quicker rate of 17.6 percent. **Table 1.1** illustrates the growth in truck traffic crossing the Blue Water Bridge between 1970 and 2005.

Table 1.1 Truck Traffic Using the Blue Water Bridge

Year	Annual Trucks		Average Daily Traffic		Annual Growth Rate*		
	West Bound into the U.S.A.	East Bound into Canada	West Bound into the U.S.A.	East Bound into Canada	Annual Growth Rate Period	West Bound into the U.S.A.	East Bound into Canada
1970	95,600	93,800	262	257	-	-	-
1980	106,600	106,700	292	292	1970 to 1980	1.1%	1.3%
1990	361,200	308,900	990	846	1980 to 1990	13.0%	11.2%
2000	837,000	739,800	2,293	2,027	1990 to 2000	8.8%	9.1%
2005	920,530	870,160	2,522	2,384	2000 to 2005	1.9%	3.3%

* Annual Compounded Rate

The rapid truck growth prior to 2001 can be attributed to several factors including completion of Highway 402 in Canada in 1982, and completion of I-69 between Port Huron and Indianapolis, Indiana in 1992. In 1989, the United States-Canada Free Trade Agreement was implemented followed in 1994 by the North American Free Trade Agreement (NAFTA). These trade agreements helped create strong growth in international trade and commercial traffic between the United States and Canada. For the purposes of this study two potential options of truck growth were looked at to depict a high and a low growth option. The traffic analysis was developed based on the high growth option as discussed in the **Traffic Growth to the Year 2030** section.

Passenger vehicle crossings at the Blue Water Bridge declined 23 percent between 1990 and 2005. **Table 1.2** illustrates the trends in passenger vehicle crossings at the Blue Water Bridge since 1970. New shopping centers in Port Huron along with the strong value of the Canadian dollar led to significant growth in passenger vehicle crossings in the late 1980's and early 1990's. This growth subsided in the late 1990's due in part to the decline of cross-border shopping and the weakening value of the Canadian dollar. The September 11, 2001 terrorist attacks also resulted in fewer passenger vehicle crossings.

Table 1.2 Passenger Vehicles (Cars, Vans, and Light Trucks) Using the Blue Water Bridge

Year	Annual Passenger Vehicles		Average Daily Traffic		Annual Growth Rate*		
	Westbound into the U.S.A.	Eastbound into Canada	Westbound into the U.S.A.	Eastbound into Canada	Annual Growth Rate Period	Westbound into the U.S.A.	Eastbound into Canada
1970	1,124,200	1,126,000	3,080	3,085	-	-	-
1980	1,656,700	1,671,200	4,539	4,579	1970 to 1980	4.0%	4.0%
1990	2,422,900	2,417,200	6,638	6,622	1980 to 1990	3.9%	3.8%
2000	2,224,600	2,165,700	6,095	5,933	1990 to 2000	-0.9%	-1.1%
2005	1,865,150	1,849,820	5,110	5,068	2000 to 2005	-3.5%	-3.1%

* Annual Compounded Rate

Both truck and passenger vehicle crossings are expected to increase in the future. The following paragraph provides data on expected traffic growth to the year 2030.

Traffic Growth to the Year 2030: Based on long-term growth trends, truck and car crossings at the Blue Water Bridge are projected to increase between 2005 and 2030. Two separate commercial forecasts were developed based on existing and historical truck crossing data to estimate the possible future demand for cross-border traffic. The first forecast is based on growth patterns associated with a longer time period and anticipates cross-border commercial traffic to continue to grow at a rate similar to pre-9/11 levels. The annual number of trucks entering the United States at the bridge under this forecast is projected to increase by approximately 109 percent between 2005 and 2030. This represents an average annual increase of 4.4 percent per year. The number of trucks exiting to Canada is forecast to increase by approximately 100 percent between 2005 and 2030, an average annual increase of four percent per year. **Table 1.3** illustrates the truck traffic forecast for the Blue Water Bridge.

Table 1.3 Blue Water Bridge High Growth Truck Forecast

Year	Trucks		Average Daily Traffic		Annual Growth Rate***		
	Westbound into the U.S.A.	Eastbound into Canada	Westbound into the U.S.A.	Eastbound into Canada	Annual Growth Rate Period	Westbound into the U.S.A.*	Eastbound into Canada**
2005	920,530	870,160	2,522	2,384	-	-	-
2010	1,120,900	1,043,900	3,071	2,860	2005 to 2010	4.0%	3.7%
2020	1,521,700	1,521,700	4,169	3,812	2010 to 2020	3.1%	3.8%
2030	1,922,800	1,922,800	5,268	4,764	2020 to 2030	2.4%	2.4%

* Between 2005 and 2030 there is an average annual increase of 4.4% per year of trucks entering the United States at the bridge.

** Between 2005 and 2030 there is an average annual increase of 4.0% per year of trucks exiting to Canada.

*** Annual Compounded Rate

The second forecast, which represents a slowed-growth scenario, reflects the growth patterns associated with a much shorter period of time. For this lower growth estimate, the cross-border commercial patterns during the 2000-2005 time periods were used to project future commercial growth rates. In this slowed-growth projection, the annual number of trucks entering the United States at the bridge under this forecast is projected to increase by approximately 61 percent between 2005 and 2030. This represents an average annual increase of 2.4 percent per year. The number of trucks exiting to Canada is also forecast to increase by approximately 61 percent between 2005 and 2030, an average annual increase of 2.4 percent per year. **Table 1.4** illustrates the truck traffic forecast if current crossing trends were to be projected to 2030 for the Blue Water Bridge.

Under either of these commercial traffic growth trends however, the existing plaza footprint does not provide adequate capacity for CBP or MDOT to carry out its daily operations. Consequences of not providing additional space for primary and secondary inspections will result in increased border delays for the aforementioned commercial volumes.

Table 1.4 Blue Water Bridge Low Growth Truck Forecast

Year	Trucks		Average Daily Traffic		Annual Growth Rate***		
	West Bound into the U.S.A.	East Bound into Canada	West Bound into the U.S.A.	East Bound into Canada	Annual Growth Rate Period	West Bound into the U.S.A.*	East Bound into Canada**
2005	920,530	870,160	2,522	2,384	-	-	-
2010	1,033,315	974,550	2,831	2,670	2005 to 2010	2.3%	2.3%
2020	1,258,520	1,183,330	3,448	3,242	2010 to 2020	2.0%	2.0%
2030	1,484,090	1,392,110	4,066	3,814	2020 to 2030	1.7%	1.6%

* Between 2005 and 2030 there is an average annual increase of 2.4% per year of trucks entering the United States at the bridge.

** Between 2005 and 2030 there is an average annual increase of 2.4% per year of trucks exiting to Canada.

*** Annual Compounded Rate

Total passenger traffic at the Blue Water Bridge is forecast to grow by approximately 21 percent between 2005 and 2030, an average annual increase of approximately 0.8 percent. **Table 1.5** illustrates the forecast passenger vehicle traffic growth. The recent decline in passenger vehicle crossings is unlikely to continue indefinitely. Normal population growth in Ontario and Michigan along with greater acceptance of and adaptation to new border inspection procedures by travelers is likely to halt the decline in passenger vehicle crossings over the next few years. This is reflected in the passenger car forecast which continues to decline until 2010 when the forecast begins to grow again. Improvements to the plaza and the I-94/I-69 corridor are expected to be sufficient to handle proposed traffic numbers at the build-out year of 2030.

Table 1.5 Blue Water Bridge Passenger Vehicle (Cars, Vans, and Light Trucks) Forecast

Year	Passenger Vehicles		Average Daily Traffic		Annual Growth Rate***		
	Westbound into the U.S.A.	Eastbound into Canada	Westbound into the U.S.A.	Eastbound into Canada	Annual Growth Rate Period	Westbound into the U.S.A.*	Eastbound into Canada**
2005	1,866,300	1,841,600	5,110	5,068	-	-	-
2010	1,637,000	1,609,300	4,485	4,409	2005 to 2010	-2.6%	-2.7%
2020	1,951,700	1,914,800	5,347	5,246	2010 to 2020	1.8%	1.8%
2030	2,266,300	2,220,300	6,209	6,083	2020 to 2030	1.5%	1.5%

* Annual Compounded Rate

Existing inspection and toll collection facilities on the plaza are inadequate to deal with this projected traffic growth. As discussed below, significant truck queues can occur even when all commercial primary inspection booths are staffed.

Backups Need to be Reduced

Improvements to the United States Plaza must minimize backups of commercial and passenger vehicles on both the Canadian and United States sides of the border. Some recent improvements have been made on the existing plaza to help reduce backups. These include conversion of inspection booths for use by both cars and trucks, increased inspection staffing, and an additional on-ramp lane to the plaza from I-94/I-69. CBP has implemented requirements for electronic pre-notification for truck shipments at the border which has also had some effect on border backups. These improvements will not address long-term potential backups resulting from new inspection procedures and/or traffic growth.

What Are Pre-notification Requirements?

Pre-notifications require traders shipping goods to the U.S. to submit certain cargo and conveyance information to the U.S. CBP before goods arrive at the border.

Fatal accidents due to vehicles rear-ending trucks during backups have occurred on both sides of the border. These backups interfere with local traffic using I-94/I-69 and often require traffic to stop quickly when reaching the end of the backup. Improvements to facilities on the Canadian side of the bridge are not part of this study. The BWBA has a plan for expansion of the Canadian plaza facilities to address their own

Figure 1.3 Truck Traffic Backups on the Blue Water Bridge

long-term space needs as a result of the growth in cross-border traffic. Space for backed up traffic headed to Canada is limited on the United States Plaza. Changes in inspection procedures, including outbound inspections as discussed previously under **New Inspection Technologies and Procedures Require More Space**, may lead to more frequent backups on I-94/I-69.

Table 1.6 Border Crossing Traffic Backup Frequency

Border Crossing	Type of backup	Frequency of Occurrence
Westbound to USA	Passenger Vehicles	Mainly associated with holidays
	Commercial Vehicles	Once a week on heavy commercial days
	I-94/I-69; Highway 402 backups	Averages twice a month
	Severe Weather	Once a year
Eastbound to Canada	Passenger Vehicles	Associated with holidays

Backups of trucks and cars waiting to enter the United States, as illustrated in **Figure 1.3** and discussed in **Table 1.6**, are common at the Blue Water Bridge. Daylight hours on Tuesday, Wednesday, and Thursday are the peak times for truck crossings. For security and operational reasons, traffic is held at the toll plaza on the Canadian side of the bridge when backups extend to the center of the bridge. As backups near the middle of the bridge, adequate sight distance for drivers who must stop to join the queue is a concern. As illustrated in **Figure 1.4**, backups have extended three to five miles into Canada, nearly to the fourth interchange on the Canadian side of the bridge. Due to the implementation of pre-notification requirements such as FAST and NEXUS, three to five mile back-ups of trucks are now rare. The longest backups now occur for cars on holiday weekends. Although cars and trucks are instructed by signs to remain in certain lanes, these backups frequently create conflicts with Highway 402 traffic attempting to use interchanges near the Blue Water Bridge in Canada. This can require traffic to quickly adjust from freeway speeds to a complete stop. The backups are of

substantial concern to Canadian authorities and local residents.

Figure 1.4 Truck Traffic Backup on Highway 402
Courtesy: Blue Water Bridge Authority

The backups of commercial and passenger vehicles into Canada are caused by the inadequacy of inspection facilities on the existing United States Plaza. These backups will likely worsen over time as the traffic utilizing the Blue Water Bridge increases and at the same time, if no improvements are made.

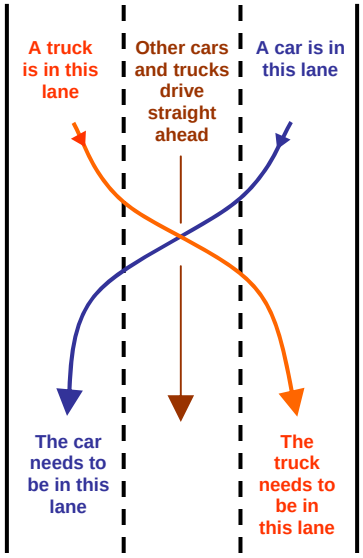
Reducing the Potential for Future Traffic Conflicts and Crashes

Plaza improvements must address a series of traffic weave movements and vehicle and pedestrian conflicts in order to enhance safety on the plaza and neighboring ramps and highways.

Traffic Weaves and Conflicts: A traffic weave is the movement of vehicles when traffic from one lane must cross in front of traffic in another lane (**Figure 1.5**). Weave movements should be avoided in congested situations where possible and designed to the American Association of State Highway and Transportation Officials (AASHTO) standards. A weave becomes more difficult and unsafe with the addition of large numbers of trucks as seen at the Blue Water Bridge. The potential for crashes and conflicts will increase as the commercial truck traffic increases.

Weaves occur at three locations at the Blue Water Bridge: 1) crossing the westbound bridge, 2) between trucks leaving primary inspection and trucks leaving secondary inspection, and 3) cars and trucks exiting the plaza toward either the M-25 Connector or I-94/I-69.

What is a traffic weave?



The car and truck must cross the other traffic to get to the lane they want to be in.

Figure 1.5

Two contributing factors are responsible for a weave movement on the westbound span of the Blue Water Bridge. The commercial secondary inspection area is located in the center of the plaza. Consequently, to avoid a severe weave on the plaza, primary inspection is placed on the left hand side for commercial vehicles and the right hand side for cars entering the United States. This alignment of inspection booths is in conflict with the general highway system in which trucks drive in the right hand lane. Commercial vehicles enter the Canadian plaza on the right hand side and drive through the toll booths with passenger vehicles on the left hand side. As a result of the placement of the United States inspection facilities, trucks must weave to the left most lanes to be inspected. The BWBA enacted an interim solution to deal with this undesirable weave and used a barrier wall to force all traffic west of the toll booths into one lane while exiting the Canadian toll plaza at slow speeds (this is considered a short-term fix). The barrier wall creates an undesirable situation for the Canadian toll booths, reducing their capacity and creating larger traffic queues along Highway 402.

Due to the location of commercial secondary inspection at the center of the U.S. plaza, a conflict also occurs between trucks leaving primary inspection and trucks leaving secondary inspection. Although vehicles are still traveling at relatively slow speeds, an undesirable conflict occurs.

There also are pedestrian and vehicle conflicts on the plaza as inspection officers, MDOT staff, customs brokers, and members of the public walk between primary and secondary inspection. Pedestrians are currently required to walk across the plaza through the flow of truck traffic, with no designated pedestrian crossings. MDOT spends approximately $85,000 each year on staff to direct traffic on the plaza during high traffic periods.

Crash Potential: Current crash rates on the bridge are below statewide averages. This low accident rate is directly caused by the slow moving or congested traffic combined with a high presence of surveillance across the bridge resulting in drivers paying more attention and being more careful.

The potential for serious crashes remains a concern. Fatal crashes have occurred as a result of backups on both I-94/I-69 and Highway 402. Improvements to the U.S. plaza facility, including the removal of the mid-bridge weave will improve the flow of traffic and improve operations on the bridge.

Improvements to I-94/I-69 Infrastructure

Black River Bridge

I-94/I-69 corridor improvements will allow for much needed updates to aging infrastructure including the replacement of the existing I-94/I-69 bridge over the Black River. The bridge was built in 1950 and is in poor structural condition with substandard shoulders. Currently the Black River Bridge has a below average sufficiency rating which qualifies the bridge for replacement. With continued deteriorating bridge conditions and forecasted increases in traffic, the replacement and expansion of the bridge will provide a safer and more efficient roadway.

The Black River Bridge shoulder widths do not meet the latest freeway standards and if a vehicle breaks down on the bridge, there is no shoulder to move to, therefore a lane is blocked. Upgrading the existing Black River Bridge, including the shoulders, would reduce the chance of a blocked lane and provide better conditions for avoiding back-up related rear-end collisions. Both deck conditions and the bridge structure will be improved to meet current MDOT standards.

Both the Water Street Bridge over I-94/I-69 and the Lapeer Connector overpass currently have deteriorating conditions that need to be addressed. The structure and deck of the Water Street Bridge (built in 1953) and the Lapeer Connector overpass (built in 1964) will be replaced and the Water Street Bridge deck elevated. In doing so, the under-clearance will be increased to meet current MDOT standards. In order to provide better access to the I-94/I-69 freeway, the Water Street Bridge will be widened from two lanes to four lanes with dedicated turning lanes. This will also reduce congestion on Water Street as it is a major freeway access point from the City of Port Huron and Port Huron Township. The Water Street interchange and Lapeer Connector improvements also are needed due to the widening of I-94/I-69 from four to eight

lanes. These lane additions will improve safety and accommodate traffic growth in the corridor.

Improving Local Roads and Access to Port Huron

An additional goal of the project is to improve local access to and around the plaza. Downtown Port Huron and the St. Clair County riverfront are two locations that could be served by improved access to and from the plaza. The downtown area and the riverfront are important features that contribute to the vitality of the local community. Plaza improvements should also improve the access to and the visibility of the duty free store affiliated with the plaza.

The existing plaza entrance and exit ramps are positioned to provide connections to and from I-94/I-69 but do not provide easy access to downtown Port Huron and the St. Clair Riverfront. **Figure 1.2** on page 1-4 illustrates the existing ramps between I-94/I-69, the plaza, and local roads. Improving congested local roads around the existing plaza may also assist economic development in the Port Huron area.

The duty free store also lacks the visibility and access of similar stores at many other border plazas. It is located off of Hancock Street and Pine Grove Avenue, past the ramp from I-94/I-69 to the plaza. Many drivers miss the opportunity to shop at the duty free store due to its current location. At other crossings the duty free store is generally located in a more visible and accessible location, often past the toll plaza. The existing duty free store also has poor control of exiting cars and trucks, which allows patrons to potentially, illegally exit the facility without going to Canada as is required for purchasing duty free goods.

Maintenance

The existing Blue Water Bridge Plaza presents maintenance challenges. The exit ramps to I-94/I-69 and the M-25 Connector are one-lane facilities. When the exit ramp to I-94/I-69 requires maintenance, traffic wishing to access the interstate must travel on a detour along local city roads. The plaza and United States side of the Blue Water Bridge are a part of the interstate system and significant maintenance requires

detouring international interstate freeway traffic onto city streets. The crowded existing elevated plaza also presents challenges in terms of snow removal and storage during large snowfalls.

Role of Canadian Officials: The plaza facilities on the Canadian side are owned and operated by the Blue Water Bridge Authority (BWBA), which reports to the Government of Canada. As a result of international agreements, including the North American Free Trade Agreement (NAFTA), the BWBA has stated that improvements to the U.S. Plaza should not have adverse transboundary impacts on operations of the BWBA or Highway 402 in Canada. Among the concerns of the BWBA are fixing the westbound mid-bridge weave, minimizing traffic backups on Canadian facilities, and accommodating future traffic growth, which are discussed in this document. The BWBA is currently in the process of making improvements to their plaza facilities.

New Welcome Center

The Michigan Welcome Center is located on the north side of the Water Street Interchange and is accessible from the westbound exit ramp from I-94/I-69. See **Figure E-1** for a locator map of the existing Welcome Center. Currently, the Welcome Center is difficult to access, insufficient in size for the amount of visitors it receives, has inadequate parking, and restrooms are separated from the main building.

Michigan Welcome Center

The existing Welcome Center will be removed as part of the upgrades to the Water Street Interchange and is proposed to be relocated to an off-site location west of the Lapeer Connector. The new facility will be upgraded to replicate one similar to others around the state of Michigan and will have space for 50 trucks and 100 cars. A new Welcome Center will better accommodate current and future border crossing traffic levels and provide a better gateway for international travelers entering Michigan and the Unites States.

State and Local Planning Support for Plaza Improvements

The Southeast Michigan Council of Governments (SEMCOG) 2030 Regional Transportation Plan includes engineering, right-of-way acquisition, and construction of improvements to the border plaza at the Blue Water Bridge. All of these phases of improvements are included in the 2006-2010 timeframe for the Regional Transportation Plan.

CHAPTER 2

ALTERNATIVES CONSIDERED

This chapter discusses the alternatives considered for improvements to both the United States Plaza at the Blue Water Bridge and the I-94/I-69 corridor and how the Study Team developed, refined and analyzed the alternatives over the course of the study.

Existing United States Blue Water Bridge Plaza

The first part of the chapter, **Section 2.1 Alternatives Development**, discusses the alternatives development process and all of the alternatives that were considered during the study. The second part of the chapter, **Section 2.2 Alternatives Carried Forward**, discusses the No-Build Alternative and the three Build Alternatives still being considered by the Study Team. The third part of this chapter, **Section 2.3 Evaluation of Alternatives,** discusses how well the alternatives address the reasons for improving the plaza. **Section 2.4** discusses why the Study Team has identified the **City West Alternative as the Preferred Alternative**.

2.1 Alternatives Development

This section discusses how the Michigan Department of Transportation (MDOT) and the Federal Highway Administration (FHWA) worked with government agencies, stakeholders, and the public to develop, refine, and evaluate potential alternatives for improvements to the United States Plaza at the Blue Water Bridge. The No-Build Alternative was always a consideration and was carried forward throughout the evaluation process. The alternatives development process included several steps. First, the Study Team developed some initial concepts for a new plaza. These initial concepts were further developed into 19 Illustrative Alternatives concepts. The Illustrative Alternatives concepts were further refined into six Illustrative Alternatives that were presented to the public. The other concepts were eliminated because they did not adequately address the purpose of and need for the improvements as stated in **Chapter 1 Why Are Improvements Needed?** The Study Team then evaluated the Illustrative Alternatives and modified them based on public and agency comments. Three of the Illustrative Alternatives were

What is an Illustrative Alternative?

Illustrative Alternatives are conceptual layouts or ideas for proposed improvements and are developed early on in the process. There is not a lot of detailed engineering that goes into the Illustrative Alternatives.

eliminated because they did not address the reasons for the improvements as well as the other alternatives. The remaining Updated Alternatives were presented for further public and agency comments. Based on a further analysis, the Study Team reduced the list of alternatives down to three Build Alternatives and the No-Build Alternative. These final four alternatives carried forward are described in detail in **Section 2.2 Alternatives Carried Forward** and are discussed throughout this Draft Environmental Impact Statement.

2.1.1 Initial Concepts

What is a Charrette?

A charrette is a workshop to facilitate an open discussion between the stakeholders of a project, which typically uses a mixture of brainstorming and laying out of potential alternatives.

Initial Concepts Charrette

The Study Team began the alternatives development process by collecting data on the existing facilities at the Blue Water Bridge plaza/corridor and discussing future facility needs with stakeholders. **Chapter 6 Public and Agency Coordination** identifies the stakeholders for the project. An initial list of the facilities needed was developed based on a facilities analysis prepared by the General Services Administration (GSA) and other needs expressed by plaza agencies.

Using the facility needs developed through GSA, MDOT held an Initial Concepts Charrette with plaza stakeholders. The charrette was attended by 47 individuals including representatives from Customs and Border Protection (CBP), GSA, Canadian stakeholders, and local governments. Charrette participants worked in breakout groups to identify issues and concerns to develop preliminary concepts for plaza improvements. Ideas from the charrette were used in the development of the Illustrative Alternatives.

2.1.2 Illustrative Alternatives - Phase 1

The Illustrative Alternatives development process included two phases. In the first phase, a wide variety of concepts and ideas for plaza improvements were explored. Some of these concepts were fully developed into alternative plans. Others were discarded once it became apparent they would not meet the objectives of the project. Nineteen concepts were evaluated during this phase of alternatives development. These alternatives are described below.

Illustrative Alternative 1 - Expand Elevated Plaza North and South over Pine Grove Avenue

Illustrative Alternative 1 expanded the elevated plaza to the north and south over Pine Grove Avenue. An 11.5 acre street level truck secondary inspection area was added to the north between the existing plaza and Hancock Street. Illustrative Alternative 1 required property from the blocks between Hancock Street and the existing plaza and along the north side of Mansfield Street. Elmwood Street, between 10th Avenue and Pine Grove Avenue, and Harker Street west of 10th Avenue would have been closed. Illustrative Alternative 1 was refined into Illustrative Alternative A during Phase 2 of the Illustrative Alternatives development process as described later in this section.

Initial Concepts Charrette

Illustrative Alternative 2 - West Loop Ramp for Local Access

Illustrative Alternative 2 expanded the elevated plaza to the north and south over Pine Grove Avenue. This alternative included a large bridge structure that provided additional local access and plaza movements at a central access point. A 12-acre street level truck secondary inspection area was added to the north between the existing plaza and Hancock Street. Illustrative Alternative 2 would have required property from the blocks between Hancock Street and the existing plaza and from both sides of Mansfield Street west of Pine Grove Avenue. Plaza ramps would have impacted properties on Elmwood Street and 17th Avenue west of the M-25 Connector. Due to extensive relocations and poor ramp connections with the freeway and local road system, Illustrative Alternative 2 was not carried forward. Illustrative Alternative 2 did not meet the purpose and need of the project.

DTE Energy Substation by the Existing Plaza

Illustrative Alternative 3 - Expand Elevated Plaza with Minimal Secondary Inspection Expansion

Illustrative Alternative 3 maintained the existing north plaza boundary east of Pine Grove Avenue while expanding the elevated boundary along the southern edge. All of the plaza functions remained elevated with this alternative. A six-acre elevated truck secondary inspection facility was proposed on the location of the existing duty free store and DTE Energy

Existing Duty Free Store

Why are Sightlines Important?

Clear sightlines between inspection booths and the other inspection facilities on the plaza are important as CBP wants to ensure that vehicles sent for further inspection actually go to the inspection area they are sent to.

The former London's Dairy Plant on the south side of the existing plaza has been demolished

substation. Illustrative Alternative 3 would have required relocations along the north side of Mansfield Street, west of Pine Grove Avenue. Harker Street would have been closed west of Poplar Street and Mansfield Street would have been closed between 12th Avenue and Pine Grove Avenue. Due to the limited space provided for truck inspections and parking, poor sightlines for security, and large distances between buildings and booths, the Study Team decided not to carry Illustrative Alternative 3 forward. Illustrative Alternative 3 did not meet the purpose and need of the project.

Illustrative Alternative 4 - Expand Plaza North and East

Illustrative Alternative 4 maintained the existing elevated north and south plaza edges west of Pine Grove Avenue. The plaza was expanded slightly to the north and south on the east side of Pine Grove Avenue. A 12.5 acre street level truck inspection area was added to the north between the existing plaza and Hancock Street. Toll booths were also at street level while other plaza facilities remained elevated. Illustrative Alternative 4 included staggered truck primary inspection booths and arc shaped outbound toll booths. Illustrative Alternative 4 used part of the London's Dairy property and would have required Elmwood Street between Pine Grove Avenue and 10th Avenue to be closed. Illustrative Alternative 4 was refined into Illustrative Alternative B during Phase 2 of the Illustrative Alternatives development process as described later in this section.

Illustrative Alternative 5 - Expand Plaza South

Illustrative Alternative 5 maintained the existing north plaza edge, and expanded the plaza only to the south. All plaza facilities were kept above grade. Illustrative Alternative 5 required property on both sides of Mansfield Street east of Pine Grove Avenue. Mansfield Street and Harker Street would have been closed east of Pine Grove Avenue while 11th Avenue and 12th Avenue would have been terminated north of Scott Avenue. Due to the limited space provided for truck inspections and parking, lack of flexibility for future modifications that may be required by CBP, and lack of significant local access improvements, the Study Team decided not to carry Illustrative Alternative 5 forward.

Illustrative Alternative 5 did not meet the purpose and need of the study.

Illustrative Alternative 6 - Expand Plaza West of Pine Grove Avenue

Illustrative Alternative 6 maintained the same elevated plaza footprint to the east of Pine Grove Avenue. West of Pine Grove Avenue the elevated plaza was expanded to the south. A 14.5 acre street level truck secondary inspection facility was added to the north between the existing plaza and Hancock Street. Illustrative Alternative 6 required property from both sides of Mansfield Street west of Pine Grove Avenue. Mansfield Street would have been closed west of Pine Grove Avenue. 11th Avenue and 12th Avenue would have been terminated between Scott Avenue and Mansfield Street. Illustrative Alternative 6 was refined into Illustrative Alternative C during Phase 2 of the Illustrative Alternatives development process as described later in this section.

Illustrative Alternative 7 - Offsite Secondary Inspection with Electronic Tracking

Illustrative Alternative 7 expanded the existing elevated plaza to the south and east. Primary inspection, tolls, outbound inspection, and the duty free store would have remained on the existing plaza. Truck secondary inspection was moved to a 32.5 acre offsite location on the north side of I-94/I-69 approximately two miles west of the existing plaza. This alternative proposed using the existing I-94/I-69 freeway to provide access between primary and secondary inspection. Vehicles would have been monitored using electronic tracking technology. Illustrative Alternative 7 would have required property on the north side of Mansfield Street and required the closures of Harker Street west of 10th Avenue and 11th Avenue, and 12th Avenue north of Mansfield Street. Representatives from CBP stated that electronic tracking technology did not provide adequate security for ensuring vehicles reported for secondary inspection. As a result, the Study Team dropped Illustrative Alternative 7 from further consideration. Illustrative Alternative 7 did not meet the purpose and need of the project.

The use of electronic tracking technology was considered

Illustrative Alternative 8 - Offsite Secondary Inspection with Dedicated Lanes on the North Side of I-94/I-69

Illustrative Alternative 8 expanded the existing elevated plaza and moved truck secondary inspection off-site in the same manner as Illustrative Alternative 7. Access to secondary inspection was provided through dedicated and secure lanes constructed on the north side of I-94/I-69. In addition to the property impacts described for Illustrative Alternative 7, Illustrative Alternative 8 would have required property along the north side of I-94/I-69 between the existing plaza and the proposed off-site location. This property acquisition would have included parts of two township parks.

What is Section 4(f)?

Section 4(f) is a part of the1966 Department of Transportation Act which prohibits the use of land from a public park, recreations area, wildlife and waterfowl refuge, or historic site for transportation projects unless there is no prudent or feasible alternative to using the land.

Illustrative Alternative 8 impacted protected Section 4(f) sites in the form of two township parks. With six Illustrative Alternatives fully developed for the project, including an alternate potential location for off-site facilities, MDOT was able to find a prudent and feasible alternative to using park land. As a result, this alternative was dropped from further consideration.

Illustrative Alternative 9 - Relocate Pine Grove Avenue to the West

Illustrative Alternative 9 would have brought much of the plaza down to street level and relocated Pine Grove Avenue west of its existing location. Existing Pine Grove Avenue traffic would have used the relocated Pine Grove Avenue, which was combined with the existing M-25 Connector. The relocated section of Pine Grove Avenue would have connected with the existing Pine Grove Avenue at Scott Avenue. Illustrative Alternative 9 would have required property from the blocks between Hancock Street and the existing plaza and on both sides of Mansfield Street west of 10th Avenue. Illustrative Alternative 9 was refined into Illustrative Alternative D during Phase 2 of the Illustrative Alternatives development process as described later in this section.

The existing elevated plaza crosses over Pine Grove Avenue

Illustrative Alternative 10 - Relocate Pine Grove Avenue to the East

Illustrative Alternative 10 would have brought much of the plaza down to street level and relocated Pine Grove Avenue to 10th Avenue between Hancock Street and Scott Avenue. Illustrative Alternative 10 would have required property from the blocks between Hancock Street and the existing plaza and from the north side of Mansfield Street west of 10th Avenue. Illustrative Alternative 10 was refined into Illustrative Alternative E during Phase 2 of the Illustrative Alternatives development process as described later in this section.

Illustrative Alternative 11 - Relocate Most Plaza Functions Offsite

Illustrative Alternative 11 would have relocated almost all of the plaza facilities to an alternate 71 acre plaza approximately 1.5 miles west of the current plaza. Illustrative Alternative 11 would not have expanded the existing plaza. The existing I-94/I-69 freeway lanes would have been converted to a secured route to take vehicles between the new plaza and the Blue Water Bridges. Local traffic was to be shifted onto a new extension of the M-25 Connector on the south side of the existing freeway. The existing bridge over the Black River would have remained at four lanes and an additional four-lane bridge would have been built over the Black River for the new local extension of the M-25 Connector.

The relocated plaza facilities included a relocated Welcome Center and the MDOT Maintenance facility. Illustrative Alternative 11 was refined into Illustrative Alternative F during Phase 2 of the Illustrative Alternatives development process as described later in this section.

What is NEXUS?

NEXUS is a program that allows pre-approved low risk travelers to enjoy a simplified border crossing process. NEXUS pass holders can use dedicated lanes at border crossings, reducing their waiting time.

What is FAST?

The Free and Secure Trade (FAST) program offers quicker clearance of pre-registered, low risk shipments. To be eligible to use the dedicated FAST lanes, the importer, trucking company, and driver must all be pre-approved.

Illustrative Alternative 12 - Transportation Systems Management

Transportation Systems Management (TSM) refers to a wide range of minor system and technology improvements to improve the efficiency and safety of existing and future highways. Potential TSM improvements for the Blue Water Bridge Plaza Study could include highway information

systems, changeable signs, and demand management efforts. Current and potential systems management efforts are described below.

Dedicated NEXUS/FAST lanes have been added on the existing plaza at the primary inspection booths to provide quicker inspection times for participating vehicles. Advance signing could be provided along the I-94/I-69 corridor to allow NEXUS/FAST participants to efficiently process through primary inspection.

Changeable Message Sign

Changeable message signs are being installed at various locations along the I-94/I-69 corridor to provide traffic with up-to-date information about current bridge plaza traffic conditions. Signs could also be used to redirect outbound traffic to the Pine Grove Avenue plaza entrance during freeway backups. Another changeable message sign could be placed on the southbound M-25 Connector prior to the connection with the plaza off ramp. This sign could be used to warn southbound vehicles of heavy oncoming traffic flows from the plaza and provide for an easier merge movement for the vehicles exiting the plaza.

What is a Ramp Meter?

A ramp meter is a set of traffic signals located on a freeway entrance ramp, usually about halfway down the ramp. Ramp meters regulate the flow of traffic onto the freeway so that merging traffic does not slow down the freeway.

Ramp metering could provide for smoother merge flows onto freeways during peak traffic times. A ramp meter could be added to the plaza off ramp where it meets the southbound M-25 Connector to reduce the high merge volume's affect on freeway flow. The meter could be used during peak traffic times and turned off at other times.

Entrance Ramp Meter

Expansion of current ramps along the corridor provide for more capacity could help ease congestion on the interstate/street network surrounding the plaza. Additional plaza exit capacity could be provided by widening the existing bridge and ramp over the northbound M-25 Connector to two lanes. Designating the right hand lane on the Black River Bridge, between Water Street and the plaza, for plaza traffic only would help reduce network congestion. A dedicated off ramp to Water Street on the westbound side of the bridge could also improve the system.

MDOT, CBP, and Canadian officials implemented several short-term solutions to improve traffic flow at the Blue Water

Bridge Border Crossing. Several of the potential Transportation System Management (TSM) improvements were implemented as part of the 25 percent Challenge for the border crossing. The 25 percent Challenge was a collaborative effort between the U.S. and Canada and included the private sector with the goal to reduce transit times by 25 percent in Southeast Michigan within one year. The 25 percent Challenge was announced on December 17, 2004. This has included the conversion of several car only inspection booths into combined booths for cars and trucks so that more trucks can be processed during periods of high truck traffic.

The Study Team concluded that an alternative consisting exclusively of TSM improvements and the 25 percent Challenge would fail to address long-term traffic growth and the accommodation of new inspection technologies as outlined in the Purpose of and Need for the project. As a result, Illustrative Alternative 12 was not carried forward. However, TSM improvements were included as possible interim and permanent improvements as part of the Build Alternatives.

What is a Bridge Span?

A bridge span is the main part of the bridge that spans over the river, road or other feature.

Illustrative Alternative 13 - Use of Land Underneath the Bridge Spans, east of Stone Street

The Study Team considered using the land underneath the existing Blue Water Bridge spans for plaza facilities. Ideas for the use of this land included turning traffic around as they come off the bridge and routing it to plaza facilities underneath the spans. The Study Team also considered this area for parking or storage of impounded vehicles.

At Stone Street, the Blue Water Bridge spans are approximately 52 feet above street level. To use the land under the spans for inspection facilities, traffic would have to be turned around and brought to street level. Turning traffic around and bringing it to street level prior to Pine Grove Avenue is not possible from an engineering standpoint. For security reasons, plaza traffic crossing Pine Grove Avenue and/or 10th Avenue at street level would not be acceptable. Closing or rerouting both Pine Grove Avenue and 10th Avenue would be extremely disruptive to north-south traffic patterns in Port Huron and would not be practical from a local traffic circulation and access perspective. As a result, the use of land

underneath the bridge spans east of Stone Street has been dropped from consideration for full regulation of plaza facilities.

Illustrative Alternative 14 - Use of Land North of Hancock Street

Hancock Street Near Existing Plaza

This initial concept involved expanding the truck secondary inspection facilities north of the existing plaza to cover the block immediately north of the plaza and west of Pine Grove Avenue and the block further north across Hancock Street. Alternatives crossing Hancock Street would require either the closure of the street or construction of a new structure similar to the one over Pine Grove Avenue. As Hancock Street is a major thoroughfare at that point and because there are a variety of alternatives that do not require crossing it, use of land north of Hancock Street for expansion of the plaza was dropped from further consideration.

Illustrative Alternative 15 - Bridging Pine Grove Avenue over the Plaza

Alternatives that involved bridging Pine Grove Avenue over the plaza were considered. This would allow more of the plaza facilities to be placed at street level. However, a bridge over the plaza would require more than 2000 feet of right-of-way along Pine Grove Avenue. The bridge would also necessitate closing access from Church Street, Elmwood Street, Harker Street, and Mansfield Street to Pine Grove Avenue. For these reasons, bridging Pine Grove Avenue over the plaza was dropped from future consideration.

The Study Team Considered Multi-modal and Transit Alternatives

Illustrative Alternative 16 - Multi-modal and Mass Transit Alternatives

The existing plaza facilities have lanes for inspection of buses and all alternatives will accommodate bus inspection facilities. Both commercial and passenger rail traffic cross the border in Port Huron and are inspected at separate locations, approximately two miles south of the plaza. As this study is about plaza improvements, multi-modal and mass transit alternatives are not appropriate for the context of the study. Individuals and cargo would require inspection regardless of

the mode of transportation used. The potential for cross border transit services is beyond the scope of this study. As a result, multimodal and mass transit alternatives were dropped from further consideration.

Illustrative Alternative 17 - Relocation of Plaza Facilities to Canada

Canadian Blue Water Bridge Plaza in Point Edward, Ontario

The Study Team considered the possibility of moving some or all plaza inspection facilities to the Canadian side of the bridge. The major barrier to moving United States facilities to the Canadian side of the crossing is sovereignty related issues over jurisdiction, which can only be worked out through international diplomatic channels and are beyond the scope of this study. This alternative was dropped from further consideration.

Illustrative Alternative 18 - Use of Port Huron Township Park No. 2 and RV Park

Early on in the alternatives development process, members of the study team identified Port Huron Township Park No. 2 and RV Park as a possible location for potential off-site facilities. The park and campground are about one mile west of the existing plaza along I-94/I-69. This site was thought to have had potential for off-site facilities because it is near the Water Street Interchange, the first interchange southwest of the plaza.

Port Huron Township RV Park

The RV Park is a Section 4(f) recreation site. With several Illustrative Alternatives fully developed for the project, including an alternate potential location for off-site facilities, MDOT was able to find a prudent and feasible alternative to using the park and campground. As a result, this alternative was dropped from further consideration.

Illustrative Alternative 19 - Prior 1999 Study Alternatives

GRIT Building on Existing Plaza

A 1999 Bridge and Toll Plaza Operations Study suggested six alternative concepts for plaza improvements. At the time, inspection technologies such as permanent gamma ray inspection technology (GRIT) facilities, FAST program facilities, entry-exit program changes, truck unloading docks,

warehouse facilities, and radiation portals were not included in the development of these concepts and there was no identified space for these facilities. In addition, these concepts did not include enough booths to accommodate the forecasted 2030 traffic. As a result, none of these concepts were kept as an Illustrative Alternative. However, several beneficial features of these concepts have been incorporated into other Illustrative Alternatives.

2.1.3 Illustrative Alternatives - Phase 2

Phase 1 of the Illustrative Alternatives development process included extensive coordination with stakeholders and preliminary evaluation of the concepts based on the objectives of the project and potential impacts. As a result of this coordination and evaluation process, six of the Illustrative Alternatives emerged as more feasible and favorable. The Study Team discussed these alternatives, along with a No-Build Alternative, with stakeholders over the summer of 2003 and presented them at a public meeting on September 23, 2003. For clarity, the Illustrative Alternatives developed and presented in Phase 2 were renamed with letters as Illustrative Alternatives A through F. The following is a discussion of the Phase 2 set of Illustrative Alternatives.

Illustrative Alternative A - Expanded Elevated Plaza

Illustrative Alternative A was a refined version of Illustrative Alternative 1 discussed previously. Minor refinements included the addition of parking layouts and gates to connect the inbound and outbound sides of the plaza to accommodate maintenance and bridge closure situations. Illustrative Alternative A was originally estimated to require 28 residential and 10 business relocations. Illustrative Alternative A was carried forward and refined into Updated Alternative 1 discussed below.

Illustrative Alternative B - Expand Plaza North and East

Illustrative Alternative B was a refined version of Illustrative Alternative 4. Minor refinements included the addition of new crossover ramps where the bridge spans approach the plaza to accommodate maintenance and bridge closure

situations. Illustrative Alternative B was originally estimated to require no residential and seven business relocations.

Illustrative Alternative B was dropped from consideration due to its inability to adequately address the objectives of the project as well as the other alternatives. Not expanding the plaza over Pine Grove Avenue would result in a plaza which is very constrained and has little flexibility for both CBP's current and future inspection procedures. The constrained nature of Illustrative Alternative B also resulted in limited queuing space and a potential bottleneck for cars entering the United States as compared to other alternatives. This could lead to longer future back-ups onto the Canadian side of the bridge.

Refinements to the plaza footprint to address the problems with Illustrative Alternative B would have resulted in layouts and impacts similar to Illustrative Alternative A. Therefore, Illustrative Alternative B was not carried forward.

Illustrative Alternative C - Expand Plaza West of Pine Grove Avenue

Illustrative Alternative C was a refined version of Illustrative Alternative 6. Refinements included changes in duty free access, expansion of employee parking, and gates to connect the inbound and outbound sides of the plaza, to accommodate maintenance and bridge closure situations. Illustrative Alternative C was originally estimated to require 49 residential and eight business relocations.

Illustrative Alternative C was not carried forward to the due to its failure to address the objectives of the project as well as other alternatives. Illustrative Alternative C did not expand the plaza over Pine Grove Avenue resulting in limited queuing space and a potential bottleneck for passenger vehicles entering the United States as compared to other alternatives. This would have potentially led to longer backups onto the Canadian side of the bridge. Illustrative Alternative C featured a potentially confusing exit from the passenger vehicle inspection area that resulted in short decision points and potential weaving situations for vehicles exiting the plaza.

Why is Queuing Space Important?

Queuing space is where cars and trucks will line up for inspection at the booths on the plaza. If there is not enough queuing space or if the queuing space is poorly designed backups onto the Blue Water Bridge and I-94/I-69 will be more likely.

Refinements to the plaza footprint to address the problems with Illustrative Alternative C would result in layouts and impacts similar to Illustrative Alternative A. Therefore, Illustrative Alternative C was not carried forward.

Illustrative Alternative D - Relocate Pine Grove Avenue to the West

Illustrative Alternative D was a refined version of Illustrative Alternative 9 presented above. Minor refinements included gates to connect the inbound and outbound sides of the plaza to accommodate maintenance and bridge closure situations. Illustrative Alternative D was originally estimated to require 13 residential and 23 business relocations.

Illustrative Alternative D was originally dropped from consideration due to its similarities to Illustrative Alternative E and the initial conclusion that Illustrative Alternative E would have fewer impacts on the community. After further development and review of the alternatives, Customs and Border Protection (CBP) suggested that the Study Team evaluate an alternative that refined and expanded upon the original Illustrative Alternative D concept. This expanded alternative concept became Alternative 4 in the Updated Alternatives phase discussed below and eventually became the City West Alternative discussed in **Section 2.2 Alternatives Carried Forward** and throughout this DEIS.

Illustrative Alternative E - Relocate Pine Grove Avenue to the East

Illustrative Alternative E was a refined version of Illustrative Alternative 10 presented above. Refinements included bringing more of the outbound part of the plaza down to street level and providing gates to connect the inbound and outbound sides of the plaza to accommodate maintenance and bridge closure situations. This at-grade plaza configuration required the relocation of Pine Grove Avenue to the east, combining it with 10th Avenue. Illustrative Alternative E was originally estimated to require 36 residential and 12 business relocations.

Illustrative Alternative E was carried forward and expanded and refined into Alternative 2 and eventually became the City East Alternative discussed in **Section 2.2 Alternatives Carried Forward** and throughout this DEIS.

Illustrative Alternative F - Relocated Plaza in Port Huron Township

Illustrative Alternative F was a refined version of Illustrative Alternative 11. Refinements included a more detailed layout of parking and facilities at the proposed relocated plaza and a rearrangement of the existing plaza to allow for local access to a small set of primary inspection booths and toll booths. New ramps were introduced at the proposed plaza relocation site to avoid having a traffic signal at the exit of the relocated plaza. Illustrative Alternative F was originally estimated to require no residential or business relocations.

Illustrative Alternative F was carried forward and expanded and refined into Alternative 3 and eventually became the Township Alternative discussed in **Section 2.2 Alternatives Carried Forward** and throughout this DEIS.

What is Outbound Inspection?

Outbound inspection booths allow CBP to inspect individuals and cargo leaving the country. Currently CBP conducts random exit control interviews by flagging down outbound vehicles after they pass through the toll booths. These inspections can cause severe backups on I-94/I-69.

2.1.4 Updated Alternatives

In Phase 2 of the Illustrative Alternatives development process, the original 19 alternatives were narrowed down to six Illustrative Alternatives (A through F), as well as a No-Build Alternative. After evaluating the potential impacts further and coordinating with stakeholders, these six Illustrative Alternatives were reduced to four Updated Alternatives. These Updated Alternatives were modified versions of the most feasible Illustrative Alternatives. The modifications were based on the objectives of the study, environmental concerns, traffic analyses, and both local stakeholder and public input. The Updated Alternatives for the plaza were substantially larger in size than the Illustrative Alternatives. Most of the increase in size was due to the additional space for adequate CBP inspection facilities including the addition of outbound inspection facilities. Outbound inspection booths and parking were added to allow CBP to inspect cars and trucks leaving the United States. Other inspection areas were also expanded to ensure better

Existing Elevated Plaza Wall

traffic flow on the proposed plazas. The expanded outbound inspection and other facilities added approximately 30 to 40 acres to the Updated Alternatives, and increased the number of homes and businesses that would be purchased for the plaza.

The following paragraphs discuss the Updated Alternatives in detail.

Alternative 1 - Expanded Elevated Plaza

Alternative 1 was a refined version of Illustrative Alternative A, which was a refined version of Illustrative Alternative 1. Alternative 1 expanded the plaza to the north and south over Pine Grove Avenue. The secondary inspection area for trucks would have been at street level and connected by ramps to the elevated plaza. Alternative 1 would have used all the land between the M-25 Connector and Pine Grove Avenue that lies south of Hancock Street and north of Scott Avenue, as well as the area bordered by Pine Grove Avenue, 10th Avenue, Church Street, and Mansfield Street. Alternative 1 as originally shown would have required 86 residential and 17 business relocations and occupied 75 acres.

Alternative 1 was not carried forward as it would have similar environmental impacts as Alternative 2 and Alternative 4 but did not address the project objectives as well as the other alternatives. Due to the high cost of building and maintaining a large elevated plaza, it was also more expensive than the other alternatives. A large elevated plaza would not have the flexibility to address future unknown security needs and technology as the elevated portions of the plaza would have been very expensive to alter. During the refinement of the Updated Alternatives, the area required for each plaza expanded by another twenty acres. Local road improvements were also required along Hancock Street and Pine Grove Avenue for all Build Alternatives. Had Alternative 1 been carried forward, it also would have expanded to a plaza area similar to the City Alternatives and would have included local road improvements similar to the other Build Alternatives. As a result, Alternative 1 would have had the highest number of residential and business relocations of any alternative and similar community impacts to the City of Port Huron as the

City East Alternative. The Study Team decided there was no point in continuing to study an alternative that was less flexible, had greater impacts, and was more costly when compared to the other Alternatives.

Alternative 2 – City East Alternative

Alternative 2 expanded the plaza at its existing site in the City of Port Huron. Alternative 2 was a refined version of Illustrative Alternative E, which was a refined version of Illustrative Alternative 10. Alternative 2 relocated Pine Grove Avenue between Hancock Street and 10th Avenue, east of the existing plaza. Pine Grove Avenue would have been combined with 10th Avenue for three blocks and wrapped around the new plaza. Pine Grove Avenue would no longer run under the plaza. Alternative 2 was originally forecast to require 87 residential and 21 business relocations and 82 acres of land.

The Study Team carried Alternative 2 forward and refined it into the City East Alternative. The City East Alternative is one of the alternatives still under consideration and is discussed in detail in this DEIS. **Section 2.2.4 City East Alternative** discusses its features in detail.

Alternative 3 – Township Alternative

Alternative 3 relocated the major plaza functions to an off-site plaza in Port Huron Township along I-94/I-69, west of the Lapeer Connector exit. Alternative 3 was a refined version of Illustrative Alternative F, which was a refined version of Illustrative Alternative 11. This alternative originally required 126 acres of right-of-way, including existing plaza re-use.

Alternative 3 included secured lanes to the relocated plaza along the existing I-94/I-69 alignment. Barrier walls were included to ensure security. Alternative 3 featured service drives parallel to the secured I-94/I-69 corridor to provide access for local traffic to I-94/I-69 west of the plaza, the plaza, the Lapeer Connector, Water Street, and Hancock Street. Alternative 3 also included a new intersection at the Lapeer/I-94/I-69 interchange. Alternative 3 was forecast to require 9 residential relocations and 1 acre of land.

What is Meant By Secured Lanes?

Alternative 3 features a secured roadway along existing I-94/I-69 between the proposed relocated plaza and the Blue Water Bridge. The secured westbound and eastbound lanes would not allow vehicles or people to enter or exit the roadway between the relocated plaza and the Blue Water Bridge. The secured lanes would assure that all vehicles and people from Canada must be inspected at the new plaza. The secured lanes would also make sure that those leaving the United States must go to Canada after passing through the new plaza.

The Study Team carried Alternative 3 forward and refined it into the Township Alternative. **Section 2.2.6 Township Alternative** discusses its features in detail.

Alternative 4 – City West Alternative

Alternative 4 expanded the plaza at its existing site in the City of Port Huron. Alternative 4 was developed after the other Updated Alternatives. In 2006, after reviewing the initial analysis of the other alternatives, CBP concluded that a potential alternative building on the original Illustrative Alternative D concept could reduce impacts in the City of Port Huron while still meeting the required security and facility needs. The Study Team developed this alternative in detail and determined that it merited further evaluation.

Alternative 4 was similar to the City East Alternative except that it relocated Pine Grove Avenue to the west of the plaza instead of east of the plaza. Most of the plaza facilities are at street level. Pine Grove Avenue would be relocated west of the plaza and merged into the existing M-25 Connector. Pine Grove Avenue would no longer run under the plaza.

Several local roadway options were evaluated as part of Alternative 4. This included a ring road around the plaza where northbound traffic would run east of the plaza and southbound traffic would loop around the plaza to the west. The Study Team also evaluated whether the relocated Pine Grove Avenue should be a boulevard with a planted median or a five-lane roadway with a continuous center turn lane. Although both options would fit within the footprint for this alternative, the Study Team concluded that the boulevard section allowed for better traffic flow through intersections and reduced potential conflict points, enhancing safety in the Study Area.

As Alternative 4 was developed later in the process, comparable impacts and costs in 2004 dollars do not exist for Alternative 4 as compared to the other alternatives. The Study Team carried Alternative 4 forward as the City West Alternative. **Section 2.2.5 City West Alternative** discusses its features in detail. A full alternatives comparison of the impacts and costs is included in **Section 2.3** and **Chapter 3.**

2.2 Alternatives Carried Forward

There are four alternatives still under consideration for improvements to the Blue Water Bridge Plaza and the I-94/I-69 corridor. The Alternatives Carried Forward include:

- The No-Build Alternative, which involves no expansion of the existing plaza or the I-94/I-69 corridor
- The City East Alternative, which expands the plaza in the City of Port Huron and relocates Pine Grove Avenue to the east and makes improvements along the I-94/I-69 corridor
- The City West Alternative, which expands the plaza in the City of Port Huron and relocates Pine Grove Avenue to the west and makes improvements along the I-94/I-69 corridor
- The Township Alternative, which relocates most plaza functions to a plaza in Port Huron Township and makes improvements along the I-94/I-69 corridor

What are the Alternatives Carried Forward?

The Alternatives Carried Forward are refined versions of Illustrative Alternatives that have undergone increased engineering, traffic, social, environmental, and economic analysis. These alternatives have been selected based on their ability to adequately address the objectives of the project.

All of the other alternatives discussed in **Section 2.1 Alternatives Development** have been eliminated from further consideration. The Alternatives Carried Forward were selected based on their ability to best address the reasons for improving the plaza/corridor when compared with other potential alternatives. The No-Build Alternative is considered the baseline condition for comparing the other alternatives. The No-Build Alternative could be selected if the benefits of the other alternatives do not outweigh the negative environmental effects. **Section 2.3 Evaluation of the Alternatives** discusses how well the alternatives address the reasons for plaza/corridor improvements identified in **Section 1.0 Why Are Improvements Needed? Section 2.4 The City West Alternative is the Preferred Alternative** identifies the City West Alternative as the Preferred Alternative and explains why the Study Team believes it is the best course of action for the project. The environmental effects of the alternatives are discussed in detail throughout **Section 3.0 The Environment: What's There Now and Project Effects.**

The Existing Plaza

The Alternatives Carried Forward are described in detail in the subsections that follow.

The separate **Appendix E** volume contains exhibits of the Alternatives Carried Forward that can be referred to while reading this document.

What are Design Criteria?

Design criteria are the basic standards that a construction project needs to meet. In the case of this study, there are two types of design criteria: engineering design criteria and plaza facilities/security design criteria.

Engineering design criteria are the basic engineering standards and guidelines that should be followed in developing transportation improvements. There are different design criteria for different types of roads and bridges that guide the engineer in determining the best possible layout for a transportation project.

The plaza facilities/security design criteria were provided by CBP and GSA and include minimum standards for facilities to ensure an efficient, safe, and secure border crossing.

What are the Build Alternatives?

The term Build Alternatives refers to the alternatives that are still under consideration other than the No-Build Alternative. In the case of this DEIS, there are three Build Alternatives: the City East, City West and Township Alternatives.

2.2.1 What Design Criteria Were Used in Developing the Alternatives?

The Study Team identified key engineering and facilities design criteria based on reasonable engineering standards and information on facilities and security provided by CBP and GSA. Detailed roadway and bridge design criteria tables have been developed for the three Build Alternatives; see **Figures E.6 and E.7** in the separate **Appendix E** volume. This criteria contains fundamental roadway and bridge design elements adhering to MDOT and American Association of State and Highway Transportation Officials (AASHTO) guidelines. The design criteria were utilized in the development of the layouts of the Build Alternatives.

Roadway Design Criteria

Roadway design criteria were utilized in laying out the improvements for the roadways affected by the Build Alternatives, including freeways and local roads. The Build Alternatives meet or exceed the desirable roadway design criteria except for curve length, radii, and design speed at a few specific locations. The situations where the design criteria are not met are discussed in **Design Exceptions** (below).

All of the design criterion used can be found in the following documents:

- MDOT Road Design Manual
- MDOT Standard Plans
- MDOT Geometric Design Guides
- MDOT Drainage Design Manual
- MDOT Highway Capacity Manual
- MDOT Bridge Design Manual
- AASHTO Geometric Design of Highways and Streets (2004)
- AASHTO LRFD Bridge Specifications

Bridge Design Criteria

New bridges are part of all Build Alternatives. The proposed bridges will either cross existing waterways or separate local roads and ramps from I-94/I-69. The preliminary specifications for bridges and other structures for the three Build Alternatives are based on design criteria values found in the documents listed above.

Design Exceptions

As mentioned above, three of the desired design criteria values were not met at every location by the alternatives. A design exception is requested when the AASHTO design guidelines cannot be met. The following criteria are considered critical design elements and failure to meet the standard for any one of them results in a design exception:

- Design Speed
- Lane Width
- Shoulder Width
- Bridge Width
- Structural Capacity
- Horizontal Alignment
- Vertical Alignment
- Grade
- Stopping Sight Distance
- Cross Slope
- Superelevation
- Vertical Clearance (underneath bridges)
- Horizontal Clearance (not including clear zone)
- Acceleration and Deceleration lengths

The aim of a new design is to avoid all design exceptions, however with constricted sites it may be cost prohibitive in some instances. When adhering to design standards are too costly or require unreasonable right-of-way impacts, design exceptions may be requested, provided that the roadway will still operate safely and maintain adequate performance.

The Study Team Engineers identified potential elements of the Build Alternatives requiring design exceptions. The specific locations of potential design exceptions are discussed in **City**

What Do Engineers Mean by Grade?

Grade refers to the slope of the roadway. A four-percent grade means that the road rises or falls four feet for every 100 feet of length.

What is Superelevation?

A road has a superelevation when one side of the road is higher than the other through a curve in the road. This allows vehicles to drive through the curve at higher speeds and greater comfort.

East Alternative Design Issues, **City West Alternative Design Issues and Township Alternative Design Issues** later in this section. As part of the refinement of the Preferred Alternative, the Study Team will look at options for eliminating these design exceptions.

Plaza Facilities/Security Design Criteria

The following briefly describe the basic criteria for plaza facilities and safety and security per CBP and GSA guidelines.

A new plaza requires the following basic facilities:

- Sixty to 80 acres of plaza inspection space
- Approximately 190,000 square feet of inspection office buildings and 18,000 square feet of docks to unload cargo
- Space for up to three GRIT buildings including appropriate circulation space for traffic entering from Canada and space for one GRIT building for traffic leaving the United States
- Twenty inspection booths for cars and trucks with space to expand to 30 booths
- An Outbound Inspection area approximately the size of a small port of entry including room for up to ten inspection booths
- Space for Radiation Detection Portals
- Space for impounding vehicles and hazardous materials containment
- An observation area for animal inspections although no unloading will occur on-site
- Four hundred employee parking spaces

The following basic security features are required:

Example Perimeter Wall

- Separation of public and inspection functions
- Eight to ten-foot perimeter walls/fencing
- All vehicles entering and exiting the plaza are subject to inspection
- Vehicle control to ensure vehicles do not exit the plaza prior to completion of inspection
- No major roadways located underneath plaza inspection facilities or under plaza exit/entry ramps (I-94/I-69),

although minor city roadways may remain under the Blue Water Bridge and under plaza exit/entry ramps
- Incorporation of basic security standards from GSA Land Port of Entry design guide for plaza facilities

Additional security features are required for any alternative which moves the border plaza further inland and requires a secure corridor to take traffic to and from the plaza. These criteria apply specifically to the Township Alternative.

- A minimum twenty-foot wall on either side of the secure corridor to prevent penetration to and from the outside; additionally, an internal 20-foot wall would be required to separate inbound and outbound traffic
- A minimum of four-foot extension fence at a 45 degree angle from the top of the 20-foot walls to prevent objects from being thrown over or individuals from scaling the walls
- The external walls should be separated from the public by a ten foot buffer and an additional fence
- Pole mounted cameras to monitor both inside and outside the secure corridor
- No ability to access the secure corridor from the middle
- All traffic must access the secure corridor from either the inspection plaza or the Canadian side of the Blue Water Bridge
- No exit for traffic at the existing plaza location; all vehicles must be inspected at the relocated plaza

Signing

Signing is one form of traffic control device used to notify road users of regulations, and provide warnings and guidance needed for the safe, uniform, and efficient flow of traffic.

The design, placement, and uniformity of signing are important in order to convey a clear message to drivers. The design of signing depends upon the type of roadway and the speed of vehicles on the roadway. Guide signs are used to give directions to the driver to reach a desired destination. Too much information on a specific sign or too many signs close together can confuse a motorist, leading to potentially erratic driving movements.

Due to the complexity of the Blue Water Bridge Plaza Study, a basic layout for guide signs was developed to ensure that signing could be done in accordance with Michigan and federal signing standards. **Figure 2.2.1** is an example of a guide sign with common information displayed.

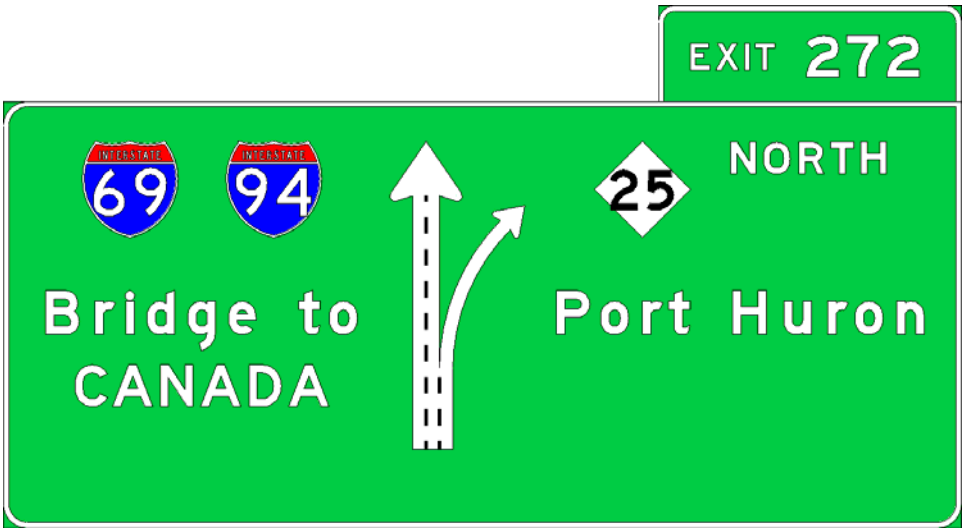


Figure 2.2.1 Sample Freeway Guide Sign

2.2.2 How Were the Alternatives Effects on Local and Border Crossing Traffic Analyzed?

The Study Team prepared a detailed traffic analysis which involved generating traffic forecasts for the Blue Water Bridge, I-94/I-69 freeway segments, and local roads surrounding the existing plaza. Forecasts were prepared for a 2030 No-Build scenario as well as for each Build Alternative carried forward. The traffic analysis consisted of the following steps:

- Collection of traffic counts and historic traffic data that served as the basis of the analysis
- Analysis of historic border crossing data to develop forecasts for future crossings at the Blue Water Bridge
- Use of the Southeast Michigan Council of Governments (SEMCOG) Travel Demand Model to develop forecasts for all of the local roads and freeways affected by the project
- Intersection congestion analysis using the Synchro™ traffic simulation program
- Highway congestion analysis using the Highway Capacity Software (HCS) program

What is the SEMCOG Travel Demand Model?

It is a regional computer model that can predict future traffic based on demographics, land uses, population trends, and estimated vehicle trips.

- Simulation of system wide traffic conditions on freeway segments, ramps, the plaza, local roads, and intersections using the WATSIM™ traffic simulation software
- Simulation of the plaza operations using GSA's Border Wizard™ software

Collection of Traffic Data and Development of Traffic Forecasts: The Study Team prepared forecasts for future traffic crossing the Blue Water Bridge based on past historical traffic volume trends and the SEMCOG travel demand model. As the decision to cross the border typically occurs independent of the exact roadway configuration on either side of the border, the same cross-border traffic forecast was assumed regardless of the alternative. The plaza traffic analysis used 2005 traffic counts as the base year and 2030 as the forecast future year. The annual historical traffic volumes provided were used to calculate Annual Average Daily Traffic (AADT) for the plaza. The 2005 daily AADT was 4,900 trucks and 10,200 passenger cars for a total AADT of 15,100. The forecast for 2030 is 10,000 trucks and 12,300 passenger cars, for a total AADT of 22,300.

MDOT collected traffic counts in October 2003, on I-94/I-69 and local roadways potentially affected by improvements to the plaza. Traffic counts were also collected at two locations on Highway 402 in Canada by the Ontario Ministry of Transportation in order to identify patterns in the traffic entering the Blue Water Bridge. **Figure E.8,** located in the separate **Appendix E** volume, illustrate the roadway segments where traffic counts were collected or where counts could easily be derived through addition and subtraction of neighboring counts. These segments also served as the basic set of locations for the traffic forecasts prepared for the 2030 No-Build Alternative and the Build Alternatives. Following standard practices, all daily traffic counts were rounded to the nearest 100.

The collected traffic counts were converted into Annual Average Daily Traffic volumes. The conversion was accomplished by using seasonal and area-type adjustment factors developed by MDOT. The AADT volumes were then used to develop AM and PM Peak hour volumes and Design Hour Volumes (DHVs). The 2005 Existing AADT and DHVs served as the benchmark for comparing and adjusting the

What is WATSIM™?

A network micro-simulation tool that analyzes freeways segments, ramps, local roads, and intersections as an integrated transportation system. This allows the analyst to see how traffic at individual locations is performing from a network perspective.

What is Annual Average Daily Traffic (AADT)?

AADT is the average number of vehicles that use a roadway segment on an average day. It is an estimate of the number of cars and trucks that use the road segment during the entire year divided by 365. Sometimes AADT is used interchangeably with ADT (Average Daily Traffic).

What are Design Hour Volumes (DHV)?

The DHV for a given segment approximates the 30th highest hourly traffic volume that will use that segment over the course of a year. DHV is used to determine traffic loads on the roadway, and is used to design appropriately sized transportation facilities.

What is a Peak Hour?

The peak hour is the hour of the day when traffic volumes on a roadway are at their highest. The peak hour typically occurs during the rush hour in the morning or afternoon, when people are traveling to and from work.

What is a Geographic Information System?

A geographic information system is a computer software package that allows people to examine and analyze data using maps.

What does it mean to "balance" traffic volumes?

The daily traffic volumes and the DHV were assumed to have a 50/50 directional split. This means that on an east-west roadway the number of cars headed east during the day was assumed to equal the number of cars headed west. Traffic volumes were balanced throughout the Study Area except on Hancock Street, Pine Grove Avenue north of Elmwood Street, and through the Hancock Street and M-25 Connector intersection due to irregular travel patterns related to the Blue Water Plaza.

traffic forecasts from the SEMCOG model. **Figure E.8** also displays the AADT for each segment under study.

The SEMCOG regional travel demand model developed for Southeast Michigan was used to develop traffic forecasts for freeways and roads potentially affected by the project. This model was designed to replicate existing travel characteristics, forecast future traffic volumes, and allow for analysis of alternative transportation improvement options. In developing this model, TransCAD[R] software was utilized, both for its Geographic Information System and travel demand modeling capabilities.

The SEMCOG model is a regional model covering seven counties. However, its use for this project was limited to the local area for the Blue Water Bridge Study. Traffic volumes were developed for the future 2030 No-Build and for the Build Alternatives carried forward based on the output from the SEMCOG Model. The general methodology used to develop future traffic volumes included:

- Develop Base Daily Volumes from SEMCOG Model
- Adjust Base Daily Volumes to ensure they reflect known local conditions
- Calculate AM and PM Peak Hour Volumes
- Balance AM and PM Peak Hour Volumes, including Turning Movement Counts at intersections and ramps
- Calculate Design Hour Volumes and Turning Movements

The final 2030 traffic forecasts for the carried forward alternatives are contained in the traffic discussions for each of the alternatives, located further on in this Chapter.

Intersection Congestion Analysis: Traffic analysts performed intersection capacity analysis at eight key intersections in the Study Area using Synchro™ and WATSIM™ traffic simulation software packages. These six intersections were identified by the Study Team as "Critical Intersections".

- Hancock Street and M-25 Connector
- Hancock Street and Pine Grove Avenue
- Pine Grove Avenue and the Plaza on-ramp
- Pine Grove Avenue and 10th Avenue

- Water Street and the eastbound I-94 off-ramp
- Water Street and the westbound I-94 off-ramp

Intersection capacity analysis was performed at these critical intersections for the existing and No-Build conditions and for each Build Alternative carried forward. The traffic analyses were conducted for existing conditions and future conditions for the year 2030. Each alternative was evaluated for the PM peak hour volumes, which represented the worst case volume for the majority of movements.

Because several intersections within the Study Area would have high congestion (greater than 55 seconds delay) under the No-Build Alternative, intersection improvements were recommended for the carried forward alternatives. Improvements were made in the following order until the traffic simulation showed that the intersection would operate with acceptable levels of delay:

- Modify proportions of green times
- Modify signal phasing
- Modify signal cycle length
- Add right or left turn bays
- Add through lanes or consider grade separation

Under existing conditions, the majority of the intersections within the Study Area do not experience high congestion (greater than 55 seconds delay). However, the intersections of Hancock Street and Pine Grove Avenue and Pine Grove Avenue and 10th Avenue currently have some congested turning movements. **Figure E.9,** located in the separate **Appendix E** volume, illustrate where existing congestion is occurring in the Study Area.

Based on the existing traffic information and future traffic forecasts, a congestion analysis was performed on the freeway links within the Study Area. The Highway Capacity Software (HCS) 2000 was used to analyze each freeway segment in each scenario (Existing, No-Build, City East Alternative, City West Alternative and Township Alternative). In addition to the freeway links, the merge/diverge points and any defined weaving sections were also evaluated.

What are Critical Intersections?

Critical intersections are those intersections that have been identified by the Study Team as having high traffic volumes and will most likely be impacted by plaza improvements.

What is Intersection Capacity Analysis?

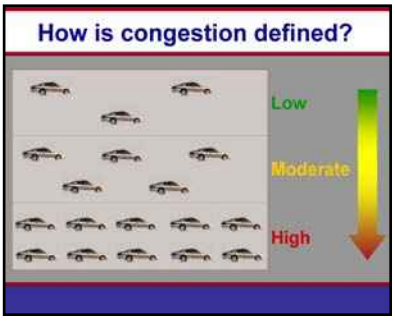
Intersection capacity analysis is the process of examining how well an intersection allows traffic to move through it. The number of turn lanes and the length of red and green lights are among the items that affect the capacity of an intersection. The goal is to reduce delays at the intersection as much as possible.

What is Synchro™?

Synchro is a computer program that assists with intersection capacity analysis.

How is congestion defined?

The Study Team has defined congestion in terms of low, moderate, and high congestion based on the speed, crowding and delays that can be expected at each location. These levels of congestion are based on standards set by FHWA for the level of service or performance of highways, roads, and intersections.



What are merge/diverge points?

A merge occurs where one stream of traffic flow joins the lane of another, such as an entrance ramp. A diverge occurs where one stream of traffic flow leaves another, such as an exit ramp. Merge/diverge points are where the merge/diverge lanes end or begin.

What is Border Wizard™?

A computer simulation program produced for the General Services Administration (GSA) to model border crossing facility requirements in the United States.

Results of the intersection and freeway congestion analysis are discussed in the individual traffic sections for each alternative located later in this chapter.

Plaza Traffic Analysis Using Border Wizard™: The Border Wizard™ software was used to analyze future facility requirements and preliminary operations for the city and township alternatives. Border Wizard™ simulations were run for a period of 24 hours for the truck and car peak times on Wednesday and Sunday accordingly. A 24-hour profile was used to give the full spectrum of plaza operations delay and backups. A new Border Wizard™ analysis will be performed on the Preferred Alternative following its formal selection.

Detailed explanations, descriptions, results and tables for the overall traffic analysis can be found in the **Blue Water Bridge Traffic Analysis Technical Memorandum.** The memorandum contains existing traffic data and the results of the traffic forecasts and level-of-service analysis for the freeway segments, local roads, and intersections. The memorandum also contains a summary discussion of the WATSIM™ micro-simulation results.

2.2.3 No-Build Alternative

The No-Build Alternative would not involve any changes to the existing plaza configuration or ramps. **Figure E.2,** located in the separate **Appendix E** volume, illustrates the existing plaza and the No-Build Alternative. The No-Build Alternative would not include any improvements to the Black River Bridge or the I-94/I-69 Corridor.

The No-Build Alternative would include continued maintenance and technology improvements as space allows, over the next 25 years. Accommodation of all of the required facilities for CBP would not be possible on the existing plaza and substantial gridlock would occur on the plaza as new facilities are introduced and the limited existing parking and queuing space is reduced. There would be no expansion of the existing plaza footprint.

Recent Border Processing Improvements: New notification requirements for cargo carriers entering the United States

include the need to electronically file information with CBP at least one hour before they arrive at the border crossing. This change has reduced the frequency of secondary inspection of cargo carriers. Also, in an effort to meet the 25% Challenge, a challenge by CBP and Canadian officials to increase vehicle processing capacity at the border crossing by 25 percent, CPB has implemented operational changes that include, but are not limited to: (1) streamlining processing procedures, (2) increasing staffing to meet demand, (3) converting car-only inspection booths to combined booths for cars and trucks during peak truck traffic, and, (4) encouraging participation in NEXUS/FAST Programs as described in **Section 2.1**.

These changes have helped to reduce vehicle processing times and backups of cars and trucks entering the United States. However, over the long-term, the benefits from these operational changes would be greatly reduced without expansion of the plaza facilities, as proposed under the Build Alternatives. The No-Build Alternative lacks the inspection facilities to meet long range traffic forecasts and the space to implement all of the security and inspection procedures discussed in **Chapter 1**.

No-Build Alternative Traffic Impacts

Four traffic simulation software packages were used to determine the traffic impacts of each alternative. Three of the software packages were used to analyze the portion of the roadway/border crossing network that best fit the capabilities of the particular software.

- The Synchro™ software was used to examine the local intersections and road network
- The Highway Capacity Software (HCS) 2000 was used to analyze each freeway segment including the on/off-ramps in each scenario
- The Border Wizard™ software was used to develop future facility requirements for the Blue Water Bridge Plaza

The fourth software package, WATSIM™, was used to examine the entire network as a whole.

Local traffic would experience long queues and delays at intersections under the No-Build Alternative

Local Traffic Impacts: Projected 2030 traffic volumes indicate that the current problems on the local roadways and intersections would worsen. This would result in long queues and delays at several intersections. The intersections identified to be at risk for high congestion (greater than 55 seconds delay) are the Hancock Street and M-25 Connector intersection, the Hancock Street and Pine Grove Avenue intersection, the Pine Grove and 10th Avenue intersection, and the Water Street interchange.

Freeway Impacts: The freeway was divided into separate segments using the on/off-ramps as the beginning and end points between each segment. Each segment and the on-ramps and off-ramps were analyzed.

In the No-Build Alternative, the freeway segments which have high levels of congestion (greater than 88% of capacity) include the westbound segment between the existing plaza on-ramp and the westbound M-25 Connector as well as the westbound collector-distributor road between the Water Street entrance ramp and the ramp to the Lapeer Connector. These areas are illustrated in **Figure E.10,** located in the separate **Appendix E** volume.

What is a Collector-Distributor Road?

A secondary roadway providing access between two or more major roadways. i.e. I-94/I-69 to the Lapeer Connector.

All freeway ramps would experience low (less than 48% of capacity) or moderate levels (between 48% to 88% of capacity) of congestion without factoring potential delay caused by traffic backups onto the I-94/I-69 freeway from the existing plaza.

Border Crossing Impacts: The existing plaza operations sometimes produce large queues (up to one mile) and lengthy delays (one to two hours). Conditions at the plaza would likely worsen under the No-Build Alternative. Anticipated traffic growth would cause travelers to experience more severe delays and much larger queues into Canada and on the I-94/I-69 freeway. The steady increase in traffic would gradually increase the delays and queues at the plaza. The outbound plaza traffic queue is the spot that would trigger backups that would affect the entire roadway network.

WATSIM™ *Microsimulation:* As noted, the WATSIM™ software package was used to analyze a single, integrated

transportation network. The WATSIM™ simulations confirmed the following:

As the congestion builds at the local intersections, the traffic queues would also grow. Eventually the line of vehicles would stretch from the Pine Grove and 10th Avenue intersection all the way back to the Hancock Street and Pine Grove Avenue intersection. This would add to the high congestion already experienced at the Hancock Street and Pine Grove Avenue intersection. The same problem would occur between the Hancock Street and Pine Grove Avenue intersection and the Hancock Street and M-25 Connector intersection. The long queues from the Hancock Street and M-25 Connector intersection would extend onto I-94/I-69 as congestion grows high at this intersection. While this is happening on the local streets, the freeway would also have problems.

The high congestion and queues at the outbound plaza would extend onto I-94/I-69 lanes. Eventually, this queue would reach the eastbound Water Street on-ramp, which would already be experiencing high congestion. Local traffic wishing to travel north on the M-25 Connector would then be required to merge with stopped vehicles on the freeway. As a result, the backup would continue to grow until the entire roadway network is at a standstill.

No-Build Alternative Bridges

With the No-Build Alternative, the Black River Bridge would not be replaced. A report on the condition of the bridge demonstrates that the deck surface has approximately 30 percent surface deficiency.

The Black River Bridge pier deterioration

No-Build Alternative Utilities

No improvements to the current utility services are anticipated for the No-Build Alternative.

2.2.4 City East Alternative – Relocate Pine Grove Avenue to the East Around Expanded Plaza

This section discusses the features of the City East Alternative and begins with a basic description of the alternative. The section also includes a discussion of the following features of the City East Alternative.

- Layout and design issues
- Effects on border and local traffic
- Bridges, walls, and other structures
- Drainage
- Keeping traffic flowing during construction
- Utilities

Describe the City East Alternative

Truck Inspection Booths

Radiation Detection Portals

The City East Alternative, as illustrated in **Figure E.3 – Sheets A, B, C, and D** located in the separate **Appendix E** volume, expands the existing plaza within the City of Port Huron. The City East Alternative would cover 67 acres and bring most of the existing elevated plaza down to street level. The City East Alternative would require the relocation of Pine Grove Avenue to the east along 10th Avenue between Hancock Street and Scott Avenue and would wrap around the northeast side of the plaza and tie into Pine Grove at Hancock Street. A section view of this area is shown in **Figure E.3 Appendix E**. Pine Grove Avenue and 10th Avenue would merge for a combined five-to-seven-lane segment between Scott Avenue and Elmwood Street. This description of the City East Alternative area includes all of the inspection facilities needed by the year 2030.

The Plaza: The City East Alternative brings traffic off of the Blue Water Bridge down to street level as quickly as possible. By the time cars and trucks reach the inspection booths on the plaza they are at street level. There would be 35 inspection booths for cars and trucks arriving from Canada. The number of booths may be reduced to 20 high-low booths (may be used for truck and car), however this will not affect the overall size of the plaza. Before the cars and trucks reach the inspection booths, they would pass through radiation detection portals, which ensure that they are not bringing radioactive material

into the United States. At the inspection booths, drivers and passengers answer questions from CBP officers and discuss or provide paperwork on the cargo they are carrying. If cars and trucks clear primary inspection, they would have two options to exit the plaza. They could take a ramp to I-94/I-69 headed west or a ramp north to the M-25 Connector and local city streets. The freeway exits from the plaza would be similar to the existing plaza. Trucks exiting the plaza would have to show proof that they are cleared to leave the plaza at an additional exit control booth.

Trucks not cleared at the inspection booths are sent to the secondary truck inspection area. The City East Alternative uses the block between Hancock Street and the existing plaza, west of Pine Grove Avenue for the expanded truck inspection area. The truck inspection area would contain adequate parking to accommodate trucks sent to secondary inspection for document processing, plus 12 docks for unloading trucks, and 43,500 square feet of office and unloading space. The office space would include space for the inspection agencies and for customs brokers who help process paperwork and payments for truck drivers. The inspection agent's offices would be in a separate secure area away from the customs broker's offices. The truck inspection area would also include separate space for the inspection of livestock. Up to three Gamma-Ray Inspection Technology (GRIT) buildings would be constructed, which allow CBP officers to electronically scan the contents of vehicles.

GRIT Building on Existing Plaza

Cars with passengers that are not cleared to enter the United States or require further processing are sent to a secondary inspection building in the middle of the plaza, shown in dark blue on **Figure E.3 – Sheet D**. This building also would contain additional office space for the inspection agencies and the Michigan Department of Transportation staff. There would also be a parking area for cars that require further inspection and a garage for detailed car inspections.

What is Outbound Inspection?

Outbound inspection booths and facilities allow CBP to enforce export control legislation and inspect certain individuals leaving the country. Currently CBP conducts random exit control interviews by flagging down outbound vehicles after they pass through the toll booths.

Cars and trucks traveling to Canada would have two entrances to the plaza. One is off of I-94/I-69 and the other is a ramp from the combined Pine Grove Avenue/10th Avenue roadway. Facilities would be provided to allow CBP to inspect cars and trucks leaving the United States. This area is

called outbound inspection. The outbound inspection facilities would include 19 booths, ten docks for unloading trucks, and adequate truck and car parking spaces. Following outbound inspection, cars and trucks would pass through 11 toll booths. A new duty free store and parking would occupy approximately four acres and could only be accessed by drivers who have already cleared outbound inspection and the toll booths. Following the duty free store, all vehicles would take the bridge to Canada.

The plaza would also include parking for both plaza employees and visitors. An employee lot would be located at the southeast corner of the plaza. A lot that would be divided into separate secure lots for employees and visitors would be located off of Pine Grove Avenue, across from the truck inspection area. The plaza would also have buffer areas, shaded green on **Figure E.3**, for the neighborhood northeast of the plaza and the neighborhood south of the plaza.

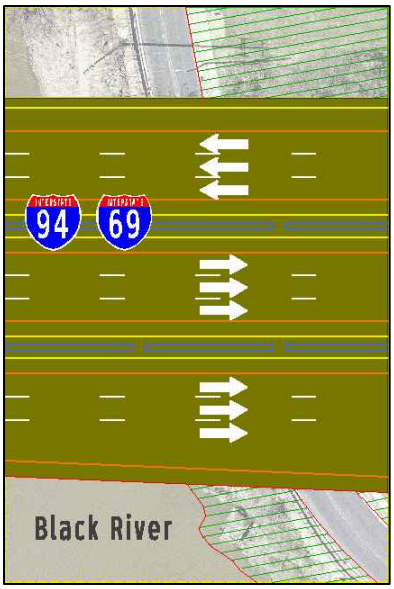


Figure 2.2.2 City East Alternative Lanes on the Black River Bridge

The Black River Bridge and I-94/I-69: The City East Alternative includes replacement and expansion of the Black River Bridge, the Water Street Interchange and the Lapeer Connector Interchange. It also includes additional lanes on I-94/I-69, separation of eastbound border crossing traffic from local traffic, and a new MDOT Welcome Center in Port Huron Township. The City East Alternative and the City West Alternative feature the same improvements along the I-94/I-69 corridor.

Black River Bridge: The City East Alternative includes an expansion and replacement of the I-94/I-69 Bridge over the Black River. The existing bridge is approximately 64 feet wide and has four travel lanes, two for eastbound traffic and two for westbound traffic along with narrow shoulders. **Figure 2.2.2** shows the proposed lane configuration on the Black River Bridge. The new bridge will be approximately 200-feet wide and will consist of 13 spans. The new bridge will have nine travel lanes, three lanes for eastbound local traffic, three lanes for eastbound traffic heading to Canada, and three lanes for combined border crossing and local westbound traffic. The designated lanes for eastbound border crossing traffic will be barrier separated from the lanes for local traffic. To reduce the potential for conflicts between border crossing traffic waiting

to be inspected and local traffic, separate lanes for eastbound border and local traffic are provided between the Lapeer Connector and the plaza. The border crossing lanes would include one lane for cars, one lane for trucks, and one lane for vehicles enrolled in the FAST and NEXUS program for pre-cleared cars and trucks.

The eastbound local traffic lanes would include two lanes connecting to the M-25 Connector and one lane to an off ramp to Pine Grove Avenue. The off ramp would be a one way connection between I-94/I-69 and Pine Grove Avenue, south of the new plaza along what is currently Scott Street. Eastbound traffic headed to Canada will use the barrier separated middle lanes to flow directly onto the plaza. The new bridge will include 12-foot shoulders for emergency access/vehicle storage, an upgrade over the two foot shoulders on the existing bridge.

City Access: Local traffic exiting the eastbound freeway wishing to visit the city of Port Huron will remain in the right lane and will have direct access via a connector road intersecting Pine Grove Avenue at Mansfield Street. Local traffic that has cleared customs and wishing to visit the city will be required to take a ramp to the northbound M-25 Connector, turn right onto Hancock Street and right on Pine Grove Avenue.

I-94/I-69 Corridor: The City East Alternative includes resurfacing and expansion of 2.5 miles of existing I-94/I-69, as shown in **Figure E.3**. Much of the expansion includes an extension of the eastbound M-25 Connector between the ramps to the existing plaza and the Lapeer Connector. This will allow for the separation of local traffic from eastbound traffic crossing the border. The three lanes for local traffic will have a posted speed of 40 miles per hour and will provide all of the same access to Water Street, Hancock Avenue, and northern Port Huron as the existing I-94/I-69 Corridor provides.

Water Street Interchange: The City East Alternative includes the replacement of the existing interchange at Water Street including the Water Street Bridge over I-94/I-69. The replacement bridge will be four lanes wide, with two lanes in

What is a Roundabout?

A roundabout is a circular intersection where two or more roadways meet. Vehicles entering the roundabout must yield to vehicles already in the roundabout.

Roundabouts are being considered for several intersections for the Build Alternatives.

either direction. The bridge will also accommodate pedestrian traffic by including two five foot sidewalks. Adequate right-of-way exists to place either traffic signals or roundabouts at the two intersections between Water Street and the freeway ramps. The exact configuration of the intersections would be determined during the design phase of the project. The ramps to Water Street will be upgraded to current design standards.

Lapeer Connector Connections: The City East Alternative would improve access for local traffic to the Lapeer Connector. Currently only traffic headed to I-94/I-69 east, or from I-94/I-69 west, can use the Lapeer Connector. The City East Alternative includes access in all directions between the Lapeer Connector and the new I-94/I-69 Corridor as illustrated in **Figure E.3**. Eastbound I-94/I-69 will have direct ramp access from the freeway to the Lapeer Connector. The other access movements will all use auxiliary/connector lanes. Traffic from northbound Lapeer Connector wanting to travel east will travel through the Water Street Interchange to connect to the eastbound lanes for local traffic.

A collector road will be constructed along westbound I-94/I-69 that will connect with the westbound intersection at the Water Street interchange. The collector road will include an intersection at the Lapeer Connector that will allow westbound traffic to turn on to the Lapeer Connector and head south. Northbound traffic on the Lapeer Connector will be able to turn left at this intersection and proceed onto westbound I-94/I-69. Traffic from westbound I-94/I-69 wanting to travel south on the Lapeer Connector will exit at Water Street, travel through the Water Street intersection and then onto the collector road. The collector road also would serve as the ramp from Water Street to westbound I-94/I-69 as well.

Existing Welcome Center

The new Lapeer Connector configuration would require the entrance from Indian Drive onto the Lapeer Connector to be shifted approximately 300 feet south to meet safety standards.

New Welcome Center: Two locations for the new welcome center were initially considered; on the vacant land to the north of I-94/I-69 approximately one mile west of it's current location, and within the median (between eastbound and

westbound lanes) of I-94/I-69, also one mile west of the current welcome center. The median option was not carried forward due to safety concerns by FHWA regarding left exiting and entering lanes. Additionally, the amount of space available within the median did not meet the amount of parking required for a full service International Welcome Center. **Figure E.3** shows a conceptual layout for the new Welcome Center for the City East Alternative. The new Welcome Center will consist of a modern building per MDOT's current design standards for Welcome Centers along with parking for up to 100 cars and 50 trucks. The Welcome Center will be landscaped and will include a berm of up to 15-feet high on three sides to reduce noise and visual impacts for surrounding residents. MDOT will hold a public workshop to develop aesthetic and landscaping treatments for the Welcome Center. These will include preservation to the extent possible of existing forested land and wetlands on the site in areas not affected by the Welcome Center complex.

Local Road Improvements: The City East Alternative would include several improvements to the local roads surrounding the plaza. The intersections between Hancock Street and the M-25 Connector and Hancock Street and Pine Grove Avenue would be rebuilt as either intersections with additional turn lanes or roundabouts. The City East Alternative would widen Hancock Street between the M-25 Connector and Pine Grove Avenue to add extra turn lanes. The combined Pine Grove Avenue/10th Avenue would be two to three lanes in each direction with extra turn lanes added at the intersections with Hancock Street, the new plaza ramp, and 10th Avenue southbound. The current six-legged intersection between 10th Avenue, Scott Avenue, and Pine Grove Avenue would be eliminated and replaced with separate intersections with 10th Avenue and Scott Avenue.

Roundabout Example

City East Alternative Design Issues

The following paragraphs identify locations where the City East Alternative fails to meet the design criteria as listed in **Figures E.6 and E.7**. The failure of an alternative to meet certain design criteria is acceptable when safety is not compromised and a substantial reduction in impacts is achieved.

The City East Alternative uses curve lengths that are less than desirable at several locations. Both Water Street exit ramps to I-94/I-69 and the westbound entrance ramp from I-94/I-69 are constrained by right-of-way limits, resulting in curve lengths that do not meet the desired design criteria. This is also true for the exit ramp from I-94/I-69 to Pine Grove Avenue, south of the new Blue Water Bridge Plaza. This design issue also exists for the City West and Township Alternatives.

The deceleration lane where eastbound local traffic on I-94/I-69 is separated from plaza bound traffic is approximately 10 percent short of the desired standard. This allows the proposed ramp to the Lapeer Connector to be kept inside the existing right-of-way and reduces impact to Stocks Creek. This design issue also exists for the City West Alternative.

The City East Alternative reduces the speed of an interstate freeway section along I-94/I-69 from a design speed of 60 miles per hour to a design speed of 30 miles per hour. This occurs where the freeway ends at the ramps to the new plaza and the approach to locations where plaza traffic will have to stop to pay tolls and for potential outbound inspections. Although this doesn't technically meet the design criteria, the reduced speed on the interstate system is beneficial at this point as it avoids high speed traffic approaching a stop condition. It also results in right-of-way savings. This design issue also exists for the City West Alternative.

City East Alternative Traffic Impacts

The improvements for the City East Alternative are described in the sections above. The same traffic analysis techniques were used to analyze the traffic impacts of each alternative.

Local Impacts: In addition to relocating Pine Grove Avenue and expanding the plaza on street level, a number of local intersection improvements would be required to prevent the high congestion and queues experienced in the No-Build Alternative. Improvements were made at each intersection in the following step-by-step order until congestion was reduced to a moderate level.

- Adjust the traffic signal operations

- Add turn lanes
- Add through lanes

The resulting improvements are outlined in **Table 2.2.1**.

The City East Alternative improvements, along with the local intersection improvements noted above, would allow the Hancock Street and Pine Grove Avenue intersection, the Hancock Street and southbound M-25 Connector intersection, and both of the Water Street intersections to experience moderate congestion (21 to 55 seconds delay per vehicle) during the peak travel periods instead of high congestion (greater than 55 seconds delay per vehicle). The other intersections would have low levels of congestion (zero to 20 seconds delay per vehicle). Each of the critical intersections would experience fewer delays than under the No-Build Alternative.

Table 2.2.1 Intersection Improvements for City East Alternative

Intersection	Needed Improvements
Hancock and M-25 Connector	• Prevented all left turn movements • Added additional westbound right turn lane • Added southbound right turn bay • Added northbound right turn green arrow • Provided indirect left turn at north approach for northbound left and westbound left
Hancock and Pine Grove	• Added eastbound left turn and right turn lanes • Added westbound left turn lane
Pine Grove and 10th Avenue	• Redesigned as two T-intersections
Water Street and EB Off-ramps	• Added protected right turn arrow for the off-ramp • Added through lane for Lapeer Connector traffic
Water Street and WB Off-ramps	• Added protected right turn arrow for the off-ramp • Added through lane for Lapeer Connector traffic

Freeway Impacts: Like the No-Build Alternative, the freeway was divided into separate segments using the on/off-ramps as the beginning and end points between each segment. Each segment and the on-ramps and off-ramps were analyzed separately.

In the City East Alternative, all freeway segments would experience low levels of congestion (0 to 47% of capacity). These areas are illustrated in **Figure E.13** in **Appendix E**. Each of the ramps would experience only moderate levels of congestion (48 to 88% of capacity).

Border Crossing Transboundary Impacts: The Border Wizard™ analysis indicated that the city alternatives would improve traffic flow through the plaza with moderate levels of congestion and vehicle queues. The Canadian bound traffic has three dedicated lanes separated from the local freeway traffic that extend back to the Lapeer Connector. This would allow the FAST/NEXUS traffic to flow freely up to the plaza and reduce the likelihood of backups onto I-94/I-69 in the event of a border slow down due to national security concerns or possible traffic delays on the Canadian side.

WATSIM™ *Microsimulation:* The City East Alternative would relocate Pine Grove Avenue and reconstruct the intersection of Pine Grove Avenue and 10th Avenue as two T-intersections; a northern intersection and a southern intersection. Between these two intersections, the through traffic on Pine Grove Avenue and 10th Avenue would be combined on a five to seven lane section. In addition, the City East Alternative was considered with typical intersections and with roundabouts at the following intersections:

- Hancock Street/M-25 Connector
- Hancock Street/Pine Grove Avenue
- Pine Grove Avenue/10th Avenue (N)
- Pine Grove Avenue/Mansfield Street
- Water Street Ramps to I-94/I-69

Example of a Single-Span Rectangular Bridge

There were no major queues or delays in the WATSIM™ analysis under the City East Alternative option, using either roundabouts or signalized intersections. However, because the City East Alternative combines both Pine Grove and 10th

Avenue, if a traffic incident were to occur on it, alternative north–south routes would be reduced and EMS response times adversely affected.

City East Alternative Bridges, Walls, and Other Structures

Bridges: Two new bridges would be constructed with the City East Alternative and five existing bridges would be reconstructed. The new bridge is described in **Table 2.2.2.**

Table 2.2.2 City East Alternative New Bridges

N1	Inbound traffic to I-94/I-69 and Ramp to M-25 Connector over send-back lane on Plaza
N2	Outbound Car/Trucks over M-25 Connector

Example of a Multi-Span Curved Bridge

Bridge N1 could be a single-span rectangular structure. The inbound lanes and M-25 Ramp would be elevated slightly above street level. Bridge N2 could be a multi-span curved structure.

The existing bridges requiring reconstruction for the City East Alternative are identified in **Table 2.2.3.**

Table 2.2.3 City East Alternative Reconstructed Bridges

R1	Inbound Cars/Trucks over M-25 Connector
R2	I-94/I-69 over the Black River
R3	Water Street over I-94/I-69
R4	Ramp from I-94/I-69 to Lapeer Connector over I-94/I-69 Inbound and Outbound
R5	I-94/I-69 Over Stocks Creek East of Proposed Welcome Center

MSE Wall Example

Example of a Post and Panel Sound Wall

Bridge R1 would be widened multi-span curved structure. Bridge R2 would be rebuilt wider and longer than the current structure. One option for the new bridge would consist of three independent structures on common foundations. This structure would be built utilizing longer spans over the Black River, resulting in fewer obstructions in the waterway. Bridge R3 would be reconstructed wider and longer than the current structure to accommodate the additional lanes on Water Street and to span the widened I-94/I-69/eastbound M-25 Connector. Bridge R4 would be reconstructed as a multi-span rectangular

structure shorter than the original due to a less severe skew angle with I-94/I-69. The structure will be wider to accommodate the new movement from the northbound Lapeer Connector to the westbound I-94/I-69. The existing culverts (R5) at Stocks Creek would be replaced with a single span rectangular structure.

What are Geotechnical Components?

The elements of design for a transportation project that deal with soil conditions.

Walls: The City East Alternative would require at least three different types of walls, retaining walls, security walls, and sound walls. Mechanically Stabilized Earth (MSE) retaining walls would be utilized in areas of the proposed plaza where different elevations would be required. Various styles of sound walls could be investigated for the areas around the expanded plaza affected by noise. The most common style is a pre-cast concrete post and panel sound wall.

Geotechnical Components: The banks of the Black River contain very poor soils within the proposed footprint of the new bridge. The poor soil conditions could impose foundation design challenges including its suitability for foundations or backfill for the bridge over the Black River. Soil borings indicate that the poor soil conditions exist up to 80 feet below the existing surface. The existing soils are not suitable for large foundations or retaining walls. There are three options that will be investigated to overcome the poor soils in the river bank regions.

Existing I-94/I-69 Bridge over the Black River

The options are as follows:

1) Build a longer bridge over the poor soil area. This is typically referred to as a "land bridge". The land bridge is a structure built very low to the ground utilizing support piers founded on piles, the piers in-turn support the bridge beams approximately three to four feet off the ground. A land bridge would be located outside the limits of the navigable waters of the Black River.

Example of a Land Bridge

2) Utilize a construction technique known as a drained surcharge to compress the underlying poor soil layer. The surcharge is a large berm of engineered fill designed to be heavy enough, and placed long enough to compress the poor soils region. Once compressed

the roadway can be constructed. This option typically requires additional construction time to sufficiently allow the soil compression to take place.

3) Instead of bridging the poor soils (land bridge) or compressing the poor soils (surcharge), utilize light weight foam blocks as a backfill material behind retaining and bridge abutment walls to reduce the load on the poor soils to a manageable level. Further investigation into all foundation options will be provided in the FEIS.

City East Alternative Drainage

Drainage improvements for the City East Alternative are discussed as part of **Section 3.11 Groundwater, Drainage, and Surface Water Quality.**

City East Alternative Maintenance of Traffic/Construction Staging

Maintenance of Traffic (MOT) is related to construction staging as they both have substantial impact on the amount of time it takes to build a project. In construction staging, an in-depth plan is laid out for each stage of construction to determine which elements of a project may or may not be constructed simultaneously and to make sure that traffic flow can be sufficiently maintained.

The main objectives of construction staging are to minimize delays and congestion, maintain the required access locations, and complete the project in a reasonable timeframe. Another means of MOT is a detour route which allows construction to progress most efficiently without the hindrance and danger that traffic in a construction zone presents. The MDOT would typically coordinate with local communities and study the residential and commercial traffic requirements in the area to determine desirable detour routes and access.

Plans for maintaining traffic, road detours and closures, and staged construction, would be designed per the Michigan Manual of Uniform Traffic Control Devices design manual. The current edition of the MDOT Standard Specifications for

Construction presents guidelines for traffic control and maintaining traffic.

The following is a description of a potential MOT staging plan that could apply to the City East Alternative focusing on the plaza. The City East Alternative MOT plan would maintain the cross-border and local traffic throughout the construction of a new plaza and could consist of five stages of MOT.

Stage 1: Site preparation would be accomplished in stage 1 of construction, including the demolition of all required structures within the construction limits and removing debris from the site.

Stage 2: The local access ramp and relocated Pine Grove/10th Avenue would be constructed. To maintain traffic in stage 3 temporary ramps would be built for outbound traffic. The bridge to Canada over 10th Avenue, and the ten primary inspection booths would also be constructed to allow processing to continue throughout all stages of construction.

What is Part-Width Construction?

Part-width construction involves maintaining traffic flow on one half of the roadway while the other half is being re-constructed. Crossovers are constructed to direct traffic from one set of lanes to the other.

Stage 3: The truck secondary inspection area, northbound M-25 Connector, and outbound bridge over northbound M-25 Connector would be built. To maintain traffic during stage 3, Pine Grove traffic would be moved to the newly constructed Pine Grove/10th Avenue. Northbound M-25 Connector traffic would be diverted along the local access ramp to Pine Grove.

Stage 4: The existing plaza would be removed and traffic would be moved to the previously constructed areas of the new plaza. The central area of the plaza with the main building would be completed in this stage along with the inbound bridge over the M-25 Connector.

An Example of Crossovers for Part-Width Construction

Stage 5: The outbound inspection areas and southbound M-25 Connector would be completed. M-25 Connector traffic would be maintained on the new section of northbound M-25 Connector with the use of a traffic crossover and part-width construction.

The Lapeer Connector, Water Street, and Black River Bridge construction would be independent from the plaza construction and would therefore be staged separately.

Although control of all construction related inconveniences is not possible, proper signing of all construction areas will ensure motorist and pedestrian safety. Access would be maintained to properties adjacent to the proposed right-of-way during construction, to the extent possible. The final maintenance of traffic plans will be developed in conjunction with local stakeholders during the design phase.

City East Alternative Utilities

The City of Port Huron has an established, functional water and sewage treatment system. A ten-inch water main is crossed by M-25 Connector at Elmwood Street, and a 72-inch combined storm and sanitary sewer line crosses underneath and services the plaza. The City maintains sewer and water mains along 10th Avenue, however it is not anticipated these utilities would require relocation for the City East Alternative.

Numerous overhead and buried utilities (electrical, cable and street lighting) run throughout the city and currently provide services to the existing plaza. A DTE Energy electrical substation, located on the north side of the existing plaza, provides power to the plaza and will be relocated. Further investigation and coordination with utility providers for the provision of electrical service during the construction of a new plaza would be accomplished during the Final EIS phase. One solution may consist of providing an off-site power supply capable of servicing temporary plaza facilities during construction

Existing DTE Energy Substation

SEMCO Energy has established natural gas pipeline networks throughout the plaza area. Telephone service in the City is provided by AT&T. It is not anticipated that these lines will need to be relocated.

The Black River Bridge and Water Street Bridge carry electrical conduit which would be maintained during construction by means of temporary supports.

2.2.5 City West Alternative – Relocate Pine Grove Avenue to the West Around Expanded Plaza

This section discusses the features of the City West Alternative and begins with a basic description of the alternative. The section also includes a discussion of the following features of the City West Alternative.

- Layout and design issues
- Effects on border and local traffic
- Bridges, walls, and other structures
- Drainage
- Keeping traffic flowing during construction
- Utilities

Describe the City West Alternative

The City West Alternative, as illustrated in **Figure E.4 – Sheets A, B, C, and D** located in the separate **Appendix E** Volume, expands the existing plaza within the City of Port Huron.

Truck Inspection Booths

Radiation Detection Portals

The plaza component of the City West Alternative would cover 65 acres and bring most of the existing elevated plaza down to street level. The City West Alternative would require the relocation of Pine Grove Avenue to the west between 10th Avenue and Hancock Street. The relocated Pine Grove Avenue would wrap around the south and west sides of the new plaza. The relocated Pine Grove Avenue would then split into separate northbound and southbound lanes. The northbound lanes would turn back east and connect to the existing Pine Grove Avenue at approximately Riverview Street. The southbound lanes would follow the existing M-25 Connector. This description of the City West Alternative area includes all of the inspection facilities needed by the year 2030.

The Plaza: The City West Alternative brings traffic off of the Blue Water Bridge down to street level as quickly as possible. By the time cars and trucks reach the inspection booths on the plaza they are at street level. There would be 20 (expandable to 30) inspection booths for cars and trucks arriving from Canada. The number of booths may be reduced to 20 high-low booths (may be used for truck and car), however this will not affect the overall size of the plaza. Before the cars and

trucks reach the inspection booths, they would pass through radiation detection portals, which ensure that they are not bringing radioactive material into the United States. At the inspection booths, drivers and passengers answer questions from CBP officers and discuss or provide paperwork on the cargo they are carrying. If cars and trucks clear primary inspection, they would have two options to exit the plaza. They could take a ramp to I-94/I-69 headed west or a ramp to connect to the relocated Pine Grove Avenue at a signalized intersection. The freeway exits from the City West plaza would be similar to those for the existing plaza. Trucks exiting the plaza would have to show proof that they are cleared to leave the plaza at an additional exit control booth.

Trucks not cleared at the inspection booths are sent to the secondary truck inspection area. The City West Alternative uses the block bordered by Hancock Street, 10th Avenue, the existing plaza, and the existing M-25 Connector for the expanded truck inspection area. The truck inspection area would contain adequate parking to accommodate trucks sent to secondary inspection for document processing, plus 12 docks for unloading trucks, and 43,500 square feet of office and unloading space. The office space would include space for the inspection agencies and for customs brokers who help process paperwork and payments for truck drivers. The inspection agent's offices would be in a separate secure area away from the customs broker's offices. The truck inspection area would also include separate space for the walk-around inspection (no unloading would occur on the plaza) of livestock. Up to three Gamma-Ray Inspection Technology (GRIT) buildings would be constructed, which allow CBP officers to electronically scan the contents of vehicles.

Cars with passengers that are not cleared to enter the United States or require further processing are sent to a secondary inspection building in the middle of the plaza, shown in dark red on **Figure E.4 – Sheet D**. This building also would contain additional office space for the inspection agencies and the Michigan Department of Transportation staff. There would also be a parking area for cars that require further inspection and a garage for detailed car inspections.

City West (Preferred) Alternative

What is Outbound Inspection?

Outbound inspection booths and facilities allow CBP to enforce export control legislation and inspect certain individuals leaving the country. Currently CBP conducts random exit control interviews by flagging down outbound vehicles after they pass through the toll booths.

Cars and trucks traveling to Canada would have two entrances to the plaza. One is off of I-94/I-69 and the other is a ramp from the relocated Pine Grove Avenue. Facilities would be provided to allow CBP to inspect cars and trucks leaving the United States. This area is called outbound inspection. Eight toll lanes will precede outbound inspection facilities. Following the toll lanes, cars and trucks pass through the outbound inspection facilities which include three booths, five docks for unloading trucks, and adequate truck and car parking spaces. A new duty free store and parking would occupy approximately four acres and could only be accessed by drivers who have already cleared outbound inspection and the toll booths. Following the duty free store, all vehicles would take the bridge to Canada.

The plaza would also include parking for both plaza employees and visitors. Employee and visitor parking lots would be located in the northeast corner of the plaza. The proposed plaza would include separate secure lots for employees and visitors. The plaza would also have a buffer area, shaded green on **Figure E.4**, for the neighborhood south of the plaza.

Figure 2.2.3 City West Alternative Lanes on the Black River Bridge

The Black River Bridge and I-94/I-69: The City West Alternative includes replacement and expansion of the Black River Bridge, the Water Street Interchange and the Lapeer Connector Interchange. It also includes additional lanes on I-94/I-69, separation of eastbound border crossing traffic from local traffic, and a new MDOT Welcome Center in Port Huron Township. The City West Alternative and the City East Alternative feature the same improvements along the I-94/I-69 corridor.

Black River Bridge: The City West Alternative includes an expansion and replacement of the I-94/I-69 Bridge over the Black River. The existing bridge is approximately 64 feet wide and has four travel lanes, two for eastbound traffic and two for westbound traffic along with narrow shoulders. **Figure 2.2.3** shows the proposed lane configuration on the Black River Bridge. The new bridge will be approximately 200 feet wide and will consist of 13 spans. The new bridge will have nine travel lanes, three lanes for eastbound local traffic, three lanes for eastbound traffic heading to Canada, and three lanes for

combined border crossing and local westbound traffic. The designated lanes for eastbound border crossing traffic will be barrier separated from the lanes for local traffic.

To reduce the potential for conflicts between border crossing traffic waiting to be inspected and local traffic, separate lanes for eastbound border and local traffic are provided between the Lapeer Connector and the plaza. The border crossing lanes would include one lane for cars, one lane for trucks, and one lane for vehicles enrolled in the FAST and NEXUS program for pre cleared cars and trucks. The eastbound local traffic lanes would include two lanes connecting to the relocated Pine Grove Avenue, and a T-intersection where traffic may either turn on to Pine Grove Avenue going right to northern destinations or left to access downtown Port Huron. Eastbound traffic headed to Canada will use the barrier separated middle lanes to flow directly onto the plaza. The new bridge will include 12 foot shoulders for emergency access/vehicle storage, an upgrade over the two foot shoulders on the existing bridge.

City Access: Local traffic exiting the eastbound freeway wishing to visit the city of Port Huron will have direct access from the separated local traffic lanes. Drivers will have two right turn lanes available to them which provide direct access to southbound Pine Grove Avenue. Local traffic that has cleared customs and wishing to visit the city will be able to turn left at a signal and proceed southbound on Pine Grove Avenue.

I-94/I-69 Corridor: The City West Alternative includes resurfacing and expansion of 2.5 miles of existing I-94/I-69 as shown in **Figure E.4**. Much of the expansion includes an extension of the eastbound M-25 Connector between the ramps to the existing plaza and the Lapeer Connector. This will allow for the separation of local traffic from eastbound traffic crossing the border. The three lanes for local traffic will have a posted speed of 40 miles per hour and will provide all of the same access to Water Street, Hancock Avenue, and northern Port Huron as the existing I-94/I-69 Corridor provides.

Water Street Interchange: The City West Alternative includes the replacement of the existing interchange at Water Street including the Water Street Bridge over I-94/I-69. The replacement bridge will be up to four lanes wide, with two lanes in either direction. The bridge will also accommodate pedestrian traffic by including two five-foot sidewalks. Adequate right-of-way exists to place either traffic signals or roundabouts at the two intersections between Water Street and the freeway ramps. The exact configuration of the intersections would be determined during the design phase of the project. The ramps to Water Street will be upgraded to current design standards.

Lapeer Connector Connections: The City West Alternative would improve access for local traffic to the Lapeer Connector. Currently, only traffic headed to I-94/I-69 east or from I-94/I-69 west can use the Lapeer Connector. The City West Alternative includes access in all directions between the Lapeer Connector and the new I-94/I-69 Corridor as illustrated in **Figure E.4**. Eastbound I-94/I-69 will have direct ramp access from the freeway to the Lapeer Connector. The other access movements will all use auxiliary/connector lanes. Traffic from northbound Lapeer Connector wanting to travel east will travel through the Water Street Interchange to connect to the eastbound lanes for local traffic.

Proposed Lapeer Connector Interchange

A collector road will be constructed along westbound I-94/I-69 that will connect with the westbound intersection at the Water Street interchange. The collector road will include an intersection at the Lapeer Connector that will allow westbound traffic to turn on to the Lapeer Connector and head south. Northbound traffic on the Lapeer Connector will be able to turn left at this intersection and proceed onto westbound I-94/I-69. Traffic from westbound I-94/I-69 wanting to travel south on the Lapeer Connector will exit at Water Street, travel through the Water Street Interchange intersection and then onto the collector road. The collector road also would serve as the ramp from Water Street to westbound I-94/I-69 as well.

The new Lapeer Connector configuration would require the entrance from Indian Drive onto the Lapeer Connector to be shifted approximately 300 feet south to meet safety standards.

New Welcome Center: Two locations for the new welcome center were initially considered; on the vacant land to the north of I-94/I-69 approximately one mile west of it's current location, and within the median (between eastbound and westbound lanes) of I-94/I-69, also one mile west of the current welcome center. The median option was not carried forward due to geometric and safety concerns by FHWA regarding left exiting and entering lanes. Additionally, the amount of space available within the median did not meet the amount of parking required for a full service International Welcome Center. **Figure E.4** shows a conceptual layout for the new Welcome Center for the City West Alternative. The new Welcome Center will consist of a modern building per MDOT's current design standards for Welcome Centers along with parking for up to 100 cars and 50 trucks. The Welcome Center will be landscaped and will include a berm of up to 15 feet high on three sides to reduce noise and visual impacts for surrounding residents. MDOT will hold a public workshop to develop aesthetic and landscaping treatments for the Welcome Center. These will include preservation to the extent possible of existing forested land and wetlands on the site in areas not affected by the Welcome Center complex.

Local Road Improvements: The City West Alternative would include several improvements to local roads surrounding the plaza. The intersection at 10th Avenue and Pine Grove Avenue would be reconstructed for the new Pine Grove Avenue. Scott Avenue would no longer connect to this intersection, ending in two cul-de-sacs. North of the plaza, Hancock Street would be slightly realigned to connect with the relocated Pine Grove Avenue. The M-25 Connector northbound would be closed north of Hancock Street. The southbound lanes would remain open carrying traffic southbound as part of the relocated Pine Grove Avenue. A minor realignment of Riverside Drive would occur where it crosses under I-94/I-69 and connects to Scott Avenue.

Pine Grove Avenue Relocation: The relocation of Pine Grove Avenue to the west of the new plaza is a key part of the City West Alternative. Existing Pine Grove Avenue between 10th Avenue and Hancock Street would be closed. The new Pine Grove Avenue would be a boulevard from 12th Avenue northbound with an open center median and roundabouts or

signals at key intersections. A final plan for signals and roundabouts would be developed as part of the final design for the project. The proposed Pine Grove Avenue would include the following as illustrated in **Figure E.4**:

- A roundabout for neighborhood access at 12th Avenue, south of the plaza
- A ramp from Pine Grove Avenue northbound to the new plaza
- An intersection at the ramp for local traffic from I-94/I-69 to Pine Grove Avenue
- A bridge over the ramps from I-94/I-69 to the plaza
- An intersection at the ramp from the new plaza to Pine Grove Avenue to provide access in all directions and access from Pine Grove Avenue to westbound I-94/I-69
- A new intersection with Hancock Street for the new northbound lanes for the relocated Pine Grove Avenue. The southbound lanes would connect to a modified version of the existing M-25 Connector/Hancock Street intersection
- A connection to existing Pine Grove Avenue at Riverview Street for the northbound lanes of the realigned Pine Grove Avenue

The Blue Water Bridge

Several options were considered in the development of the relocated Pine Grove Avenue including:

- An option that would have split Pine Grove Avenue into a pair of one way streets that would circle the plaza for the entire plaza perimeter. Northbound Pine Grove Avenue would have run east of the plaza and southbound Pine Grove Avenue would have run west of the plaza. This option was dropped because it led to worse congestion than the boulevard option discussed above and because it would have resulted in a major roadway running along 10th Avenue underneath the connection between the Blue Water Bridge and the new plaza. The Study Team considers this a fatal flaw and a higher security risk as is the case for the City East Alternative. This option also presented more difficulty for ensuring easy access for emergency services in the areas surrounding the plaza.

- An option which included a five-lane roadway along the whole length of the relocated Pine Grove Avenue instead of a raised median. This option was dropped due to safety concerns with allowing left turns at all places along the busy new roadway. This option would have taken almost all of the traffic away from the existing businesses along Pine Grove Avenue between Hancock Street and the north side of Garfield Street.

- An option which connected the new Pine Grove Avenue/M-25 Connector to the existing Pine Grove alignment around Hancock Street and uses Pine Grove Avenue as the major roadway to take traffic north. This option redirects traffic to the original Pine Grove alignment and thus encourages visits to existing businesses.

After evaluating these options, the Study Team selected the last option discussed above and shown in **Figure E.4** as the best concept for relocating Pine Grove Avenue as part of the City West Alternative. This concept may be refined further as the study and design proceed.

City West Alternative Design Issues

The City West Alternative has the same roadway configuration as the City East Alternative west of the Black River. The City West Alternative includes the same design issues at the Water Street Interchange, the separation between border and local traffic, and the lower freeway speed as discussed earlier for the City East Alternative.

City West Alternative Traffic Impacts

The improvements for the City West Alternative are described in the sections above. The same traffic simulation software packages were used to analyze the traffic impacts of each alternative.

Local Impacts: In addition to relocating Pine Grove Avenue and expanding the plaza on street level, a number of local intersection improvements would be required to prevent the high congestion and queues experienced in the No-Build

Dual Left Turn Lane Example

Alternative. Improvements were made at each intersection in the following step-by-step order until congestion was reduced to a moderate level (21 to 55 seconds delay per vehicle).

- Adjust the traffic signal operations
- Add turn lanes
- Add through lanes

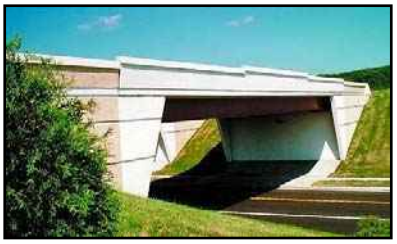
The resulting improvements are outlined in **Table 2.2.4**.

The City West Alternative improvements, along with the local intersection improvements noted above, would allow the Hancock Street and Pine Grove Avenue intersection, the Hancock Street and southbound M-25 Connector intersection, the Pine Grove and 10th Avenue and both of the Water Street intersections to experience moderate (21 to 55 seconds delay per vehicle) instead of high congestion (greater than 55 seconds delay per vehicle). The other intersections would have low levels of congestion (0 to 20 seconds delay per vehicle). Each of the critical intersections would experience fewer delays than under the No-Build Alternative.

Table 2.2.4 Intersection Improvements for City West Alternative

Intersection	Needed Improvements
Garfield Street and Pine Grove/M-25 Connector	• Separated northbound and southbound traffic movements • Added northbound left turn lane • Added northbound through lane • Added southbound through lane
Hancock and Pine Grove/M-25 Connector	• Added northbound right turn bay • Added northbound through lane • Eliminated northbound and southbound left turn movements – traffic to use crossovers • Added southbound through lane
Pine Grove /M-25 Connector and WB Plaza ramps	• New intersection and signal • One left turn lane onto WB I-94/I-69 • Ramp from Plaza with right turn lane and left turn lane
Pine Grove and M-25 Connector	• New intersection and signal • Eastbound two left and two right turn lanes
Pine Grove and 12th Avenue	• New roundabout • Employee access to plaza
Pine Grove and 10th Avenue	• Added southbound Pine Grove Avenue right turn lane • Added northbound Pine Grove Avenue right turn lane • Added northbound and southbound 10th Avenue double left turn lanes • Removed Scott Avenue from intersection (added cul-de-sac)
Water Street and EB Off-ramps	• Added eastbound through lane to the existing left and right turn lanes • Dedicated southbound left turn lane
Water Street and WB Off-ramps	• Added westbound through lane to the existing left and right turn lanes • Dedicated northbound left turn lane and through lane

Freeway Impacts: Like the No-Build Alternative, the freeway was divided into separate segments using the on/off-ramps as the beginning and end points between each segment. Each segment and the on-ramps and off-ramps were analyzed separately.



Example of a Single-Span Rectangular Bridge

In the City West Alternative, two freeway segments would experience moderate (48 to 88% of capacity) levels of congestion. These segments include the westbound segment between the Water Street on-ramp and the westbound I-94/I-69 off-ramp as well as the eastbound segment between the I-94/I-69 on-ramp and the Water Street off-ramp. These areas are illustrated in **Figure E.16** in **Appendix E**. Each of the ramps would experience moderate levels of congestion (48 to 88% of capacity).

Border Crossing Transboundary Impacts: The Border Wizard™ analysis indicated that the city plaza alternatives would improve traffic flow through the plaza with moderate (48 to 88% of capacity) levels of congestion and vehicle queues. The east bound Canadian bound traffic has three dedicated lanes separated from the local freeway traffic that extend back to the Lapeer Connector. This would allow the FAST/NEXUS traffic to flow freely up to the plaza and reduce the likelihood of backups onto I-94/I-69 in the event of a border slow down due to national security concerns or circumstances on the Canadian side.

What is Border Wizard™?

A computer simulation program produced for the General Services Administration (GSA) to model border crossing facility requirements in the United States.

The outbound inspection facility is of particular concern as it has to be of sufficient size and capacity to prevent backups from occurring on the freeway network. For the City West Alternative, the Study Team's analysis indicated that up to three outbound inspection booths would be required to prevent backups from occurring during the maximum outbound inspection process.

Example of a Multi-Span Bridge

City West Alternative Bridges, Walls, and Other Structures

Bridges: One new bridge would be constructed with the City West Alternative and five existing bridges would be reconstructed. The new bridge is described in **Table 2.2.5.**

Table 2.2.5 City West Alternative New Bridge

N1	Relocated Pine Grove Avenue over I-94/I-69 lanes to plaza.

Bridge N1 would likely be a two-span rectangular structure. The ramps to/from I-94/I-69 would be below street level and slope upwards to connect to the plaza.

The existing bridges requiring reconstruction for the City West Alternative are identified in **Table 2.2.6.**

Table 2.2.6 City West Alternative Reconstructed Bridges

R1	I-94/I-69 over the Black River
R2	Water Street over I-94/I-69
R3	Lapeer Connector over I-94/I-69
R4	I-94/I-69 over Stocks Creek

Bridge R1 would be rebuilt wider and longer than the current structure. One option for the new bridge would consist of three independent structures on common foundations. This structure would be built utilizing longer spans over the Black River, resulting in fewer obstructions in the waterway. Bridge R2 would be reconstructed wider and longer than the current structure to accommodate the potential roundabouts or expanded intersections off each end of the structure. Bridge R3 would be reconstructed as a multi-span rectangular structure shorter than the original due to a less severe skew angle with I-94/I-69. The structure will be wider to accommodate the new movement from the northbound Lapeer Connector to the westbound I-94/I-69. The existing culverts (R4) at Stocks Creek would be replaced with a single span rectangular structure.

MSE Wall Example

Walls: The City West Alternative would require at least three different types of walls, retaining walls, security walls, and sound walls. Mechanically Stabilized Earth (MSE) retaining walls would be utilized in areas of the proposed plaza where different elevations would be required. Various styles of sound walls could be investigated for the areas around the expanded plaza affected by noise. The most common style is a pre-cast concrete post and panel sound wall.

Geotechnical Components: The banks of the Black River contain very poor soils within the proposed footprint of the new bridge. The poor soil conditions could impose foundation design challenges including its suitability for foundations or backfill for the bridge over the Black River. Soil borings indicate that the poor soil conditions exist up to 80-feet below the existing surface. The existing soils are not suitable for large foundations or retaining walls. There are three options

Example of a Land Bridge

Existing I-94/I-69 Bridge over the Black River

What is Part-Width Construction?

Part-width construction involves maintaining traffic flow on one half of the roadway while the other half is being re-constructed. Crossovers are constructed to direct traffic from one set of lanes to the other.

that will be investigated to overcome the poor soils in the river bank regions.

The options are as follows:

1) Build a longer bridge over the poor soil area. This is typically referred to as a "land bridge". The land bridge is a structure built very low to the ground utilizing support piers founded on piles, the piers in-turn support the bridge beams approximately three to four feet off the ground. A land bridge would be located outside the limits of the navigable waters of the Black River.

2) Utilize a construction technique known as a drained surcharge to compress the underlying poor soil layer. The surcharge is a large berm of engineered fill designed to be heavy enough, and placed long enough to compress the poor soils region. Once compressed the roadway can be constructed. This option typically requires additional construction time to sufficiently allow soil compression to take place.

3) Instead of bridging the poor soils (land bridge) or compressing the poor soils (surcharge), utilize light weight foam blocks as a backfill material behind retaining and bridge abutment walls to reduce the load on the poor soils to a manageable level. Further investigation into all foundation options will be provided in the FEIS.

City West Alternative Drainage

Drainage improvements for the City West Alternative are discussed as part of **Section 3.11 Groundwater, Drainage, and Surface Water Quality.**

City West Alternative Maintenance of Traffic/Construction Staging

Maintenance of Traffic (MOT) is related to construction staging as they both have a substantial impact on the amount

of time it takes to build a project. In construction staging, an in-depth plan is laid out for each stage of construction to determine which elements of a project may or may not be constructed simultaneously and to make sure that traffic flow can be sufficiently maintained.

An Example of Crossovers for Part-Width Construction

The main objectives of construction staging are to minimize delays, minimize congestion, maintain the required access locations, and complete the project in a reasonable timeframe. Another means of MOT is a detour route which allows construction to progress most efficiently without the hindrance and danger that traffic in a construction zone presents. The MDOT would typically coordinate with local communities and study the residential and commercial traffic requirements in the area to determine desirable detour routes and access.

Plans for maintaining traffic, road detours and closures, and staged construction, would be designed per the Michigan Manual of Uniform Traffic Control Devices design manual. The current edition of the MDOT Standard Specifications for Construction presents guidelines for traffic control and maintaining traffic.

The following is a description of a potential MOT staging plan that could apply to the City West Alternative focusing on the plaza. The City West Alternative MOT plan would maintain the cross-border and local traffic throughout the construction of a new plaza and could consist of five stages of MOT.

Stage 1: Site preparation would be accomplished in stage 1 of construction, including the demolition of all required structures within the construction limits and removing debris from the site. Hancock Avenue will be temporarily widened to allow for relocated Pine Grove Avenue in Stage 2. Pine Grove Avenue south of the proposed plaza will be constructed. All traffic will be maintained on the freeway and Pine Grove Avenue during this stage.

Stage 2: Pine Grove traffic will be routed to the temporary 10th Avenue/Hancock detour and removal of Pine Grove will commence. The secondary commercial inspection area will be constructed and temporary inspection booths will be installed

to allow processing to continue throughout all stages of construction. Eastbound I-94/I-69 will be constructed from the Black River Bridge to approximately the location of the Pine Grove bridges over I-94/I-69. All traffic will be maintained on the freeway and plaza during this stage.

Stage 3: Inbound plaza traffic from Canada will use the newly constructed inspection lanes during this stage. A temporary gated exit will be constructed on Hancock for cleared plaza traffic while the permanent exit ramps are constructed. Pine Grove Avenue will be completed during this stage including the bridges over I-94/I-69. Five primary inspection lanes for traffic to Canada will be constructed and construction of the remainder of eastbound I-94/I-69 will be completed during this stage.

Stage 4: Plaza construction would be completed during this stage and temporary inspection facilities would be removed. Traffic would be shifted from the temporary 10th/Pine Grove detour onto the newly constructed Pine Grove west of the plaza. 10th Avenue will then be reconstructed north and south of Pine Grove and the temporary widening for the detour route will be removed. All traffic will be in its final configuration on side streets, Pine Grove Avenue, the interior plaza and I-94/I-69 at the completion of this stage.

The Lapeer Connector, Water Street, and Black River Bridge construction would be independent from the plaza construction and would therefore be staged separately. Although control of all construction related inconveniences is not possible, proper signing of all construction areas will ensure motorist and pedestrian safety. Access would be maintained to properties adjacent to the proposed right-of-way during construction, to the extent possible.

City West Alternative Utilities

The City of Port Huron has an established, functional water and sewage treatment system. A ten-inch water main is crossed by M-25 Connector at Elmwood Street, and a 72-inch combined the storm and sanitary sewer line crosses underneath and services the plaza. The city maintains sewer and water mains along 10th Avenue, however it is not

anticipated these utilities would require relocation for the City West Alternative.

Existing DTE Energy Substation

Numerous overhead and buried utilities (electrical, cable and street lighting) run throughout the city and currently provide services to the existing plaza. A DTE Energy electrical substation, located on the north side of the existing plaza, provides power to the plaza. Further investigation and coordination with utility providers for the provision of electrical service during the construction of a new plaza would be accomplished during the Final EIS phase. One solution may consist of providing an off-site power supply capable of servicing temporary plaza facilities during construction.

SEMCO Energy has established natural gas pipeline networks throughout the plaza area. Telephone service in the City is provided by AT&T.

The Black River Bridge and Water Street Bridge over I-94/I-69 carry electrical conduit which would be maintained during construction by means of temporary supports.

2.2.6 Township Alternative – Relocated Plaza in Port Huron Township

This section discusses the Township Alternative and begins with a basic description of the alternative. The section also includes a discussion of the following features of the Township Alternative:

- Layout and design issues
- Effects on border and local traffic
- Bridges, walls, and other structures
- Drainage
- Keeping traffic flowing during construction
- Utilities

Describe the Township Alternative

The Township Alternative, illustrated in **Figure E.5 – Sheets A to D,** located in the separate **Appendix E** volume, involves the relocation of major plaza functions to a mostly undeveloped site in Port Huron Township, 1.5 miles west of the current

facility. This description of the Township Alternative includes all of the facilities needed by the year 2030.

For the Township Alternative, inbound traffic would no longer be able to exit at the existing plaza

The Plaza: Traffic entering the United States would come off the Blue Water Bridge and continue west on a three lane roadway across the current Blue Water Bridge Plaza. The current plaza footprint would remain in place, however local traffic would no longer be able to exit at the existing plaza or use Pine Grove Avenue to access the plaza. All inspections would occur at the new plaza. The new plaza would be located in Port Huron Township and use 103 acres of vacant, residential, and MDOT owned land. To get to the new plaza, traffic would use a three-lane secure roadway running between the existing plaza and the new site. The roadway would be secured using 20-foot high walls with four-foot extensions angled 45 degrees inward. These three lanes would also be separated from the three secured lanes for traffic headed to Canada. There would be no gates or access points to allow vehicles to enter or exit the secured corridor other than at the new plaza or from the Canadian side of the Blue Water Bridge. **Figure E.17** in **Appendix E** provides an idea of how the secured corridor would look.

The plaza for the Township Alternative is setup with similar facilities as the plaza for the City East and City West Alternatives. There would be 34 inspection booths for cars and trucks arriving from Canada. The number of booths may be reduced to 20 high-low booths (may be used for truck and car), however this will not affect the overall size of the plaza. Before the cars reach the inspection booths, they would pass through radiation detection portals, which ensure that they are not bringing radioactive material into the United States. At the inspection booths, drivers and passengers answer questions from CBP officers and discuss or provide paperwork on the cargo they are carrying. If cars and trucks clear primary inspection, they would have three options when they exit the plaza. They could take a ramp to I-94/I-69 westbound and take either I-94 towards Detroit or I-69 towards Flint. If headed east, they could take a loop ramp that provides access to an extension of the M-25 Connector. The extension of the M-25 Connector would provide access to the Lapeer Connector, Water Street, Hancock Street, and Port Huron. Drivers could also visit a new MDOT Welcome Center, which

would occupy 31 acres, located to the west of the inspection plaza. Trucks exiting the plaza would have to show proof that they are cleared to exit at an additional exit control booth.

Trucks not cleared at the inspection booths are sent to the secondary truck inspection area. The truck inspection area would contain adequate parking to accommodate trucks sent to secondary inspection for document processing, plus 12 docks for unloading trucks, and 43,500 square feet of office and unloading space. The office space would include space for the inspection agencies and for customs brokers who help process paperwork and payments for truck drivers. The CBP offices would be in a separate secure area away from the customs broker's offices. The truck inspection area would also include separate space for the inspection of livestock. Up to three GRIT buildings, which allow CBP officers to scan the contents of vehicles, would also be constructed.

GRIT Building on Existing Plaza

Cars with passengers that are not cleared to enter the United States or require further processing would be sent to a secondary inspection building in the middle of the plaza, shown in dark blue on **Figure E.5 Sheet B**. This building also would contain more office space for the inspection agencies and the Michigan Department of Transportation staff. There would be a parking area for cars that require further inspection and a garage for detailed car inspections.

Cars and trucks would have to exit the United States at the relocated plaza in Port Huron Township and would have two entrances to the new plaza. There would be a ramp from eastbound I-94/I-69 to the new plaza. A westbound extension of the M-25 Connector would run parallel to the secured corridor and provide access to the plaza from local destinations in the Port Huron Area.

Facilities would be included to allow CBP to inspect cars and trucks leaving the United States. This area is called outbound inspection. The outbound inspection facilities would include 18 booths, ten docks for unloading trucks, and adequate truck and car parking spaces. If vehicles do not pass outbound inspection they would be sent to outbound secondary inspection. Following outbound inspection, cars and trucks would pass through ten toll booths. After the toll booths, cars

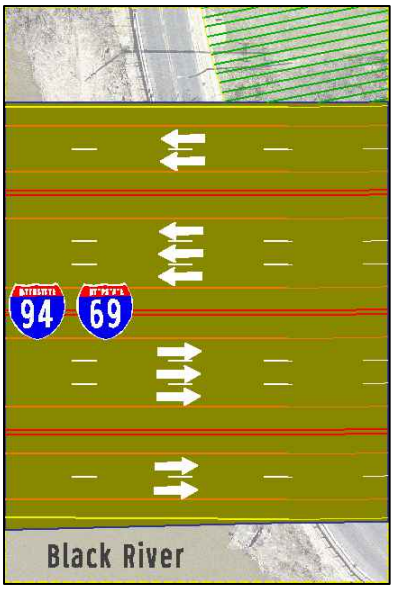


Figure 2.2.4 Township Alternative Lanes on the Black River Bridge

and trucks would use the three outbound lanes of the secured corridor to travel to the existing plaza. These lanes would also be secured with 20-foot high walls with four foot extensions angled 45 degrees inward. On the existing plaza, drivers headed for Canada would have the option of visiting a new duty free store located where plaza inspection facilities currently exist. Drivers would then proceed to Canada using the existing Blue Water Bridge.

The Township Alternative also includes parking for both plaza employees and visitors. Employees and visitors would access the plaza using the same ramps as traffic entering and exiting the country. Service drives would provide employee and visitor access to parking areas on the plaza. Two parking lots would be located next to the inspection building in the center of the plaza. A third employee parking lot would be located behind the truck inspection area on the north side of the plaza. The Township Alternative also includes buffer and berm areas, shaded green on **Figure E.5** in **Appendix E**.

The Black River Bridge and I-94/I-69: The Township Alternative would expand the Black River Bridge from a four-lane bridge to ten lanes. **Figure 2.2.4** provides an idea of the layout of the new Black River Bridge. The new bridge would include three secured lanes to carry traffic from the relocated plaza, three secured lanes to carry traffic from Canada to the relocated plaza to Canada, and four lanes to carry local traffic, two in each direction. The Township Alternative would include a one-lane off ramp to Pine Grove Avenue south of the existing plaza for eastbound travelers on the M-25 Connector destined for downtown Port Huron. The off-ramp would be a one way connection between I-94/I-69 and Pine Grove Avenue. The border crossing lanes would include one lane for cars, one lane for trucks, and one lane for vehicles enrolled in the FAST and NEXUS programs for pre-cleared cars and trucks. The lanes to carry local traffic would be an extension of the M-25 Connector and run parallel to the secure corridor, between the existing and new plazas, and connect to I-94/I-69 south of the new plaza. With the Township Alternative, local traffic would have access to and from Water Street, Hancock Street, and Pine Grove Avenue, as it does today.

Roundabouts are being considered instead of traffic signals at key intersections for all Build Alternatives

As a result of the expansion of the Black River Bridge and the extra lanes on I-94/I-69 for border crossing traffic, the Water Street Interchange would be rebuilt. The Water Street Bridge over I-94/I-69 would be widened from two lanes to four lanes, including two five-foot sidewalks. The ramps to Water Street would be re-built and new intersections or roundabouts capable of handling heavier volumes of traffic would replace the existing signalized intersections.

The Township Alternative would improve access for local traffic to the Lapeer Connector. Currently only traffic headed to I-94/I-69 east or from I-94/I-69 west, can use the Lapeer Connector. With the Township Alternative, traffic headed in all four directions would be able to use the Lapeer Connector.

Local Road Improvements: The Township Alternative would include several improvements to the local roads surrounding the existing plaza. The intersections of Hancock Street and the M-25 Connector and Hancock Street and Pine Grove Avenue would be improved with either a roundabout or an intersection with additional turning lanes on all four legs. Hancock Street would be widened between the M-25 Connector and Pine Grove Avenue, including additional turn lanes. Pine Grove Avenue would be widened between Hancock Street and 10th Avenue to include up to six lanes instead of the current four lanes and a center turn lane. The six-legged intersection between 10th Avenue, Scott Avenue, and Pine Grove Avenue would also be improved to reduce traffic conflicts. Scott Avenue would no longer have access to this intersection and would be terminated on both sides with a cul-de-sac. The new intersection between 10th Avenue and Pine Grove Avenue would feature either a roundabout or additional turning lanes to accommodate more traffic.

Part of Hancock Street would be widened under the Township Alternative

Township Alternative Design Issues

The Township Alternative includes similar roadway locations with design issues at the Water Street Interchange as discussed earlier for the City East and City West Alternatives. For the Township Alternative the issues are both Water Street ramps have curve lengths and curve radii that are less than desirable according to the design criteria. Avoidance of impacts to Port

Huron Township Park Number 1 and the Bridge Harbor Marina is the reason for these design issues.

The Township Alternative also has a less than desirable curve radius on the proposed bridge that would connect traffic from Water Street to the Lapeer Connector southbound. This is to avoid increased impacts to property owned by the Port Huron Area School District.

Township Alternative Traffic Impacts

The improvements for the Township Alternative are described in the section above. The Township Alternative was analyzed using the same traffic simulation software packages as the other alternatives.

Local Impacts: In addition to the planned relocation of the plaza to Port Huron Township, the Township Alternative would include a number of local intersection improvements to prevent the high congestion and queues experienced in the No-Build Alternative. Like the City East Alternative, the local intersection improvements were made in the following step-by-step order until congestion was reduced to a moderate level at each intersection.

- Adjust the traffic signal operations
- Add turn lanes
- Add through lanes

The resulting improvements are outlined in **Table 2.2.7** below.

The Township Alternative improvements, along with the noted local intersection improvements above, would allow all of the intersections to experience only moderate congestion (21 to 55 seconds delay per vehicle). Each of the critical intersections would experience fewer delays than the No-Build Alternative.

Freeway Impacts: As with the other alternatives, the freeway was divided into separate segments using the on/off-ramps as the beginning and end points between each segment. In addition to evaluating each segment, the on-ramps and off-ramps were analyzed. In the Township Alternative, the

freeway and arterial segments would have low to moderate (0 to 88% of capacity) levels of congestion. These areas are illustrated in **Figure E.19**. No ramps would experience high levels of congestion (greater than 88% of) for the Township Alternative.

Additional inspection booths for the Township Alternative would help backups from occurring

The Township Alternative includes a number of weave areas with the relocation of the plaza activities. There are two in the eastbound direction on the M-25 Connector between the Plaza on-ramp and the Lapeer Connector off-ramp as well as between the Lapeer Connector on-ramp and the Water Street off-ramp.

There are three weave areas in the westbound direction. They are between the Water Street on-ramp and the Lapeer Connector off-ramp, between the Lapeer Connector on-ramp and the access to the plaza, and between the I-94/I-69 merge with the M-25 Connector and the I-69 westbound off-ramp. Each of the weave areas were examined using the HCS 2000 software and resulted in moderate to low congestion. Overall, the 2030 traffic operates well with the Township Alternative improvements.

Table 2.2.7 Intersection Improvements for Township Alternative

Intersection	Needed Improvements
Hancock and M-25 Connector	• Prevent all left turn movements • Add southbound right turn bay • Provide indirect left turn at north approach for northbound left • Add two right turn lanes for indirect left to southbound M-25 Connector
Hancock and Pine Grove Avenue	• Add eastbound left and right turn lanes • Add westbound left turn lane • Add additional northbound left turn lane • Add southbound right turn bay
Pine Grove Avenue and 10th Avenue	• Add right turn lane for southbound Pine Grove Avenue • Add right turn bay for northbound Pine Grove Avenue • Add additional left turn lane for northbound 10th Avenue • Remove Scott Ave • Add cul-de-sac for Scott Avenue (approaches removed from intersection)
Water Street and EB Off-ramps	Add protected right turn arrow for the off-ramp (for the southbound left turn phase)
Water Street and WB Off-ramps	Widen bridge to provide one through and one left turn lane in each direction

Border Crossing Impacts: The Border Wizard™ preliminary analysis indicated that a township alternative would improve traffic flow through the plaza with moderate (48 to 88% of capacity) levels of congestion and vehicle queues. The secure corridor provides three dedicated lanes in each direction separated from the local traffic that would provide over two miles of vehicle storage in the event of a border slow down due to either side of the crossing.

MSE Wall Example

The outbound inspection facility is of particular concern as it has to be of sufficient size and capacity to prevent backups from occurring on the freeway network. For a township alternative, the Border Wizard™ analysis indicated that 18 outbound inspection booths would be required to prevent backups from occurring during the maximum outbound inspection process.

Township Alternative Bridges, Walls and Other Structures

Bridges: Eleven new bridges would be constructed with the Township Alternative and five existing bridges would be reconstructed. Free flow traffic conditions are desired along the new M-25 Connector Extension at the Lapeer Connector and the existing and proposed plaza. New bridges would be required at these locations to eliminate the need for traffic signals. The new bridges are detailed in **Table 2.2.8.**

Example of a Post and Panel Sound Wall

Bridge N1 and N2 would be single-span rectangular structures. Bridge N3, N5, N8 and N9 would be multi-span curved structures. Bridge N4, N6, N7, N10 and N11 would be multi-span rectangular structures.

Table 2.2.8 Township Alternative New Bridges

N1	Inbound & Outbound over the Stocks Creek Drain
N2	M-25 Connector over the Stocks Creek Drain
N3	Cleared Inbound over WB M-25 Connector & I-94/I-69 NB
N4	WB M-25 Connector over I-94/I-69 Inbound & Outbound Secured Corridor
N5	Ramp from Lapeer Connector NB to M-25 Connector WB over M-25 Connector
N6	Cleared Inbound over Sendback and Employee Parking Road
N7	WB M-25 Connector over I-94/I-69 NB
N8	Ramp from M-25 Connector to Lapeer Connector over M-25 Connector EB
N9	Outbound over M-25 Connector EB
N10	I-94/I-69 SB over Lapeer Road
N11	I-94/I-69 NB over Lapeer Road

The existing bridges requiring reconstruction are shown in **Table 2.2.9.**

Table 2.2.9 Township Alternative Reconstructed Bridges

R1	Inbound over Existing Plaza Loop Ramp
R2	Inbound over M-25 Connector
R3	I-94/I-69/M-25 Connector over the Black River
R4	Water Street over I-94/I-69
R5	Ramp from M-25 Connector to Lapeer Connector over I-94/I-69 Inbound and Outbound

Bridge R1 would be a widened single-span rectangular structure. Bridge R2 would be widened multi-span curved structures. Bridge R3 over the Black River would be rebuilt much wider and longer than the current bridge. The new bridge may be comprised of four independent structures on common foundations. The new structure could be built utilizing longer spans over the Black River, resulting in fewer obstructions in the waterway. Bridge R4 would be reconstructed wider and longer than the current structure to accommodate the extra proposed lanes. Bridge R5 would be reconstructed as a multi-span curved structure with additional span lengths to allow for the wider lanes below.

Walls: The Township Alternative freeway corridor would require a variety of different types of walls. There would be retaining walls, sound walls and security walls. Cast-in-place concrete and Mechanically Stabilized Earth (MSE) retaining walls can be built outside of the Black River overbanks. Various styles of sound walls could be investigated for the corridor; the most common style is a pre-cast concrete post and panel sound wall. The dedicated inbound and outbound lanes for the proposed plaza in the Township Alternative would require 20-foot tall security walls on each side of the secure corridors. Various materials also could be investigated for the construction of the security walls. Variations of walls may be required due to their weight. Lighter weight sound or security walls would be required on bridges.

Geotechnical Components: The banks of the Black River contain very poor soils within the proposed footprint of the new bridge. The same poor soil conditions described for the City East and West Alternatives would impose foundation design challenges. Soil borings indicate that the poor soil conditions exist up to 80 feet below the existing surface. The existing soils are not suitable for large foundations or retaining walls.

Options to overcome the poor soils are discussed in **Section 2.2.4 City East Alternative.**

Further investigation into all foundation options will be provided in the FEIS.

Township Alternative Drainage

Drainage improvements for the Township Alternative are discussed as a part of **Section 3.11 Groundwater, Drainage, and Surface Water Quality**.

Township Alternative Maintenance of Traffic/Construction Staging

Basic maintenance of traffic (MOT) and construction staging procedures are discussed under the maintenance of traffic discussion for the City East Alternative. The Township Alternative MOT plan would maintain the cross-border and local traffic throughout the construction of a new plaza. Due to the off-site location of the Township Alternative plaza, MOT impacts to border plaza traffic during construction would be minimized. Security would be maintained throughout construction as the entire new plaza and secure corridor would be constructed before moving traffic to them. Due to existing conditions at the Black River Bridge, it is likely that this bridge would be constructed first, either as a stand alone project or as part of a larger construction phase that includes the Water Street interchange. The Township Alternative could include four other stages of MOT.

The Black River Bridge

Stage 1: Temporary travel lanes east of the Lapeer Connector on I-94/I-69, M-25 and Water Street would be built. Part-width construction of the Water Street Bridge and the local access ramp to Pine Grove Avenue would occur.

Stage 2: Sections of I-94/I-69, as well as completion of the Eastbound M-25 Connector extension and ramps would be built. The Lapeer Connector/M-25 Connector interchange, the existing plaza ramps over the M-25 Connector, and the remaining section of the Water Street bridge would also be completed during stage two. Traffic would be maintained on the existing I-94/I-69 up to the Lapeer Connector where traffic

would be shifted to the north side of the roadway, to allow southern roadway construction.

Stage 3: The entire off-site plaza, the Lapeer Connector, the northern section of I-94/I-69 including the secure corridor, and Water Street Bridge ramps would be completed. Traffic would be maintained on the newly constructed eastbound M-25 Connector.

Stage 4: Construction would be completed in stage four, which includes the remaining section of the southbound M-25 Connector and construction of new buildings on the existing plaza.

Disruption of traffic in the construction area would be minimized to the extent possible. Although control of all construction-related inconveniences is not possible, proper signing of all construction areas will ensure motorist and pedestrian safety. Access would be maintained to properties adjacent to the proposed right-of-way during construction to the extent possible.

Township Alternative Utilities

The City of Port Huron and Port Huron Township have existing functional water and sewage treatment systems. Port Huron Township provides water, sanitary, and storm services from the north of the proposed plaza site. The water and sanitary services were installed in the late seventies and would most likely not require replacement. Many overhead utilities (electrical and cable) are available from the utility runs along West Water Street. Telephone service in the Township is provided by AT&T.

SEMCO Energy provides gas service via a gas main between Eastland and Westland Drives from the north, as well as Lewis Drive from the south. The gas main was installed in the mid-fifties and may require upgrading with the proposed plaza work.

The City of Port Huron has an established, functional water and sewage treatment system. A 10-inch water main is crossed by M-25 Connector at Elmwood Street, and a 72-inch

combined storm and sanitary sewer line crosses underneath and services the plaza. The city maintains sewer and water mains along 10th Avenue, however it is not anticipated these utilities would require relocation for the Township Alternative.

The Black River Bridge and Water Street Bridge over I-94/I-69 carry electrical conduit which would be maintained during construction by means of temporary supports.

2.3 Evaluation of Alternatives

The Study Team worked with the Stakeholder's Advisory Committee and Cooperating Agencies to develop criteria for evaluating the Alternatives for improvements for the United States Plaza at the Blue Water Bridge. There were two key parts of the evaluation of the Alternatives Carried Forward that guided the identification of a Preferred Alternative for design and construction. First, the Alternatives were evaluated as to how well they address the reasons for improvements to the plaza as discussed in **Chapter 1.0 Why Are Improvements Needed?**. The Study Team determined that the City West Alternative best addresses the reasons for improvements. The City East Alternative does address most of the reasons for improvements although not as well as the City West Alternative. Additionally, it possesses major security and emergency response issues compared to the City West Alternative. The Township Alternative and the No-Build Alternative both fail to address key parts of the reasons for improvements. The rest of this chapter discusses the analysis behind these conclusions in detail.

The second part of the evaluation of the Alternatives Carried Forward is the consideration of all of the impacts that they would have on the human and natural environment. **Chapter 3.0 The Environment: What's There Now and Project Effects** provides the full evaluation of the environmental effects of the Alternatives Carried Forward. **Section 2.4 The City West Alternative is the Preferred Alternative** identifies the City West Alternative as preferred based on the two part evaluation process.

Who was part of the Advisory Committee?

- FHWA
- City of Port Huron
- Port Huron Township
- St. Clair County
- CBP
- Fort Gratiot Township
- Elected Officials
- GSA
- Custom Brokers
- SEMCOG
- Transport Canada
- Blue Water Bridge Authority (Canadians)
- Coast Guard

2.3.1 How Were Alternatives Evaluated?

The Study Team developed the measures to evaluate the alternatives for the Blue Water Bridge Plaza Study in consultation with the Advisory Committee and other project stakeholders. The Study Team also used typical methods for evaluating transportation improvements and border crossing facilities. The evaluation of alternatives was based around the reasons for improvements to the United States Plaza. These include:

One reason for improvements to the plaza is to minimize back ups

- Accommodate the latest CBP inspection technologies and procedures
- Provide flexibility to accommodate future unknown inspection technologies and procedures
- Improve security
- Provide facilities that ensure cars and trucks do not leave the plaza without being inspected
- Improve safety on the bridge, plaza, and I-94/I-69
- Accommodate projected 2030 traffic growth and future facility needs
- Minimize backups on Highway 402 and I-94/I-69
- Reduce vehicle and pedestrian conflicts on the plaza
- Improve local access
- Minimize routing of commercial traffic to local roads during maintenance operations
- Improve freeway infrastructure conditions including the aging Black River Bridge
- Create a more visible and accessible Welcome Center

The evaluation of alternatives included both numeric measures where appropriate along with evaluations that went beyond basic numbers. A complete evaluation of the alternatives cannot be completed based on numeric measures alone. Many issues such as improving security or flexibility are difficult to measure based on numbers. As a result the next section evaluates the Alternatives Carried Forward not only based on numeric measures but also based on more descriptive assessments of the benefits and drawbacks of the alternatives and how well they address the reasons for plaza improvements.

The Study Team developed a basic summary of the evaluation of alternatives. In this summary, the Study Team assigned one of four possible ratings for each alternative for each of the basic reasons for improvements. The ratings were defined as follows:

Adequate – The alternative meets the basic requirements for that particular reason for improvements.

More than Adequate – The alternative exceeds basic requirements for that particular reason for improvements.

Less than Adequate – The alternative meets some but not all of the basic requirements for that particular reason for improvements. A single "less than adequate" rating would not be grounds alone to eliminate an alternative as the Preferred Alternative.

Substantial Flaws – The alternative does not meet the basic requirements for that particular reason for improvements. A single "substantial flaws" rating would be enough to eliminate an alternative as the Preferred Alternative.

Table 2.3.1 summarizes how each of the Alternatives Carried Forward addresses each of the key reasons for improvements.

Table 2.3.1 Summary of Alternatives Evaluation

	No-Build	City East	City West	Township
Accommodate the latest inspection technologies and procedures	Substantial Flaws	Adequate	Adequate	Adequate
Provide flexibility to accommodate future unknown inspection technologies and procedures	Substantial Flaws	Adequate	Adequate	More than Adequate
Improve security	Substantial Flaws	Substantial Flaws	Adequate	Substantial Flaws
Provide facilities that ensure cars and trucks do not leave the plaza without being inspected	Less than Adequate	Adequate	Adequate	Adequate
Improve safety on the bridge, plaza, and I-94/I-69	Substantial Flaws	Adequate	Adequate	Less than Adequate
Accommodate projected 2030 traffic growth and potential future facility needs	Substantial Flaws	Adequate	Adequate	Adequate
Minimize backups on Highway 402 and I-94/I-69	Substantial Flaws	Adequate	Adequate	More than Adequate
Reduce vehicle and pedestrian conflicts on the plaza	Less than Adequate	Adequate	Adequate	Adequate
Improve local access	Substantial Flaws	Less than Adequate	Adequate	Less than Adequate
Improve freeway infrastructure conditions including the aging Black River Bridge	Substantial Flaws	Adequate	Adequate	Adequate
Create a more visible and accessible Welcome Center	Substantial Flaws	Adequate	Adequate	Adequate
Minimize routing of commercial traffic to local roads during maintenance operations	Substantial Flaws	Adequate	Adequate	Adequate

2.3.2 How Well Do the Alternatives Carried Forward Address the Reasons for the Improvements?

Accommodate the Latest Inspection Technology and Procedures

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	Adequate

Accommodate the Latest Inspection Technologies and Procedures:

The No-Build Alternative would not provide enough space to accommodate necessary inspection technologies and procedures. As outlined in **Chapter 1**, the existing plaza does not have enough office space for inspections, lacks space to unload cargo, does not have room for a designated impound area or space to construct and operate three Gamma-Ray Inspection Technology (GRIT) buildings. Each of the City East, City West and Township Alternatives provide the necessary space for CBP and other agencies to carry out their required inspection procedures and use the latest technology.

Provide Flexibility to Accommodate Future Unknown Inspection Technologies and Procedures

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	More than Adequate

Provide Flexibility to Accommodate Future Unknown Inspection Technologies and Procedures:

The No-Build Alternative lacks any remaining flexibility for new facilities, technologies, or procedures requiring any substantial space. CBP and MDOT have found ways to maximize the space on the existing plaza through moving MDOT maintenance facilities off of the plaza and a series of other minor interim improvements. Each of the City East, City West, and Township Alternatives provide GSA and CBP with the necessary 60 to 80 acre facility that is desired for new or expanded border crossings. The Build Alternatives have been developed to allow flexibility within the plaza footprint for future adjustments and alterations to deal with future unknown requirements and procedures.

Improve Security

No-Build	Substantial Flaws
City East	Substantial Flaws
City West	Adequate
Township	Substantial Flaws

Improve Security:

The Alternatives Carried Forward are substantially different in their ability to provide facilities that meet the security requirements of CBP and other agencies. Both the No-Build Alternative and the Township Alternative have substantial flaws when it comes to meeting the required security criteria for a new plaza. The City East Alternative addresses some but not all security concerns. The City West Alternative addresses all of the required security criteria.

An evaluation of the security of the proposed plaza must be looked at from the perspective of the primary mission of CBP. CBP's primary mission is to secure the border while facilitating legitimate trade and travel. The new plaza must serve this primary mission well. The following are key parts of the security evaluation of the alternatives based on this mission:

- Interdiction and containment of hazardous materials and contraband from entering the country including terrorists and their instruments.
- Vulnerabilities to terrorist attacks.
- Location and distribution of inspection staff and resources.
- Personal safety and security for inspection agents, plaza staff, and plaza users.

The No-Build Alternative has substantial flaws when it comes to security primarily because it does not provide the space for the new inspection technologies and procedures as discussed in the sections above. The No-Build Alternative also fails to provide secure separation of inspection functions and public uses. The No-Build Alternative maintains Pine Grove Avenue underneath key inspection areas of the plaza; having a major roadway underneath the plaza represents an elevated risk.

The City East and City West Alternatives meet the basic security criteria of allowing for the quick interdiction and containment of people and hazardous materials that threaten the country. They allow for radiation portal monitors and other key inspection equipment to be placed close to the border and provide fewer opportunities to avoid inspection.

Pine Grove Avenue runs underneath the elevated plaza

The City East and City West Alternatives reduce the vulnerability of the plaza by removing Pine Grove Avenue from underneath the plaza. However, the City West Alternative is superior to the City East Alternative because it moves all major north-south roadways past the locations of inspections. The City East Alternative still has a major traffic flow along the combined 10th Avenue/Pine Grove Avenue that runs under the location where the Blue Water Bridge connects with the plaza. CBP has indicated that having a major traffic route under a portion of the bridge/plaza is a serious security concern. Bridges and overpasses with the

highest vulnerability to threats are those that have higher volumes of traffic, are closer to the ground, and locations where an explosive device or other incident could shut down the entire crossing for an extended period of time. The Blue Water Bridge spans are less vulnerable as they are higher and the low traffic roadways underneath them are easier to monitor. For the City West Alternative, the relocated Pine Grove Avenue is bridged over top of the major plaza entrance and exit ramps but there are other entrance and exit ramps that could be used in case of an incident. The City East Alternative remains most vulnerable to an incident where the combined 10th Avenue/Pine Grove Avenue Corridor runs underneath the bridge/plaza connection.

The City East and City West Alternatives locate all of the key inspection functions at one location and avoid splitting of resources that could reduce security. They also provide adequate space and facilities so security between public functions and inspection functions can be maintained.

The Township Alternative has substantial flaws in addressing the security needs of an improved border crossing plaza. Although the Township Alternative includes several features such as 20-foot high walls with angled extensions and buffer zones to ensure people and contraband do not avoid inspection, the 1.5-mile corridor still introduces additional risk. The location of radiation portal monitors and hazardous materials containment are key issues. With the Township Alternative, potential hazards would be allowed 1.5 miles further into the United States before being detected. If portal monitors were placed closer to the border, additional staff and space for containment would be needed at the location of the existing plaza. The separation of inspection staff introduces additional vulnerabilities in responding to a threat or incident. It would decrease the effectiveness of CBP officers in accomplishing their mission. Additional staff resources would also be needed to monitor and address potential corridor breaches.

The secure corridor for the Township Alternative provides a much easier target for terrorists than the Blue Water Bridge itself or a new street-level plaza at the location of the existing plaza. The bridge over the Black River is especially vulnerable

because of the water access and the fact that it is a relatively low bridge. Pine Grove Avenue would also remain under the existing plaza and there would be ramps for the secure corridor over the M-25 Connector. All of these locations provide a convenient target for terrorists to interrupt access to the border crossing through use of an explosive device to destroy or damage these bridges. They are all locations where a severe incident could close the entire border crossing for an extended period of time. It is likely that the vulnerability at the Black River Bridge would restrict authorized access for boat traffic under the bridge.

The additional mile and half separation between the existing Blue Water Bridge and the proposed plaza for the Township Alternative also poses security concerns over the additional time required to respond to an incident either within this corridor or on the bridge. All emergency vehicles would be required to arrive and depart through the plaza and to be inspected. Emergency vehicle access to the plaza and bridge under the City East and City West Alternative are better than the existing plaza conditions and the Township Alternative as a result of additional local access connections, along with at-street level facilities. **Section 3.5 Public Safety and Security** discusses impacts to emergency access and security in detail.

As is the case with the other Build Alternatives, the Township Alternative provides adequate space and facilities so that security between public functions and inspection functions can be maintained. These are the only security related items that the Township Alternative adequately addresses.

Provide Facilities That Ensure Cars and Trucks Do Not Leave the Plaza Without Being Inspected

No-Build	Less than Adequate
City East	Adequate
City West	Adequate
Township	Adequate

Provide Facilities That Ensure Cars and Trucks Do Not Leave the Plaza Without Being Inspected:

Exit control booths to ensure that cars and trucks do not leave the plaza once sent to secondary inspection could be added for the No-Build Alternative. However, the No-Build Alternative does not have adequate space to avoid additional queues, traffic conflicts, and potential blocked traffic as a result of the addition of exit control.

All of the Build Alternatives provide the necessary space to ensure that cars and trucks sent to secondary inspection will

arrive and cannot exit secondary inspection without verification of being inspected. All of the Build Alternatives show exit control booths as part of their plaza layouts.

Improve Safety on the Bridge, Plaza, and I-94/I-69

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	Less than Adequate

Improve Safety on the Bridge, Plaza, and I-94/I-69:

The No-Build Alternative does not address safety issues on the Blue Water Bridge, Plaza, and I-94/I-69. The problematic mid-bridge weave as described in **Chapter 1** would remain. Existing conflicts between trucks exiting secondary inspection and cars and trucks leaving primary inspection booths would remain. There would be no separation of plaza and local traffic on I-94/69 at the Black River Bridge, leaving existing weave issues and traffic conflicts in place.

The City East and City West Alternatives address each of the key safety and traffic issues identified. They both eliminate the mid-bridge weave. They both provide space to allow better circulation on the plaza. Both of the City East and City West Alternatives separate local and border crossing traffic along I-94/I-69, eliminating weaves at the Black River crossing.

The Township Alternative also eliminates the mid-bridge weave and provides space for better circulation and reduced traffic conflicts on the inspection plaza. The Township Alternative would separate border crossing traffic from local traffic at the Black River and Water Street through the use of the secure lanes to the off-site plaza. However, the Township Alternative does not provide as much traffic separation for vehicles approaching the new plaza from the I-94/I-69 interchange and creates a potential weave movement between cars exiting the plaza to I-94 and local traffic trying to exit to I-69.

The Township Alternative introduces new potential safety issues. For the Township Alternative, the extended plaza roadway system between the existing Blue Water Bridge and the new plaza would pose significant challenges to providing emergency vehicle services to the plaza, the connecting corridor, and the bridge. Emergency vehicles and local law enforcement would only be able to access the secure corridor from the inspection plaza in Port Huron Township or from Canada. The secure corridor between the bridge and the plaza

would also pose enforcement issues as to how to police this corridor to ensure proper traffic control and speed.

Accommodate Projected 2030 Traffic Growth and Future Facility Needs:

The No-Build does not provide adequate space to accommodate future traffic or potential future facility needs. Each of the Build Alternatives provides the space and inspection booths required to accommodate projected traffic to the year 2030. The Township Alternative provides 30 acres of additional future space that could allow further plaza expansion for parking, building, technology or other facilities, as yet unidentified, but may be implemented in the future. The City East Alternative has 16 acres of additional land, which is mostly incorporated into buffer zones on the south side of the proposed plaza. The City West Alternative provides 12 acres of parking and buffer that could be used for future facilities as well as space to provide an expanded number of inspection booths.

Accommodate Projected 2030 Traffic Growth and Potential Future Facility Needs – Summary

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	Adequate

Minimize Backups on Highway 402 and I-94/I-69:

The No-Build Alternative does not provide facilities to minimize long-term backups on I-94/I-69 and on Highway 402 in Canada. Many interim improvements have been made on the existing plaza to help reduce backups. These include requirements for electronic pre-notification for truck shipments, conversion of inspection booths for use by both cars and trucks, increased inspection staffing, and an additional on-ramp lane to the plaza from I-94/I-69. These interim improvements will not address long-term potential backups resulting from traffic growth and/or new inspection procedures.

Minimize Backups on Highway 402 and I-94/I-69

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	More than Adequate

Modeling of future travel forecasts on the surrounding highway systems determined that all of the Build Alternatives will not result in traffic backups onto the adjacent highways under normal inspection conditions and full staffing. All of the Build Alternatives have the space for the necessary inspection booths and other facilities to minimize future backups. The City East and City West Alternatives provide approximately one mile of storage for vehicles headed to Canada and additional queue space for vehicles headed to the

United States. The Township Alternative includes 1.5 miles of secured three-lane roadway on the approach to both the United States plaza and the Canadian plaza, providing greater storage for vehicles waiting to enter into the United States or Canada. This storage would potentially be useful under higher alert levels when increased inspection procedures are required. It is not expected to be needed under normal operating conditions.

Reduce Vehicle and Pedestrian Conflicts on the Plaza

No-Build	Less than Adequate
City East	Adequate
City West	Adequate
Township	Adequate

Reduce Vehicle and Pedestrian Conflicts on the Plaza:

Vehicle and pedestrian conflicts exist between booths and other inspection areas for all alternatives. The No-Build Alternative has the fewest conflict points but features a much smaller plaza to handle the higher future traffic volumes at conflict points. The Build Alternatives will still have locations where pedestrian and vehicle paths must cross. There is enough space on the Build Alternative plazas so that pedestrian crossings can be designed to minimize conflicts with vehicles.

Improve Local Access

No-Build	Substantial Flaws
City East	Less than Adequate
City West	Adequate
Township	Less than Adequate

Improve Local Access:

The No-Build Alternative does nothing to improve local access to and from the plaza or on local roads surrounding the plaza. As congestion worsens in the vicinity of the plaza, local access may become worse.

The City East Alternative improves local access at several points including:

- Improvements at the Pine Grove Avenue/10th Avenue intersections
- Widening on Hancock Street and improvements at the Hancock Street and M-25 Connector intersections to handle future traffic
- A new access ramp between I-94/I-69 and the combined Pine Grove Avenue/10th Avenue
- Full access in all directions at the Lapeer Connector Interchange
- Separation of local traffic and traffic crossing the border before the Black River Bridge

The City East Alternative however, reduces local access through the relocation of Pine Grove Avenue and combination with 10th Avenue. This new combined roadway is expected to handle all of the traffic although there are concerns regarding emergency access as discussed in **Section 3.5 Public Safety and Security**. All other local access points would remain similar to existing conditions with minor changes such as potential roundabouts instead of traffic signals.

Looking north along Pine Grove Avenue from the plaza

The City West Alternative also improves local access at several points including:

- Improvements at the Pine Grove Avenue/10th Avenue intersections. Scott Avenue ends in two cul de sacs at this location but a roundabout is provided at 12th Street along the relocated Pine Grove Avenue for neighborhood access.
- A new access ramp between I-94/I-69 and the relocated Pine Grove Avenue.
- An intersection for Pine Grove traffic wishing to travel westbound on I-94/I-69.
- An intersection at the local plaza exit ramp to provide access to go either north or south on the relocated Pine Grove Avenue.
- Full access in all directions at the Lapeer Connector Interchange
- Separation of local traffic and traffic crossing the border before the Black River Bridge.

The City West Alternative reduces local access through the relocation of Pine Grove Avenue to the west. Part of the existing M-25 Connector would be replaced by the new roadway. The new roadway is expected to handle all of the traffic. Access to businesses on existing Pine Grove Avenue between Hancock Street and Riverview Street will remain but would be less direct. All other local access points would remain similar to existing conditions with minor changes such as potential roundabouts instead of traffic signals.

The Township Alternative improves local access at several points including:

- Improvements at the Pine Grove Avenue/10th Avenue intersections

- Widening on Hancock Street and improvements at the Hancock Street and M-25 Connector intersections to handle future traffic
- A new access ramp between I-94/I-69 and the combined Pine Grove Avenue/10th Avenue
- Full access in all directions at the Lapeer Connector Interchange
- Separation of local traffic and traffic crossing the border before the Black River Bridge through the use of the secure corridor

The Township Alternative reduces local access for border crossers. There would be no local access for border crossers at the existing plaza as all inspection would take place at the new plaza in the township. Border crossing traffic wishing to access locations near the existing plaza, in downtown Port Huron or north of Port Huron would use the M-25 Connector extension to connect with Pine Grove Avenue and other local roads. The trip out for inspection and back to Pine Grove Avenue would be approximately four additional miles.

Minimize Routing of Commercial Traffic to Local Roads During Maintenance Operations

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	Adequate

Minimize Routing of Commercial Traffic to Local Roads During Maintenance Operations:

The No-Build Alternative would still include single lane ramps that would have to be closed during maintenance, forcing plaza traffic to use local roads. All Build Alternatives minimize the routing of commercial traffic to local roads during maintenance operations by providing ramps that can be maintained without being closed.

Improve Freeway Infrastructure Conditions Including the Aging Black River Bridge

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	Less Than Adequate

Improve Freeway Infrastructure Conditions Including the Aging Black River Bridge:

The No-Build Alternative would not replace the Black River Bridge and other substandard freeway infrastructure. All Build Alternatives improve the freeway infrastructure along with the replacement of the Black River Bridge. However, the Township Alternative freeway improvements would present new challenges for maintenance and safety as discussed earlier due to the secure corridor.

Create a More Visible and Accessible Welcome Center:

The No-Build Alternative would retain the existing substandard Welcome Center. All Build Alternatives would relocate the Welcome Center to the township location which would increase its visibility and accessibility. However, with the Township Alternative the new Welcome Center would be located next to the new border plaza. MDOT indicated that this location is less desirable for a Welcome Center due to the activities taking place at the adjacent border plaza.

Create a More Visible and Accessible Welcome Center

No-Build	Substantial Flaws
City East	Adequate
City West	Adequate
Township	Less Than Adequate

Summary:

As illustrated in **Table 2.3.1**, the No-Build Alternative fails to address most of the parts of the reasons for plaza improvements. The City East Alternative addresses the reasons for improvements except for the security and emergency response issues related to having a major single north/south traffic movement underneath the connection between the Blue Water Bridges and the new plaza. This results in an unacceptable security risk for the City East Alternative. The City West Alternative adequately addresses all of the reasons for improvements and is the only alternative to do so. The Township Alternative adequately addresses most of the reasons for improvements. However, it is substantially flawed with regards to addressing plaza and border crossing security. It also has concerns regarding safety and substantial negative changes to local access. The Township Alternative does provide the largest plaza area in terms of flexibility for future needs and addressing traffic backups during high security events.

2.3.3 Costs

Cost is another potential factor in the evaluation of alternatives although it is not covered in the analysis of the reasons for improvements or the analysis of environmental impacts. Cost is not the key factor in determining the selection of an alternative but it is an important consideration.

The Study Team developed cost estimates for the construction of each of the Alternatives Carried Forward. The estimated costs for the Alternatives Carried Forward were developed by individually estimating the items that make up the largest

parts of the alternatives. The largest costs for the alternatives are:

- **Roadway Items** – such as pavement, curbs, and sewer systems
- **Earthwork** – removing the existing soil and placing new soil
- **Bridges** – all bridge items such as steel beams, and concrete foundations
- **Walls** – providing retaining walls to hold back soils, security walls around plaza, and noise wall in various areas
- **Buildings and Plaza Facilities** – toll booths, inspection booths, main buildings (not including the MDOT Welcome Center)
- **Miscellaneous Items** – such as lighting, landscaping, traffic signals and other improvements to the existing local roads
- **Right-of-Way** – the estimated cost of purchasing homes, businesses, and vacant properties affected by the alternatives

The cost estimates are not final and are based on how the Alternatives Carried Forward have been designed to date. The actual costs will depend upon the bidding process, where the contractors and their suppliers will eventually bid on and determine the price of the Selected Alternative. These cost estimates are based on 2007 average unit prices that are tracked by the Michigan Department of Transportation.

Table 2.3.2 contains the estimated costs for constructing the three Build Alternatives.

Table 2.3.2 Alternatives Cost Estimates - 2007 Dollars

Alternative	Construction Cost (millions)	Right-of-Way Cost (millions)	Contingencies Cost (millions)	Total Estimated Cost (millions)
No-Build	$0	$0	$0	$0
City East	$237	$150	$44	$431
City West	$232	$158	$43	$433
Township	$244	$150	$47	$441

These estimated costs do not indicate or suggest what the best alternative is, and they only show that the probable costs for each of the Build Alternatives are similar. The other sections of the document evaluate other features of the Alternatives Carried Forward. Cost is only one component in the determination of the Preferred Alternative.

2.4 The City West Alternative is the Preferred Alternative

The Study Team has identified the City West Alternative as the Preferred Alternative for the Blue Water Bridge Plaza Study. The designation as the Preferred Alternative does not mean that the City West Alternative has been formally selected as the final alternative for design and construction. Selection of the final alternative will not occur until after a Public Hearing has been held to review this DEIS, a Final EIS has been published addressing comments on the DEIS, and a Record of Decision has been issued by the Federal Highway Administration. The designation of a Preferred Alternative means that at this time the Study Team believes that the City West Alternative best addresses the reasons that plaza improvements are needed while minimizing impacts to the human and natural environment to the extent feasible. Comments on this DEIS may lead to further alternative changes, reductions in environmental impacts and/or new measures to mitigate for the impacts of the project.

What is a Preferred Alternative?

It is the alternative that has been identified as best meeting the purpose and need for the project while minimizing social, environmental and economic impacts.

The Study Team identified the City West Alternative as the Preferred Alternative after a long consultative process that included discussions with the cooperating agencies for the project, meetings with local officials and multiple public meetings. Further discussion on the process of developing alternatives is contained in **Section 2.1 Alternatives Development** while discussion of the coordination process is contained in **Chapter 6 Public and Agency Coordination**.

The Study Team's identification of the City West Alternative as Preferred was based upon the evaluation contained in **Section 2.3 Evaluation of Alternatives** and the environmental effects analysis contained in **Chapter 3 The Environment: What's There Now and Project Effects**. The following paragraphs briefly highlight the reasons behind the identification of the Preferred Alternative and the reasons the other alternatives are not preferred.

2.4.1 Key Reasons Why the City West Alternative is Preferred

The City West Alternative best addresses the reasons for plaza improvements and has specific advantages over the other alternatives with regards to security and community impacts for the plaza improvements.

Inspections and technology enhance safety and security at the border.

The City West Alternative is preferred for the safety and security of the border crossing. The City West Alternative avoids having a major roadway either underneath the inspection areas or the connection between the Blue Water Bridges and the plaza. All major roadway crossings and the Black River crossing are located past the inspection points on the plaza. This enhances the security of the facility and reduces the vulnerabilities of the plaza to a terrorist incident that could shut the border crossing down for a long period of time. The City West Alternative includes all of the inspection facilities required and space for expansion for additional facilities as traffic conditions and new technology create new demand. The Preferred City West Alternative also features a facility layout that is preferred by CBP and GSA.

The City West Alternative best addresses several current and future traffic issues on the local roads surrounding the plaza and enhances local access to and from the plaza. The City West Alternative would address current layout and traffic issues at the Pine Grove Avenue and 10th Avenue intersection as well or better than the other alternatives. It will also reduce current and future congestion at the Hancock Street and M-25 Connector and Hancock Street and Pine Grove Avenue intersections.

The City West Alternative would provide several local access enhancements including direct access from the plaza to local destinations north and south of the plaza. This is a substantial improvement over the indirect access provided by the No-Build Alternative and the four miles of extra driving required for local access for the Township Alternative. As is the case with the other Build Alternatives, the City West Alternative provides access in all directions at a redesigned Lapeer Connector Interchange, an additional enhancement for road access in the Port Huron area.

The Preferred City West Alternative also has key advantages when it comes to impacts to the human and natural environment. As discussed in **Section 2.3 Evaluation of Alternatives**, there are substantial security and safety concerns with relocating the plaza to Port Huron Township. The City West Alternative has similar impact to the community in terms of relocations of homes and impacts to the local tax base of the two alternatives that expand the plaza at its existing site. The City West Alternative would relocate 18 fewer homes than the City East Alternative, although there are three more business relocations with the City West Alternative than the City East Alternative. The City West Alternative reduces the local tax base by about $700,000 less compared to the City East Alternative. Although the Township Alternative would have fewer relocations than either of the city alternatives, the lower relocation count does not compensate for the security, safety, visual and local access impacts of the Township Alternative.

The City West Alternative also provides better north-south local access around the new plaza than the City East Alternative. 10th Avenue would provide north-south access on the east and the relocated Pine Grove Avenue would provide north-south access to the west. Emergency access to neighborhoods surrounding the plaza would be better maintained with the City West Alternative. Emergency responders would still be able to use 10th Avenue or the relocated Pine Grove Avenue as a north-south alternate route if one or the other became blocked by an accident or other incident. Emergency Access to the plaza would be maintained as it is currently, through gated access from local streets.

Port Huron Number 4 Fire Station

The City West Alternative would provide a superior visual entrance to the City of Port Huron and the Port Huron area when compared to the other alternatives. The boulevard feature of the City West Alternative could provide a better visual connection to City of Port Huron destinations both north and south of the plaza. There is less opportunity to create visually appealing connections for the City East Alternative due to property and bridge pier location constraints on the combined 10th Avenue/Pine Grove Avenue. The security features for the secure corridor for the Township Alternative would make it very difficult to provide a visually

pleasing welcome to the Port Huron Area and the United States.

The City West Alternative has the same effects on natural resources as the City East Alternative and fewer natural resource impacts than the Township Alternative. This includes fewer wetland impacts and less pavement width at stream crossings.

As illustrated in **Table 2.3.2 Alternatives Cost Estimates** in **Section 2.3 Evaluation of Alternatives,** the City West Alternative has comparable construction and right-of-way costs as the other Build Alternatives. However, the City West and City East Alternatives will include lower long-term maintenance and staffing costs than the Township Alternative. The extra facilities to provide a secure corridor along I-94/I-69 will result in additional long-term maintenance costs for the Township Alternative. The major agencies that will have staff on the plaza have all indicated that the Township Alternative will require more staff to provide the same level of security and service for those crossing the border.

2.4.2 Key Reasons Why Other Alternatives are not Preferred

The following paragraphs briefly outline the key reasons why the Study Team did not identify other Alternatives Carried Forward as the Preferred Alternative. The full evaluation of the alternatives is contained throughout this DEIS and this section only highlights reasons why the other alternatives are not preferred.

Existing Vehicle Primary

No-Build Alternative: The No-Build Alternative is not preferred because it fails to address most of the reasons for plaza improvements as discussed in **Section 2.3 Evaluation of Alternatives**. The No-Build Alternative does not have the space to address existing or future inspection, security, and traffic needs as the existing plaza is approximately 18 acres and CBP requires between 60-80 acres in order to complete their mission at the border. The Study Team determined that although there are substantial impacts of the Build Alternatives, they do not outweigh the deficiencies of the

existing plaza. As a result, the No-Build Alternative is not preferred.

Pine Grove Avenue

City East Alternative: While the City East Alternative addresses most of the reasons for plaza improvements, it is substantially flawed. There are two key areas of concerns for the City East Alternative:

- The combining of Pine Grove Avenue and10th Avenue the security, circulation, and emergency access issues it creates

- The additional impacts to homes, businesses, and the local property tax base when compared to the City West Alternative

The relocation of Pine Grove Avenue to 10th Avenue leaves a major roadway running underneath the connection between the Blue Water Bridges and the plaza. This high-traffic volume running underneath parts of the Blue Water Bridges that are closer to street level leaves the border crossing more vulnerable to a terrorist action. The combined segment of Pine Grove Avenue and 10th Avenue also could affect emergency response times to neighborhoods and businesses north and south of the plaza in the event of an incident on the combined roadway that would block traffic. With the City West Alternative, emergency responders would still be able to use 10th Avenue on the east side of the plaza and the relocated Pine Grove Avenue on the west side of the plaza.

The City East Alternative would relocate 18 more homes and impact $700,000 more of the City of Port Huron's tax base than the City West Alternative. Other major impacts for the two alternatives are similar. One benefit of the City East Alternative when compared to the City West Alternative is that there would be no adverse effect on the E.C. Williams House. However, the Study Team concluded that the failure of the City East Alternative to address key parts of the reasons for improvements such as security and safety was not acceptable. As a result, the City West Alternative has been identified as the Preferred Alternative.

Township Alternative: The Township Alternative fails to adequately address three of the reasons for plaza improvements as discussed in **Section 2.3 Evaluation of Alternatives.** There are four key concerns for the Township Alternative:

- The secure corridor concept introduces additional security risks for the border crossing.
- The secure corridor would not provide good access for emergency responders dealing with an incident on the plaza.
- The secure corridor would create a visually divisive and aesthetically unappealing border crossing.
- Border crossers traveling to destinations north of or near the existing plaza would travel four additional miles, reducing the likelihood of short stops at businesses in the Port Huron area.

The Township Alternative would prevent traffic from exiting at Pine Grove Avenue

The Township Alternative has substantial flaws in addressing the security needs of an improved border crossing plaza. With the Township Alternative, potential hazards would be allowed 1.5 miles further into the United States before being detected. The secure corridor for the Township Alternative also provides an easier target for terrorists than the Blue Water Bridge itself or a new street-level plaza at the location of the existing plaza.

The Township Alternative also poses security concerns over the additional time required to respond to an incident either within the secure corridor or on the Blue Water Bridge. All emergency vehicles would be required to arrive and depart through the United States or Canadian plazas and be inspected.

The secure corridor would include minimum 20-foot high walls with four foot angled extensions as well as fenced buffer zones. These would create a 1.5 mile walled barrier between parts of the City of Port Huron and Port Huron Township that would not be visually appealing to border crossers or residents of the area.

The Township Alternative reduces local access for border crossers. There would be no local access for border crossers at

the existing plaza as all inspection would take place at the new plaza in the Township. The trip out for inspection and back to Pine Grove Avenue would be approximately four additional miles. The businesses near the existing plaza and at the Water Street interchange would be effectively bypassed, decreasing the likelihood short stops at businesses in the Port Huron area by border crossing traffic.

The Township Alternative would have lower community impacts in terms of relocations of homes and businesses and impacts to the local property tax base. The Township Alternative would also have slightly higher effects on natural resources including increased wetland impacts and wider pavement over stream crossings. The Study Team concluded that the failure of the Township Alternative to address key parts of the reasons for improvements such as security, safety, and local access was not an acceptable compromise for the lower property impacts. As a result, the Township Alternative is not preferred.

CHAPTER 3

THE ENVIRONMENT: WHAT'S THERE NOW AND PROJECT EFFECTS

This chapter presents an analysis of the potential effects of the Practical Alternatives for the United States Blue Water Bridge Plaza on people and the environment. Members of the Study Team, including planners, engineers, scientists, and biologists, completed studies of the different potential effects of the alternatives. A summary of these studies is presented here. For several of the potential effects, Study Team members completed detailed technical reports. A list of the technical reports completed for the study is found in **Appendix A** and the reports are available upon request.

The analysis for each of the potential effects is made up of three parts.

- A brief discussion of the methods used in the analysis
- A discussion of the existing conditions in the Study Area to provide background information
- The analysis of the potential effects of the No-Build Alternative, City East Alternative, City West (Preferred) Alternative, and Township Alternative

A map of the Study Area and exhibits of the Alternatives are contained in **Appendix E,** which is a separate volume that accompanies this DEIS. These exhibits can be referred to while reading the analysis of the potential effects of the Alternatives.

What are Potential Effects?

Potential effects are impacts or changes that could occur as a result of proposed improvements. The effects may be ecological, aesthetic, historic, cultural, economic, social, or health related. Examples might include how increased noise levels from traffic flow would affect nearby residents, or how the filling of wetlands as part of the construction of a new plaza would affect local habitat.

What is a Technical Report?

A technical report focuses on an environmental topic of concern such as noise, air quality, wetlands, or other built or natural resources. It presents a detailed analysis of the existing conditions for that environmental issue and discusses how the project alternatives may affect that particular area of concern. It often includes recommendations on how to best avoid or minimize adverse effects to that particular part of the environment.

3.1 Land Use and Zoning

This section discusses the existing land use and zoning conditions within the Study Area and examines the impacts and compatibility of the alternatives on existing and future land uses. The Study Area is located in the northern part of the City of Port Huron and Port Huron Township, in St. Clair County, Michigan. The Black River serves as a boundary between the two jurisdictions in the Study Area. The City West Preferred Alternative and City East Alternative would mostly affect land uses in the City of Port Huron. The Township Alternative would affect land uses in the City of Port Huron and Port Huron Township. **Figure E.20 on page E-29** of **Appendix E** illustrates the planned land uses in the Study Area.

Residential Land Uses in City of Port Huron

Residential Land Uses in Port Huron Township

Local Planning Documents: The City of Port Huron completed a Comprehensive Plan in early 2003. The Comprehensive Plan included mapping of existing land uses and a zoning map. The City also has a Zoning Ordinance that was updated in 2004. The Charter Township of Port Huron adopted a Zoning Ordinance and Regulations to guide development within the Township. The Zoning Ordinance also includes a zoning map.

The City of Port Huron Comprehensive Plan Summary describes the Blue Water Bridge as "an important gateway" and states that "Port Huron should contribute to enhancing the efficiency and beauty of this important transportation element."[1] The St. Clair County Master Plan describes the the Blue Water Bridge as "a unique and key element in St. Clair County's transportation network…" and recognizes that substantial commercial traffic growth will continue to occur with the opening of the second span.[2] Attendance at Blue Water Bridge Plaza Study meetings was part of the preparation for the St. Clair County 2030 Long Range Transportation Plan which states that "the Blue Water Bridge Plaza is under further study and may expand its current facilities to meet ongoing needs for both customs and

[1] City of Port Huron Comprehensive Plan Summary (2003), Chapter 7: Transportation, 58.

[2] St. Clair County Master Plan (2000), Pages 70, 90.

traffic…this gateway will remain a critical access point for passenger and freight traffic…"[3]

3.1.1 What are the Land Uses in the Study Area?

Both the City of Port Huron and Port Huron Township have zoning ordinances that were updated in 2004. There are various land uses within the Study Area. These land uses include single-family residential, multiple family residential, commercial, and public facilities. The following sections describe the Study Area land uses and the existing local planning documents guiding future land uses.

Table 3.1.1 lists the existing land uses in the City of Port Huron, Port Huron Township and St. Clair County.

Table 3.1.1 Existing Land Use in Study Area Communities

Land Use Type	City of Port Huron (acres)		Port Huron Township (acres)		St. Clair County (acres)	
Single-Family	2,601	(50%)	2,681	(32%)	61,868	(13%)
Multiple-Family	229	(4%)	26	(0%)	659	(0%)
Commercial and Office	544	(10%)	195	(2%)	3,072	(1%)
Institutional	500	(10%)	178	(2%)	2,026	(0%)
Industrial	630	(12%)	390	(5%)	4,276	(1%)
Transportation, Communication, and Utility	128	(2%)	650	(8%)	7,102	(2%)
Cultural, Outdoor Recreation, and Cemetery	302	(6%)	368	(4%)	4,458	(1%)
Active Agriculture	0	(0%)	256	(3%)	242,034	(52%)
Grassland and Shrub	150	(3%)	1,556	(19%)	50,882	(11%)
Woodland and Wetland	38	(1%)	1,759	(21%)	82,714	(18%)
Extractive and Barren	0	(0%)	0	(0%)	1,793	(0%)
Water	104	(2%)	181	(2%)	1,835	(0%)
Under Development	20	(0%)	147	(2%)	1,386	(0%)
Total Acres	**5,246**		**8,387**		**464,105**	

Source: SEMCOG Community Profiles at www.semcog.org. Data for 2000.

[3] St. Clair County 2030 Long Range Transportation Plan (2004), Page 24.

Both developed and undeveloped land can be found in the Study Area. Developed lands are primarily found east of the Lapeer Connector interchange with I-94/I-69 and continue east to the St. Clair River, including parts of Port Huron Township and the City of Port Huron. These developed lands include various land uses, including residential, commercial, and recreational.

Open Space in Western Part of Study Area

Undeveloped lands are generally found west of the Lapeer Connector in Port Huron Township. Existing undeveloped lands are either wooded or open fields including a large tract of vacant land directly north and east of the MDOT maintenance facility located on I-94/I-69. Existing and planned land uses in the Study Area are very similar with the exception of the proposed plaza location site for Township Alternative. This location is currently open space but is planned for residential use.

Chippewa Middle School

Study Area Land Uses: In order to adequately describe existing land uses in the Study Area, the corridor was divided into three general geographic areas:

- The I-94/I-69 Interchange east to the Lapeer Connector (Port Huron Township)
- The Lapeer Connector to the Black River (Port Huron Township)
- East of the Black River (City of Port Huron)

I-94/I-69 Interchange – Lapeer Connector: The I-94/I-69 Interchange to the Lapeer Connector area is generally undeveloped with some areas of development in close proximity to the interstate. Undeveloped land in this corridor is either wooded or in open space uses. Most of the existing development occurs along Lapeer Road focusing on community services rather than highway services. A large MDOT maintenance facility is located adjacent to and south of the existing eastbound lanes of I-94/I-69 and a manufactured housing residential area is located west of the interstate and north of Lapeer Road. Other areas of development in this corridor include single-family housing and a church campus, all located south of West Water Street and north of an existing open field adjacent to the interstate. The Chippewa and Central Middle Schools properties are located on the southern

edge of the Study Area in Port Huron Township, west of the Lapeer Connector.

The Zoning Ordinance and Map for Port Huron Township provides guidelines as to how these lands will likely be developed now and in the future. Existing zoning districts in this part of the Study Area include:

- R-1 One Family Residential – Located north of the interstate and generally allows for family residential development.
- RMH Manufactured Housing – Encompasses the existing manufactured housing area directly west of the interstate and generally allows for manufactured housing developments.
- B-2 Community Business – Located north and south of Lapeer Road and generally allows for commercial development that offers a broad range of goods and services.
- RM-1 Multiple Family Residential – Located south and east of the interstate and generally allows for single family dwellings, town homes, apartments, and row homes.
- PSP Public/Semi-Public – Located immediately southwest and adjacent to the I-94/I-69/Lapeer Connector ramps.

Stocks Creek Manufactured Housing Complex

The existing Zoning Ordinance for the Township has designated undeveloped land in the Study Area suitable for low-density residential (R-1) development.

Lapeer Connector – Black River: The Lapeer Connector to Black River corridor area contains both developed and undeveloped/recreational lands. This part of the corridor contains the Water Street interchange with I-94/I-69, where a Michigan Welcome Center is located between the westbound off ramp and the westbound freeway lanes. A large privately owned marina is located immediately south of and adjacent to the eastbound interstate between Black River and Water Street. An established commercial area south of the interstate runs parallel to the interstate between the Lapeer Connector and Water Street. North of the interstate, a public campground is located directly adjacent to the Lapeer Connector ramps from the Water Street interchange. A

Bridge Harbor Marina

township park/open space is found directly west of the Black River on the north side of the interstate.

The Port Huron Township Zoning Map indicates that existing zoning districts in this part of the Study Area include:

- B-3 General Business – Abutting the southern edge of the Right-of-Way (ROW) and north of the Water Street interchange and generally permits intensive commercial development including auto-oriented districts. Undesirable impacts generated by uses in this district render it inappropriate to locate residential uses adjacent unless extensive buffering is provided.
- PSP Public/Semi-Private – Located east and west of the Water Street interchange encompassing the existing campground and open space abutting the Black River and generally reserved for open space, greenbelts, and wooded areas.

East of Black River: The portion of the Study Area located east of the Black River is entirely within the City of Port Huron. This area is entirely developed, with no designated open space or vacant land adjacent to the existing plaza. There are two primary land uses in the vicinity of the plaza: low-medium density residential and medium density commercial. Generally, residential areas next to the plaza to the north and south contain pre-1950s housing. Institutional land uses surrounding the existing plaza consist of MDOT facilities, a Detroit Edison substation, and several churches.

Condominiums West of the Existing Plaza

The City of Port Huron Zoning Map indicates that the existing zoning districts in this part of the Study Area are:

- R-1 1&2 Family Residential – Located in all residential areas north and south of the existing plaza and includes both single family and two-family (duplex) developments.
- A-1 Multifamily Residential – Small district located immediately adjacent to Blue Water Gateway business district north of the plaza and generally allows lower-density multifamily developments such as apartments, town homes, and small scale condominium developments.

Existing Blue Water Gateway Business District

Business in Blue Water Gateway Business District

Pine Grove Avenue Mixed-Use Area

- C-1 Commercial – Located north and south of the existing Blue Water Bridge Plaza and contains both Blue Water Gateway and Pine Grove Avenue Mixed Use Districts – allows a wide range of commercial developments, including simple neighborhood services to regional shopping attractions.

The City of Port Huron Comprehensive Plan identified two commercial districts in the vicinity of the existing plaza as areas that are slated for enhancement. The City of Port Huron Comprehensive Plan Summary proposes to "create a Blue Water Gateway Business District that offers businesses that serve travelers crossing the USA/Canada border a high quality entrance to the community"[4] and states, "to best serve motorists, uses within this district need to be auto-oriented including drive-through and sit-down restaurants, gas stations, car washes, groceries, and convenience stores."[5] This district will build on the existing commercial land uses located north of the existing plaza. Enhancements to the district could include cohesive building designs, welcoming gateway treatments, and better signage. Currently, this area is an auto-oriented business area, which includes multiple gas stations and fast food restaurants as well as a bowling alley, a hotel, a car dealership, and the existing duty free store.

The City of Port Huron Comprehensive Plan describes the Pine Grove Avenue Mixed-Use Area as a separate land use category established to guide development along Pine Grove Avenue between Harker and Whipple. The area is to serve as a transition between the Blue Water Gateway Area and the downtown. Improvements are encouraged that would attract visitors into the nearby downtown area and promote high-quality development. Encouraged uses include neighborhood commercial, office, and medium and high density residential. This business area currently consists of a mix of gas stations, car dealerships, professional and para-professional offices (dentists, physiotherapists, real estate agents, etc.), and service businesses (heating and cooling, cell phone providers, etc.). It is generally aimed at serving the

[4] City of Port Huron Comprehensive Plan Summary (2003), Appendix 9: Implementation, Page 3.

[5] City of Port Huron Comprehensive Plan Summary (2003), Appendix 3: Land Use, Page 17.

surrounding neighborhoods with local service businesses and offices.

3.1.2 How Will the Alternatives Affect Land Use?

The following sections discuss the impacts of the alternatives on land uses within and adjacent to the Study Area. The compatibility of the alternatives with local zoning ordinances is also discussed. Potential impacts to land uses in communities outside the Study Area are discussed in **Section 3.7 Indirect and Cumulative Impacts**.

Assumptions and Methodologies: The Study Team analyzed local land use plans and zoning ordinances for the communities located in the Study Area. Meetings were held with local officials to discuss land use and zoning impacts of the alternatives. Local units of government consulted include: The City of Port Huron, Port Huron Township, St. Clair County, and the Southeast Michigan Council of Governments (SEMCOG). The discussion of land use and zoning compatibility is based on the planning and development data and future land use plans available at the time of the analysis.

No-Build Alternative: The No-Build Alternative would have few impacts on land use policies and decisions within the Study Area. Future land use plans by both the City of Port Huron and Port Huron Township anticipate that the Blue Water Bridge Plaza would continue to function as-is and in its current location. As a result, the plaza would have no impact on those policies. Existing land uses would not be impacted because the plaza would maintain its current footprint and would not encroach upon adjacent development. Increased plaza congestion along with the associated potential noise and air quality issues may impact adjacent residential areas but are unlikely to cause widespread conversion to other land uses.

The increases in local traffic expected by 2030 would likely result in major bottle necks and queues at several intersections which will ultimately cause gridlock in the entire network. This could impact access to local businesses.

City East Alternative: The expansion of the existing Blue Water Bridge Plaza at ground-level would impact existing residential

and commercial development within the City of Port Huron. The proposed ground level plaza would encompass an area roughly bordered by the existing M-25 Connector on the west, Hancock Street on the north, 10th Avenue on the east, and both sides of Scott Avenue on the south. This area currently contains functioning residential and commercial land uses. Residential areas both north and south of the existing plaza would be impacted, resulting in relocations. The condominiums east of the Black River and north of the interstate would be converted to open space for expansion of the Black River Bridge and freeway. In Port Huron Township, existing open space would be converted for use as an MDOT Welcome Center. This land is currently designated for residential use.

The City East Alternative would absorb the majority of the Blue Water Gateway business district through the plaza expansion, also resulting in the displacement of businesses. Much of the existing Pine Grove Avenue Mixed Use Area would be impacted as well. The relocation of Pine Grove Avenue and related improvements would result in the displacement of several blocks adjacent to the roadway west and south of the proposed plaza expansion. Businesses may be interested in relocating as close as possible to the new plaza to remain within or close to designated business districts which could result in the conversion of the homes immediately surrounding the plaza to business sites. The zoning in this area would need to be changed in order to support business activities.

City West (Preferred) Alternative: The expansion of the Blue Water Bridge Plaza at ground level will have similar land use impacts as the City East Alternative on a slightly smaller scale. Improvements to the plaza will impact existing residential and commercial development within the City of Port Huron. The proposed plaza would encompass the area from M-25 Connector on the west, Hancock Street to the north, 10th Avenue on the east and Scott Avenue on the south. Land use categories located in this area include commercial and residential. Residential areas north and south of the plaza would be impacted and would result in relocations. The condominiums east of the Black River and north of the interstate would be converted to open space for expansion of

the Black River Bridge and freeway. In Port Huron Township, existing open space would be converted for use as an MDOT Welcome Center. This land is currently designated for residential use.

The Preferred Alternative will also absorb a substantial part of the Blue Water Gateway business district which will result in the displacement of businesses. This alternative will also affect the Pine Grove Avenue Mixed Use Area. The rerouting of Pine Grove would also result in the displacement of several blocks located directly west and south of the proposed plaza expansion. Conversion of homes to businesses directly surrounding the plaza may occur if businesses are interested in relocating within close proximity of the plaza. If this occurs the zoning in this area would need to be changed.

Township Alternative: The Township Alternative has several possible impacts and implications for existing and future land use planning in the Study Area. The Township Alternative would relocate the existing plaza from its current site in the City of Port Huron to the open space north of the existing MDOT maintenance facility and interstate in Port Huron Township. As a result, the Township Alternative would have potential impacts to existing land uses as follows:

The Township Alternative would convert open space into plaza use

- Existing open space designated for residential use would be converted for use as a ground-level plaza, including commercial truck parking.

- Existing single-family housing and the church campus immediately adjacent to the existing open space would likely be impacted.

- The MDOT maintenance facility would be relocated and incorporated into the proposed plaza.

- The condominiums east of the Black River and north of the M-25 Connector ramps would be converted for lane expansions.

- Existing businesses and residences along the west side of Pine Grove Avenue and south of the existing Blue Water Bridge Plaza would be converted to accommodate lane

expansions and improvements to Pine Grove Avenue and the Pine Grove/Scott Avenue intersection.

- Existing businesses adjacent to westbound lanes of Hancock Avenue between the M-25 Connector and Pine Grove Avenue would be impacted due to improvements to the M-25 Connector, Hancock Street, and Pine Grove Avenue. (Impacts are discussed further in **Section 3.7 Indirect and Cumulative Impacts.)**

3.1.3 Are the Alternatives Consistent with Local Zoning and Ordinances?

Current zoning and future land use planning guidelines for the City of Port Huron and Port Huron Township demonstrate how land within the Study Area can be developed now and in the future. The following zoning categories are located within the Study Area:

City of Port Huron:

R-1 – One family residential
A-1 – Multi-family residential
C-1 – Commercial

Port Huron Township:

B-2 – Community Business
B-3 – General Business
R-1 – Single Family Residential
RM-1 – Multiple Family Residential
PSP – Public/Semi-Public
RMH – Manufactured Housing

No-Build Alternative: The No-Build Alternative would be consistent with local planning in the City of Port Huron and Port Huron Township. This alternative would have no impacts on land use policies and zoning within the Study Area.

City East Alternative: The current and planned zoning and land uses in the Study Area are not consistent with the needs of the City East Alternative. This alternative involves the expansion of the existing Blue Water Bridge Plaza at ground

level essentially affecting the residential and commercial establishments in the area. The proposed plaza and transportation related land uses would not be compatible with the local plans for the blocks it affects. The City of Port Huron Zoning Ordinance restricts residential properties to 2.5 stories and commercial properties to three stories. Any plaza facilities exceeding these height requirements would not be compatible with the zoning ordinance.

City West (Preferred) Alternative: The Preferred Alternative like the City East Alternative is not consistent with current and planned zoning and land uses within the Study Area. This Alternative will affect commercial and residential establishments with the expansion of the existing Blue Water Bridge Plaza down to ground level. The proposed plaza and transportation related land uses would not be compatible with the local plans for the blocks it affects. The City of Port Huron Zoning Ordinance restricts residential properties to 2.5 stories and commercial properties to three stories. Any plaza facilities exceeding these height requirements would not be compatible with the zoning.

Township Alternative: The Township Alternative would not be consistent with current and planned land use practices within the Study Area. Areas within this alternative that would need to be rezoned are R-1 (one family residential) and B-3 (general business). Current open space zoned for residential use along the west side of Pine Grove would be absorbed by the expansion and would therefore require zoning changes. The proposed plaza is not compatible with the current residential zoning in this area. The Port Huron Township zoning ordinance has a maximum allowable height of 2.5 stories in business zones and two stories in residential zones. Any plaza facilities exceeding these height requirements would not be compatible with the zoning ordinance.

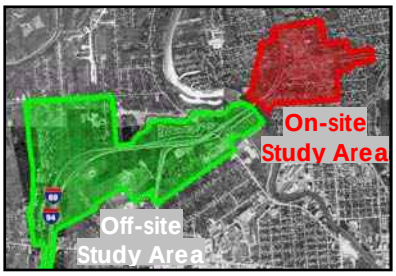
The Port Huron Township zoning ordinance has maximum allowable noise and glare levels for certain districts. Noise impacts from a proposed new plaza in Port Huron Township are discussed in **Section 3.10 Noise,** while lighting levels and glare are discussed in **Section 3.8 Aesthetic and Visual Impacts.**

3.2 Community and Neighborhood Impacts

This section discusses how the Alternatives would affect the local residents, neighborhoods, and community facilities. The section begins by providing a profile of the Port Huron Area and the Study Area. It explains who lives in the community, how they travel, and where schools and other community facilities are found. The last part of this section explains how the proposed plaza alternatives would affect the neighborhoods and community facilities.

3.2.1 Description of the Existing Communities and Neighborhoods

The Study Area is located north of downtown Port Huron around the existing Blue Water Bridge Plaza and along I-94/I-69 in Port Huron Township. **Figure E.1,** located in the separate **Appendix E** volume, provides a map of the Study Area.



Location of On-site and Off-site Study Areas

For the community analysis, the blocks surrounding the existing plaza in the City of Port Huron are referred to as the On-site Study Area. This area includes a mixture of businesses including restaurants, gas stations, and professional offices. The On-site Study Area includes a number of established lower-middle class neighborhoods consisting mainly of single family homes built primarily between 1900 and 1950. **Section 3.1 Land Use and Zoning** contains further discussions of the land uses in the Study Area. The existing plaza and the M-25 Connector serve as dividing points between neighborhoods located to the south, east, and west of the plaza. No active neighborhood associations were identified in the On-site Study Area.

Homes in the Neighborhood Surrounding the Existing Plaza

The portion of the overall Study Area in Port Huron Township is referred to as the Off-site Study Area in this community analysis. This area includes the group of businesses at the Water Street Interchange and the neighborhoods off of Maywood Drive, Eastland Road, Westland Road, and West Water Street that surround the potential plaza site for the Township Alternative. The businesses at the Water Street Interchange include gas stations, restaurants, and hotels. The neighborhoods surrounding the potential plaza site for the

Township Alternative consist primarily of middle-class homes built in the past 25 years. There is a manufactured housing residential community located west of the I-94/I-69 highway, just north of Lapeer Road. This community will not be affected by the build alternatives. No active neighborhood associations were identified in the Off-site Study Area.

Homes located in the blocks next to the boundaries of the Study Area were included in the neighborhood and community analysis to ensure that impacts on neighborhoods slightly further away from the alternatives were considered.

3.2.2 How Was a Community Assessment of the Existing Community Developed?

The Study Team used information from the United States Census Bureau, the Southeast Michigan Council of Governments (SEMCOG) and other resources to develop a general profile of the residents in the Blue Water Bridge Plaza Study Area. Information on age, race, and income are displayed in the charts and tables that follow in this section.

What is Considered a Block?

A block refers to a census block which is made up of one or more actual neighborhood blocks depending on the density of the local population.

The Study Team looked at population information for the blocks in the Study Area, the City of Port Huron, Port Huron Township, St. Clair County, and the State of Michigan. Site visits and meetings with local officials, stakeholders, residents and business owners in and surrounding the Study Area were also conducted. A listing of these meetings is included in **Chapter 6 Public and Agency Coordination**.

The Study Area was divided into two parts to allow the Study Team to examine the effects of the proposed plaza for each of the alternatives. The On-site Study Area, which is the location for the plaza for the City East and City West Alternatives, consists of 29 census blocks in the City of Port Huron. The Off-site Study Area for the Township Alternative plaza, to be located in Port Huron Township, consists of five census blocks. The City East and the City West Alternatives include improvements to I-94/I-69 in Port Huron Township and the Township Alternative includes local road improvements near the existing plaza. The Study Team considered these roadway improvements in the analysis of community impacts.

3.2.3 Who Lives in the Port Huron Area and the Study Area?

Based on information obtained from the 2000 United States Census, the Study Team compared the populations affected by the alternatives. The 29 census blocks that comprise the On-site Study Area, located within the City of Port Huron, include 1,311 residents.

The Off-site Study Area, located in Port Huron Township, has a population of 640 residents located within five census blocks.

Within the On-site Study Area and the Off-site Study Area the two largest minority groups are African-Americans and Hispanic or Latinos. A detailed discussion on minority populations within the Study Area can be found in the Environmental Justice Section of the DEIS (**Section 3.3 Environmental Justice).**

Age and Gender: **Table 3.2.1** and **Figures 3.2.1** and **3.2.2** show the age and gender profiles for the Study Area, the City of Port Huron, Port Huron Township, St. Clair County, and the State of Michigan.

The On-site Study Area surrounding the existing plaza has a higher percentage of females (54.1 percent) than males (45.9 percent). The Off-site Study Area has close to an equal number of females and males. The population of the On-site Study Area is generally younger than the Off-site Study Area. The On-site Study Area has a higher percentage of children than the Off-site Study Area, the City, the Township, the County, and the State. The Off-site Study Area has a higher percentage of people over 65 than the On-site Study Area, the City, the Township, the County, and the State. In both cases the differences are less than ten percent, however, it does indicate there are more families with children in the blocks around the existing plaza and more seniors in the potentially affected parts of Port Huron Township.

Table 3.2.1 Age and Gender Assessment

Population Characteristics	On-Site Study Area	Off-Site Study Area	Total Study Area	Port Huron Township	City of Port Huron	St. Clair County	Michigan
Total Persons	1,311	640	1,951	8,615	32,338	164,235	9,938,444
Under 18	28.2%	22.0%	26.2%	25.8%	27.0%	26.8%	26.1%
18 to 64	59.1%	63.0%	60.4%	61.7%	59.0%	61.0%	61.6%
65 and older	12.7%	15.0%	13.4%	12.5%	14.0%	12.2%	12.3%
Female	54.1%	49.7%	52.6%	50.7%	52.4%	50.7%	51.0%
Male	45.9%	50.3%	47.4%	49.3%	47.6%	49.3%	49.0%
Households	500	268	768	3,310	12,961	62,072	3,785,661

Source: U.S. Census Bureau, Census 2000

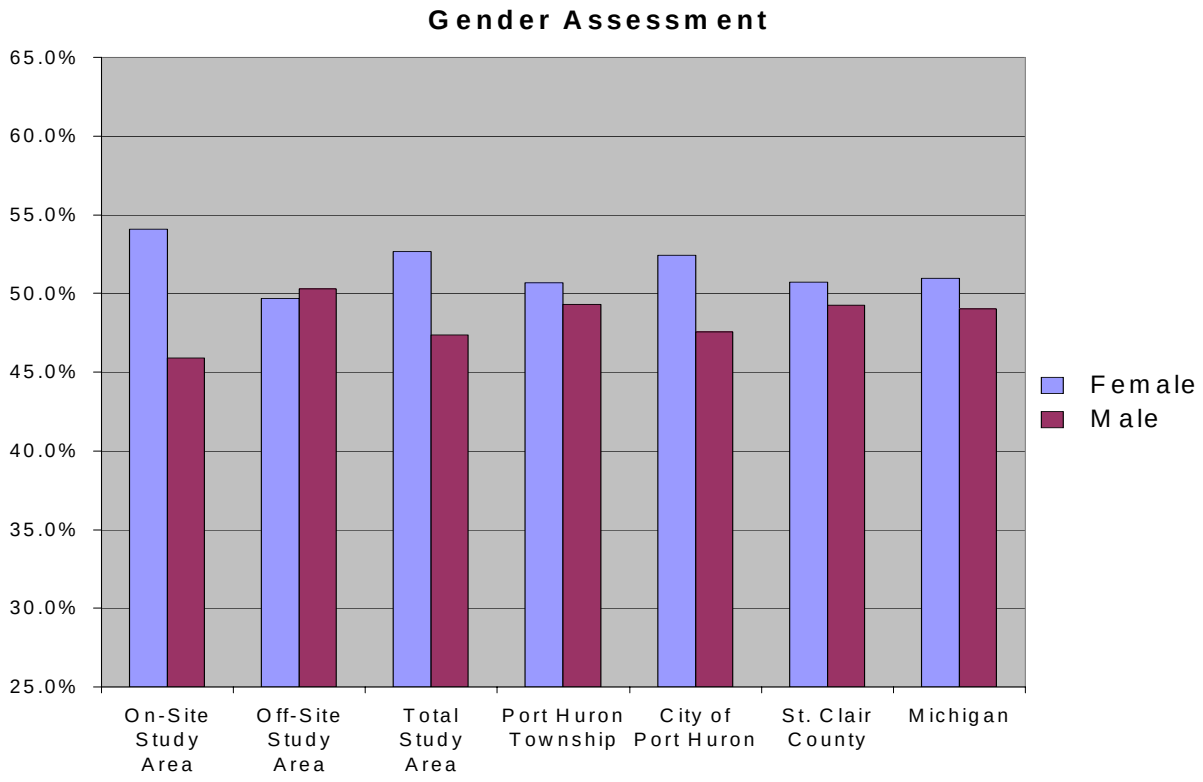


Figure 3.2.1 Gender Assessment

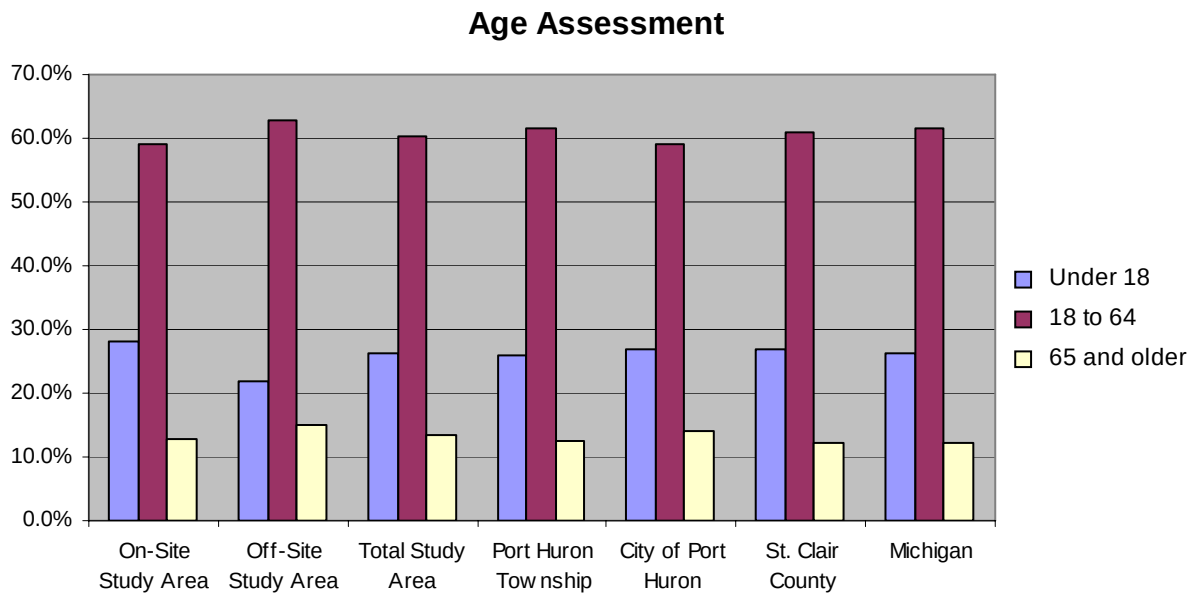


Figure 3.2.2 Age Profile

3.2.4 What are the Economic Characteristics of Study Area Residents?

This section discusses the income levels, home ownership rates, and the values of homes in the Study Area (see **Table 3.2.2**, Economic Characteristics Comparison). The Study Team examined two ways of measuring income; median and per capita. Median household income is measured by taking all of the annual incomes reported to the United States Census by households in an area, and calculating the income level that half of the households are above and half of the households are below. It is essentially the income earned by the household for whom half of their neighbors make more money and half of their neighbors make less money. Per capita income is measured by adding all of the incomes reported for an area together and dividing by the number of people in the area.

Median household income and per capita income are generally lower for the Study Area than for surrounding jurisdictions. However, the percent of individuals below the poverty line also is lower for the Study Area than for the surrounding jurisdictions with the exception of St. Clair County. This means that on average, Study Area residents

earn less money than the average resident of the Port Huron area but there are also fewer people in poverty than elsewhere in the Port Huron Area. People in poverty are those who live in households with incomes at or below the U.S. Department of Health and Human Services poverty guidelines of $18,850 for a family of four.

According to the 2000 Census, the residents in the On-site Study Area, located in the City of Port Huron, had a median household income of $36,477 and a per capita income of $16,847. Approximately 10 percent of the On-site Study Area's residents lived at or below the poverty level.

Table 3.2.2 Economic Characteristics Comparison

Economic Characteristics	On-Site Study Area	Off-Site Study Area	Total Study Area	Port Huron Township	City of Port Huron	St. Clair County	Michigan
Median Household Income	$36,447	$43,028	$38,656	$43,978	$39,869	$46,313	$44,667
Per Capita Income	$16,847	$18,197	$17,289	$21,583	$17,100	$21,582	$22,168
Individuals Below Poverty Level	10.3%	6.7%	9.1%	7.4%	16.9%	7.8%	10.5%
Median Gross Rent	$598	$679	$625	$592	$515	$537	$546
Percent Owner Occupied	66.8%	67.9%	67.2%	77.5%	57.2%	79.6%	73.8%
Percent Vacant	6.0%	2.2%	4.7%	4.8%	7.4%	7.5%	10.6%
Owner-occupied housing units: Median value	$84,508	$105,748	$91,638	$124,300	$84,400	$125,200	$115,600

Source: U.S. Census Bureau, Census 2000

Approximately 67 percent of the households in the On-site Study Area own the homes they live in. In 2000, approximately six percent of the homes were vacant. The average rent for the housing units which were rented was approximately $598 per month in 2000, while the median value of a home in the On-site Study Area was $84,508. Housing values in the Port Huron Area have increased since 2000. Current housing values are discussed in **Section 3.6.1 What is the Current Real Estate Market in St. Clair County?**

The residents in the Off-site Study Area, located in Port Huron Township, had higher incomes on average and lived in homes with higher values. Median household income was $43,028 and per capita income was $18,197. Almost seven percent of the area's residents lived at or below the poverty level. Approximately 68 percent of residents in the Off-site Study Area own the homes they live in. Approximately two percent of the homes were vacant in 2000. The average rent for those housing units that were rented was $679 per month in 2000, while the median value for homes was $105,748.

Housing in the On-site Study Area

The income and housing information for each Study Area is summarized in **Table 3.2.2** and **Figures 3.2.3, 3.2.4, and 3.2.5**. For the sake of comparison, information for Port Huron Township, the City of Port Huron, St. Clair County, and the State of Michigan was also included.

3.2.5 How Much are the Study Area Communities Going to Grow?

Table 3.2.3 illustrates population trends for the City of Port Huron, Port Huron Township, St. Clair County, and Southeast Michigan.

Home in the Off-site Study Area

The population of the City of Port Huron is forecast to continue declining while Port Huron Township and other areas of St. Clair County are forecast to increase. Between 2000 and 2004, the estimated population growth of Port Huron Township already exceeded the 2010 Township population forecast prepared by SEMCOG in 2002. However, long-term population growth in Port Huron Township will be limited by the lack of land available for development.

Table 3.2.3 Study Area Community Population Trends

	City of Port Huron	Port Huron Township	St. Clair County	Southeast Michigan
1970	35,794	7,635	120,175	4,736,008
1980	33,981	7,886	138,802	4,682,726
1990	33,681	7,621	145,607	4,590,468
2000	32,338	8,615	164,235	4,833,493
1970 to 2000 Percent Change	-9.7%	12.8%	36.7%	2.1%
2004 Estimate	31,791	10,789	170,622	4,899,748
2010	30,783	9,667	176,137	5,036,318
2020	29,892	10,904	191,436	5,221,042
2030	29,530	11,744	203,255	5,408,349
2000 to 2030 Forecast Percent Change	-8.7%	36.3%	23.8%	11.9%

Sources:
Past population data - U.S. Census Data
2004 population estimate - SEMCOG Population and Household Estimates (July 2004).
2010-2030 population forecast - SEMCOG 2030 Regional Development Forecast (2002).

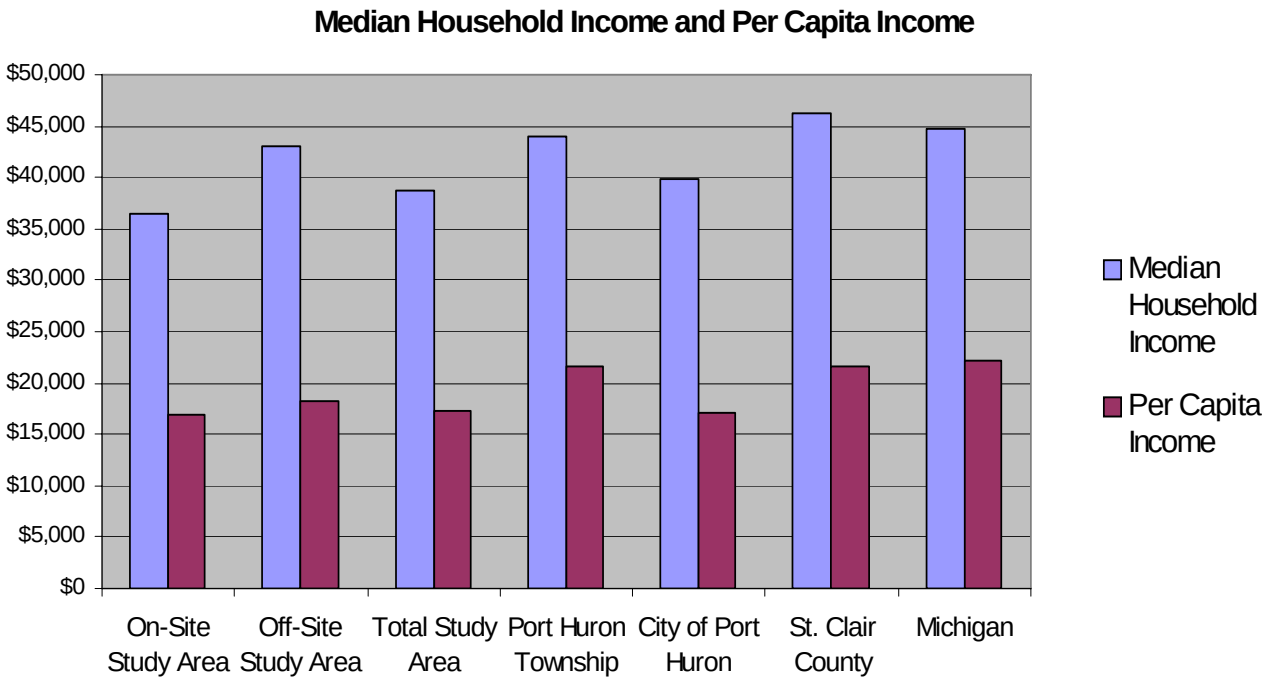


Figure 3.2.3 Median Household and Per Capita Income

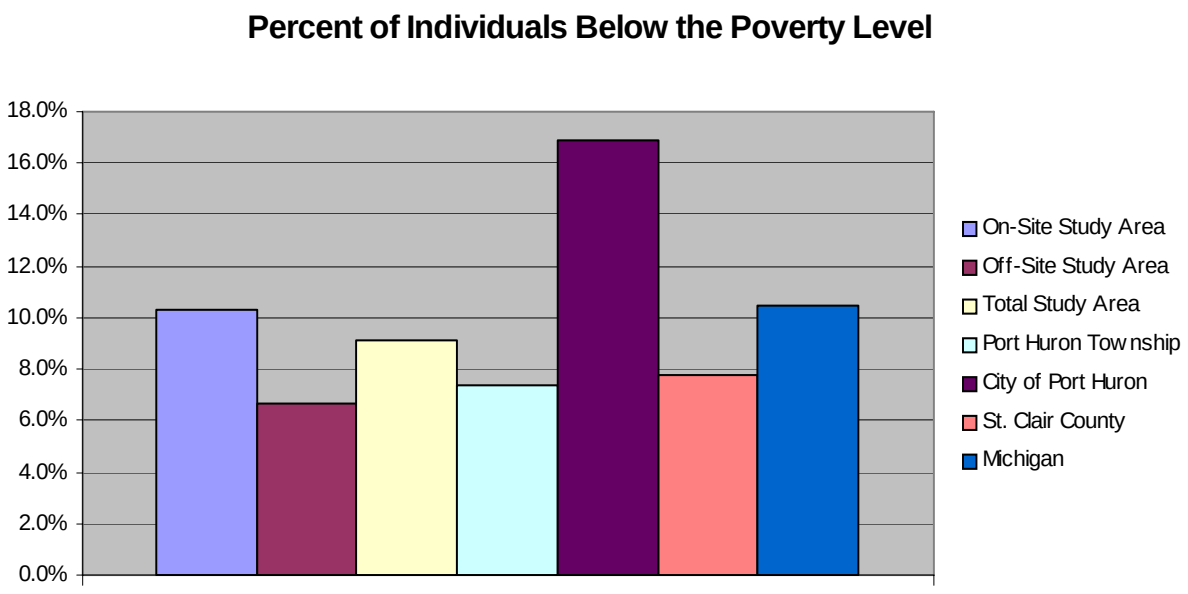


Figure 3.2.4 Percent of Individuals Below the Poverty Level

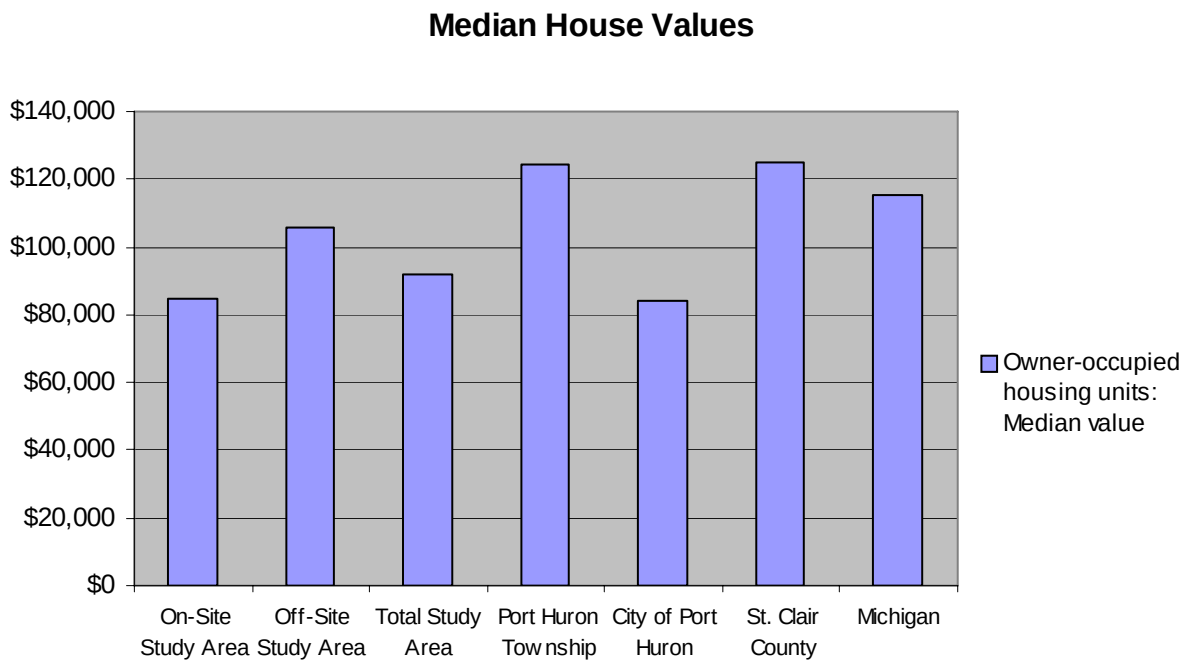


Figure 3.2.5 Median House Values

3.2.6 Describe the Local School System

Chippewa Middle School

The Port Huron Area School district operates the local elementary and secondary school system. The Port Huron Area School district has 20 schools and approximately 11,000 students. Two schools are located adjacent to the Study Area, Central and Chippewa Middle Schools. Both schools are located in the southwest quadrant of the Lapeer Connector and I-94/I-69. Currently, no charter schools exist in Port Huron or Port Huron Township. There are three private schools within the City of Port Huron, all outside the study area.

Vehicles operated by Port Huron Area Schools cross the existing I-94/I-69 bridge over the Black River more than 100 times each school day. This is an important bus route for the school system. Letters from the Port Huron Area School District that discuss concerns they have about the project are contained in **Appendix D.6**.

Table 3.2.4 shows the number of students enrolled in various types of schools in the Port Huron area. This includes Port Huron Area School District Schools, private schools, and colleges in the Port Huron area such as Baker College of Port Huron and St. Clair County Community College. Baker College is located on Lapeer Road, west of the Lapeer Connector. St. Clair County Community College is located in downtown Port Huron, approximately two miles south of the existing Blue Water Bridge Plaza. Nearly 50 percent of all students are in grades one through eight.

Table 3.2.4 also shows the education levels of Port Huron Area residents. Education levels are reasonably consistent across the Port Huron area. The City of Port Huron has a slightly higher percentage of people who have not graduated high school. Both the City of Port Huron and Port Huron Township have a slightly lower percentage of college graduates than other locations in St. Clair County. Overall, the majority of people have a high school diploma but no college experience.

Table 3.2.4 School Enrollment and Education Levels

	St. Clair County		Port Huron Township		City of Port Huron	
	Total	Percent	Total	Percent	Total	Percent
School Enrollment						
Population 3 years and over enrolled in school	**42,822**	**100%**	**2,171**	**100%**	**8,073**	**100%**
Nursery school, preschool	2,934	6.9%	134	6.2%	589	7.3%
Kindergarten	2,378	5.6%	111	5.1%	419	5.2%
Elementary school (grades 1-8)	20,679	48.3%	1,081	49.8%	3,937	48.8%
High school (grades 9-12)	10,253	23.9%	455	20.9%	1,836	22.7%
College or graduate school	6,578	15.3%	390	18%	1,292	16.0%
Education Level						
Population 25 years and over	**107,583**	**100%**	**5,735**	**100%**	**20,476**	**100%**
Less than 9th grade	4,546	4.2%	339	5.9%	1,109	5.4%
9th to 12th grade, no diploma	13,915	12.9%	781	13.6%	3,637	17.8%
High school graduate (includes equivalency)	40,018	37.2%	2,171	37.9%	7,321	35.8%
Some college, no degree	27,241	25.3%	1,367	23.8%	4,598	22.4%
Associate degree	8,339	7.8%	472	8.2%	1,492	7.3%
Bachelor's degree	8,562	8.0%	394	6.9%	1,438	7.0%
Graduate or professional degree	4,962	4.6%	211	3.7%	881	4.3%
Percent high school graduate or higher	82.8%	NA	80.5%	NA	76.8%	NA
Percent bachelor's degree or higher	12.6%	NA	10.5&	NA	11.3%	NA

Source: U.S. Census Bureau, Census 2000

3.2.7 How Do People Get Around the Port Huron Area?

Cars, trucks and vans are by far the most common sources of personal transportation for residents of the Port Huron Area and the Study Area. **Table 3.2.5** shows that over 94 percent of Study Area workers use a motor vehicle to get to work. Less than one percent of Study Area workers use public transportation.

Table 3.2.5 How Do Port Huron Area Residents Get to Work?

Geographic Area	Workers 16 years and over				
	Percent Driving To Work	Percent In Carpools	Percent Using Public Transportation	Mean Travel Time to Work (minutes)	Percent Who Worked Outside County
On-site Study Area	94.2%	12.4%	0.8%	Not Available	11.0%
Off-site Study Area	94.6%	12.1%	0.6%	Not Available	16.4%
St. Clair County	94.4%	10.6%	0.5%	28.7	36.8%
City of Port Huron	89.2%	15.0%	1.7%	19.4	11.0%
Port Huron Township	96.5%	13.3%	0.7%	23.3	18.0%

Source: U.S. Census Bureau, Census 2000

Local Roads: The heavy automobile use in the Port Huron Area means that local roads are crucial to the transportation system. The major local roads in the Study Area are shown on **Figure E.1 Appendix E**. The following are the major local roads serving the Study Area.

- Pine Grove Avenue connects the Study Area to downtown Port Huron to the south and the Fort Gratiot shopping centers to the north. Pine Grove Avenue is also Michigan State Highway 25 north of the Study Area and connects to the "Thumb" area of Michigan.
- 10th Avenue connects the Study Area to neighborhoods and businesses to the north and the south.
- Water Street provides a key local access point for Port Huron Township and City of Port Huron residents to I-94/I-69.
- I-94/I-69 over the Black River serves as a local connector for those traveling north and south on Water Street.
- The Lapeer Connector allows residents from the southern parts of Port Huron Township and the City of Port Huron

to access I-94/I-69 north and ultimately connect to Pine Grove Avenue and Fort Gratiot north of Port Huron.

There are many other local roads in the Study Area that are used by smaller numbers of Port Huron Area residents and visitors.

Pedestrians and Cyclists: There are no designated bicycle paths in the Study Area. Most of the local roads in the City of Port Huron portion of the Study Area include sidewalks and pedestrian signals at intersections. Most of the local roads in the Port Huron Township portions of the Study Area lack sidewalks. Pedestrian traffic is currently prohibited on the Blue Water Bridge spans due to a lack of pedestrian inspection facilities on the Canadian side of the bridge. Pedestrian access throughout the Study Area is limited by the lack of pedestrian facilities at the existing I-94/I-69 Black River Bridge crossing.

A recent planning tool for nonmotorized (i.e., pedestrian and bicycle) modes of travel in the Port Huron area is the St. Clair County Nonmotorized Guidelines published September 30, 2005, for MDOT. The document provides design guidance on developing nonmotorized facilities in St. Clair County. There are no designated nonmotorized routes in the vicinity of the Study Area.

According to the St. Clair County Regional Trails and Greenways Workshop there are numerous roadway-based corridors (bike lanes & sidewalks or sidepaths) in the preliminary concept stage of development. These are proposed on almost all major roads surrounding the Study Area (none are proposed on Lapeer Connector).

Public Transit: Blue Water Area Transit operates seven fixed bus routes in the Port Huron area as well as dial-a-ride services for persons with disabilities and for residents in Burtchville, Port Huron, and Fort Gratiot Townships. A shuttle between major shopping areas and a summer tourist trolley bus are also part of Blue Water Area Transit's services. Three of the fixed bus routes travel through parts of the On-site Study Area along Pine Grove Avenue, along Scott Avenue and Riverside Drive, and along Stone Street.

Blue Water Area Transit Vehicle

3.2.8 Describe the Local Community Facilities

Riverside Boat Ramp

This section discusses the existing parks, community centers, churches and other community facilities that are key parts of community and neighborhood cohesion. **Figure E.21** in the separate **Appendix E**, illustrates the existing community facilities located in and near the Study Area.

Parks and Recreation: The City of Port Huron has 31 parks and recreation facilities scattered throughout the city, including six marinas and boat ramps. Port Huron Township has eight parks including a campground and a reservoir.

There are no City of Port Huron parks located within the Study Area. The City of Port Huron's Riverside Park Boat Ramp is located at the northern edge of the Study Area, on the eastern shore of the Black River.

Port Huron Township Park No. 1

Two of the Township parks and Bakers Field (an old airplane facility) have frontage on the Black River and provide the majority of public access to the Black River. Port Huron Township Park No. 1 is located in the Study Area, between Water Street and the Black River north of I-94/I-69. This 11-acre park includes a public service building that may be rented for events, picnic equipment for small groups, a covered pavilion for large groups, benches to observe the Black River and Stocks Creek confluence and the wildlife in the pond, and playground equipment. Park No. 1 provides roughly 100 feet of frontage on the Black River and about 1,500 feet on Stock Creek which provides fishing access to visitors. Park No. 1 also houses the areas most popular sledding hill.

The Charter Township of Port Huron Five Year Parks and Recreation Plan (January 1, 2006 thru December 31, 2010) lists future plans for Park No. 1 as parking lot improvements, add a gazebo and build a toboggan run and band shell.

Port Huron Township Park No. 2 and Campground is located on the west side of Water Street across from Port Huron Township Park No. 1. This 36-acre park is used by seasonal RV campers from both Canada and the United States.

Canadian visitors stay for mostly weekend visits that allow them to take home duty free goods. A majority of the U.S. visitors are former homeowners in the Port Huron area that live in their RV year-round and winter in the south and summer in the Port Huron area. Park No. 2 has 174 campsites, a bathhouse, and a sanitary sewer dump station. It is primarily a campground but it also houses storage buildings for grounds equipment, a community service room/pavilion, former tennis courts used for rollerblading and basketball, two winter ice skating ponds, and playground equipment.

Port Huron Township Park No. 2

Not only is the Port Huron Township Park No. 2 and RV Campground an asset to the community as a quality recreation destination, but it is important to all of the Township parks because it is the primary source of funding for all maintenance and upgrades in the township's park system. The Park Fund income from the Tourist Accommodations rental from the campground was $94,011 in 2004, $141,484 in 2005, and budgeted for $161,000 in 2006.

The Charter Township of Port Huron Five Year Parks and Recreation Plan (January 1, 2006 thru December 31, 2010) lists future plans for Park No. 2 as building ice skating rinks, create a multi-use paved area with fencing, repair one of the old tennis courts and create a nature walk with a footbridge and signage. Port Huron Township's 40th Street Pond Park is located just south of the Study Area adjacent to the northeast quadrant of the I-94/I-69/Business Loop 69 interchange.

The privately owned Bridge Harbor Marina is located within the Study Area on the western shore of the Black River, south of I-94/I-69. The Port Huron Lanes bowling alley is located at the southeast corner of the M-25 Connector and Hancock Street.

Community Centers: The City of Port Huron operates one community center while Port Huron Township does not have community centers. There are no community centers located in or near the Study Area.

Churches: Four churches are located in the Study Area: Light House Baptist Church, First Free Methodist Church, Pilgrim Baptist Church, and Ross Bible Church. Lighthouse Baptist

has a congregation of 100 and Ross Bible Church has a congregation of 300. Ross Bible Church conducts an annual community food drive and hosts an annual community block party. Only the First Free Methodist Church will be affected by the project it has a congregation of approximately 70.

Ambulance on Pine Grove Avenue

Emergency Services: There are no police stations, fire stations, hospitals, ambulance dispatch centers, or other emergency service providers located in or immediately adjacent to the Study Area. Major north-south routes including Pine Grove Avenue, 10th Street, and I-94/I-69 are important emergency access routes between the northern and southern parts of the Port Huron Area.

The City of Port Huron Police Department and the St. Clair County Sheriff's office are located in downtown Port Huron, approximately two miles south of the existing plaza.

The City of Port Huron Fire Department has three fire stations serving residents and businesses within the city limits. The closest fire station to the On-site Study Area is on Sanborn Street, approximately one mile north of the existing plaza. Port Huron Township operates a fire station on Lapeer Road, approximately one mile southwest of the proposed plaza site for the Township Alternative.

The Port Huron Hospital is located approximately one mile south of the existing plaza and is accessed by using Pine Grove Avenue. Mercy Hospital is located approximately three miles south of the existing plaza and is accessed by following Pine Grove Avenue to 10th Street and taking 10th Street to the hospital.

Businesses Near the Existing Plaza

Community Businesses: Various service and retail establishments are located in the Study Area. These consist of gas stations, fast food restaurants, convenience stores, small retail establishments, and automotive dealerships. There are also recreation based businesses such as a bowling alley and a marina. Businesses in the Study Area employ people who live directly in the neighborhood as well as those who live in the neighboring communities of Port Huron, Fort Gratiot, and Kimball Townships. Employees commute from within the existing neighborhood and the surrounding communities.

3.2.9 How Will the Alternatives Affect Neighborhoods?

The following paragraphs will discuss the anticipated effects of the alternatives on existing neighborhoods and community facilities. Many of the potential effects of the alternatives on neighborhoods such as relocations, noise, air quality and visual appearance are discussed in detail in other sections of this DEIS. These affects will be mentioned briefly here and readers will be directed to the other sections of this document.

Home in the Neighborhood South of the Existing Plaza

Strong neighborhoods are those with an identity, where neighbors have easy access to each other, and are familiar with one another. Transportation projects can impact neighborhoods by relocating residents, dividing the neighborhood, removing local businesses, and creating an atmosphere that discourages neighbors from interacting with each other. For example, the construction of a new, busy road can separate one part of a neighborhood from another. The removal of some homes in a neighborhood can separate friends and leave a smaller sized neighborhood. The relocation of local businesses could change where people shop or where they eat out.

Port Huron Neighborhood Street

All Build Alternatives will affect existing neighborhoods. MDOT and FHWA will work with the local communities and neighborhoods to reduce and minimize neighborhood impacts as much as possible.

No-Build Alternative: The No-Build Alternative will affect the neighborhoods surrounding the existing plaza as increased congestion will make it more difficult to live near the plaza. Without improvements, local residents can expect increased back-ups and congestion leading to increased noise and air quality issues. These effects are discussed in more detail in **Section 3.9 Air Quality** and **Section 3.10 Noise.**

With the No-Build Alternative, Pine Grove Avenue and Hancock Street will not be improved. Increased congestion on these local roads will make it more difficult for local residents to access local businesses. Heavily congested roads will also continue to serve as barriers between the neighborhoods surrounding the plaza.

The No-Build Alternative does not relocate any homes in existing neighborhoods or any businesses that would serve these neighborhoods.

City East Alternative: The City East Alternative would displace in total, 155 households and 34 businesses. All but three of the homes and two of the businesses are located around the existing plaza. This alternative would require the relocation of a substantial number of homes in two neighborhoods. The City East Alternative (see exhibits in **Appendix E**) would require all of the homes on Mansfield Street and most of the homes on Scott Avenue west of Pine Grove Avenue. Meaning a third of the homes in this neighborhood south of the plaza would be taken for this alternative. Homes on Lyon Street would now be the first set of residences on the south side of the plaza. They currently have two blocks of homes between them and the plaza. The effects on this neighborhood would be substantial. Approximately one third of the homes would be eliminated and there would likely be pressure to develop new businesses in the parts of this neighborhood that are closest to the plaza.

Homes in the Neighborhood Northeast of the Existing Plaza

The City East Alternative would also require the relocation of 13 homes along Church Street, Elmwood Street, and 10th Street in the neighborhood northeast of the existing plaza. These homes are on the edge of a large neighborhood which already lost more than 30 homes due to previous plaza and bridge projects in the 1980s and 1990s. Some of the homes along Elmwood Street are already vacant or have been changed to office use. This shows that homes on the edge of the current plaza are less desirable for residential uses. Similar changes could occur along 10th Avenue if this alternative is built. The City East Alternative combines Pine Grove Avenue and 10th Avenue into one five lane road east of the existing plaza. This will be a busy, principal north-south street for the entire Port Huron area. There would be five homes that would remain along the Port Huron/10th Avenue combined road with likely pressure to convert these properties to commercial use in the future.

The City East Alternative would also displace all 24-units in the Riverside Drive Condominiums complex. This would also be a neighborhood type impact as existing neighbors and

friends in the complex are unlikely to relocate to the same place.

The City East Alternative would require 34 businesses to be displaced. These businesses include gas stations, restaurants, and offices that serve the local community as well as border crossing traffic. If the new plaza remains in Port Huron, many of these businesses may want to find new sites near the plaza. This may create new pressures to convert homes in the nearby neighborhoods to business sites. There will likely be a period of time, after the businesses are displaced when local residents will have to travel further to get to local businesses. Residents in the neighborhoods surrounding the plaza that walked to the nearby restaurants or filled-up at the nearby gas stations will have to travel a few extra blocks to get the same services. Impacts to businesses are discussed further in **Section 3.4 Economics**.

The new plaza for the City East Alternative would further divide the community from north to south and from east to west. The neighborhoods to the west of the plaza would be more isolated from neighborhoods to the south and east of the plaza. The new 2,060 foot wide plaza site would divide the community into separate areas north and south of the plaza. The new plaza would expand the plaza site by 1,520 feet. The wider plaza would increase the perception of the plaza and bridge as a barrier that splits the community in half. The number of north-south routes around the plaza would be reduced from three to two.

The City East Alternative would also have noise, air quality, and visual effects on residents remaining in the neighborhoods surrounding the new plaza, as well as potential noise, air quality, and visual effects on the Chippewa and Central Middle Schools and Ross Bible Church. These effects are discussed in more detail in **Section 3.9 Air Quality**, **Section 3.10 Noise,** and **Section 3.8 Aesthetic and Visual Impacts.**

City West (Preferred) Alternative: The Preferred Alternative would displace 137 households (18 residences less than the City East Alternative) and 37 businesses. Similar to the City East Alternative the Preferred Alternative would require the

relocation of a substantial number of homes in two neighborhoods. This alternative would require all of the homes on Mansfield Street and the majority of the homes on the northern side of Scott Avenue west of Pine Grove Avenue. These homes are located in the first block of a six block neighborhood located south of the plaza. Homes on the southern side of Scott Avenue would now be the first set of homes in this neighborhood. The effects on this neighborhood would be less than the City East Alternative but still substantial as a number of homes would likely be eliminated and there would likely be pressure to develop new businesses in areas of the neighborhood that are closest to the plaza.

Similarly to the City East Alternative, the Preferred Alternative would also require the relocation of 13 homes along Church Street, Elmwood Street, and 10th Street in the neighborhood northeast of the existing plaza. These homes are on the edge of a large neighborhood which already lost more than 30 homes due to previous plaza and bridge projects in the 1980s and 1990s. Some of the homes along Elmwood Street are already vacant or have been changed to office use. This shows that homes on the edge of the current plaza are less desirable for residential uses. The Preferred Alternative turns Pine Grove Avenue into a boulevard allowing it to remain a principle north-south street for the entire Port Huron Area along with 10th Avenue.

The City West Alternative would require 37 businesses to be displaced. Like the City East Alternative these businesses include gas stations, restaurants, and offices that serve the local community as well as border crossing traffic. With the plaza expansion in Port Huron, many of these businesses may want to find new sites near the plaza. This may create new pressures to convert homes in the nearby neighborhoods to business sites. There will likely be a period of time, after the businesses are displaced when local residents will have to travel further to get to local businesses. Residents in the neighborhoods surrounding the plaza that walked to the nearby restaurants or filled-up at the nearby gas stations will have to travel a few extra blocks to get the same services. Impacts to businesses are discussed further in **Section 3.4 Economics**.

The new plaza for the Preferred Alternative would further divide the community from north to south and from east to west. The neighborhoods to the west of the plaza would be more isolated from neighborhoods to the south and east of the plaza. Although the footprint for the Preferred Alternative is smaller than the City East Alternative the new 2,050 foot wide plaza site would divide the community into separate areas north and south of the plaza like the City East Alternative. The new plaza would expand the plaza site to the north and south by a total of 1,515 feet. The wider plaza would increase the perception of the plaza and bridge as a barrier that splits the community in half.

The City West Alternative would also have noise, air quality, and visual effects on residents remaining in the neighborhoods surrounding the new plaza, as well as potential noise, air quality, and visual effects on the Chippewa and Central Middle Schools and Ross Bible Church. These effects are discussed in more detail in **Section 3.9 Air Quality**, **Section 3.10 Noise,** and **Section 3.8 Aesthetic and Visual Impacts.**

Township Alternative: The Township Alternative would require 56 homes and 29 businesses to be displaced. Nine of the homes are located along Maywood Drive in Port Huron Township. The elimination of these homes would remove this entire small neighborhood at the end of Maywood Drive. The Township Alternative will displace 56 single family households in the City of Port Huron due to local road improvements. These households are located at the edge of the existing neighborhoods and, therefore, would not affect the cohesiveness of the neighborhoods.

Home on Maywood Drive

The Township Alternative would also require the displacement of all 24-units in the Riverside Drive Condominiums complex. This would also be a neighborhood type impact as existing neighbors and friends in the complex are unlikely to relocate to the same place.

All Build Alternatives would affect the Riverside Drive Condominiums

The local road improvements for the Township Alternative, along Hancock Street, Pine Grove Avenue, and at Water Street will improve traffic flow and access to these roads for local residents. The local road improvements will require the

displacement of 29 businesses that serve both the local community and existing plaza traffic. The type of businesses that develop in this area in the future may change due to the relocation of the plaza and the local road improvements. There will likely be a period of time, after the 29 businesses are displaced and while the local road improvements are being constructed, when local residents will have to travel further to get to local businesses. Residents in the neighborhoods surrounding the plaza that walked to the nearby restaurants or filled-up at the nearby gas stations will have to travel a few extra blocks to get the same services. Impacts to businesses are discussed further in **Section 3.4 Economics**.

The Township Alternative would not further divide the community in the vicinity of the existing plaza. The existing plaza footprint would remain. The Township Alternative would require security walls, buffers, and fencing along the corridor between the existing plaza and the proposed new plaza. The security requirements are discussed in detail in **Section 3.5 Public Safety and Security.** The secure corridor would act like a barrier between the Port Huron Township neighborhoods on either side. Water Street would cross over the secure corridor as it crosses over I-94/I-69 today. However, the widening of the existing I-94/I-69 corridor and the additional security features would increase the perception of the corridor as a barrier that divides the community. The Township Alternative does not have the significant neighborhood impacts that the City East and Preferred Alternatives do. However, the visual barrier of the secure corridor would be a significant impact to the overall cohesiveness of the community.

Existing I-94/I-69 Corridor West of the Water Street Interchange

The Township Alternative would also have noise, air quality, and visual affects on residents remaining in the neighborhoods surrounding the new plaza in Port Huron Township. There are neighborhoods on the north side of the proposed new plaza along Eastland Road, Westland Road and north of West Water Street that would be affected. There is also a neighborhood south of the proposed plaza site, next to the Central and Chippewa Middle Schools that would be affected. These effects are discussed in more detail in **Section 3.9 Air Quality**, **Section 3.10 Noise,** and **Section 3.8 Aesthetic and Visual Impacts.**

3.2.10 How Will the Alternatives Affect Community Services and Facilities?

The alternatives would have little effect on community services. There are no community agencies located in the Study Area and no community service providers would be relocated. The alternatives would affect schools, churches, parks, and private community facilities. These effects are discussed for each alternative below.

No-Build Alternative: The No-Build Alternative would not affect any schools, churches, parks, and public or private community facilities. Long-term congestion from backups on the plaza onto I-94/I-69 would affect the speed of school bus traffic across the Black River Bridge.

City East Alternative: The City East Alternative would displace the First Free Methodist Church at the corner of Elmwood Street and 10th Street. Construction of the City East Alternative would lead to short-term traffic congestion and detours that would affect school bus traffic and emergency services. All detours would be discussed with local officials before they are put in place. The City East Alternative would improve the flow of local traffic, including school buses, across the Black River Bridge as it adds new lanes to the bridge and separates local traffic from border crossing traffic.

This alternative requires property from the Port Huron Area School District located at the southwest corner of the interchange between the Lapeer Connector and I-94/I-69. The City East Alternative would require approximately 11 acres of forested and open land owned by the School District. This property is part of the Chippewa and Central Middle Schools property. No school buildings or facilities would be acquired. The property is not used for school programs or recreational purposes. The Study Team has discussed this property with the Port Huron Area School District through letters and meetings and believes that arrangements can be made to purchase the property.

Chippewa Middle School

City West (Preferred) Alternative: The Preferred Alternative would have similar affects to community services and facilities as the City East Alternative. The Preferred Alternative would

displace the First Free Methodist Church at the corner of Elmwood Street and 10th Street. This alternative would also require the same property from the Port Huron Area School District located at the southwest corner of the interchange between the Lapeer Connector and I-94/I-69. No school buildings or facilities would be acquired.

Construction of the City West Alternative would lead to short-term traffic congestion and detours that would affect school bus traffic and emergency services. All detours would be discussed with local officials before they are put in place. The Preferred Alternative will ultimately improve the flow of local traffic.

The Preferred Alternative like the City East Alternative would impact one private recreational business. The Port Huron Lanes Bowling Alley, located at the corner of Hancock Street and the M-25 Connector would be relocated.

Township Alternative: The Township Alternative requires property from the Port Huron Area School District located at the southwest corner of the interchange between the Lapeer Connector and I-94/I-69. The Township Alternative would require approximately 11 acres of forested and open land owned by the school district. This property is part of the Chippewa and Central Middle Schools property. No school buildings or facilities would be acquired. The property is not used for school programs or recreational purposes. The Study Team has discussed this property with the Port Huron Area School District through letters and meetings and believes that arrangements can be made to purchase the property. Construction of the Township Alternative would lead to short-term traffic congestion and detours that would affect school bus traffic. All detours would be discussed with local officials before they are put in place. The Township Alternative would improve the flow of local traffic including school buses across the Black River Bridge as it add lanes to the bridge and separates local traffic from border crossing traffic.

Ross Bible Church

The Township Alternative would require property from Ross Bible Church for the new plaza. The church building and facilities would not need to be purchased. Ross Bible Church

planned to use the land to build assisted living housing. If this alternative is constructed the church would no longer be able to build the assisted living facility at this location.

This alternative would also have potential noise, air quality, and visual effects on the Chippewa and Central Middle Schools and Ross Bible Church. These effects are discussed in detail in **Section 3.9 Air Quality**, **Section 3.10 Noise,** and **Section 3.8 Aesthetic and Visual Impacts.**

The Township Alternative would impact one private recreational business. Parking for the Port Huron Lanes Bowling Alley would need to be purchased as part of local road improvements.

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 the use of such land.

3.2.11 How Will the Alternatives Affect Public Parkland and Potential Section 4(f) or 6(f) Properties

There are four properties located within or adjacent to the Study Area that could be potentially impacted by the project:

- Port Huron Township Park No. 1
- Port Huron Township Park No. 2
- Riverside Park
- E.C. Williams House

What is Section 6(f)?

Section 6(f) of the Land and Water Conservation Act prohibits the conversion of any property acquired or developed with the assistance of the land and water conservation funds to anything other than public outdoor recreation use without the approval of the Secretary of the Department of Interior.

The three parks qualify for protection under Section 4(f) because they are publicly owned. The E.C. Williams House qualifies due to its historic significance. There are no properties affected by any of the Build Alternatives that are regulated by Section 6(f).

Minor property acquisition is required from Port Huron Township Park No. 1 for the construction of the freeway and interchange at Water Street as part of all three Build Alternatives. Access to the park may be altered during construction but the playground equipment, pavilion and service building, and fishing access will not be affected by the construction.

Port Huron Township Park No. 2 and RV Campground and Riverside Park do not have any potential impacts due to the

Build Alternatives. Details on all three parks are discussed under **3.2.8 Describe the Local Community Facilities.**

The E.C. Williams House would be acquired and relocated as part for the construction of the Preferred (City West) Alternative to accommodate a larger plaza area. There would be no direct impacts to the E.C. Williams House under the City East or Township Alternative. Further discussion of the impacts on historic sites is located in **Section 3.15 Cultural Resources** and in **Section 4.0 Section 4(f) and 6(f) Evaluation.**

City of Port Huron Fire Station Number 3

Port Huron Township Fire Station

3.2.12 How Will the Alternatives Affect Emergency Services?

None of the alternatives will require the relocation of any hospitals, fire, police, or other emergency service facilities. The effects of all of the alternatives will be changes in emergency access routes and response times. The No-Build Alternative will not change any of the existing emergency access to the plaza or across the Port Huron area. The No-Build Alternative will potentially affect response times due to congestion caused by border crossers backed up on the Black River Bridge. Local road congestion would also affect response times for the No-Build Alternative.

The City East Alternative eliminates one north-south road through the area surrounding the existing plaza. This could have a major affect on emergency service routes and response times. The Township Alternative would have few effects on emergency service responses in the Port Huron Area but substantially changes the emergency service access to the plaza and the I-94/I-69 corridor itself. The City West Alternative provides north-south road access through the area with the new Pine Grove Boulevard and 10th Avenue. Both city plaza alternatives would improve local emergency access along I-94/I-69 by reducing border related backups and separating local traffic from border crossing traffic. A full discussion of the affects of the alternatives on emergency services is found in **Section 3.5 Public Safety and Security.**

3.2.13 How Will the Alternatives Affect Pedestrians and Cyclists?

The alternatives would not have an effect on bicycle or pedestrian use of roads and paths within the Study Area. There are no designated bicycle routes or documented extensive use of the existing road network by bicyclists. Also, any changes to the existing road network, sidewalks, and signals would have little effect on pedestrians. Sidewalk ramps will be upgraded to current ADA standards on roadways that are altered as part of this project.

The Alternatives do not improve pedestrian and bicycle use of roads.

The alternatives do not improve access for pedestrians or cyclists. Sidewalks will be maintained on roadways which currently feature sidewalks. New sidewalks will be provided on affected roadways that do not currently have sidewalks if there is a demonstrated need for pedestrian accommodation and/or a need to maintain or improve pedestrian connectivity between the neighborhoods affected by the proposed project. Changes to the current policy of prohibiting cyclist and pedestrian access to the border crossing, except under special circumstances, are not part of this project. The Township Alternative would make providing pedestrian access to the border crossing more difficult than either of the city alternatives due to the 1.5 mile secured corridor between the proposed plaza and the Blue Water Bridge.

A pedestrian crossing across the Black River Bridge was evaluated by the Study Team however local adjacent connections have not been identified. MDOT will continue to work with local stakeholders to assess level of importance and decide if it should be added during the FEIS and design phase.

3.2.14 How Will the Alternatives Affect Transit and Carpooling?

The Build Alternatives will create minor alterations to the existing public transit services within the Study Area. The current routes for buses, dial-a-ride vans, shuttles, and trolley services may change due to the closure and relocation of certain local roads, but changes are expected to be minor and would likely have little effect on the efficiency of existing services. Local road improvements on Pine Grove Avenue

may enhance transit times through the Study Area. There will be short-term construction related delays and detours for transit routes as local roads are improved and a new plaza is constructed. The Build Alternatives are not expected to change carpooling rates.

3.2.15 How Will MDOT and FHWA Reduce and Compensate for the Neighborhood and Community Impacts?

The above paragraphs discuss several potential impacts to neighborhoods and community facilities. There are various ways that MDOT and FHWA will attempt to avoid, reduce or compensate for these potential impacts. This is called mitigation of impacts. MDOT and FHWA will continue to work with the community on measures to mitigate or compensate for the negative effects of the project throughout the environmental clearance process and the design and construction of a new plaza. **Chapter 5 Mitigation** discusses the potential ways that MDOT will mitigate the negative effects of the project.

3.3 Environmental Justice

This section analyzes the potential adverse and excessive environmental and human health impacts the proposed project may have on low-income and minority communities. The area of analysis includes the City of Port Huron, Port Huron Township, Kimball Township, and Fort Gratiot Township. **Figures 3.3.2, 3.3.3, and 3.3.4,** at the end of this section, show the analysis area and where in the analysis area the low-income and minority communities are located.

3.3.1 What is Environmental Justice?

In early transportation projects, many of the impacts affected minority and low-income populations in greater ways than other groups. This has been partly attributed to low-income populations and neighborhoods being located near downtowns and other common destinations which were the target of transportation projects. These neighborhoods were typically low value properties with a perceived lack of political power and representation. As a result low income and minority populations and neighborhoods were impacted more often than other populations and neighborhoods.

Title VI of the 1964 Civil Rights Act:

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

Environmental Justice is an attempt to address disproportionately high and adverse human health or environmental impacts that projects funded by the federal government may have on minority and low income populations. The current Environmental Justice analysis requirements were created through Executive Order 12898 by the President of the United States in 1994. The President directed all federal agencies to make Environmental Justice part of their missions and to identify and address the effects of their programs, policies and activities on minority and low-income populations. Environmental Justice built on Title VI of the 1964 Civil Rights Act which prohibits discrimination on the basis of race, color, sex, and national origin in programs and activities receiving federal financial assistance. Environmental Justice is a policy that 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 transportation decision making process
- Ensure minority and low income populations receive their equal share of the benefits from the project

3.3.2 What Groups are Included in Environmental Justice Analysis?

Low-Income Populations Defined:

Those households with incomes at or below the Department of Health and Human Services poverty guidelines of $18,850 for a family of four.

For the analysis of Environmental Justice in projects like the Blue Water Bridge Plaza Study, minority persons are defined as any person who is Black, Hispanic, Asian American, American Indian, or Alaskan Native. Low-income populations are those households with incomes at or below the Department of Health and Human Services poverty guidelines of $18,850 for a family of four. Whether or not they fit the definition of an Environmental Justice population, all groups and individuals have the right to access and participate in the transportation decision-making process as protected by Title VI of the Civil Rights Act.

The Environmental Justice analysis was performed using a set of guidelines provided by the Federal Highway Administration (FHWA) and in consultation with MDOT officials responsible for Environmental Justice issues. The Study Team tailored the general principles and procedures of the guidelines to the unique character of the community and the alternatives being studied.

As discussed in **Section 3.2 Community and Neighborhood Impacts**, the Study Team performed an analysis of the Blue Water Bridge Plaza Study Area using United States Census data. The Study Area for Environmental Justice was selected by including all of the Census block groups partially contained in the Study Area. Within the On-site Study Area in the City of Port Huron 29 census block groups made up of 1311 residents were used to determine the Environmental Justice population. The Off-site Study Area in Port Huron Township consists of 640 residents within five census block groups. This data was incorporated into a geographical information system (GIS) to identify any minority or low-income populations. The

GIS software allowed the Study Team to create maps showing where low-income and minority populations are found in the Port Huron area. **Figures 3.3.2, 3.3.3, and 3.3.4** are examples of the types of maps that were created with the GIS software. One low income family housing complex is located in the Study Area, Gratiot Village and is located on Riverview Street between 10th and 12th Avenues. The project will not affect this family housing complex. However, there are several low-income families within the project area that receive a housing subsidy who may be displaced as a result of this project. Representatives from both the Port Huron Housing Commission and the Michigan State Housing Development Authority have indicated to MDOT that there is sufficient replacement housing in the Port Huron area to accommodate any of the displaced families that receive a housing subsidy.

The Study Team also asked local agencies and churches to identify any neighborhoods with higher numbers of minority or lower income people. The resulting analysis identified that there were parts of the Study Area that contained a larger percentage of minority or low-income populations than others and that there is a greater percentage of minority and low-income populations residing in the neighborhoods surrounding the existing plaza as opposed to the Off-site Study Area. Within the Study Area the two largest minority groups are African American and Hispanic or Latinos. Other groups in the Study Area includes White (Non-Hispanics), Indian, and Asian populations. The study team did not identify any concentrations of other populations or ethnic groups that would be protected under Title VI but do not fit the specific criteria of Environmental Justice populations.

Both Federal and State Environmental Justice policies stress that early and ongoing public outreach is a vital component of the Environmental Justice process. The Study Team solicited information from potentially low-income and/or minority individuals who live and work in the proposed plaza expansion areas and provided many opportunities to have full and fair participation in the decision making process. Public meetings and workshops were held in local area facilities on major bus routes allowing access to low income populations. Additionally, MDOT provided bi-weekly one on one meetings

to community members expressing interest in discussing the project. These activities were used to establish trust and an open dialogue with community members. The strategy used for effective public participation included a series of well advertised public meetings:

- In March 2003, the Public Involvement Kickoff Meeting was held to introduce the study.
- In September 2003, a public meeting was held to present Illustrative Alternatives.
- In May 2004, a public meeting was held to present Updated Alternatives.
- In February 2005, a meeting was held to present further refined alternatives and receive comments from the public.
- In June 2006, the first Values and Visioning Workshop was held to allow the public to discuss and identify characteristics within the community they felt were important and to determine the look and feel of the area surrounding the plaza.
- In July 2006, a Values and Visioning Workshop was held to assist the study team in developing an integrated vision for the future that demonstrates how the project area should look and feel
- In September 2006, a public meeting was held to introduce the new City West Alternative to the public.
- In December 2006, a public information meeting was held to present alternatives for I-94/I-69 Corridor Improvements.
- In March 2007, a community visioning workshop for I-94/I-69 Corridor improvements was held.

March 2007, a Community Visioning Workshop for I-94/I-69 Corridor improvements was held

The Study Team encouraged the public to comment on the study and alternatives at all meetings. Newsletters, including meeting notices and study updates, were sent to homes and businesses within the study corridor including all minority and lower income households. Several hundred copies of the newsletters also were provided at local gathering places, including churches, to be distributed to concerned citizens who may not have received the newsletter through other sources. Late afternoon and evening sessions were held to make it as convenient as possible for the public to attend meetings, and the locations of all public meeting sites were chosen with accessibility and convenience for all citizens in

mind. All locations were public transit accessible, enhancing the opportunity for lower income citizens or those who do not own automobiles to attend.

All public meeting locations were public transit accessible

Low-income, minority, and other community members will have further chances to comment on the project through a well advertised public hearing process and public comment period during the review process of this Draft Environmental Impact Statement.

3.3.3 Minority Groups in the Study Area

Based on information obtained from the 2000 United States Census, the Study Team compared the populations affected by the alternatives. The Study Area for Environmental Justice was selected by including wholly or partially all of Census block groups contained in the Study Area. Of the 1,311 residents found in the On-site Study Area, located within the City of Port Huron, 90.6 percent of the residents are identified as white (non-Hispanic). African-Americans and Hispanic or Latinos are the two largest minority groups at 3.1 percent and 3.0 percent of the total population, respectively.

The Off-site Study Area, located in Port Huron Township, has a population of 640 residents. Approximately 95.8 percent of the residents are identified as white (non-Hispanic). The largest minority group in the Off-site Study Area is Hispanic or Latinos who make up 2.0 percent of the population.

Ethnic characteristics and the percent of minority populations are shown in **Table 3.3.1** and **Figure 3.3.1**. The table and figure also present data for Port Huron Township, the City of Port Huron, St. Clair County, and the State of Michigan as well. Minority populations located in Port Huron Township and the City of Port Huron but not directly within the Study Area were also considered as part of the analysis of Environmental Justice Impacts as they could be indirectly affected by proposed improvements.

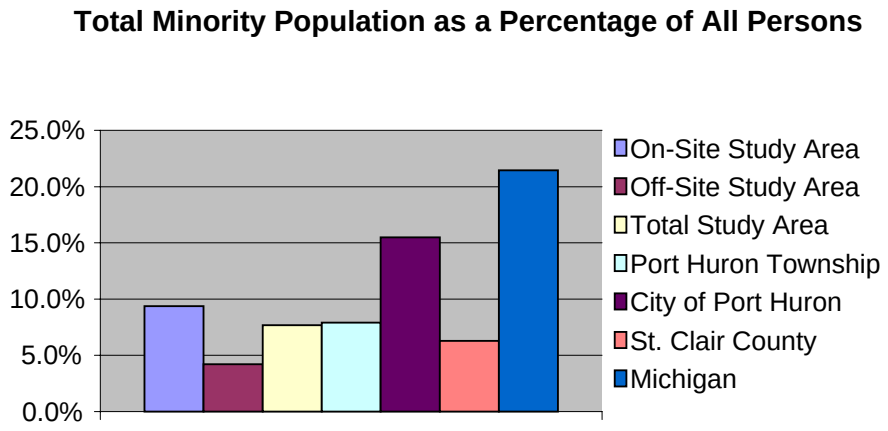


Figure 3.3.1 Minority Populations

Table 3.3.1 Ethnicity

Ethnicity Characteristics	On-Site Study Area	Off-Site Study Area	Total Study Area	City of Port Huron	Port Huron Township	St. Clair County	Michigan
Total Persons	1,311	640	1,951	32,338	8,615	164,235	9,938,444
Total Minority Population as a Percent of All Persons	9.4%	4.2%	7.7%	15.5%	7.9%	6.3%	21.4%
White Population (Non-Hispanic) as a Percent of All Persons	90.6%	95.8%	92.3%	84.5%	92.1%	93.7%	78.6%
African American Population as a Percent of All Persons	3.1%	0.6%	2.3%	7.7%	3.5%	2.1%	14.2%
American Indian Population as a Percent of All Persons	1.0%	0.5%	0.8%	0.9%	0.6%	0.5%	0.6%
Asian Population as a Percent of All Persons	0.4%	1.1%	0.6%	0.6%	0.3%	0.4%	1.8%
Hispanic (all races) Population as a Percent of All Persons	3.0%	2.0%	2.7%	4.3%	2.5%	2.2%	3.3%
Other Race Alone as a Percent of All Persons	1.4%	0.0%	0.9%	1.3%	0.6%	0.6%	1.3%
Two or More Races as a Percent of All Persons	1.9%	0.0%	1.3%	2.8%	1.3%	1.4%	1.9%

Source: 2000 U.S. Census Data. Study Area data is for the Census Blocks (Population Characteristics) and Census Block Groups (Economic Characteristics) located in the Study Area.

3.3.4 What are the Effects of Each Alternative on Environmental Justice Populations?

Potential Environmental Justice effects are defined as the unavoidable negative effects of the project that would be mostly experienced by minority and low income populations or are higher than the negative effects that would be suffered by non-minority and/or non-low-income populations. The analysis has determined that there are no disproportionately high and adverse human health or environmental impacts on minorities and/or low-income populations by any of the Practical Alternatives.

Impacts from any Practical Alternative would be similar for all groups regardless of the demographic or socioeconomic characteristics of the community. All negative impacts to environmental resources, such as air quality, noise, and public services will be avoided, minimized, or rectified to the extent possible. MDOT will provide purchasing and relocation assistance and advisory services for any member of the community whose property was needed for the project. MDOT will inform individuals, businesses and non-profit organizations of the impacts of the project on their property.

All residents of the Study Area including minorities and lower income groups will benefit from positive impacts of a potential new Blue Water Bridge Plaza. Potential beneficial impacts include relief of local traffic congestion, increased border safety and security, job creation, and improved economic conditions for businesses that depend on trade.

No-Build Alternative: The No-Build Alternative will have no adverse impacts on any segment of the population including minorities and low income persons. However, the potential benefits of the Build Alternatives such as traffic congestion relief, job creation, general economic revitalization, and increased border safety and security would be lost.

City East Alternative: No minority or low income groups would receive disproportionately high and adverse impacts as a result of the construction of a new plaza in the City of Port Huron. The primary area of analysis for the City East Alternative consisted of 29 blocks surrounding the existing

plaza. Information on the population living in the City East Alternative analysis area is contained in the tables and graphs found in this section under Minority Groups in the Study Area. Approximately 9.4 percent of the residents surrounding the existing Blue Water Bridge Plaza would be considered part of a minority group. This percentage is smaller than the minority population percentage for the entire City of Port Huron, which is 15.5 percent. Two blocks located at the north end and the far east end of the Study Area are the only ones that contain greater than 15.5 percent minority population. The block at the north has 104 people, 42 of whom are minorities. The block at the far east end of the Study Area contains 17 people, six of whom are minorities. No property would be required from either of these blocks for the new plaza. The minority group with the greatest representation of its total population located within the blocks affected by the City East Alternative is American Indian/Alaskan Natives peoples. Approximately five percent (12 total residents) of Port Huron's total American Indian/Alaskan Native population live in the impacted blocks for the City East Alternative.

Ross Bible Church

The blocks affected by the City East Alternative contain a substantially lower percentage of residents living below the poverty level when compared with the whole City of Port Huron. **Figure 3.2.4** in **Section 3.2 Communities and Neighborhoods**, illustrates an economic characteristics comparison. Approximately 10 percent of the City East Alternative area's residents live at or below the poverty rate, while the total for the City of Port Huron was approximately 17 percent. However, the median household income level ($36,447) and average per capita income level ($16,847) for the blocks affected by the City East Alternative were lower than the averages for the entire city of Port Huron.

The City East Alternative will affect Environmental Justice populations in a similar manner to the general population. All of the impacts for the City East Alternative discussed in **Chapter 3 The Environment: What's There Now and Project Effects** will affect various segments of the general population based on their proximity to the project and their use of the existing roads and border crossing in the Study Area. The City East Alternative would require the acquisition of approximately 133 acres of land around the existing Blue

Water Bridge Plaza east of the Black River in order to accommodate the new plaza and local road configuration. The 155 residences that would be relocated for the City East Alternative include minority, low-income, and elderly households. The potential relocation of 34 businesses currently operating in the Study Area will also affect low income, minority, and elderly households. The relocation effects of the City East Alternative are further discussed in **Section 3.6 Relocations**. The previous plaza and bridge improvements in the 1980s and 1990s displaced 33 residences and six businesses in the Study Area. There has been a cumulative pattern of plaza related impacts as discussed in **Section 3.7 Indirect and Cumulative Impacts.**

Neighborhood cohesion in the blocks surrounding the existing plaza would be divided as a result of plaza expansion at the existing location. Several local businesses would be relocated. This could present a challenge to the local low-income population to find sufficient alternatives to these departed businesses. Similar businesses to the relocated businesses, such as gas stations and restaurants would still exist in the Study Area. However, some unique businesses such as the bowling alley and dentist's offices would have greater effects if these or similar businesses do not locate at other sites near the Study Area. Low-income residents may be limited in personal transportation options and rely on public transit to reach similar businesses in other parts of the Port Huron area.

Neighborhood effects created by the City East Alternative will be the same for all persons regardless of race, income, or age. Environmental Justice populations will experience the same changes in access, emergency service routes and minor transit re-routing as the entire population. Changes in noise levels, as discussed in **Section 3.10 Noise,** will also affect low income, minority, and elderly households. The aesthetic and visual impacts of expanded plaza facilities, discussed in **Section 3.8 Aesthetic and Visual Impacts**, will affect Environmental Justice populations in the same manner as the general population. The City East Alternative will result in the reduction of the local tax base which will be felt by all Port Huron and Port Huron Township residents regardless of income, race, or age.

Environmental Justice populations and border crossers will share in the potential benefits of the City East Alternative. There will be traffic congestion relief resulting in reduced travel times for border crossings and travel on local roads. As discussed in **3.4 Economics**, excess border congestion is costly to local, state, and national economies. Border crossing improvements may lead to more jobs and reduced transportation costs, with widespread benefits to the general population including minorities and low-income persons in the United States and Canada. These groups will also share in the benefits of improved border security.

City West (Preferred) Alternative: The City West Alternative like the City East Alternative will not affect any minority or low-income groups with disproportionately high and adverse impacts. The primary area of analysis for the Preferred Alternative consisted of 29 blocks surrounding the existing plaza. Information on the population living in the Study Area is contained in **Table 3.3.1** and **Figure 3.3.1** to **Figure 3.3.4.** Approximately 9.4 percent of the residents surrounding the existing Blue Water Bridge Plaza would be considered part of a minority group. This percentage is smaller than the minority population percentage for the entire City of Port Huron, which is 15.5 percent. Two blocks located at the north end and the far east end of the Study Area are the only ones that contain greater than 15.5 percent minority population. The block at the north has 104 people, 42 of whom are minorities. The block at the far east end of the Study Area contains 17 people, six of whom are minorities. No property would be required from either of these blocks for the new plaza. The minority group with the greatest representation of its total population located within the blocks affected by the Preferred Alternative and the City East Alternative is American Indian/Alaskan Natives peoples. Approximately five percent (12 total residents) of Port Huron's total American Indian/Alaskan Native population live in the impacted blocks for both The City East Alternative and the Preferred Alternative.

Emergency service routes are one shared effect of the City West Alternative for all persons

The blocks affected by The City West Alternative contain a lower percentage of residents living below the poverty level when compared with the whole City of Port Huron. Approximately 10 percent of the Study Area's residents live at or below the poverty rate, while the total for the City of Port

Huron was approximately 17 percent. **Figure 3.2.4** in **Section 3.2 Communities and Neighborhoods** gives an economic characteristic comparison. However, the median household income level ($36,447) and average per capita income level ($16,847) for the blocks affected by the City West Alternative were lower than the averages for the entire city of Port Huron.

The Preferred Alternative like the City East Alternative will affect Environmental Justice populations in a similar manner to the general population. All of the impacts for the City West Alternative discussed in **Chapter 3 The Environment: What's There Now and Project Effects** will affect various segments of the general population based on their proximity to the project and their use of the existing roads and border crossing in the Study Area. The Preferred Alternative would require the acquisition of approximately 129 acres of land around the existing Blue Water Bridge Plaza east of the Black River in order to accommodate the new plaza and local road configuration. The 137 residences that would be relocated for the City West Alternative include minority, low-income, and elderly households. The potential relocation of 37 businesses currently operating in the Study Area will also affect low income, minority, and elderly households. The relocation effects of the Preferred Alternative are further discussed in **Section 3.6 Relocations**. The previous plaza and bridge improvements in the 1980s and 1990s displaced 33 residences and six businesses in the Study Area. There has been a cumulative pattern of plaza related impacts as discussed in **Section 3.7 Indirect and Cumulative Impacts.**

Neighborhood cohesion in the blocks surrounding the existing plaza would be divided as a result of plaza expansion at the existing location. Several local businesses would be relocated. This could present a challenge to the local low-income population to find sufficient alternatives to these departed businesses if comparable types of businesses are not located in the remaining commercial area as they may be limited in personal transportation and public transit service to outlying areas.

Neighborhood effects created by the City West Alternative will be the same for all persons regardless of race, income, or age. Environmental Justice populations will experience the

same changes in access, emergency service routes and minor transit re-routing. Changes in noise levels, as discussed in **Section 3.10 Noise,** will also affect low income, minority, and elderly households. The aesthetic and visual impacts of expanded plaza facilities, discussed in **Section 3.8 Aesthetic and Visual Impacts**, will affect Environmental Justice populations in the same manner as the general population. Similarly to the City East Alternative the Preferred Alternative will also result in the reduction of the local tax base which will be felt by all Port Huron and Port Huron Township residents regardless of income, race, or age.

Environmental Justice populations and border crossers will share in the potential benefits of the City East Alternative. There will be traffic congestion relief resulting in reduced travel times for border crossings and travel on local roads. As discussed in **3.4 Economics**, excess border congestion is costly to local, state, and national economies. Border crossing improvements may lead to more jobs and reduced transportation costs, with widespread benefits to the general population including minorities and low-income persons in the United States and Canada. These groups will also share in the benefits of improved border security.

Township Alternative: No minority population would receive disproportionately high and adverse impacts as a result of the construction of the Township Alternative. Local road improvements for the Township Alternative would affect many of the same blocks around the existing plaza as the City East and City West Alternatives. However, the Township Alternative would relocate 99 fewer homes than the City East Alternative and 81 fewer than the City West (Preferred) Alternative. Information on the population living in the Township Alternative analysis area is contained in **Table 3.3.1** and **Figure 3.3.1** to **Figure 3.3.4**. The five block area immediately surrounding the new plaza site in the Township Alternative has a total minority population of 4.2 percent. For Port Huron Township, the minority population is 7.9 percent of the total population. None of the five blocks contained greater than 20 percent minority population. Approximately 1.1 percent of the Study Area population surrounding the new plaza location was classified as Asian. This was the only minority group that had greater representation in the Study

The Township Alternative will relocate 29 businesses

Area as opposed to Port Huron Township as a whole. Approximately one-fourth (seven residents) of Port Huron Township's total Asian population (30 total residents) lived in the affected blocks.

For low income populations, the percentage of residents living at or below the poverty rate in the Study Area was slightly less than for Port Huron Township as a whole. Approximately 6.7 percent of the residents within the Study Area were living at or below the poverty rate, while that figure was 7.4 percent for Port Huron Township. However, like the City East and City West Alternatives the median household income level and average per capita income level were slightly less for the Study Area than the surrounding community as a whole. The homes that must be relocated for the Township Alternative are fewer and more spread out than the City East and City West Alternatives resulting in fewer impacts on community cohesion. Despite the secure corridor required for the Township Alternative, existing crossings of I-94/I-69 would be maintained.

The Township Alternative would affect Environmental Justice populations in a similar manner to the general population. As with the City East and West Alternatives, all of the impacts for the Township Alternative are discussed throughout **Chapter 3 The Environment: What's There Now and Project Effects** and would affect various segments of the general population based on their proximity to the project and their use of the existing roads and border crossing in the Study Area.

The Township Alternative would relocate minority and low-income households as part of the 56 residential relocations required for this alternative. As there are less overall relocations and fewer relocations in neighborhoods with low-income residents, the Township Alternative would result in fewer minority and low income households being relocated. The Township Alternative would relocate 29 businesses. The relocation effects of the Township Alternative are further discussed in **Section 3.6 Relocations**. The reductions in local tax bases that would result from the Township Alternative will be a burden for all groups including Environmental Justice populations.

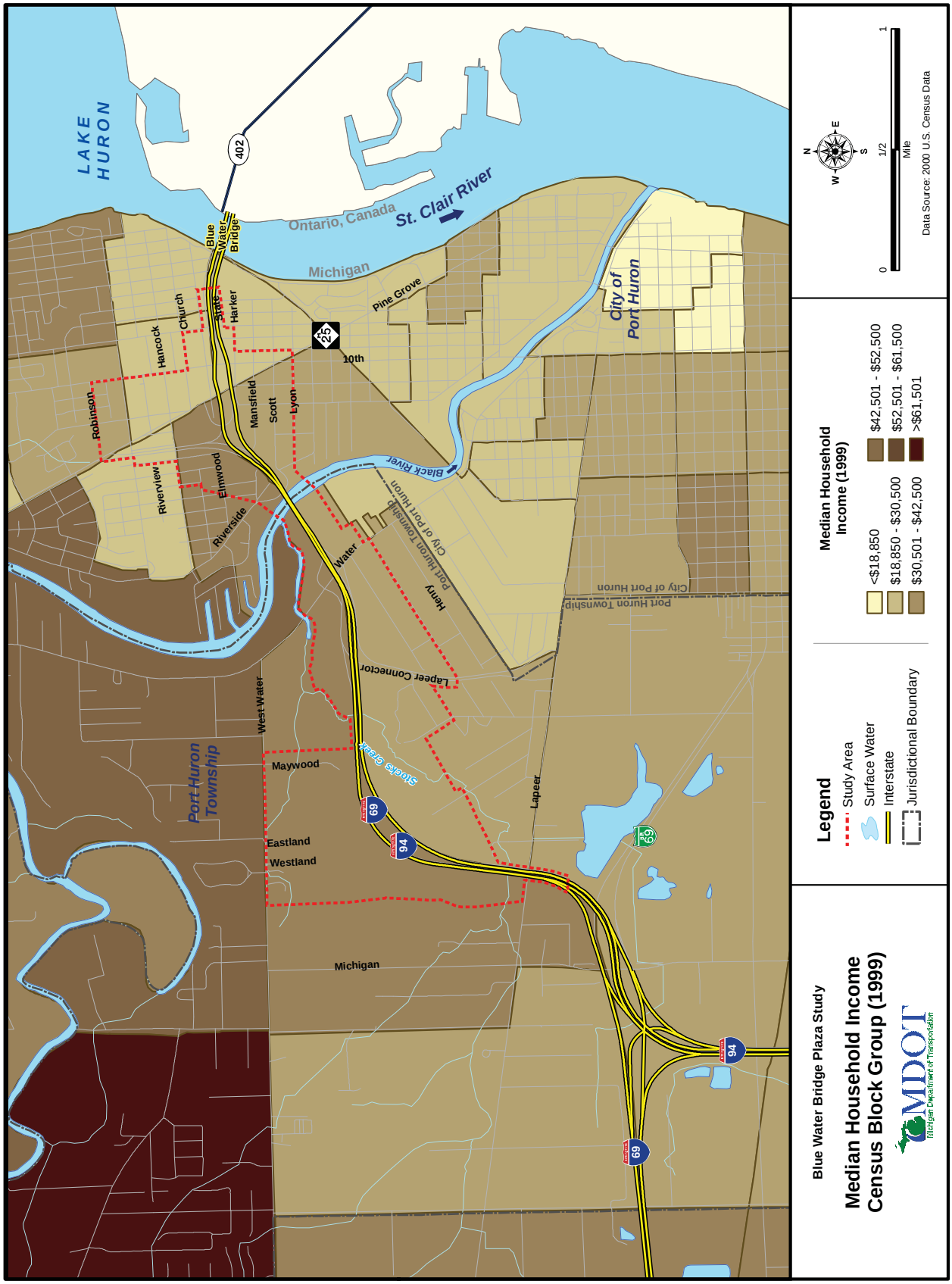
Reduced congestion time is one benefit of the Township Alternative

Environmental Justice populations would share in the neighborhood impacts created by the Township Alternative. They will experience the same changes in access, emergency service routes, and minor transit re-routing as the entire population. Changes in noise levels, as discussed in **Section 3.10 Noise** would affect all community groups in similar manner, but not disproportionately affect low income and minority households. The aesthetic and visual impacts of expanded plaza facilities and the secured corridor for the Township Alternative discussed in **Section 3.8 Aesthetic and Visual Impacts**, will affect Environmental Justice populations in the same manner as the general population.

Environmental Justice populations, especially border crossers, will share the potential benefits of the Township Alternative. Reduced congestion and travel times for crossing the border and on local roads will benefit all users. As discussed in **3.4 Economics**, excess border congestion is costly to local, state, and national economies. Border crossing improvements may lead to more jobs and reduced transportation costs, with widespread benefits to general population including low income and minority populations in the United States and Canada. The benefits will be similar for the Township Alternative as the City East and City West Alternatives although local border crossers, including local Environmental Justice populations, will no longer have direct access to the border crossing from Pine Grove Avenue. Environmental Justice populations will also share in the benefits of improved border security.

LAKE HURON
St. Clair River
Ontario, Canada
Michigan
402
Blue Water Bridge
Pine Grove
10th
25
City of Port Huron
Church
Harker
State
Hancock
Robinson
Mansfield
Scott
Lyon
Riverview
Elmwood
Riverside
Black River
Water
Port Huron Township
City of Port Huron
Henry
Port Huron Township
City of Port Huron
Lapeer Connector
West Water
Port Huron Township
Maywood
Stokes Creek
Lapeer
Eastland
Westland
Michigan
69
94
Legend
Study Area
Surface Water
Interstate
Jurisdictional Boundary
Percent Minority
No Data
< 6%
6.1% - 20%
20.1% - 50%
50.1% - 80%
> 80.1%
N
W
E
S
0
1/2
1
Mile
Data Source: 2000 U.S. Census Data
Blue Water Bridge Plaza Study
Minority by Census Block
Normalized by Population
MDOT
Michigan Department of Transportation

Figure 3.3.2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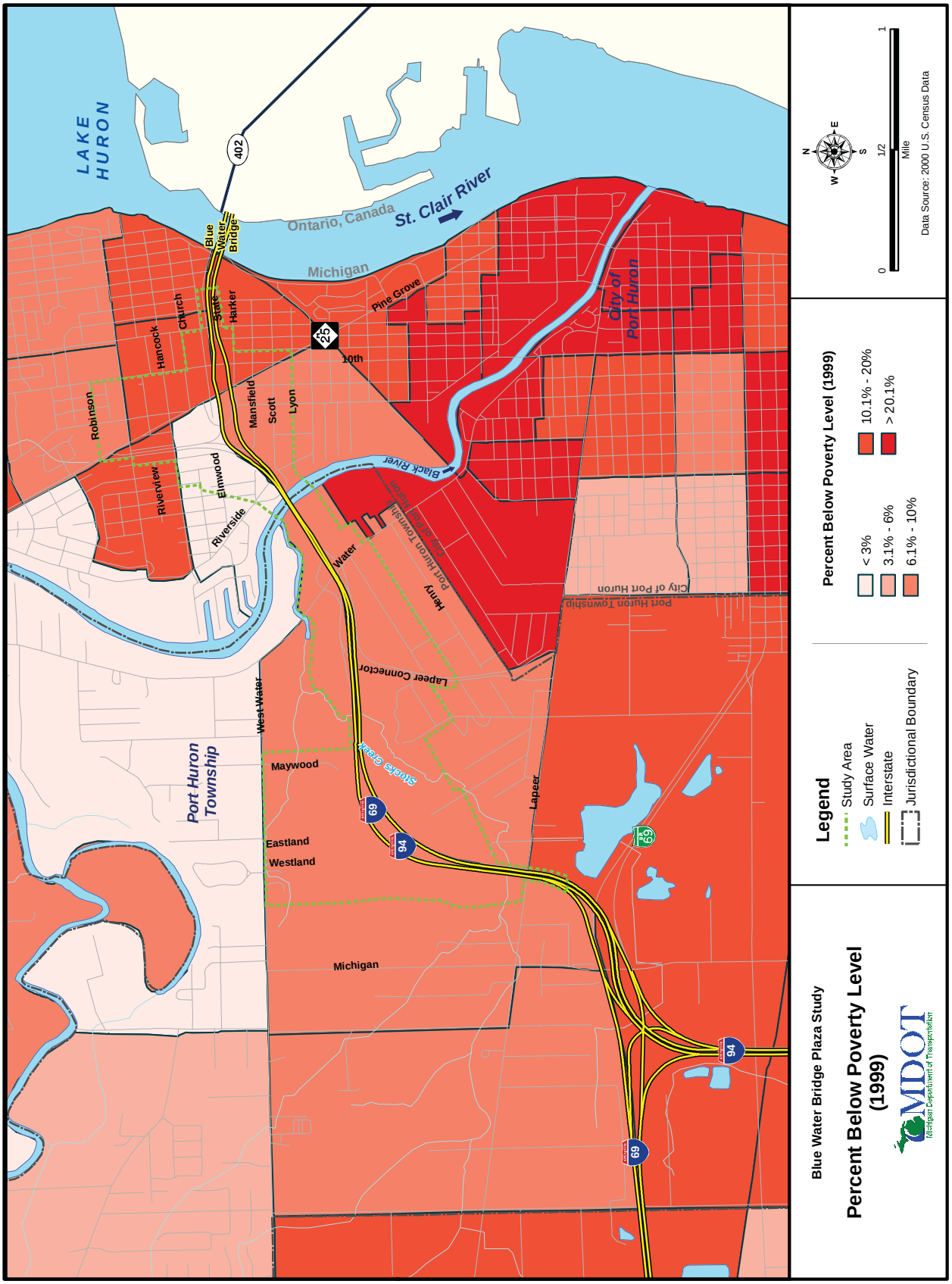
Elmwood
Riverside
Black River
City of Port Huron
Port Huron Township
Henry
Water
Port Huron Township
City of Port Huron
Lapeer Connector
West Water
Port Huron Township
Maywood
Sixteen Creek
69
94
Eastland
Westland
Lapeer
Michigan
Blue Water Bridge Plaza Study
Median Household Income Census Block Group (1999)
MDOT
Michigan Department of Transportation
Legend
Study Area
Surface Water
Interstate
Jurisdictional Boundary
Median Household Income (1999)
<$18,850
$18,850 - $30,500
$30,501 - $42,500
$42,501 - $52,500
$52,501 - $61,500
>$61,501
N
W
E
S
0
1/2
1
Mile
Data Source: 2000 U.S. Census Data

Figure 3.3.3


LAKE HURON
St. Clair River
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Robinson
Mansfield
Scott
Lyon
Riverview
Elmwood
Riverside
Black River
City of Port Huron
Port Huron Township
Henry
Water
Lapeer Connector
West Water
Maywood
Stocks Creek
Port Huron Township
Eastland
Westland
Lapeer
Michigan
69
94
Legend
Study Area
Surface Water
Interstate
Jurisdictional Boundary
Percent Below Poverty Level (1999)
< 3%
3.1% - 6%
6.1% - 10%
10.1% - 20%
> 20.1%
0
1/2
1
Mile
Data Source: 2000 U.S. Census Data
Blue Water Bridge Plaza Study
Percent Below Poverty Level (1999)
MDOT
Michigan Department of Transportation

Figure 3.3.4

3.4 Economics

The movement of people and goods across the Blue Water Bridge affects local, regional, state, national and international markets and economic conditions. The United States Plaza at the Blue Water Bridge is a key part of the Blue Water Bridge border crossing system. The location of the plaza and its ability to efficiently and securely process people and goods entering and exiting the United States will impact all the markets. The presence of the Blue Water Bridge also affects local businesses by bringing people through the Port Huron area. A new plaza will also require some existing businesses to move and will remove land from the tax base of the City of Port Huron. This section discusses the impacts of the Alternatives Carried Forward on local businesses, tax bases, jobs, and trade.

Trucks Waiting to Enter the United States on the Existing Plaza

3.4.1 What are the Existing Local Economic Conditions?

Income and Poverty: **Section 3.2.4 What Are the Economic Characteristics of Study Area Residents?** discusses the income and poverty levels for the Study Area in detail. The per capita income of St. Clair County was $21,582 in 2000, slightly below the Michigan average of $22,168. The median household income for the County was $46,313, slightly above the Michigan average of $44,667 (U.S. Census, 2000). The portions of the Study Area in Port Huron Township generally have higher median incomes, higher housing values, and a lower poverty rate than the parts of the Study Area within the City of Port Huron.

Existing Businesses and Economic Activity: Travel-oriented businesses including gas stations, fast food and sit down restaurants, and hotels dominate the commercial areas of the Study Area. Additional commercial uses include professional offices, car dealerships, and private recreation facilities. The City of Port Huron has designated two commercial zones in the Study Area, the Blue Water Gateway Business Area and the Pine Grove Avenue Mixed Use Area. These commercial zones are discussed in **Section 3.1.1 What are the Land Uses in the Study Area?**

The Intersection of Pine Grove Avenue and Hancock Street has a lot of travel-oriented businesses

Downtown Port Huron is located less than two miles south of the existing Blue Water Bridge Plaza. Port Huron's downtown contains several city, county, and state office buildings. Downtown Port Huron also has approximately 70 restaurants, bars, and small stores. The City of Port Huron views its downtown as an attractive tourist destination for people coming from Canada or elsewhere in Michigan.

There is a commercial corridor along Pine Grove Avenue and 24th Avenue, north of the existing plaza in northern Port Huron and Fort Gratiot Township. Birchwood Mall, several other smaller shopping centers, and large free-standing retail stores are located approximately 3.5 miles north of the existing plaza on 24th Avenue. There are also a series of travel oriented businesses including restaurants, a gas station, and hotels at the Water Street Interchange.

The Port Huron Area has several other business and industrial areas. Other business locations are discussed in **Section 3.7.1 Why do We Look at Existing Conditions and Development Trends?**.

What is Meant by the Term Workforce?

The workforce consists of all people 16 and over who are working or are actively looking for work.

Jobs: Unemployment in St. Clair County is higher than the average for the State of Michigan. The unemployment rate in the City of Port Huron is higher than the rate for the County. **Table 3.4.1** lists the 2005 average unemployment rates and workforce sizes for the jurisdictions within the Study Area. Employment in St. Clair County is forecast to grow by 26 percent between 2000 and 2030 (2007 SEMCOG Profile for St. Clair County).

Table 3.4.1 Unemployment and Workforce Data

Workforce Characteristics	City of Port Huron	St. Clair County	State of Michigan
2005 Average Unemployment Rate	11.2%	7.9 %	6.7%
2005 Average Workforce Size	16,445	85,206	5,097,000

Source: Michigan Office of Labor Market Information. Annual unemployment is not measured for townships under 25,000 people.

St. Clair County has nine industrial employers with more than 300 employees[1]. Most of these large private sector firms manufacture automobile-related components. Mueller Brass, with approximately 500 employees is the largest manufacturer in the City of Port Huron. Other major employers in the County include Detroit Edison, Port Huron Hospital, Mercy Health Services, and St. Clair County Community College. Approximately 485 individuals including federal inspection agents, MDOT staff, and customs brokers have jobs located in St. Clair County that are directly related to the Blue Water Bridge and Plaza. This makes the Blue Water Bridge and Plaza one of the top ten employers in the City of Port Huron and one of the top 20 employers in St. Clair County.

The Sarnia area has six industrial or office related employers with more than 300 employees. Chemical and rubber manufacturing are major industries in the Sarnia area. Major public sector employers include Blue Water Health, local school systems, and the Point Edward Charity Casino.[2]

Locations of Employment: Residents of the Port Huron area work throughout the county and beyond. **Figures 3.4.1 to 3.4.3** illustrate where residents of the City of Port Huron, Port Huron Township, and Fort Gratiot Township work. **Figures 3.4.4 to 3.4.6** illustrate where employees who work in the City of Port Huron, Port Huron Township, and Fort Gratiot Township live. This information is taken from the United States Census and represents United States residents only.

Based on discussions with several major employers, the Study Team is aware of at least 200 residents of Canada who work in the Port Huron area and must use the Blue Water Bridge to get to work. According to Census 2000, there are 36 St. Clair County residents who work in Canada and also rely on crossing the border to get to work. These maps illustrate the major commuting patterns in the area and assist in the analysis of how changes in access to the Blue Water Bridge Plaza and improvements along I-94/I-69 and to local roads may affect workers and businesses.

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[1] Data on major St. Clair County Employers is from the Michigan Economic Development Corporation, Profile of St. Clair County.

[2] Ontario Investment Service Data.

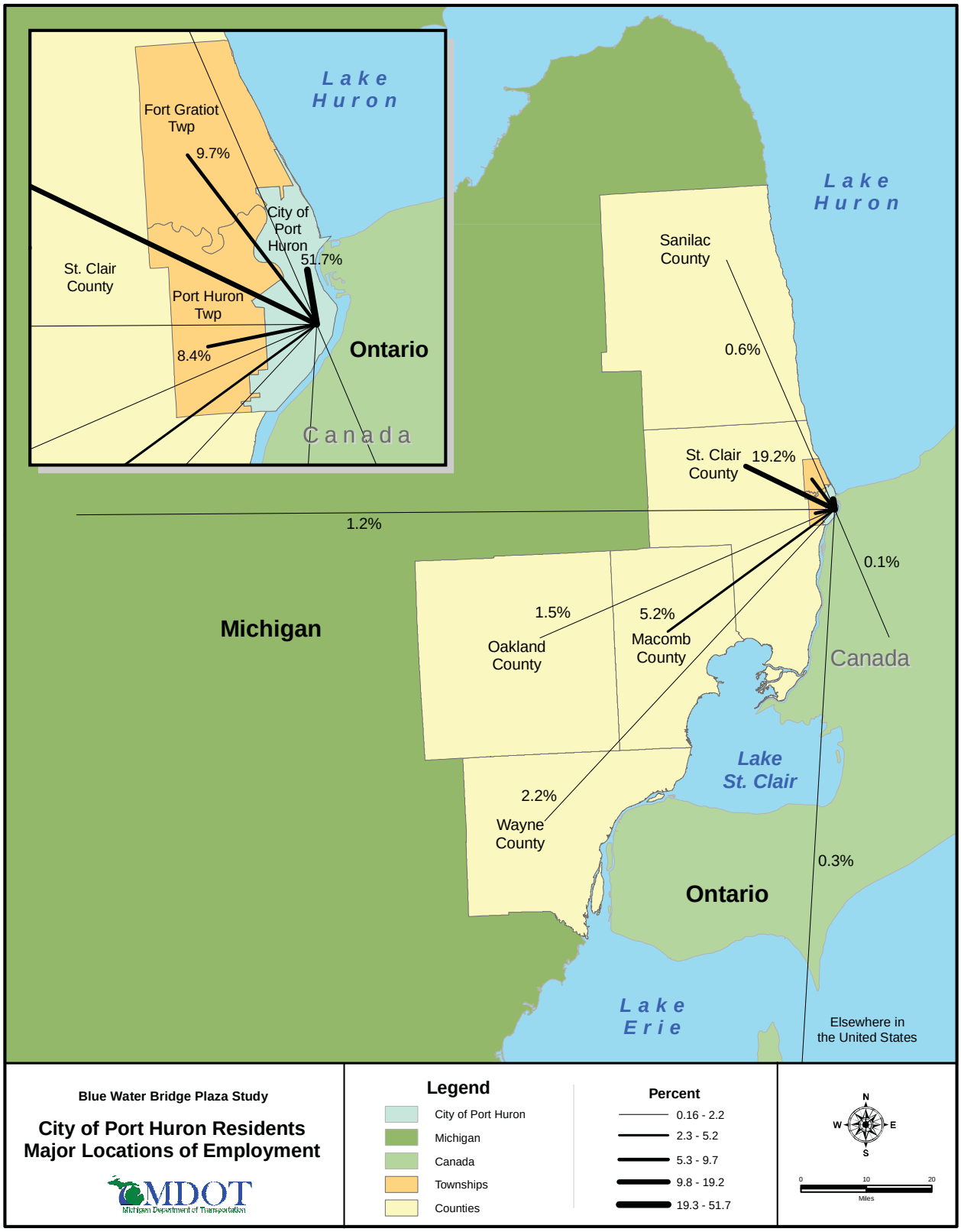

Lake Huron
Fort Gratiot Twp
9.7%
City of Port Huron
51.7%
St. Clair County
Port Huron Twp
8.4%
Ontario
Canada
Lake Huron
Sanilac County
0.6%
St. Clair County
19.2%
1.2%
0.1%
Michigan
1.5%
Oakland County
5.2%
Macomb County
Canada
Lake St. Clair
2.2%
Wayne County
0.3%
Ontario
Lake Erie
Elsewhere in the United States
Blue Water Bridge Plaza Study
City of Port Huron Residents Major Locations of Employment
MDOT
Michigan Department of Transportation
Legend
City of Port Huron
Michigan
Canada
Townships
Counties
Percent
0.16 - 2.2
2.3 - 5.2
5.3 - 9.7
9.8 - 19.2
19.3 - 51.7
N
W
E
S
0
10
20
Miles

Figure 3.4.1

Lake Huron
Fort Gratiot Twp
7.1%
St. Clair County
City of Port Huron
Port Huron Twp
17.2%
35.3%
Ontario
Canada
Lake Huron
Sanilac County
0.7%
St. Clair County
22.4%
0.8%
0.1%
3.9%
9.3%
Oakland County
Macomb County
Michigan
Canada
Lake St. Clair
3.2%
Wayne County
0.2%
Ontario
Lake Erie
Elsewhere in the United States
Blue Water Bridge Plaza Study
Port Huron Township Residents Major Locations of Employment
MDOT
Michigan Department of Transportation
Legend
City of Port Huron
Michigan
Canada
Townships
Counties
Percent
0.1 - 0.8
0.9 - 3.9
4.0 - 9.3
9.4 - 22.4
22.5 - 35.3
N
W
E
S
0
10
20
Mile

Figure 3.4.2

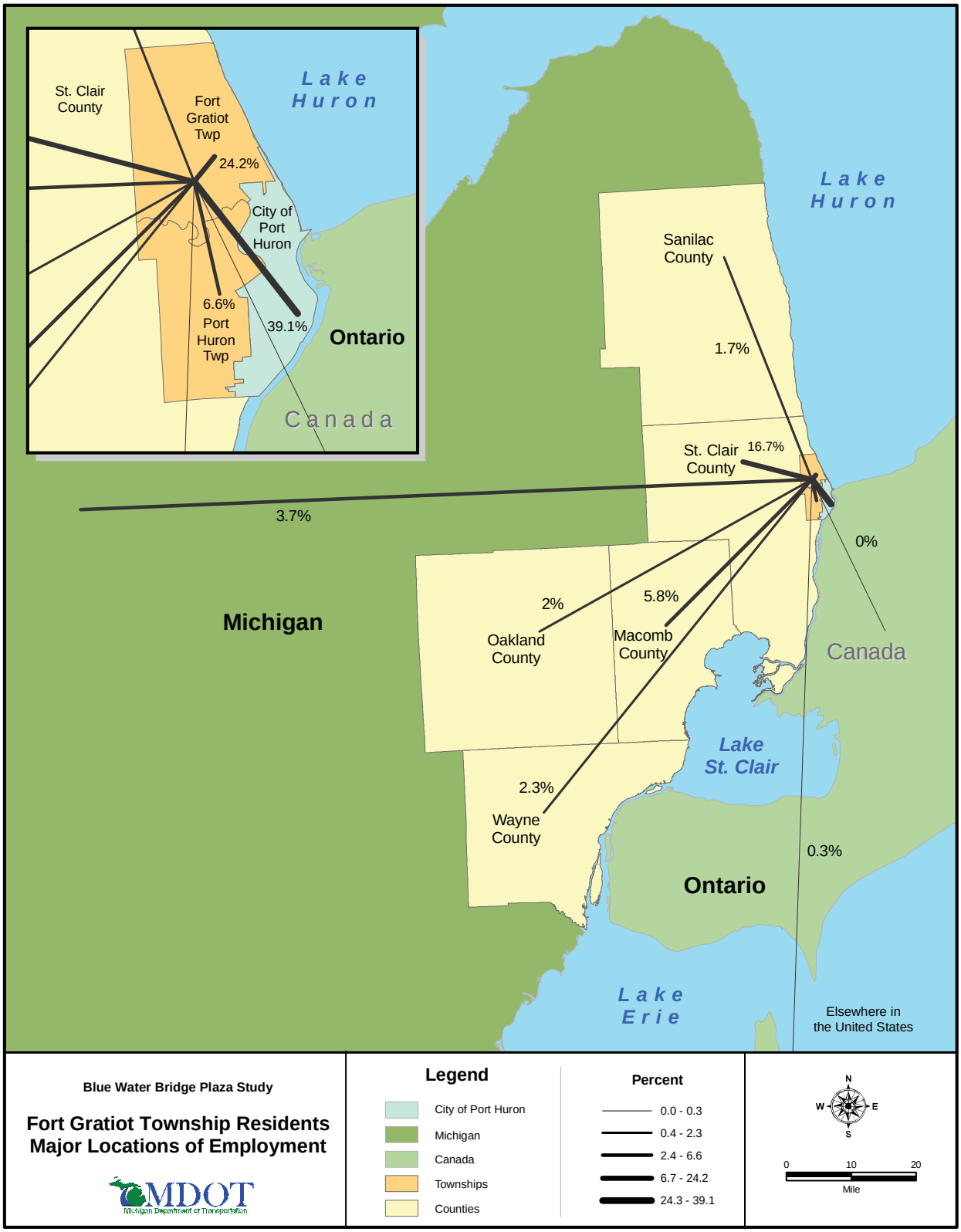

St. Clair County
Fort Gratiot Twp
Lake Huron
24.2%
City of Port Huron
6.6%
Port Huron Twp
39.1%
Ontario
Canada
Lake Huron
Sanilac County
1.7%
St. Clair County
16.7%
3.7%
0%
Michigan
2%
5.8%
Oakland County
Macomb County
Canada
Lake St. Clair
2.3%
Wayne County
0.3%
Ontario
Lake Erie
Elsewhere in the United States
Blue Water Bridge Plaza Study
Fort Gratiot Township Residents Major Locations of Employment
MDOT
Michigan Department of Transportation
Legend
City of Port Huron
Michigan
Canada
Townships
Counties
Percent
0.0 - 0.3
0.4 - 2.3
2.4 - 6.6
6.7 - 24.2
24.3 - 39.1
N
W
E
S
0
10
20
Mile

Figure 3.4.3

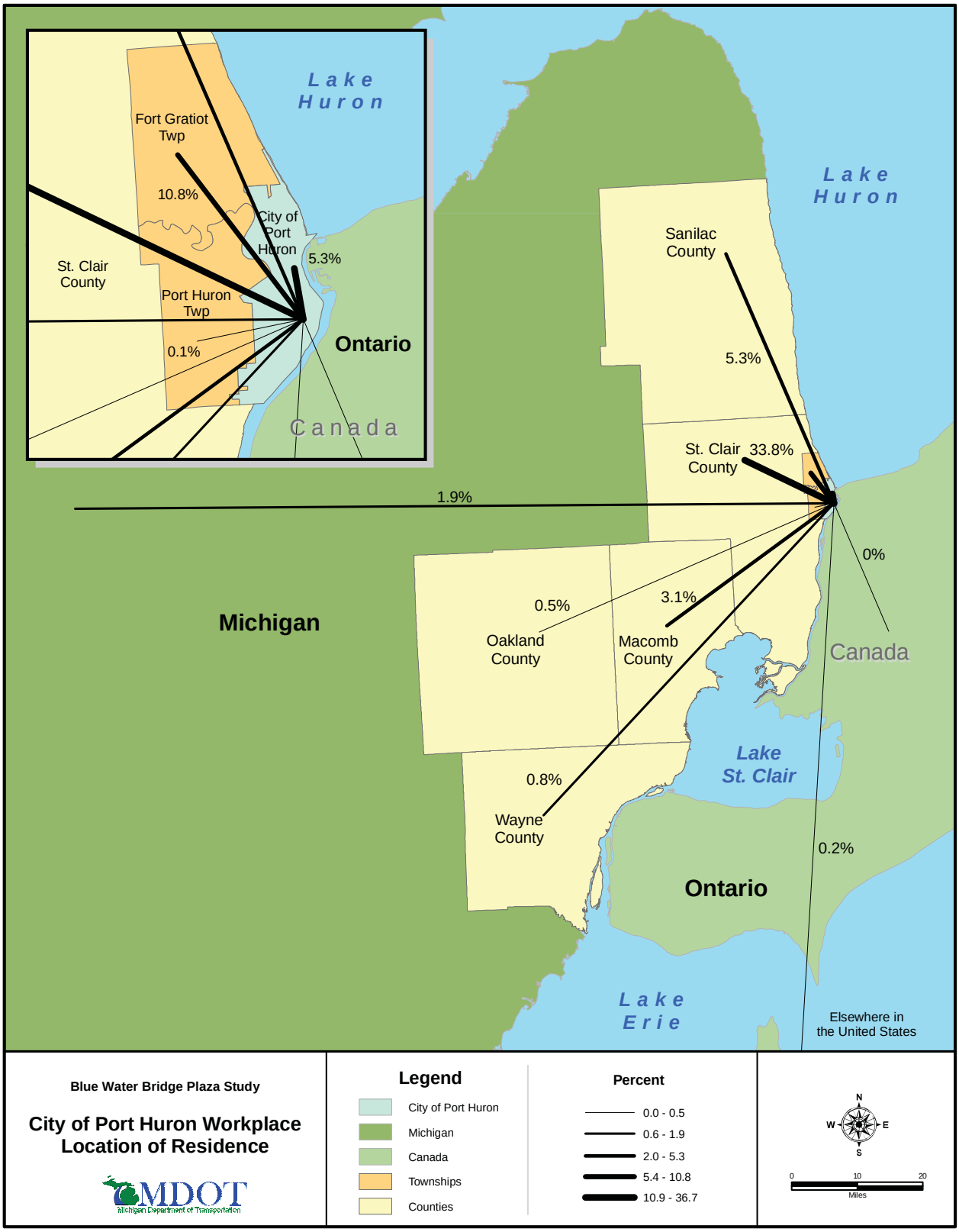

Lake Huron
Fort Gratiot Twp
10.8%
City of Port Huron
5.3%
St. Clair County
Port Huron Twp
0.1%
Ontario
Canada
Lake Huron
Sanilac County
5.3%
St. Clair County
33.8%
1.9%
0%
0.5%
3.1%
Oakland County
Macomb County
Canada
Michigan
Lake St. Clair
0.8%
Wayne County
0.2%
Ontario
Lake Erie
Elsewhere in the United States
Blue Water Bridge Plaza Study
City of Port Huron Workplace Location of Residence
MDOT
Michigan Department of Transportation
Legend
City of Port Huron
Michigan
Canada
Townships
Counties
Percent
0.0 - 0.5
0.6 - 1.9
2.0 - 5.3
5.4 - 10.8
10.9 - 36.7
N
W
E
S
0
10
20
Miles

Figure 3.4.4

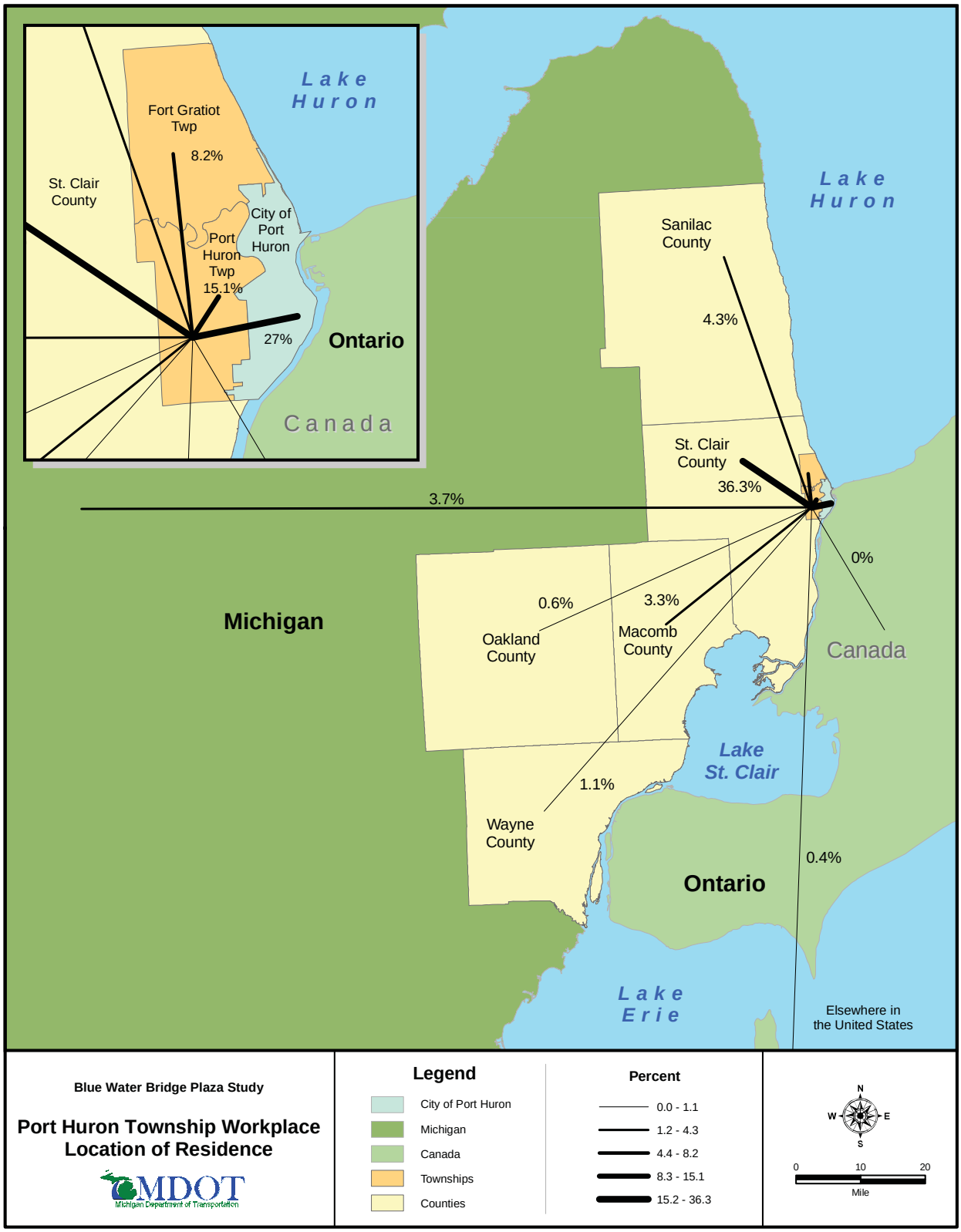

Lake Huron
Fort Gratiot Twp
8.2%
St. Clair County
City of Port Huron
Port Huron Twp
15.1%
27%
Ontario
Canada
Lake Huron
Sanilac County
4.3%
St. Clair County
36.3%
3.7%
0%
0.6%
3.3%
Oakland County
Macomb County
Michigan
Canada
Lake St. Clair
1.1%
Wayne County
0.4%
Ontario
Lake Erie
Elsewhere in the United States
Blue Water Bridge Plaza Study
Port Huron Township Workplace Location of Residence
MDOT
Michigan Department of Transportation
Legend
City of Port Huron
Michigan
Canada
Townships
Counties
Percent
0.0 - 1.1
1.2 - 4.3
4.4 - 8.2
8.3 - 15.1
15.2 - 36.3
N
W
E
S
0
10
20
Mile

Figure 3.4.5

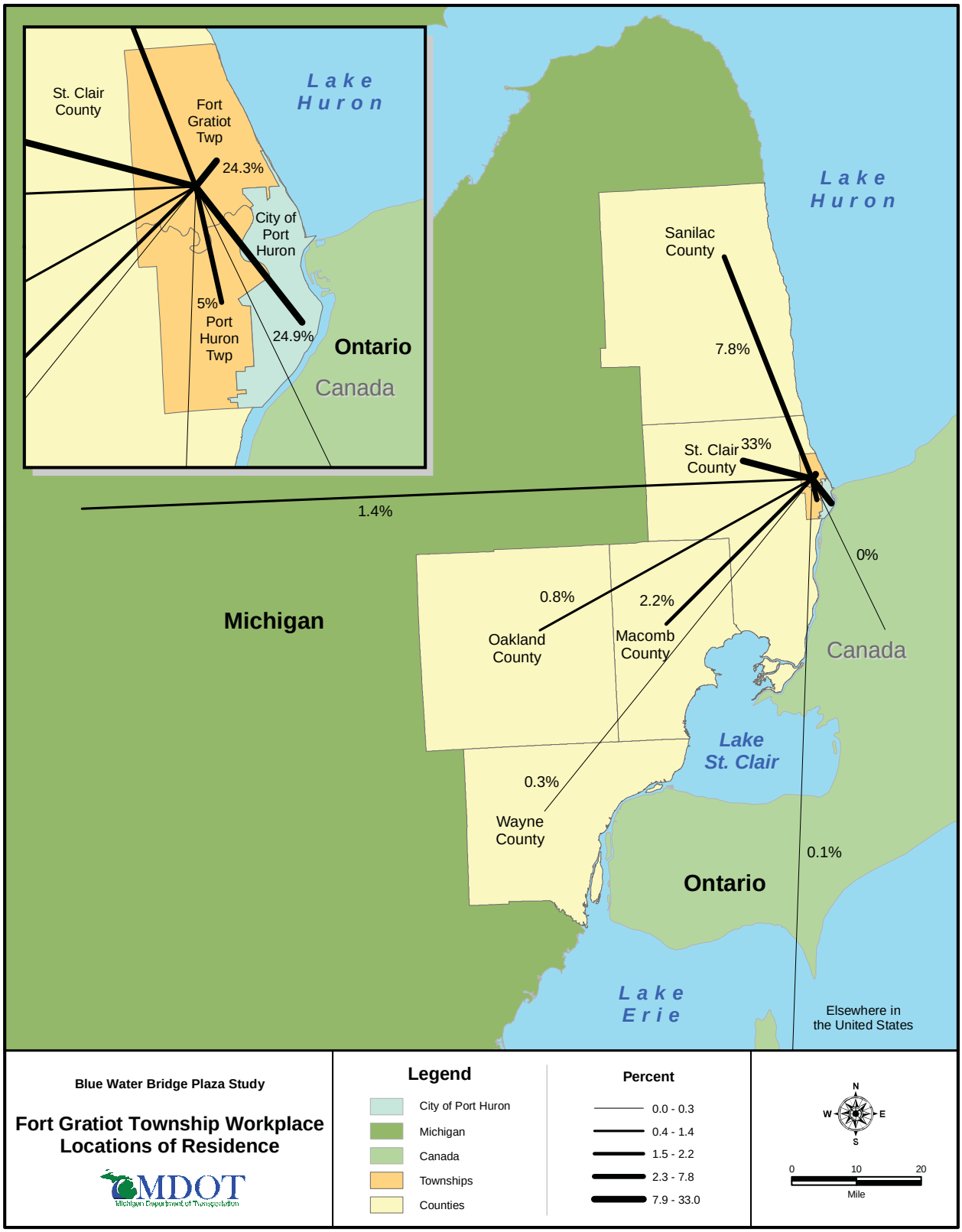

St. Clair County
Fort Gratiot Twp
Lake Huron
24.3%
City of Port Huron
5%
Port Huron Twp
24.9%
Ontario
Canada
Lake Huron
Sanilac County
7.8%
St. Clair County
33%
1.4%
0%
0.8%
2.2%
Michigan
Oakland County
Macomb County
Canada
Lake St. Clair
0.3%
Wayne County
0.1%
Ontario
Lake Erie
Elsewhere in the United States
Blue Water Bridge Plaza Study
Fort Gratiot Township Workplace Locations of Residence
MDOT
Michigan Department of Transportation
Legend
City of Port Huron
Michigan
Canada
Townships
Counties
Percent
0.0 - 0.3
0.4 - 1.4
1.5 - 2.2
2.3 - 7.8
7.9 - 33.0
N
W
E
S
0
10
20
Mile

Figure 3.4.6

3.4.2 How Important is the Blue Water Bridge to Businesses and Trade?

The North American Automobile Industry depends on border crossings

The Blue Water Bridge is one of the United State's busiest border crossings for both trucks and cars. In 2005, over $38 billion in goods crossed the Blue Water Bridge by truck, over $100 million per day. Approximately 14 percent of the truck trade between the United States and Canada crosses the Blue Water Bridge in Port Huron.

The automobile and automobile parts industries are very important parts of the economies of both the United States and Canada, especially in Michigan and Ontario. The automobile industry depends heavily on the quick transportation of goods across the border. Parts plants in Ontario provide supplies to car factories in Michigan and vice-versa. A car or truck may contain parts that have been partially assembled at multiple plants on both sides of the border. In 2000, automotive related trade accounted for $58 billion of the $93 billion in total Ontario exports to the Central-Eastern U.S. (mainly Michigan) as well as $28 billion of $74 billion of Ontario imports from the Central Eastern U.S.[3] The Blue Water Bridge, along with other Michigan Border Crossings, is a key link in keeping the automobile industry and other industries working.

What Are Travel-Oriented Businesses?

Travel oriented businesses are businesses that serve travelers such as gas stations, restaurants, and hotels. Most travel oriented businesses also serve local customers. A lower percentage of customers will have planned to stop at a specific travel-oriented business than at other types of businesses. Customers tend to shop at travel oriented businesses because of their convenient location, not because they provide unique goods or services.

Most of the business and trade benefits of the Blue Water Bridge and Plaza are felt by industries, workers, and business owners located throughout Michigan and Ontario and across the United States and Canada. However, the Blue Water Bridge is also an important part of the local Port Huron and Sarnia Area (Lambton County, Ontario) economy. There are three major ways that the presence of the Blue Water Bridge helps the local economy. First, there are Port Huron area businesses and agencies that use the bridge to transport goods and people across the border, and benefit from the bridge and plaza the same way as businesses outside the Port Huron area do. Second, the Blue Water Bridge Plaza has approximately 485 federal, state, and private business employees. Most of these employees live in the Port Huron area. If the border crossing were located elsewhere, these jobs would not exist in

[3] *Transportation and Trade, Chapter 7 of Transportation in Canada.* Transport Canada, 2002.

the Port Huron area. Third, travelers that use the Blue Water Bridge also visit local businesses. Over 15,000 cars and trucks cross the Blue Water Bridge on an average day. Only 13 percent of these border crossings are made by vehicles that begin their trip in St. Clair County. More than 13,000 vehicles from other places in Canada or the United States pass through or stop in the Port Huron area on an average day.[4] Some of the drivers and passengers of these 13,000 vehicles will stop for food, lodging, gasoline, supplies, tourist attractions and other business reasons in the Port Huron area. The vast majority of these travelers would have no reason to pass through the Port Huron area if the border crossing was located in another community.

3.4.3 Assumptions and Methodologies

Business Impact Analysis: In assessing business impacts the Study Team examined the businesses that would be relocated and identified how any access changes would affect remaining businesses.

Tax Base Analysis: Local property tax base impacts are discussed based on the taxable value of parcels that must be acquired for right-of-way, for the alternatives. Tax roll data was collected from the City of Port Huron and Port Huron Township to assist in the calculation of the property tax impacts. Future changes in taxable value due to the impacts of a particular alternative on neighboring parcels are not accounted for in the assessment, as it is extremely difficult to forecast the impacts of a transportation project on the taxable value of a property.

Job Impact Analysis: Study Team members contacted businesses in the Study Area to develop estimates of the jobs that would be relocated as part of the potential business relocations. Based on employment at similar businesses, the Study Team estimated the number of relocated jobs for businesses for whom employment data was unavailable. The Study Team also estimated the number of construction and other related jobs that would be created by the investment of

What is the Property Tax Base?

The property tax base of a community is the combined taxable value of all properties in the community. This includes the taxable value of real estate and of personal property such as equipment owned by businesses. The property tax base is different from property taxes. Property taxes are calculated by multiplying the property tax base by the property tax rates for the community.

[4] *Ontario – Michigan Border Crossing Traffic Study – Technical Report*. Michigan Department of Transportation, 2001. and *NRS/MTO Commercial Vehicle Survey*, 1999/2000.

state dollars in the proposed project using statewide average estimates of jobs created per dollar of investment in construction.

Cost of Congestion Analysis: In 2003, Dr. John C. Taylor, Dr. Douglas Robideaux, and Dr. George C. Jackson prepared a paper: *The U.S.-Canada Border: Cost Impacts, Causes, and Short to Long Term Management Options* for the United States, Michigan, and New York Departments of Transportation. The paper identified many different costs associated with border crossings between the United States and Canada. The cost of congestion analysis prepared for the Blue Water Bridge Plaza Study is based in part on the methodology contained in this paper, as discussed below.

3.4.4 How Would a No-Build Alternative Affect Businesses, Taxes, Jobs, and Trade?

The No-Build Alternative will have minimal effects on existing local businesses and local tax bases. The No-Build Alternative will have negative impacts on trade between the United States and Canada and between Michigan and Ontario due to increasing levels of plaza congestion causing longer delays for shipments across the Blue Water Bridge.

Impacts on Existing Local Businesses: The No-Build Alternative will have very minor impacts on existing local businesses. No businesses are relocated and there are no access changes that would affect existing business patterns.

Tax Base Impacts: There is no new right-of-way required for the No-Build Alternative and thus no direct impacts to the property tax base for any community. As the plaza would remain in Port Huron, there would be no impacts to the city income tax collected from plaza employees.

The No-Build Alternative would have long-term negative impacts on the tax bases of the United States, Canada, Michigan, and Ontario to the extent that revenues from international trade are harmed by border congestion. The potential trade and economic impacts of the alternatives are discussed in the following paragraphs.

Job Impacts: As the No-Build alternative involves no property acquisition or changes in access, it is unlikely to have any direct impacts on local employment. Jobs related to trade and trucking would be negatively affected by a No-Build Alternative to the extent that congestion and backups raise the cost of transporting goods across the border, resulting in negative impacts on trade between the United States and Canada. There are substantial congestion issues at each of the major border crossings between Michigan and Ontario. Cars and trucks will not be able to avoid border congestion by diverting to other crossings.

Other studies have suggested that there will be high job losses unless the Michigan border crossings, including the Blue Water Bridge, are improved. A study completed for the Border Transportation Partnership concluded that approximately 90,000 full time jobs would be lost in the United States and approximately 35,000 full time jobs would be lost in Canada if improvements are not made to border crossings between Ontario and Michigan[5].

Why Does Uncertainty in Border Crossing Time Hurt the Economy?

Many manufacturers rely on parts arriving at their plants just when they need them. They do not want to pay for large warehouses of parts. Uncertainty in the time it takes to cross the border means that parts from factories on the other side of the border may not arrive when they are needed. As a result, manufacturers have to keep and store an extra supply of parts just in case of supply delays or risk having to shut down production. Keeping extra part supplies raises the cost of manufacturing.

Figures 3.4.1 to 3.4.3 show that approximately 11 percent of employed City of Port Huron residents and 16 percent of employed Fort Gratiot Township residents work outside of St. Clair County. Many of these workers will use the roadways in the Study Area as part of their commute to and from work. Approximately 46 percent of employed Fort Gratiot Township residents work in the City of Port Huron or Port Huron Township and 10 percent of employed City of Port Huron residents work in Fort Gratiot. Most of these workers will pass through the Study Area as part of their journey to work each day. Congestion and backups within the Study Area and along I-94/I-69 due to the selection of a No-Build Alternative will lengthen the commute times for Port Huron Area workers traveling through the Study Area.

Trade Impacts: As discussed in **Chapter 1 Why Are Improvements Needed?,** the No-Build Alternative would result in the worsening of traffic backups and congestion on the United States Plaza at the Blue Water Bridge. Future

[5] *Regional and National Economic Impact of Increasing Delay and Delay Related Costs at the Windsor-Detroit Crossings*. Canada-United States, Ontario-Michigan Border Transportation Partnership, 2004.

backups and congestion under a No-Build condition would have a negative effect on international trade. Backups and congestion are costly for trucking firms and the traveling public. The costs of backups and congestion include wages for drivers waiting to cross, lost productivity of trucks, and a reduction in the number of daily trips drivers can make across the border. The backups and congestion also cost trucking firms and manufacturers because of the uncertainty they create in the delivery process. Many industries in Ontario and Michigan, especially the auto industry, depend on parts from both sides of the border. Dealing with anticipated delays can be very costly due to production shut downs or the need to have an excess inventory of parts in case of delayed shipment.

Based on the methodology and assumptions developed by Taylor et al., the Study Team analyzed the cost of congestion and backups at the United States plaza. This analysis only included costs directly related to congestion and backups such as:

- Costs of truck waiting time at primary inspection
- Costs of truck secondary inspection processing time
- Costs of excess carrier company planned time for border crossings above actual crossing times, which could not be recouped
- Costs of a reduced number of driving cycles (trips back and forth between destinations) due to congestion at the border
- Extra costs for excess manufacturers inventory that must be kept due to uncertainty in border crossings, and
- Costs of passenger vehicle transit time at primary inspection

The analysis concluded that the estimated cost of congestion and backups was $160 million in 2006 and would be cumulatively $4.3 billion (2006 Dollars) between 2010 and 2030 if the No-Build Alternative is selected instead of one of the Build Alternatives based on the bulleted analysis criteria above.

Excess inventory held by manufacturers to deal with uncertainty and waiting times for trucks at primary inspection made up the largest share of the estimated cost of congestion.

These costs are felt directly by trucking companies, manufacturers, and individuals crossing the border. The costs may also be passed on to consumers in the form of higher prices to account for higher transportation and inventory storage costs.

Fuel consumption will also increase for both border crossers and local traffic caught in plaza related congestion and backups. This would increase the cost of transporting goods and costs for commuters to get to work.

3.4.5 How Would the City East Alternative Affect Businesses, Taxes, Jobs, and Trade?

Economic effects of the City East Alternative would include the relocation of local businesses, changes in access for local businesses, and impacts to the local tax bases for the City of Port Huron and Port Huron Township. The City East Alternative also would reduce future congestion at the Blue Water Bridge border crossing, providing positive economic benefits to trucking firms and other companies and individuals involved in cross-border trade. The economic effects of the City East and City West Alternatives would be similar, with minor differences in business relocations, tax base impacts and effects of changes in local access and traffic patterns.

Impacts on Existing Businesses: As discussed in detail in **Section 3.6 Relocations**, the City East Alternative relocates 34 businesses. Approximately 75 percent of the relocated businesses own their site while the others lease their business location. These businesses may choose to relocate to a different jurisdiction, a different part of the community, or remain close to their existing location if possible. Some changes in existing business patterns for residents and business owners in the vicinity of the plaza are inevitable with this number of commercial relocations. The City East Alternative eliminates six vacant business sites within the City of Port Huron's designated Blue Water Gateway Business Area or the Pine Grove Avenue Mixed Use Area. The total number of business relocations in the vicinity of the existing plaza and the conversion of several business sites to plaza use represent significant economic impacts on the local

community. Some of the potential relocations are due to the need to acquire parts of the land of a business but not the whole property. In these cases MDOT may be able to work out an agreement so that the business can remain in its existing location if the property owner is interested. Relocated and new businesses would likely develop on available sites in the vicinity of the new plaza.

The City East Alternative changes a key access route for remaining businesses through the relocation of Pine Grove Avenue to 10th Street. The City East Alternative maintains access to businesses in the vicinity the existing plaza by providing similar ramps to and from the existing plaza. Travel times for cross-border traffic to access businesses in the vicinity of the plaza, along M-25, and to downtown Port Huron will improve during periods of high traffic volumes due to plaza improvements. Travel times to businesses remaining in the vicinity of the plaza will be similar to existing conditions. The changes in access to most remaining businesses in the vicinity of the plaza are minor. Existing businesses would not be bypassed. As a result, economic impacts to existing businesses due to changes in access would be minor.

Looking north along Pine Grove Avenue from the plaza

The City East Alternative would have minimal effect on businesses in downtown Port Huron. The alternative would add a ramp between I-94/I-69 and the proposed Pine Grove Avenue/10th Street combination. This ramp would provide more direct access for eastbound travelers to get to downtown Port Huron and would help support economic development efforts focused on the area between the plaza and downtown. The City East Alternative does not change access to northern Port Huron or Fort Gratiot Township except for the Pine Grove Avenue/10th Street combination. This combined street is forecast to operate efficiently so the City East Alternative would have minimal effects on access to businesses in northern Port Huron or Fort Gratiot Township.

The City East Alternative would relocate two businesses on the south side of the Water Street Interchange. Three other businesses would be affected due to minor partial property acquisition and driveway access issues during construction. Other businesses at Water Street should not be affected as

Water Street will remain a full access interchange and will remain as the first exit off of I-94/I-69 past the plaza.

Tax Base Impacts: **Table 3.4.2** lists the local property tax base impacts by alternative.

Table 3.4.2 Local Property Tax Base Impacts – 2006 Dollars

Alternative	City of Port Huron			Port Huron Township		
	Taxable Value Lost $Millions	Total Taxable Value $Millions	Percent of Total Taxable Lost	Taxable Value Lost $Millions	Total Taxable Value $Millions	Percent of Total Taxable Lost
No-Build	$0.0	$756.0	0.0%	$0.0	$281.2	0.0%
City East	$11.3	$756.0	1.5%	$1.4	$281.2	0.5%
City West	$10.6	$756.0	1.4%	$1.4	$281.2	0.5%
Township	$5.2	$756.0	0.7%	$3.6	$281.2	1.3%

Source: Raw Property Tax Data provided by City of Port Huron and St. Clair County.

MDOT would not pay property taxes on the property purchased for a new plaza and other roadway improvements. The City of Port Huron would fore go approximately 1.5 percent of its existing property tax base if the City East Alternative was constructed. The property tax base of the City of Port Huron grew approximately 4.4 percent annually between 2003 and 2006. The loss of tax base to the City of Port Huron would be less than one year's annual growth in taxable value. This loss of taxable value would represent a permanent reduction in the taxable property to the City of Port Huron's revenue and thus would affect budgets and programs. A better facility will make the area more attractive to this developmental tax base.

Port Huron Township would lose approximately 0.5 percent of its existing property tax base if the City East Alternative was constructed. The property tax base of Port Huron Township grew approximately 5.5 percent annually between 2003 and 2006. The loss of tax base to Port Huron Township would also be less than one year's annual growth in taxable value. This loss of taxable value would represent a permanent loss to Port Huron Township's revenue.

St. Clair County and the Port Huron Area School District would also lose tax base as a result of the City East

Alternative. These jurisdictions have larger tax bases than the City of Port Huron and the resulting losses to their tax bases would be a much smaller percentage.

A 160 unit housing development was to be constructed on land where the new MDOT Welcome Center would be located. This land would no longer be available for housing if the City East was constructed. At an average taxable value of $90,000 per unit, based on an average selling price of $160,000 to $200,000 per unit, this would represent a lost opportunity of over $14 million each year in potential future tax base for the Township. This is based on complete build-out of the housing development.

If the City East Alternative is constructed, the home and business owners that remain around the plaza may experience changes in their property values and property taxes. It is very difficult to isolate the effect of transportation improvements on the value of particular parcels of lands. Some parcels may increase in value due to improved access while other properties may lose value due to noise or visual impacts. A property, which may have lower value as a residential property, may also have a much greater value as a potential business site. It is also difficult to differentiate between the effects of the project and changes in values due to property improvements or changes in the local market. As a result, MDOT does not attempt to assess the potential changes in value for individual properties that do not need to be purchased for the project. MDOT does not directly compensate property owners for potential losses in property values due to their proximity to the project nor does MDOT charge property owners for any potential additional value created by the project.

The City of Port Huron has a local income tax that plaza workers are subject to. The City East Alternative keeps all of the existing plaza jobs in the City of Port Huron. The additional potential CBP and MDOT staff to operate the expanded plaza would also be subject to Port Huron's local income tax. Workers employed at businesses required to relocate by the new plaza would still be subject to the Port Huron income tax if they live in the city or if the business relocates within the city limits. There could be local income

tax revenue reductions if businesses and residents who must relocate because of the City East Alternative chose to move to other communities.

The construction and operation of the City East Alternative would substantially reduce or eliminate the estimated $4.3 billion in trade costs due to excess congestion discussed above for the No-Build Alternative. This will lead to increased revenue and employment for industries that rely on the border crossing to ship products and parts between the United States and Canada. Increased revenue and jobs will translate into tax benefits to the United States, Michigan, Canada, and Ontario.

Job Impacts: The City East Alternative will impact jobs through the relocation of jobs that are connected with businesses to be displaced. **Table 3.4.3** lists the estimated job relocations for the City East Alternative as well as the other Alternatives Carried Forward.

Table 3.4.3 Estimated Local Job Relocations

Alternative	City of Port Huron Job Relocations	Port Huron Township Job Relocations
No-Build	0	0
City East	375	15
City West	385	15
Township	280	115

The City East Alternative would displace businesses with a total estimated employment of 390 people. If some of the displaced businesses choose to shut down or move outside of the Port Huron area, there would be a loss of local jobs. The City East Alternative would benefit national employment by decreasing the cost of transporting goods across the border and increasing revenue and efficiency for firms that rely on the border crossing to ship products and parts between the United States and Canada.

The investment of construction dollars for the project will result in the creation of new jobs. When an investment is made in the construction of a new facility, the companies and individuals receiving payment for building the project will in turn spend the money they receive on other goods and

services. Companies and individuals receiving benefits in terms of reduced travel time and accident costs would also invest portions of these savings in the local and state economies. Based on the estimated construction cost for the City East Alternative of $237 million, the Study Team estimates that 4,310 jobs will be created over a five-year construction period. Most of these jobs will be short-term construction related positions. Local job benefits from construction of the alternative constructed would depend in part on the availability of local materials and workers. MDOT seeks the best possible value from its investments when tendering construction projects and, like any other project, there is no guarantee local firms would be selected or local materials used.

Downtown Port Huron

Trade Impacts: The City East Alternative would result in positive impacts on trade and commerce across the Blue Water Bridge through a reduction in travel times and congestion. Reduced congestion will lead to less uncertainty in border crossings, allowing firms that transport goods across the border to meet just in time delivery schedules with less warehouse inventory required. The earlier discussion of the No-Build Alternative identified the cost of excess congestion and delay between 2010 and 2030 as $4.3 billion in 2006 dollars. All Build Alternatives will reduce congestion to a minimum by providing the facilities needed to the future substantial backups for the No-Build Alternative. The City East Alternative would thus result in an estimated savings to the United States and Canadian economies of more than four billion during its first 20 years of operation.

3.4.6 How Would the Preferred (City West) Alternative Affect Businesses, Taxes, Trade, and Jobs?

The City West Alternative would have similar impacts on businesses, local tax base, trade, and jobs as the City East Alternative. The two alternatives would have minor differences in business and tax base impacts due to differences in the quantity and location of the properties that would need to be purchased. The City West Alternative would have different effects on remaining businesses due to the realignment of Pine Grove Avenue to the west of the new plaza instead of to the east as is the case for the City East

Alternative. The City West Alternative also would reduce future congestion at the Blue Water Bridge border crossing, providing positive economic benefits to trucking firms and other companies and individuals involved in cross-border trade.

Impacts on Existing Businesses: As discussed in **Section 3.6 Relocations**, the City West Alternative relocates 37 businesses. Approximately 75 percent of the relocated businesses own their site while the others lease their location. The relocated businesses may choose to move to a different community or remain close to their current location if possible. Some changes in existing businesses patterns for residents and business owners in the vicinity of the plaza are inevitable with this number of business relocations. The City West Alternative also eliminates six vacant business sites within the City of Port Huron's designated Blue Water Gateway Business Area or the Pine Grove Avenue Mixed Use Area. The total number of business relocations in the vicinity of the existing plaza and the conversion of several potential business sites to plaza use represent significant economic impacts on the local community. Some of the potential relocations are due to the need to acquire parts of the land of a business but not the whole property. In these cases MDOT may be able to work out an agreement so that the business can remain in its existing location if the property owner is interested. Relocated and new businesses would likely develop on available sites in the vicinity of the new plaza.

The City West Alternative changes a key access route for remaining businesses through the relocation of Pine Grove Avenue to the west of the new plaza. As a result, Pine Grove Avenue will no longer be a through traffic route for the commercial block north of the plaza between Hancock Street and Riverview Street. That stretch of Pine Grove Avenue currently carries approximately 21,000 cars on an average day. Following the re-routing of Pine Grove Avenue as result of the City West Alternative, that stretch of road will likely carry a small fraction of this original traffic level. This reduction in traffic levels will have an impact on businesses such as gas stations and fast food restaurants that depend on pass by traffic for a certain portion of their customers. The relocated northbound lanes of Pine Grove Avenue would connect with

the existing Pine Grove Avenue near Riverview Street, so this one block of businesses should still be visible from the main route. The impact on existing businesses could be reduced by signing and driveway access changes that encourage traffic using the realigned Pine Grove Avenue to visit the bypassed businesses. These commercial blocks are also a likely future location for businesses serving border crossing traffic. Several businesses that are displaced by the City West Alternative may wish to relocate to these blocks north of the plaza.

The Blue Water Twin Bridges

The City West Alternative will maintain border traffic access to businesses remaining in the vicinity of the existing plaza by provided ramps between the plaza and the realigned Pine Grove Avenue. Travel times for cross-border traffic to access businesses in the vicinity of the plaza, along M-25, and to downtown will improve during periods of high traffic volumes due to plaza improvements.

The City West Alternative would have minimal effect on businesses in downtown Port Huron. The alternative would include direct ramp access between I-94/I-69 and the realigned Pine Grove Avenue. This access will make it easier for eastbound travelers to get to downtown Port Huron and would help support economic development efforts focused on the area between the plaza and downtown. The alternative provides an intersection between the local access ramp from the plaza and Pine Grove Avenue. This will allow traffic exiting the plaza to turn toward downtown Port Huron more easily than with existing plaza access. The City West Alternative does not change access to northern Port Huron or Fort Gratiot Township except for the realignment of Pine Grove Avenue. The realigned Pine Grove Avenue is forecast to operate efficiently so the City West Alternative would have minimal effects on access to businesses in northern Port Huron or Fort Gratiot Township.

The City West Alternative would relocate two businesses on the south side of the Water Street Interchange. Three other businesses would be affected due to minor partial property acquisition and driveway access issues during construction. Other businesses at Water Street should not be affected as Water Street will remain a full access interchange and will remain as the first exit off of I-94/I-69 past the plaza.

Tax Base Impacts: The tax base impacts of the City West Alternative are shown in **Table 3.4.2**. MDOT would not pay property taxes on the property acquired for the new plaza. The City of Port Huron would lose approximately 1.4 percent of its existing property tax base if the City West Alternative was constructed. The property tax base of the City of Port Huron grew approximately 4.4 percent annually between 2003 and 2006. The loss of tax base to the City of Port Huron would be less than one year's annual growth in taxable value. This loss of taxable value would represent a permanent loss to the City of Port Huron's revenue and would affect budgets and programs.

Port Huron Township would lose approximately 0.5 percent of its existing property tax base if the City West Alternative was constructed. The property tax base of Port Huron Township grew approximately 5.5 percent annually between 2003 and 2006. The loss of tax base to the Port Huron Township would also be less than one year's annual growth in taxable value. This loss of taxable value would represent a permanent loss to Port Huron Township's revenue.

St. Clair County and the Port Huron Area School District would also lose tax base and tax revenue as a result of the City West Alternative. These jurisdictions have larger tax bases than the City of Port Huron and the resulting losses to their tax bases would be a much smaller percentage. Also, the tax base loss would be partially offset by the value of new development.

Chippewa Middle School

A 160-unit housing development was to be constructed on land where the new MDOT Welcome Center would be located. This land would no longer be available for housing if the City West Alternative was implemented. At an average taxable value of $90,000 per unit, based on an average selling price of $160,000 to $200,000 per unit, this would represent a loss of over $14 million each year in potential future tax base for the Township. This is based on complete build-out of the housing development.

The City West Alternative may cause changes in the property values and property taxes for homes and business owners that remain in the vicinity of the plaza. It is very difficult to isolate

the effect of transportation improvements on the value of particular parcels of land in an urban area. Some parcels may increase in value due to improved access while other parcels may lose value due to noise or visual impacts. A property, which may have lower value as a residential property, may also have a much greater value as a potential business site. It is also difficult to differentiate between the effects of the project and changes in values due to property improvements or changes in the local market. As a result, MDOT does not attempt to assess the potential changes in value for individual properties that do not need to be purchased for the project. MDOT does not directly compensate property owners for potential losses in property values due to their proximity to potential additional value created by the project.

Blue Water Bridge Span

The City West Alternative keeps all of the existing plaza related jobs in the City of Port Huron. Existing and additional potential CBP and MDOT staff that work on the expanded plaza would be subject to Port Huron's local income tax. Workers employed at businesses required to relocate by the new plaza would still be subject to the Port Huron income tax if they live in the city or if the business relocates within the city limits. There could be local income tax revenue reductions if businesses and residents who must relocated because of the City West Alternative choose to move to other communities.

The construction and operation of the City West Alternative would substantially reduce or eliminate the estimated $4.3 billion in trade costs due to excess congestion as discussed above for the No-Build Alternative. This will lead to increased revenue and employment for industries that rely on the border crossing to ship products and parts between the United States and Canada. Increased revenue and jobs will translate into tax benefits to the United States, Michigan, Canada, and Ontario.

Job Impacts: The City West Alternative will relocate the jobs that are connected with the businesses that are displaced. The job relocations for the City West Alternative are listed in **Table 3.4.3**. The alternative would displace businesses with a total estimated employment of 400 people. If some of the displaced businesses choose to shut down or move outside of the Port Huron, there would be a loss of local jobs.

The City West Alternative would benefit national employment by decreasing the cost of transporting goods across the border and increasing revenue and efficiency for firms that rely on the border crossing to ship products and parts between the United States and Canada.

The investment of construction dollars for the project will result in the creation of new jobs. When an investment is made in the construction of a new facility, the companies and individuals receiving payment for building the project will in turn spend the money they receive on other goods and services. Companies and individuals receiving benefits in terms of reduced travel time and accident costs would also invest portions of these savings in the local and state economies. Based on the estimated construction cost for the City West Alternative of $232 million, the Study Team estimates that 4,220 jobs will be created over a five-year construction period. Most of these jobs will be short-term construction related positions. Local job benefits from construction of the Preferred City West Alternative would depend in part on the availability of local materials and workers. MDOT seeks the best possible value from its investments when tendering construction projects and, like any other project, there is no guarantee local firms would be selected or local materials used.

Trade Impacts: The City West Alternative would result in similar positive impacts on trade and commerce across the Blue Water Bridge through a reduction in travel times and congestion as the other Build Alternatives. Reduced congestion will lead to less uncertainty in border crossings, allowing firms that transport goods across the border to meet just in time delivery schedules with less warehouse inventory required. The earlier discussion of the No-Build Alternative identified the cost of excess congestion and delay between 2010 and 2030 as $4.3 billion in 2006 dollars. All Build Alternatives will reduce congestion to a minimum by providing the facilities needed to avoid future substantial backups for the No-Build Alternative. The City West Alternative would thus result in an estimated savings to the United States and Canadian economies of more than four billion dollars during its first 20 years of operation.

Trade and commerce would benefit under the City West Alternative

3.4.7 How Would the Township Alternative Affect Businesses, Taxes, Trade, and Jobs?

The economic effects of the Township Alternative would include the relocation of local businesses and jobs, changes in access for local businesses, and changes to the local tax base for the City of Port Huron and Port Huron Township. The Township Alternative also would reduce future congestion at the Blue Water Bridge border crossing, providing positive economic benefits to trucking firms and other companies and individuals involved in cross-border trade.

Impacts on Existing Businesses: As discussed in greater detail in **Section 3.6 Relocations**, the Township Alternative relocates 29 businesses. Approximately 65 percent of the displaced businesses own their site while the others lease their business location. These businesses may choose to relocate to a different jurisdiction, a different part of the community, or remain close to their existing location when possible. For many of the proposed business relocations for the Township Alternative, only a small portion of the parcel is required for right-of-way. In these cases MDOT may be able to work out an agreement so that the businesses could remain in its existing location if the property owner is interested. Regardless, potential long-term business sites would remain within the City of Port Huron's designated Blue Water Gateway Business Area and the Pine Grove Avenue Mixed Use Area. The Township Alternative would relocate a substantial number of businesses that would have a short to medium term impact on the local economy.

What is Pass-By Traffic?

Pass-by traffic refers to customers that do not live in the local neighborhood and area but are traveling through the area. Most of the border crossers at the Blue Water Bridge who stop at businesses in the Study Area are pass-by traffic.

The Township Alternative would substantially change the access to existing businesses for cross-border traffic. All cross-border traffic would be inspected at the relocated plaza. As a result, businesses in the vicinity of the existing plaza and along Pine Grove Avenue would not be as accessible to cross-border travelers. Motorists whose destinations are outside the Port Huron Area are unlikely to backtrack to access the businesses in the vicinity of the existing plaza. Businesses that rely on pass-by traffic, such as gas stations and restaurants, will be bypassed by border traffic and will see a reduction in sales as a result. Similarly, businesses at the Water Street interchange would also be impacted by a

reduction in sales from cross border traffic, as motorists would have to backtrack to access them. Businesses that cater to interstate traffic located at the Range Road exit on I-94 and the Wadhams Road exit on I-69 would likely see an increase in sales, as they would now be located at the first interchanges after the border crossing. New businesses could also develop at the Range Road and Wadhams Road interchanges. Impacts at those locations are discussed further is **Section 3.7 Indirect and Cumulative Impacts**. Relocated and new businesses would likely develop on available sites in the vicinity of the existing plaza after local road improvements are made.

The Township Alternative will also impact travel times for most individuals who use the border crossing to travel between Canada and specific commercial destinations, work places, and residences in the Port Huron area. Motorists traveling to and from destinations north of the existing plaza would experience an estimated increase of 6.7 minutes in travel time in each direction compared to existing plaza conditions or the alternatives that expand the plaza in the City of Port Huron. These 6.7 minutes do not include border inspection time, which would be much higher for the No-Build than for the Build Alternatives. **Table 3.4.4** lists the estimated changes in travel times for key destinations in the Port Huron area compared to a No-Build condition. This information is also shown in **Figures 3.4.7** and **3.4.8**.

Table 3.4.4 Estimated Change in Travel Time to Key Destinations, the Township Alternative Compared to No-Build, City East, and City West Alternatives

Location	No-Build/ City Alts. Distance (miles)	Township Distance (miles)	Net Change in Distance (miles)	No-Build/ City Alts. Estimated Travel Time (minutes)	Township Estimated Travel Time (minutes)	Net Change in Travel Time (minutes)
Birchwood Mall	3.5	7.6	4.1	12.5	19.2	6.7
Baker College	2.9	4.7	1.8	5.0	8.5	3.5
Port Huron Hospital	2.3	6.4	4.1	7.4	14.1	6.7
Mercy Hospital	4.4	7.4	3.0	15.6	19.2	3.6
Wadhams Road Interchange	7.2	7.3	0.1	8.5	10.3	1.8
Range Road Interchange	6.0	6.1	0.1	7.3	9.1	1.8

* All distances and travel times are measured from the center of the Blue Water Bridge but do not include times for inspections.

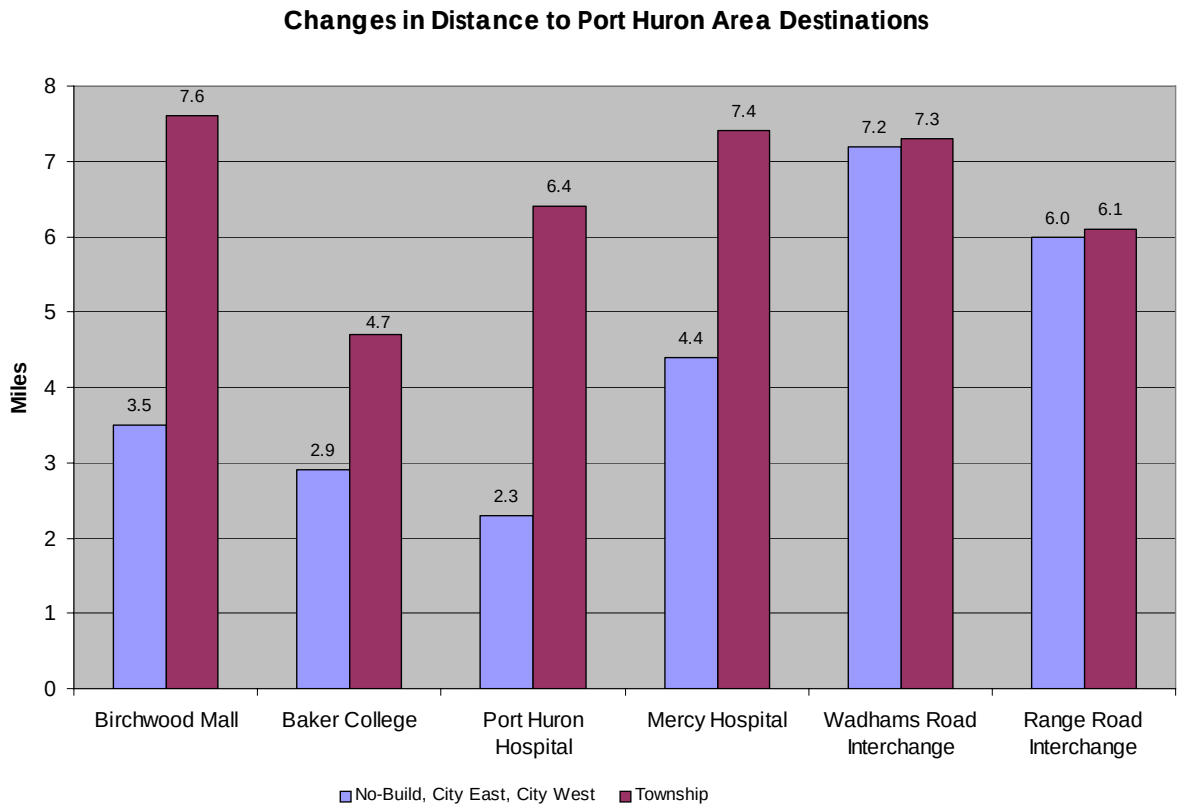


Figure 3.4.7 Changes in Distance

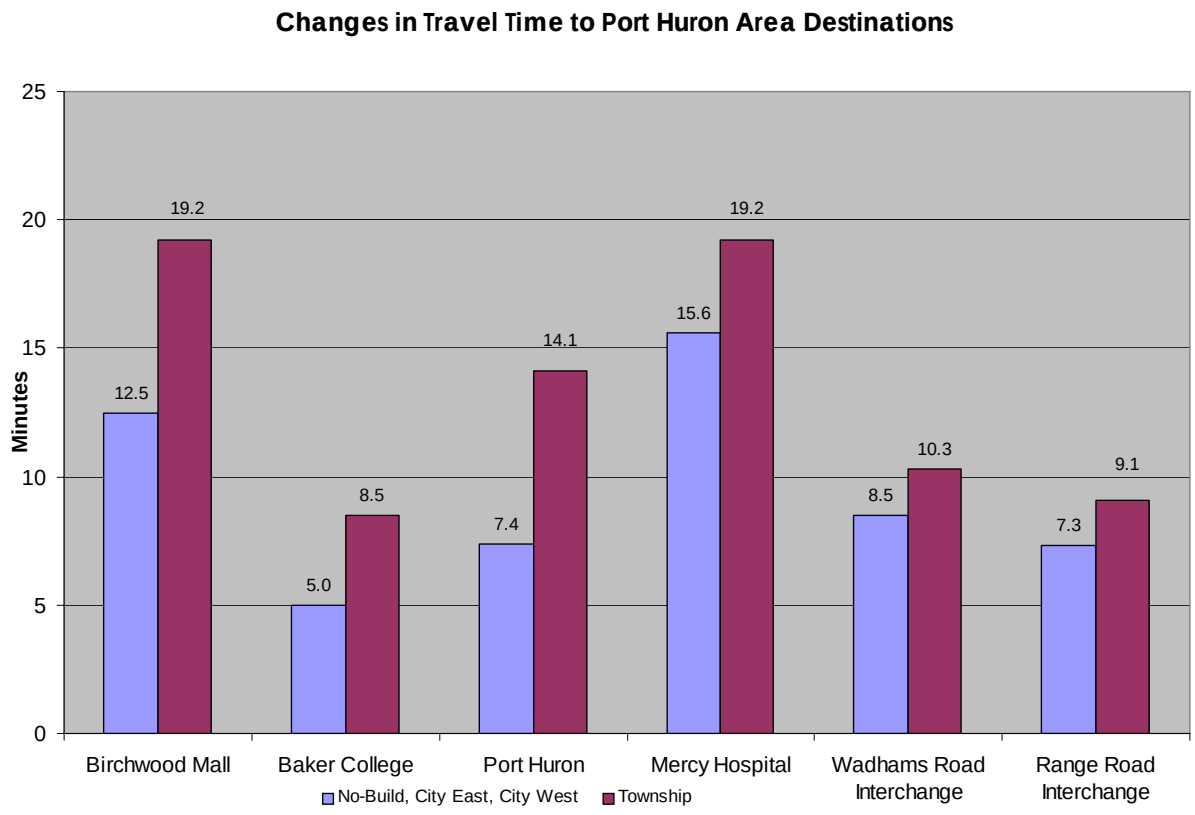


Figure 3.4.8 Changes in Travel Time

Downtown Port Huron

The Township Alternative would have minor effects on businesses in downtown Port Huron. With the Township Alternative, all border crossers would be inspected at the new plaza. There would be no exit on the existing plaza site at Pine Grove Avenue. The existing route for border crossers to reach downtown Port Huron requires multiple turns around the existing plaza. With the Township Alternative, border crossers would be able to choose between using the Lapeer Connector, Water Street, or Hancock Street and Pine Grove Avenue to access downtown. The distance traveled between the plaza and downtown will increase by approximately 1.5 to two miles depending on the route chosen. The additional distance to reach downtown could be a disincentive for border travelers to visit downtown. Downtown Port Huron is currently a destination for shopping and dining and is not well signed at the existing plaza. Better signage directing travelers to the downtown would help mitigate the effect of relocating the plaza, for businesses located in downtown Port Huron.

The Township Alternative would have minor effects on businesses in Fort Gratiot Township. The Birchwood Mall and a series of large retail stores, restaurants, and smaller malls are located along 24th Avenue, approximately three to four miles north of the existing plaza. The new plaza for the Township Alternative would be located approximately five to six miles from these businesses. The total travel distance between the border and the businesses in Fort Gratiot Township would increase by approximately four miles as border crossers would travel to the new plaza and back north to reach Fort Gratiot Township. The Birchwood Mall and the other businesses in Fort Gratiot Township are located more than three miles away from the existing plaza. Border crossers are unlikely to travel there except on a planned shopping trip. There are no signs to the mall at the existing plaza and it is highly unlikely that pass-by travelers with no knowledge of the area would head that far north for food, lodging, shopping, or gasoline. The Birchwood Mall area acts more as a retail destination for cross-border shoppers who know the Port Huron Area. These cross-border shoppers will not likely be deterred by the extra four mile drive, especially if congestion is reduced through the construction of a new plaza. There is a shopping area in Marysville, approximately six miles south of the proposed

new plaza for the Township Alternative along I-94, which could be a possible shopping destination for traffic headed south to Detroit and would likely provide minor competition to the mall for cross-border shoppers. The potential for the development of new businesses to serve plaza traffic if the Township Alternative is constructed is discussed in **Section 3.7 Indirect and Cumulative Impacts.**

Tax Base Impacts: **Table 3.4.2** lists the local property tax base impacts by alternative.

MDOT would not pay property taxes on the property purchased for a new plaza and other roadway improvements. The City of Port Huron would lose approximately 0.7 percent of its existing property tax base if the Township Alternative was constructed. The property tax base of the City of Port Huron grew approximately 4.4 percent annually between 2003 and 2006. The loss of tax base to the City of Port Huron would be less than one year's annual growth in taxable value. The loss of taxable value would represent a permanent loss to the City of Port Huron's revenue and thus would affect budgets and programs.

Port Huron Township would lose approximately 1.3 percent of its existing property tax base if the Township Alternative was constructed. The property tax base of Port Huron Township grew approximately 5.5 percent annually between 2003 and 2006. The loss of tax base to Port Huron Township also would be less than one year's annual growth in taxable value. The loss of taxable value would represent a permanent loss to Port Huron Township's revenue and would affect budgets and programs.

St. Clair County and the Port Huron Area School District would also lose tax base and tax revenue as a result of the Township Alternative. These jurisdictions have larger tax bases than the City of Port Huron and Port Huron Township and the resulting losses to their tax bases would be much lower on a percentage basis.

If the Township Alternative is constructed, the homeowners that remain in the vicinity of the new plaza, in Port Huron Township, may experience changes in their property values

Homeowners who remain in the new plaza area may experience tax changes

and property taxes. Home and business owners located near the existing plaza also may experience changes in their property values and taxes. It is very difficult to isolate the effect of transportation improvements on the value of particular parcels of lands. Some parcels may increase in value due to improved access while other properties may lose value due to noise or visual impacts. A property, which may have lower value as a residential property, may also have a much greater value as a potential business site. It is also difficult to differentiate between the effects of the project and changes in values due to property improvements or changes in the local market. As a result, MDOT does not attempt to assess the changes in value for individual properties that do not need to be purchased for the project. MDOT does not directly compensate property owners for potential losses in property values due to their proximity to the project nor does MDOT charge property owners for any potential additional value created by the project.

The City of Port Huron collects a local income tax from plaza workers. The Township Alternative would relocate approximately 485 plaza related jobs to Port Huron Township. The plaza employees who would relocate to the new plaza and who do not live in the City of Port Huron would no longer pay income tax to the City of Port Huron. Workers employed at businesses relocated by the new plaza would still be subject to the Port Huron income tax if they live in the City or if the business relocates within the City limits. There could also be local income tax revenue reductions if businesses and residents who must relocate because of the Township Alternative choose to move to other communities.

The construction and operation of the Township Alternative would substantially reduce or eliminate the estimated $4.3 billion in trade losses due to excess congestion discussed above for the No-Build Alternative. This will lead to an increase in revenue and employment for those involved in the transportation of goods and for industries that rely on the border crossing to ship products and parts between the United States and Canada. Increased revenue and jobs will translate into tax benefits of the United States, Michigan, Canada, and Ontario.

Job Impacts: The Township Alternative will impact jobs through the relocation of jobs that are connected with businesses to be displaced. **Table 3.4.3** lists the potential job relocations for the Township Alternative as well as the other alternatives.

The Township Alternative would displace businesses with a total estimated employment of 395 people. If some of the displaced businesses chose to shut down or move outside of the Port Huron area, there would be a loss of additional local jobs. As discussed above, the Township Alternative would also move the jobs on the existing plaza from the City of Port Huron to Port Huron Township. The Township Alternative would benefit national employment by decreasing the cost of transporting goods across the border and increasing revenue and efficiency for firms that rely on the border crossing to ship products and parts between the United States and Canada.

Based on the estimated construction cost for the Township Alternative of $244 million, the Study Team estimates that 4,440 jobs will be created over a five-year construction period. Most of these jobs will be short-term construction related positions. Local job benefits from construction of the Township Alternative would depend in part on the availability of local materials and workers. MDOT seeks the best possible value from its investments when tendering construction projects and, like any other project, there is no guarantee local firms would be selected or local materials used.

Trade Impacts: The Township Alternative would also result in positive impacts on trade and commerce across the Blue Water Bridge through a reduction in travel times and congestion. Reduced congestion will lead to less uncertainty in border crossings, allowing firms that transport goods across the border to meet just in time delivery schedules with less warehouse inventory required. The earlier discussion of the No-Build Alternative identified the cost of excess congestion and delay between 2010 and 2030 as $4.3 billion in 2006 dollars. All Build Alternatives will reduce congestion by providing the facilities needed to avoid the future substantial backups for the No-Build Alternative. The Township Alternative would thus result in an estimated savings to the

United States and Canadian economies of more than $4 billion between 2010 and 2030 in the same manner as the other Build Alternatives.

3.4.8 What are the Border Crossing Economic Impacts on Traffic?

Economic factors such as trade, economic growth, jobs, changes in certain industries, exchange rates and tourism will play a substantial role in determining future traffic growth at the Blue Water Bridge. There is no one single economic factor that determined past traffic growth trends. Future traffic growth at the Blue Water Bridge will depend on the complex interrelationship of a wide variety of economic and other factors. The growth of truck traffic will depend on different economic factors than the growth of passenger car traffic. Truck traffic growth will depend more heavily on international trade patterns and the state of the economies across the Midwest and Western United States, Ontario and even Mexico. Passenger vehicle volumes will depend more on the exchange rates, job prospects and discrete trip attractions in southeast Michigan and adjoining states. The following paragraphs discuss some of the economic factors that will affect future traffic volumes at the Blue Water Bridge. A key part of this economic analysis is that the Blue Water Bridge is not like many border crossings in that it serves far more than just a local or regional market. Future traffic growth at the Blue Water Bridge will depend much more on economic conditions across most of the United States and Canada/Ontario than it will on local or regional economic growth.

Economic factors will help determine future traffic growth, at the Blue Water Bridge

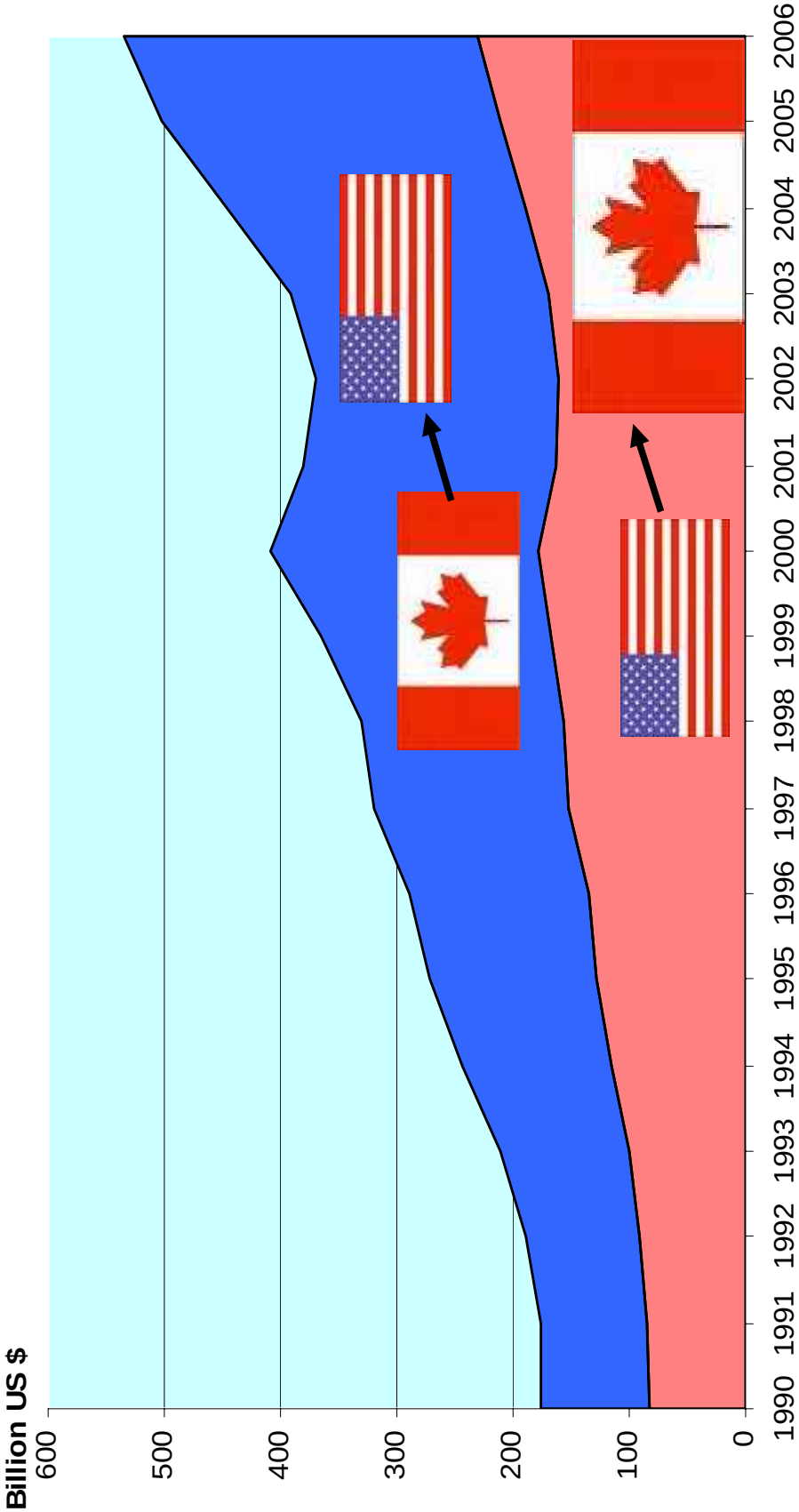
International Trade: The world's largest bilateral trade relationship exists between the United States and Canada. Goods and people moving across the border substantially impact the economies of Michigan, Ontario, the United States, and Canada. The United State's trade with Canada averages more than $1.2 billion per day. **Figure 3.4.9** shows the growth in total trade between the United States and Canada since 1990. In 2005, surface transportation trade between the United States and Canada totaled $458 billion. Over the past 30 years, United States/Canada trade has grown faster than the rate of growth of Gross Domestic Product (GDP), at an annual rate of

11 percent per year. Michigan is by far the largest United States trading partner with Canada with nearly $72 billion in goods traded in 2005. Two thirds of United States-Canada trade moves by truck. (United States Census Bureau and Bureau of Transportation Statistics Data, 2006).

The growth in trade was first boosted by the United States-Canada Free Trade Agreement that took effect in 1989. This treaty was superseded by the North American Free Trade Agreement in 1994, which now includes Mexico. These trade agreements abolished or reduced tariffs on exports between the countries. The Blue Water Bridge border crossing has been affected by these trade agreements as much as any border crossing on the northern border.

These trade agreements are likely the largest factor behind the growth in truck traffic since 1990. The terrorist attacks of September 11, 2001 have caused a decline in truck traffic and traffic in general at some border crossings. So has the recent downturn in the auto industry and the Michigan economy in general. However, truck traffic at the Blue Water Bridge has continued to grow. This is due to the importance of the border crossing to overall North American trade.

There are nine states that were the origin or destination for at least $1 billion worth of goods that crossed the border by truck in Port Huron in 2005. These are shown in **Figure 3.4.10** along with the percentage of the total value of truck shipments crossing at Port Huron. Michigan had the highest share of shipments of any state but only approximately 24 percent of the total. Approximately 76 percent of all goods (by value) that crossed the border by truck at Port Huron either came



U.S. To Canada Exports and Imports

Figure 3.4.9

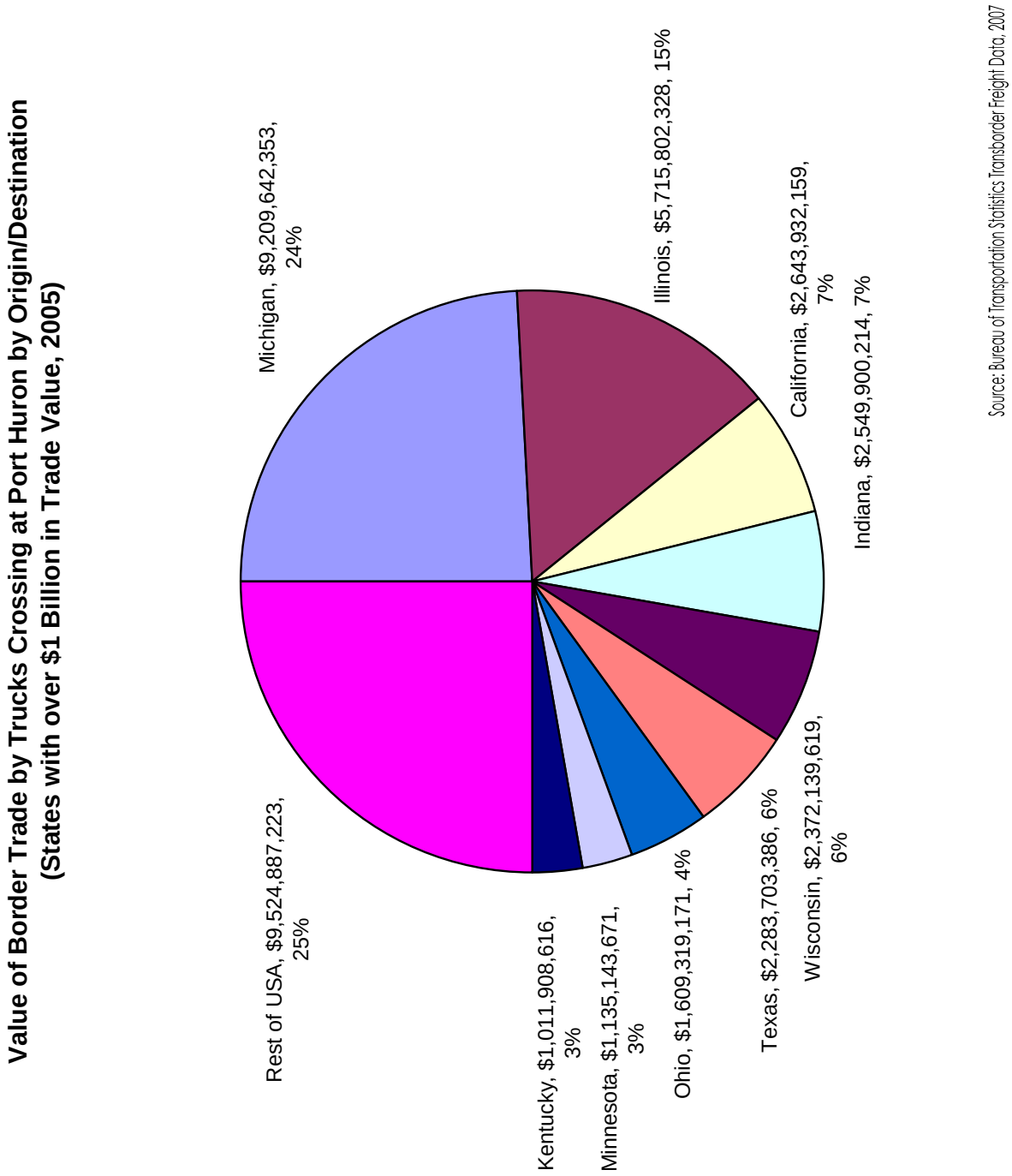

Value of Border Trade by Trucks Crossing at Port Huron by Origin/Destination
(States with over $1 Billion in Trade Value, 2005)
Michigan, $9,209,642,353, 24%
Illinois, $5,715,802,328, 15%
California, $2,643,932,159, 7%
Indiana, $2,549,900,214, 7%
Wisconsin, $2,372,139,619, 6%
Texas, $2,283,703,386, 6%
Ohio, $1,609,319,171, 4%
Minnesota, $1,135,143,671, 3%
Kentucky, $1,011,908,616, 3%
Rest of USA, $9,524,887,223, 25%
Source: Bureau of Transportation Statistics Transborder Freight Data, 2007

Figure 3.4.10

from or went to states outside Michigan. Illinois had the second highest total followed by California, Indiana, and Wisconsin (Bureau of Transportation Statistics Transborder Freight Data, 2007). In evaluating future truck traffic growth, it is important to consider the likely economic growth throughout the Midwest and Western United States and Eastern Canada. This includes consideration of further transportation developments that may enhance the Blue Water Bridge's position as a key destination for North American Trade. One example would be the proposed I-69 freeway that starts at the Blue Water Bridge. Currently I-69 ends in Indianapolis, Indiana but there are plans in various stages of development to make I-69 a north-south NAFTA highway stretching from the Blue Water Bridge to the Mexican border in Texas.

Trade between the United States and Canada has not shown any long-term signs of decreasing, although there are occasional years of decline such as 2001 and 2002 based on economic cycles and unforeseen events such as the terrorist attacks. Between 2000 and 2005, total trade value between the United States and Canada increased by 25.5 percent. Trade by truck increased by 14.5 percent between 2000 and 2005 (Bureau of Transportation Statistics Transborder Freight Data, 2007). The truck traffic forecasts for the Blue Water Bridge reflect a continued expectation of trade growth between the United States and Canada. On a national level, freight volumes are growing much faster than the United States population or even the United States Gross National Product. As the economy grows, so does the volume of goods shipped. Despite declines in manufacturing employment, manufacturing output continues to grow. American manufacturing is increasingly relying on high end, high value products to differentiate itself from growing foreign manufacturers who focus on high volume. As output grows, so does the demand for freight services.

The value of international trade is forecast to grow from the equivalent of 13 percent of the United States economy in 1990 to 35 percent in 2020 and 60 percent by 2035. (AASHTO, America's Freight Challenge, May 2007).

Michigan Economy: Michigan's economy is facing unprecedented challenges and probable structural changes. Michigan's auto manufacturing industry has been undergoing a substantial transition with major buyouts and layoffs at the Big Three auto companies. Michigan's economy has grown more slowly than the rest of the nation for 11 consecutive years. Over this time period, the Gross State Product (GSP) has increased an average of 1.7 percent per year, approximately half of the growth rate for the national economy. This has had an impact in terms of lower growth in incomes and employment.

The effects of Michigan's economic growth are only one of a number of factors affecting the growth in truck traffic at the Blue Water Bridge. **Figure 3.4.11** shows the growth rate for the values of truck shipments crossing the border at Port Huron for the same key states identified above. Between 2000 and 2005, the value of trade crossing at Port Huron has increased substantially for most of the states except Michigan, which has experienced a decline. This shows that it is trade growth from other states that is causing recent increased traffic at Port Huron. The economic slow down in Michigan has tempered but not eliminated the growth in truck traffic at the Blue Water Bridge. Additionally, overall trade between Michigan and Canada has actually increased by five percent between 2000 and 2005 indicating a shift of Michigan shipments away from the Blue Water Bridge to other crossings or other modes of transportation.

Trade growth is causing increased traffic at Port Huron

In the near-term Michigan is expected to exhibit weak growth with continued higher unemployment rates. How long the period of weak growth lasts will likely depend on the time required for Michigan-based auto manufacturers to stabilize their business and reposition themselves in the global marketplace and the diversification of the economy to other industry sectors.

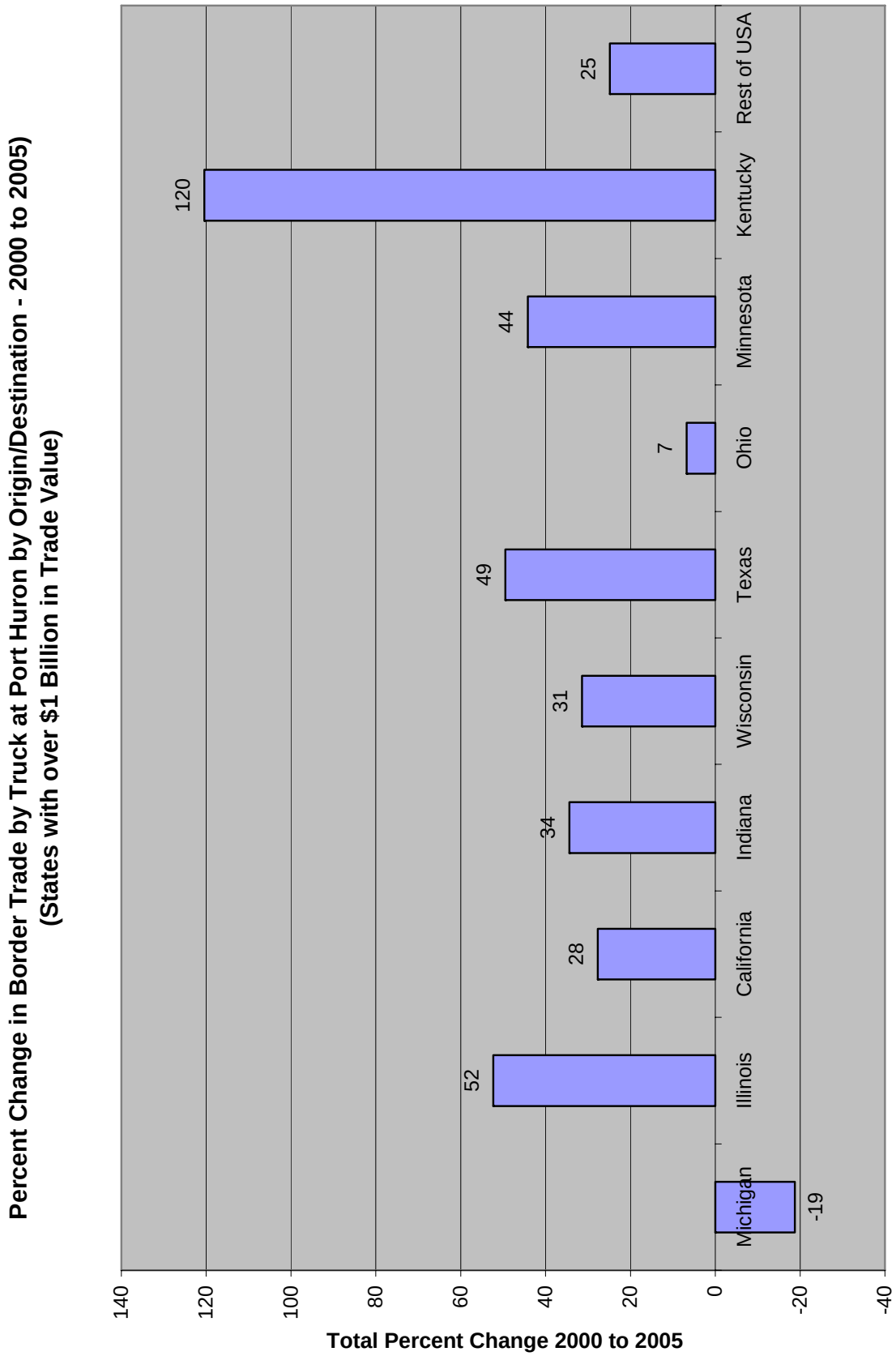

Percent Change in Border Trade by Truck at Port Huron by Origin/Destination - 2000 to 2005)
(States with over $1 Billion in Trade Value)
140
120
100
80
60
40
20
0
-20
-40
Total Percent Change 2000 to 2005
Michigan
-19
Illinois
52
California
28
Indiana
34
Wisconsin
31
Texas
49
Ohio
7
Minnesota
44
Kentucky
120
Rest of USA
25

Figure 3.4.11

United States Economy: As discussed above, the overall health and growth of the United States (and Canadian) economy and its impact on trade will likely be a greater factor in determining future traffic levels at the Blue Water Bridge than the local, regional, or Michigan economy. Truck growth at the Blue Water Bridge has weathered Michigan's economic downturn and continued growth is expected based on national and international trade trends.

Since November 2001, the United States economy has been steadily recovering from the slide it took when the technology bubble burst. Despite the increasing pressure from inflation, as evidenced by high oil prices and rising interest rates, the United States economy has demonstrated resilient growth in recent years. Unemployment has steadily dropped since the third quarter of 2003, although manufacturing jobs have continued to decline.

In the near-term, the United States economy is expected to grow. Based on the forecast released by the Congressional Budget Office (CBO), real GDP is expected to grow between 2.3 and 3.1 percent annually between 2007 and 2009 and unemployment to remain at 5 percent or less. Long-term there will likely be cyclical periods of short-term slowdown or decline for the United States economy. The CBO forecasts that real GDP growth will average 2.9 percent annually between 2009 and 2012 and 2.5 percent annually between 2013 and 2017 (Congressional Budget Office Director, The Budget and Economic Outlook: Fiscal Years 2008 to 2017, 2007). Some of the current economic concerns include rising budget and trade deficits, high oil prices, unstable supplies of resources from foreign countries, and an uncertain housing market resulting in increased foreclosures.

Population growth is likely the single largest determinant of overall economic growth in the United States that will cause greater demand for products and trade. As shown in **Figure 3.4.12**, the United States population is expected to grow by 29.2 percent between 2000 and 2030 to a total of approximately 364 Million. The Midwest is expected to grow by 9.5 percent and the West is expected to grow by 45.8 percent between 2000

and 2030. Michigan is forecast to grow by 7.6 percent between 2000 and 2030 (United States Census Bureau Forecasts, 2005).

The traffic forecasts for the Blue Water Bridge assume that the United States economy will continue to grow in the long-term and will continue to support trade growth. Previous cyclical

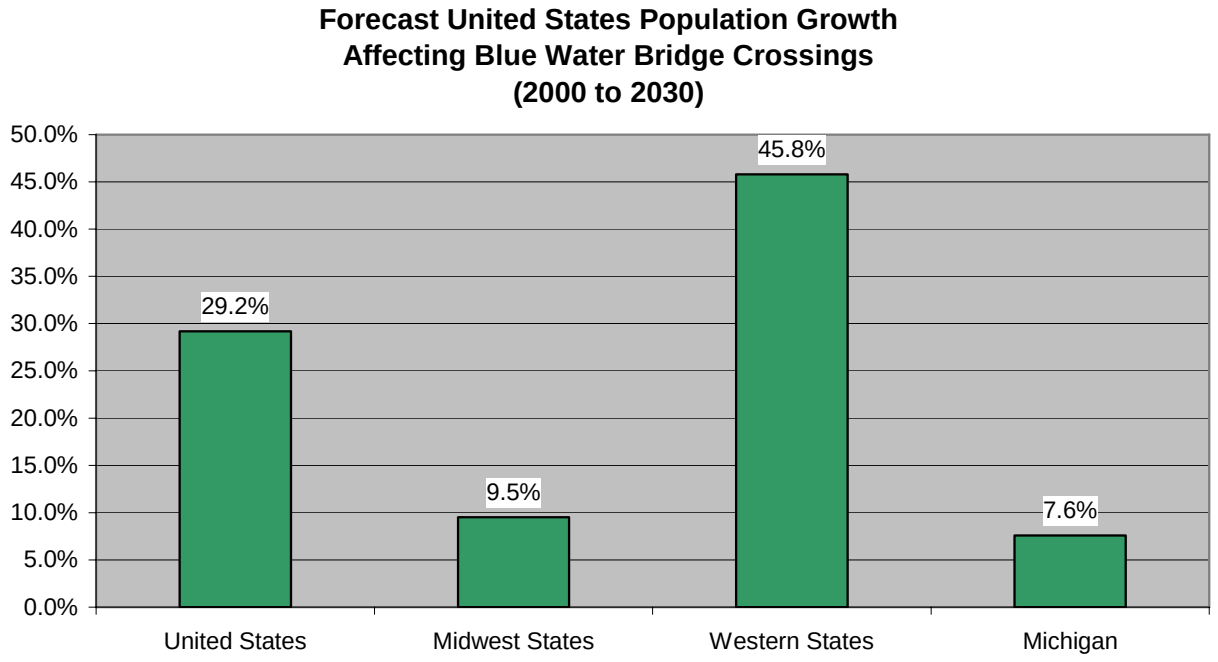


Figure 3.4.12

declines in the United States economy have dampened but not eliminated truck traffic growth at the Blue Water Bridge.

Canadian/Ontario Economy: The Canadian economy and specifically economic conditions in Ontario also have substantial effects on traffic growth at the Blue Water Bridge. Ontario origin/destination shipments represent approximately 89 percent of the truck shipments by value crossing at Port Huron.

According to the Ontario Ministry of Finance Long-Term Outlook, Ontario's population is forecast to grow by nearly 25 percent between 2005 to 2025 to approximately 15.7 million. Ontario's GDP is forecast to grow between 2.3 and 3.0 percent per year over the same time period and the unemployment rate is expected to slowly decline (Ontario Ministry of Finance, Towards 2025: Assessing Ontario's Long-Term Outlook).

This population and economic growth in Ontario should translate into continued traffic growth, especially commercial traffic growth at the Blue Water Bridge. Growth in Southwestern Ontario is expected to be slower than for Ontario as a whole. This would potentially translate into lower but positive long-term passenger vehicle traffic growth at the Blue Water Bridge as passenger traffic volumes are more dependent on regional growth.

Local/Regional Economy: Economic growth is substantially slower for Southeast Michigan including Port Huron and St. Clair County. The Economic and Demographic Outlook for Southeast Michigan Through 2035 published by SEMCOG (March 2007) shows continued slow population and economic growth for the region as a whole. The recent trends for the region have included lost jobs, struggles for the automotive industry, and mixed population change including decline in older communities. SEMCOG forecasts a total increase in employment of 7.1 percent between 2005 and 2035 and a 3.4 percent increase in population over the same time period. SEMCOG readily acknowledges there are different potential growth scenarios depending on if and how well the automotive industry rebounds and how well the economy diversifies into other industries such as knowledge based industries.

The impact of a slow growing or stagnant regional economy on the future traffic forecasts for the Blue Water Bridge is mixed. As discussed above, truck shipments for the Blue Water Bridge are more dependent on national and international trade trends than on regional economic growth. As a result, there should only be a minimal drag on truck traffic growth from a poorer performing regional economy. The effect would be larger for passenger vehicle traffic although there is still forecast growth in both population and the economy for Southeast Michigan and for Southwestern Ontario. This alone suggests that at some point the recent downward trend of passenger vehicle crossings at the Blue Water Bridge should reverse itself.

Trucking employs more than eight million people nationwide

Modal and Freight Trends: Nearly every product consumed in the U.S. at some point is transported upon a truck. The trucking industry plays a key role in today's globally

integrated economy, employing 8.6 million people nationwide. Nationally, trucking accounts for 69 percent of freight movements by weight and 87 percent by value. Michigan closely mirrors the national modal split profile with 70.5 percent of freight tonnage moving by truck and 86 percent by value. Trucking accounted for nearly 474 million tons of commodity movements in, out, within, and through Michigan in 2003, with an estimated value exceeding $1 trillion.

Goods must move along complex supply chains that originate with raw commodities, move the various value-added manufacturing processes, ultimately to warehouses and stores and to the doorstep of the American consumer. A significant portion of America's productivity gains in recent years have come from logistics. The need for high-value, time sensitive shipments has grown geometrically. American producers and consumers now demand a precisely tuned and reliable network to provide what they want, when they want it (AASHTO, America's Freight Challenge, May 2007).

The traffic forecasts for the Blue Water Bridge assume that this modal pattern is not going to substantially change and that there is not going to be a widespread movement of freight to other modes, reducing the use of this border crossing. **Figure 3.4.13** which illustrates anticipated national trends in modal choice for freight movements supports the conclusion that truck traffic will continue to be the dominant mode. The rising price of gas coupled with future enhancements to rail technology that improve its flexibility for just-in-time delivery and local business delivery could cause a future change in modal patterns. Because of the amount of long-haul trade traffic crossing the Blue Water Bridge, this crossing has a higher potential from the effects of a switch to other modes of freight movement such as rail. However, there is not an evident trend to suggest that such a modal switch is occurring. There are also limits on capacity for rail freight movements on the Michigan/Ontario border as well as in Chicago and other key points throughout the country. Rail shipments also require inspections in the same manner as truck shipments.

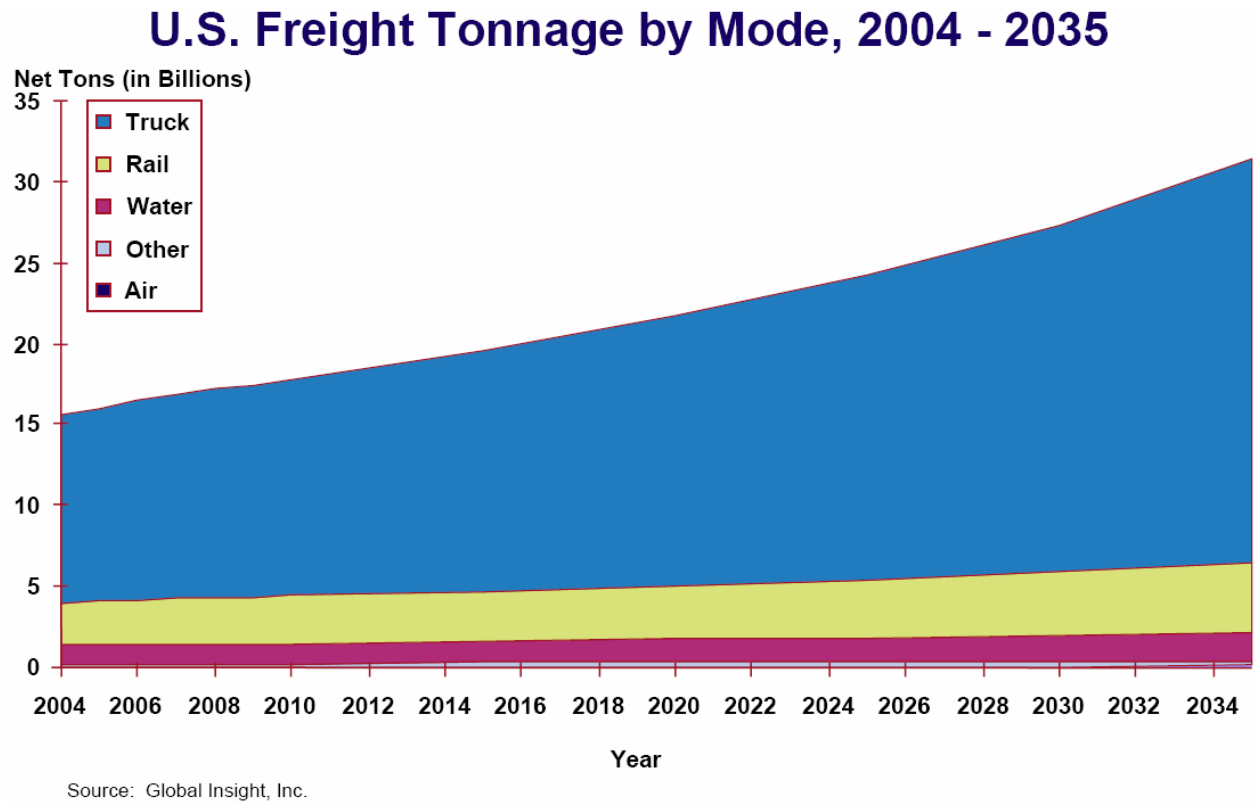


Figure 3.4.13

Exchange Rates: The exchange rate between the United States dollar and the Canadian dollar could have variable and mixed effects on the growth of traffic at the Blue Water Bridge. A period of high value for the Canadian dollar could lead to increased cross border shopping by Canadians in stores in the United States. This was clearly seen during the early to mid 1990s when passenger traffic levels peaked at the northern border crossings. The Canadian dollar declined substantially from the mid-1990s through the early part of the 2000s. This may have contributed to the decline of passenger vehicle crossings at the Blue Water Bridge, coupled with other factors such as a reduction in newly developed stores or malls in the area. There was no evident reverse trend of widespread shoppers from the United States heading to Canada to take advantage of the low Canadian dollar. The Canadian dollar has been relatively high in value again over the past two years and has reached a 30-year high in the past month (May 2007). This has not evidently resulted in a substantial increase in passenger vehicle crossings.

If the Canadian dollar remains high for a long period of time, it could have a negative effect on Canadian exports by making them more expensive relative to products in the United States. This has been a recent issue of concern to Canadian manufacturers. A long-term trend of higher costs for Canadian exports could reduce traffic across the Blue Water Bridge. This is currently a short-term developing condition whose long-term impact is uncertain.

Tourism: Travel for tourism purposes is a large contributor to cross-border passenger traffic at the Blue Water Bridge. Short-term tourism would include crossings to play at the casino in Sarnia, to play casinos within the United States, for entertainment or dining purposes in the Sarnia/Port Huron area, or for shopping opportunities as discussed above. There are also longer distance tourism related trips to a large number of destinations in either the United States or Canada.

Forecasting tourism growth or decline and its effects on passenger vehicle traffic at the Blue Water Bridge is very difficult. Population and economic growth are the leading factors that indicate tourism will increase to some extent over time. However, new passport requirements, gasoline costs, exchange rates, and the availability of new attractions will all factor into changes in tourism based trips.

Catastrophic Events: Short-term and long-term catastrophic events could always affect the economic factors that determine traffic growth at the Blue Water Bridge. The changes in border policy following the attacks of September 11, 2001 had a substantial short-term impact (virtual border closure) and a long-term impact in terms of new inspection requirements. There appears to have been a greater impact on passenger vehicle/tourism related traffic than on trade and commercial traffic. A health epidemic such as the SARS concerns in the Toronto area from 2003 could also have a substantial short-term impact. Some sort of catastrophic events of these types are likely to happen and affect traffic levels for a short-term period, potentially measured in years. But unless they result in the termination of trade agreements, closure of the border, or other extreme measures, long-term trends for trade and economic growth should be more dominant. To forecast lower

traffic levels in anticipation of one or more of these events is unlikely to be prudent in the long-term.

Conclusions: Three major conclusions can be derived from the examination of the economic factors that will determine future traffic levels at the Blue Water Bridge. These formed the development of border crossing forecasts for the Blue Water Bridge Plaza Study.

1) There are many different economic factors to consider and an attempt to isolate the anticipated future growth to one or a few specific measurable factors is very difficult. In addition, many of the key economic factors such as GDP growth are very difficult to predict in the long-term with any certainty.

2) Because of the markets it serves, national economic trends in the United States and international economic trends in Ontario/Canada and Mexico will be more significant determinants of traffic growth at the Blue Water Bridge than Michigan, Southeast Michigan, or local forecasts.

3) Long-term growth in terms of population, employment, GDP, and trade are expected for the United States and for Ontario/Canada. These growth trends suggest there will not be a substantial decline in the growth of truck traffic due to trade and that passenger vehicle volumes are going to rebound at some point in the future. The traffic forecasts are based on these assumptions and that trucks will continue to play a significant role in moving goods across the border.

3.5 Public Safety and Security

This section discusses the current fire, law enforcement, emergency medical, and plaza security services for the Blue Water Bridge Plaza Study Area, and examines the affect of the alternatives, on the delivery of these services.

Ambulance on Pine Grove Avenue

Methodology: Information and data included in this section was obtained by holding several task force and agency meetings, discussing relevant issues with public safety officials, and reviewing protection and security design standards in use by the United States government.

A Security and Emergency Management Task Force was formed to provide input on the alternatives. The Task Force includes representatives from the following agencies and organizations:

- City of Port Huron Police, Fire, and Engineering Departments
- Tri-Hospital EMS Corporation
- Port Huron Township Fire Department
- St. Clair County Office of Emergency Management
- St. Clair County Metropolitan Planning Commission
- St. Clair County Sheriff Department
- Michigan State Police
- Customs and Border Protection (CBP)
- General Services Administration (GSA)
- Federal Highway Administration (FHWA)
- Michigan Department of Transportation (MDOT)
- Federal Motor Carrier Safety Administration

On September 1, 2005, the Security and Emergency Management Task Force met to review the alternatives, and discuss the effects on public safety and security. The alternatives were reviewed from the perspective of providing service to and from the plaza, on the plaza, and in the vicinity of the plaza. To clarify emergency management and plaza security issues, additional meetings were held with CBP, and City, Township, and State public safety officials on October 24 and 25, 2005. **Section 3.5.2** discusses the recommended design considerations presented at the above referenced meetings.

3.5.1 What are the Current Plaza Security Features and Emergency Services Provided?

Existing Agreements: As owners of the plaza, MDOT has an agreement with the City of Port Huron to provide first responder police, fire, ambulance, and other related emergency services for the plaza and bridge.

There is also a reciprocal agreement between MDOT and Canadian officials to provide back-up emergency services, as needed.

Port Huron Fire Department on Sanborn Street

Existing Conditions: Emergency management service providers access the plaza from the Pine Grove Avenue ramp, on the north side of the plaza, or from the I-94/I-69 approach to the plaza, from the west. **Figure E.2** located in the separate **Appendix E** volume shows the existing plaza, I-94/I-69 roadways, and local access ramp from Pine Grove Avenue. In the event of an emergency on the plaza, the Port Huron Fire Department dispatches equipment and personnel from the station nearest the plaza, located at 1914 Sanborn Street, or from the central station at 515 River Street. The Sanborn Street station (shown as Fire Station 1 on **Figure E.22** located in the separate **Appendix E** volume) is approximately one mile northwest of the plaza. The central station (shown as Fire Station 2 on **Figure E.22**) is approximately two miles south of the plaza.

The Port Huron Police Department has divided the city into patrol areas that are patrolled in 12 hour shifts. The night shift typically has eight to nine patrol units and the day shift four to five patrol units. The patrol unit nearest the plaza typically responds to an emergency on the plaza.

Tri-Hospital EMS provides ambulance service to the plaza. In case of an emergency, an ambulance is sent to the plaza from the EMS facility at 309 Grand River, two miles south of the plaza. Ambulances transport patients to Port Huron Hospital, one mile south of the plaza.

If there is an emergency along the I-94/I-69 corridor west of the Black River, the Port Huron Township Fire Department and St. Clair County Sheriff's Office are first to respond.

Emergency calls are received by the St. Clair County Sheriff's Dispatcher and routed to the appropriate emergency service providers in the Township or County. The Township Fire Department (shown as Fire Station 3 on **Figure E.22**) will dispatch equipment and personnel from their station located at 3848 Lapeer Road.

Port Huron Township Fire Station

The Sheriff's Office provides law enforcement in Port Huron Township. There are four patrol units assigned to the Township. Typically, the patrol unit closest to an incident will respond. The Michigan State Police provides back-up to the Sheriff's Office as needed.

Canadian emergency service providers in Sarnia provide back-up for emergencies on the plaza or bridge. Sarnia Fire Rescue Services have five stations in the City of Sarnia. The closest stations to the plaza are located at 1133 Colborne Road and 240 E Street North, three and four miles from the plaza, respectively.

CBP provides border security and prevents unauthorized entry of goods or persons into the United States. CBP is responsible for the security of the plaza infrastructure and notifies the city dispatcher in case of an emergency.

Elevated Plaza

The existing plaza is elevated 24-feet above ground providing inherent security to the plaza operations. Existing plaza security features include a three-foot high concrete barrier topped with a one-foot high cast aluminum railing along the perimeter of the elevated portion of the plaza, a seven-foot chain link fence on top of a three-foot high concrete barrier in the elevated secondary inspection area, a five-foot high chain link fence on the approach ramp from Pine Grove Avenue, and a six-foot high chain link fence along the perimeter of the at-grade portions of the secondary inspection area.

Plaza Wall along Elevated Portion of Plaza

Annual Plaza Incidents and Average Response Times: The City of Port Huron Fire and Police Departments and the Tri-Hospital EMS Corporation were contacted to determine the frequency and time of response to emergency incidents on the existing plaza. Estimated response times are based on dispatching equipment and personnel from the location nearest the plaza.

Table 3.5.1 shows the results for the specific emergency service providers.

Table 3.5.1 Historical Rates for Plaza Incidents and Response Times

	Average Number of Responses/Year (2003-2005)	Estimated Avg. Response Time (minutes)
Fire	25	2
Police	174	3
EMS (ambulance)	15	5

3.5.2 General Design Considerations and Criteria

General Design Considerations: Security and emergency service design elements that are part of the alternatives center on three main issues: 1) the prevention of unauthorized entry of goods and persons into the United States, 2) traffic safety, and, 3) the ability of the emergency service providers to assist and respond to incidents on the plaza/bridge and related roadway corridor.

Potential security threats to the border crossing include, but are not limited to:

- Vehicular crashes
- Emergency medical incidents
- Hazardous/Flammable material spills
- Breach of the perimeter at the plaza or corridor
- Criminal or terrorist attack at the plaza, or attempted entry by an individual with hostile intent

Stakeholder Input on the Design Considerations: The Security and Emergency Management Task Force provided several design recommendations at the September 1, 2005 meeting with the Study Team. These recommendations are listed below, by alternative. The Preferred Alternative (City West Alternative) was not under consideration at that time, and therefore, no design recommendations specific to the Preferred Alternative were made by the Task Force; however, design recommendations for the City East Alternative will also be considered for the Preferred Alternative.

City East Alternative

- Provide a controlled gate access on the north side of the proposed plaza
- Improve the internal access to all areas of the plaza
- Provide a dedicated emergency access lane along the plaza entrance road off of Pine Grove Avenue
- Consider upgrading Stone Street and Gratiot Avenue to improve north-south traffic flow in the area
- Consider locating a first-responder station at or adjacent to the proposed plaza

CBP also recommended the following security measures:

- Provide an eight-foot high perimeter barrier that would effectively keep people and vehicles out of the secure plaza area
- Locate facilities to allow visual observation of traffic and pedestrian movements on the plaza

City West (Preferred) Alternative

- Provide a controlled gate access on the north side of the proposed plaza
- Improve the internal access to all areas of the plaza
- Provide a dedicated emergency access lane along the plaza entrance road off of Pine Grove Avenue
- Consider upgrading Stone Street and Gratiot Avenue to improve north-south traffic flow in the area
- Consider locating a first-responder station at or adjacent to the proposed plaza

CBP also recommended the following security measures:

- Provide an eight-foot high perimeter barrier that would effectively keep people and vehicles out of the secure plaza area
- Locate facilities to allow visual observation of traffic and pedestrian movements on the plaza

Township Alternative

- Provide access to the plaza from the local street system, north and south of the plaza
- Provide a dedicated emergency access lane within the secured corridor
- Allow for additional emergency access points along the secured corridor in addition to access at both ends
- Consider locating a first-responder station at or adjacent to the proposed plaza

CBP also recommended the following security measures:

- Provide an eight-foot high perimeter barrier that would effectively keep people and vehicles out of the secure plaza area
- Locate facilities to allow visual observation of traffic and pedestrian movements on the plaza
- Provide a buffer zone between the roadway and the perimeter barrier, within the secure corridor, to monitor activity
- The secure corridor should have a 20-foot high opaque barrier on either side of the corridor. This barrier should be topped with a four-foot long cantilevered, non-climbable fence set inward at a 45-degree angle. This barrier should be capable of withstanding an explosion that would compromise the integrity of the barrier.
- Provide a buffer area and fence between the local roadway system and the secure corridor to deter outside access and enhance visual surveillance
- Provide pole-mounted cameras to monitor either side of the perimeter barrier along the secure corridor
- Outbound and inbound traffic lanes should be securely separated
- Allow for public access to the secure corridor only from controlled points at either end of the corridor, including emergency service providers

Security and Emergency Management Design Criteria: All potential incidents on the plaza cannot be prevented; however, design elements can be incorporated in plaza improvements that would 1) make incidents less likely, 2) reduce the

potential effects of an incident, and 3) enable a more effective response to an incident.

The design criteria are based on the review of threat assessments conducted for the Blue Water Bridge Plaza, an analysis of their applicability to the proposed Build Alternatives, the review of federal design guidelines for ports-of-entry, the research of other border crossings in the United States that are similar in design, and design considerations provided by the Security and Emergency Management Task Force and CBP.

General design criteria include the following:

1. Twenty-foot high perimeter barriers would be used along the secure corridor of the Township Alternative. Eight-foot high perimeter barriers would be used around plaza areas.

2. A 20-foot high perimeter barrier would have the following characteristics:
    a. Fabricated of anti-climb material.
    b. Made of solid (e.g. concrete panel wall) or close mesh material with less than ¾-inch mesh openings to prevent objects from being passed through the barrier and that resists cutting with bolt or wire cutters.
    c. Opaque or semi-opaque in the case of close mesh material.
    d. Protected from vehicle or other impacts that might damage or destroy it.
    e. Topped with a four-foot long cantilevered, non-climbable fence slanted inward at a 45 degree angle toward the secure corridor.

3. An eight-foot high perimeter barrier would have the following characteristics:
    a. Fabricated of anti-climb material.
    b. Made of solid (e.g. concrete panel wall) or close mesh material with less than ¾-inch mesh openings to prevent objects from being passed through the barrier and that resists cutting with bolt or wire cutters.

c. Opaque or semi-opaque in the case of close mesh material.
d. Protected from vehicle or other impacts that might damage or destroy it.

4. For the Township Alternative there should be a buffer area on either side of a perimeter barrier along the secure corridor that includes a concrete median barrier located at the edge of the shoulder of the outside corridor lanes, and on the outside of the perimeter barrier between the local roadway system and the secure corridor. This would discourage people from walking or driving next to the barrier.

5. Any buffer areas should be monitored with devices such as intelligent cameras and motion sensors. In order for remote monitoring to be successful, cameras and sensors must be monitored, adequate lighting must be provided, and agency personnel must have the ability to rapidly respond.

6. Design of the plaza should include controlled access points for emergency vehicles at both the north and south sides of the plaza.

The effects of the alternatives on security and emergency services for the plaza and surrounding community, and recommended design elements specific to each alternative are discussed below.

3.5.3 Effects of the Alternatives on Public Safety and Security

Any security measures proposed for the alternatives must take into consideration the threat risk, cost, and effectiveness. A reasonable combination of measures should be provided to deter a reasonable threat.

No-Build Alternative: The No-Build Alternative will not change the current access points for emergency service providers. The main impact of this alternative on emergency services will be delays due to congestion in responding to emergency calls on the plaza or in the vicinity of the plaza. This is due to

projected traffic backups on the Black River Bridge and along major north-south streets such as Pine Grove Avenue and the M-25 Connector.

The No-Build Alternative does not include any specific security improvements to the existing plaza. CBP has discussed the likelihood of some security improvements over time, as funding permits. These improvements would not include the same security features as in the City East, Township, and Preferred Alternatives.

City East Alternative: This alternative provides two controlled access points for emergency service personnel. One access will occur on the north side of the plaza, and the other on the south side of the plaza. Emergency service access to the plaza from the west will be similar to the No-Build Alternative. Most of the plaza would be at ground level.

The following security design elements are proposed for the City East Alternative:

1. Eight-foot high perimeter barriers at strategic locations along the perimeter of the plaza. The use of landscaping, bollards, planters, grading, etc. can soften the visual impact of the perimeter barriers. The design details for the perimeter barrier will be addressed at the final design phase of the project.

2. Controlled access points into the secure plaza located at the north and south boundaries of the plaza, for emergency service personnel.

The City East Alternative would have little or no effect on emergency service response times to and from the plaza, with response times similar to current response times shown in **Table 3.5.1**.

Plaza over Pine Grove Avenue

There are two major north-south roadways through this area of the city, 10th Avenue (four lanes) and Pine Grove Avenue (five lanes). This alternative would reroute Pine Grove Avenue to share the roadway with the existing 10th Avenue and eliminate the portion of Pine Grove Avenue that runs under the plaza, thus combining, for a short distance, these

two roadways into one five to seven-lane roadway. Emergency service response times to neighborhoods and businesses north and south of the plaza could be affected in the event of an incident on the relocated roadway that would block traffic. Emergency service along I-94/I-69 would be improved with better separation of local and plaza traffic.

Currently, the Blue Water Bridge Plaza is a major hazardous materials crossing and will continue to be. The existing plaza has an emergency spill containment area. This feature will also be incorporated into City East Alternative. It will be important to be able to quickly access the plaza in the event of a spill.

City West (Preferred) Alternative: This alternative provides two controlled access points for emergency service personnel. One access will occur on the north side of the plaza from Hancock Street, and the other on the south side of the plaza via the relocated Pine Grove Avenue. Emergency service access to the plaza from the west will be similar to the No-Build Alternative via the I-94/I-69 approach. Most of the plaza would be at ground level.

The following security design elements are proposed for the Preferred Alternative:

1. Eight-foot high perimeter barriers at strategic locations along the perimeter of the plaza. The use of landscaping, bollards, planters, grading, etc. can soften the visual impact of the perimeter barriers. The design details for the perimeter barrier will be addressed at the final design phase of the project.

2. Controlled access points into the secure plaza located at the north and south boundaries of the plaza, for emergency service personnel.

Plaza over Pine Grove Avenue

The Preferred Alternative would have little or no effect on emergency service response times to and from the plaza, with response times similar to current response times shown in **Table 3.5.1**.

There are two major north-south roadways through this area, 10th Avenue (four lanes) and Pine Grove Avenue (five lanes). This alternative would relocate Pine Grove Avenue to the west from its intersection with 10th Avenue and tie into the M-25 Connector. This will eliminate the portion of Pine Grove Avenue that runs under the plaza. Emergency service responders will be able to access the neighborhoods and businesses north and south of the plaza via 10th Avenue and Pine Grove Avenue.

Emergency service along I-94/I-69 would be improved with better separation of local and plaza traffic.

Currently, the Blue Water Bridge Plaza is a major hazardous materials crossing and will continue to be. The existing plaza has an emergency spill containment area. This feature will also be incorporated into the Preferred Alternative. It will be important to be able to quickly access the plaza in the event of a spill. Estimated response times for the Preferred Alternative are shown in **Table 3.5.2**.

Table 3.5.2 Estimated Emergency Service Response Times* To Selected Locations (in minutes)

	No-Build	City East	City West	Township	
	To Plaza	To Plaza	To Plaza	To New Plaza	To Existing Plaza
Port Huron Township Fire Department	5	5	5	3	6
St. Clair County Sheriff	3	3	3	2	5
City of Port Huron Fire Department	2	2	2	5	8
City of Port Huron Police Department	3	3	3	5	8
Tri-Hospital EMS	5	5	5	10	13

*Maximum times rounded to nearest whole number. Estimated times assume the shortest route to the destination.

Township Alternative: There are no specific design criteria for a secure corridor as proposed for the Township Alternative in GSA or CBP standards.

The Township Alternative creates three distinct areas that will need security and emergency service access. They are: (1) the existing plaza area, (2) the secure roadway between the existing plaza and the new plaza, and (3) the new plaza.

Emergency access to the new plaza would occur from the north side via a controlled gate at the end of Eastland or Westland Drive, or an alternate driveway. Emergency access to the south side of the plaza would occur via I-94/I-69 or the Lapeer Connector.

Under the Township Alternative, the plaza infrastructure will be in both Port Huron Township and the City of Port Huron. The inspection stations and support facilities will be in Port Huron Township and the Duty Free Store and maintenance facility will be in the City of Port Huron. The secure roadway corridor will be split between the two jurisdictions. This design layout will require close interaction between emergency service providers from St. Clair County, Port Huron Township, and the City of Port Huron. It will be important to establish clearly defined roles and responsibilities for the delivery of emergency services by the jurisdictions involved.

Currently, the Blue Water Bridge Plaza is a major hazardous materials crossing and will continue to be. The existing plaza has an emergency spill containment area. This feature will also be incorporated into the Township Alternative. It will be important to be able to quickly access the plaza or secure corridor in the event of a spill as the spills will be occurring further inside the country.

Special attention will need to be given to traffic safety within the secure corridor. It will be important to control speeding and have the ability to notify the public of any traffic delays within the corridor. Some of the ways this might be accomplished is to post slower speed limits for the corridor and use variable message signs to notify the public.

The following design elements are proposed for this Alternative:

1. Eight-foot high perimeter barriers at strategic locations along the at-grade areas of the plaza. The use of landscaping, bollards, planters, grading, etc. can soften the visual impact of the perimeter barriers. The design details for the perimeter barrier will be addressed at the final design phase of the project.

2. Twenty-foot high perimeter barriers along the outside of the outbound and inbound lanes of the secure roadway corridor.

3. A 12-foot wide shoulder along the outside lanes of inbound and outbound traffic to assist emergency service providers in reaching an incident.

4. A buffer area up to 10-feet wide between the 20-foot high perimeter barriers and the shoulders of the outside lanes of both inbound and outbound traffic within the secure roadway corridor with a concrete median barrier at the edge of the shoulder.

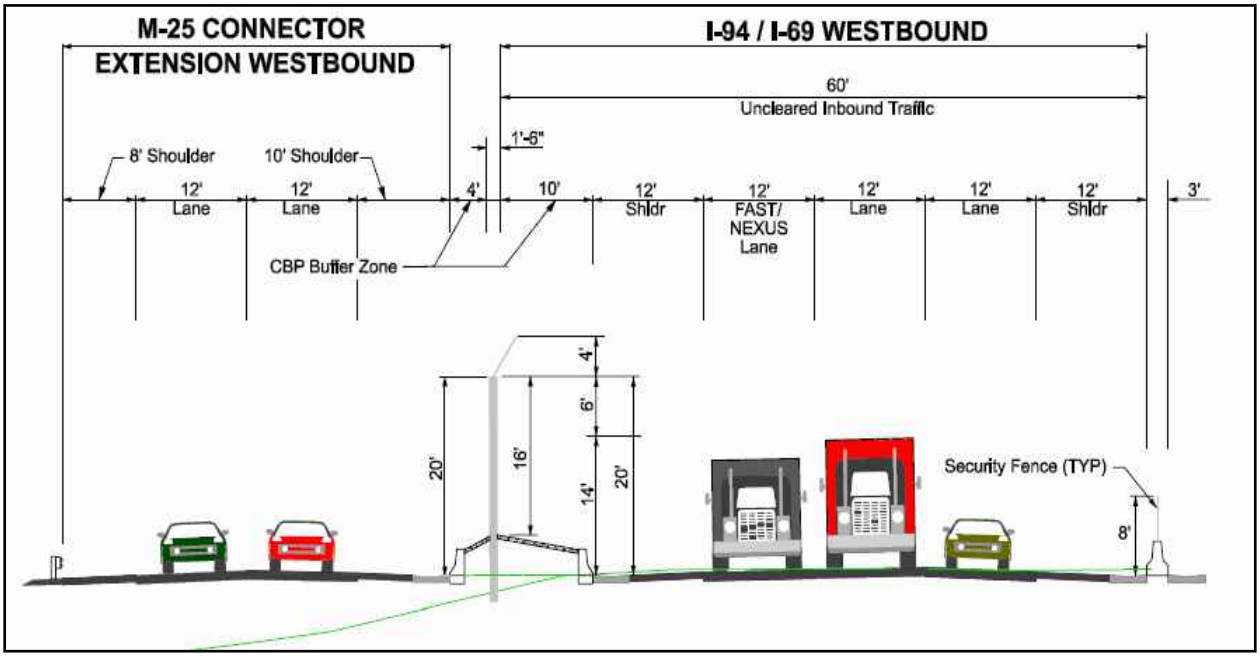


Figure 3.5.1 A Typical Cross Section of the Secure Corridor in the Township Alternative

5. A buffer area up to four-feet wide along the outside of the perimeter barriers of the secure corridor, containing a low-level barrier to discourage people from walking or driving next to the barrier.

6. A twenty-foot high barrier dividing the inbound and outbound lanes within the secure corridor.

Design details for the proposed barriers (i.e., wall specifications, gate types, etc.) will be addressed during the final design phase of the project.

The Township Alternative introduces new potential safety issues. The extended plaza roadway system between the Blue Water Bridge and the new plaza would pose significant challenges to providing emergency vehicle services to the plaza, the connecting corridor, and the bridge. Emergency vehicles and local law enforcement would only be able to access the secure corridor from the inspection plaza in Port Huron Township or from Canada. The secure corridor between the bridge and the plaza would also pose enforcement issues as to how to police this corridor to ensure proper traffic control and speed.

The Township Alternative would have little effect on emergency service to the City of Port Huron. However, depending on the emergency service provider, there could be longer response times in reaching an incident on the new plaza in Port Huron Township or in the secure corridor. The Township Alternative would improve local emergency service along the M-25 Connector with the separation of local and plaza traffic. Estimated response times for the Township Alternative are shown in **Table 3.5.2**.

3.5.4 Comparison of Emergency Response Times by Alternative

Rapid emergency service response to incidents is critical for the safety of the public and plaza staff. **Table 3.5.2** compares the estimated response times of the emergency service providers for each alternative.

Response times were estimated by determining the ratio between current response time and travel distance to the existing plaza, by the respective emergency service provider. Current response times were based on interviews with the emergency service providers. Travel distances were determined by measuring the distance between the beginning and end point of the most direct route to the plaza. This ratio was then applied to plaza locations for the alternatives to calculate estimated response times.

The emergency response provider most affected by the Township Alternative is Tri-Hospital EMS. The estimated response time doubles when responding to an incident at the new plaza located in Port Huron Township as compared to incidents on the existing plaza. There is no national standard response time for ambulance service; however, local service guidelines and contracts typically establish a response time of eight to ten minutes or less 90 percent of the time for urban areas, and 12-15 minutes or less 90 percent of the time for rural areas. This is the standard that Tri-Hospital EMS has committed to under current contracts with the City of Port Huron and Port Huron Township. The estimated ambulance response time to the new plaza in the Township Alternative would comply with these contract standards. The estimated response time to the existing plaza in the Township Alternative would not comply with the contract standards due to the limited access to the existing plaza and secure corridor. Access to the existing plaza will be available only westerly from the Blue Water Bridge or easterly from the secure corridor. Emergency vehicles will have to enter the new plaza site, pass through customs, and then travel the secure corridor easterly to reach the existing plaza.

The City East Alternative and Preferred Alternative would have little effect on the response times for fire and police, depending on the service provider. As expected, the City of Port Huron Fire Department would have better response times to incidents involving plaza facilities that are located in the city limits (No-Build, City East, and Preferred Alternative), and the Port Huron Township Fire Department would have better response times to incidents involving plaza facilities located in the township (new plaza in the Township Alternative).

The City of Port Huron Police Department and the St. Clair County Sheriff's Office have comparable estimated response times to incidents associated with any of the alternatives.

3.6 Relocations

All of the Build Alternatives will require MDOT to purchase existing homes and businesses in the Study Area. These are called relocations. Residential relocations are homes that must be purchased including single family homes, duplexes, apartments, and condominiums. Commercial relocations are businesses that must be purchased including stores, offices and restaurants. Relocations will only be necessary if a Build Alternative directly impacts a home or business. The City East Alternative will require the displacement of 155 residential units, 34 businesses, and one community facility (church). The City West (Preferred) Alternative will require 129 residential, 30 business, and one church relocation(s). The Township Alternative will require 56 residential, and 29 business relocations. The following discusses the existing real estate market in the Port Huron area and the relocations required for each Build Alternative. This information will be used to review the availability of similar housing and sites for the households and businesses that will be displaced by the Build Alternatives.

All of the Build Alternatives require homes and businesses to be purchased

3.6.1 What is the Current Real Estate Market in St. Clair County?

The Eastern Thumb Association of Realtors, which covers St. Clair, Sanilac, and parts of Lapeer and Macomb Counties, reported 1,349 home sales in the entire year of 2006, with an average selling price of $155,252. Given their age, size, and assessed values, homes in the Study Area would generally sell for lower average prices than those reported for the Eastern Thumb area. **Table 3.6.1** illustrates the availability of different types of housing within the Port Huron Area according to the Multiple Listings Service at www.realtor.com as of December 2006. This table does not include private sales by owners or agents not affiliated with the web site.

Table 3.6.1 Houses Listed For Sale on the Multiple Listings Service at Realtor.Com - 2006

Housing Price Range/Type	Port Huron	St. Clair County
$0 to $50,000	16	35
$50,000 to $100,000	297	461
$100,000 to $150,000	223	790
$150,000 to $200,000	67	720
$200,000 +	130	1472
1 Bedroom	6	29
2 Bedroom	165	488
3 Bedroom	341	1955
4 Bedroom	113	724
5 Bedrooms or more	103	279

The number of residential building permits issued in St. Clair County in 2006 was 460. The City of Port Huron accounted for 34 residential building permits and Port Huron Township accounted for 29 of the total St. Clair County residential building permits. **Table 3.6.2** shows the residential building permits issued in 2006.

Table 3.6.2 Residential Building Permits – 2006

Location	Single Family/ Detached Condo	Town-house/ Attached Condo	Two-Family/ Duplex	Multi-Family/ Apartments	Total New Units
St. Clair County	452	4	4	0	**460**
City of Port Huron	34	0	0	0	**34**
Port Huron Township	29	0	0	0	**29**

Source: Southeast Michigan Council of Governments

The City of Port Huron Comprehensive Plan states, "there are a sizeable number of under-represented retail and related service establishments in Port Huron and the County when

compared to other communities." The Comprehensive Plan also concluded that St. Clair County has relatively fewer restaurants and bars than other comparison communities and that there is the potential for the City of Port Huron and the immediate area to expand by about 290,000 square feet of retail and related services space.

The total amount of non-residential development under construction in St. Clair County in 2005 was 419,683 square feet. This accounts for one percent of the Southeast Michigan Council of Governments (SEMCOG) region's development. Some of the commercial/business development is taking place in the Fort Gratiot Township and the Port Huron communities. In 2005, Fort Gratiot Township completed 1,905 square-feet of non-residential development for a Lynn Brandl Accounting office. The City of Port Huron is expected to complete 40,400 square feet of mixed-use development for the Blue Water Ambulatory Surgery Center as well as an E&A Credit Union. **Table 3.6.3** shows the amount of non-residential square feet completed or under construction in the region.

Table 3.6.3 Non-Residential Development – 2005/2006

Location	Completed (square feet)	Under Construction (square feet)
St. Clair County	284,561	135,122
Fort Gratiot Township	1,905	0
Port Huron	0	40,400
Source: Southeast Michigan Council of Governments		

Local realtors indicate that businesses are growing in the Port Huron area. The long-term trends for commercial development in the Port Huron region are positive as local realtors are seeing an increase in business relocations from the Detroit Metropolitan region to Port Huron. The presence of the Blue Water Bridge also assists businesses in the City of Port Huron. The type of commercial space currently available in Port Huron includes a mixture of office, factory, restaurant and retail space. Local realtors indicate that the existing supply of commercial properties exceeds the demand for commercial space.

3.6.2 What are the Relocations Required for Each Build Alternative?

The selection of a Build Alternative will require the relocation of homes and businesses. The following paragraphs discuss the number and type of relocations for each Build Alternative. Acquisition of parcels and buildings will be needed in both Port Huron Township and the City of Port Huron for all of the Build Alternatives.

Assumptions and Methodologies: The relocations identified for each alternative represent the worst case scenario. For the most part, if any land was required from a parcel with a residence or business on it, it was counted as a relocation. The relocation figures will be refined in the design phase of the project. Through engineering refinements there may be opportunities to reduce the number of relocations needed for each alternative. In order to determine the availability of replacement housing and commercial property, 2000 Census Data for the affected communities was reviewed and local realtors serving the Study Area were contacted.

MDOT will compensate homeowners that are relocated and assist with the relocation process. All relocation assistance would be provided in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Resources will be made available without discrimination to all residential and business owners who are relocated. Under the requirements of this Act no relocations can occur until it is shown that comparable housing is available in the area for relocation purposes. Replacement housing must be similar both in type and price range. Typically, community facilities that are relocated by a project require rebuilding rather than relocation.

The average price for homes in the Port Huron area is approximately $155,252 with prices ranging from $80,000 to over $150,000 in the city and township portions of the Study Area. Near Lake Huron and the St. Clair River, home prices were $200,000 and higher. There are a wide variety of home styles on the market. **Table 3.6.1** lists the number of homes recently available in St. Clair County at various sizes and price ranges.

No-Build Alternative: The No-Build Alternative would not require any relocations.

Impacts of the Build Alternatives: The relocation estimates are based on a worse case scenario of acquiring all structures on parcels whose land is required for a Build Alternative. The residential relocations of each Build Alternative consists of single family homes and multi-family units, and are representative of the overall housing stock within the Study Area. As shown in **Table 3.6.4**, the City East and City West Alternatives require substantially more relocations than the Township Alternative. Most of the homes that may be relocated are owner occupied. Some multi-unit rental property relocations are required; a few of the relocations are single family home rentals. There is a multi-unit condominium property whose residents will need to be relocated for all Build Alternatives. Analysis of census data and community information indicates that the residential displacements would include a small percentage of minority and low income households. Impacts to minority and low income households are discussed further in **Section 3.3 Environmental Justice**.

Table 3.6.4 Relocation Impacts by Alternative and Community

Alternatives/ Community		Residential			Business				Community Facilities		
		Single-Family	Multi-Family	Residential Total	Service	Retail	Business Total	Vacant Sites for Sale/Rent	Churches	Other Community Facilities	Community Facilities Total
City East Alternative	City of Port Huron	128	24	152	16	15	31	6	1	-	1
	Port Huron Township	3	-	3	2	1	3	-	-	-	-
	City East Alt. Total	**131**	**24**	**155**	**18**	**16**	**34**	**6**	**1**	**-**	**1**
City West Alternative	City of Port Huron	102	24	126	15	13	28	6	1	-	1
	Port Huron Township	3	-	3	1	1	2	-	-	-	-
	City West Alt. Total	**113**	**24**	**129**	**16**	**14**	**30**	**6**	**1**	**-**	**1**
Township Alternative	City of Port Huron	23	24	47	9	14	23	-	-	-	-
	Port Huron Township	9	-	9	3	3	6	-	-	-	-
	Twp. Alt. Total	**32**	**24**	**56**	**12**	**17**	**29**	**-**	**-**	**-**	**-**

The business relocations for each Build Alternative would also require the relocation of a number of jobs. An estimate of the jobs connected with the business relocations is presented in **Table 3.6.5.** These estimates were made through contacting the businesses that would be potentially relocated. In instances where an employment count for a business was unavailable, an estimate was made based on similar businesses in the Study Area. These estimates do not include the employees who work on the plaza and would be relocated from the City of Port Huron to Port Huron Township under the Township Alternative. The impact of those job relocations is discussed in **Section 3.4 Economics**.

Table 3.6.5 Estimated Job Relocations*

Alternative	Number of Estimated Commercial/ Industrial Relocations	Estimated Total Jobs Relocated
No-Build	0	0
City East	34	390
City West	30	370
Township	29	395

* These estimates do not include the employees who work on the plaza and would be relocated from the City of Port Huron to Port Huron Township under the Twp. Alt.. The impact of those job relocations is discussed in **Section 3.4 Economics**.

City East Alternative: The City East Alternative has the largest number of relocations of the Build Alternatives. Commercial businesses in the Blue Water Gateway Area, Pine Grove Avenue mixed-use corridor, and along Water Street would require relocation. The City East Alternative requires 34 commercial relocations. The businesses relocated by this alternative are small to medium sized establishments (generally 25 people or fewer). The retail/service businesses are typical of those in most communities similar in size of those in the Study Area. These businesses should be able to find comparable new locations relatively easily. Few long-term job losses are expected with the City East Alternative as it relocates businesses that are not highly dependent on their current locations. Approximately 75 percent of the businesses relocated by this alternative own their property.

The City East Alternative would have 155 residential relocations, the largest number of relocations of the Build Alternatives. Expanding the Blue Water Bridge Plaza with this alternative, would require the displacement of residents occupying homes on both the north and south side of the existing plaza. In addition, the City East Alternative requires the relocation of a church. This alternative would impact the Port Huron Area School District, as it would require approximately 11 acres of the district's land. No school buildings or facilities would be relocated.

The City East Alternative requires relocations along Hancock Street, Pine Grove Avenue, 10th Avenue, 11th Avenue, 12th Avenue, Church Street, Elmwood Street, Harker Street, Mansfield Street, Scott Avenue, Riverside Drive, Water Street, and Maywood Drive. The overall exhibits of the City East Alternative, **Figure E.3** located in the separate **Appendix E** volume, show the relocations for this alternative.

City West (Preferred) Alternative: The City West Alternative has the second largest number of relocations of the Build Alternatives. As with the City East Alternative, commercial businesses in the Blue Water Gateway Area, Pine Grove Avenue mixed-use corridor, and along Water Street would require relocation. The City West Alternative requires 30 commercial relocations. Similar to the City East relocations, the businesses relocated by this alternative are small to medium sized establishments (generally 25 people or fewer). The retail/service businesses should be able to find comparable new locations relatively easily. Few long-term job losses are expected with this alternative as it relocates businesses that are not highly dependent on their current locations. As with the City East Alternative, approximately 75 percent of the businesses relocated by this alternative own their property.

The City West Alternative would have 129 residential relocations. This alternative would require the displacement of residents occupying homes on both the north and south side of the existing plaza, as well as the relocation of a church. This alternative would impact the Port Huron Area School District, as it would require approximately 11 acres of the district's land. No school buildings or facilities would be relocated.

The Preferred Alternative requires relocations along Hancock Street, Pine Grove Avenue, 10th Avenue, 11th Avenue, 12th Avenue, Church Street, Elmwood Street, Harker Street, Mansfield Street, Scott Avenue, Riverside Drive, Water Street, and Maywood Drive. The overall exhibits of the City West Alternative, **Figure E.4** located in the separate **Appendix E** volume, show the relocations for this alternative.

Township Alternative: The Township Alternative would have 29 business relocations. The businesses relocated by the Township Alternative are small to medium size establishments (25 or less employees). The businesses requiring relocation include health offices, service retailers, fast food/restaurants and commercial office space. It is expected that these businesses will be able to find comparable new locations within the community. Few long-term job losses are expected with this alternative, as it has fewer business relocations and relocates businesses that are not highly dependent on their current locations. Approximately 65 percent of all the businesses relocated by the Township Alternative own their premises.

The Township Alternative would have 56 residential relocations. The proposed plaza is located in Port Huron Township and occupies 153 acres of vacant, residential and MDOT owned land. This alternative would impact the Port Huron Area School District, as it would require approximately 11 acres of the district's land. No school buildings or facilities would be relocated. A local private marina would also need to be relocated.

The Township Alternative requires relocations along Hancock Street, Pine Grove Avenue, 10th Avenue, Harker Street, Mansfield Street, Scott Avenue, Riverside Drive, Water Street, and Maywood Drive. The overall exhibits for this alternative, **Figure E.5** located in the separate **Appendix E** volume, show the relocations for the Township Alternative.

Availability of Replacement Property: Replacement property should be of a similar size and pricing of the original home. No relocations can occur until it is shown that comparable housing is available. Port Huron has a wide variety of neighborhoods with schools and parks including homes with a range of values that should provide adequate housing for those that are required to relocate. **Table 3.6.1** lists available housing in the City of Port Huron and St. Clair County. See the Conceptual Relocation Plan in **Appendix B** for more information on replacement property potential in the area.

3.7 Indirect and Cumulative Impacts

This section analyzes the potential indirect and cumulative impacts of the proposed project. The area of analysis includes the City of Port Huron, Port Huron Township, Kimball Township, and Fort Gratiot Township. **Figure 3.7.1** shows the analysis area. This section will analyze the indirect and cumulative effects of the proposed project on land use, traffic patterns, farmland, and wetlands. These issues are discussed because they have the greatest potential to be affected, indirectly or cumulatively, by the project.

What Are Direct Impacts?

Direct impacts are caused by the construction of the project. Direct impacts are covered mostly in **Chapter 3 The Environment: What's There Now and Project Effects** and are a simple cause and effect. Example: A wetland is filled to accommodate construction of a roadway. **Section 3.7** will cover the impacts that are not direct impacts.

What Are Indirect Impacts?

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." Consider the construction of a new highway on what is now farmland. With increased access to this rural area, developers build new residential developments, and new houses increase demand on water supplies. The construction of the homes and increased water consumption are not directly caused by road construction, but rather are indirect impacts.

3.7.1 Why Do We Look at Existing Conditions and Development Trends?

When considering a project's indirect and cumulative effects, it is important to understand past and current conditions of the natural and built environment, and use these observations as a point of reference for assessing the project's potential affect on a particular natural or cultural resource. The following discussion sets the stage for understanding current conditions and development trends in areas that may be affected, indirectly or cumulatively, by the project.

3.7.2 What is the Development History of the Port Huron Area?

The location and nature of the formal border crossings in the Port Huron, Michigan-Sarnia, Ontario area have affected regional development since the middle of the 19th century. The City of Port Huron was incorporated in 1857, with a population of more than 3,000. Between 1859 and 1872, a chain ferry operated between Fort Gratiot and Point Edward, in the vicinity of the existing Blue Water Bridge. The railroad reached Port Huron from Detroit in 1857 and the depot was located in the Village of Fort Gratiot near the site of the existing Blue Water Bridge. By 1877, Port Huron was connected to Chicago via rail. A steam ferry replaced the chain ferry in 1872. In 1885, new ferry docks were located on Quay Street in downtown Port Huron. The Fort Gratiot Steam Ferry closed in 1892. The original rail tunnel under the St. Clair River was opened in 1891 and the rail depot moved to a location on 22nd Street, southwest of downtown Port Huron.

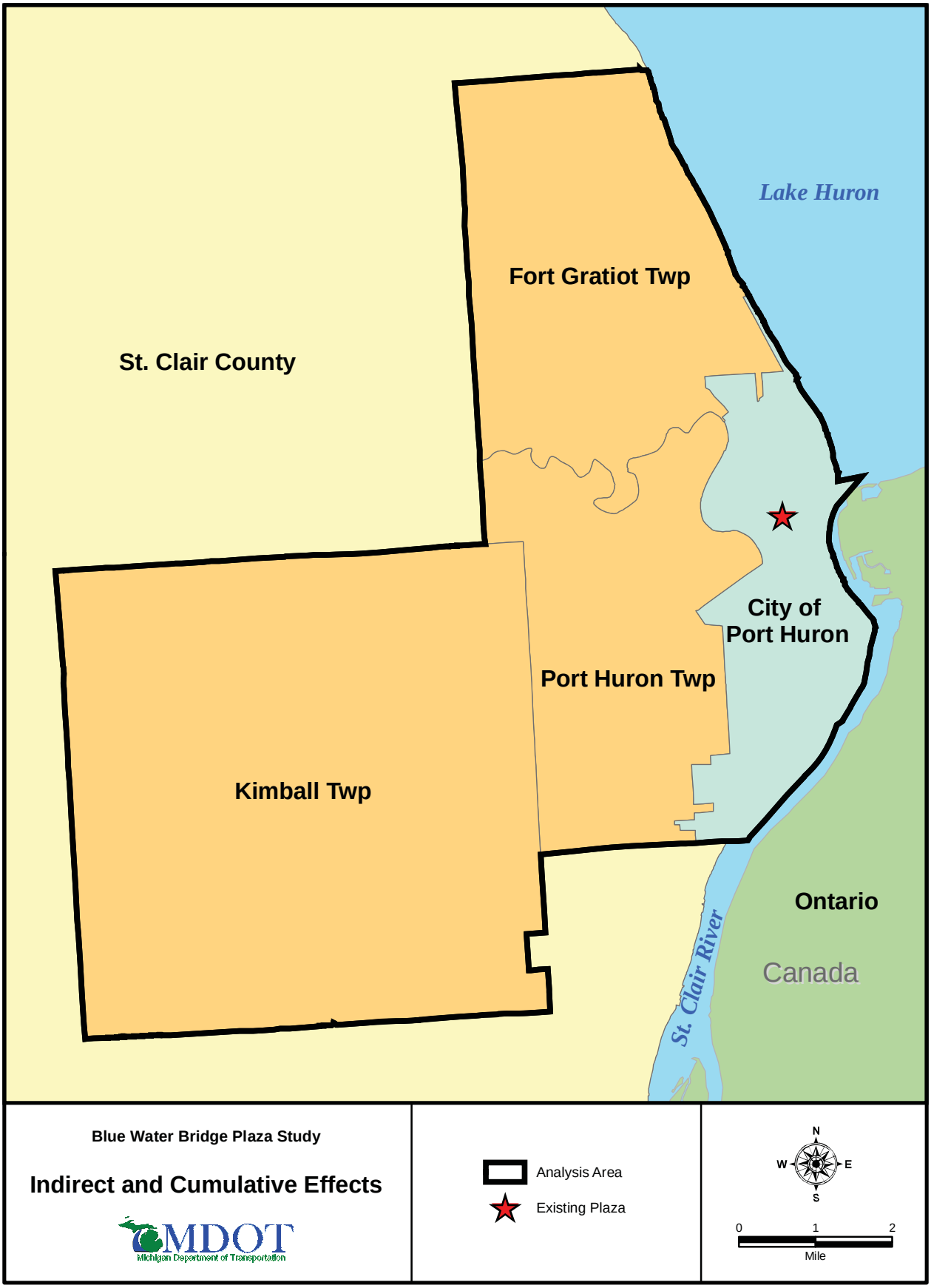

Lake Huron
Fort Gratiot Twp
St. Clair County
City of
Port Huron
Port Huron Twp
Kimball Twp
Ontario
Canada
St. Clair River
Blue Water Bridge Plaza Study
Indirect and Cumulative Effects
MDOT
Michigan Department of Transportation
Analysis Area
Existing Plaza
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Figure 3.7.1

At this point, all major border crossing and transportation operations had shifted from the Village of Fort Gratiot to central Port Huron. In 1893, the Village of Fort Gratiot was annexed into the City of Port Huron, including the location of the existing Blue Water Bridge and plaza.

The population of Port Huron grew dramatically between 1880 and 1930, from 8,883 to 31,361, a 250 percent increase. In that same period, transportation and shipping increased both across the St. Clair River and along the St. Clair River between Lake St. Clair and Lake Huron. Various advancements to the regional transportation system included inter-urban rail (1886-1920s), the first concrete-paved street (1912), the 10th Street two-lane swing bridge (1898, replaced in 1958), the opening of M-21 to Flint, Michigan (1921-22), and the designation of US-25 on Gratiot Avenue (1926). In 1922, the explosion of a ferry boiler downtown prompted the relocation of the docks to the St. Clair River, at Grand River Avenue. In this same period, the residential and commercial portions of the city increased in size.

Other important events were the opening of the Blue Water Bridge in 1938, and the long-term decline of the Port Huron – Sarnia passenger ferry services with the last river ferry (City of Sarnia) sinking at the dock in 1948. By the early 1960s, Port Huron was fully built out to the city limits, the Blue Water Bridge Bonds were paid off, and Interstate 94/US-25 was completed from Mount Clemens, Michigan to Lapeer Road in Port Huron, connecting the Detroit area to the Blue Water Bridge and Canada. By 1966, the M-21 (later I-69) freeway was completed from Wadhams Road to I-94, and extended to Flint by 1971. The I-69 Corridor, from the Blue Water Bridge to Flint, was completed in 1985. The Michigan economy slowed in the 1980s; the United States-Canada Free Trade Agreement was signed in 1989, and the North American Free Trade Agreement in 1992.

The 1990s brought a new double-stack rail tunnel under Port Huron in 1995, rendering the rail ferry obsolete. This was followed by the construction of the second span of the Blue Water Bridge and expansion of the bridge plaza in the period from 1997-1999. By 2000, the population of St. Clair County was 164,235 while the U.S. population was 275 million. At this

What Are Cumulative Impacts?

Cumulative impacts are impacts on the environment resulting 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. An example: Homes were acquired for the original construction of the Blue Water Bridge and plaza. When the bridge and plaza were upgraded in the 1990s, additional homes were acquired. This next phase of improvement to the plaza will result in yet more homes being acquired. While the direct impact of residential acquisition from the current project is at one level, the cumulative effect of the bridge on housing in Port Huron since the 1930s has been much greater.

time, the Canadian population was 30 million and the Sarnia area, consisting of Lambton County, had a population of 131,800. The September 11, 2001 attacks on the United States ushered in a heightened emphasis on homeland security. By 2005, the last commercial cargo dock and rail yard in Port Huron were closed. There are 30 oil and gas pipelines that cross the St. Clair River into Canada.

3.7.3 Description of Development in St. Clair County and the Port Huron Area

Blue Water Bridge

The majority of St. Clair County's urban development has occurred along its eastern shorelines with Lake Huron, the St. Clair River, and Lake St. Clair. Outside of the county's urban population centers, residential uses primarily line major and minor roadways with commercial uses located at the intersections. Southern portions of the county have been experiencing development pressures for housing and commercial centers, to accommodate people commuting to Detroit for work. Port Huron is currently the largest population center in the county.

Existing Border Plaza

Existing Plaza Area: The existing plaza area includes all facilities built to date to process the international traffic leaving and entering the United States. The Blue Water Bridge was first constructed in 1938 and a new span added in 1997, doubling the capacity of the bridge. The most recent improvements to the plaza were completed around 1997. The plaza was constructed after the original development of the area. The original approaches to the bridge ran through a residential area along Elmwood Street. The location of the bridge (and therefore the area originally impacted by the plaza) was influenced by soils and height requirements for the bridge, and the need for easy access to Sarnia, Ontario and downtown Port Huron. It is clear that the plaza has influenced land development patterns in the immediate area for some time.

In general, the primary land uses that surround the plaza include medium-high density commercial and low-medium density residential. A detailed description of existing land uses around the plaza can be found in **Section 3.1 Land Use and Zoning**.

Downtown Port Huron: Downtown Port Huron, like many other Midwestern downtowns, reflects the patterns of development from the late 19th and early 20th centuries. The downtown straddles both sides of the Black River and offers a mix of commercial and governmental uses typically found in a downtown area of a small to medium-sized city. The location of downtown Port Huron is shown on **Figure E.1** located in the separate **Appendix E** volume.

Fort Gratiot Township: Fort Gratiot Township, north of the plaza and Port Huron, has a more suburban pattern of development than does Port Huron. Modern commercial development is located along M-25 which includes a shopping mall and auto-oriented strip commercial. Typical businesses include such stores as Wal-Mart, Home Depot, and Meijer. Residential development occurs at a lower density in Fort Gratiot Township than in Port Huron.

Water Street and I-94/I-69 Interchange: The Water Street and I-94/I-69 Interchange offers the first southern exit for people traveling from Canada to the United States, via the plaza. A highway rest area, Port Huron Township Parks No. 1 and No. 2, motel, and highway-oriented commercial businesses are located on the north side of the interchange. Development immediately south of the interchange consists of highway-oriented commercial and a marina.

M-25 Connector and Hancock Intersection: This is the first intersection encountered by people traveling north after crossing the Blue Water Bridge from Canada. Typical highway oriented commercial development is located on the east side of the intersection and residential development on the west.

Wadhams Road and I-69 Interchange: The Wadhams Road and I-69 Interchange is the first interchange after the Water Street, I-94/I-69 Interchange when traveling west on I-69. **Figure 3.7.2** provides an aerial view of the area around Wadhams Road and the I-69 Interchange. Commercial and light-industrial businesses located at this interchange include a gas station, an auto repair shop a fast-food restaurant, an animal clinic, and a heating service. A low-density residential development is located at the southwest quadrant of the interchange. There

Wadhams Road Businesses

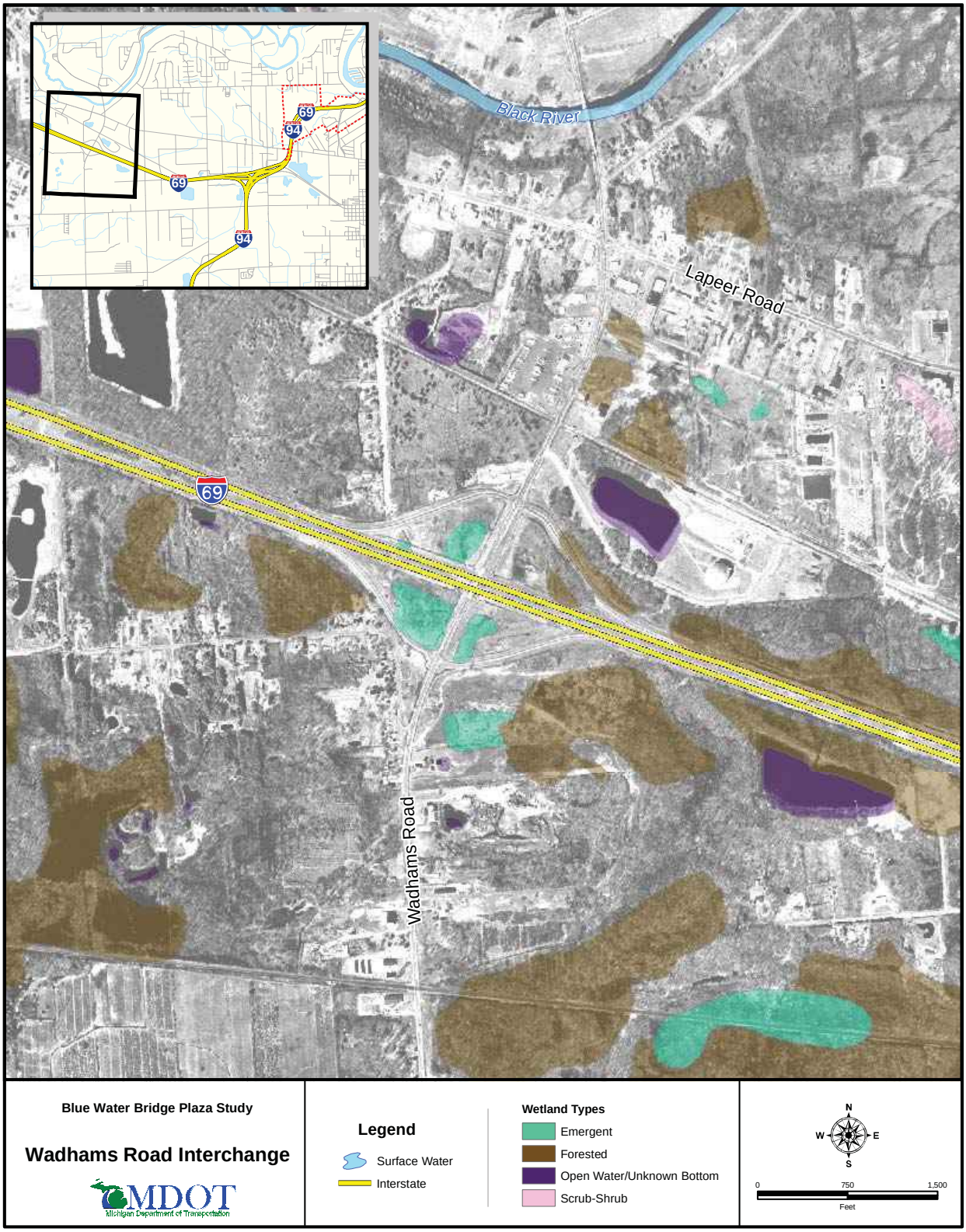

Black River
Lapeer Road
Wadhams Road
69
94
Blue Water Bridge Plaza Study
Wadhams Road Interchange
MDOT
Michigan Department of Transportation
Legend
Surface Water
Interstate
Wetland Types
Emergent
Forested
Open Water/Unknown Bottom
Scrub-Shrub
N
W
E
S
0
750
1,500
Feet

Figure 3.7.2

are vacant restaurant and small business sites mixed in among the active businesses.

Range Road Outlet Mall

Range Road and I-94 Interchange: The Range Road and I-94 Interchange is the first interchange after the Water Street and I-94/I-69 Interchange when traveling south on I-94, from the plaza. **Figure 3.7.3** provides an aerial view of the area around the Range Road and I-94 Interchange. There is a mix of residential, commercial, and light industrial development in the vicinity of the interchange. A retail outlet mall with a number of commercial vacancies is located at the northwest corner of the interchange. Development immediately east of the interchange consists of a mix of land uses that include single-family residences, a glass supply company, a wholesale landscape company, an auto auction business, and an ice arena.

Acheson Ventures Development: Acheson Ventures is a proposed redevelopment project that will provide mixed use development along the St. Clair River approximately 2.5 miles south of the existing plaza. Along with the creation of the Harborside Office Center and a Cruise Ship Terminal, this development will revitalize one mile of Port Huron waterfront property that has historically been industrial waterfront and railroad land uses. Development improvements include a naturalized park, bike path, and boat basin. The Harborside Office Center will provide 100,000-square feet of office and commercial space and a 340-car parking garage.

3.7.4 What are the Indirect Impacts?

Indirect impacts occur later in time, or are further removed in distance, than direct effects. An example of an indirect impact would be land use changes that occur along a newly constructed highway, such as the development of motels. While the new highway did not directly cause the construction of motels, it encouraged their construction by providing improved automobile access to the area. In turn, these motels may have filled wetlands to accommodate construction. In this case, the newly constructed highway would have an indirect effect on both commercial growth and wetlands.

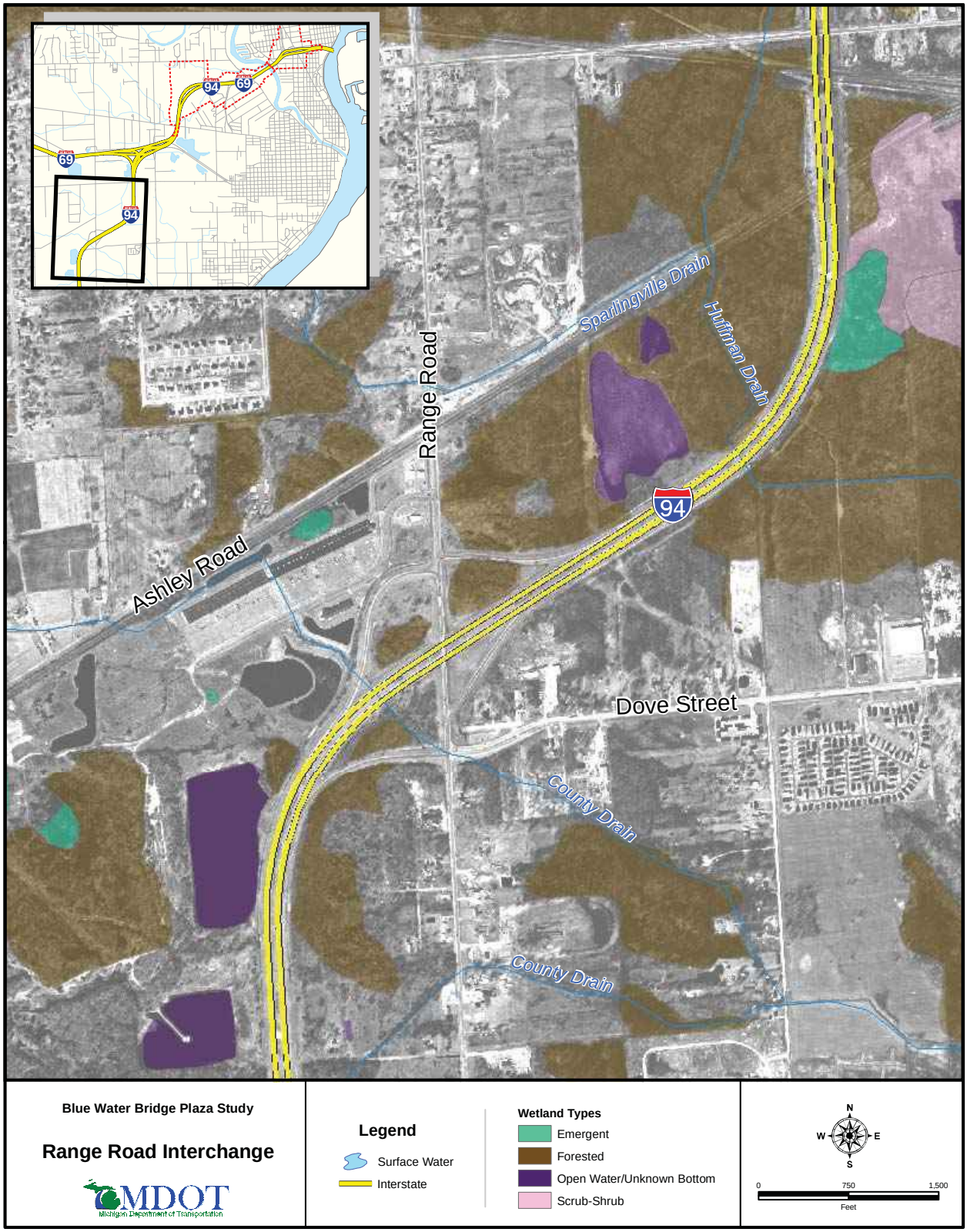

Blue Water Bridge Plaza Study
Range Road Interchange
MDOT
Michigan Department of Transportation
Legend
Surface Water
Interstate
Wetland Types
Emergent
Forested
Open Water/Unknown Bottom
Scrub-Shrub
N
W
E
S
0
750
1,500
Feet
Sparlingville Drain
Huffman Drain
Range Road
Ashley Road
Dove Street
County Drain
County Drain
94
69

Figure 3.7.3

The alternatives have the potential to indirectly impact land use, businesses, traffic patterns, farmlands, and wetlands. The following discussion addresses how each proposed alternative may indirectly affect these elements of the environment.

No-Build Alternative: The No-Build Alternative would not involve any expansion of the existing plaza. There would likely be some layout changes to improve the operation of the plaza over the long term.

Under this alternative, traffic backups would likely increase over time along the streets and at intersections near the plaza. This may indirectly affect the travel patterns of people living in the vicinity of the plaza, as they try to avoid the areas of congestion. However, it does not appear that the affect on traffic patterns would be significant.

Traffic backup on I-94/I-69

There is the potential for some increase in certain air pollutants over time such as particulate matter, due to increased traffic congestion. **Section 3.9 Air Quality** discusses the impact of air pollutants for each alternative.

Overall, the No-Build Alternative would not have a significant indirect impact on land use, businesses, traffic patterns, farmland, or wetlands.

City East Alternative: The City East Alternative would expand the existing plaza area and bring most of the plaza down to street level. Pine Grove Avenue would be rerouted to the east and several intersections in the vicinity would be rebuilt. This alternative would require the relocation of 34 businesses. It is highly likely that some of these businesses would relocate in the general area of the plaza to serve local and plaza traffic. This induced growth would probably occur north of Hancock Street, between the M-25 Connector and Pine Grove Avenue. This area is currently zoned for business use so land use patterns would not be affected. There are vacant or under-used sites in this area north of Hancock Street. New business growth could also occur along the combined Pine Grove Avenue/10th Avenue and along Pine Grove Avenue south of the project. This business growth could cause pressure to convert the first block of neighboring houses to commercial use provided local zoning was changed to allow it.

Chippewa Middle School

The 155 homes relocated for the City East Alternative could result in a short-term effect on enrollment and funding for the Port Huron Area School District. The Study Team estimates that approximately 80 school-aged children live in the homes that would be relocated. This represents approximately 0.7 percent of the total enrollment of the district. If these families relocate outside of the district, the project would cause a loss of enrollment and funding for the district. The Port Huron Area School District encompasses a fairly large area including Fort Gratiot Township to the north and Port Huron Township to the west. It is likely that families who wish to remain in the area would remain in the school district. The Draft Relocation Plan, located in **Appendix B**, indicates that there is ample available and suitable replacement housing for families who wish to remain in the area. The relocation of these families could also affect enrollment patterns and boundaries for individual schools, specifically Crull Elementary and Garfield Elementary, which are the closest schools to the neighborhood. Though both Crull Elementary and Garfield Elementary have capacity to accept new students, without enrollment boundary changes, they will most likely lose students.

The City East Alternative may have minor indirect impacts due to reduced access for border crossing traffic at Water Street and increased access between the interstate and Lapeer Road via the enhanced, Lapeer Connector. The Lapeer Connector is currently a limited access route and will continue to be a limited access route. These minor changes to the road network are unlikely to cause major changes in development and use or indirect impacts to farmland, wetlands and other natural resources.

The proposed improvements to I-94/I-69 may cause some motorists heading to Canada to bypass the services currently available at the Water Street Interchange. Motorists headed to Canada will be directed into separated lanes that lead directly to the Blue Water Bridge prior to the Water Street Interchange. This is being done to reduce traffic conflicts between local traffic and border crossers. Border crossing traffic will still have the option to access the Water Street Interchange via the lanes for local traffic and could then use Pine Grove Avenue to access the bridge plaza. However, motorists unfamiliar with this particular border crossing would be unaware of this

option to access Water Street. There would still be full access to Water Street for local traffic and border crossers coming from Canada in the same manner that exists today. As a result, the indirect effect on development at Water Street would be minor.

The City East Alternative will include enhanced access to the Lapeer Connector for local traffic. Currently only traffic headed to I-94/I-69 east or from I-94/I-69 west can use the Lapeer Connector. With the City East Alternative, traffic headed in all four directions would be able to use the Lapeer Connector. As driveway access along the Lapeer Connector is restricted due to it being limited access, this increase in traffic is unlikely to cause any new development along the Lapeer Connector. The Lapeer Connector provides a 0.8 mile connection between I-94/I-69 and Lapeer Road. The increase in traffic may slightly increase the potential customer base for existing businesses along Lapeer Road.

The minor traffic pattern changes caused by the City East Alternative should have minimal affects on land use patterns and development at the potentially affected interchanges along I-94/I-69. The City East Alternative does not increase access to or direct large traffic flows to locations with undeveloped land. As a result of the minor traffic pattern changes, a small number of drivers may switch the location for their gas or meal purchases between the various interchanges in the vicinity of the I-94/I-69 Corridor but there is unlikely to be enough change to sustain new businesses or development. No indirect impacts on land uses, wetlands, farmland and other natural resources are expected with the City East Alternative.

Pine Grove Avenue looking north towards plaza

City West (Preferred) Alternative: The City West Alternative would expand the existing plaza area and bring most of the plaza down to street level. Pine Grove Avenue would be relocated to the west and several new intersections would be built along the relocated roadway. This alternative would require the relocation of 30 businesses. It is highly likely that some of these businesses would relocate in the general area of the plaza to serve local and plaza traffic. This induced growth would probably occur north of Hancock Street. The relocated Pine Grove Avenue provides new frontage access to existing

vacant or underutilized business locations north of Hancock Street. This may be an attractive location for new or relocated businesses, providing some revitalization to the blocks north of the plaza. Most of this area is currently zoned for business use; however, the induced business growth could cause pressure to convert more of this area to commercial use provided local zoning was changed to allow it. In addition, new business growth could also occur along 10th Avenue and along Pine Grove Avenue south of the project. This business growth could cause pressure to convert the first block of neighboring houses to commercial use as well, provided local zoning was changed to allow it.

Pine Grove commercial corridor

The City West Alternative may indirectly affect traffic patterns by allowing people the option to take alternate routes, such as the rerouted Pine Grove Avenue or 10th Avenue, around the plaza facility. However, this affect is not expected to be major. All of the Build Alternatives will likely have a positive indirect effect on the Canadian side of the border crossing, in Sarnia, Ontario. These proposed alternatives will reduce stress on Canadian resources, in particular, the Ontario Provincial Police, by reducing traffic backups and associated law enforcement oversight on Highway 402.

The 129 homes relocated for the City West Alternative also could result in a short-term effect on enrollment and funding for the Port Huron Area School District. The Study Team estimates that approximately 70 school-aged children live in the homes that would be relocated. This represents approximately 0.6 percent of the total enrollment of the district. If these families relocate outside of the district, the project would cause a loss of enrollment and funding for the district. The Port Huron Area School District encompasses a fairly large area including Fort Gratiot Township to the north and Port Huron Township to the west. It is likely that families who wish to remain in the area would remain in the school district. The Draft Relocation Plan, located in **Appendix B**, indicates that there is ample available and suitable replacement housing for families who wish to remain in the area. The relocation of these families could also affect enrollment patterns and boundaries for specific schools, specifically Crull Elementary and Garfield Elementary, which are the closest schools to the neighborhood.

The City West Alternative may have minor indirect impacts due to reduced access for border crossing traffic at Water Street and increased access between the interstate and Lapeer Road via the enhanced Lapeer Connector. These impacts are identical to those for the City East Alternative. These minor changes to the road network are unlikely to cause major changes in development and use or indirect impacts to farmland, wetlands and other natural resources.

The proposed improvements to I-94/I-69 may cause some motorists heading to Canada to bypass the services currently available at the Water Street interchange. Motorists headed to Canada will be directed into separated lanes that lead directly to the Blue Water Bridge prior to the Water Street. This is being done to reduce traffic conflicts between local traffic and border crossers. Border crossing traffic will still have the option to access the Water Street Interchange via the lanes for local traffic and could then use Pine Grove Avenue to access the bridge plaza. However, motorists unfamiliar with this particular border crossing would be unaware of this option to access Water Street. There would still be full access to Water Street for local traffic and border crossers coming from Canada in the same manner that exists today. As a result, the indirect effect on development at Water Street would be minor.

Water Street off-ramp

The City West Alternative will include enhanced access to the Lapeer Connector for local traffic. Currently only traffic headed to I-94/I-69 east or from I-94/I-69 west can use the Lapeer Connector. With the City West Alternative, traffic headed in all four directions would be able to use the Lapeer Connector. As driveway access along the Lapeer Connector is restricted, this increase in traffic is unlikely to cause any new development along the Lapeer Connector. The Lapeer Connector provides an 0.8 mile connection between I-94/I-69 and Lapeer Road. The increase in traffic may slightly increase the potential customer base for existing businesses along Lapeer Road.

The minor traffic pattern changes caused by the City West Alternative should have minimal affects on land use patterns and development at the potentially affected interchanges along I-94/I-69. The City West Alternative does not increase access to or direct large traffic flows to locations with

undeveloped land. As a result of the minor traffic pattern changes, a small number of drivers may switch the location for their gas or meal purchases between the various interchanges in the vicinity of the I-94/I-69 Corridor but there is unlikely to be enough change to sustain new businesses or development. No indirect impacts on land uses, wetlands, farmland and other natural resources are expected with the City West Alternative.

Township Alternative: The Township Alternative includes a secured roadway corridor from Blue Water Bridge to the proposed plaza, located west of the existing Water Street and I-94/I-69 Interchange. Unless travelers choose to turn around and go back to Port Huron after being inspected, they will bypass the services available in the blocks surrounding the existing plaza and at Water Street. The interchanges at Range Road and I-94, and Wadhams Road and I-69 will become the first opportunity for travelers to exit the interstate after leaving the plaza when heading west or south.

Commercial properties around the Range and Wadhams Road interchanges

Range Road is the boundary between Kimball Township to the west and Port Huron Township to the east. The land immediately east of the Range Road and I-94 Interchange is zoned for commercial uses. The land immediately west of this interchange is zoned for light industrial and agricultural uses. The future land use designation for property west of the interchange is commercial. **Section 3.7.1 Why Do We Look at Existing Conditions and Development Trends?** describes the types of land uses at this interchange.

The Wadhams Road and I-69 Interchange has a mix of land uses. **Section 3.7.1 Why Do We Look at Existing Conditions and Development Trends?** describes the types of land uses currently located at this interchange. The northwest and southeast quadrants of the interchange are zoned commercial. The northeast quadrant is zoned light industrial and the southwest quadrant is zoned medium-density residential. The future land use designation for property north of the interchange is commercial and industrial, and south of the interchange is medium-density residential.

It is likely that both of the above interchanges will experience some commercial growth, to take advantage of their closer

proximity to the proposed plaza. The types of new businesses that would locate at the interchanges would likely be similar to the existing businesses, such as, fast food restaurants, gas stations, etc. Existing zoning and future land use plans would accommodate this potential growth. A potential indirect impact will be the acceleration of new development. It is likely that new businesses will locate near these interchanges sooner, if the Township Alternative is built than for other alternatives.

The Township Alternative may indirectly affect potential wetlands located near the Range Road and I-94 Interchange. Wetlands located near the Range Road exit consist mainly of forested wetlands with some emergent wetlands and some open water areas (see **Figure 3.7.3**). The Township Alternative would encourage new commercial development which, in turn, could affect wetlands in the area. Any wetland impacts would be subject to the permitting regulations that exist at the time of the impacts. There are vacant existing commercial sites at the Range Road Interchange. If development were directed to reuse of the vacant developed property, indirect wetland impacts would be minimized.

The Township Alternative could have a similar indirect effect on wetlands located near the Wadhams Road Interchange with I-69. Wetlands located near this interchange also consist mainly of forested wetlands with pockets of emergent wetlands and a few open water areas (see **Figure 3.7.2**). The Township Alternative would encourage new business construction, which in turn could affect wetlands. As with Range Road, there are vacant existing commercial properties along Wadhams Road near the interchange where new development could be directed. This would minimize additional wetland impacts.

Outlet Mall located on Range Road

The Township Alternative may indirectly affect traffic patterns by encouraging people to take alternate routes, such as the Lapeer Connector, into downtown Port Huron.

The 56 homes relocated for the Township Alternative could result in a short-term effect on enrollment and funding for the Port Huron Area School District. The Study Team estimates that approximately 30 school-aged children live in the homes

that would be relocated. This represents approximately 0.3 percent of the total enrollment of the district. If these families relocate outside of the district, the project would cause an loss of enrollment and funding for the district. The Port Huron Area School District encompasses fairly large area including Fort Gratiot Township to the north and Port Huron Township to the west. It is likely that families who wish to remain in the area would remain in the school district. The Draft Relocation Plan, located in **Appendix B**, indicates that there is ample, available and suitable replacement housing for families who wish to remain in the area. The relocation of these families could also affect enrollment patterns and boundaries for specific schools, specifically Crull Elementary and Garfield Elementary, which are the closest schools to the neighborhood. The potential effect for the Township Alternative on enrollment at these schools would be lower than for the City East and City West Alternatives.

The Township Alternative will include enhanced access to the Lapeer Connector for local traffic. With the Township Alternative, traffic headed in all four directions would be able to use the Lapeer Connector. As driveway access along the Lapeer Connector is restricted, this increase in traffic is unlikely to cause any new development along the Lapeer Connector. The Lapeer Connector provides an 0.8 mile connection between I-94/I-69 and Lapeer Road. The increase in traffic may slightly increase the potential customer base for existing businesses along Lapeer Road.

There is no agricultural land in the Study Area that is either currently farmed or zoned for agricultural purposes. Township Alternative will not have a significant indirect impact on farmland.

3.7.5 What are Transboundary Effects?

Agencies must analyze indirect effects of the project on the Canadian side of the border including potential effects on growth, safety, human and natural resources, as well as cumulative effects. Environmental regulations require the Study Team needs to discuss whether the plaza expansion would result in any positive or negative impacts within Canada.

3.7.6 Does the Project have any Transboundary Effects?

All Build Alternatives will likely have a positive indirect effect on the Canadian side of the border crossing, in Sarnia, Ontario. The Build Alternatives may reduce stress on Canadian resources, in particular, the Ontario Provincial Police, by reducing traffic backups and associated law enforcement operations on Highway 402. The Build Alternatives will also reduce delay for Canadians waiting to enter the United States.

The Canadian Blue Water Bridge Authority (BWBA) is in the early stages of a total reconstruction of their border plaza. The BWBA recognizes the need for expanded border operations at the Blue Water Bridge and are in strong support of the expansion of the U.S. border plaza.

As discussed in **Chapter 2**, there currently is an undesirable truck weave that takes place on the main bridge. The westbound trucks are required to be on the right side as they pass through the Canadian toll booths and then switch over to the left lanes for inbound primary inspection on the U.S. Plaza. The Canadians have indicated the weave needs to be eliminated with the construction of the new U.S. plaza to provide safer travel conditions.

Only the No-Build Alternative will result in a negative transboundary effect, as it does not fix the mid-span truck weave. In addition, the traffic backups on the Highway 402 will continue to occur and result in unsafe conditions. All of the Build Alternatives will likely result in positive indirect effects on the Canadian side of the crossing by reducing the traffic backups that are currently occurring and by fixing the mid-span truck weave.

The Build Alternatives will not affect environmental resources in Canada but could result in reduced localized air quality impacts and use of fuel due to less congestion on the Canadian side of the bridge from cars and trucks waiting to enter the United States.

3.7.7 How did the Study Team Determine if the Alternatives would have Cumulative Effects?

What Are Cumulative Effects?

Effects that result when adding the impacts of a project to other past, present, and future projects.

Environmental regulations require that the cumulative effects of a proposed action or project be evaluated. Cumulative effects are those effects that result when adding the incremental impacts of a project to other past, present, and foreseeable future projects. The incremental impacts of a project may be minor. However, when these impacts are added to impacts from other projects, the overall impact could be considerable. Cumulative impacts can be positive or negative depending on the environmental resource being evaluated.

In general, a particular action or group of actions would be included in the cumulative analysis, provided:

- The impacts occur in a common area
- The impacts are similar in nature
- The impacts are long-term

Projects considered in this cumulative analysis consist of past, present, or future transportation and land development projects, and projects directly associated with the development of the plaza. The time frame for considering past, present, and future projects is from 1980 to 2030. Using 1980 as the starting point for the analysis allowed an assessment of the changes since the last major expansion of the plaza. The year 2030 is the year used in the regional transportation documents. Also, it would accommodate the build-out of any planned improvements to the plaza.

Comprehensive plans for the Townships of Port Huron and Fort Gratiot, and the City of Port Huron were reviewed to identify future actions that could have cumulative impacts. Also, the 2030 Long Range Transportation Plan, prepared by the St. Clair County Transportation Study, was reviewed for any major transportation projects that may have cumulative effects.

The following additional documents were reviewed:

- St. Clair County 2030 Long Range Transportation Plan / SEMCOG Long Range Plan
- City of Port Huron Master Plan Summary
- Charter Township of Port Huron Zoning Ordinance and Zoning Map
- St. Clair County GIS Data
- 2000 U.S. Census Data
- SEMCOG Demographic Data, estimates, and forecasts
- 1983 I-94 Blue Water Bridge and Plaza FEIS and Section 4(f) Statement
- 1994 Blue Water Bridge Additional Capacity Project Environmental Report and Reevaluation of 1983 FEIS
- Detroit River International Crossing Study (DRIC) - in progress, currently in the alternatives evaluation phase
- Proposed improvements to Highway 402 in Ontario

To evaluate the effects of the proposed project in terms of cumulative impacts, past, present and reasonably foreseeable future actions need to be assessed. Past actions are documented in the records. Future actions that may have potential cumulative effects were identified by reviewing plans and ordinances for the area. Meetings were held with the City of Port Huron staff and the Port Huron Township Board to identify current development projects that might be included in the analysis.

The following projects were considered in the evaluation of potential cumulative effects:

- Past Blue Water Bridge and Plaza construction in the 1990's
- Anticipated improvements along I-69 and I-94 south and east of the project
- Other border crossing projects in the Detroit area
- Current development in projects in the Port Huron area including the Acheson Ventures development

3.7.8 Are There any Cumulative Effects?

Upon reviewing potential projects to be included in the cumulative analysis the Study Team determined that the only

projects with long-term cumulative effects are the various plaza and related improvements over time.
Cumulative impacts to the community and neighborhoods, as a result of past plaza development activity include residential and business displacements and neighborhood fragmentation. Bridge and plaza improvements completed by 1994 resulted in the relocation of 33 residential units and six businesses. These displacements removed part of an existing neighborhood and affected the cohesive nature of the neighborhood and surrounding area.

The Study Team also identified potential short-term cumulative effects for all Build Alternatives if border crossing projects in Detroit and improvements along I-69 and I-94 outside the Study Area were constructed at the same time as the plaza project. The cumulative effect of construction of all of these projects at the same time would be substantial congestion for border crossing traffic and trade entering Michigan. There would also be a potential shortage of construction resources for these types of projects, raising project costs. These short-term cumulative effects can be reduced or eliminated by scheduling the various construction projects at different times over a period of years.

Homes in the Neighborhood South of the Existing Plaza

No-Build Alternative: The No-Build Alternative would not affect existing neighborhoods and, thus, would not result in a cumulative impact on the community and neighborhoods.

City East Alternative: The City East Alternative would require the relocation of 155 residences, 34 businesses, and one church. The relocations would affect two neighborhoods located south and north of the plaza, by reducing their size and impacting the cohesive nature of the neighborhoods and surrounding community. The proposed relocations, in combination with past relocations since 1980, would result in a significant cumulative impact. The cumulative effect would be the relocation of 188 residences and 40 businesses since 1980. There is also a cumulative effect on the tax base for the City of Port Huron.

City West (Preferred) Alternative: The City West Alternative would require the relocation of 137 residences, 37 businesses, and one church. The relocations would affect the same two

neighborhoods located south and north of the plaza as the City East Alternative, by reducing their size and impacting the cohesive nature of the neighborhoods and surrounding community. The proposed relocations, in combination with past relocations since 1980 and the proposed relocations due to the I-94/I-69 Corridor project, would result in a significant cumulative impact. The cumulative effect would be the relocation of 170 residences and 43 businesses since 1980. There is also a cumulative impact to the tax base of the City of Port Huron.

Township Alternative: The Township Alternative would require the relocation of 56 residences and 29 businesses. Twenty-four of the 56 residential units to be relocated are in the same condominium complex. Also, the remaining residential units to be relocated are at the edge of an existing neighborhood, reducing the impact on the neighborhood, in comparison to the City Alternatives. However, from a cumulative standpoint, the Township Alternative would still have a significant impact due to its contribution toward the displacement of 89 residences and 35 businesses since 1980.

Riverside Drive condominium complex

3.8 Aesthetic and Visual Impacts

The Federal Highway Administration's (FHWA) Technical Advisory T6640.8A (TA) dictates that whenever a potential for visual impacts exists from a proposed transportation project, the environmental study should identify the potential visual impacts to the adjacent land uses as well as measures to avoid, minimize, or mitigate these potential visual impacts.

The visual assessment process consists of four study components. These include:

- Determining the existing Landscape Viewshed
- Analyzing the Landscape Character and Experience
- Predicting Baseline Impacts
- Identifying Mitigation Options

The visual assessment process provides an analysis of the landscape character for the Study Area. It is also used to determine the type and degree of visual impact for various viewers, such as the interstate/plaza user, the recreational tourist and the local resident.

The exact appearance of each Build Alternative is still conceptual. The development of Context Sensitive Solutions (CSS) has been an ongoing part of the study process to date. The Study Team has held ongoing public consultation and has examined conceptual ideas for buffer zones and wall types. The Study Team plans to hold a series of CSS workshops during the final EIS process.

What Are Context Sensitive Solutions (CSS)?

FHWA defines CSS as "a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist."

3.8.1 What does the Existing Study Area Look Like?

The Study Area and surroundings are best described (from east to west) as an urban area that begins transitioning to a more suburban less populated area as the viewer proceeds west through the study corridor. Residential and commercial properties are the most dominate land uses in the Study Area. Single-family homes make up the majority of the residential land uses, while business properties are prevalent along Pine Grove Avenue and near the Water Street Interchange. Public land uses include parks, a public campground, and a Michigan Welcome Center, all located west of the Black River Bridge.

Area Around Existing Plaza

The Study Area is mostly flat with the exception of the Black River and Stocks Creek crossings which are low lying areas. The area around the Black River gently slopes toward the river creating a visual experience that differs from the rest of the corridor. The western edge of the Study Area past the Water Street Interchange, which includes Stocks Creek, exists in more of a natural state than the remainder of the corridor. There are small woodland areas along with open areas of old fields and meadows. As one approaches Port Huron from the west, the trees and natural features are replaced with signs, billboards, power lines, streetlights, and commercial businesses.

There are a few key land uses within the Study Area that contribute to the visual identity of the area. The most significant of these are the Black River, adjacent marinas and parks. A public campground, owned and operated by Port Huron Township, is located on the north side of the freeway west of the Water Street Interchange. Residences are an important land use near the existing plaza. Their view includes an elevated plaza approximately 24-feet high with associated buildings and traffic. In the area dedicated to the new plaza in Port Huron Township, there are single-family residences located to the north and south of the existing freeway, a mobile-home park located further southwest, a large church located north of the freeway west of Stocks Creek, and a school located south of the freeway west of the Lapeer Connector. Residences in the Township area currently do not have a view of the existing plaza, but do have a view of the I-94/I-69 freeway and the associated traffic.

The visual quality of an area may depend on the preferences and subjective values of the viewer. FHWA produced a manual titled Visual Impact Assessment for Highway Projects to assist in evaluating the visual qualities of a Study Area.

In order to complete the analysis, the Study Area was divided into four areas that display consistent visual characteristics and a uniform visual experience which are called "Visual Assessment Units" (VAU). Each VAU may be thought of as outdoor room that has a direct relationship to the natural layout of the area and associated land uses. The boundaries of these visual environments occur where there is a change in visual character. The strongest determinations of the visual

boundaries are topography and landscape components. The four VAUs **(Figure 3.8.1)** within the Blue Water Bridge Plaza corridor have the following characteristics and include:

- **VAU-1, Port Huron Township** – This VAU consists of generally old field/meadow with some woods and low lying areas. Several billboards along with powerlines and a MDOT maintenance building make up the landscape. There is a cluster of single-family residences visible in the distance to the north and a mobile home park located just off of I-94/I-69 to the southwest.
- **VAU-2, Water Street/Lapeer Connector Area** – The area in and around this VAU consists of gently rolling terrain that is dominated by constructed elements. As the viewer travels from west to east, through this VAU, the area transitions from a rural to urban landscape. Views from I-94/I-69 are of billboards and signs promoting local businesses.
- **VAU-3, Black River Area** – The sloping terrain of the Black River constitutes VAU-3. The dominant feature in this VAU is the I-94/I-69 crossing of the Black River. The crossing is surrounded by marinas, public parks, several residences, a condominium building, and commercial establishments that overlook the river valley.
- **VAU-4, Existing Plaza Area** – The visual center of this VAU is the existing Blue Water Bridge Plaza. The elevated plaza dominates the views in this VAU. The plaza itself eliminates most of the views from the street level surrounding the plaza. However, there are excellent views of the surrounding neighborhoods and businesses from the plaza.

Highway median in VAU-1

I-94/I-69 in VAU-2

View of the Black River Bridge in VAU-3

View from Plaza in VAU-4

The visual quality rating of the visual environment in each VAU can be collectively defined using the attributes of vividness, intactness and unity—each of which is evaluated independently. The visual landscape is also divided into three parts for the evaluation:

- Foreground zone – 0.25 to 0.5 miles from the viewer,
- Middle ground zone – extends from the foreground zone to three to five miles from the viewer,

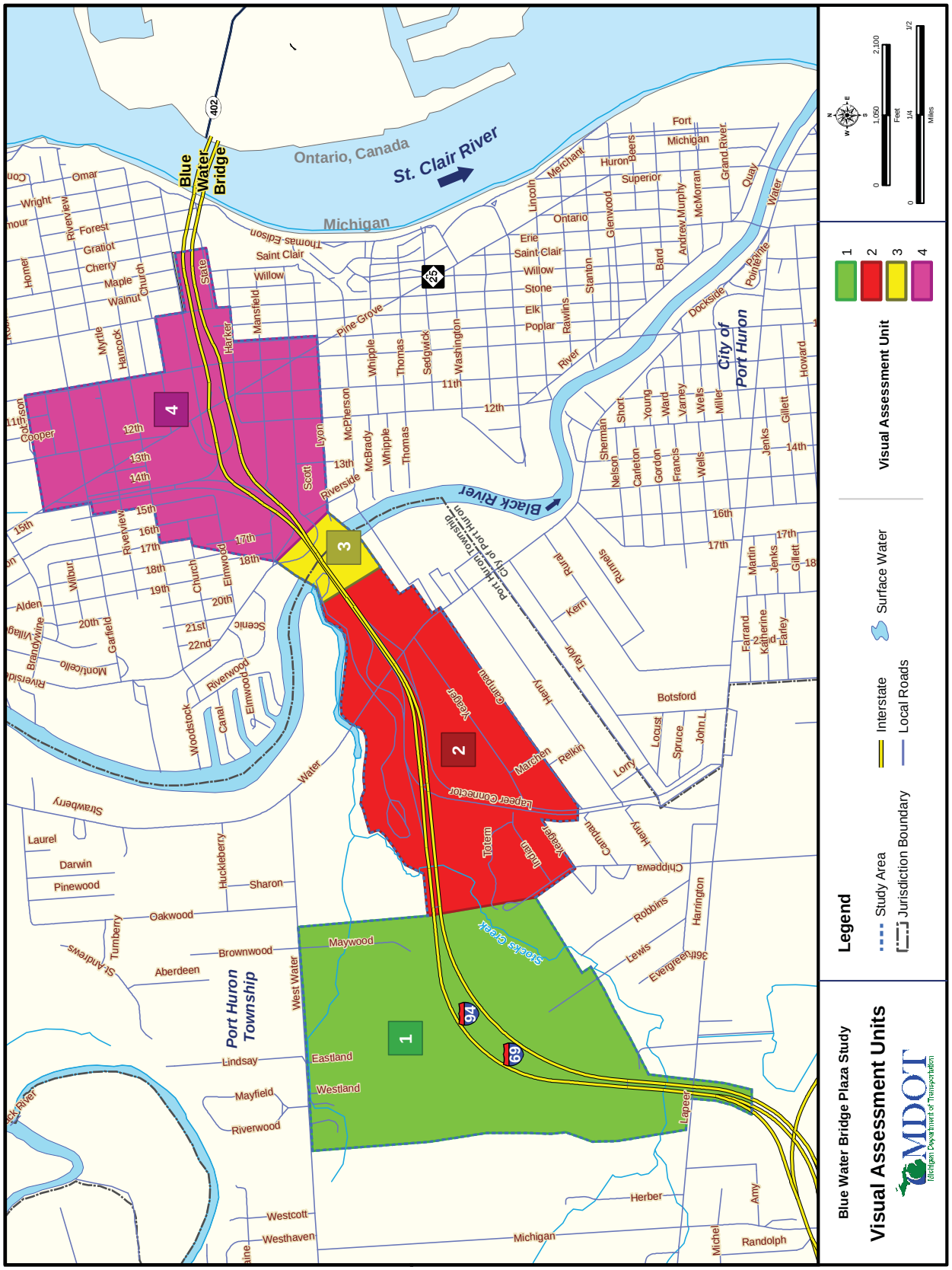

Blue Water Bridge Plaza Study
Visual Assessment Units
MDOT
Michigan Department of Transportation
Legend
Study Area
Jurisdiction Boundary
Interstate
Local Roads
Surface Water
Visual Assessment Unit
1
2
3
4
St. Clair River
Ontario, Canada
Michigan
Blue Water Bridge
Black River
City of Port Huron
Port Huron Township
Stocks Creek
Lapeer Connector
Port Huron Township
City of Port Huron

Figure 3.8.1

- Background zone – extends from the middle ground zone to as far as anyone can see.

Each VAU's visual quality is based on a rating from 1–7. On this scale, 1 = very low, 4 = average/moderate, and 7 = very high. **Tables 3.8.1 and 3.8.2** display the ratings assigned to the existing visual quality for each VAU for both viewers of and viewers from the highway.

Table 3.8.1 Visual Quality of Surrounding Environment (Viewers from the Highway)

Factor	Zone	VAU-1	VAU-2	VAU-3	VAU-4
Vividness	Foreground	2	2	5	5
	Midground	3	3	4	7
	Background	3	4	5	7
Intactness	Foreground	4	3	3	3
	Midground	5	2	3	4
	Background	5	3	2	4
Unity	Foreground	3	2	4	2
	Midground	4	2	3	3
	Background	4	4	3	3

Visual Quality Scale: 1= Very Low, 4= Average/Moderate, 7= Very High
Source: Wilbur Smith Associates

Table 3.8.2 Visual Quality of Plaza Study Corridor (Viewers of the Highway)

Factor	Zone	VAU-1	VAU-2	VAU-3	VAU-4
Vividness	Foreground	3	2	5	2
	Midground	3	2	4	2
	Background	3	2	4	3
Intactness	Foreground	4	1	2	1
	Midground	5	2	3	2
	Background	6	1	2	4
Unity	Foreground	4	2	4	1
	Midground	4	3	4	1
	Background	5	3	3	1

Visual Quality Scale: 1= Very Low, 4= Average/Moderate, 7= Very High
Source: Wilbur Smith Associates

A final visual quality rating for each VAU was determined by taking the sum of all of the ratings (foreground, midground, background) and averaging them. **Table 3.8.3** shows the final

Vividness: The relative strength of the seen image, the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive pattern.

Intactness: The integrity of visual order in the natural and human-built landscape, and the extent to which the landscape is free from visual encroachment.

Unity: The overall visual harmony of the composition and degree to which various elements combine in a coherent way.

ratings. These ratings are meant to provide a relative overall value of the visual quality of the existing landscape. All of the VAU units had an overall final rating of two to four. This indicates that the overall visual quality of the Study Area is low to average when compared to the visual resources that might be found elsewhere such as on a nature preserve or State or National Park. The highest overall visual ratings are for the area surrounding the potential off-site plaza area and at the Black River crossing.

Table 3.8.3 Visual Quality Rating for each VAU

Visual Assessment Units	Visual Quality Rating
VAU-1 – Port Huron Township	4
VAU-2 – Water Street/Lapeer Connector Area	2
VAU-3 – Black River Area	4
VAU-4 – Existing Plaza Area	3
A final visual quality ranking for each VAU was determined by averaging the sum of all three rankings.	

3.8.2 What are the Visual and Aesthetic Effects of a New Plaza on the Surrounding Area?

Assumptions and Methodologies: As noted previously in more detail, an initial assessment of existing visual quality was made by breaking the Study Area into four VAUs, and assigning rankings for the vividness, intactness, and unity of foreground, midground and background views. These rankings were made both for views from the road and plaza, and views of the road and plaza.

The exact appearance of each of the three Build Alternatives is only conceptual at this time. Since the ultimate appearance of the facility will have a dramatic effect on the visual quality of the area, the CSS workshops planned for the FEIS development process will involve public input to ensure that the visual elements of the new plaza and roadways will be as compatible as possible with the surroundings.

The assessment that follows looks primarily at the impact from a conceptual perspective. The specific effects of the project on visual resources will be better defined during the FEIS process.

No-Build Alternative: Under the No-Build Alternative, the existing plaza would remain as is and the visual landscape would not be changed from its current situation.

City East Alternative: This alternative would expand the existing plaza significantly and subsequently change the view surrounding the existing plaza location. The plaza would still be a dominant visual element for the surrounding residences, but in a somewhat different manner. Although it would no longer be entirely elevated, portions of the plaza would continue to remain slightly elevated and the mostly at-grade plaza would have a perimeter security fence up to eight feet tall encompassing the new facility. This fence would be approximately one mile in total length and would block some views of the plaza from the adjacent residences and businesses. The buildings located on the plaza would be similar in height to the current buildings on the plaza. However, their ground elevation would be at grade instead of 24 feet in the air, thus reducing some of the views from the surrounding neighborhoods and businesses.

Another visual change is that traffic would no longer travel under the plaza on Pine Grove Avenue. Pine Grove Avenue would be relocated to the east and traffic would go around the plaza. Thus the motoring public would no longer have the tunnel effect of the plaza on Pine Grove Avenue.

Traffic would no longer travel under the plaza for the City East Alternative

For drivers coming into or leaving the country, the view from the highway and plaza facility would be less striking visually if the plaza were reconstructed at street level. The Blue Water Bridge and the surrounding area would be less visible to drivers from the plaza. The view drivers would see of the plaza would not change much as the driver would still be viewing the elements of a border crossing, although a newer one.

Overall, the change in view for the City East Alternative would be most evident for those residents or businesses that are adjacent to the new plaza (VAU-4) as the new plaza would

have a security perimeter that would obstruct some of the view of the new plaza and would likely be an improvement from the current view of the elevated plaza.

Examples of barrier walls

City West (Preferred) Alternative: Similar to the City East Alternative, the City West Alternative would expand the existing plaza significantly and subsequently change the view surrounding the existing plaza location. As described earlier the City East Alternative would relocate Pine Grove Avenue to the east and traffic would go around the plaza. Whereas, Preferred Alternative will relocate Pine Grove Avenue to the west. For both alternatives, the motoring public would no longer have the tunnel effect of the plaza over Pine Grove Avenue.

Overall, the change in view for the Preferred Alternative would be most evident for those residents or businesses that are adjacent to the new plaza (VAU-4) as security perimeter of the new plaza would obstruct some of the view of the plaza and would likely be an improvement from the current view of the elevated plaza.

Township Alternative: This alternative would impose visual impacts on the entire Study Area through a new plaza location and the potential 20-foot high security barriers that would secure the 1.5 mile interstate corridor between the Blue Water Bridge structures and the new plaza. For travelers making an international border crossing, this section will provide them with a "tunnel vision" restricted view with 20-foot high vertical barriers to each side of the roadway. Depending upon the movement of the sun across the sky at different times of the day and the year, the secure corridor would likely be in shadow a good portion of the day. It is likely that this portion of roadway would be heavily lit at night, not only for security reasons, but also because much of the ambient nighttime light would also be shaded in a similar fashion.

The Township Alternative would impact VAU-1 the most. The new plaza would significantly alter the existing landscape in the township area and change the associated views. The new plaza would be located in an area that is zoned residential and currently consists of old field and open space. The view from the interstate also includes residences and a large church. The addition of the plaza, security fencing and associated

lighting would change the visual quality of VAU-1. This would limit the views of those who currently look out over this land. The interstate footprint would be expanded elsewhere in VAU-1, eliminating some of the wooded areas.

The new relocated plaza in the Township Alternative would introduce a large border crossing facility to an area currently occupied by open space. Nearby residents and church patrons will experience a change in the visual appearance of the site, from open fields to the border crossing facility. While most of the new plaza facility will be at-grade, the facility will necessitate new elevated ramps on fill or structure to accommodate movements into and out of the plaza and a perimeter security wall or fence that will be up to eight-feet high. These ramps will be a prominent addition to the landscape as well. Residents located north of the existing freeway currently have a view of the I-94/I-69 freeway in the distance. The new view will be of a perimeter security wall or fence and the plaza buildings. Much of the plaza should be shielded by the perimeter security feature.

The addition of the security walls for the I-94/I-69 corridor would probably have the least amount of impact for viewers from I-94/I-69 in VAU-2 because the visual quality of the area is already quite low. Viewers of the interstate would see a reduction in visual quality. The public campground and park that sit north of the corridor near Water Street would have views of the security barriers for the corridor where vegetation does not currently block the view of the freeway and traffic. The new view would include the 20-foot high security barriers, although these barriers would hide much of the traffic.

The view shed through the Black River area (VAU-3) would also be changed as a result of Township Alternative. The security barriers would likely eliminate any views of the Black River for those motorists traveling along I-94/I-69. Viewers of the interstate would also have their views diminished by the presence of the security barriers. The nearby marinas and parks would be affected the most from this change in view. The barriers would reduce the vividness of the view and would also lower the intactness and unity of the view.

The view of the Black River Bridge would change for The Township Alternative

The existing viewsheds and visual quality rating in VAU-4 would remain relatively unchanged. The existing plaza area would continue to remain elevated and contain a duty free shop. Some residents in the western end of this VAU would have a change in their view. With the new security barriers in place and a new ramp to Pine Grove Avenue, these residents would no longer have the view of the interstate that they once possessed.

3.8.3 What are Potential Light Pollution Effects?

What is a Light Pollution?

The International Dark-Sky Association describes light pollution as, "Any adverse effect of man-made light including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste."

The effects of artificial lighting provided for nighttime activities at the plaza facility and project roadways are a notable concern raised by stakeholders on this project. The provision of artificial lighting needs to balance the security needed for visual recognition of persons, goods and vehicles in the plaza with the environmental and quality-of-life impacts that come from the lighting at night.

Artificial lighting can have a number of effects on the surrounding area. While fixtures are generally designed to focus and direct light downward to cover only the areas that need illumination, light often gets directed laterally or upwards (either intentionally or unintentionally), contributing to "light pollution" that is often observed in densely settled areas. The effects of light pollution are already present at the existing plaza, and increasing the footprint of the plaza and associated roadways would increase the areas affected by light pollution in the Study Area unless mitigation measures are implemented. Light pollution may:

- Affect the natural responses of plants and animals to light. Light pollution can disrupt feeding, migration, or defense 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

To roughly estimate the likely provision of light in the Study Area, two sources were consulted; the "United States Land

Port of Entry Design Guide, April 22, 2005" ((from General Services Administration (GSA) and other federal agencies)) and GSA document P100, "Facilities Standards for the Public Buildings Service". Design of lighting at the plaza and associated roadways will have to meet numerous requirements. At the federal level alone, the port of entry design guide 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. To minimize glare for inspectors, lighting must have low cut-off angles. As light level requirements vary from location to location in the facility, the transition should be gradual and not abrupt.
- Spot illumination of license plates is needed for the visual or surveillance camera documentation. Lighting is also needed to improve recognition of items or people within vehicles. Lighting needs to be "true color" for vehicle and passenger identification purposes.
- In many cases, light must come from two or more directions to avoid shadows. Day lighting is also to be used as needed.

The GSA guide notes:

- Placement of lights should consider glare and contrast to allow for better night vision. Illumination must not allow light to "trespass" off of the 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.

Port Huron Township has its own light guidelines as part of its zoning ordinance:

- Any operation or activity which produces glare shall be conducted so that direct and indirect illumination from the source of light does not exceed one-half (1/2) of one (1) footcandle when measured at any point along the property line of the site on which the operation is located.

Given these considerations, the following effects of light pollution are expected:

No-Build Alternative: This alternative would be expected to keep the facility in its existing configuration and lighting design. While the No-Build Alternative already produces substantial illumination in the Study Area, it is presumed that the lighting would remain as it is today, with no new areas of effect or changes in the brightness or desired/undesired light levels that currently impact the Study Area. The portions of the Study Area primarily impacted by the No-Build Alternative would be VAU-4.

City East Alternative: This alternative will keep the reconstructed plaza in the same general location as it exists today. There would be mixed effects of this alternative on undesired light pollution. By lowering the height of portions of the plaza, there might be reduced levels of light overspilling the margins of the facility in selected locations.

Artificial Lighting Example

The City East Alternative will have a substantial impact on adjoining properties throughout the Study Area, as discussed in greater detail in **Section 3.6 Relocations**. In VAU-1, relocations of residential properties would remove some existing light sources/affected properties while the new roadways and other plaza improvements would introduce some new sources of light in the same general area. Similarly, relocations of businesses such as those found on Pine Grove Avenue and Hancock Street would reduce the levels of light pollution in that area if those areas are converted to green space. New plaza facilities and roadways would re-introduce light in new directions and new locations.

One benefit from the relocations associated with this Alternative is that there would generally be a greater buffer distance between the most intensely-lighted parts of the plaza and nearby residential properties, particularly the properties south and east of the existing plaza/interstate. Widening of the interstate may bring the lighting of the roadways closer to some properties in VAU-1, VAU-2, and VAU-3.

City West (Preferred) Alternative: Similar to the City East Alternative, there would be mixed effects of the City West Alternative on undesired light pollution.

The Preferred Alternative will have a substantial impact on adjoining properties throughout the Study Area, as discussed in greater detail in **Section 3.6 Relocations**. Relocations of businesses such as those found on Pine Grove Avenue, Hancock Street would reduce the levels of light pollution in that area if those areas are converted to green space.

Similar to the City East Alternative, one benefit from the relocations associated with Preferred Alternative is that there would be a greater buffer distance between the most intensely-lighted parts of the plaza and nearby residential properties.

Township Alternative: In general, the Township Alternative will introduce more new light pollution than the other Build Alternatives, and the pollution would be more widespread. In VAU-4, the existing plaza site would continue to be elevated and used for maintenance facilities and the duty-free shop, though these facilities may have lower requirements for illumination than the security plaza-oriented facilities which would be moved to the new plaza site.

For VAU-2 and VAU-3 the widening of the interstate would bring light sources closer to adjoining areas. In addition, the level of illumination on the roadways themselves would likely increase due to security requirements.

The most prominent light pollution impacts from the Township Alternative would be the lighting for the new plaza in VAU-1. This area is currently much less densely developed than the other VAUs, and therefore, there are fewer existing sources of ambient light. The removal of the open space in the new site location will introduce a new source of light pollution to properties both north and south of the existing interstate highway.

3.9 Air Quality

The U.S. Environmental Protection Agency (EPA) has jurisdiction over pollutants that are regulated under the Federal Clean Air Act (CAA) of 1970 and its amendments. Two sets of pollutants are of concern with regards to this project: Criteria pollutants regulated under the National Ambient Air Quality Standards (NAAQS) and Mobile Source Air Toxics (MSAT).

National Ambient Air Quality Standards (NAAQS)

The NAAQS were formulated to protect public health, safety, and welfare from known or anticipated air pollutants. The most recent amendments to the Clean Air Act contain criteria for sulfur dioxide (SO_2), particulate matter (PM_{10}, ten-micron and smaller and $PM_{2.5}$ 2.5 micron, and smaller) carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb). The specific NAAQS are presented in **Table 3.9.1**.

Locations that do not meet these standards are designated by the EPA as "nonattainment" areas for each pollutant that does not meet the standards. Amendments to the Clean Air Act have established time schedules for the states to reduce pollutant levels to comply with the NAAQS in nonattainment areas.

Sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) are important mobile source pollutants; sulfur dioxide (SO_2) particularly in regard to diesel engines. For transportation projects, particular attention is focused on ground-level ozone (O_3), carbon monoxide (CO) and particulate matter (PM).

Ozone (O_3): In the upper atmosphere, O_3 protects us from ultraviolet radiation (the "ozone layer"). However, near the ground, ozone is a pollutant of particular concern to people with lung and respiratory problems such as asthma. O_3 is not created directly by cars and trucks, but rather is created by chemical reactions in the atmosphere involving sunlight and precursors such as volatile organic compounds (VOC) and oxides of nitrogen (NO_x). These precursors are emitted by motor vehicles and industrial sources. Ozone precursors can be transported by wind for long distances from where they are

What Measuring Units are Used for Air Quality Measurements?

When chemical compounds are in tiny concentrations, they are often represented with one of the following:

Parts Per Million (ppm): This is a ratio of the number of molecules of a pollutant compared to a million molecules of air. So 3 ppm concentration of CO means 3 CO molecules per million air molecules.

Parts Per Billion (ppb): This is a ratio of the number of molecules of a pollutant compared to a billion molecules of air.

Micrograms (µg): A microgram is a millionth of a gram. $\mu g/m^3$ is shorthand for micrograms per cubic meter. (Similarly, mg/m^3 is milligrams per cubic meter; one thousandth of a gram).

Microns: are millionths of a meter. The classes of particulate pollution of concern are particulate matter smaller than ten microns in size (PM_{10}) and particulates smaller than 2.5 microns in size ($PM_{2.5}$).

initially emitted and for this reason, ozone is more of a regional concern than a localized issue.

EPA's eight-hour ozone standard of 0.08 parts per million (ppm) is designed to protect against longer ozone exposure periods. The one-hour primary standard was revoked by the EPA June 15, 2005.

Table 3.9.1 National Ambient Air Quality Standards (NAAQS) as of June, 2007

Pollutant	Averaging Time	Primary Standard[1]	Secondary Standard[2]
Sulfur Dioxides (SO_2)	Annual (Arithmetic Mean)	0.03 ppm (80 μg/m^3)	
	24 – Hour	0.14 ppm (365 μg/m^3)*	
	3 – Hour		0.5 ppm (1300 μg/m^3)*
Particulate Matter ($PM_{2.5}$)	Annual (Arithmetic Mean)	15 μg/m^3	Same as Primary
	24 – Hour	35 μg/m^3	No Secondary Standard
Particulate Matter (PM_{10})	24 – Hour	150 μg/m^3*	No Secondary Standard
Carbon Monoxide (CO)	8 – Hour	9 ppm (10 mg/m^3)*	No Secondary Standard
	1 – Hour	35 ppm (40 mg/m^3)*	No Secondary Standard
Ozone (O_3)	8 – Hour[3]	0.08 ppm (157 μg/m^3)	Same as Primary
Nitrogen Dioxide (NO_2)	Annual (Arithmetic Mean)	0.053 ppm (100μg/m^3)	Same as Primary
Lead (Pb)	Calendar Quarter (Arithmetic Mean)	1.5 μg/m^3	Same as Primary

1) "Primary air standard" means the level of air quality, which provides protection for public health with an adequate margin of safety.
2) "Secondary air standard" means the level of air quality, which may be necessary to protect welfare from unknown or anticipated adverse effects.
3) The 8-hour primary and secondary standards are met when the 3-year average of the 4th highest average concentration is less than or equal to 0.08 ppm.
* Concentration not to be exceeded more than once per year
Source: US EPA web site on NAAQS at http://www.epa.gov/air/criteria.html, accessed 6/7/07.

Carbon monoxide (CO): CO is a colorless and odorless gas which is the product of incomplete combustion, and is the major pollutant from gasoline-fueled motor vehicles. CO is harmful because it reduces oxygen delivery to the body's organs and tissues. It is most harmful to those who suffer from heart and respiratory disease. CO emissions are greatest from vehicles operating at low speeds and prior to complete engine

warm-up (within approximately eight minutes of starting), particularly in colder winter months. Congested urban intersections tend to be the principal problem areas for CO.

Particulate Matter (PM): Particulate matter (PM) is the term for solid or liquid particles suspended in the air. Some particles are large or dark enough to be seen as soot or smoke, but fine particulate matter is generally not visible to the naked eye. Two types of PM are of concern. PM_{10} (ten microns or smaller) particulates are coarse particles, such as windblown dust from fields and unpaved roads. $PM_{2.5}$ (2.5 microns or smaller) covers finer particulates smaller than 2.5 microns in size. $PM_{2.5}$ particulates are generally emitted from activities such as industrial and residential combustion and from vehicle exhaust. $PM_{2.5}$ is a health concern because fine particles can reach the deepest regions of the lungs. Health effects include asthma, difficult or painful breathing, and chronic bronchitis, especially in children and the elderly. Fine particulate matter associated with diesel exhaust is also thought to cause lung cancer.

In recent years, the EPA has modified the NAAQS for $PM_{2.5}$ Currently, the standard is 15 micrograms per cubic meter ($\mu g/m^3$) (annual arithmetic mean) and the 24-hour standard is 35 $\mu g/m^3$. EPA revoked the annual standard for PM_{10} in December 2006; there is still a 24-hour standard of 150 $\mu g/m^3$.

Since an important component of the Blue Water Bridge Plaza project will be serving heavy-duty vehicles, diesel exhaust is a particular concern. Diesel exhaust is a complex mixture of inorganic and organic (carbon-based) compounds that occur as a blend of gases and particles. The particle phase of diesel exhaust consists of elemental carbon, adsorbed organic compounds and small amounts of sulfate, nitrate, metals and other trace elements. Diesel particulate matter has been estimated to comprise about six percent of the total $PM_{2.5}$ inventory nationwide but more in urban areas, excluding natural and miscellaneous sources (EPA, 2002).

Mobile Source Air Toxics (MSAT)

In addition to the pollutants regulated under the NAAQS, EPA also regulates air toxics, also called "hazardous air

What are Other Vehicular Air Pollutants Covered by the NAAQS not Discussed at Length?

Lead: Lead (Pb), a toxin, has steadily declined since the 1970s with introduction of unleaded fuels.

VOCs: Volatile Organic Compounds (VOCs) come from vehicles and industrial sources. The term VOCs encompasses thousands of compounds, including petroleum constituents as well as industrial thinners, solvents, etc. VOCs are of interest primarily from their role in ozone formation, a regional pollutant and as a precursor of $PM_{2.5}$.

NO_x: The term "Oxides of Nitrogen" (NO_x) covers a number of chemical compounds containing both nitrogen and oxygen. Like VOCs, NO_x also are ozone and $PM_{2.5}$ precursors and generated by motor vehicles. NO_2 (nitrogen dioxide) is a specific type of NO_x (see **Table 3.9.1**). NO (nitric oxide) is also an irritant and ozone precursor, which reacts with oxygen to form NO_2.

(SO_2): The main product from the combustion of sulfur compounds and is often described as the "smell of burning sulfur". SO_2 is produced by volcanoes and in various industrial processes. Since coal and petroleum contain various amounts of sulfur compounds, their combustion generates sulfur dioxide.

pollutants." Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries). EPA has identified 188 air toxics of concern, of which 21 come from mobile sources. Six of these 21 have been identified as "priority MSATs." 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.

Which Air Toxics are of Most Concern?

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

Benzene is a known human carcinogen.

Acrolein's carcinogenicity has not been determined based on inadequate data on oral inhalation exposure.

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

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

Acetaldehyde is a probable human carcinogen based on tumors in lab 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.

FHWA's I*nterim Guidance on Air Toxic Analysis in NEPA Documents* (February 3, 2006) was applied to this project. Early in 2007, EPA signed a final rule, "Control of Hazardous Air Pollutants from Mobile Sources", which sets standards to control MSATs. Under this rule, EPA is setting standards on fuel composition and vehicle exhaust emissions to be phased in through 2015.

MSATs are projected to decline dramatically over the next two decades as regulations for fuels and motor vehicle technology create reductions in the emissions of these pollutants.

3.9.1 What is the Current Status of Air Quality?

The Clean Air Act requires each state to have a State Implementation Plan (SIP) to demonstrate how it will attain and/or maintain federal air quality standards.

The Blue Water Bridge Plaza project is located within the Metropolitan Detroit-Port Huron Intrastate Air Quality Control Region (AQCR #123). St. Clair County is currently in attainment status for five of the seven criteria NAAQS pollutants, and has been classified as being in non-attainment for $PM_{2.5}$ and the eight-hour ozone standard.

The Michigan Department of Environmental Quality (MDEQ) reported in the most recent annual report, "Michigan's 2005 Annual Air Quality Report", published in August 2006, that the entire state has continued to stay in attainment for CO, lead, NO_2 and SO_2 with "levels well below the NAAQS." The

main contributing factors to Michigan's O_3 and $PM_{2.5}$ non-attainment areas are "on-road and non-road emission sources (O_3: 33 percent and 30 percent, respectively; $PM_{2.5}$: 18 percent and 32 percent, respectively). In addition, area sources also contribute 37 percent of $PM_{2.5}$ emissions. Therefore, with the new federal Clean Air Rules, along with Michigan's continued reduction efforts, both of these criteria pollutants levels should continue to decline."

The Annual Air Quality Report also presents the following information:

- CO levels are estimated to be 20 percent less than the emission levels in 1990, which is slightly better than national trends. Motor vehicles on Michigan roads contribute approximately 69 percent of CO emissions.

- Lead emissions have decreased significantly over the last 25 years with the elimination of leaded gasoline. With no major point sources in Michigan, ambient lead concentrations are less than one tenth of the NAAQS.

- NO_2 levels in Michigan have always been less than half the NO_2 NAAQS. Motor vehicles on Michigan roads contribute approximately 46 percent of NO_2 emissions.

- O_3 levels across the country have improved over the last 20 years. Year by year variations in O_3 are influenced by weather, population growth and emissions of VOCs and NOx, the precursors to O_3 production. VOC and NOx emissions have decreased 25 percent and 12 percent nationwide over the past ten years. Michigan's O_3 levels have followed national trends. Using the three year average period of 2001-2003, only four locations in Michigan met the eight-hour NAAQS. The three-year period from 2003-2005 resulted in 24 of the 27 monitoring sites having O_3 levels meeting or below the eight-hour O_3 NAAQS. Motor vehicles on Michigan roads contribute approximately 33 percent of VOC emissions.

- PM_{10} emissions on a nationwide base are primarily produced by area sources, agricultural and forestry activities, paved and unpaved roads. Motor vehicles on

What is Conformity Analysis?

Transportation Conformity Analysis consists of two parts for conformity to NAAQS: Mesoscale (regional) and Microscale (localized). The Blue Water Bridge Plaza improvements have been included as part of the short-term and long-term plans for regional transportation improvements, thus Mesoscale. If MDOT wishes to receive partial federal funding for transportation projects, the plans must consider the air quality of the region and legally mandated requirements to work towards "conformity" with the NAAQS. Therefore, the effects of this project on regional air quality have already been accounted for, along with all the other mobile and non-mobile sources of air pollution in the region.

Michigan roads contribute approximately 14 percent of PM_{10} emissions.

- $PM_{2.5}$ source emissions decreased 17 percent between 1993 and 2002 across the country. In Michigan the primary source of $PM_{2.5}$ emissions are area sources, followed closely by the contribution of internal combustion engines, non-road and highway. The July 7, 2005 signing of the Clean Air Non-road Diesel Rule has the potential to reduce exhaust emissions of $PM_{2.5}$ from non-road diesel engines by more than 90 percent. Motor vehicles on Michigan roads contribute approximately 18 percent of $PM_{2.5}$ emissions.

- SO_2 levels in Michigan have been well below the NAAQS since achieving attainment status in 1982. Motor vehicles on Michigan roads contribute approximately three percent of SO_2 emissions.

- Air toxics have primarily been an issue in larger cities such as Detroit, where there are numerous sources; smaller cities and rural areas are not as much of a concern. MDEQ has not maintained a non-industrial monitoring station in St. Clair County since 1991.

3.9.2 What Impacts from Carbon Monoxide are Anticipated with the Project's Alternatives?

What is Microscale Analysis?

Microscale Analysis is part of Transportation Conformity Analysis. Also known as "hot-spot" analysis, it is the localized conformity to NAAQS.

Microscale carbon monoxide (CO) analyses for different years were performed to determine if the project would exceed the NAAQS.

The M-25/Hancock Street intersection was selected as the worst-case location for the microscale CO modeling because of the potential for backups at the signalized intersection for the three build alternatives (City East, City West, and Township Alternatives). Fifteen air quality receptors, A1 through A15, were placed along all four approach queues of the M-25/Hancock Street intersection and at two nearby residences and one commercial building for the City East and City West Alternatives. Six more receptors were added to account for the one-way pair proposed with the Township Alternative. Receptors were placed parallel to the roadways. The receptors along Hancock Street were located on existing and proposed

sidewalks. The receptors along M-25 were located at the right-of-way. The first receptor in each quadrant was located ten-feet from the intersection of the crosswalk with the curb or ten-feet from the extended right-of-way to the curb. The remaining two receptors in each quadrant were located at 82-foot intervals from the first receptor or if a cross street intervened, equidistant between the cross streets. The location of the air quality receptors were based upon the recommendations presented in EPA's CO Modeling Guidelines. The location of the air quality receptors are presented in **Figures 3.9.1, through 3.9.4.**

MOBILE6.2 and approved CAL3QHC models were used to analyze vehicular emissions and the hourly dispersion of CO at the receptors.

The results of the CO microscale air quality modeling are presented in **Table 3.9.2.** The maximum one-hour CO concentrations were 6.2 ppm for existing conditions (2005). The maximum No-Build concentrations decreased to 4.9 ppm in 2013 and 4.7 ppm in 2030. The City East Alternative would create 1-hour CO concentrations ranging from 3.8 to 4.7 ppm in 2013 and 3.9 to 5.1 ppm in 2030. CO concentrations for the City West Alternative would range from 4.0 ppm to 5.1 ppm in 2013 and from 4.0 to 4.9 ppm in 2030. The Township Alternative would create one-hour concentrations ranging from 3.9 to 5.1 ppm in 2013 and from 4.0 to 5.2 ppm in 2030. None of these concentrations exceed either the one-hour (35 ppm) or eight-hour (9 ppm) NAAQS. All concentrations include a background concentration of 3.4 ppm. Since the one-hour analysis predicted CO concentrations which are less than 9.0 ppm, a separate eight-hour analysis was not necessary.

As the calculated concentrations are within the NAAQS, no violations of the standards are anticipated.

How Do the Air Quality Models Work?

Calculations of existing and future concentrations of CO were modeled using two computer programs.

MOBILE6.2: calculates the rates of CO emissions (in grams per mile and grams per hour) of different vehicles in the present and future. These emission rates are influenced by the year (since emission-control technology improves each year), local fuel types (which vary by region), inspection / maintenance programs, composition of the local vehicle fleet by age, and other influences that vary by region.

CAL3QHC: calculates the concentration of CO (in ppm) at a given location (receptor). Starting with the emission rates from MOBILE 6.2, the calculations take into account the dispersion of emissions between vehicle tail-pipes and receptors. This dispersion is influenced by the location of roadways relative to the receptors, traffic volumes, how much idling occurs at traffic signals, the direction of winds and other meteorological factors.

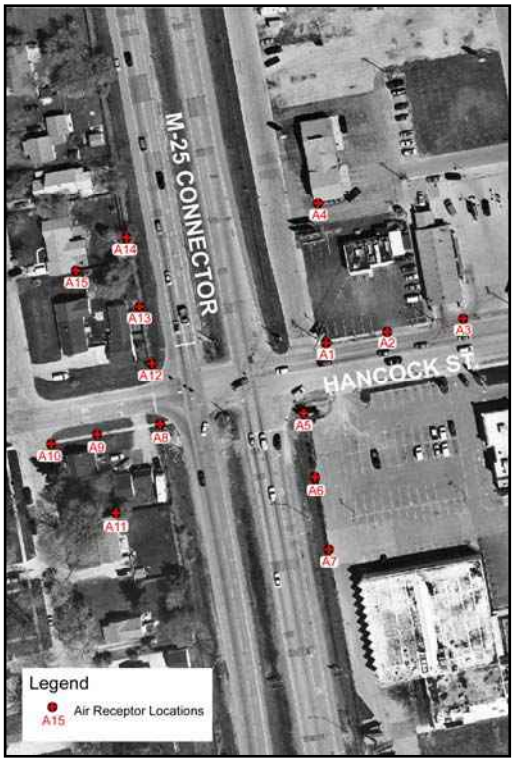


Figure 3.9.1 Air Quality Receptors for Carbon Monoxide Modeling for the No-Build Alternative

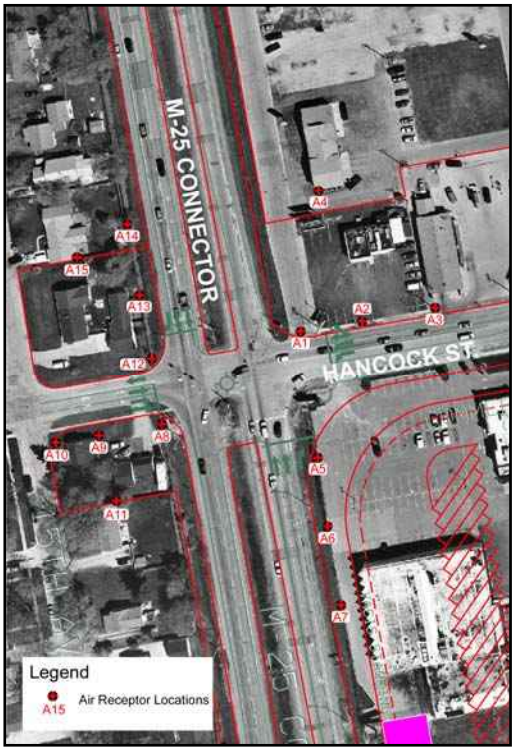


Figure 3.9.2 Air Quality Receptors for Carbon Monoxide Modeling for City East Alternative

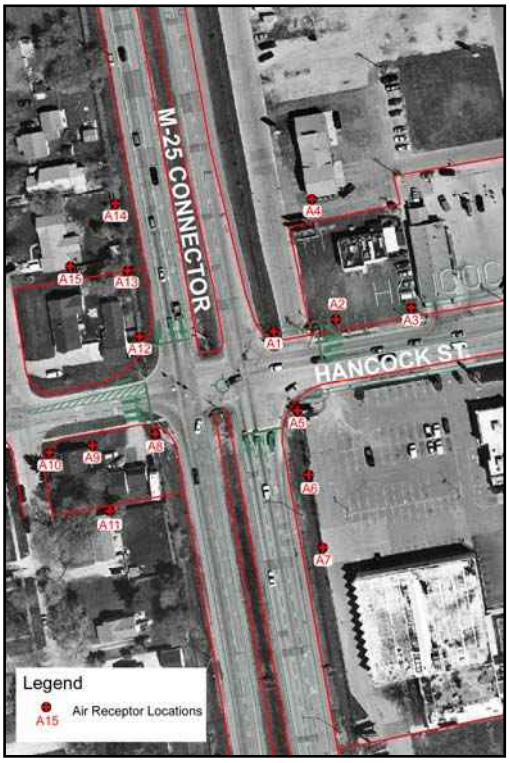


Figure 3.9.3 Air Quality Receptors for Carbon Monoxide Modeling for the Township Alternative

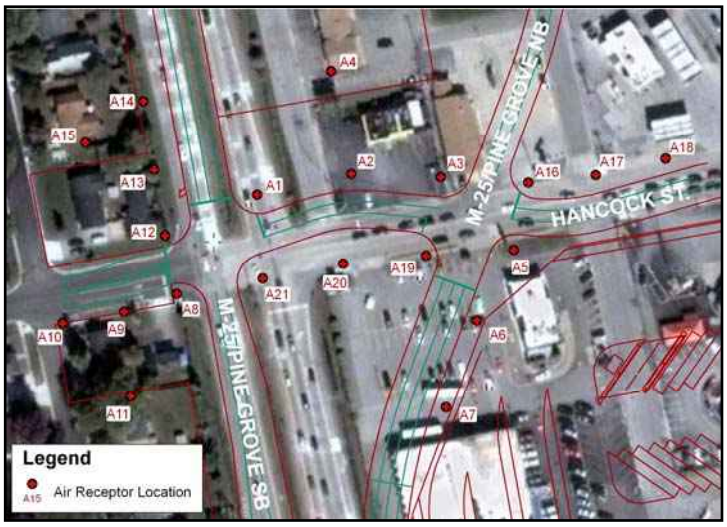


Figure 3.9.4 Air Quality Receptors for Carbon Monoxide Modeling for City West Alternative

Table 3.9.2 Maximum One-Hour CO Concentrations (ppm)*

Air Quality Receptor ID	Existing (2005)	2013				2030			
		City East	City West	Town-ship	No-Build	City East	City West	Town-ship	No-Build
A1	6.1	4.4	4.7	4.4	4.6	4.6	4.7	4.7	4.7
A2	6.1	4.7	5.0	4.3	4.8	5.0	4.8	4.1	4.7
A3	5.7	4.1	5.1	4.7	4.9	5.1	4.7	4.7	4.6
A4	4.8	3.8	4.0	3.9	3.9	3.9	4.0	4.0	4.0
A5	6.2	4.6	4.5	4.7	4.6	4.7	4.6	4.6	4.9
A6	5.8	4.5	4.5	5.0	4.5	4.4	4.5	4.8	4.7
A7	6.0	4.5	4.6	4.8	4.6	4.5	4.5	4.9	4.7
A8	5.6	4.6	4.9	4.4	4.7	4.7	4.9	4.8	4.6
A9	5.4	4.4	4.4	4.3	4.6	4.4	4.4	4.3	4.2
A10	4.9	4.1	4.4	4.1	4.4	4.4	4.3	4.1	4.0
A11	4.8	4.0	4.1	4.0	4.0	4.1	4.1	4.2	4.1
A12	5.7	4.4	5.0	4.6	4.6	4.5	4.7	5.0	4.6
A13	5.5	4.4	4.8	4.9	4.6	4.5	4.7	5.0	4.6
A14	5.9	4.3	4.7	4.8	4.5	4.5	4.7	5.0	4.6
A15	4.8	4.0	4.4	4.2	4.1	4.0	4.1	4.2	4.0
A16				5.1				4.6	
A17				4.9				4.4	
A18				4.6				4.1	
A19				5.1				5.2	
A20				4.5				4.5	
A21				4.5				4.9	

* The National Ambient Air Quality Standard for CO is 35 ppm for a one hour average.
Concentrations include an ambient background level of 3.7 ppm.

Shaded blocks indicate maximum concentration for each alternative and year of analysis.

3.9.3 What Impacts from Particulates are Anticipated with the Project's Alternatives?

The Blue Water Bridge is unique in that it has a customs plaza where trucks will idle as they queue for customs inspection

both primary and, potentially, secondary. Once a Recommended Alternative has been formally selected, plaza activity will be examined to determine whether a baseline of 100 tons a year is exceeded for $PM_{2.5}$.

Currently, there are no good models for the purposes of quantitatively predicting particulate concentrations from transportation projects. Therefore, EPA and FHWA issued joint guidance in March 2006 on how to perform qualitative hot-spot analyses in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas.

Prior to the preparation of the Final Environmental Impact Statement, this guidance will be applied to the Preferred Alternative to determine the likely qualitative effects of the project on $PM_{2.5}$ levels. This analysis will consider the following:

- existing air quality conditions
- sources of existing particulate matter in the area
- meteorological conditions
- existing and future traffic
- emissions from queuing at the inspection/toll booth areas
- projected trends in heavy diesel particulate emissions
- How the proposed project would change particulate emissions based on preliminary regional data

St. Clair County, Michigan is in attainment for PM_{10}. Therefore, a PM_{10} hotspot analysis is not required to demonstrate transportation conformity. The proposed action represents a series of projects spread over time – interchange ramps, plaza, and bridge; not all the booths will be developed initially. Therefore, the amount of exposed earth will be limited at any time during the construction process. MDOT's 2003 Standard Construction Specification Sections 107.15(A) and 107.19 will apply to control fugitive dust during construction and cleaning of haul roads.

3.9.4 What Impacts from Mobile Source Air Toxics (MSAT) are Anticipated with the Project's Alternatives?

MDOT and FHWA reviewed the proposed operational improvements of the plaza and determined that this project is considered to be a project with "low potential MSAT effects"

(Tier II analysis). This determination is based on the fact that both the U.S. inspection facility and the Canadian plaza improvements will reduce idling on the I-94/I-69 corridor and within the plaza, and most of the inspection areas are further from residences. Additionally, the overall change in elevation for the proposed primary inspection area is not significantly lower than the existing primary inspection area, traffic volumes associated with the No-Build and all three build alternatives are almost identical, and the maximum AADT on the I-94/I-69 corridor is well below 140,000 AADT. Finally, national MSAT emissions are projected to continue to decrease. Given all of these findings, a Tier III MSAT analysis was determined not to be warranted.

Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable quantitative estimates of MSAT emissions at the project level. EPA has not developed specific MSAT standard for use in NEPA analysis. Therefore, FHWA guidance calls for a qualitative assessment of future MSAT emissions for each alternative.

The following paragraphs provide a summary of the Tier II analysis completed for this project in accordance with FHWA's MSAT guidelines.

- **Similar Build Alternatives:** The amount of MSATs emitted would be proportional to the traffic projected for each alternative, assuming that other variables such as fleet mix are the same for each alternative. The traffic projected for the City East Alternative is identical to the No-Build Alternative. The traffic projected for the City West and Township Alternatives are slightly higher than the No-Build Alternative. These changes are due to revised traffic patterns, not as a result of increased capacity. The resulting MSAT emissions along the corridor are going to be very similar with only a slight increase expected along the section from the Black River Bridge to the new Township Alternative Plaza. The potential emissions increase with any of the proposed alternatives is offset somewhat by lower MSAT emission rates. The overall change in MSAT emissions with the

What are FHWA's MSAT Analysis Guidelines?

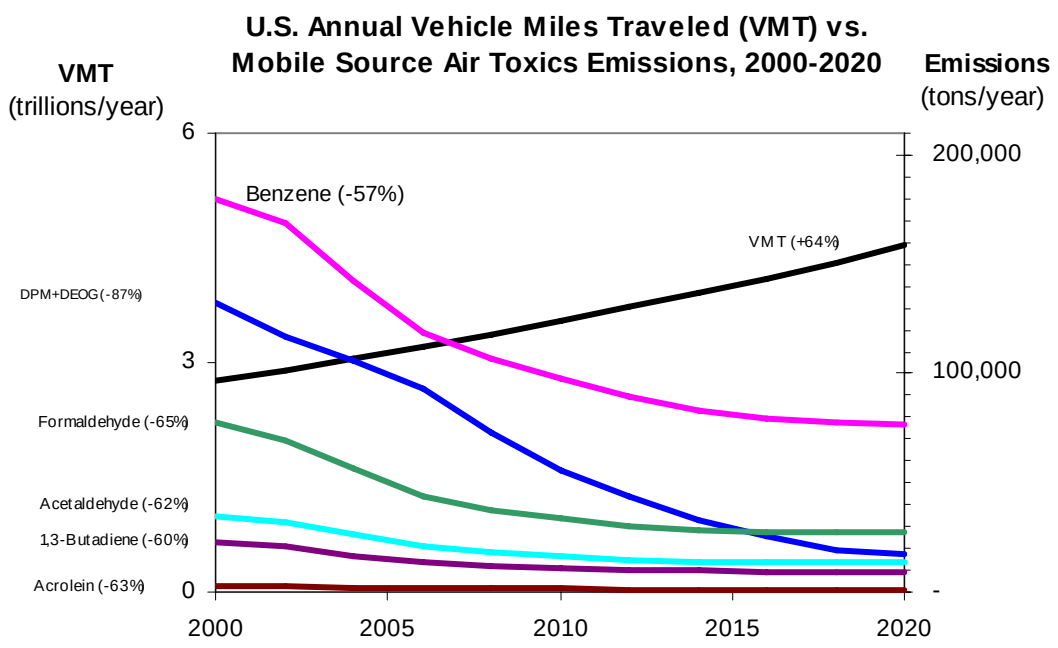
FHWA's Interim Guidance on Air Toxics Analysis for NEPA Documents, presents a tiered approach for analyzing Mobile Source Air Toxics (MSATs). Depending on project specifics, FHWA has identified three levels of analysis that can be completed for transportation projects. These analysis levels are:

- **Tier I:** No analysis is completed for projects with no potential for meaningful MSAT effects.
- **Tier II:** Qualitative analysis is completed for projects with low potential MSAT effects. These projects are typically those that serve to improve highway operations without adding substantial new capacity.
- **Tier III:** Quantitative analysis of emissions is completed to differentiate alternatives for projects with higher potential MSAT effects. These projects typically create new or add significant capacity to urban highways or interstates with traffic volumes are projected to be in the range of 140,000 to 150,000 vehicles a day or greater.

various alternatives cannot be reliably projected due to the inherent deficiencies of technical models.

Because the traffic projected for each alternative is nearly the same and the project will not create additional cross border traffic, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives.

- **National Emissions Trends:** Regardless of the alternative chosen, as illustrated in **Figure 3.9.5** emissions are projected to be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, traffic growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for traffic growth) that MSAT emissions in the Study Area are likely to be lower in the future in nearly all cases.



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM +DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

Figure 3.9.5 National MSAT Emissions Trends

- **Vicinity to Adjacent Residences:** The additional travel lanes contemplated as part of all the alternatives from the Lapeer Connector east to the area of the existing plaza will have the effect of moving some traffic closer to nearby homes, and businesses; the Township Alternative will move the relocated plaza closer to a church and pre-school.

  The proposed improvements also change the relative distance from the major operations within both the City East and City West plaza alternatives to the nearest residences. Presently the nearest residences north of the Primary Inspection area are within 150-350 feet. South of plaza the residences are 400 to 500 feet away from the bridge toll booths and the Secondary Inspection. In the future the nearest residence will be approximately 400 feet from the Primary Inspection area with the remainder approximately 1,200 feet away. The bridge toll booth will be approximately 700 feet from the nearest residence, which is south of Scott Avenue. The nearest residences to the Secondary Inspection area will be along Hancock Street north of the plaza. These properties would be approximately 400 feet away. The GRIT facility is being relocated from the southwest corner of the plaza to the west edge along the M-25 Connector and Pine Grove Avenue. This facility will be approximately 50 feet closer to the nearest residence. As the GRIT process improves this procedure may eventually take place at the Primary Inspection area.

  Under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under certain Build Alternatives than the No-Build Alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models.

- **Reduced Idling:** The proposed plaza improvements will reduce idling on the plaza in two primary areas on the plaza, the inspection booths used for primary inspection and in the vicinity of the Secondary Inspection. In the past, trucks were sent to the Secondary Inspection area for lack of proper paper work, or for additional inspection.

Recently procedures have changed and the paper work for a truck must be on hand before the truck arrives at the border. This procedure, which is already in place, reduces potential idling in the vicinity of the Secondary Inspection.

While trucks are in Secondary Inspection the inspectors require the drivers to turn off their vehicles. Trucks often idle when they are in a queue waiting to be processed through Gamma Ray Inspection Technology (GRIT) or Non-Intrusive Inspection (NII). The proposed improvements will provide three GRIT or NII lanes compared to today's two. Therefore, idling times would be expected to decrease by 33% compared to today's configuration. The final area where trucks idle is while they are in queue for Primary Inspection. The proposed plaza improvements will increase the number of truck Primary Inspection lanes from 10 to 20, with an option to expand to 30 in the future. This improvement should decrease the number of trucks idling in the queue by 50%.

- **Reduced Plaza Elevation:** The proposed plaza would also be lower than the existing plaza. The MDOT bridge toll booth would be at grade with outbound traffic climbing to the bridge. The Primary Inspection area however would be approximately eight feet lower than existing which would still be 16 feet above the nearest residences.

In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternatives could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

3.9.5 Is Any Mitigation of Air Quality Impacts Needed?

Based on the air quality analyses completed for the proposed improvements, this project will not contribute to any violation

of the NAAQS and is not expected to have a substantial effect on MSATs in the region. MDOT's 2003 Standard Construction Specification Sections 107.15(A) and 107.19 will apply to control fugitive dust during construction and cleaning of haul roads. No mitigation is proposed for reducing MSAT emissions; however MDOT and CBP will continue to utilize best management practices such as anti-idling procedures on the plaza particularly at toll booths, inspections stations and when backups occur due to incidents and heavy traffic. Additionally, MDOT will utilize Intelligent Traffic Systems, such as changeable message signs along the I-94/I-69 corridor to most effectively manage traffic operations and reduce long durations of idling where feasible.

3.10 Noise Impacts

3.10.1 Introduction to the Principles of Noise

Noise is defined as excessive or unwanted sound. Sound intensity is measured in decibels (dB), based on a logarithmic scale. The human ear does not respond identically to sound levels of different frequencies, being more sensitive to middle and high frequencies than low frequencies. When sound is described in terms of the frequencies humans are capable of hearing, the term 'dBA' is used. This refers to an 'A-weighted' scale, which does not consider those frequencies outside of the human hearing range. **Figure 3.10.1** shows examples of typical noise levels associated with transportation and other common activities in dBA.

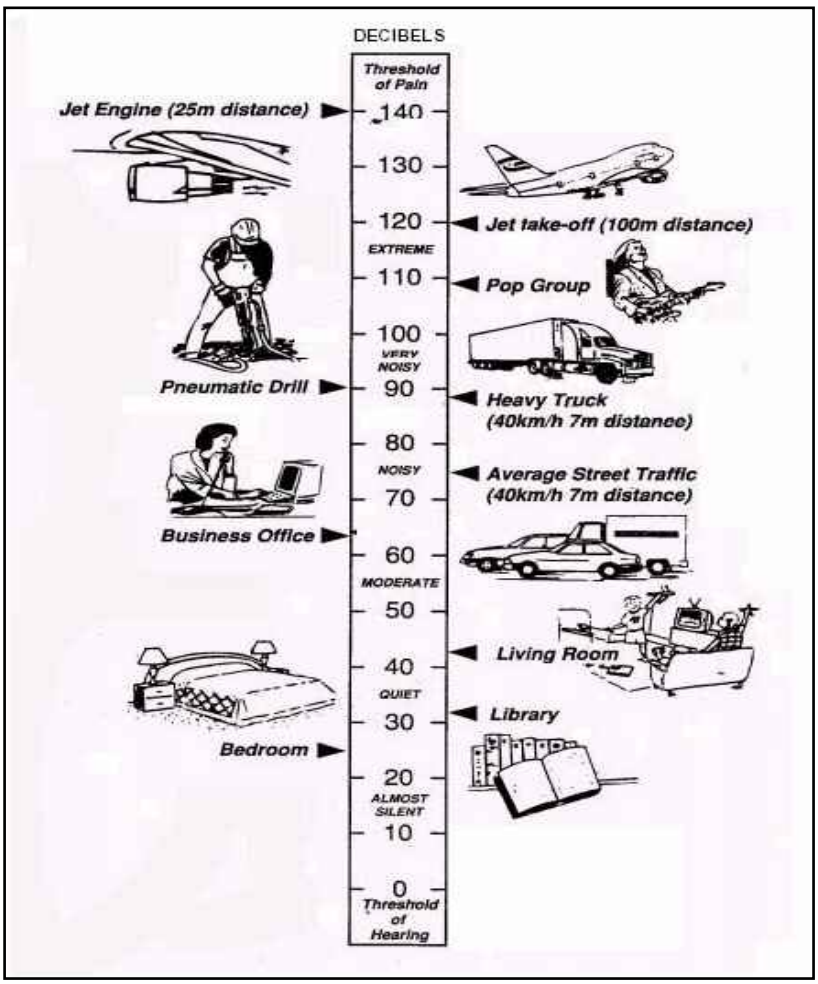


Figure 3.10.1
Illustrated Comparison of Noise Sources
Source: Real Traffic Noise Task Force Final Report, May 1999, Australian Environmental Protection Authority

What is meant by a Logarithmic Scale?

Since decibels are measured on a logarithmic scale, noise levels do not follow a linear progression. A doubling of noise energy creates an actual increase of about 3 dBA. For example, if one source of noise is at a 50 dBA level, a doubling of the noise intensity (two identical 50 dBA sources) would create a combined level of about 53 dBA, not 100 dBA. Four identical sources combined would produce 56 dBA.

Conversion of Metric Units to English Units

100 meters = 328 feet
25 meters = 82 feet
7 meters = 23 feet

40 kilometers/hour = 25 miles/hour

Several "rules of thumb" are helpful to keep in mind when considering noise impacts:

- The average human ear can barely perceive a 3 dBA change in noise level; a 5 dBA change is readily perceivable
- A 10 dBA increase is perceived as a "doubling" of noise, so a 60 dBA noise level is perceived as "twice as loud" as a 50 dBA noise level

Trucks on the Plaza

In an urban environment, noise is made up of two distinct parts. One is ambient or background noise. Wind noise and distant traffic noise make up the acoustical environment surrounding the project. These sounds are not readily recognized, but combine to produce a non-irritating ambient sound level. The other component of urban noise is intermittent and louder than the background noise. Local transportation and industrial noises are examples of this type of noise.

Noise levels from transportation facilities are influenced by several variables:

- Traffic volumes are a factor, though the effect is logarithmic. 2,000 vehicles per hour will be perceived as "twice as loud" as 200 vehicles per hour.
- Speed is a factor. Traffic traveling at 65 mph is perceived as "twice as loud" as the equivalent traffic traveling at 30 mph.
- Roadway vehicle noise comes from tires, engines, and exhaust.
- Engines typically will be louder when accelerating on a ramp or traveling uphill versus moving at a constant speed and/or traveling on a horizontal surface. Trucks downshifting down a downhill slope also increase engine noise.
- Heavy trucks create a disproportionate contribution to noise levels. The sound sources associated with trucks are noises from tires, engines, and exhaust.
- The worst-case noise levels will be achieved under a condition where traffic is moving the fastest while carrying the largest volume of vehicles (especially trucks). Therefore, on congested roadways, the peak traffic hour of the day may not be appropriate for a noise study because traffic would be moving very slowly from congestion.

Traffic noise is not constant. It varies over time as each vehicle passes a point. L_{eq}, or Equivalent Level, is the steady-state noise level during a given amount of time, L_{eq} represents the low and high noise levels averaged over a given time period (such as one hour) equated to a single continuous noise level. The term L_{eq}(h) or "hourly L_{eq}") is used to describe the L_{eq} in an hour's time.

3.10.2 What are the Existing Noise Levels in the Study Area?

The FHWA has established Noise Abatement Criteria (NAC) to consider the noise impacts on certain land uses. These criteria are in the Code of Federal Regulations, Title 23 Part 772. MDOT has a Highway Traffic Noise Analysis and Commission Policy 10136, Noise Abatement, for implementing the NAC. The NAC for the various land uses are presented in **Table 3.10.1**.

Table 3.10.1 Noise Abatement Criteria, Hourly A-Weighted Sound Level in dBA

Activity Category	L_{eq} (1 Hr period)	Description of Activity Category / Land Uses
A	57 dBA (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the lands are to continue to serve their intended purpose.
B	67 dBA (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 dBA (Exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	---	Undeveloped lands.
E	52 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Source: Code of Federal Regulations, Title 23 Part 772, Revised April 2005

According to FHWA and MDOT policy, noise abatement measures will be considered when the predicted noise levels approach or exceed those values shown for the appropriate activity category in the table, or when the predicted traffic noise levels substantially exceed the existing noise levels. MDOT

defines "approach" as being within 1 dBA less than the noise levels shown in the table. MDOT has defined an increase over existing noise levels of 10 dBA or more as being "substantial."

Existing noise level measurements were conducted on July 28, 2004 at 14 representative sites in the Study Area: one park, one school, and 12 residences. The measurements were made in accordance with FHWA guidelines (23 CFR 772) using an integrating sound level analyzer. Traffic counts were taken at nine of the 14 sites concurrent with the noise measurements. The Study Team used FHWA Traffic Noise Model® (TNM) Version 2.5 to model the nine field measurements with concurrent counts to determine the applicability of the model to the specific project environment. The following parameters were used in this model to calculate the hourly L_{eq} at a specific receiver location:

Home near the Plaza

- Distance between roadway and receiver
- Relative elevations of roadway and receiver
- Hourly traffic volumes by vehicle type
- Vehicle speed
- Roadway grade
- Topographic features, including retaining walls and berms
- Noise source height of the vehicles

The model results were close enough to the measured noise levels to conclude that the noise model could be used for the project. All nine modeled sites compared within 0-3 dBA of the measured levels. This represents a reasonable correlation since the human ear can barely distinguish a 3 dBA change in the L_{eq} noise level in the urban environment. The site by site comparison is presented in **Table 3.10.2.**

Table 3.10.2 Comparison of Measured and Modeled Noise Levels

Field Site[1]	Noise Level, dBA L_{eq}		Difference in Noise Level, dBA L_{eq} (Modeled Minus Measured)
	Measured	Modeled	
152	66	69	3
132	69	67	-2
87	63	66	3
81	55	57	2
64	63	65	2
51	60	62	2
45	61	59	-2
7	53	56	3
26	66	66	0

[1]Sites 107, 70, 17, 22, and 42 were not modeled, no traffic counts were available.

3.10.3 How Will the Alternatives Affect Noise Levels?

After establishing existing noise levels, TNM 2.5 was used to model future peak hour traffic noise levels for each alternative, for the year 2030. The modeling effort considered 180 representative receiver locations (numbered 1 through 176, plus four additional receivers numbered 79A, 80A, 120A and 130A) as shown in **Figure E.24 of Appendix E**. These representative receivers were selected to model the noise impacts at two churches, three schools with playfields, two parks (including 50 RV spots in one of the parks), one hotel, 15 businesses, and 401 residences, which include apartments and trailer homes adjacent to the proposed project. The results of the computer modeling are presented in **Figure E.25 A to C of Appendix E**. and summarized below.

No-Build Alternative: Year 2030 No-Build traffic noise levels within the corridor would approach or exceed the NAC at 101 residences, six businesses including one hotel/motel, and at Township Park No. 1.

City East Alternative: Year 2030 design hour noise levels adjacent to the City East Alternative would approach or exceed the NAC at 74 residences and four businesses including one hotel/motel, and at one township park. None of the noise receivers would be exposed to noise levels that "substantially exceed existing" noise levels.

City West (Preferred) Alternative: The City West Alternative would cause 2030 design hour noise levels to approach or exceed the NAC at 48 residences and four businesses including one hotel/motel, and at one township park. None of the noise receivers would be exposed to noise levels that "substantially exceed existing" noise levels.

Township Alternative: Year 2030 design hour noise levels adjacent to the Township Alternative would approach or exceed the NAC at two businesses, 65 residences, and at 14 RV spots in Township Park No. 2. None of the noise receivers would be exposed to noise levels that "substantially exceed existing" noise levels.

What is the Parallel Barriers Effect?

When there are two walls that are parallel and close together, noise occurring in the corridor between the two walls can reflect off of one wall and carry over the top of the other wall. In this case, the noise barriers would be less effective in reducing the noise impacts on neighboring homes and businesses.

The security walls adjacent to I-94/I-69 for the secured corridor for the proposed Township Alternative could further increase the noise levels for Receivers 42 – 70 and 79 – 114 above those shown in **Figure E.24 of Appendix E**. This phenomenon would be caused by the "parallel barriers" effect. Because both sides of the secured I-94/I-69 would contain high walls, noises can reflect off the nearer wall and carry over the top of the other wall. The TNM 2.5 program provides a parallel barrier analysis tool.

A parallel barrier study was performed at three locations between the Black River and the relocated bridge plaza. Based on this analysis, the security fences could raise noise levels 3 to 8 dBA above the results shown in **Figure E.25 Sheets A to C of Appendix E**. The increases vary widely and are a function of the height of the security walls and the relative elevation

differences between the roadways and the receivers. The noise effects of the parallel barriers will be analyzed and noise abatement measures developed, based on the final specifications for the secured corridor, if the Township Alternative is selected as the Preferred Alternative.

3.10.4 How Will the Noise Levels that Exceed the NAC be Mitigated?

MDOT has criteria for determining where noise abatement should be provided. These criteria are summarized as follows:

- Noise abatement will be recommended if found "feasible" and "reasonable" for existing developments, and any future developments approved before the "date of public knowledge" only (in this case, issuance of a Record of Decision).

- Commercial and industrial sites generally prefer a full view to their establishments. Sites zoned commercial/industrial or expected to convert to those uses will be asked if they want noise abatement. If they do not want it, it will not be provided.

- Mitigation needs to be feasible from an engineering standpoint.

- A noise abatement measure is not feasible if it cannot achieve at least a 5 dBA noise reduction.

- Noise mitigation will be considered "reasonable" if the construction cost is less than $38,060 or less (in 2007 dollars) per benefiting dwelling unit.

- Local jurisdiction(s) may be required to enter into a maintenance agreement with MDOT regarding the noise barrier.

- A majority of the affected residents must be in favor of abatement.

- Where an extreme noise impact is identified (80 dBA Leq or greater), special consideration may be given on an

Noise Wall Example

individual basis.

Within the framework of MDOT's criteria, various methods could be considered:

- reduction of speed limits
- restriction of truck traffic to specific times of the day,
- a total prohibition of trucks,
- alteration of horizontal and vertical alignments,
- property acquisition for construction of noise barriers or berms,
- acquisition of property to create buffer zones to prevent development that could be adversely impacted,
- noise insulation of public or nonprofit institutional structures and in certain circumstances, residential structures,
- use of berms,
- and the use of sound barriers

What is a "Berm"?

A noise berm (pictured above), also called an earth berm, is a mound of dirt that appears natural and blends smoothly with adjacent topography for an attractive appearance. It can be an effective way of mitigating traffic noise if it can block the line of sight between the traffic and nearby homes. However, an earth berm can require a lot of land if it is very high, so it may encroach into adjacent properties as well as require a lot of highway right of way. Noise walls are sometimes placed on top of berms to get more benefit. (Photograph courtesy of FHWA).

Reductions of speed limits, although acoustically beneficial, are seldom practical unless the design speed of the proposed roadway is also reduced. Restriction or prohibition of trucks is counter to the project's purpose and need. Design criteria and recommended termini for the proposed project preclude substantial horizontal and vertical alignment shifts that would produce noticeable changes in the projected acoustical environment. The construction of noise berms is neither feasible nor reasonable because of the amount of space that would be required. Therefore, only the construction of noise barriers was reviewed. The berm shown for the Township Alternative around the proposed plaza is intended as a visual screen.

Under the Township Alternative, mitigation of the reflected noise in the area of the security fences could be accomplished with absorptive facings on the roadway side of the security fences. Depending on the absorption coefficient of the materials and the area covered it is possible that the noise increases created by the parallel barriers could be reduced from a range of 3 to 8 decibels to a range of 1 to 3 decibels.

3.10.5 Where were Noise Barriers Considered?

Representative Michigan Noise Wall

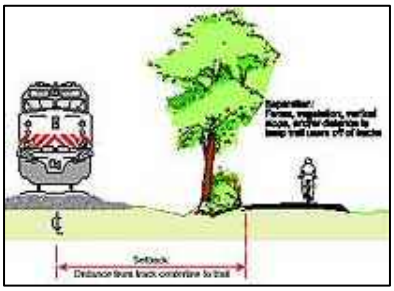
Noise barriers were analyzed at six locations within the project limits. Two of the noise barrier locations were analyzed for the City East Alternative, one was evaluated for the City West Alternative and three were analyzed for the Township Alternative. Noise barriers were modeled for the City East, City West and Township Alternatives west of the M-25 Connector between Hancock Street and the Black River. Noise barriers were also modeled for the City East and Township Alternatives west of the M-25 Connector between Garfield Street and Hancock Street.

The sixth noise barrier location was modeled for the Township Alternative and was located west of I-94/I-69 and north of Lapeer Street. No noise barrier was modeled in this area for the City East and City West Alternatives since the location of I-94/I-69 in this area is not being changed and no additional capacity is being provided.

The results of the barrier analysis, including barrier location, future hourly Leq noise levels without and with a barrier, barrier length and height, estimated cost, the number of residential units benefited, the noise reduction provided by the barrier and the cost per residential unit are presented in **Table 3.10.3**. All of the noise barriers analyzed meet MDOT's feasibility criteria. However, only five noise barriers (Noise Barriers 1, 2, 4, 5, and 6) meet MDOT's definition for "reasonableness" described above.

There are other areas along the I-94/I-69 Corridor where individual receptors exceed the NAC, such as Receivers 1, 3 and 4 which extend along the right-of-way for approximately 1,400 feet. However, it is impossible to design a barrier for single receptors that would meet MDOT's cost criterion of $38,060. There are additional locations along the improved local streets in Port Huron where receptors exceed the NAC. In these areas, local cross streets and driveway access prohibit the construction of feasible noise barriers.

3.10.6 Are There Considerations for Preventing Future Development from Being Adversely Affected by Noise?



Example of a setback.

As part of the noise modeling effort, a "setback" distance was calculated for protecting properties from noise on major roadways. The setback distance for residential properties impacted by a 66 dBA Leq hourly noise level along the I-94/I-69/M-25 corridor was calculated as 380 feet for the City East and City West Alternatives and 340 feet for the Township Alternative. Noise levels within these distances, measured perpendicular to the centerline of the nearest lane of the roadway, was modeled to be 66 dBA or greater. This setback distance was developed to assist local planning authorities in developing land use control over the remaining undeveloped lands along the project in order to prevent further development of properties that would experience excessive noise levels.

3.10.7 What will the Effects from Construction Noise be and How would they be Mitigated?

The major construction elements of this project are expected to be demolition, hauling, grading, paving, and bridge construction. General construction noise impacts for passersby and those individuals living or working near the project can be expected particularly from demolition, earth moving and paving operations. Considering the relatively short-term nature of construction noise, and the fact that construction will only take place from dawn to dusk, impacts are not expected to be substantial. The ability of buildings to reduce indoor noise levels to acceptable levels is believed to be sufficient to moderate the effects of intrusive construction noise.

3.10.8 What are the Next Steps in Addressing Noise Impacts?

Based on the study completed and as shown in **Table 3.10.3**, **Appendix E and figure E.24** MDOT recommends the installation of the noise barriers for the City East and Township Alternatives. The noise barriers proposed west of the M-25 Connector, between Garfield Street and Hancock

Street and between Hancock Street and the Black River, are feasible and reasonable for the City East or the Township Alternatives, while the noise barrier west of I-94/I-69 and north of Lapeer Street is feasible and reasonable only for the Township Alternative. If final design results in substantial changes in roadway design from modeled conditions, noise abatement measures will be reviewed.

During the public comment period on the DEIS, comments on noise concerns will be solicited at public meetings from local residents, and officials of the jurisdiction(s) affected by the project. These comments will be considered in the noise analysis in the Final EIS. During the design phase the feasibility and reasonableness of the noise barriers are reviewed in greater detail and may be altered or eliminated.

Table 3.10.3 Acoustical Mitigation Noise Barriers Analyzed

Barrier Number	Locations	Existing Hourly L_{eq} Noise Levels, dBA	Range of Future Hourly L_{eq} Noise Levels, dBA		Noise Reduction (dBA)	Barrier Characteristics		Cost[1]	Number of Units Attenuated	Cost/ Unit	Feasible and Reasonable
			Without Barrier	Barrier		Length (ft)	Height (ft)				
	City East Alternative										
1	West of M-25, between Hancock St. and Black River	59 - 73	61 - 73	52 - 61	5-13	2510	12-18	$1,591,739	44	$36,176	Yes
2	West of M-25, between Garfield St. and Hancock St.	58 - 68	61 - 70	55 - 62	5-11	865	15	$547,011	16	$34,188	Yes
	City West Alternative										
3	West of M-25, between Hancock St. and Black River	65-73	65 - 71	60 - 64	5-10	1,023	12-15	$591,629	8	$73,954	No
	Township Alternative										
4	West of I-94/69, north of Lapeer St.	59 – 70	64 – 72	59 – 61	5 – 11	1,838	12 - 18	$1,143,844	40	$28,596	Yes
5	West of M-25, between Hancock St. and Black River	59 – 73	56 - 70	51 – 63	5 – 13	2,488	12 - 15	$1,520,707	40	$38,018	Yes
6	West of M-25, between Garfield St. and Hancock St.	58 – 68	61 - 71	55 – 60	5 – 11	865	15	$547,011	18	$30,390	Yes

[1]Based on year 2007, estimates of $25.50 per square foot and an additional cost of $219.60 per lineal foot consistent with other noise walls constructed in the past.

3.11 Groundwater, Drainage, and Surface Water Quality

3.11.1 Are there any Critical Groundwater Resources in the Study Area?

The Study Area does not contain any Sole Source Aquifers or Critical Aquifer Protection Areas as defined by the Environmental Protection Agency under the authority of the Safe Drinking Water Act. As a result, no impacts are anticipated to groundwater resources.

Sole Source Aquifers

Supplies 50 percent or more of the drinking water in a given area.

3.11.2 How is Stormwater in the Study Area Currently Managed?

In the vicinity of the existing plaza, the stormwater runoff drains into the City of Port Huron's stormwater and combined sanitary/storm sewer system.

Existing I-94/I-69 areas around Water Street and the Black River Bridge drain to the Black River via overland flow and bridge drains.

3.11.3 What is Classified as Surface Water?

Surface waters are waters stored or flowing at the earth's surface including natural bodies of water (rivers, lakes, and wetlands), as well as water in human-made storage and conveyance facilities (lakes, detention ponds, and piped drainage systems). Discharges to these waters are regulated by the Clean Water Act. Impacts to surface waters can occur when vegetated areas are converted to hard surfaces such as pavement. When surface water, sometimes in the form of stormwater, cannot be absorbed by the ground, runoff occurs and water volumes increase. Changes in runoff volumes and velocities can cause stream bank erosion, bridge undercutting, and increased flooding risks.

The Clean Water Act

Provides for federal regulation of all sources of water pollution and prohibits the discharge of pollutants from non-permitted sources.

3.11.4 What Surface Water Features are Found in the Study Area?

The Study Area is located within the Black River watershed which includes the sub-watershed of Stocks Creek. **Figure**

3.11.1 shows the watersheds relative to the Study Area. In addition to these streams, a few wetlands are located within the Study Area, primarily near the Black River or Stocks Creek.

What is a Watershed?

The area of land that catches rain and snow and drains or seeps into a marsh, stream, river, lake or groundwater.

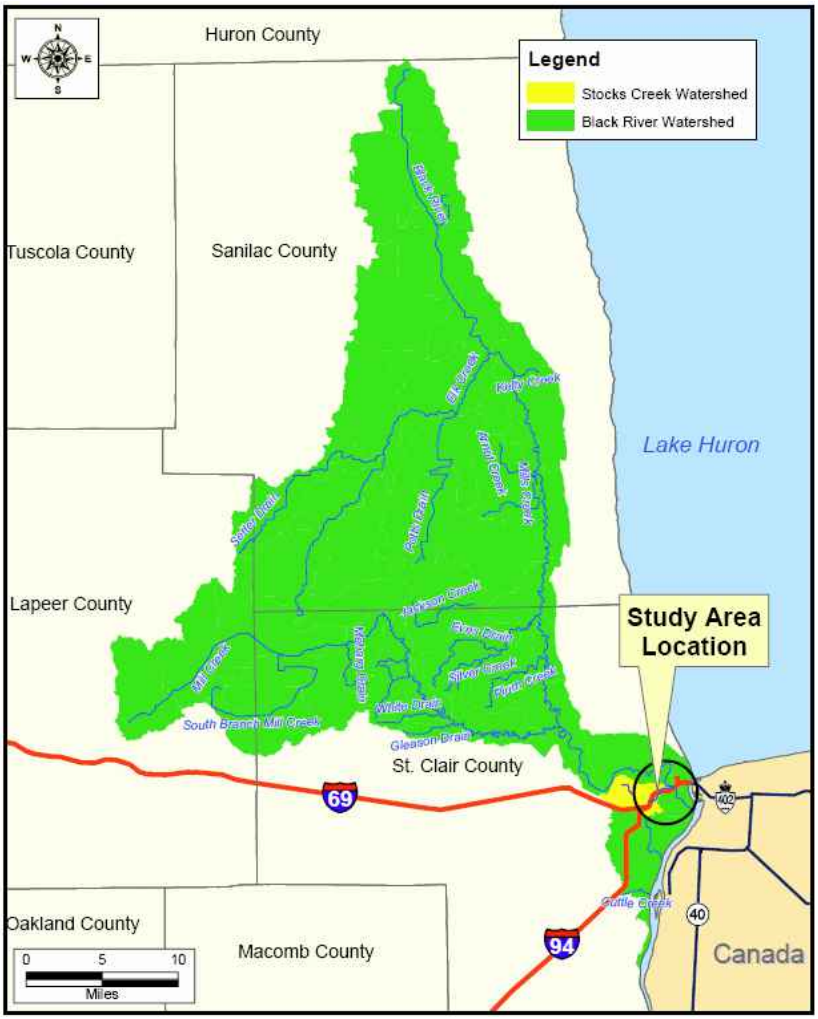


Figure 3.11.1 Black River and Stocks Creek Watersheds

In the eastern portion of the Study Area, the majority of the wetlands are associated with the Black River or Stocks Creek. Wetlands within the Study Area are evaluated and discussed in **Section 3.13, Wetlands.**

Black River: The headwaters of the Black River are located in the northern portion of Sanilac County. The river runs from north to south through Sanilac and St. Clair Counties before it discharges into the St. Clair River, in the City of Port Huron. The Black River crosses through the Study Area under the I-94/I-69 bridge, west of the existing plaza (**Figure 3.11.2**).

Within the Study Area the Black River is approximately 240 feet wide and approximately ten-feet deep. The bottom of the river is primarily composed of silt, clay and organic material. The existing I-94/I-69 Bridge over the Black River includes two piers in the river channel. At this location, the river has a wide, linear channel that has been dredged in the past. A public boat launch is located upstream of I-94/I-69 and the river has been widened immediately downstream, where marinas are present. The river banks indicate signs of erosion and contain large amounts of debris including old boats, broken concrete, and household trash.

Black River Under I-94/I-69

Stocks Creek: Stocks Creek originates to the west of the Study Area. The stream crosses under I-94/I-69 twice within the Study Area. The first location is just north of Lapeer Avenue. Stocks Creek runs from the west to the east at this point and crosses under I-94/I-69 perpendicularly through three side by side approximately two hundred-foot long, six-foot diameter corrugated metal culverts. The second location is just west of the Lapeer Connecter interchange with I-94/I-69. At this location, Stocks Creek runs from the south to the north and crosses under I-94/I-69 perpendicularly through an approximate 210-foot long, 12x8 foot, elliptical concrete culvert. North of this crossing, the stream turns east, crosses under Water Street, and eventually discharges into the Black River just north of the I-94/I-69 bridge over the Black River (**Figure 3.11.2**). Within the Study Area, Stocks Creek is approximately six-feet wide and two-feet deep. The bottom of Stocks Creek is primarily composed of sand and clay with some areas of gravel.

Stocks Creek

Corrugated Metal Pipe

3.11.5 How will the Project Affect Surface Water Features?

The following sections describe the potential impacts and proposed stormwater maintenance with each of the project alternatives.

Elliptical Concrete Culvert

No-Build Alternative: The No-Build Alternative would have minimal impact on surface water quality.

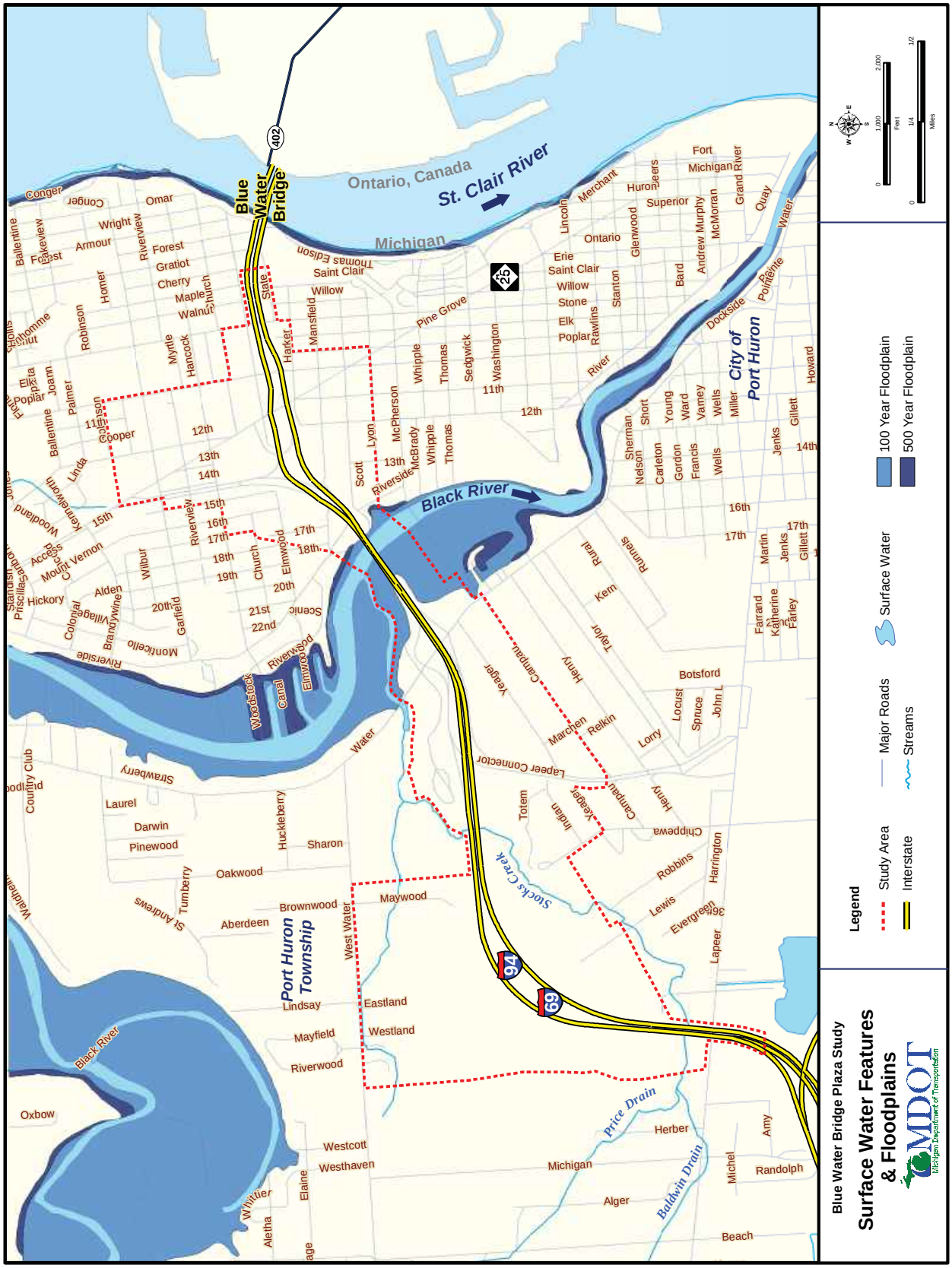

Blue Water Bridge Plaza Study
Surface Water Features & Floodplains
MDOT
Michigan Department of Transportation
Legend
Study Area
Interstate
Major Roads
Streams
Surface Water
100 Year Floodplain
500 Year Floodplain
Feet
Miles
St. Clair River
Ontario, Canada
Michigan
Black River
City of Port Huron
Port Huron Township
Stocks Creek
Price Drain
Baldwin Drain
Blue Water Bridge
402
25
94
69

Figure 3.11.2

City East Alternative: The City East Alternative would have minimal impact on surface water quality. The larger plaza and wider roadways included in the City East Alternative would increase the amount of paved surfaces, resulting in a greater discharge of stormwater into the surrounding water bodies. As a result, stormwater detention basins will be constructed to control the rate of water discharged to match the existing discharge rates. These detention basins would control water volume and preserve water quality. The proposed detention basins would be constructed in the grassy area of the Welcome Center between I-94/I-69 and passenger parking, and the east side of Stocks Creek, south of I-94/I-69. A 300-foot grassy buffer area would be constructed at each stormwater outlet prior to discharging into Stocks Creek or the Black River to help filter any suspended sediment prior to discharge.

What are Detention Basins?

Stormwater structures that temporarily detain runoff water prior to release to a stream or receiving waterway.

Currently the majority of runoff in the areas west of the Black River discharges into Stocks Creek. The proposed ditch flow patterns will be designed to match the existing conditions where feasible. Roadside and median ditches would be the primary drainage facilities for this alternative. Detention basins that discharge to roadside ditches are required for retaining wall sections.

The areas around Water Street will drain over land into a 300-foot grassy buffer area and then into Stocks Creek, just east of Water Street.

Stormwater runoff from the I-94/I-69 bridge over the Black River, will be directed toward the Black River. Stormwater drains on the bridge deck will not discharge directly into the Black River. Instead, the runoff from the bridge will be collected and channeled into a roadside ditch and through a 300-foot grassy buffer area to help filter any suspended sediment prior to discharging into the Black River.

The area to the east of the Black River is almost entirely drained by Port Huron's combined sanitary/storm sewer system. Stormwater concepts have been developed that discharge the proposed plaza stormwater to the existing City system or through vegetated controls toward the Black River.

An oil separator system would be used to provide pollutant removal (oil and solids) from the stormwater. Underground storage is required to reduce the peak flow, maintaining the existing flow level of the project into the City's system. Preliminary hydraulic analysis has been conducted which includes Hydrologic Engineering Centers River Analysis System (HEC-RAS) analysis and runoff calculations.

A more detailed hydraulic analysis will be performed during the FEIS phase for the Stocks Creek and Black River crossings to determine the size of the stormwater facilities necessary to adequately handle the proposed runoff.

City West (Preferred) Alternative: The Preferred Alternative would have slightly less of an impact to surface water quality than the City East Alternative due to a slight decrease in the total paved surface area. Stormwater from the proposed plaza would discharge into Port Huron's sanitary/sewer system or through vegetated controls toward the Black River, as is the case with the City East Alternative.

Stocks Creek at the Black River

Currently, runoff in the areas west of the Water Street Interchange discharges into Stocks Creek. The proposed ditch flow patterns will be designed to match the existing conditions where feasible. Roadside and median ditches would be the primary drainage facilities for this alternative. Detention basins that discharge to roadside ditches are required for retaining wall sections.

Based on preliminary drainage analysis, the areas around Water Street will drain over land into a 300-foot grassy buffer area and then into Stocks Creek.

The stormwater runoff from the Black River Bridge will be channeled into a roadside ditch and through a 300-foot grassy buffer area to help filter any suspended sediment prior to discharging into the Black River.

The area to the east of the Black River is almost entirely drained by Port Huron's combined sanitary/storm sewer system. Stormwater concepts have been developed that discharge the proposed plaza stormwater to the existing city system. An oil separator system would be used to provide

pollutant removal (oil and solids) from the stormwater. Underground storage or diversion chambers are required to reduce the peak flow, maintaining the existing flow level of the project into the city's system. Preliminary hydraulic analysis has been conducted.

A more detailed hydraulic analysis will be performed during the FEIS phase for the Stocks Creek and Black River crossings to determine the size of the stormwater facilities necessary to adequately handle the proposed runoff.

The Township Alternative: Similar to the City East and City West Alternatives, the Township Alternative would have minimal impact to surface water quality. The proposed plaza for the Township Alternative would be constructed in an area that is currently an abandoned farm field. This alternative would require paving a large area that is currently unpaved; therefore, the amount of stormwater runoff would increase. However, proposed detention basins would prevent an increase in the stormwater discharge rate into the natural water bodies. The detention basins will also improve water quality by allowing sediments to settle out prior to discharge. The detention basins for the Township Alternative are at the following locations: the northeast quadrant of the Water Street interchange; east and west side of Stocks Creek on the south side of I-94/I-69; and, the proposed plaza site. A 300-foot grassy buffer area will be constructed at each stormwater outlet to Stocks Creek or the Black River to help filter any suspended sediments prior to discharge.

Stocks Creek at Water Street

The drainage from the plaza site and roadways west of Water Street primarily discharge into Stocks Creek. The existing ditch flow patterns would be maintained. Roadside and median ditches are the primary drainage facilities for this alternative. Detention basins and enclosed storm sewers will be required for the secured lanes and retaining wall sections. These detention basins will discharge to the roadside ditches, as quickly as possible. An oil separator system will be provided to remove pollutants (oil and solids) from the storm-water.

The I-94/I-69 bridge over the Black River and Water Street area drainage concepts for the Township Alternative will be similar

to the City East and Preferred Alternatives. As part of the Township Alternative, the existing plaza, Hancock Street, and much of Pine Grove Avenue will be reconstructed. Stormwater will be discharged into the existing city system. To ensure that the city's stormwater system has the capacity to handle runoff from any new plaza development, stormwater will be discharged into detention basins prior to the release into the city system, at a rate equal to or less than pre-development flow rates. A more detailed hydraulic analysis will be performed at the Stocks Creek and Black River Crossings later in the design phase to size the stormwater facilities.

Surface water impacts to wetlands are discussed in **Section 3.13 Wetlands**.

3.12 Floodplains

3.12.1 What is a Floodplain?

A river, stream, lake, or open ditch can sometimes overflow their banks and flood nearby lands. The land that is flooded is defined as a floodplain. A 100-year floodplain is the land area that will be flooded by the overflow of water resulting from a 100-year flood.

What is a 100-year flood?

A flood which has a one percent chance of occurring any given year.

The floodplain is divided into two parts, the floodway which carries most of the flow during a flood event, and the floodway fringe which is an area of very slow moving water or "slack water". These are high hazard areas during times of flooding.

Executive Order 11988, Floodplain Management, dated May 24, 1977, implemented by DOT Order 5650.2, dated April 23, 1979, requires agencies to avoid disrupting floodplain areas wherever there is a practicable alternative, and to minimize any environmental harm that might be caused by the proposed action.

The State of Michigan's Floodplain Regulatory Authority, found in Part 31, Water Resources Protection, of PA 451, the Natural Resources and Environmental Protection Act (NREPA), as amended, requires that a permit be obtained prior to any alteration or occupation of the 100-year floodplain. The purpose of Part 31 is to assure that structures do not obstruct the flow of water in the 100-year floodplain, and that this portion of the floodplain is not used for residential construction. The Michigan Department of Environmental Quality (MDEQ), in cooperation with the U.S. Army Corps of Engineers, is the regulatory agency responsible for any construction activities within a given floodplain.

3.12.2 Does the Study Area Contain any Floodplains?

The Black River and Stocks Creek are located within the Study Area. The Black River flows from the northwest to the southeast through the Study Area, has a drainage area of 707 square miles, and drains into the St. Clair River southeast of the Study Area. In this area, the Black River is considered

Black River Floodplain

navigable, although the clearance at I-94/I-69 Bridge over the Black River, prevents large or tall boats from passing underneath. Depending on water levels, the existing boat clearance at the Black River Bridge is 15 to 20 feet. The existing clearance distance will be maintained or enlarged for any proposed structure. A Section 9 Permit will be required from the U.S. Coast Guard for the replacement of the Black River Bridge.

The Black River

The Black River floodplain located within the Study Area contains some scattered low-quality wetlands and habitat, but are mostly valued for stormwater control and pollution filters. On the east side of the Black River there is urban development and a local roadway located adjacent to the river. On the west side of the river, south of the freeway, there is a private marina, while on the north side of the freeway there is a local park. The parkland is mostly located within the floodplain and provides marginal wildlife habitat and limited plant diversity. There are no migratory bird-nesting sites on the parkland.

Stocks Creek is a tributary of the Black River and is not navigable. It flows east under I-94/I-69 into the Study Area just north of Lapeer Avenue, turns north and flows under I-94/I-69 just west of the Lapeer Connector, turns east and flows under Water Street and then into the Black River just north of the I-94/I-69 Black River Bridge. Stocks Creek at the I-94/I-69 crossing west of the Lapeer Connector has an associated floodplain and an upstream drainage area of 6.9 square miles. At this location, the Stocks Creek floodplain is mostly low lying emergent wetlands.

The Study Area contains 64.6 acres of land within the 100-year floodplains of the Black River and Stocks Creek. The location of the floodplain in the Study Area was identified by examining Flood Insurance Rate Maps (FIRM) published by the Federal Emergency Management Agency (FEMA). The approximate limit of the floodplain is shown in **Figure 3.11.2** in **Section 3.11 Groundwater, Drainage, and Surface Water Quality**.

3.12.3 How will the Project Impact Floodplains?

Efforts have been made to design project alternatives that will minimize impacts to the floodplains. Any impact to the 100-year floodplain will be offset by providing additional storage capacity for flood waters. This is referred to as compensatory storage. Compensatory storage balances the loss of natural flood storage capacity within the floodplain. The MDEQ requires compensatory storage if more than 300 cubic feet of fill material is placed in the 100-year floodplain.

A hydraulic analysis was performed and determined that the 100-year flood elevation at the I-94/I-69 bridge crossing over Black River is 586.14 feet, and 585.91 feet at the I-94/I-69 Stocks Creek crossing just west of the Lapeer Connector. The lowest elevation of the existing bridge deck is 596.00 feet, which is about ten-feet higher than the 100-year flood elevation. Additionally, the lowest roadway elevation on the I-94/I-69 approaches is 594.78 feet, which is approximately eight-feet higher than the 100-year flood elevation. The proposed Black River Bridge improvements will be at or above these existing elevations and, therefore, will be protected from water flooding over the roadway/bridge in the event of a 100-year flood.

The design of the new bridge over the Black River will increase the existing opening under the bridge. This will help to offset any proposed fill in the 100-year floodplain, improve water flow under the bridge, and ensure that no upstream flood elevations are affected.

As a result, there would be no impacts on natural and beneficial floodplain values, there would be no change in flood risks, and there would be no increase in potential for interruption or termination of emergency service or emergency evacuation routes.

No-Build Alternative: The No-Build Alternative would have no effects on the 100-year floodplain.

Build Alternatives over the Black River: The City East, City West, and the Township Alternatives would require the Black River Bridge and associated approaches to be significantly widened

from the existing four lanes. Both the City East and City West Alternatives would require nine lanes while the Township Alternative would require ten lanes. This widening would require the placement of fill material within the 100-year floodplain west of the Black River Bridge along both sides of I-94/I-69. The City East and City West Alternatives would require approximately 625 cubic yards and the Township Alternative would require approximately 2,450 cubic yards. Although the Township Alternative is only one lane wider than both City Alternatives, the Township Alternative's width is much greater than both city alternatives due to shoulders and security features. Compensatory storage will be provided by lengthening the bridge over the Black River to ensure that the new bridge would not impact 100-year floodplain elevations. Fill for the longer bridge will be required at the Water Street ramp locations, which will be above the 100-year floodplain elevations.

Mouth of Stocks Creek at the Black River

To ensure that all environmental and hydraulic impacts associated with the floodplain crossings of the Preferred Alternative are minimized, further evaluation of crossing options will be conducted during the design phase. This would include an examination of bridge spans and approaches, median widths, and side slopes. The analysis would consider existing and proposed conditions, and would determine the necessary and proper bridge types, openings, lengths, and locations of abutments and piers to minimize or eliminate floodplain impacts. A preliminary hydraulic analysis has concluded that the proposed I-94/I-69 bridge over the Black River provides a greater waterway area through the structure than the existing and the proposed spans on the west bank, do not negatively affect the waterway area.

Build Alternatives over Stocks Creek: Currently, Stocks Creek runs from the south to the north and crosses under I-94/I-69 perpendicularly through an approximate 210-foot long, 12x8-foot, elliptical concrete culvert. The Township Alternative would require two bridge or culvert structures crossing Stocks Creek to accommodate the six-lanes of the secured corridor and the six-lanes of the M-25 Connector. The two new structures would be separated by an open grassy median approximately 170-feet wide. At this time the proposed structures are each anticipated to be between 130

and 250-feet long. A new single-span bridge structure is proposed for both city alternatives. The bridge will be continuous in length under both the eastbound and westbound lanes of freeway and is anticipated to match the existing 210-foot length. A preliminary hydraulic analysis has concluded that the proposed single-span structure would not create an adverse effect on the hydraulic capacity and efficiency of the Stocks Creek crossing.

3.13 Wetlands

Wetland delineations and assessments were conducted in the Study Area to identify locations and sizes of wetlands, assess the functions associated with each wetland, and identify the potential wetland impacts of each alternative. Wetland function is defined by the beneficial effects of a wetland on the surrounding environment. The methods used for wetland identification were based on Part 303, Wetland Protection of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well as guidance manuals and procedures set forth by the Michigan Department of Environmental Quality.

What is a Wetland Delineation?

The process used to determine the size and type of a wetland.

3.13.1 Why are Wetlands Important?

Wetlands play a significant role in the health and existence of other natural resources such as inland lakes, ground water, fisheries, and wildlife. Michigan's wetland statute recognizes the following benefits provided by wetlands:

- Flood and stormwater control through absorption and storage
- Provide habitat for many forms of wildlife including migratory waterfowl and rare, threatened, or endangered species
- Protection of ground water resources, watersheds and the ability to recharge ground water supplies
- Pollution treatment by serving as a filter to purify surface water
- Erosion control by serving as a filtering basin, absorbing silt and organic matter
- Sources of nutrients in water food cycles and nursery grounds and refuge for fish

These benefits are often referred to as wetland functions and values.

3.13.2 How were Wetlands Identified?

Before the field investigations began information was gathered from several sources to provide direction and focus. The Study Team reviewed the U.S. Department of Agriculture's

What are hydric soils?

A soil that is saturated long enough during the growing season to deprive the root system of oxygen, likely indicating a wetland.

Soil Survey for St. Clair County and the U.S. Fish and Wildlife Service's National Wetland Inventory Map for the Study Area, to identify potential wetland areas. Wetland specialists then developed field maps by overlaying hydric soil maps and wetland area maps with land features on aerial photography. The wetland specialists used these maps to identify the approximate location and size of potential wetland complexes within the Study Area.

Wetland boundaries were identified based on the presence of wetland plants, visual signs of water, elevation changes, and the presence of hydric soils. Functions, values, benefits, and uses that each wetland provides were determined. The wetlands were then rated as low, medium, or high quality based on the presence or absence of functions and values and the degree of benefits those functions and values provide.

Invasive Species

Are introduced, non-native plants that out-compete native plants for space and resources.

The wetland specialists conducted an inventory of all plant species present within each wetland area. The plant species were entered into the Michigan Department of Natural Resources' database. This database was used to calculate and assess the quality of each wetland. Wetlands with fewer invasive species and more native species were given a higher rating than those having a larger number of invasive species and fewer native plants.

Scrub-shrub/forested wetland

Fifty-six (56) wetland areas were delineated and assessed within the Study Area during the summer and fall of 2003. Eighteen (18) of the wetland areas are roadside ditches and were not included in the impact evaluations because they are not regulated wetlands. The remaining 38 wetland complexes contain emergent, scrub-shrub, forested, and open water wetlands. Emergent wetlands are those that contain plants that root in water for much of the year, but grow tall enough to stick out of the water. Scrub-shrub is a term used to define a wetland that contains small trees and bushes less than 20-feet tall, while a forested wetland typically contains trees greater than 20-feet tall. Of these 38 wetlands, five were classified as high quality, 11 were classified as medium quality, and 22 were classified as low quality wetlands (**Table 3.13.1**). Most of the wetlands in the Study Area are less than 0.5 acre in size.

Table 3.13.1 Type and Acreage of Wetlands in the Study Area

Wetland Type (in acres)									
	OW	**FO**	**FO SS EM**	**FO SS**	**FO EM**	**SS**	**SS EM**	**EM**	**Total**
Total	0.67	2.74	1.07	1.62	0.04	0.68	1.33	4.13	12.28

OW-Open Water Wetland
FO-Forested Wetland
SS-Scrub/Shrub Wetland
EM-Emergent Wetland

The majority of the wetlands within the Study Area are located west of Water Street along I-94/I-69, (**Figure E.26** in **Appendix E**). The eastern portion of the Study Area is more urbanized with wetlands located primarily along the Black River. These wetlands are dominated by invasive plant species and contain significant amounts of garbage and debris. However, these types of wetlands, adjacent to rivers, lakes and streams, can provide higher water quality functions, erosion control, and wildlife habitat.

Two wetland areas adjacent to Stocks Creek represent the highest quality and largest wetlands within the Study Area. These wetlands are located on the north and south side of I-94/I-69, just west of the Lapeer Connector. Both of the wetlands border Stocks Creek and provide flood storage, water filtration, nutrient uptake and erosion control functions, in addition to wildlife habitat. It is likely that these two wetlands were historically one complete wetland complex that was fragmented at the time I-94/I-69 was initially constructed.

3.13.3 How Many Acres of Wetland will be Impacted?

Of the 38 regulated wetlands in the Study Area, 29 could potentially be impacted by the project. The City East and City West Alternatives would impact 17 wetland areas, while the Township Alternative would impact 29 wetland areas which include the 17 wetlands impacted by both the City Alternatives. Wetland impacts include filling the wetlands partially or entirely.

Table 3.13.2 illustrates the type and acreage of wetlands that will be impacted by each alternative. Emergent, scrub/shrub, and open water wetlands are separated from forested wetlands as the mitigation ratio for impacting these wetlands differs from the others. Emergent, scrub/shrub, and open water wetlands require 1.5 acres of wetland to be created for every one-acre of impact. Forested wetlands require two acres of wetland to be created for every one-acre of impact. Mitigation requirements for wetland impacts are discussed further in **Chapter 5 Mitigation**.

Table 3.13.2 Estimate of Wetland Impacts

Project Alter-natives	Number of Regulated Impacted Wetlands	Type and Acreage of Wetland Impacts			Acres of Highest Quality Wetland Impacts
		Emergent, Scrub-Shrub and Open Water	Forested	Total	
No-Build	0	0	0	0	0
City East Alt.	17	3.24	1.12	4.36	1.31
City West Alt.	17	3.24	1.12	4.36	1.31
Twp. Alt.	29	7.22	2.94	10.16	3.80

No-Build Alternative: There would be no impact to any wetland under this alternative.

City East Alternative: Proposed improvements for the City East Alternative are concentrated in the northeastern portion of the Study Area where the Black River and linear roadside ditches are present. This alternative would impact a total of 4.36 acres of wetland within 17 wetland areas (**Figure 3.13.1**). Twelve wetland areas would be partially impacted and five would be entirely removed by this alternative. These wetlands have relative low value, function, and floristic significance.

City West (Preferred) Alternative: As with the City East Alternative, the proposed improvements for the City West Alternative are concentrated in the northeastern portion of the

Study Area where the Black River and linear roadside ditches are present. The Preferred Alternative would have the same impacts as the City East Alternative, a total of 4.36 acres of wetland within 17 wetland areas (**Figure 3.13.1**). Twelve (12) wetland areas would be partially impacted and five would be entirely removed by this alternative. These wetlands have relative low value, function, and floristic significance. Mitigation measures to offset potential wetland impacts are discussed in **Chapter 5 Mitigation**.

Township Alternative: The Township Alternative would impact approximately 10.16 acres of wetlands located within 29 wetland areas. Nine wetlands would be partially impacted and 20 would be entirely removed with this alternative. **Figure 3.13.2** shows the locations of impacted wetlands for this alternative. The majority of the wetlands impacted by the Township Alternative are small, isolated, and have relatively low overall function, value, and floristic significance.

The wetlands adjacent to Stocks Creek would experience the most impact. These wetlands provide the highest diversity of wildlife habitat and the greatest water quality functions within the Study Area. Approximately one-third of the wetland acres that would be impacted by this alternative are associated with these three wetlands. Mitigation measures to offset potential wetland impacts are discussed in **Chapter 5 Mitigation**.

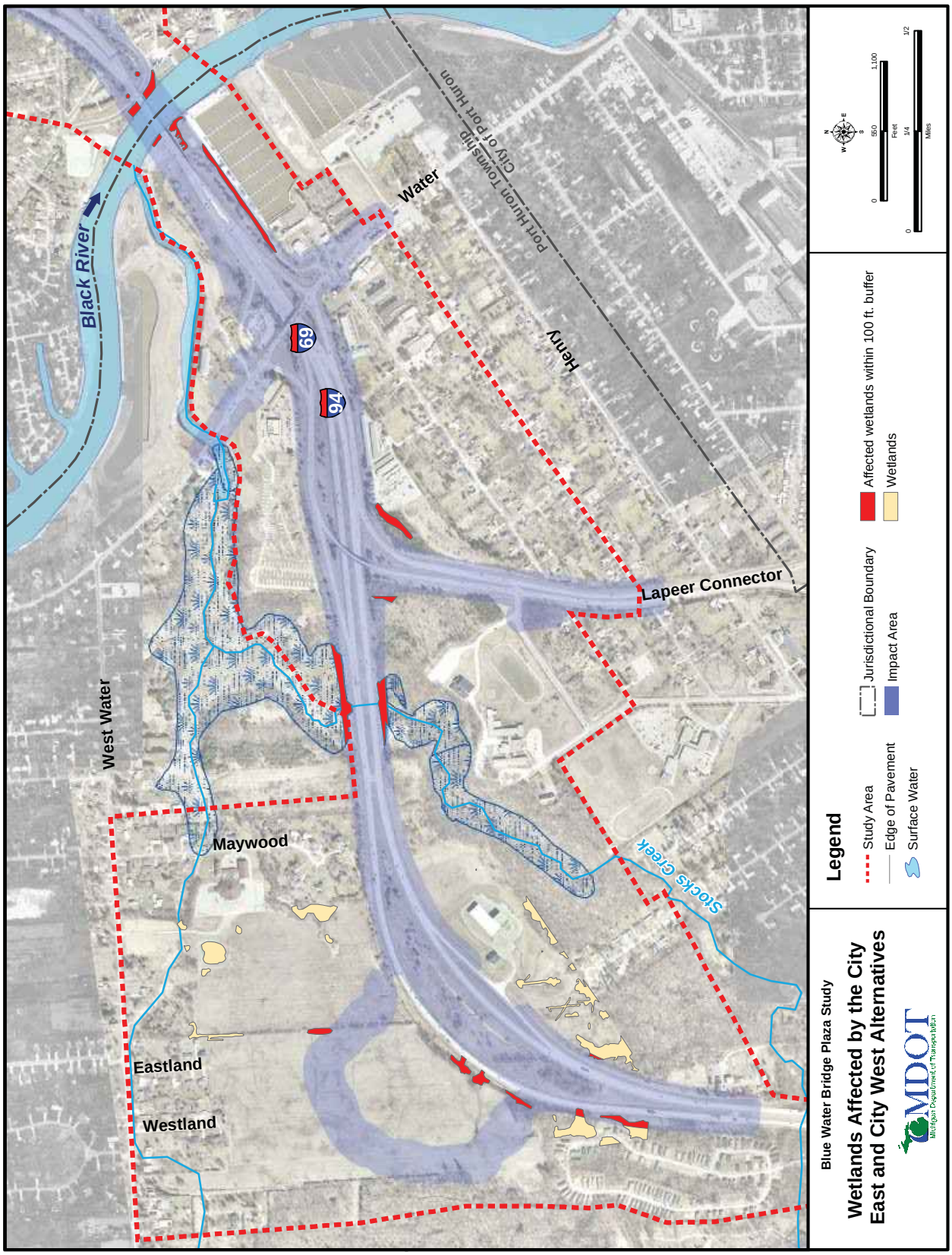

Black River
West Water
Maywood
Eastland
Westland
69
94
Water
Port Huron Township
City of Port Huron
Henry
Lapeer Connector
Stocks Creek
Legend
Study Area
Edge of Pavement
Surface Water
Jurisdictional Boundary
Impact Area
Affected wetlands within 100 ft. buffer
Wetlands
0
550
1,100
Feet
0
1/4
1/2
Miles
Blue Water Bridge Plaza Study
Wetlands Affected by the City East and City West Alternatives
MDOT
Michigan Department of Transportation

Figure 3.13.1

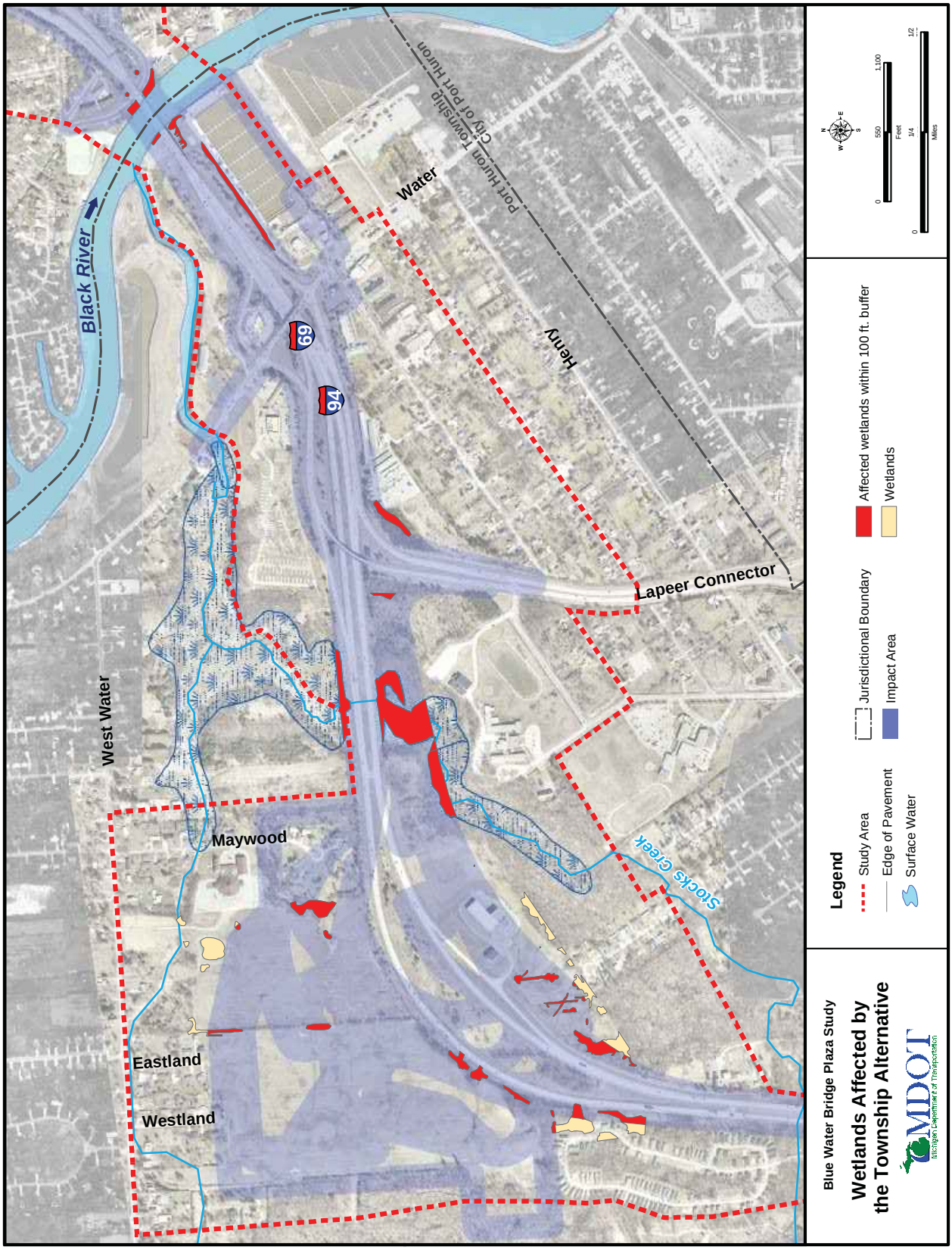

Black River
West Water
Maywood
Eastland
Westland
69
94
Water
Port Huron Township
City of Port Huron
Henry
Lapeer Connector
Stocks Creek
Legend
Study Area
Edge of Pavement
Surface Water
Jurisdictional Boundary
Impact Area
Affected wetlands within 100 ft. buffer
Wetlands
0
550
1,100
Feet
0
1/4
1/2
Miles
Blue Water Bridge Plaza Study
Wetlands Affected by the Township Alternative
MDOT
Michigan Department of Transportation

Figure 3.13.2

3.14 Plants, Wildlife, and Threatened and Endangered Species

The following sections explain the effects that the project alternatives will have on plants, wildlife and threatened and endangered species in the Study Area. Threatened and endangered species is the classification given to a plant or animal that is in danger of extinction throughout all or a large portion of their range, or are likely to become endangered in the future. As discussed below, none of the alternatives would have significant impacts on plants and wildlife. No threatened and endangered species were found in the Study Area.

3.14.1 What Methods were Used?

The identification of plants, wildlife and threatened and endangered species consisted of record searches and field investigations. Information was obtained from the following sources to provide initial direction and focus for field assessments: The United States Department of Agriculture Soil Survey for St. Clair County, St. Clair County Plat Book, St. Clair County Element List courtesy of the Michigan Department of Natural Resources, and United States Fish and Wildlife Service federal list of threatened and endangered species and National Wetland Inventory maps. A request was made to the Michigan Department of Natural Resources and Michigan Natural Features Inventory for records and information on state threatened or endangered species, and species of concern previously identified within the Study Area or surrounding areas (see **Agency Early Coordination Letters in Appendix D.1**).

These resources allowed qualified biologists to focus on specific species and habitats during the field reviews of the Study Area. Specific target species and target habitat were identified based on information received from the Michigan Department of Natural Resources and the Michigan Natural Features Inventory. Target species are state or federally listed as threatened, endangered, or species of concern and determined by past studies and literature reviews to potentially live in the Study Area. Target habitats are those

What is habitat?

An area that provides an animal or plant with adequate food, water, shelter, and living space.

habitats identified in the literature and past studies that support the target species.

Field investigations were conducted in accordance with Section 365 of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended, and "Guidelines for Conducting Endangered and Threatened Species Surveys", as set forth by the Endangered Species Coordinator with the Wildlife Bureau, Michigan Department of Natural Resources. Field inspections included a minimum of two qualified biologists visually inspecting all of the Study Area and recording all observations of plant and animal species present. Biologists recorded each different community type on aerial photography maps (see **Threatened and Endangered Species Assessment Technical Memorandum**).

3.14.2 What does the Existing Environment Look Like?

The following paragraphs discuss the existing plant habitats, wildlife habitats and threatened and endangered species that are found in the Study Area.

Farm field near the Study Area

Habitats: Thirty-three distinct community types were identified within the Study Area. The majority of these areas consist of developed land, disturbed land, farm field, old field, road side ditches, maintained right-of-way, and segmented wetland areas with relatively low native plant diversity. Native plants are those species that occur naturally in any given area. The habitat types located in the Study Area are typical for Southeastern Michigan.

Wildlife: Based on field surveys, the plant communities in the Study Area provide the type of wildlife habitat that includes many introduced/exotic plants and supports some animal species found in Southeastern Michigan. These plant communities can provide protective cover, nesting/denning sites, and food sources for a variety of wildlife species. However, due to the existing development in the Study Area, wildlife diversity is limited to those species which are tolerant of human activities.

Threatened and Endangered Species: Threatened and endangered species surveys were conducted from September 2003 through July 2004. Two animal species, the spotted turtle (*Clemmys*

guttata) and round hickory-nut mussel (*Obovaria subrotunda*), were identified by the Michigan Department of Natural Resources and the Michigan Natural Features Inventory as having potential to exist within the Study Area. The spotted turtle is a state threatened species while the round hickory-nut mussel is a state endangered species.

The spans of the Blue Water Bridge provide habitat for the Peregrine Falcon (*Falco Peregrinus*) and have been monitored by the Michigan Department of Natural Resources since 2005 because the State of Michigan considers them to be an endangered species. The bridge spans are outside of the study limits of this project and the falcon habitat will not be affected by any of the alternatives.

Spotted Turtle: The spotted turtle can live in many different types of wetlands, but is typically found in bogs, boggy ponds, fens, sphagnum seepages, and grassy marshes. This species prefers shallow, clean water with mud bottom and clumps of sedge or marsh grass (Lee 2000). Nesting occurs in mid-June on well-drained soils that receive full sunlight.

Fens, bogs, and sphagnum seeps are not present within the Study Area. However, grassy marshes are present in habitat areas 16 and 17 as shown on **Figure 3.14.1**. These areas are dominated by reed canary grass and open water is present, but only within the banks of Stocks Creek.

The Michigan Natural Features Inventory indicated that the marsh near Stocks Creek is potential spotted turtle habitat. This marsh includes Areas 16, 17, and 18 as shown in **Figure 3.14.1.** Area 16 consists of a large emergent and wet meadow wetland near Stocks Creek. It is surrounded by upland slopes where potential spotted turtle nesting habitat could exist. These areas were surveyed throughout the study period. Although these areas contain potential habitat for the spotted turtle, no spotted turtles were observed.

Round Hickory-nut Mussel: The round hickory-nut mussel is most commonly found near the mouth of medium and large rivers with moderate flow and sand and gravel bottoms (Carman 2001). The Michigan Natural Features Inventory identified the Black River as potential habitat for this mussel

What is a bog?

A bog is a type of wetland that builds up peat, has no inflows or outflows of water, and is acidic.

Spotted Turtle

What is a fen?

A fen is a nutrient rich, organic wetland influenced by mineral-rich groundwater.

What is a wet meadow?

A wet meadow is a grassland with waterlogged soils.

Round Hickory-Nut Mussel

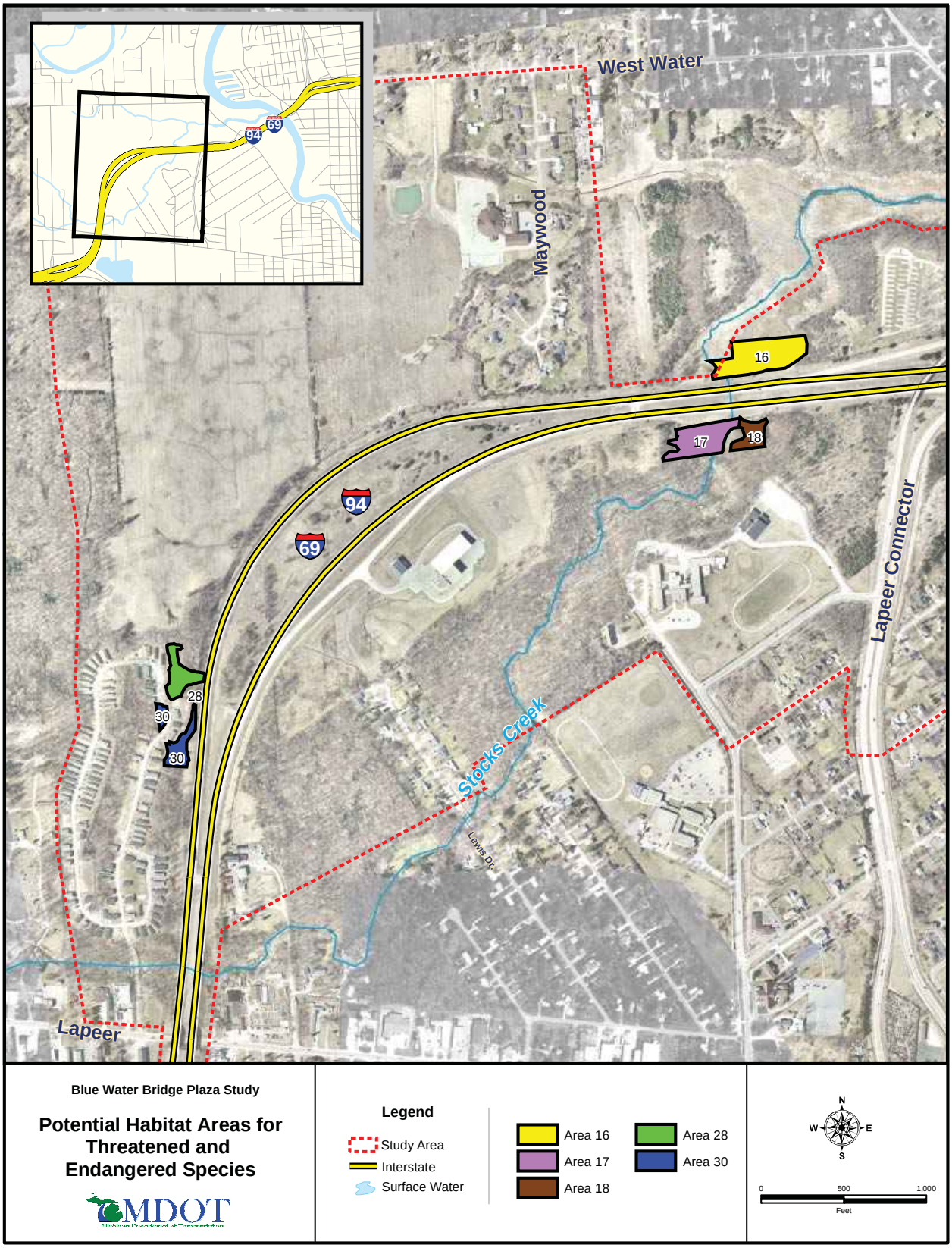

West Water
Maywood
Lapeer Connector
Stocks Creek
Lewis Dr.
Lapeer
94
69
16
17
18
28
30
30
Blue Water Bridge Plaza Study
Potential Habitat Areas for Threatened and Endangered Species
MDOT
Legend
Study Area
Interstate
Surface Water
Area 16
Area 17
Area 18
Area 28
Area 30
N
W
E
S
0
500
1,000
Feet

Figure 3.14.1

species. Within the Study Area the Black River has a wide, straight channel that has been dredged in the past. Water clarity in the river was low during all site visits. Boat launches are located upstream and downstream of the Black River Bridge. The Black River has been widened downstream of the bridge near the existing marinas. Riverbanks show signs of erosion and contain large amounts of debris including old boats, broken concrete, and household garbage.

Investigations for the round hickory-nut mussel focused on water quality and river bottom substrates in the Black River. Fourteen sediment samples were collected from the Black River. Twelve of the 14 samples were made up of fine sediments dominated by silts, clays and organics. Two samples collected at the mouth of Stocks Creek consisted of coarse sands that are similar to habitat preferred by the round hickory-nut mussel. No round hickory-nut mussels were found in any of the samples.

Plant Communities: No threatened, endangered or special concern plant species were found in the Study Area. None of the identified community types contain a Floristic Quality Index (FQI) value that would be considered high. The better a plant community is, the higher it's floristic quality index and the possibility of it containing threatened, endangered, or special concern plant and animal species. On the other hand, plant communities that are impacted by many types of human disturbances have more invasive plant species, lower FQI values, and less chances of containing threatened, endangered, and/or species of concern.

What are invasive species?

Invasive species are introduced, non-native species that out compete native species for space and resources.

Five of the 33 habitat areas identified consist of large or diverse wetland complexes. While these areas are not believed to have threatened and endangered plant species, they are identified as the highest quality habitats in the Study Area. More discussion on wetlands in the Study Area is located in **Section 3.13 Wetlands**.

Fish and Aquatic Biota: To determine the biological quality of the Black River and Stocks Creek within the Study Area, the biological makeup of the watercourses was sampled by aquatic biologists according to the Great Lakes Environmental Assessment Section (GLEAS), Procedure #51, *Qualitative*

Biological and Habitat Survey Protocols for Wadable Streams and Rivers (1997). The survey provided an evaluation of the macroinvertebrate and fish communities along with the quality of aquatic habitat present in the Study Area.

What are macroinvertebrates?

Macroinvertebrates are invertebrates visible to the naked eye, such as insects crayfish, and worms. Macroinvertebrate studies provide a good environmental indicator of stream health because many species are known to be either tolerant or intolerant of pollution.

Black River: The Black River is a warm water stream with cool water fisheries. Results of Black River surveys indicated poor water quality conditions with degraded habitats and poor macroinvertebrate communities. In consolation with MDNR it was determined that sampling for fish was not necessary. However, discussions with the MDNR, Fisheries Division, revealed that the Black River receives annual spawning runs of steelhead (*Oncorhynchus mykiss*) and chinook salmon (*Onchorhychus tshawytscha*). Spawning is not known to occur within the Study Area, but does occur in upstream reaches, where hard, gravel and cobble bottom substrates are present. In addition, a large emergent wetland system is present immediately upstream of the confluence of Stocks Creek that contains potential nursery, spawning, and feeding habitat for a variety of warm and cool water fish species.

Stocks Creek: The habitat quality associated with Stocks Creek is good to excellent. However, fish and macroinvertebrate communities are indicative of a stream with lower water quality. One reason for the degraded biological communities may be a lack of connection to higher quality in-stream habitats. Between the sampling locations in Stocks Creek and the Black River, Stocks Creek has been altered and appears to be highly degraded, perhaps eliminating fish migration between systems. Upstream influences may also be contributing to degraded water quality. However, a more detailed analysis would be required to identify specific reasons for the lack of aquatic macroinvertebrate diversity where relatively good physical habitat is present.

3.14.3 Will the Project Impact any Plants, Wildlife, or Threatened and Endangered Species?

The following paragraphs describe the potential impacts caused by each of the alternatives.

No-Build Alternative: The No-Build Alternative would have little or no impact on the plants, wildlife or threatened and endangered species within the Study Area.

Build Alternatives: Of the Build Alternatives, the Township Alternative would have more impacts than the City Alternatives on the plants, and wildlife within the Study Area. However, none of the Build Alternatives would have a significant impact.

Wildlife: Because the impacted areas are near existing roads and developed areas, the plant communities that would be eliminated are not considered good wildlife habitat. Wildlife species that would be affected are common in the surrounding area, tolerant of noise and visual disturbances, and would easily relocate to similar habitats.

Threatened and Endangered Species: No state or federally threatened and endangered animal species were found within the Study Area. However, habitat areas that could be used by the spotted turtle are present within Areas 16, 17, and 18 (**Figure 3.14.1**). The Township Alternative is the only alternative that impacts these areas. The majority of impact is associated with Areas 17 and 18 where the habitat quality for the spotted turtle is low. Although the Township Alternative impacts Area 16, the impacts would be small because most of the work is restricted to the existing road right-of-way.

All of the alternatives impact the Black River, where the round hickory-nut mussel has been previously recorded to occur. Sediment samples revealed that habitat for the mussel is not present within the Study Area and Alternatives are not expected to impact the mussel or its habitat.

Black River Bridge

Special care will be given when working in potential spotted turtle habitat. The spotted turtle hibernates in shallow water under the mud through out the winter. No work will occur in wetland areas adjacent to Stocks Creek between mid-October and the end of March. During construction, thorough searches will be conducted for the turtle within the work area. Any turtles found will be relocated to an appropriate safe area. Barriers will also be constructed to prevent re-entry of the turtle into the work area.

No threatened and endangered plant species were found within the Study Area. All plant communities within the Study Area were found to be low quality. However, five habitat areas (16, 17, 18, 28, and 30), shown in **Figure 3.14.1**, have relatively high plant diversity and/or are larger wetland complexes that provide wildlife habitat. While these areas did not have threatened and endangered plant species, they were identified as having the highest quality native plant assemblage within the Study Area. Habitat Areas 28 and 30 would not be affected by the Build Alternatives. The Township Alternative would have minor impacts to Areas 16, 17, and 18.

Habitat Area 16 contains large areas of reed canary grass, an invasive species, with no open water areas except within the banks of Stocks Creek. Area 17 contains wet meadow and scrub-shrub areas near Stocks Creek, and Area 18 contains forested wetland and seasonal standing water.

Minor impacts are anticipated in Area 16, along the I-94 /I-69 right-of-way. These impacts would be associated with new lane construction necessary to accommodate traffic to and from the Blue Water Bridge crossing, and off-site plaza areas to the west. The majority of the impacts to plant communities would occur in Areas 17 and 18, within the area of Stocks Creek. Relocation of the new lanes to the north would minimize impacts to the more diverse habitats associated with areas 17 and 18, but would require greater impacts to habitats associated with area 16.

Plants: The Township Alternative is the only alternative that impacts higher quality plant habitats within the Study Area. Impacts are not expected to be major with any build alternative. No unique or special plant communities exist within the Study Area and any species that would be affected are common to urbanized areas in the vicinity of the Study Area.

Fish and Aquatic Biota: Overall impacts to the fish and aquatic biota within the Black River are expected to be minimal under all of the alternatives. Surveys conducted in the Black River indicate the biotic habitat to be poor and a macroinvertebrate community tolerant of poor water quality conditions. Bridge

construction could result in loss of specific areas for macroinvertebrate production, however overall impacts are expected to be minor.

Stocks Creek could potentially be impacted by the Township Alternative through the extension of the stream enclosure under I-94/I-69 and the new M-25 Connector extension. The existing Stocks Creek structure is 210 feet in length. The new Stocks Creek structure for I-94/I-69 would be approximately 130 feet while the new structure for the M-25 Connector would be approximately 250 feet. These two structures would be separated by approximately 170 feet of open median. An increase in the Stocks Creek stream enclosure could result in negative resource impacts to the creek. Stream enclosures can result in significant habitat changes, essentially eliminating bottom bank, and other in-stream habitats. These impacts could result in migration barriers to fish, excluding them from areas of required or preferred habitats. Enclosures also eliminate sunlight penetration, which is necessary for primary production. Loss of primary production results in a reduction in food sources in downstream waters, thereby reducing fish and macroinvertebrate production. All efforts will be made during the design phase of the project to minimize the length of stream enclosures to Stocks Creek.

What is primary production?

The growth produced by the organisms on the bottom of the food chain (plants, algae), which fuels the rest of the food chain.

For both the City East and City West Alternatives, the new Stocks Creek structure would be the same length as the existing structure, 210 feet.

3.15 Cultural 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.

What are Cultural Resources?

Sites, structures, landscapes, and objects that are of some importance to a culture or community for scientific, traditional, religious, or other reasons.

To satisfy Section 106 of the National Historic Preservation Act and Section 4(f) of the Department of Transportation Act, MDOT coordinated with the Michigan State Historic Preservation Office (SHPO) to identify an Area of Potential Effect (APE) for the project. The SHPO recommended that MDOT conduct historic and archaeological surveys to locate sites eligible for listing on the National Register of Historic Places (NRHP).

What is the State Historic Preservation Office (SHPO)?

Established by the National Historic Preservation Act of 1966, the SHPO is an agency within each state, territory and protectorate government charged with enforcing the provisions of the Act. SHPOs receive federal funds from the National Park Service and allocate matching funds and grants to local agencies and private citizens for the protection of sites eligible for listing in the National Register of Historic Places.

Native American Consultation: The Study Team sent an early coordination letter dated, October 10, 2002, to the federally recognized Saginaw Chippewa Indian Tribe. The Saginaw Chippewa Tribe responded in a letter dated November 12, 2002, stating that they do not have any information concerning the presence of any Indian Traditional Cultural Properties, Sacred Sites, or other Significant Properties in the APE.

The APE for this project is the same as the Study Area, a 924-acre area roughly centered on the Blue Water Bridge Plaza in Port Huron, St. Clair County, Michigan along with parts of the Study Area in Port Huron Township. The APE addresses a worst-case scenario for the potential 2030 footprint of the future plaza. The Study Team evaluated historic structures and performed archaeological field exploration and testing as needed. The Study Area for cultural resources, shown in **Figure E.21**, located in the separate **Appendix E** volume, has generally been determined as the limits of the APE.

3.15.1 How did the Study Team Identify Historic Properties?

Study Team historians conducted a study 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

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

The official list of cultural resources worthy of preservation maintained by the National Park Service. Authorized under the National Historic Preservation Act of 1966, the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

What is the Area of Potential Effect (APE)?

The geographic area or areas within which a project may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effect is influenced by the size and nature of a project and may be different for different kinds of effects caused by the project.

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

Previous surveys for above-ground cultural resources were conducted within the APE. These surveys included a 1983 survey for improvements planned to the Blue Water Bridge Plaza at that time. St. Clair County also performed an inventory of historic structures countywide in 1983. Of the 102 structures inventoried by both surveys, none were recommended as eligible for listing on the NHRP. Currently 35 of the 102 previously surveyed structures still exist.

In 1994, an updated Environmental Report was produced for the second Blue Water Bridge and earlier plaza improvements. At that time, the only recognized resource eligible for the NRHP within that study's Area of Potential Effect (APE) was the original Blue Water Bridge itself. By that time, the original plaza had been documented, demolished, and reconstructed.

3.15.2 What Historic Properties are in the Study Area?

The Study Team conducted a Cultural Historic Survey for above-ground cultural resources in March and September 2003 and identified an additional 184 structures older than 50 years of age in addition to those 35 structures that were previously

surveyed. In total, the Study Team assessed the eligibility for 219 structures for listing on the National Register of Historic Places. Of these, only one structure, located at 2511 10th Avenue and known as the E.C. Williams House, was recommended as eligible for the NRHP.

The E.C. Williams House is a Registered Michigan Historic Site, and is eligible for the NRHP under Criterion B for its association with E.C. Williams, a prominent local newspaper publisher in the area's history. It is also eligible for the NRHP under Criterion C, as an excellent example of an early Queen Anne duplex residence.

3.15.3 Are there Archaeological Sites in the Study Area?

Prior to any archaeological field work, the Study Team researched the archives for the area and discovered one previously recorded archaeological site (20SC155) within the Area of Potential Effect. This site has been determined as ineligible for listing on the NHRP. In a letter dated September 18, 2003, from the SHPO to MDOT, SHPO stated that the area of the project between Stock's Creek and the existing plaza required no survey. As site 20SC155 is located within this area, SHPO determined no further work was necessary.

Also within the 2003 letter, SHPO requested that the Study Team archaeologists conduct deep testing on both sides of the Black River. September 2, 2004, the deep testing was conducted by a geomorphologist who assessed the disturbance on the east side of the Black River and recommended no further work. On the west side of the Black River, however, five trenches measuring approximately six yards in length were excavated. These trenches were placed approximately 66-yards to 131-yards apart with the last trench (Trench #5) located 372-yards west of the Black River crossing. The buried surface encountered in each trench was very marshy and likely would have been unsuitable for human occupation or encampment. The area has also been disturbed by earlier construction. Neither evidence of prehistoric occupation nor potential historic artifacts were found. Therefore the potential for archaeological resources is low.

What Do Archaeologists Mean When They Use the Word Disturbed?

Areas where an event or action has occurred that changed the context of materials within a site, such as moving and mixing materials between layers of soil. Some causes of disturbance are farming, heavy construction, rodent burrowing, and natural forces such as floods. Important archaeological resources are less likely to be found in disturbed areas.

What is Deep Testing?

The use of specialized equipment and methods to test for cultural deposits that may be buried in the ground beyond the limits of normal testing methods. Some tools used to conduct deep testing are backhoes and augers. This work is usually directed by a soil specialist such as a geomorphologist.

What is a Geomorphologist?

A person who studies the characteristics, origin, and development of landforms.

Additionally, SHPO stated in a letter dated September 18, 2003 that MDOT would need to conduct an archaeological survey for the route of the proposed new connector road along with the footprint of the potential new plaza for the Township Alternative. A portion of the area has been developed into an MDOT facility and is already disturbed. In September 2005, Study Team Archaeologists surveyed some of the undisturbed areas that would be impacted by the Township Alternative including the median area between the eastbound and westbound lanes of I-94/I-69 and 62 acres of the proposed plaza site for the Township Alternative. MDOT could not obtain permission to survey the remaining portions of the potential plaza site for the Township Alternative from the property owner. The survey consisted of a walkover by two archaeologists and shovel probes at key locations. No artifacts were discovered in this survey and the archaeologists concluded that there would be a low probability of finding any archaeological resources in the Study Area.

3.15.4 Will the Alternatives Affect Historic Properties?

The following paragraphs discuss the potential effects of the Alternatives on cultural resources. Potential effects on historic properties and archaeological sites are discussed separately.

The historic survey described above found only one property within the Area of Potential Effect, the E.C. Williams House, eligible for the National Register of Historic Places.

No-Build Alternative: The No-Build Alternative will have no effect on the E.C. Williams House.

City East Alternative: The City East Alternative would not take any of the E.C. Williams House property, so there would be no direct impact on the house or yard, located at 2511 10th Avenue. For the City East Alternative, the reconstruction of the plaza would have a number of indirect effects on the property. The house currently is located on a small urban lot, surrounded on all sides by smaller residential properties of varying ages and levels of repair. The E.C. Williams House is more than a full block away from the existing bridge plaza. This block (bounded by Church Street on the north, 10th

Avenue on the east, Elmwood Street on the south, and Pine Grove Avenue on the west), provides a visual buffer between the existing plaza and the house. The neighborhood contains numerous mature trees and is long-established.

Front View E.C. Williams House

The City East Alternative would acquire the block that buffers the house from the existing plaza to accommodate the realignment of Pine Grove Avenue. The houses and businesses located on the south side of Church Street and on the west side of 10th Avenue would be acquired and the block would be converted to landscaped open area and the realigned curve section of Pine Grove Avenue, as shown in **Figure 3.15.1.**

Side View E.C. Williams House

In addition, the automobile dealership on the western half of the block containing the E.C. Williams House would be acquired for the realignment of Pine Grove Avenue. Since the automobile dealership is not contributing to the historic value of the E.C. Williams House, any impacts from MDOT acquiring the dealership property would be neutral to the house.

The realignment of Pine Grove Avenue will bring the traffic noise and glare closer to the E.C. Williams House, though traffic volumes immediately next to the house on 10th Avenue are not anticipated to substantially change. Traffic volumes on Church Street would decline with its closure as a cul-de-sac. The residences on Church Street directly across from the E.C. Williams House would be removed for the plaza buffer. While these residences do not have a direct relationship with the E.C. Williams House, they provide a residential context for the house and some buffer between the existing plaza and the house.

The changes in landscape and traffic will not affect the characteristics that make the E.C. Williams House historically significant. Landscaping and the design of the curve realigning Pine Grove Avenue, if feasible, could minimize its intrusion on the remaining homes in the neighborhood, including the E.C. Williams House. Based on this and the fact

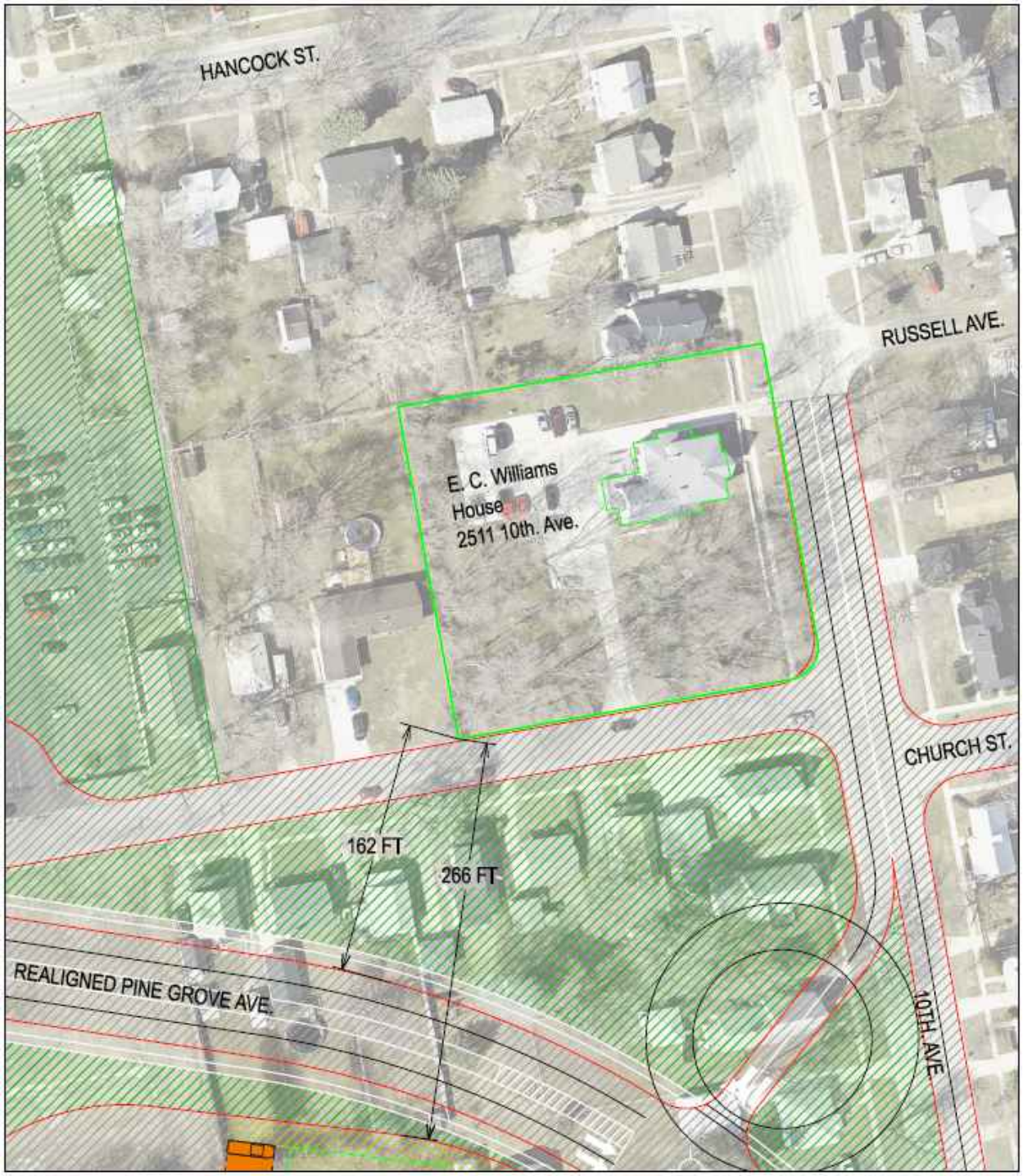
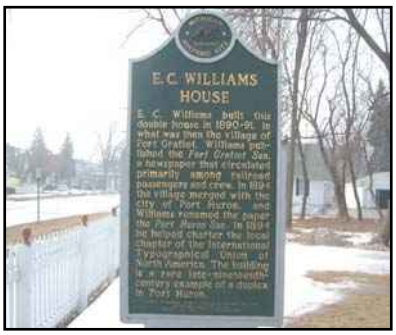


Figure 3.15.1 City East Alternative

that this structure has always been within an urban setting, MDOT has received concurrence, February 1, 2006 from SHPO that the City East Alternative will not adversely affect this property. Although the City East Alternative would not impact the E.C. Williams House, selecting this alternative as the Preferred Alternative is not prudent due to the security and safety concerns related to combining Pine Grove Avenue and 10th Avenue.

City West (Preferred) Alternative: The City West Alternative would directly affect the E.C. Williams House property. Currently, the E.C. Williams House is more than a full block away from the existing bridge plaza. The Preferred Alternative would acquire the block that buffers the house from the existing plaza and the block on which the E.C. Williams House resides. The new northern and eastern boundaries of the plaza would be Hancock Street and 10th Avenue. The houses and businesses located on the south side of Hancock Street, on the north side of Church Street, and on the west side of 10th Avenue would be acquired and the block would be converted to two separate office buildings along with employee and visitor parking (shown in **Figure 3.15.2).**



Historic Marker for E.C. Williams House

Based on the direct impact to the house, MDOT has received concurrence from SHPO on March 15, 2007 that the Preferred Alternative will adversely affect this property. See **Chapter 4.0 Section 4(f) and 6(f) Evaluation** and **Chapter 5.0 Mitigation** for more information. A draft Memorandum of Agreement (MOA) is included in Appendix D.

Township Alternative: The Township Alternative does not propose any new road construction closer to the E.C. Williams House than the current road configuration. The existing plaza would be reconfigured for different use, but would remain within its current footprint.

3.15.5 Will the Alternatives Affect Archaeological Sites?

No-Build Alternative: The No-Build Alternative will have no effect on known archaeological resources.

City East Alternative: The City East Alternative will have no effect on known archaeological resources. All construction would take place within existing disturbed areas.

Figure 3.15.2 City West Alternative

City West (Preferred) Alternative: The Preferred Alternative will have no effect on known archaeological resources. All construction would take place within existing disturbed areas.

Township Alternative: The Township Alternative would create a new plaza facility on mostly open space. A portion of the proposed new plaza area has been developed into an MDOT maintenance facility and is already disturbed.

Archaeological surveys of areas that would be impacted by the Township Alternative found no historic or prehistoric artifacts. The median area between the eastbound and westbound lanes of I-94/I-69 was extensively disturbed during the construction of the freeway and no artifacts were recovered. Archaeologists also found no artifacts during the survey of the 62 acres of the potential plaza site for the Township Alternative and no artifacts were found on the site of the existing MDOT maintenance facility. Study Team archaeologists concluded that there is a low probability of finding any archaeological resources in the areas that would be impacted by the Township Alternative. Based on this information, MDOT received concurrence on February 1, 2006 from SHPO that the Township Alternative would have no adverse effect on archaeological resources. No further archaeological investigations are recommended. In the event of an archaeological discovery during construction, work will be halted in the area of the discovery and MDOT will coordinate with SHPO regarding the find.

3.16 Potential Contaminated Sites

The Study Team performed two contaminated site surveys of the areas surrounding the existing Blue Water Bridge Plaza and the potential relocated plaza site for the Township Alternative. The purpose of these surveys was to locate and identify potential contaminated sites within or near to the potential areas of construction. Such sites would contain Recognized Environmental Conditions (RECs). This section summarizes the results of these contaminated sites surveys. **Figure E.23,** in the separate **Appendix E** volume, shows the approximate locations of potential contaminated sites in the Study Area.

Recognized Environmental Conditions (RECs)

The presence of or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products.

3.16.1 What Methods were used to Determine if Contaminated Sites Exist in the Study Area?

The contaminated sites search included a review of regulatory databases on known contaminated sites, a review of the history of land uses in the area, a walkover, and discussions with the companies that provide power, water, and sewer services.

The Study Team used the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Standard E1527-00) in developing the geographical areas for the database reviews and walkovers. Contaminated sites specialists completed site walkovers on October 2, 2003 for the area surrounding the existing plaza, and on March 11, 2004 for the area surrounding the relocated plaza for the Township Alternative. The purpose of the site visits was to locate the sites identified through the database review and to locate any additional suspect sites not identified through the database review.

Review of Regulatory Lists and Databases: The Study Team reviewed the following state and federal regulatory agency lists and databases to identify potential regulated and/or environmentally impacted sites in the vicinity of the Study Area:

- MDEQ – Remediation and Redevelopment Division (RRD), Michigan Act 451 Part 201 Sites of Environmental Contamination; 1-mile radius. (Part 201 Contaminated Sites)
- MDEQ – RRD, Open and Closed Leaking Underground Storage Tank (LUST) Sites; 1/2-mile radius. (Open LUST/Closed LUST)
- MDEQ – Waste and Hazardous Materials Division (WHMD), Registered Underground Storage Tanks (UST)
- MDEQ – WHMD, Operating Solid Waste Landfills in Michigan listing, Solid Waste Disposal Areas in Michigan listing, and the Inactive Landfill listing;1/2-mile radius
- United States Environmental Protection Agency (USEPA) Superfund Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Hazardous Waste Sites; 1/2-mile radius
- USEPA Superfund CERCLIS Archive No Further Remedial Action Planned (NFRAP) sites
- USEPA Superfund NPL listing; 1-mile radius
- USEPA Federal Resource Conservation and Recovery Act of 1976 (RCRA) Large Quantity Generators (LQG) and Small Quantity Generators (SQG) List for Michigan
- USEPA RCRA Treatment Storage and Disposal (TSD) Facilities List; 1/2-mile radius
- Federal Resource Conservation and Recovery Information System (RCRIS) Corrective Action (CORRACTS) Facilities List; 1-mile radius
- USEPA Emergency Response Notification System (ERNS) List
- MDEQ Baseline Environmental Assessment (BEA) List

Contaminated sites specialists went to the sites identified in the regulatory database search where possible. Further details are discussed below.

Review of Historical Land Uses: The Study Team also conducted a historical review of the former uses of properties in the Study Area to determine any potential contaminated sites. This historical review included four different types of information:

- Topographic maps produced by the U.S. Geological Survey which show roadways and name some specific prominent land uses (schools, industry, parks, etc.)

- Historic aerial photographs of the Study Area and surrounding areas, dating from the 1940s until the present day

- Sanborn fire insurance maps of the project area for those parts of the Study Area covered by these maps near the existing plaza site

- Local street directories dating as far back as 1906 for the On-site Study Area surrounding the existing plaza and to the year 1936 for the Off-site Study Area in Port Huron Township

For the On-site Study Area surrounding the existing plaza, the reviews identified 18 potential sites that could be labeled as RECs. This included four gas stations, four former gas stations, three auto service/maintenance garages, an auto wash, an oil change facility, a dry cleaner/former gas station, a former truck stop, a substation transit yard, a railroad spur/coal yard, and a combination of former auto parts manufacturing facility/sheet metal contracting/railroad spur/exterior storage.

Many gas station sites are RECs

For the Off-site Study Area, the reviews identified two potential sites representing RECs in connection with the Study Area. One site was a property that had housed a former gas station, a roofing/siding company and a restaurant. The other site had a former gas station and subsequently has been redeveloped as a small office plaza.

Walkover/Interviews: The historical review identified many of the same sites identified through the review of state and federal agency lists. After concluding the database and historic documentation reviews, the Study Team then conducted walkovers of the Study Area to identify additional RECs and verify potential contaminated sites where possible. The walkover for the On-site Study Area was performed on October 22, 2002 and the walkover for the Off-site Study Area was performed on March 11, 2004. The walkovers considered

chemical use and storage, evidence of underground and above ground storage tanks, equipment containing polychlorinated biphenyls (PCBs), and sites that generate, treat, store, or dispose of waste.

Walkovers only evaluated the outside of buildings where documented. Blue Water Bridge staff were interviewed for additional information about the usage of hazardous materials on the existing bridge plaza site.

On-site Study Area Walkover: The walkover verified the presence of 18 potential sites representing RECs in the On-site Study Area.

Above Ground Storage Tank

Underground storage tank systems (USTs) were observed in the Study Area and represent RECs. There were former aboveground storage tanks (ASTs), but they are not considered RECs in connection with the Study Area because there was no staining on the concrete at the former tank locations.

Underground Storage Tank

The walkover also identified potential RECs associated with the Detroit Edison Substation adjacent to the existing plaza. No evidence of leakage from the transformers at other locations was found, nor were stains observed on the ground beneath or around them. Based on the age of the Substation Transit yard (present since at least 1948), PCBs were potentially used with the transformers.

There was no visual evidence of the generation, treatment, storage, or disposal of liquid or solid wastes observed in the On-site Study Area other than household and commercial restaurant waste. Based on the age of the buildings located within the Study Area, asbestos-containing materials and/or lead-containing paint may be present. There is a well for monitoring methane gas within the Study Area, but it is not considered a REC. Gas samples will be taken from all boring drill holes to evaluate the presence of methane or other gases.

Methane gas in Port Huron comes from the bedrock found within the area. It is sometimes expelled from median to stiff clays with water under significant pressure but more frequently it is just vented. As supports for major structures

are driven by piles or drilled, shaft methane is a concern as the foundation structure may create a channel for methane gas to flow to the surface of foundation levels including basements. Support of single story structures such as toll or bridge inspection booths will be on shallow footing. Therefore, it is not expected that methane gas will be encountered during or after construction. Although there is a remote chance that sand seams could carry the gas to the surface/foundation level.

Off-site Study Area Walkover: The walkover verified the presence of two potential sites representing RECs in connection with the Off-site Study Area.

One of the two sites had a documented LUST, and had experienced some past remediation efforts through tank removal, though contaminated soil was never removed from the site.

What is a LUST?

Leaking Underground Storage Tank

A number of electrical utility transformers (both pad and pole-mounted) were observed, but with no evidence of leakage. There was no visual evidence of the generation, treatment, storage, or disposal of liquid or solid wastes observed on the Study Area other than household and commercial/restaurant wastes. Based on the age of the buildings located within the Study Area, asbestos-containing materials and/or lead-containing paint may be present.

3.16.2 Will the Alternatives Affect any Contaminated Sites?

No-Build Alternative: There would be no impacts to potentially contaminated sites as a result of the No-Build Alternative.

All three Build Alternatives would require the acquisition of potentially contaminated sites beyond the limits of the existing Blue Water Bridge facilities, and these properties have been described above and in the tables that follow. In addition, there are documented contamination sites located within the existing Blue Water Bridge plaza area that could be impacted by the City East and the City West Alternatives.

City East and West Alternatives: A total of 20 RECs were identified during the assessment of existing conditions. Eighteen of these sites could be affected by construction as

part of the reconstruction of the existing plaza under the City East or City West Alternatives. Two sites would be impacted by reconstruction of the Water Street interchange. **Table 3.16.1** gives an inventory of the 20 RECs located within the limits of the area potentially impacted by the City Alternatives.

Township Alternative: The Township Alternative would potentially affect ten RECs that were identified during the assessment of existing conditions. Every one of these ten sites would potentially be affected by construction of the City Alternatives. None of these properties are on or near the site of the new plaza. The ten properties would be affected by improvements to local roadways under the Township Alternative, including the reconstruction of the Water Street interchange, Pine Grove Avenue, Hancock Street and the M-25 Connector. **Table 3.16.2** gives an inventory of the ten RECs located within the limits of the Township Alternative. The site numbering is consistent with the sites listed in **Table 3.16.1**.

Mitigation: Further consideration of contaminated sites and hazardous materials in the Study Area will be necessary to ensure the safety of workers during construction, prevent any future migration of existing subsurface contaminants, and address potential liability associated with purchase of those parcels. Under any of the Alternatives, a Phase II subsurface assessment will be needed to further investigate the contamination at the REC sites (20 under the City East and Preferred Alternative and ten under the Township Alternative). Depending upon the findings of the Phase II assessment, it may be necessary to perform further investigation or remediation.

Any structures acquired for the project should be tested for asbestos-containing materials and lead-containing materials before demolition.

Table 3.16.1 Potential RECs Affected by the City East and City West Alternatives

REC #	General Portion of Study Area	Use at Time of Study	Notes on Other Previous Uses
1	Hancock St. Area	car wash	previously residential
2	Hancock St. Area	gas station	residential, parking lot
3	Hancock St. Area	gas station	gas station since 1926±
4	Pine Grove Ave. North of Existing Plaza	auto sales and repair	residential
5	Pine Grove Ave. North of Existing Plaza	gas station	auto dealer, residential
6	Pine Grove Ave. North of Existing Plaza	vacant	grocery, gas station
7	Existing Plaza	n/a, under current BWB plaza since 1990s reconstruction	former BWB maintenance facility; hydraulic hoists and salt storage
8	Existing Plaza	n/a, under current BWB plaza since 1990s reconstruction	former gas station
9	Pine Grove Ave. South of Existing Plaza	parking lot	part of dairy facilities, gas station
10	Pine Grove Ave. South of Existing Plaza	auto sales and repair	auto use since 1930s
11	Existing Plaza	n/a, under current BWB plaza since 1990s reconstruction	coal storage/distribution, railroad spur
12	Harker Street	vacant	truck fueling facility
13	Existing Plaza	electrical utility substation	
14	Existing Plaza	BWB ramp right of way	gas station
15	Existing Plaza	duty free store, ramp right of way	general contractor, florist, auto parts metal contractor, commercial sales, railroad spur, exterior storage mounds
16	Hancock St. Area	gas station	auto dealer, fruit market, agricultural
17	Hancock St. Area	oil change facility	residential
18	Pine Grove Ave. South of Existing Plaza	On-site dry cleaning	gas station
19	Water Street	commercial	gas station, roofing contractor, restaurant
20	Water Street	commercial strip plaza	gas station

Table 3.16.2 Potential RECs Affected by Township Alternative

Site #	General Portion of Study Area	Use at Time of Study	Notes on Other Previous Uses
1	Hancock St. Area	car wash	previously residential
2	Hancock St. Area	gas station	residential, parking lot
3	Hancock St. Area	gas station	gas station since 1926±
4	Pine Grove Ave. North of Existing Plaza	auto sales and repair	residential
9	Pine Grove Ave. South of Existing Plaza	parking lot	part of dairy facilities, gas station
10	Pine Grove Ave. South of Existing Plaza	auto sales and repair	auto use since 1930s
16	Hancock St. Area	gas station	auto dealer, fruit market, agricultural
18	Pine Grove Ave. South of Existing Plaza	on-site dry cleaning	gas station
19	Water Street	commercial	gas station, roofing contractor, restaurant
20	Water Street	commercial strip plaza	gas station

3.17 Farmland

3.17.1 How Much Farmland Exists in the Study Area?

Although the existing plaza is located within the City of Port Huron, the Study Area includes a rural/suburban area of Port Huron Township that, at one time, was used for agricultural purposes. At this time, inactive agricultural land still exists in the Port Huron Township portion of the Study Area, however it has been rezoned for residential development.

Farm in St. Clair County

According to the 2002 Census of Agriculture, St. Clair County has 242,034 acres of actively farmed land representing 52 percent of the land in the county. It includes crop land, feed lots, permanent pastures and related agriculture uses. Farming accounts for three percent of the county's total employment. The average size farm in St. Clair County is 145 acres, with half of the farms being smaller than 70 acres. The average estimated market value of farmland and associated buildings in St. Clair County is $3,970 per acre.

Part 361, Farmland and Open Space Preservation, of the Natural Resources and Environmental Protection Act, Public Act 451 of 1991 formerly known as the Farmland and Open Space Preservation Program (PA116) of 1974 preserves farmland and open space through restrictive covenants and provides tax incentives for participation in the program. It enables a farm owner to enter into a Development Rights Agreement with the state, which ensures that the land remains in an agricultural use for a minimum of 10 years. In return for maintaining the land in an agricultural use, the landowner is entitled to certain income tax benefits, and the land is not subject to special assessments for sanitary sewer, water, lights or non-farm drain projects.

St. Clair County's Purchase of Development Rights Program is a voluntary program that compensates owners of agricultural property for their willingness to accept a permanent deed restriction on their land that limits future development of the land for non-agricultural purposes. Landowners are compensated for the fair market value of their land based on the difference between what it could be sold for on the open market with no restrictions for development purposes and

what it can be sold for agricultural purposes. Currently, no development rights have been purchased in St. Clair County.

The City of Port Huron has no land currently being used for farmland purposes, while Port Huron Township has 256 acres of land designated to farming (SEMCOG, 2000). Although farmland exists within Port Huron Township Study Area, this land is not actively farmed and has been rezoned residential. There is no land zoned for farming/agriculture within the Study Area.

Neighboring communities of the Study Area also contain agricultural lands. In Fort Gratiot Township, agricultural lands include cultivated land, pasture, grazing lands, and fallow lands. There are 1,709 acres of farmland which constitute 16.8 percent of Fort Gratiot Township. The agricultural land can be considered fragmented or isolated with few farms larger than 80 acres.

In Kimball Township, 75 percent of the land is farmed, vacant, or contains natural features. Much of this agricultural land has been plowed but left unseeded or is used for pasture.

3.17.2 Is there Prime and Unique Farmland in the Study Area?

Farmstead in St. Clair County

The Federal Farmland Protection Policy Act (PL 97-98) of 1981, modified in 1987 protects "prime farmland", "unique farmland" or "farmland that is of statewide or local importance". In the Study Area there are no prime or unique farmlands or farmland that is of statewide or local importance per the Important Farmlands Map of St. Clair County. Additionally, none of the soils located in the Study Area are prime agricultural soils.

Coordination with the Michigan Department of Agriculture indicated that there are no properties in the Open Farmland and Open Space Preservation Act (PA116 of 1974) within the Study Area.

3.17.3 How will the Project Affect Farmland?

As is required by the Farmland Protection Policy Act, the Natural Resources Conservation Service has been coordinated with and the Form NRCS-CPA-106 has been completed (see **Appendix C**). Since this project received a total point value of less than 160 points, this site will receive no further consideration for farmland protection. This project will have no significant impact on farmland.

There presently are no active farmlands or land zoned for farmland or agriculture in the Study Area. If a Build Alternative is chosen there will be no impact on farmland or agriculture. None of the Practical Alternatives would have an impact on farmland, farm employment or farm production.

What is Form NRCS-CPA-106?

Form AD-1006, "Farmland Conversion Impact Rating" is the form used by federal agencies who wish to convert farmland to nonagricultural uses.

3.18 Wild and Scenic Rivers

In 1968 the United States Congress passed the National Wild and Scenic Rivers Act. This act states that certain selected rivers of the United States, which have outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The idea behind the National Wild and Scenic Rivers Act is not to halt the use of a river; instead, the goal is to preserve the character of a river.

There are no federal Wild or Scenic River systems in the Study Area. Additionally, there are no state designated rivers within the Study Area.

3.19 Coastal Zone

3.19.1 What is a Coastal Zone?

The Coastal Zone Management Act, originally passed in 1972, enables coastal states, including Michigan, to develop a coastal management program to improve protection of sensitive shoreline resources, to identify coastal areas appropriate for development, to designate areas hazardous to development and to improve public access to the coastline.

Michigan was among the first states to have its coastal program approved in 1978. The program is administered by the Michigan Department of Environmental Quality's (MDEQ) Environmental Science and Services Division.

What is the Ordinary High Water Mark?

The water elevation marking the highest water level which has been maintained for a long enough time to leave a mark on the shoreline.

Michigan's coastal zone boundary generally extends a minimum of 1,000-feet inland from the Ordinary High Water Mark of the Great Lakes and connecting channels, or further to include coastal lakes, river mouths and bays, floodplains, coastal wetlands, designated sand dune areas, public parks, recreation and natural areas and urban areas.

3.19.2 Is the Study Area Located in a Coastal Zone?

The project is located within a designated Michigan Coastal Zone Management Area. Therefore, review and authorization from the Michigan Coastal Zone Management Program will be required. In order to comply with Michigan State Law, since federal funding will be used, a review of federal agency activities is required for consistency with Michigan's Coastal Zone Management Program.

3.19.3 Will the Project Affect the Coastal Zone?

Impacts to the coastal zone will be avoided during construction of the project. A preliminary review of the project by the MDEQ indicates it is consistent with the Michigan Coastal Management Program. The project involves expansion of the Blue Water Bridge Plaza in areas that have been previously disturbed. The Study Team has indicated that these areas are not in direct or indirect contact with regulated coastal resources.

Modifications to the Black River Bridge will involve lengthening the piers located in the Black River. Due to physical disturbances to the river channel during construction, permits will be required from the State of Michigan and various federal agencies. However, the Study Team has determined that no significant impacts to the coastal zone are anticipated with any of the project alternatives.

3.20 Coastal Barriers/Critical Dunes

3.20.1 What are Coastal Barriers?

Coastal barriers are defined as bay barriers, barrier islands, and other geological features made up of sediment that protect landward aquatic habitats from direct wind and waves. These barriers provide essential habitats for wildlife and marine life, natural storm buffer zones, and areas of scientific, recreational, historic, and archaeological significance.

The Coastal Barrier Resources Act protects undeveloped coastal barriers and related areas by prohibiting direct or indirect federal funding of various projects in these areas that might support development. Limited exceptions are allowed, such as funding for fish and wildlife research.

3.20.2 What are Critical Dunes?

The Michigan Legislature has found that the critical dune areas of Michigan "are a unique, irreplaceable, and fragile resource that provides significant recreational, economic, scientific, geological, scenic, botanical, educational, agricultural, and ecological benefits to the people of this state and to people from other states and countries who visit this resource." (MDEQ Website, 2005)

3.20.3 Are there any Coastal Barriers or Critical Dunes in the Study Area?

The Study Area contains no federally designated coastal barriers or state designated critical dunes, as defined in Part 353, Sand Dune Protection and Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451.

3.21 Construction Impacts

3.21.1 What are the Construction Impacts of the No-Build Alternative?

Over time, maintenance of the existing plaza and local roads would periodically impact travelers passing through the Study Area. These impacts would be temporary during the time periods in which the maintenance would occur. The No-Build Alternative would create construction noise and vibration during the maintenance of existing roadways and the plaza The No-Build Alternative would not affect water, sanitary sewer, gas, telephone, or electrical transmission lines other than during temporary maintenance activities.

3.21.2 What are the Construction Impacts of the City East, City West (Preferred), and Township Alternative?

The City East, City West (Preferred), and Township Alternative would all have temporary and short-term impacts on plaza users and the local community during construction. MDOT and FHWA plan to construct the project in phases. This will reduce the construction related impacts that occur at any one time to smaller parts of the Study Area. Temporary changes to existing travel patterns due to road closures and detours would likely impact traffic on local roads in the vicinity of plaza improvements. While these impacts are considered unavoidable, reducing the temporary impacts to motorists, pedestrians, and residents would be a key part of the construction staging and plans for traffic flow and detours during construction. While specific detour routes are unknown at this stage of the study, no lengthy detour routes are anticipated for any of the alternatives. Potential detour routes would vary; however, no two adjacent parallel routes would be closed at the same time.

MDOT will develop plans to keep traffic moving during construction.

Traffic Flow Impacts: Temporary delays to existing traffic due to construction will occur on I-94/I-69 and other local roadways with all three of the Build Alternatives. MDOT and FHWA will stage construction so that there are no total closures of I-94/I-69. Local roadways may experience some temporary closures.

Detours on local roads could be required during construction.

Under the Build Alternatives, traffic interruptions would occur at locations where the new or reconstructed roadway connects with existing roadways and where bridge and interchange improvements are proposed. At bridge locations where Build Alternatives pass over existing roadways, temporary lane closures and construction equipment access drives may be required. For bridge replacements at Water Street and the Lapeer Connector, temporary road closures and detours may be required until the new bridges are open to traffic.

Detours will result in increased traffic congestion on local roadways, delays, longer trips, and access changes to some commercial and private properties. Temporary changes in access to businesses due to detours could potentially affect retail businesses if appropriate measures are not taken to maintain access to all affected properties.

Minimizing delays, congestion, and access restrictions would be a priority during construction. MDOT will coordinate with local communities and the St. Clair County Road Commission to determine the best detour routes and access for the community.

MDOT will maintain public awareness throughout the project by providing specific information such as duration and location of detours, lane closures, alternative routes, upcoming activities, and anticipated construction deadlines.

Security and Disruption of Plaza Operations During Construction: The existing plaza performs an essential role in protecting the national security of the United States. All three Build Alternatives will have some construction-period effects on portions of the existing plaza. Under the Township Alternative, this disruption will be minimal because the new plaza will be constructed while the existing one continues to operate. Both the City East and Preferred Alternative reconstruct the existing plaza in its current location. Both of these alternatives will have to be constructed in stages so that security is not compromised. In addition, construction staging will also have to work around the existing activities on the site.

MDOT will coordinate actively with the Blue Water Bridge Authority and the U.S. Customs and Border Protection to ensure that construction is as minimally disruptive as possible.

Construction Impacts to Businesses and Neighborhoods: All three Build Alternatives would temporarily disrupt access to some local businesses and neighborhoods in the vicinity of the existing plaza and at the Water Street interchange.

Contractors will be required to maintain access to businesses at all times to the extent possible. Contractors will coordinate with business owners continuously throughout the project. In neighborhoods impacted by construction, MDOT and the contractor will coordinate with residents regularly.

Construction Impacts to Emergency Services: The three Build Alternatives would likely impact emergency vehicle routes due to road closures, detours, and temporary traffic congestion/delays. The Township Alternative would likely be the least disruptive of the three Build Alternatives because it does not require the reconstruction of the M-25 Connector, Pine Grove Avenue, and 10th Avenue, all three major north-south roadways in the most densely populated part of the Study Area.

MDOT will coordinate with emergency service providers prior to the beginning of construction and at the beginning of new phases of construction. Communication will be maintained throughout construction. Adjustments to emergency response plans will be developed based on project activity.

Construction Impacts to Surface Streets: The City East and Preferred Alternative would be more disruptive to Pine Grove Avenue and 10th Avenue during construction than the Township Alternative. The City East Alternative involves the rerouting of Pine Grove Avenue to 10th Avenue while the Preferred Alternative would reroute Pine Grove Avenue to the M-25 Connector to the west of the plaza. The Township Alternative includes the widening of Pine Grove Avenue. All three Build Alternatives widen Hancock Street between the M-25 Connector and Pine Grove Avenue and would reconstruct the Water Street interchange with I-94/I-69. Each of these roads will at least be partially closed and/or require

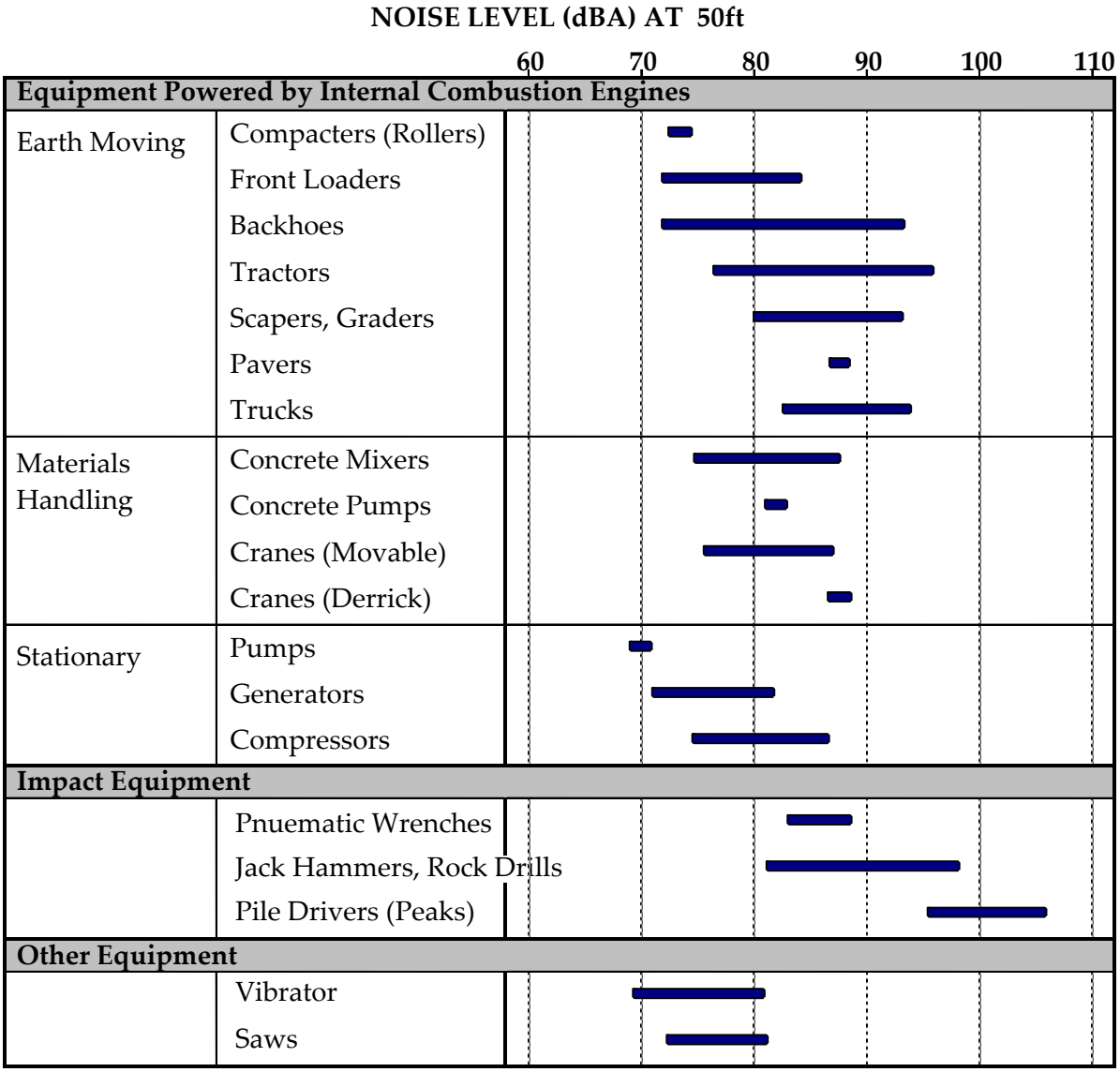
detours during periods of construction. The new plaza under the Township Alternative is not anticipated to create disruption to the local streets surrounding it because the plaza will be secured with no access other than from the interstate highway.

Construction equipment would generate temporary noise impacts.

Construction Noise and Vibration Impacts: The noise generated by construction operations and equipment would vary greatly, depending on the equipment type and model, mode and duration of operation, and specific type of work in progress. General construction noise impacts for those individuals living or working near the project can be expected from demolition, earth moving, and paving operations. **Figure 3.21.1** lists some typical peak operating noise levels at a distance of 50-feet. Impacts resulting from construction noise would be temporary and would affect homes and businesses close by. As construction would be phased, different homes and businesses would be affected by construction noise at different times. Construction could create vibrations that would pose a temporary disturbance to people and animals, and could affect nearby structures. Considering the relatively short-term nature of construction noise and the fact that construction will only take place from dawn to dusk, impacts are not expected to be substantial.

Much of the construction under both the City East and Preferred Alternative would be located within the boundaries of the existing plaza. While a number of nearby residential and commercial properties would be acquired, there would still be properties close to the plaza that would be impacted by noise and vibrations.

The Township Alternative would entail construction of new local roadway lanes and a new plaza on a new site. There are some residences close to the site of the potential new plaza, particularly north of the new plaza site, which would be impacted by nearby construction noise and vibration. The Township Alternative would also include new security barriers and local travel lanes in the I-94/I-69 corridor, all of which would have construction noise impacts on neighboring properties.



SOURCE: U.S. Report to the President and Congress on Noise, February, 1972.

Figure 3.21.1 Construction Equipment Sound Levels

Construction noise would be minimized by requiring that construction equipment have mufflers, that portable compressors meet federal noise-level standards, and that all portable equipment be placed away from or shielded from sensitive noise receptors, if at all possible.

Care would be taken to prevent vibration damage to adjacent structures. In areas where construction-related vibration is anticipated, basement surveys would be conducted before construction begins to document any damage caused by highway construction.

Construction Water Quality and Resources Impacts: Surface water quality impacts would be expected from constructing any of the Build Alternatives. Construction-related erosion, siltation, and riverbed disturbance would be the short-term construction effects. Temporary increases in sedimentation and turbidity levels of surface waters would occur during construction depending on how close excavated areas are to rivers and how often storms occur.

MDOT would use proper sediment and erosion control measures during construction.

Proper sediment and erosion control would minimize these impacts. Groundwater is not expected to be impacted because appropriate erosion and sediment control measures would be implemented.

Construction Air Quality Impacts: All three Build Alternatives would have a temporary air quality impact due to construction equipment pollutants, traffic emissions, and dust from areas where soil is exposed or traveled on by construction equipment.

Disruption of Utility Services: The Build Alternatives would affect utilities that are adjacent to or crossed by the project. These include: electrical, cable, street lighting, gas pipelines, sewers, watermains, and phone service. Even if utilities do not require permanent relocation or adjustment, service to the project area may be temporarily interrupted during short periods of construction. For the most part, the effects on utilities would go unnoticed.

Construction activities would have temporary visual impacts.

MDOT and its contractors will coordinate with the utilities and affected communities prior to beginning construction or implementation of new phases. The coordination will be maintained throughout the project.

Visual Impacts from Construction Activities: For residences and businesses located near construction sites, there would be temporary visual impacts associated with construction work, particularly from earthwork operations, storage of materials / equipment, and removal of buildings.

3.22 The Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

All alternatives under study (including the No-Build Alternative) would involve short-term and long-term tradeoffs. In the case of the Blue Water Bridge Plaza improvements, the money, labor, and construction materials used to construct the project will be substantial. Based on all of the improvements included in the project, the ultimate benefits should justify the initial costs. These costs and benefits are not limited to the spending of public dollars, but also include hard-to-quantify items such as improved security, improved border processing, economic development benefits, etc.

For this discussion, "short-term" refers to the immediate direct consequences of the project while "long-term" refers to its direct or indirect effects on future generations.

Short-term consequences to the environment resulting from the Build Alternatives have been discussed throughout **Chapter 3 The Environment: What's There Now and Project Effects.**

In the case of the No-Build Alternative, there will be fewer short-term uses of the human environment above and beyond existing or planned activities at the plaza. Existing land uses would remain as they are today, and the existing plaza would continue to follow the same long-term trends for processing international border crossings. Over the long term, congestion and delay at the plaza will likely increase as international traffic grows and requirements for Homeland Security measures increase in magnitude and complexity.

In the case of the Build Alternatives, short term uses of the environment would include:

- Temporary air, noise, water pollution, and visual effects caused by reconstruction of roadways

- Temporary air, noise, water pollution, and visual effects caused by reconstruction of the existing plaza into new uses. In the case of the City East and Preferred Alternative, these effects would be greater near the existing facility. In the case of the Township Alternative, the effects near the existing plaza would be less intensive, since the existing plaza "footprint" would remain to provide maintenance and duty-free services
- In the case of the Township Alternative, temporary air, noise, water pollution and visual effects caused by construction of a new facility on mostly open space
- Increased cost to motorists in time and fuel efficiency because of construction delays and detours
- Disturbances to businesses, homes, and institutions because of construction
- Conversion of open space, agricultural land, woodlands, and wetlands to transportation or Homeland Security use
- Relocation of people and businesses, including expenses that would be incurred as these people and businesses are compensated
- Reduction in property tax revenues resulting from relocation of people, businesses, and other land uses
- Use of public funds to build the highway and plaza infrastructure

Most of the long-term benefits from making the improvements to the Blue Water Bridge Plaza are addressed in **Chapter 1 Why Are Improvements Needed?** The No-Build Alternative would not provide any long term benefits, and instead, the plaza would likely deteriorate over time as the existing plaza becomes more out of date and less efficient. Under the Build Alternatives, there will be long-term benefits including:

- An improved level of security and the economic and social benefits that come with the higher security
- Improvements in both domestic and international driver convenience, safety, travel time, and energy use
- In the case of the Township Alternative, an increase in the distance between nearby affected residences and plaza activities
- Economic development opportunities from improved access and local opportunities for contractors in the region

- Reduction of air pollution and noise due to more efficient processing of vehicles on the plaza

The improvements to the Blue Water Bridge plaza, local roads, and I-94/I-69 are consistent with the long range transportation plans of Southeast Michigan Council of Governments and the Michigan Department of Transportation.

3.23 Permanent and Lasting Commitments of Resources

This section discusses the permanent and lasting commitments of resources involved in the selection and construction of an alternative to improve the United States Plaza at the Blue Water Bridge. Permanent commitments of resources occur when you convert something like wildlife habitat to a transportation project. You could try and convert it back later or replace it, but the habitat will never quite be the same. Lasting commitments of resources are the money, materials, and labor put into a project. Some of these resources, like materials, could possibly be recycled. Others would be gone forever.

No-Build Alternative: Permanent commitments of the No-Build Alternative include the money, time, and personal hardship related to increasing congestion on the plaza and local roadways and the inability of the current plaza to meet the needs of Customs and Border Protection. As the plaza deteriorates over time, there would be increasing costs for energy and the time required for business travel and personal driving. As traffic delay and operational inefficiencies increase, air pollution, noise pollution, and crashes would affect the local environment to a greater extent than exists today.

Build Alternatives: Construction of the Build Alternatives involves the commitment of a range of natural, physical, human resources and public tax dollars. Land used for construction of the proposed improvements is considered a permanent commitment during the time period that the land is used for a highway or security facility. For right-of-way, land resources would be converted from natural, agricultural, residential, and commercial areas. However, if a greater need arises for the use of the land or if the highway facilities and plaza are no longer needed, the land can conceivably be converted to another use. At present, there is no reason to believe such a conversion would ever occur.

Construction of any Build Alternative would utilize considerable amounts of fossil fuels, labor, and construction materials such as cement, stone, and asphalt materials. Such a

resource use would be generally permanent, although it would be possible to retrieve and reuse these resources to a limited extent. Any construction would also require a substantial one-time expenditure of both state and federal funds which are irretrievable.

The commitment of these resources is based on the concept that residents in the local region around the Blue Water Bridge Plaza, the State of Michigan and Province of Ontario, and the United States and Canada will benefit from these improvements.

CHAPTER 4

SECTION 4(f) AND 6(f) EVALUATION

The purpose of this section of the DEIS is to analyze the adverse impacts of the project on sites that are regulated by Section 4(f) of the Department of Transportation Act of 1966 (as amended). Section 4(f) states that no highway 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 the use of such land. In addition, adverse impacts to these 4(f) sites must include all possible planning to minimize harm resulting from such use. This evaluation will provide facts about each Section 4(f) protected property in the Study Area and potential effects on these sites.

What is a Section 4(f) Property?

A Section 4(f) property could be a public park, recreation area, wildlife or waterfowl area, or a historic property such as a house or building.

The Study Team determined that there would be two Section 4(f) properties affected by the project and evaluated whether there are feasible/prudent alternatives to the use of the site, and identified potential measures to minimize harm. A different piece of legislation that also covers recreational properties is Section 6(f) of the Land and Water Conservation Act of 1965. There are no 6(f) properties affected by any of the build alternatives.

The alternatives associated with the project, including the Preferred Alternative (City West) have been discussed in detail in **Section 2.0 Alternatives Considered** of the DEIS. In brief, the project will reconstruct the existing Blue Water Bridge inspection plaza and the I-94/I-69 roadways to better accommodate future security and transportation needs.

4.1 Are there any 4(f) Properties located within the Study Area?

There are four properties located within or adjacent to the Project Study Area as shown on **Figure E.21, Community Facilities** in **Appendix E**. They include:

- Port Huron Township Park No. 1
- Port Huron Township Park No. 2

Riverside Park

Port Huron Township Park No. 2

RV Park in Port Huron Township Park No. 2

- Riverside Park
- E.C. Williams House

Port Huron Township Parks No. 1 and No. 2 are both located adjacent to the north side of I-94/I-69 along Water Street. Township Park No. 1 is located to the east of Water Street and is a day use park. It is approximately 11 acres and includes playground equipment, a picnic area, and in the winter is a popular sledding location. Township Park No. 2 is located on the west side of Water Street and is a 36 acre seasonal RV campground owned and operated by the Township.

Riverside Park is located along the east bank of the Black River on the north side of I-94/I-69 and includes a boat ramp access to the Black River.

The E.C. Williams House is a historic house located north of the existing plaza on 10th Avenue. The house is currently being used as a dentist's office.

4.2 Are there any Impacts to these Properties?

Both Township Park No. 2 (the campground) and Riverside Park would not be impacted by the proposed project. There would be no effect on the activities, features, and attributes that qualify these resources for protection under Section 4(f).

Some minor property acquisition would be required from Township Park No. 1 for the construction of the freeway and interchange at Water Street under all three of the Build Alternatives.

The E.C. Williams House would be acquired for the construction of the Preferred Alternative (City West).

4.3 Port Huron Township Park No. 1

4.3.1 What are the Effects of the Project on the Port Huron Township Park No. 1?

The No-Build Alternative would have no effect on Port Huron Township Park No. 1.

Under the City East Alternative, City West Alternative, and Township Alternative, reconstruction of the I-94/I-69 mainline and Black River Bridge would have a negligible effect on the function of the park, as they would require only a narrow strip of park property (approximately 0.3 acre) along the edge of the property that now borders the interstate off-ramp. Temporary right-of-way (approximately 0.1 acre) would be needed at the entrance to the park to allow for driveway grading and connection to the new Water Street roadway. There is the potential that stormwater detention (approximately 1.2 acres) may be needed on the park property near the Black River for drainage purposes.

Port Huron Township Park No. 1

MDOT coordinated with Port Huron Township officials and with the Township Parks and Recreation Commission regarding the potential impacts to Township Park No. 1. Meetings were held with the Township Supervisor and Parks and Recreation Commission December 6, 2006 and February 9, 2007. Park exhibits were prepared and presented to the public as part of the public meeting held December 7, 2006 at the Girl Scout building on Water Street.

A letter was received from Port Huron Township April 10, 2007 indicating the following: *"Based on information provided and the representations made by MDOT, the Charter Township of Port Huron believes that the proposed work will involve minor or de minimums use of the Port Huron Township Park No. 1"*. Further the letter indicated: *"The Chairman of the Charter Township of Port Huron Parks and Recreation Commission has reviewed and agrees with the assessment of the impacts of the proposed project as well as the proposed mitigation"*. A copy of this letter is included in **Appendix D.6** of the DEIS. The Parks and Recreation Commission indicated at the meetings that they were interested in the following mitigation items:

- Potentially returning excess property to the Township Park
- Landscaping the potential drainage easement so that it is an aesthetically pleasing natural area.

FHWA has determined that the potential impacts to Port Huron Township Park No. 1 are *de minimis* based on the following:

1) The transportation use of the park does not adversely affect the activities, features, and attributes that qualify the park for protection under Section 4(f).
2) The Township officials with jurisdiction over the park have been informed of the intent to make the *de minimis* impact finding and have concurred with that finding.
3) The public has been afforded an opportunity to review and comment on the effects of the project on the park.

Ultimately, the Preferred (City West) Alternative will not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).

What Does *de minimis* Mean?

Recent changes to the Section 4(f) requirements allows the Federal Highway Administration to determine that certain minor uses of Section 4(f) land will have no adverse effect on the protected resource. This determination, called *de minimis*, greatly simplifies the process for complying with Section 4(f).

4.4 E.C. Williams House

4.4.1 Where is the E.C. Williams House? Why is it of Historic Importance?

The E.C. Williams House is located at 2511 10th Avenue in Port Huron, and has been determined to be eligible for the National Register of Historic Places (NRHP). The Section 106 Evaluation found in **Section 3.15 Cultural Resources** of the DEIS provides greater detail on the history of the property.

The E.C. Williams House is a Registered Michigan Historic Site, and is eligible for the NRHP under Criterion B for its association with E. C. Williams, a prominent local newspaper publisher in the area's history. Criterion B is for properties that are associated with the lives of people significant to our past. It is also eligible for the NRHP under Criterion C, as an excellent example of an early Queen Anne duplex residence. Criterion C is for properties that represent characteristics of a type, period or method of construction.

What is a Section 106 property?

Section 106 of the National Historic Preservation Act of 1966 requires every Federal agency to "take into account" how its projects will affect historic properties, which includes prehistoric and historic ruins. Activities include construction, rehabilitation, demolition, licenses, permits, loan guarantees, transfer of federal property, etc.

4.4.2 What are the Project Impacts on the E.C. Williams House?

The effects of the project are described in greater detail in the Section 106 evaluation in **Section 3.15** of the DEIS and are summarized here.

Front View E.C. Williams House

Side View E.C. Williams House

No-Build Alternative: The No-Build Alternative would have no effect on the E.C. Williams house.

City East Alternative: The City East Alternative would not take any of the E.C. Williams House property, so there would be no direct impact on the house or yard. However, the established urban neighborhood that buffers the property from the bridge plaza and commercial area nearby would be substantially affected as part of the project. Further, realignment of Pine Grove Avenue would bring the traffic noise and glare closer to the E.C. Williams house, though traffic volumes immediately next to the house on 10th Avenue are not anticipated to substantially change.

The features that make the house historically significant would not change and landscaping could mitigate adverse indirect effects on the house. Furthermore, since this structure has always been located within an urban setting, MDOT has received concurrence from the State Historic Preservation Office (SHPO) that the City East Alternative would not adversely affect this property.

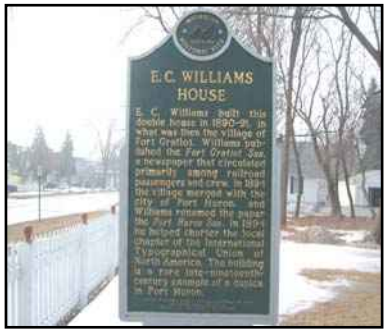
City West (Preferred) Alternative: The City West Alternative will require the full acquisition of the property and relocation of the E.C. Williams House. Therefore, MDOT has proposed relocating the house from its historic location as a way to preserve the structure. The SHPO has determined that this will constitute an Adverse Effect on the property.

Township Alternative: The Township Alternative does not propose any new road construction closer to the E.C. Williams House than the current road configuration. The existing plaza would be reconfigured for different use, but would remain within its current footprint. SHPO has concurred with MDOT that this alternative would have No Adverse Effect on the property.

What is the State Historic Preservation Office (SHPO)?

Established by the National Historic Preservation Act of 1966, the SHPO is an agency within each state, territory and protectorate government charged with enforcing the provisions of the Act. SHPOs receive federal funds from the National Park Service and allocate matching funds and grants to local agencies and private citizens for the protection of sites eligible for listing in the National Register of Historic Places.

4.4.3 Is There Any Way to Avoid Any Impact Upon the E.C. Williams House?



Historic Marker for E.C. Williams House

As noted above, the City East and Township Alternative would not have any direct effect on the property and the effects of these alternatives have been classified as No Adverse Effect based on coordination with SHPO. However, these alternatives do not meet the Purpose and Need of this project, the security needs of CBP, and could severely hinder emergency service response times. For that reason these alternatives are not considered prudent. There is no way to fully implement the Preferred Alternative without requiring the acquisition and relocation of the E.C. Williams property. Leaving the E.C. Williams House in place would create an Adverse Effect as the house would become part of a large street level parking lot within the plaza complex and would be inaccessible to the general public.

4.4.4 How Will MDOT and FHWA Minimize Harm on the E.C. Williams House?

As noted above MDOT has proposed to relocate the house, which is considered an Adverse Effect, though it is preferable to demolishing the house or building around it. SHPO has concurred that relocating the house would be the best course of action. In coordination with MDOT dated March 15, 2007, SHPO has requested the following mitigative measures be performed in association with the house relocation:

Historic Marker: SHPO has noted that the existing house contains a single-post Michigan historic marker at its current location. The proposed new location appears to have little in common with the original location since it will not be in a neighborhood setting. Nevertheless, since Williams started the local newspaper and since the building is a unique example of a duplex, SHPO feels the building is significant enough to have a new two-post marker to be erected at the relocation site. The new marker would replace the old one to inform people that the house has been relocated.

Additional Research: SHPO has requested the following additional work be done so that adequate documentation is available about the house and its history:

- Biographical information, including an obituary, for Edwin C. Williams
- Additional information about the Fort Gratiot Sun (publishing dates and subsequent papers as well)
- SHPO does not have information on the Alex J. Sarjeant family who occupied the home from 1904 through 1988. Therefore, they have requested biographical information about this family and their role in the community.

4.4.5 What Efforts have MDOT and FHWA made in Coordinating with SHPO on the Effects of this Project on the E.C. Williams House?

As noted previously, MDOT and FHWA have actively coordinated with SHPO and the general public on this project. They will continue to do so and also actively provide notification to the Advisory Council on Historic Preservation (ACHP). The SHPO has requested that ACHP be provided with the following information as per 80 CFR §800.11:

- A description of the proposed project, specifying the federal involvement, and its area of potential effects, including photographs, maps, and drawings, as necessary
- A description of the steps taken to identify historic properties
- A description of the affected historic properties, including information on the characteristics that qualify them for the NRHP
- A description of the proposed project's effects on historic properties
- An explanation of why the criteria of Adverse Effect were found applicable or inapplicable, including any conditions or future actions to avoid, minimize or mitigate adverse effects
- Copies or summaries of any views provided by consulting parties and the public

A Memorandum of Agreement (MOA) will be drafted between FHWA, SHPO and ACHP to ensure that adverse effects of the project will be adequately addressed.

What is the Advisory Council on Historic Preservation (ACHP)?

ACHP was established by the National Historic Preservation Act of 1966. ACHP is an independent Federal agency that promotes the preservation, enhancement, and productive use of our Nation's historic resources, and advises the President and Congress on national historic preservation policy. ACHP is the only entity with the legal responsibility to encourage federal agencies to factor historic preservation into Federal project requirements.

ACHP ensures through the Section 106 review process, that the public, Indian tribes, and state and local governments have a voice in federal decisions that impact historic properties.

CHAPTER 5

MITIGATION

5.1 What is Mitigation?

Mitigation is defined as the elimination, reduction or control of the negative environmental effects of a project, and includes measures to address any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

The goal of mitigation in this project is to preserve, to the greatest extent possible, existing neighborhoods, land use, and resources, while improving transportation and security. Although some negative impacts are unavoidable, the Michigan Department of Transportation (MDOT), through design, environmental, and construction processes, takes precautions to protect as many social and environmental systems as possible. MDOT will commit to facilitate discussion between the local community and other state agencies that may have grants or other resources to bring to the Port Huron community that could enhance the overall community. Construction activities that include the mitigation measures described below are contained in the 2003 Michigan Standard Specifications for Construction.

The following paragraphs discuss the mitigation concepts that are being considered at this time for the project. Without the benefit of detailed design plans and data, tentative mitigation ideas are proposed as a means to avoid or reduce adverse impacts on certain resources. Further agency coordination will continue throughout the remaining phases of the environmental clearance and design stages. More mitigation measures may be developed if additional impacts are identified.

Specific project mitigation measures will be included on the design plans and permit applications and can be found in the Project Mitigation Summary "Green Sheet" located at the end of this section.

5.2 How are Right-Of-Way Acquisitions and Relocation Impacts Mitigated?

Compliance with State and Federal Laws: Right-of-way acquisition and relocation assistance and advisory services will be provided by MDOT in accordance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Act 87, Michigan P.A. 1980, as amended. MDOT will inform individuals, businesses and nonprofit organizations if the project will have any impacts on their property. Every effort will be made, through relocation assistance, to reduce the impact if and when it occurs.

Residential: MDOT is required to determine the availability of comparable, decent, safe and sanitary housing for eligible displaced individuals. Appropriate measures will be taken to ensure that all eligible displaced individuals are advised of the rights and benefits available and course of action open to them.

Business and Nonprofit Organization: MDOT is required to offer relocation assistance to displaced businesses and nonprofit organizations. Appropriate measures will be taken to ensure that all eligible displaced businesses or nonprofit organizations are advised of the rights and benefits available and courses of action open to them.

Purchasing Property: MDOT will pay fair and just compensation for fee purchase or easement use of property required for transportation purposes. "Just compensation," as defined by the courts, is the payment of "fair market value" for the property rights acquired plus allowable damages to any remaining property. "Fair market value" is defined as the highest price estimated, in terms of money, the property would bring if offered for sale on the open market by a willing seller, with a reasonable time allowed to find a purchaser, buying with the knowledge of all the uses to which it is adapted and for which it is capable of being used.

Hardship Acquisitions: During this portion of the Study period, MDOT is acquiring a limited number of "hardship

acquisitions", as allowed and defined in the Federal Guidelines as having "health, safety or financial" hardships. Property Owners that believe they qualify to be purchased have been encouraged to Contact: MDOT Acquisition Project Manager, Pamela Evans at (248) 483-5187 and to send their supporting documentation to: Pamela Evans, MDOT Acquisition Project Manager, 18101 W. 9 Mile Road, Southfield, MI 48075.

Relocation Information: A booklet entitled "Your Rights and Benefits" detailing the relocation assistance program can be obtained from MDOT, Real Estate Support Area, P.O. Box 30050, Lansing, Michigan, 48909 or phone (517) 373-2200.

Property Acquisition Information: A booklet entitled "Public Roads & Private Property" detailing the purchase of private property can be obtained from MDOT, Real Estate Support Area, P.O. Box 30050, Lansing, Michigan, 48909 or phone (517) 373-2200.

Conceptual Stage Relocation Plan: The conceptual stage relocation plan prepared for this project is located in **Appendix B.**

5.3 How are the Aesthetic and Visual Conditions Mitigated?

Mitigation of aesthetic and visual impacts could come in many forms. Some of the more common measures could include:

- Developing and applying corridor standards for selective vegetative clearing and thinning, earthwork, landscaping or other methods of screening
- Incorporating architectural features into the design of retaining walls, security walls, and other structures
- Utilizing directional lighting and creative berm concepts at the plaza and along the highway corridor
- Applying colors and/or textures to help soften the visual appearance of proposed structures and hard surfaces

Attractive landscaping in the Study Area would also enhance the visual character for both drivers and those viewing the facility from adjacent properties. The local community could also adopt uniform standards in the Study Area for

What is Directional Lighting?

A method of providing light to a given area without lighting unwanted areas nearby.

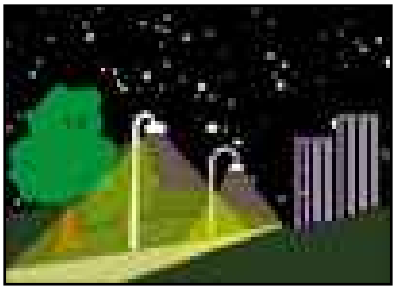


Illustration of Directional Lighting

landscaping and signage in order to improve the aesthetic value.

Selection of properly-shielded light fixtures will be critical in minimizing unwanted light pollution. Placement and alignment of fixtures should be designed to maximize light where light is needed, minimize shadows where shadows are not wanted, and provide a secure environment for the plaza.

5.4 How will Air Pollution be Controlled During Construction?

The construction contractors must comply with all federal, state, and local laws and regulations governing the control of air pollution.

Dust Control: During the construction of any project, the contractors will be responsible for adequate dust-control measures so as not to cause detriment to the safety, health, welfare, or comfort of any person, or cause damage to any property, residence, or business.

Bituminous

Bituminous refers to asphalt pavement.

Bituminous and Concrete Plants: All portable bituminous and concrete plants and crushers must meet the requirements for the rules of Part 55, Air Pollution Control of Act 451, Natural Resource and Environmental Protection. Any portable bituminous or concrete plant and crusher must meet the minimum 250-foot setback requirement from any residential, commercial, or public assembly property and the contractor may be required to apply for a permit-to-install or a general permit from the MDEQ. The permit process including any public comment period, if required, may take up to six months.

What does PM stand for?

Particulate matter (PM) is the term for solid or liquid particles suspended in the air. Some particles are large or dark enough to be seen as soot or smoke, but fine particulate matter is generally not visible to the naked eye.

Dust collectors will be provided on all bituminous and concrete proportioning plants. Dry, fine aggregate material removed from the dryer exhaust by the dust collector will be returned to the dryer discharge unless otherwise directed by the engineer.

Construction emission may represent a large new source of PM2.5 emissions. The implementation of a construction emissions reduction plan may be considered to target emissions from construction sources. This plan may include

actions such as retrofitting off-road construction equipment, using ultra low sulfur fuels for all equipment and limiting the age of on-road vehicles used in construction projects, fugitive dust control plans, diesel particulate traps and oxidation catalysts as well as using existing power sources or clean fuel generators rather than temporary power generators.

Off-Road Construction Equipment: Construction equipment will be retrofitted with diesel oxidation catalysts or diesel particulate filters from the EPA or the California Air Research Board Verified List. Additionally, emissions will be further reduced by installing retrofit emission control devices on all non-road equipment with higher emissions than EPA's Tier 2 Standards. The following table indicates the model year for which these standards take effect. Equipment that is of a model year older than the year given for that equipment's respective horsepower range should be retrofitted.

Horsepower Range	Model Year (or newer)
50-99	2004
100-299	2003
300-599	2001
600-749	2002
750 and up	2006

Nuisance Odors and Unnecessary Air Pollution: In addition to installing the required emission control devices, contractors should be required to use methods to control nuisance odors and unnecessary air pollution associated with diesel emissions from construction equipment including, without limitation, the following:

1. turning off diesel combustion engines on construction equipment not in active use, and on trucks that are idling while waiting to load or unload material for five minutes or more;
2. locating diesel equipment away from the general public and sensitive receptors (e.g., fresh air intakes, air conditions, and windows); and

3. utilizing electronically-powered scissor/man lifts.

Signage: The addition of signage at the Plaza and along the Blue Water Bridge will encourage truck drivers, tour bus drivers, and drivers of passenger vehicles to turn off engines to reduce unnecessary idling during long delay periods. For example, signs can be activated when accidents occur on the Bridge or at the Plaza or during peak traffic periods or when vehicles awaiting customs inspection will be stopped for a lengthy period of time, unless idling is necessary to power work-related mechanical or electrical operations for reasons other than propulsion.

5.5 How will Traffic Noise be Mitigated?

Examples of Noise Barriers

Noise barriers were analyzed at three locations within the Study Area. Two noise barriers were analyzed for the City East Alternative, one for the Preferred Alternative and three for the Township Alternative. Noise abatement through the use of noise barriers and other mitigation techniques will be considered according to the MDOT noise abatement criteria discussed in **Section 3.10 Noise Impacts**. MDOT has defined a five-decibel reduction in the design-hour L_{eq} noise level as the minimum desired standard for the implementation of noise mitigation to be considered feasible. MDOT considers $38,060 (2007 dollars) or less per residence as the reasonability criteria for the implementation of mitigation measures. Potential areas where it is deemed reasonable and feasible to locate noise barriers are (1) northwest of the M-25 Connector between Hancock Street and the Black River, for either the City East Alternative, the Preferred Alternative, or the Township Alternative, and (2) west of I-94/I-69 and north of Lapeer Road for the Township Alternative.

5.6 How will Noise and Vibration be Controlled During Construction?

Construction noise will be minimized by measures such as requiring that construction equipment have mufflers, that portable compressors meet federal noise-level standards for that equipment, and that all portable equipment be placed away from or shielded from sensitive noise receptors if at all

possible. Construction activities will be limited to dawn to dusk and all local noise ordinances will be followed.

Where pavement must be fractured, structures removed, or foundation piles driven, care will be taken to prevent vibration damage to adjacent structures. In areas where construction-related vibration is anticipated, basement surveys will be conducted before construction begins to document any damage caused by highway construction. Identification of properties to be offered basement surveys will be determined during the design phase.

Special care will be given to prevent excess noise and vibration

5.7 What Measures will be taken to Protect Water Quality?

Adequate soil erosion and sedimentation control measures based on MDOT's approved soil erosion program will be implemented for all Alternatives. Runoff will be diverted through vegetative controls (grassed waterways) into containment (detention) areas prior to outletting into the streams, wherever possible. This will promote infiltration, thereby reducing the potential impact on the streams from added runoff, sediments, and associated pollutants, including deicing salts, heavy metals, and herbicides. The Black River Bridge will be designed so that water runoff will be collected and channeled down the slope adjacent to the river rather than directly off the bridge into the river. Scupper drains will not be used on the bridge portion over the water.

What are Scupper Drains?

Drains on bridges which allow water to fall into the river.

Existing scupper drain on the Black River Bridge

Storm water detention basins will be constructed to control the rate of water discharged to match the existing discharge quantities. The proposed detention basins would be constructed in the northeast quadrant of the Water Street Interchange and the east side of Stocks Creek, south of I-94/I-69. Runoff from the detention basins will be directed into a 300-foot long vegetated ditch prior to discharging into Stocks Creek or the Black River, to help filter any suspended sediment prior to discharge.

Example of a detention basin

The use of best management practices (BMPs), including vegetative controls such as swales and buffer strips will be evaluated in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) statewide stormwater discharge permit. Runoff will be diverted through

vegetative controls and into containment areas prior to outletting to waters of the State to the maximum extent practical.

5.8 What Measures will be taken to Protect Groundwater?

Sealing water wells and sewer lines for the protection of groundwater quality is ensured by MDOT specifications imposed on the contractor. For houses or other structures in urban situations that are relocated or must be torn down, sewer lines must be filled with concrete grout at the basement level, and water must be turned off at the street. Abandoned water wells must be filled with cement grout applied from the bottom upwards through a conduit extended to the bottom of the well (in one continuous operation) until the well is filled. The contractor must also meet all local and Michigan Department of Community Health (MDCH) requirements.

Contractors are generally allowed 60 to 90 days following issuance of the demolition contract for the site to be completely cleared. However, only 48 hours is permitted following removal of any structure to fill the foundation to ground level. If the foundation is not filled within this time, MDOT may take independent action to fill the foundation, charging the costs incurred to the contractor. The MDEQ notification procedures for demolitions will be followed.

Artesian Head

Is a groundwater feature under enough pressure to rise above the aquifer containing it.

The above specifications have been approved by the MDCH. The contractor is also referred to the local health department for assistance when special conditions such as flowing wells or wells with a high artesian head are encountered. If high water tables are encountered in cut sections, special methods will be used to reduce any negative effects on the area groundwater. One such method is to raise the road grade.

Drains will be built as necessary along the pavement to drain the roadway sub-base. Edge drains are used to intercept horizontal seepage. Stone baskets are used to maintain and reroute the flow of springs when found below the roadway. Intercepted water will be discharged into an available roadside ditch or watercourse. Siltation of watercourses from intercepted water is rare.

5.9 What Measures will be taken to Protect Floodplains, Streams, and Drain Crossings?

Bridge and culvert work at river, stream, and drain locations will require construction staging and additional protection items to minimize impacts on the watercourse. The following items are general mitigation items designed to reduce impacts at water crossings. The design plans will show all specific controls for each watercourse.

Black River Bridge

1. All work below the ordinary high water mark of any river, stream, or drain will require permits from the Michigan Department of Environmental Quality, and/or the U.S. Army Corps of Engineers. All permit conditions will be adhered to during construction. No work will be done in the Black River or Stocks Creek between March 15th and June 30th to provide protection for fish spawning. Work may be done behind an enclosed cofferdam installed prior to the start of the protection dates.

What is Riprap?

Is large rock or other material placed along the banks of a body of water to prevent erosion.

2. All construction operations adjacent to watercourses will include appropriate temporary and permanent erosion and sedimentation controls.

Example of riprap

3. The contractor will be required to maintain a navigable channel on the Black River during all phases of the project. During part-width construction operations, the contractor will place signs both upstream and downstream of the construction area that clearly indicates the location of the navigable channel. The contractor may be required to provide lighting for barges or other navigation obstructions at night.

Erosion

Is the wearing down or washing away of the soil and land surfaces by water or wind.

4. All construction activities will be isolated from flowing watercourse where possible. This can be done by installing a cofferdam (steel sheeting or sand bags) around the construction area.

5. Any channel excavation or riprap placement will be done using part-width construction methods. Work will be done on part of the channel while the water flow is temporarily diverted away from the work area. MDOT has a standard detail showing the temporary water flow

diversion that will be included on the design plans for all projects that require in-stream work.

6. Fill quantities within the 100-year floodplain that exceed 300 cubic yards will require compensating cut to prevent any increase in upstream water surface elevations.

7. Water from dewatering operations will be treated prior to discharge.

5.10 How will Soil Erosion and Sedimentation be Prevented?

Sedimentation

Is a process that deposits soils, debris, and other materials either on the ground surface or in bodies of water.

Accelerated erosion and sedimentation caused by construction will be controlled before it enters a water body or leaves the right-of-way by the placement of temporary or permanent erosion and sedimentation control measures. MDOT has developed a series of standard erosion control items to be included in design plans to prevent erosion and sedimentation. The design plans will describe the erosion controls and their locations. Payment is made to the contractor for construction and maintenance of items used from this list or items specifically developed for the project.

Example of damage caused by erosion

MDOT has on file with MDEQ an approved operating erosion and sedimentation control program which ensures compliance with Act 451, Part 91 Soil Erosion and Sedimentation Control. MDOT has been designated an "Authorized Public Agency" by MDEQ and is self-regulated in its efforts to comply with Part 91. However, MDEQ may inspect and enforce soil erosion and sedimentation control practices during construction to ensure that MDOT and the contractor are in compliance with Part 91 and the acceptable erosion and sedimentation control program.

Silt fencing helps to control erosion and sedimentation during construction

The following is a partial listing of general soil erosion and sedimentation control measures to be carried out in accordance with permit requirements.

1. No work will be done in the Black River or Stocks Creek channels during periods of seasonally-high water, except as necessary to prevent erosion.

2. All road and bridge construction operations will be confined to the existing or proposed right-of-way limits or acquired easements.

3. Road fill side slopes, ditches, and other raw areas draining directly into the Black River or Stocks Creek will be protected with riprap (up to three feet above the ordinary high water mark), sod, seed and mulch, or other measures, as necessary to prevent erosion.

4. The surface area of erodible earth material exposed at any one location at one time will be limited to 5,000 feet of dual roadway or 10,000 feet of single roadway. Once the contractor has final graded and stabilized a section of roadway, additional clearing and grading will be allowed.

5. Areas disturbed by construction activities will be stabilized and vegetated within five days after final grading has been completed. Where it is not possible to permanently stabilize a disturbed area, appropriate temporary erosion and sedimentation controls will be implemented. All temporary controls will be maintained until permanent soil erosion and sedimentation controls are in place and functional.

6. The contractor shall have the capability of performing seeding and mulching at locations within 150 feet of any wetlands, lakes, streams, and drains within 24 hours of being directed to perform such work by the engineer.

7. Special attention will be given to protecting the natural vegetative growth outside the project's slope stake line from removal or siltation. Natural vegetation, in conjunction with other sedimentation controls, provides filtration of runoff not carried in established ditches.

8. The integrity of any agricultural drainage or field tile system encountered will be maintained.

9. The contractor will be responsible for preventing the tracking of material onto local roads and streets. If material is tracked onto roads or streets, it shall be immediately removed.

Ordinary High Water Mark

For streams, the OHW is generally the top of the bank of the channel.

Grading

Is the process of smoothing, leveling, or creating desired ground slopes in preparation for construction.

5.11 How are Wetlands Mitigated?

Wetland Mitigation: Before

Wetland Mitigation: After

For those wetland impacts that cannot be avoided, MDOT will restore previously existing wetlands or create new wetlands in accordance with Act 451, Part 303 Wetland Protection. The wetland mitigation site will be designed, constructed, and monitored in accordance with MDEQ's *Technical Guidance for Wetland Mitigation* dated September 9, 2003. Wetland mitigation will occur within the Black River watershed. Wetland impacts will be mitigated at a ratio of 2:1 for forested wetlands, and 1.5:1 for emergent, scrub-shrub, and open water wetlands. Compensatory mitigation will be in kind; i.e., it will attempt to replace the ecological types and functional values of wetlands impacted.

Monitoring the wetland mitigation site is necessary to determine if the wetland meets the MDEQ's performance standards. Monitoring of the wetland will include items such as water level measurements, vegetation sampling, measurements of different habitat types, documentation of any wildlife activity, photographic records, and documentation of any problem areas. Monitoring of the mitigated wetland will be required for a minimum of five years following construction with a monitoring report submitted annually. Once the mitigated wetland is constructed the site will be protected by a permanent conservation easement to provide for the permanent protection of the natural resource functions and values of the mitigation site.

Although final design will likely result in the further minimization of wetland impacts, preliminary impacts and compensatory mitigation acreages are used for planning purposes at this stage of the project. These preliminary wetland impact calculations and acreages of proposed mitigation for the alternatives are summarized in **Table 5.11.1.**

Table 5.11.1 Summary of Wetland Mitigation

Alternative	Impacts to Forested Wetlands	Proposed Mitigation Acreage Required	Impacts to Emergent, Scrub-Shrub, or Open Water Wetlands	Proposed Mitigation Acreage Required	Total Proposed Mitigation Acreage Required
No-Build	0	0	0	0	0
City East Alternative	1.12 acres	2.23 acres	3.24 acres	4.86 acres	7.10 acres
City West Alternative	1.12 acres	2.23 acres	3.24 acres	4.86 acres	7.10 acres
Township Alternative	2.94 acres	5.88 acres	7.22 acres	10.83 acres	16.71 acres

5.12 What Measures are taken to Protect Existing Vegetation?

Although some tree removal will be necessary, the existing natural and ornamental vegetative cover will be retained wherever possible within the right-of-way. Where the existing groundcover must be removed, replacement vegetation will be established in a timely manner using seed and mulch, or sod.

Roadside trees adjacent to residences will be saved wherever possible. Where trees are to be removed from in front of residences, property owners will be given appropriate notice, and will be offered replacement trees to help offset the functional or aesthetic loss of the trees.

Replacement tree species, size, and numbers will be determined by MDOT's Region Resource Specialist or the Roadside Development Section following coordination with adjacent property owners. For those owners who request replacement trees, the trees will be placed (with the property owner's approval) on adjacent private property as close to the right-of-way line as possible. Property owners will then assume the responsibility for maintaining these trees.

5.13 What will be done to Maintain Wildlife Habitat?

Impacts to terrestrial and aquatic habitats will be minimized during final design through refinements that maintain existing

hydrological conditions, and require construction techniques that minimize the removal of mature trees.

The Black River is managed by the Michigan Department of Natural Resources for trout and salmon. However it is not a designated trout stream. No work will be done in the Black River or Stocks Creek between March 15th and June 30th to provide protection for fish spawning. Work may be done behind an enclosed cofferdam installed prior to the start of the protection dates.

5.14 How are Threatened and Endangered Species Mitigated?

Spotted Turtle

Round Hickory-Nut Mussel

Two animal species, the spotted turtle (*Clemmys guttata*) and round hickory-nut mussel (*Obovaria subrotunda*), were identified by the Michigan Department of Natural Resources and the Michigan Natural Features Inventory as having potential to exist within the Study Area. The spotted turtle is classified by the State of Michigan as a threatened species and the round hickory-nut mussel is classified by the State of Michigan as an endangered species. No records of federally protected species were identified within the Study Area.

No state or federal threatened and endangered animal species were found within the Study Area during the field surveys conducted from September 2003 through June 2004. However, habitat that could be used by the spotted turtle is present within the Study Area adjacent to Stocks Creek.

Special care will be given when working in the potential spotted turtle habitat. Timing of construction will avoid habitats used by the turtle during that particular time of year. June is the primary month female turtles leave their drying pools to nest in nearby upland areas. Thorough searches will be conducted for the turtle within the area of work, and if found, relocated to an appropriate safe area. Barriers will also be constructed to stop the potential for re-entry of the turtle into the work zone. No work will occur in wetland areas adjacent to Stocks Creek between mid-October and the end of March in order to protect potential winter hibernating habitat for the spotted turtle.

5.15 What will be done to Ensure no Migratory Birds will be Impacted?

On projects that involve work on structures over watercourses, MDOT reviews potential impacts to migratory birds that may make (or have made) nests underneath the bridges. During the design phase of the project, the Black River Bridge will be reviewed for past migratory bird nesting activity. If evidence of migratory bird nesting is discovered, coordination between MDOT (Environmental Section and Region Resource Specialist), MDEQ, and U.S. Fish and Wildlife Service will occur. A "Special Provision" that describes procedures for dealing with migratory birds will be included within the project specifications. MDEQ permits required to conduct work on bridges over watercourses may include specific dates when work on bridges will be prohibited for the protection of migratory birds.

5.16 How are Cultural Resources Mitigated?

E.C. Williams House

Measures to minimize impacts include avoidance, preservation in place, and recordation of the property and structures prior to the start of construction activities. Appropriate mitigation measures will be developed through consultation between MDOT, SHPO, and any affected property owners. Archaeological surveys conducted within the Study Area found no evidence of historic or prehistoric artifacts. Based on these surveys, there is a low probability of finding any archaeological resources in the Study Area. There is one historic property, located at 2511 10th Avenue and known as the E.C. Williams House, that was recommended as eligible for the National Register of Historic Places. The E.C. Williams House may be affected by the City East Alternative and the Preferred Alternative. The Preferred Alternative would take the block that the E.C. Williams House resides and as a result, the home would have to be relocated. The City East Alternative would not take any of the property; however, the relocation of Pine Grove Avenue would bring traffic noise and glare closer to the E.C. Williams House. Potential mitigation measures may include creating a landscape buffer between the E.C. Williams House and the relocated Pine Grove Avenue, and/or designing the curve realignment to maximize the distance between the road and the house. A

discussion of potential mitigation of specific cultural resource sites is located in **Section 3.15 Cultural Resources.**

Any potential non-motorized crossing over the Black River Bridge will be considered by MDOT after local communities make adjacent connections a priority.

5.17 How are Hazardous/Contaminated Materials Mitigated?

The Study Team performed two Project Area Contamination Surveys (PACS) of the areas surrounding the existing Blue Water Bridge Plaza and the potential relocated plaza site for the Township Alternative. The purpose of these surveys was to locate and identify potential contaminated sites within or near to the potential areas of construction. Such sites would contain Recognized Environmental Conditions (RECs).

Vacant Gas Station on Pine Grove

City East Alternative: A total of 20 RECs were identified during the assessment of existing conditions. Eighteen of these sites could be affected by construction as part of the reconstruction of the existing plaza under the City East Alternative. Two sites would be impacted by reconstruction of the Water Street interchange.

City West (Preferred) Alternative: Of the 20 RECs that were identified during the assessment of existing conditions, 18 of these sites could be affected by construction as part of the reconstruction of the existing plaza under the Preferred Alternative. Two sites would be impacted by reconstruction of the Water Street interchange.

Township Alternative: The Township Alternative would potentially affect ten RECs that were identified during the assessment of existing conditions. Every one of these ten sites would potentially be affected by construction of the Township Alternative. None of these properties are on or near the site of the new plaza. The ten properties would be affected by improvements to local roadways under the Township Alternative, including the reconstruction of the Water Street interchange, Pine Grove Avenue, Hancock Street, and the M-25 Connector.

Further consideration of contaminated sites and hazardous materials in the Study Area will be necessary to ensure the safety of workers during construction, prevent any future migration of existing subsurface contaminants, and address potential liability associated with purchase of those parcels. Under either Alternative, a Phase II subsurface assessment will be needed to further investigate the contamination at the REC sites (20 under the City East and Preferred Alternative and ten under the Township Alternative). Depending upon the findings of the Phase II assessment, it may be necessary to perform further investigation or remediation.

Any structures acquired for the project should be tested for asbestos-containing materials and lead-containing materials before demolition. A Worker Health and Safety Plan will be prepared if any of these materials are identified.

MDOT will also coordinate with the MDEQ Water Bureau and the Waste and Hazardous Materials Division when limits of excavation or disturbance of bottom sediments is determined in areas of known river, stream, or lake bottom sediment contamination. Coordination could include testing of bottom sediments within the project area, reviewing results with the Water Bureau to determine if any contamination exists, and reviewing results with the Waste and Hazardous Materials Division to determine if any special disposal methods will be required.

Recycling programs will be used if they are provided by the community and do not compromise maintenance or security.

5.18 How are Surplus or Unsuitable Materials Disposed?

Unsuitable material

Can be any unwanted items leftover from clearing or preparing the site for construction such as tree stumps or broken concrete.

Surplus or unsuitable material generated by removal of structures, trees, peat, etc., must be disposed of in accordance with the following provisions designed to control the possible detrimental impacts of such actions:

1. All regulations of the MDEQ governing disposal of solid wastes must be complied with.

2. Inert debris may be used as a basement fill to a depth not less than two feet below the ground level if the basement is

not within the roadway cross-section. Debris used as fill must be covered with at least two feet of clean soil to fill voids. Basement walls are to be removed to ground level.

3. When surplus or unsuitable material is to be disposed of outside of the right-of-way, the contractor shall obtain and file with MDOT written permission from the owner of the property on which the material is to be placed. In addition, no surplus or unsuitable material is to be permanently disposed of in any public or private wetland area, watercourse, or floodplain. No temporary disposal of material will occur in any public or private wetland area, watercourse, or floodplain without prior approval (and permit) by the appropriate resource agencies and the Federal Highway Administration.

5.19 How will Traffic be Maintained During Construction?

Disruption of traffic in the construction area will be minimized to the extent possible. Although control of all construction-related inconveniences is not possible, motorist and pedestrian safety will be ensured by signing all construction areas. Access will be maintained to properties adjacent to the Study Area to the extent possible. Traffic will be maintained using both part-width construction techniques and the use of detour routes. Part-with construction techniques involve maintaining the traffic on one half of the roadway while the other half is being reconstructed. Detours would involve temporarily closing down certain roadways for construction while providing an alternate route of transportation.

Detailed plans will be developed during the design phase of construction with local officials. Informing the public of current and upcoming construction/traffic related concerns will be an important part of the construction process. Public awareness will be maintained throughout the project by addressing public concerns, and providing specific information such as duration and location of detours, lane closures, alternative routes, upcoming activities, and anticipated construction deadlines. This will be completed through the use of a Motorist Information Plan, which will provide as much information to visitors, motorists, area

residents, and business owners as possible through the use of temporary electronic message signs, the project website (www.michigan.gov/mdotstudies), and the toll-free project hotline (1-800-955-3515).

5.20 How will Construction Impacts to Surface Streets be Mitigated?

The contractors will be required to repair of all surface streets that are damaged as a result of being used as a detour or for equipment access. Upon completion of construction activities, roadway inspections will take place and permanent repairs will be made as necessary.

5.21 How will Public Utility Services be Maintained?

Water, sanitary sewer, gas, telephone, and electrical transmission lines adjacent to or crossed by the project may require relocation or adjustment. If relocations or adjustments are required, MDOT will coordinate with the affected utility company during design, and relocation will take place prior to construction if possible. The contractors will coordinate construction activities with the affected utility company.

5.22 What Permits will be Required for Construction?

Depending on the resources impacted, MDOT often must obtain various permits for construction activities. MDOT obtains these permits from various state, federal, and local agencies with jurisdiction over lakes, streams, drains, wetlands, threatened and endangered species, air quality, or other environmental resources. The following is a list of permits that MDOT will likely need to obtain for construction of a new plaza for the Blue Water Bridge.

State Permits:

- *Wetlands* - MDOT must obtain a permit from the MDEQ Land and Water Management Division for any wetlands disturbance, temporary as well as permanent. Permanent disturbances would include the placement of any fill material in wetlands. This permit is issued pursuant to the Clean Water Act, Section 404 of 1972 and Part 303,

Wetlands Protection of Michigan P.A. 451 Natural Resources and Environmental Protection Act, 1994, as amended.

- *Point Source Discharge of Stormwater* - MDOT must obtain coverage from the MDEQ Water Bureau for discharging stormwater into inland lakes, streams, or drains. This coverage is issued pursuant to Part 31 Water Resources Protection of P.A. 451, as amended and Section 401 of the Clean Water Act of 1972.
- *Fill in Floodplain* - MDOT must obtain a permit from the MDEQ Land and Water Management Division to place fill material within any part of a floodplain with a drainage area of two square miles or greater. This permit is issued pursuant to Part 31, Floodplain Regulatory Authority of P.A. 451, as amended.
- *Work Below Ordinary High Water Mark* - MDOT must obtain a permit from the MDEQ Land and Water Management Division for any work below the ordinary high water mark of any inland lake, stream, or drain including the placement of a temporary crossing, haul road, or construction access pad. This permit is issued pursuant to Part 301, Inland Lakes and Streams of P.A. 451.
- *Installation of Bituminous or Concrete Plants* - MDOT or its designated contractor must obtain a permit from the MDEQ Air Quality Division for the installation and use of bituminous or concrete plants during construction. This permit is issued pursuant to Part 55, Air Pollution Control of P.A. 451.

Federal Permits:

- *Black River and Adjacent Wetlands* - MDOT must obtain a permit from the United States Army Corps of Engineers for the placement of fill material in waters of the United States. This permit is issued pursuant to U.S. Section 404, Clean Water Act of 1972 and U.S. Section 10 River and Harbors Act of 1899.
- *Impacts to Navigable Waterways* - MDOT must obtain clearance from the United States Coast Guard for potential impacts to the Black River as a navigable waterway. This clearance is issued pursuant to U.S. Section 9 River and Harbors Act of 1899.

In addition to the above permits, MDOT will also have to provide notice of coverage to MDEQ for stormwater discharges during construction activities under the National Pollution Discharge Elimination System. MDOT has determined that no permits for threatened and endangered species or impacts to registered contaminated sites will be required for the project.

MDOT will develop final mitigation measures for the areas requiring the above permits in consultation with the appropriate resource agencies and will include them in the permit application.

5.23 Additional Mitigation or Modifications

The final mitigation package will be reviewed by division representatives on MDOT's project study team, in cooperation with concerned federal, state, and local agencies.

Some changes in the early mitigation concepts discussed in this document may be required when design begins. These mitigation concepts will be implemented to the extent possible. Where changes are necessary, they will be designed and field reviewed before permits are applied for and construction begins. Changes may also be necessary during the construction phase, but they will reflect the early mitigation intent. The preceding mitigation concepts are based on the best information available through June 2007.

Project Mitigation Summary "Green Sheet"

(DRAFT) August 2007

Draft Environmental Impact Statement
And Draft Section 4(f) Evaluation

Blue Water Bridge Plaza Study in the City of Port Huron
and Port Huron Township
St. Clair County, Michigan

This project mitigation summary "Green Sheet" contains the project specific mitigation measures considered at this time. An updated "Green Sheet" will be prepared and included in the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD). These mitigation items and commitments may be modified during the final design, right-of-way acquisition or construction phases of this project.

I. Social and Economic Environment

a. ***Aesthetic and Visual Resources*** - The exact appearance of each Build Alternative is still conceptual. The Study Team plans to hold a series of workshops on Context Sensitive Solutions (CSS) during the Final EIS process, after a Preferred Alternative has been selected. Mitigation of aesthetic and visual impacts could come in many forms. Some of the more common measures include:

- Developing and applying corridor standards for selective vegetative clearing and thinning, earthwork, landscaping or other methods of screening
- Incorporating architectural features into the design of retaining walls, security walls, and other structures
- Utilizing directional lighting and creative berm concepts at the plaza, new welcome center, and along highway corridors
- Applying colors and/or textures to help soften the visual appearance of the proposed structures and hard surfaces

b. ***Noise*** - Based on the results of the noise analysis, MDOT intends to install noise barriers that are deemed feasible and reasonable. The noise barriers proposed west of the M-25 Connector between Hancock Street and the Black

River, and between Garfield Street and Hancock Street are feasible and reasonable for the City East or Township Alternatives, while the noise barrier west of I-94/I-69 and north of Lapeer Road is feasible and reasonable for the Township Alternative. If final design results in substantial changes in roadway design from currently modeled conditions, noise abatement measures will be reviewed.

c. *Recreation* – MDOT will coordinate with Port Huron Township regarding the access road for Township Park No. 1 and No. 2. Access to both parks will be maintained during all hours of operation. The existing landscape buffer between the parks and I-94/I-69 will remain. No material or equipment storage on park property will be allowed during construction.

The navigation channel in the Black River will be maintained under the I-94/I-69 Bridge to accommodate boaters using the City of Port Huron Riverside Boat Ramp.

II. Natural Environment

a. *Stream Crossing* – A Construction Staging Plan will be provided to the contractor that will define construction access to the Black River Bridge piers. The Construction Staging Plan will be prepared and reviewed with MDEQ prior to any Act 451, Part 31 (Floodplains) and Part 301 (Inland Lakes and Streams) permit application. Coordination regarding the Construction Staging Plan will also occur with the U.S. Army Corps of Engineers and U.S. Coast Guard prior to the submittal of federal permit applications. The plan will include soil erosion/sedimentation controls including dewatering operations, temporary causeway/access pad design, installation/removal phasing, and stream navigation requirements (signing and lighting). No work will be done in the Black River or Stocks Creek between March 15th and June 30th to provide protection for fish spawning. Work may be done behind an enclosed cofferdam installed prior to the start of the protection dates.

b. *Wetlands* – The City East and City West (Preferred) Alternatives would impact 3.24 acres of palustrine emergent wetland and 1.12 acres of palustrine forested wetland. The Township Alternative would impact 7.22 acres of palustrine emergent wetland and 2.94 acres of palustrine forested wetland. Using the 2 to 1 mitigation ratio for forested and 1.5 to 1 ratio for emergent, the City East and City West (Preferred) Alternatives would require a total of approximately 7.1 acres of wetland mitigation, while the Township Alternative would require a total of approximately 16.71 acres. The wetland mitigation site has not been selected at this time, but will be included in the FEIS. The wetland mitigation and monitoring plan will be part of any Act

451, Part 303 permit application to MDEQ.

c. ***Floodplains*** – The City East, Township and City West (Preferred) Alternatives would all require fill within the 100-year floodplain of the Black River. The City East and City West (Preferred) Alternatives would require approximately 625 cubic yards of fill. The Township Alternative would require approximately 2450 cubic yards of fill. The MDEQ requires compensatory storage if more than 300 cubic yards of fill material is placed in the 100-year floodplain.

To ensure that all environmental and hydraulic impacts associated with the floodplain crossings of the City West (Preferred) Alternative are minimized, further evaluation of crossing options will be conducted during the design phase. This will include an examination of bridge spans and approaches, median widths, and side slopes. The analysis will consider existing and proposed conditions, and will determine the necessary and proper bridge types, openings, lengths, and locations of abutments and piers, to minimize or eliminate floodplain impacts.

d. ***Water Quality*** - Roadway runoff will be treated by maximizing the use of vegetated buffers (300 foot minimum) for drainage conveyance and minimizing the direct discharge of bridge runoff. Disturbed sanitary sewer lines will be restored to pre-construction condition. Any disturbed groundwater wells will be properly abandoned.

Recycling programs will be used if they are provided by the community, and do not compromise maintenance or security

e. Threatened and Endangered Species - No work will occur in wetland areas adjacent to Stock's Creek between mid-October and the end of March in order to protect potential winter hibernating habitat for the spotted turtle. During construction, thorough searches will be conducted for the turtle within the work area as they nest in mid-June. Any turtles found will be relocated to an appropriate safe area.

III. Cultural Environment

a. Historic Resource – MDOT will relocate the E.C. Williams House if City West is selected as the Preferred Alternative. If City East is selected, feasible buffering and design options to shield the E.C. Williams House will be explored.

IV. Hazardous/Contaminated Materials

a. Project Contamination - A Project Area Contamination Survey (PACS) was performed for this project. Further investigation of contaminated sites and hazardous materials in the Study Area will be necessary to ensure the safety of workers during construction, prevent any future migration of existing subsurface contaminants, and address potential liability associated with the purchase of those parcels. Under the Build Alternatives, a Phase II subsurface assessment will be conducted at the REC sites (20 under City East and City West and ten under Township). Depending upon the findings of the Phase II assessment, it may be necessary to perform additional investigation or remediation.

Any structures removed for the project will be assessed for asbestos-containing materials and lead-containing materials before demolition. A Worker Health and Safety Plan will be prepared if any of these materials are identified.

V. Construction

a. ***Maintaining Traffic*** - A Motorist Information Plan (website and temporary electronic message signs) will be developed and implemented during construction to identify lane closures and alternate routes. Coordination with local officials will occur to facilitate emergency service and school bus routes. Access to residences and businesses within the project area will be maintained during construction.

CHAPTER 6

PUBLIC AND AGENCY COORDINATION

When an Environmental Impact Statement (EIS) is being prepared, the agencies proposing the project, in this case the Federal Highway Administration (FHWA) and the Michigan Department of Transportation (MDOT), are required to solicit ideas and input from people and organizations that may be affected by, or have regulatory authority over, the project. FHWA and MDOT have accomplished this through a variety of tools and methods that are described in this section. These tools and methods will continue to be used as this project progresses through design and construction.

Public Involvement is an important part of the study

6.1 How did the Study Team Coordinate with Federal and State Agencies?

Agreement and input is critical in order to proceed through the various stages of the Study. As a result an early effort to coordinate with federal and state agencies took place. Letters and preliminary study information were sent to these agencies in October 2002. The agencies are listed below and their letters of response are included in **Appendix D.1**.

- U.S. Customs and Border Protection (CBP)
- U.S. General Services Administration (GSA)
- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (EPA)
- U.S. Coast Guard (USCG)
- U.S. Department of Agriculture (USDA)
- Natural Resources Conservation Service (NRCS)
- Michigan Department of Natural Resources (MDNR)
- Michigan Department of Environmental Quality (MDEQ)
- Michigan Department of Agriculture (MDA)
- Michigan State Historic Preservation Office (SHPO)

Notice of Intent to Prepare an EIS: The federal agency that is preparing an EIS needs to officially notify the public when the study will begin. The FHWA satisfied this requirement by publishing a *Notice of Intent* in the Federal Register. This notice was issued January 12, 2005 and published in the January 27, 2005 issue of the Federal Register (Vol. 70, No. 17,

Pg 3974). A copy of this Notice of Intent is located in **Appendix D.2**.

Scoping Meetings: The above referenced agencies were invited to three scoping meetings over the course of this study. The scoping meetings were focused on identifying key environmental issues to be considered for the project. An initial meeting was held on June 19, 2003 to describe the study and conduct a site tour of the plaza and surrounding area. A scoping information package was prepared as part of this meeting. A second meeting to present three alternatives and gain consensus from the group was held July 27, 2004. On July 19, 2005, a third meeting was held to discuss study updates, scheduling, and the need to convert the study from an Environmental Assessment document to a more detailed EIS.

Coordination with federal agencies

Federal Cooperating Agencies: Five of the above mentioned agencies were requested to be cooperating agencies, by FHWA. A cooperating agency typically has special authority or expertise over the construction of a project. There is enhanced communication and cooperation between cooperating agencies and the agency proposing the project. The following agencies were identified as federal cooperating agencies for this study: CBP, GSA, USACE, EPA, and USCG. Copies of the letters from these agencies accepting cooperating status are included in **Appendix D.3**.

The special relationships of the cooperating agencies to the Blue Water Bridge Plaza Study are as follows:

- CBP is the major tenant on the plaza and has authority to secure people and cargo crossing into the United States.
- GSA leases space from MDOT for all federal inspection agencies located on the plaza.
- USACE has permit authority for any improvements to the I-94/I-69 Black River Bridge due to its location in the 100-year floodplain.
- EPA has authority for ensuring the proposed project complies with the National Environmental Policy Act. If EPA determines that the action is environmentally unsatisfactory, it is required by Section 309 to refer the matter to MDEQ.

- USCG has permit authority for the I-94/I-69 Black River Bridge improvements related to boating safety and navigation clearances.

Federal Agency Meetings: In addition to the scoping meetings, several meetings were held with CBP and GSA to gain input on plaza operations and receive comments on the proposed alternatives. Details regarding the meetings are listed in **Table 6.1**.

Table 6.1 Federal Agency Meetings

Date	Location	Topic of Discussion
September 16, 2002	Port Huron, MI	Current plaza activities
November 12, 2002	Port Huron, MI	Plaza needs/opportunities
July 17, 2003	Port Huron, MI	Alternatives review
February 10, 2004	Lansing, MI	Alternatives review
April 22, 2004	Port Huron, MI	Alternatives review
September 9, 2004	Washington, DC	Alternatives refinement
December 2, 2004	Detroit, MI	Alternatives and traffic modeling
August 8, 2005	Indianapolis, IN	Security for Practical Alternatives
October 24, 2005	Port Huron, MI	Security for Practical Alternatives
February 13, 2006	Lansing, MI	Project Coordination with MDOT, FHWA, CBP, and GSA
June 12, 2006	Detroit, MI	Alternative development
August 24, 2006	Port Huron, MI	Alternative development

6.2 Stakeholders Advisory Committee

A Stakeholders Advisory Committee was formed to provide expertise and input on all pertinent issues related to the plaza study. The Advisory Committee consists of a core group of

stakeholders representing plaza inspection agencies, local and state officials, Canadian officials, private firms, and key representatives from the local community. A list of people invited to the Advisory Committee meetings is provided in **Appendix D.4**. The Advisory Committee held 13 meetings and was instrumental in: (1) defining the purpose of and need for the project outlined in **Chapter 1 Why Are Improvements Needed?**, (2) providing input on how best to involve the public in the study process, (3) developing ways to measure the effectiveness of the proposed alternatives, (4) reviewing and refining the proposed alternatives, and (5) sharing specific agency concerns.

What is a Charrette?

A charrette is a workshop to facilitate an open discussion between the stakeholders of a project, which typically uses a mixture of brainstorming and laying out of potential alternatives.

Initial Concepts Charrette: April 29, 2003, the Michigan Department of Transportation (MDOT) held a charrette with border crossing stakeholders for the Blue Water Bridge Plaza. A charrette is a workshop to facilitate open discussion and brainstorming on particular issues. The Initial Concepts Charrette was held at the St. Clair County Administration Building in Port Huron, Michigan. The charrette involved 47 people representing a wide variety of stakeholders, including representatives from:

Initial Concepts Charrette Photos

- CBP
- GSA
- U.S. Food and Drug Administration (FDA)
- USDA
- Blue Water Bridge Authority (BWBA), operator of the Canadian side of the crossing
- Canada Customs and Revenue Agency (CCRA)
- City of Port Huron
- St. Clair County Transportation Study (SCCOTS)
- Southeast Michigan Council of Governments (SEMCOG)
- Customs Brokers
- FHWA
- MDOT

The purpose of the Initial Concepts Charrette was to encourage communication and understanding between stakeholders, identify concepts that address study objectives, identify potential cost saving measures, and identify new issues of concern. **Appendix D.5** provides a summary of the charrette.

6.3 How did the Study Team Coordinate with Local Agencies?

A variety of local agencies participated in the Stakeholders Advisory Committee Meetings. In addition to those meetings, over 40 individual meetings were held with local agencies to understand agency issues and concerns and review proposed concepts. These meetings included the following agencies:

Coordination with local agencies

- St. Clair County
- City of Port Huron
- Port Huron Township
- Fort Gratiot Township
- St. Clair County Road Commission
- Economic Development Authority of St. Clair County
- City of Port Huron City Council
- Port Huron Area School District

At the request of the County and City, the Study Team met with local representatives monthly to discuss project issues. Additionally, a local Security and Emergency Management Task Force committee was created to focus on specific issues related to local security and emergency response.

Copies of letters from local agencies are contained in **Appendix D.6**.

6.4 How did the Study Team Coordinate with Canadian Officials?

Canadian stakeholders were active participants in the review of the project and its alternatives. Canadian officials submitted several letters outlining their positions on the plaza study, supplied relevant reports concerning the operation of the Canadian side of the Blue Water Bridge crossing, and attended the Stakeholders Advisory Committee Meetings. **Appendix D.7** includes the letters submitted by Canadian officials.

August 13, 2003, MDOT held a Canadian agencies meeting that included the following agencies: the BWBA, the Ontario Ministry of Transportation, the Canadian Border Services Agency (CBSA), and Transport Canada. Discussion focused

on design alternatives for the plaza. Individual meetings were also held throughout the study with BWBA to discuss their issues and concerns in more detail.

6.5 How has the Study Team Involved the Public?

Key objectives of the public involvement process are to provide access to the study information, to obtain feedback and information from the public, and to build consensus among members of the general public. This was accomplished by using open forum meetings and a variety of tools to notify the public, explain the project, and obtain feedback.

Public Meeting #2

Public Information Meetings: A news release was issued to local media announcing the study and the kick-off public meeting. The kick-off news release was published February 27, 2003. The release resulted in editorials in local newspapers and radio coverage on the study.

Public Meeting #3

The Study Team held six public information meetings to provide study information and receive comments from the general public. MDOT notified people by issuing press releases in the local newspaper, conducting interviews with local media, and mailing informational brochures to over 400 households located in the vicinity of the plaza. Brochures for each meeting were also distributed to key city, township, and county offices and to churches in the Study Area. All of the meetings were held at transit and disabled accessible facilities in Port Huron, Michigan. The meetings were held in a large hall using an open forum format. Members of the public could visit stations and discuss different aspects of the proposed project (study process, traffic, environmental constraints, etc.) with project team members. All attendees were encouraged to fill out comment forms. **Table 6.2** provides the details of each of the public information meetings.

Table 6.2 Public Meetings Held

Meeting	Date	Location	Number of People Who Signed In	General Purpose
Public Meeting No. 1	March 13, 2003	Port Huron Municipal Office Center	70	Introduce the study and study process
Public Meeting No. 2	September 23, 2003	Michigan Technical Education Center	287	Present Illustrative Alts.
Pubic Meeting No. 3	May 17, 2004	Michigan Technical Education Center	146	Present Updated Alts.
Public Meeting No. 4	February 9, 2005	St. Clair County Community College	213	Present Refined Alts.
Public Meeting No. 5	September 26, 2006	Girl Scout Building	224	Present new Alt. City West
Public Meeting No. 6	December 7, 2006	Girl Scout Building	118	Present Alts. for I-94/I-69 Corridor

Public Information Resources: Additional tools were used to provide the general public with information on the plaza study and to receive comments. These included: (1) mailing newsletters prior to each public information meeting to all individuals on the project mailing list, (2) providing a toll-free phone number (1-800-955-3515) to call with any questions concerning the study, (3) establishing a web site located at www.michigan.gov/mdotstudies that contained study information, updates, and a link for e-mail feedback, and (4) issuing press releases through the local media. The web site will remain active through the review and approval of the EIS.

The public involvement process generated over 600 public contacts that were entered into the study database. The Study Team responded to approximately 115 public phone calls and 113 letters and e-mails related to the study, through May 2007.

Community Involvement Workshop

Community Involvement Workshop

Community Involvement Workshops: Three Community Involvement Workshops were held to assist the Study Team in incorporating the values and visions (aesthetics, land use, community etc.) of Port Huron area residents into the planning process. The purpose of these workshops were to gather information about what characteristics participants valued in their community and neighborhood and how they would like to see the area surrounding the project look and feel. Two workshops focused on the on-site Study Area and the third workshop focused on the off-site Study Area. Four additional Community Involvement Workshops are planned for the Blue Water Bridge Project. **Table 6.3** provides the details of each of the Community Involvement Workshops.

Meetings with Specific Groups: Informal meetings were held with individuals or groups that had specific concerns or interests in the study. These meetings allowed for an exchange of ideas and a focus on issues of special concern. Meetings were held with U.S. Representative Candice Miller, State Senator Jud Gilbert and staff members for State Representative Steve Ehardt and U.S. Senators Debbie Stabenow and Carl Levin. Following their election, State Representatives Phil Pavlov and John Espinoza attended several project meetings. The Study Team also met with the Ross Bible Church, local Chambers of Commerce, several local business owners, and customs brokers.

In the spring 2007 the Study Team began to hold open office hours in the MDOT Port Huron TSC on the first and third Friday of each month to answer any questions the public had about the Blue Water Bridge Plaza Study. The public could request a specific appointment time or drop in to the TSC between 10 am and 2 pm.

Formal Public Comment: When the Draft EIS is available for review the public will be notified and a formal comment period will begin. This formal comment period will last a minimum of 45 days and will include a formal Public Hearing.

Table 6.3 Community Involvement Workshops Held

Meeting	Date	Location	Number of People Who Signed In	General Purpose
Community Involvement Workshop No. 1	June 29, 2006	Girl Scout Building	92	Discuss and identify important characteristics of the Study Area
Community Involvement Workshop No. 2	July 27, 2006	Girl Scout Building	86	To generate a vision for the future of the Study Area
Community Visioning Workshop No. 3	March 07, 2007	Girl Scout Building	84	To produce a transportation system built on and supported by community values

Local Project Office Hours in Port Huron: Beginning in March 2007 MDOT held regular office hours on the first and third Friday of each month from 10:00 am-2:00 pm. Members of the Study Team were available to answer questions regarding the ROW acquisition process, the NEPA process, and answer other project related questions.

CHAPTER 7

LIST OF PREPARERS

Preparers and Reviewers

Name	Education and Experience	Primary Responsibilities
Wilbur Smith Associates, Inc.		
Todd Davis, AICP	B.S. Environmental Science 17 years transportation planning experience	Project Manager, Public Involvement Coordinator, Environmental Planning and QA/QC
Doug LaVoie, P.E.	B.S. Civil Engineering 17 years transportation engineering, and planning experience	Engineering Lead, Plaza Site Design, Public Involvement, QA/QC
Chris Nazar, AICP	B.A. Economics and Urban Studies M.S. Urban Planning 7 years economics and transportation planning experience	Lead Transportation Planner, Economic Analysis, Public Involvement, Purpose and Need, Affected Environment and Consequences
Kirk Haybarker, AICP, RLA	B.S. Landscape Architecture/Planning 22 years transportation and environmental planning experience	Consultant Project Director, Project Coordination, QA/QC
Paul Hershkowitz	B.A. Sociology 33 years traffic and transportation planning experience	Lead Traffic Analyst
Adrian Stroupe, AICP	B.A. Geography 15 years transportation and environmental planning experience	Environmental Planning, Project Coordination, and QA/QC
Lindsay Lee	B.S. Geography 2 years transportation planning experience	GIS Exhibits QA/QC
Nicole McCleary	B.A. Psychology M.A. Urban Planning 3 years planning experience	Social and Community Analysis, Public Involvement, Affected Environment and Environmental Consequences
Rhonda Vance	B.S. Communications 9 years experience in public affairs	Project Coordination, QA/QC
Saurabh Shukla	B.S. Architecture M.S. Urban and Regional Planning 1 year of transportation planning experience	Purpose and Need, Traffic, FEIS production

Name	Education and Experience	Primary Responsibilities
Doug Zang	B.A. Biology 14 years experience in NEPA analysis for transportation projects	Air and Noise Analysis, Environmental Consequences, QA/QC
Randy Rowson, AICP	M.A. Urban and Regional Planning 6 years transportation planning experience	Traffic Engineering Highway/ Intersection Analysis
Matt Hunter, P.E.	B.S. Civil Engineering 4 years engineering experience	Roadway Designer, Border Wizard
David Kent, P.E.	B.S. Civil Engineering 11 years engineering experience	Roadway Design Engineer
Randy Day	Engineering Technician 32 years experience	Structural Support and 3D Visualization
Mark Helinski, P.E.	B.S. Civil Engineering 14 years bridge design engineering experience	Bridge Design and Inspection
Matt Wendling, P.E.	B.S. Civil Engineering 10 years experience in bridge design and inspection	Bridge Design and Inspection
Traci Sandefeur	B.S. Anthropology 14 years experience in cultural resources planning	Archeological Investigations
Howard Beverly	B.A. Anthropology M.A. Anthropology 11 years experience	Archeological Investigations GIS Exhibits
Robert Ball	B.A. Anthropology M.A. Historic Preservation 10 years experience in archeology and cultural resources	Historic Architectural Survey, Cultural Resources
HNTB Michigan, Inc.		
Thomas Weston, P.E.	B.S. Civil Engineering 16 years transportation engineering experience	Roadway Design Engineer
John Jaeckel, P.E.	B.S. Applied Science and Engineering 29 years air quality and noise analysis experience	Environmental Quality Engineer, Air and Noise analysis
Paul Carr, P.E.	B.S. Civil Engineering 12 years transportation engineering exeperience	Roadway Design Engineer
Suheil Acra	B.S. Civil Engineering M.S. Civil Engineering 12 years air quality and noise analysis experience	Environmental Quality Engineer, Noise Analysis

Name	Education and Experience	Primary Responsibilities
Sear Brown Group, Inc. (A Stantec Company)		
William Holthoff	B.S. Civil Engineering M.S. Civil Engineering 28 years of transportation engineering	Lead Plaza Design/User Agency Coordinator
Tawney Farmer, P.E.	B.S. Civil Engineering 19 years experience in site engineering	Plaza Site Engineering
KLD Associates, Inc.		
Mark Yedlin, P.E.	B.S. Civil Engineering M.S. Transportation Engineering 29 years experience in transportation engineering and traffic simulation modeling	Lead for Traffic Simulation Analyses
Reuben Goldblatt, P.E., PTOE	B.S. Aerospace Engineering M.S. Aeronautics M.S. Transportation Planning 33 years experience	Simulation Analysis
Lakshmi Kanth R Naredla, EIT	B. Tech. Civil Engineering M.S. Civil Engineering 3 years experience	Traffic Analysis – Border Wizard
Wetland and Coastal Resources, Inc.		
Stu Kogge, PWS	B.S. Fisheries and Wildlife M.S. Fisheries and Wildlife 15 years wetland studies experience, 14 years threatened and endangered species experience	Senior Wetland and Aquatic Biologist
Mike Nurse, PWS	B.S. Fisheries and Wildlife M.S. Fisheries and Aquatic Biology 13 years wetland studies and threatened & endangered species experience	Wetland and Aquatic Biologist
Soils and Materials Engineers, Inc.		
Larry Heinig, P.E.	B.S. Civil Engineering M.S. Civil Engineering 41 years engineering experience	Geotechnical Engineering
Caryn Owens	B.S. Environmental Engineering 4 years environmental engineering experience	Hazardous Material Investigation

Name	Education and Experience	Primary Responsibilities
Michigan Department of Transportation (MDOT)		
Matt Webb, AICP	B.S. Resource Development 10 years transportation planning experience	MDOT Project Manager
Paul McAllister	B.S. English M.A. Anthropology 25 years experience in NEPA project analysis with MDOT	MDOT NEPA Project Coordinator/Project Manager
Lloyd Baldwin	M.S. Historic Preservation 12 years experience	MDOT Environmental Review and Cultural Resources
Eric Dhanak, P.E.	B.S. Civil Engineering 22 years transportation engineering experience	MDOT Traffic and Safety
Jeff Edwards, AICP	M.A. Landscape Architecture 12 years planning experience	MDOT Transportation Planner, Metro Region
Tom Jay	B.A. Business Administration 27 years real estate experience	MDOT Region Real Estate Manager
Robert Parsons	B.S. Interpersonal and Public Communication 25 years professional communications experience	MDOT Public Hearings Officer, public hearing coordination and certification
Paul Sander, SR/WA	B.D.E. State of Michigan 31 years of transportation right-of-way experience	MDOT Real Estate Analysis
Michael Szuch, P.E.	B.S. Civil Engineering 20 years experience in the construction, engineering and public works fields	MDOT Blue Water Bridge Manager
Edmund Waddell	B.S. Urban Planning M.S. Transportation Planning 23 years experience	MDOT Transportation Planner, Special expertise in project level traffic analysis, project alternative analysis, and development
Paul Wisney, P.E.	B.S. Civil Engineering 22 years transportation engineering experience	MDOT Engineering Lead
Larry Young P.E.	B.S. Civil Engineering 21 Years MDOT experience	MDOT Port Huron TSC Manager
Stephanie Aldighieri, P.E.	B.S. Civil Engineering M.S. Civil Engineering 8 years traffic engineering experience	Traffic Analysis

CHAPTER 8

DISTRIBUTION LIST

The Draft Environmental Impact Statement is being distributed to the following federal, state, regional, and local agencies and interested parties for their review and comment.

Federal Agencies

- Advisory Council on Historic Preservation
- U.S. Army Corps of Engineers, Detroit District
- U.S. Coast Guard, Ninth District, Cleveland, OH
- U.S. Customs and Border Protection, Port Huron, MI
- U.S. Customs and Border Protection, Indianapolis, IN
- U.S. Department of Agriculture, Natural Resource Conservation Service, Michigan State Conservationist
- U.S. Department of Commerce, NEPA Coordinator, Washington, D.C.
- U.S. Department of Energy, Office of NEPA Project Assistance, Washington, D.C.
- U.S. Department of Health and Human Services, Center for Disease Control
- U.S. Department of Homeland Security, Washington, D.C.
- U.S. Department of Housing and Urban Development, Area Director
- U.S. Department of Interior, Bureau of Indian Affairs, Area Director, Fort Snelling, MN
- U.S. Department of Interior, Bureau of Indian Affairs, Michigan Agency, Sault Ste. Marie, MI
- U.S. Department of Interior, Fish and Wildlife Service, East Lansing Field Office
- U.S. Department of Interior, National Park Service Midwest Region
- U.S. Department of Transportation, Federal Aviation Administration, Michigan Section
- U.S. Department of Transportation, Federal Highway Administration, Midwestern Resource Center, Olympia Fields, IL
- U.S. Environmental Protection Agency, Filing Section, Washington, D.C.
- U.S. Environmental Protection Agency, Region 5, Chicago, IL

- U.S. Federal Emergency Management Agency, Region 5, Chicago, IL
- U.S. General Services Administration, Great Lakes Region, Chicago, IL

U.S. Senators and Representatives

- Senator Debbie Stabenow, MI
- Senator Carl Levin, MI
- Representative Candice Miller, 10th District, MI

State Senators and Representatives

- Representative Daniel Acciavatti, District 32, MI
- Representative Phil Pavlov, District 81, MI
- Representative John Espinoza, District 83, MI
- Senator Jud Gilbert, District 25, MI

Canadian Agencies and Local Jurisdictions

- Blue Water Bridge Authority
- Canada Border Services Agency, Ottawa, ON
- Ontario Ministry of Transportation, London, ON
- Transport Canada, Ottawa, ON
- City of Sarnia, ON
- Village of Point Edward, ON

State Agencies, Michigan

- Michigan Department of Agriculture
- Michigan Economic Development Corporation
- Michigan Department of Environmental Quality
- Michigan Department of Community Health
- Michigan Department of History, Arts, and Library, State Historic Preservation Officer
- Michigan Department of Natural Resources
- Michigan Department of Transportation
- Michigan Environmental Science Board
- Michigan Family Independence Agency
- Michigan State Housing Development Authority

Local Jurisdictions and Agencies, Michigan

St. Clair County

- St. Clair County Road Commission
- St. Clair County Board of Commissioners

- St. Clair County Drain Commissioner
- St. Clair County Transportation Study
- St. Clair County Clerk
- St. Clair County Economic Development Department
- St. Clair County Emergency Services/Management

City of Port Huron

- City of Port Huron Office of the City Engineer
- City of Port Huron Office of the City Manager
- City of Port Huron Office of the Director of Finance
- City of Port Huron Office of the Fire Chief
- City of Port Huron Police Department
- City of Port Huron Planning and Development
- City of Port Huron Council/Clerk

Townships

- Port Huron Township
- Fort Gratiot Township
- Kimble Township

Other Agencies and Interest Groups

- Canadian / American Border Trade Alliance
- Clean Water Action
- DTE Energy Company
- Economic Development Alliance of St. Clair County
- Great Lakes Trade Corridor Association
- Michigan Environmental Council
- Michigan Gas Utilities
- Michigan Infrastructure & Transportation Association
- Michigan Municipal League
- Michigan Townships Association
- Michigan United Conservation Clubs
- National Wildlife Federation, Great Lakes Chapter
- Port Huron Area Public School District
- Port Huron Chamber of Commerce
- Sierra Club, Mackinac Chapter
- Southeast Michigan Council of Governments
- West Michigan Environmental Action Council
- Ziibiwing Cultural Society

CHAPTER 9

GLOSSARY OF TERMS

100-Year Flood Elevation: The 100-year flood elevation is defined by the Federal Emergency Management Agency (FEMA) as the flood elevation that has a one-percent chance of being equaled or exceeded (inundated) in any given year. Thus, despite its name, a 100-year flood could occur more than once in a relatively short period of time. See also floodplain.

Air Quality Index (AQI): The AQI is a guide for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health concerns you should be aware of. The AQI focuses on health effects that can happen within a few hours or days after breathing polluted air. The U.S. Environmental Protection Agency (EPA) uses the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, USEPA has established national air quality standards to protect against harmful health effects.

Alternative: Alternatives are different options under consideration for a project. By evaluating the impacts associated with different Alternatives, a decision can be made as to which one will be the "Preferred Alternative" or "Recommended Alternative." There have been a number of Alternatives considered as part of this project, and all the terms below are defined separately as well:

- Illustrative Alternatives
- No-Build Alternative
- Build Alternatives (City East, City West, Township)

American Association of State Highway and Transportation Officials (AASHTO): A nonprofit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia and Puerto Rico whose primary goal is to foster the development, operation, and maintenance of an integrated national transportation system.

American Society for Testing and Materials (ASTM): Founded in 1898, ASTM is a nonprofit organization providing standards that are accepted and used in research and development, product testing, quality systems, and commercial transactions around the globe. In over 130 varied industry areas, ASTM standards serve as the basis for manufacturing, procurement, and regulatory activities.

Annual Average Daily Traffic (AADT): The average number of vehicles passing a fixed point on a roadway in a 24-hour time frame. To reflect daily variation over time, AADT averages the daily traffic volumes over the course of a year. Used as a measure of traffic volume on a roadway. AADT is essentially the yearly traffic volume divided by 365.

Archaeological Site: The location of past cultural activity which could be used to describe and explain the nature and evolution of cultural systems; a defined space with mainly continuous archaeological evidence. Most archaeological resources are below ground level and yield information important in history or pre-history.

Architectural Resource: A building or other structure with potential historic significance based on its age, type, or its association with a person(s) or event(s). Such a property may have the distinctive characteristics of a type, period, or method of construction or may represent the works of a master or may possess high artistic values.

Area of Potential Effect (APE): In the context of cultural resources, the APE is the geographic area or areas within which a project may directly or indirectly cause alterations in the character or use of historic or archaeological resources, if any such properties exist. The area of potential effect is influenced by the size and nature of a project and may be different for different kinds of effects caused by the project.

Blue Water Bridge Authority (BWBA): The Canadian portion of the Blue Water Bridge is owned and operated by Blue Water Bridge Authority (BWBA). The BWBA was created as a corporation in 1964 by the Blue Water Bridge Authority Act and is responsible for the Canadian plaza operations, maintenance of the Canadian side of the bridge, capital infrastructure improvements, and toll collection. Specifically, the BWBA is responsible for the toll collection for westbound traffic (Canada to United States) and the provision of toll collection booths, Customs & Immigration booths, and bridge capacity.

Build Alternatives: A collective description of all Alternatives that include physical construction and therefore are distinct from the No-Build Alternative. For this document, the Build Alternatives are the City East, City West, and Township Alternatives.

Canada Border Services Agency (CBSA): Created December 12, 2003, the CBSA is responsible for providing integrated border services that support national security priorities and facilitate the free flow of persons and goods, into Canada including animals and plants, which meet all legislated requirements under the program legislation.

Clean Air Act Amendments (CAAA): The CAAA is legislation designed to curb three major threats to the nation's environment and to the health of Americans: acid rain, urban air pollution, and toxic air emissions. It called for establishing a national permits program to make the law more workable, and an improved enforcement program to help ensure better compliance with the Act. The original Clean Air Act of 1970 was last amended in 1990.

Clean Water Act: The Clean Water Act provides for comprehensive federal regulation of all sources of water pollution. It prohibits the discharge of pollutants from non-permitted sources.

Combined Sewer Overflows (CSOs): Combined sewer systems are an older design of sewers used in the late 19th and early 20th century. Because these systems collect rainwater runoff,

domestic sewage, and industrial wastewater in the same pipe, high water levels from rain events can result in sewage and wastewater to be discharged as CSOs into lakes and streams. Municipal utilities across the country have been upgrading their sewer systems in recent decades to separate storm water from sewage and wastewater, which are treated separately.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Created in 1980, it is also known unofficially as "Superfund." CERCLA provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. By creating the designation of "Superfund" sites, CERCLA established provisions for the liability, use, and funding for remediation of hazardous waste sites, particularly when no responsible party could be identified.

Congestion: The level at which transportation system performance and delay is no longer acceptable due to traffic interference. The level of acceptable performance may vary by type of transportation facility, geographic area, and/or time of day.

Controlled Access: This is the regulated limitation of access into (ingress) and out of (egress) properties abutting a roadway. A controlled access roadway has few (or no) driveways, may be physically separated by a median, and intersections with crossroads are widely spaced. A freeway would have limited access with access to and from the roadway limited to interchange ramps.

Cross-Section: Depicts the physical dimensions of a roadway facility as seen from a driver's perspective, including lane, shoulder, median, and typical right-of-way widths.

Cultural Resources: A location, building, structure, or place with potential historic or archaeological significance.

Cumulative Impacts: The impact on the environment which results from the incremental impact of action(s) when added to other past, present, and reasonably foreseeable future actions.

Customs and Border Protection: U.S. Customs and Border Protection (CBP) is the unified border agency within the Department of Homeland Security (DHS). CBP combined the inspection workforces and broad border authorities of U.S. Customs, U.S. Immigration, Animal and Plant Health Inspection Service and the entire U.S. Border Patrol. CBP's role is to manage, control and protect the Nation's borders, at and between the official ports of entry. CBP is the lead agency that inspects border crossers and cargo on the United States Plaza at the Blue Water Bridge.

Design Loading: The amount of weight a bridge is designed to hold.

Design Hour Volume (DHV): An hour with traffic volumes that represent a reasonable value for designing the geometric and control element of a facility.

Design Speed: A speed used to design the curvature and grades of a highway, taking into account the composition and volume of traffic. To ensure safe operations, it is typically desirable for engineers to choose a design speed that equals or exceeds the anticipated posted speed, and complements the highway type, setting, functional classification, traffic volume, and terrain.

Direct Impacts: A direct impact is an impact caused by a project that occurs at the same place as the project and at the same time as the project is implemented, i.e. is a direct result of the project.

Diverge: A movement in which a single lane of traffic separates into two lanes without the aid of traffic control devices such as when vehicles exit a freeway.

Draft Environmental Impact Statement (DEIS): See Environmental Impact Statement.

Endangered Species: Endangered Species are any species of animal or plant life that is in danger of extinction throughout all or a significant part of its range. Species can be designated "endangered" by either the U.S. Fish and Wildlife Service or a state's Natural Heritage program. With this designation comes legal protection at the federal level (Endangered Species Act) and/or the state level. Species can also be designated by state or federal government as Threatened Species or Special Concern Species for species with populations that are somewhat less in jeopardy than endangered species.

Environmental Consequences: The Environmental Consequences discussion in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) assesses the anticipated effects of the proposed project alternatives on all possible resources (air quality, wildlife, wetlands, etc.) that may be affected by the project. This discussion compares and contrasts the impacts associated with all alternatives, including the No-Build Alternative.

Environmental Impact Statement (EIS): An environmental document that is prepared when it is initially determined that the action/project may cause significant impacts to the environment, when environmental studies and early coordination indicate significant impacts, or when review of a previously prepared environmental assessment indicates that the impacts anticipated to result from the project may be significant. A Draft EIS (DEIS) compares all reasonable alternatives to the proposed project and summarizes the studies, reviews, consultations, and coordination required by legislation and Executive Orders to the extent appropriate at the draft stage in the environmental process. A Final EIS (FEIS) identifies and addresses the social, economic, and environmental impacts of a Preferred Alternative and addresses public comments received during the formal public commenting period as well as the public comments received throughout the NEPA process. After publishing the Draft and Final EIS, the NEPA process concludes with a Record of Decision (ROD).

Facility: Any type of transportation infrastructure such as highways, local roads, transit centers, etc. that is used to move people and goods.

Family Independence Agency (FIA): The FIA is Michigan's public assistance, child and family welfare agency directing the operations of public assistance and service programs through a network of over 100 county family independence agencies in every county in Michigan.

Farmland Protection Policy Act (FPPA): The purpose of FPPA is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. FPPA ensures, to the maximum extent practicable, that federal programs are administered in a manner that is compatible with state, unit of local government, and private programs to protect farmland.

Farmland and Open Space Preservation Program: This program enables a farm owner to enter into a development rights agreement with the state, ensuring that the land remains in an agricultural use for a minimum of ten years and that the land is not developed in a non-agricultural use.

Farmlands of Local Importance: The Natural Resources Conservation Service defines these farmlands as "those lands that are nearly Prime Farmland and that economically produce high yields when treated and managed according to modern farming methods. Some may produce as high a yield as prime farmlands, if conditions are favorable".

Federal Highway Administration (FHWA): Division of the U.S. Department of Transportation which funds highway planning and construction programs and is headquartered in Washington, D.C., with field offices located across the United States. The FHWA provides expertise, resources, and information to continually improve the quality of our nation's highway system and its intermodal connections. The Federal-Aid Highway Program is the main program through which the FHWA performs its mission. The Federal-Aid Highway Program provides federal financial assistance to the States to construct and improve the National Highway System, urban and rural roads, and bridges.

Final Environmental Impact Statement (FEIS): See Environmental Impact Statement.

Floodplain: Any land area susceptible to being inundated by floodwaters from any source.

Food and Drug Administration (FDA): The FDA is one of several federal agencies that work cooperatively with Customs and Border Protection to determine if foreign goods should enter into the United States. FDA reviews imported entries of foods, drugs, medical devices, biologics, cosmetics, as well as a number of other products that fall under FDA jurisdiction. FDA helps to assure that imported food products are safe and wholesome, drugs and devices are safe and effective and that all other imported FDA regulated products meet the laws and requirements of the United States.

Free and Secure Trade Program (FAST): This program partners the United States and Canadian governments with the private sector to ensure a secure supply chain for low risk goods. FAST offers expedited clearance to those carriers, drivers, and importers who have registered and are pre-authorized. For low risk goods being imported from Canada into the U.S. by a pre-authorized importer, a pre-authorized carrier, and a registered driver, the carrier provides Customs and Border Protection (CBP) with an electronic transmission of limited data in advance of the arrival of the shipment at the border. When the shipment arrives at the border, it is processed through dedicated lanes where the driver will present his registration card and the CBP officer uses a bar code or transponder to identify the shipment. FAST opened at the Blue Water Bridge in December 2002.

Freeway: A divided highway for through traffic with controlled access. All crossings of the freeway by other roadways are vertically grade-separated (i.e. bridges carry the freeway above the other roadway or vice versa) and all access to the roadway is provided exclusively by interchange ramps that merge with the freeway traffic.

General Services Administration (GSA): The General Services Administration (GSA) is a federal agency created by Congress to improve government efficiency and effectiveness. GSA provides office space, courthouses, warehouses, laboratories, and border stations, and provides the protection services necessary to make these facilities secure.

Gore Area: The sharply-angled area located immediately between the left edge of a ramp pavement and the right edge of the roadway pavement at a merge or diverge area.

Gamma Ray Inspection Technology (GRIT): GRIT is a gamma-ray imaging system used to non-intrusively inspect freight contained on and in trucks, cargo containers, and passenger vehicles. GRIT allows operators to view the gamma-ray images on a video monitor to quickly and efficiently identify voids, false walls or ceilings, and other secret compartments typically associated with the transportation of drugs, explosives and weapons.

Habitat: An area that provides an animal or plant with adequate food, water, shelter, and living space.

Hazardous Materials: Substances or materials capable of posing unreasonable risk to health, safety and property when transported in commerce, or when encountered in underground contamination.

Historic Resources: Historic resources are properties that may possess potential historic significance based on its age, type, or its association with a person(s) or event(s). Such a property may have the distinctive characteristics of a type, period, or method of construction or may represent the works of a master or may possess high artistic values.

Hydraulic Influence: The hydraulic influence is the area that has a change in water levels because of a structure blocking the normal river flow.

Hydric Soils: A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to favor the growth of wetland plants.

Illustrative Alternatives: Preliminary concepts developed at the onset of a transportation planning project. Illustrative Alternatives are typically very conceptual by nature and are intended to examine all reasonable alternatives to address the transportation needs of the study area, prior to detailed study to identify their feasibility.

Impacts: Effects which occur as a result of implementing a transportation improvement. Direct impacts most commonly occur when proposed right-of-way actually crosses a resource in question such as a residence, business, wetland, or other regulated resources. Impacts can also be indirect impacts and can be part of a cumulative impact.

Indirect Impacts: 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."

Infrastructure: Term used to describe the physical assets of a society or community including roads, bridges, transit facilities, bikeways, sidewalks, parks, sewer/water systems, communications networks, and other capital facilities.

Invasive Species: Invasive species are non-native plants or animals that are introduced far from their original range, and become more successful at competing with native species for space and resources.

Land Evaluation Site Assessment (LESA): LESA is a point-based approach for rating the relative importance of agricultural land based upon specific measurable features.

Land Use: The way specific portions of land or the structures on them are used or planned for future use. Land use is typically based on local zoning guidelines and long term land use plans. Example land uses include commercial, residential, industrial, retail, agricultural, vacant, etc.

Limited Access Facility: A freeway facility that does not have driveway access or roadway intersections. Access is limited to freeway interchanges.

Median: A barrier, often found on multi-lane roadways or freeways, which provides separation distance between opposing traffic movements. A median can consist of either a grass or natural setting typical of a rural cross-section, or a concrete wall or guardrail barrier which is typical of an urban setting.

Merge: A movement in which two separate lanes of traffic combine to form a single lane without the aid of traffic signals or other right-of-way controls. An example of a merge is traffic merging or entering onto a freeway from an on-ramp.

Michigan Department of Environmental Quality (MDEQ): The state agency responsible for review of any wetland, floodplain, potentially contaminated sites, air quality, and/or water quality impacts.

Michigan Department of Natural Resources (MDNR): The state agency responsible for review of state threatened and endangered species, parkland, and fisheries impacts.

Michigan Department of Transportation (MDOT): The state agency responsible for planning, construction, and maintenance of all interstate, U.S., and state highways, bridges, and other modes of transportation within the State of Michigan.

Mitigation: Actions provided to avoid, minimize, or compensate the negative effects of a project.

Mobile Source Air Toxics (MSAT): Regulated by the EPA, MSATs are known as "hazardous air pollutants." Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

National Ambient Air Quality Standards (NAAQS): Air quality standards set by the U.S. Environmental Protection Agency for pollutants considered harmful to public health and the environment.

National Environmental Policy Act (NEPA): Federal act passed in 1969 which requires the assessment of the social, economic, and environmental impacts that a federally funded or federally permitted project might cause. This includes the identification of the purpose of and need for the project, and evaluation of alternatives to minimize resulting impacts.

National Pollution Discharge Elimination System (NPDES): The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of Clean Water Act.

National Register of Historic Places (NRHP): The NHRP is the nation's official list of cultural resources worthy of preservation. This list was established under the National Historic Preservation Act of 1966 and is administered by the Department of the Interior.

Natural Resources Conservation Service (NRCS): The federal agency responsible for providing leadership in a partnership effort to help people conserve, maintain, and improve our

natural resources and environment. NRCS was formerly known as the Soil Conservation Service.

Network: A transportation system with its many roadways and routes often showed either graphically or mathematically.

NEXUS: NEXUS is a joint program that has been implemented with the cooperation of the American and Canadian governments and is now being expanded nationally.

Participants in the NEXUS program are approved by both the U.S. and Canada as low-risk, pre-approved travelers, enjoying a simplified entry process while traveling back and forth across the U.S./Canada border.

NEXUS pass holders use dedicated lanes at border crossings, and are not regularly subjected to the usual customs and immigration questioning. These lanes are provided in an effort to reduce traffic congestion and delays at bridge and land crossings while maintaining a safe and secure border.

Non-Attainment Area: A designation by the Environmental Protection Agency of any area in the United States failing to meet the National Ambient Air Quality Standards (NAAQS).

Non-Motorized Transportation: Bicycles, roller blades, running, walking, wheelchairs, scooters, sled dogs, etc.

North American Free Trade Agreement (NAFTA): A pact that calls for the gradual removal of tariffs and other trade barriers on most goods produced and sold in North America. NAFTA became effective in Canada, Mexico, and the United States January 1, 1994. NAFTA forms the world's second largest free-trade zone, bringing together 365 million consumers in Canada, Mexico, and the United States in an open market.

Peak Hour: The 60-minute period in the AM or PM in which the largest volume of travel is generally experienced on a roadway segment (e.g. rush hour).

Port: A United States port of call is designated to accept and release entries of merchandise, collect duties and enforce the various provisions of Customs laws. The Blue Water Bridge Plaza is officially a port of entry.

Practical Alternative: Practical Alternatives are developed from refinements made to the initial Illustrative Alternatives. These alternatives are subject to increased levels of traffic, engineering, social, economic, and environmental analysis as well as public and agency comment to determine if they are capable of meeting the purpose and defined goals of the project.

Preferred Alternative: The Preferred Alternative is selected from the Practical Alternatives after extensive engineering, social, economic, and environmental analysis. It could include

components of several Practical Alternatives in any combination found to be the most beneficial.

Primary Inspection: The first point of contact or set of inspection booths at a border station for both trucks and cars is called Primary Inspection. If all of a truck's paperwork is in order and was processed ahead of time, the truck is a "Line Release" truck and this may be its only stop. If the paperwork is not in order, the carrier must visit a broker, or if the carrier is selected for examination, the truck will be directed to Secondary Inspection.

As individuals enter the U.S. or Canada they will be stopped and questioned prior to entry into that country at Primary Inspection. Each person in the vehicle must be able to prove their citizenship. Individuals requiring further questioning or processing will be sent to Secondary Inspection.

Prime Farmland: The Natural Resources Conservation Service has designated prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, forage, fiber, and oilseed crops. The land could be crop, pasture, range, forest, or other uses, but does not include urban built-up land or water bodies since these two are considered irreversible uses. It has the soil quality, growing season, and moisture supply needed to economically produce and sustain high yields when treated and managed according to modern farming methods, including water management" (USDA, 1983).

Public Hearing: A hearing formally advertised and convened to allow any person who deems their interest to be affected by a project an opportunity to be heard. A public hearing includes formal documentation of all comments received.

Recognized Environmental Conditions (RECs): The presence of or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products.

Record of Decision (ROD): A final environmental document published after a Final Environmental Impact Statement (FEIS) that identifies the selected alternative. A ROD discusses the alternatives considered and the basis of the decision as well as any mitigation measures for environmental impacts.

Resource Conservation and Recovery Act (RCRA): Passed by Congress in 1976 to provide cradle-to-grave management of hazardous waste. Regulation is enforced by the U.S. Environmental Protection Agency (EPA) and the Michigan Department of Environmental Protection (DEP).

Right-of-Way (ROW): Public land reserved for locating infrastructure such as a roadway or a utility line. A road right-of-way includes area for any required shoulders, drainage ditches, curb, median, barriers, and fences in addition to the roadway.

Secondary Inspection: The separate locations for additional processing and inspection of commercial vehicles or individuals by Customs and Border Protection after Primary Inspection.

Section 4(f): This is Section 4(f) of the Department of Transportation Act of 1966 as amended. Section 4(f) states that no highway 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 the use of such land. In addition, adverse impacts to these 4(f) sites must include all possible planning to minimize harm resulting from such use. In the context of Section 4(f), "use" can be either a direct impact (taking of property), or a "constructive use", which may not actually require acquisition of land, but otherwise impairs the function of the resource through changes in access or surroundings.

Section 106: Section 106 of the National Historic Preservation Act of 1966 is the main protection that archaeological, historical, and cultural resource sites have against the encroachment of federally-funded programs in the United States. Section 106 requires that the State Historic Preservation Office (SHPO) review all federal actions for any potentially adverse effect on cultural resources.

Sole Source Aquifers: Aquifer that supplies 50 percent or more of the drinking water in a given area.

Superelevation: The slope to which a roadway is banked between the inner-most lane and the outer-most lane. On freeways and other high-speed facilities, curved segments are often superelevated so traffic can safely travel through the curve at higher speeds.

State Historic Preservation Officer (SHPO): The state agency having jurisdiction over protecting archaeological and aboveground historic architectural resources (e.g. cultural resources).

Stopping Sight Distance: Stopping sight distance is the sum of two distances: (1) the distance traversed by a vehicle from the instant the driver sights a reason for stopping until the instant the brakes are applied; and (2) the distance needed to stop the vehicle from the instant brake application begins. These are referred to as brake reaction distance and braking distance, respectively.

Technical Memorandum: Reports detailing the processes and descriptions of various analyses such as Traffic, Air and Noise, Wetland Delineation, and others which were used to prepare a Draft and/or Final Environmental Impact Statement.

Temporary Impact: Refers to impacts occurring during construction that cease to exist after construction associated with the project is completed (e.g. dust associated with construction activities).

Threatened Species: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Traffic Count: Mechanical, digital, or photographic means of counting the number and type of vehicles passing a given location.

Transit: Transportation mode involving buses, trains, and other vehicles that individually move larger numbers of people than do individual automobiles. Also known as mass transit, public transit, public transportation, or urban transit.

Transboundary Effects: Project effects that extend across the border and affect another country's environment. NEPA requires agencies to include analysis of reasonably foreseeable transboundary effects of proposed actions in their analysis of proposed actions in the United States.

Transportation System Management (TSM): An Alternative that includes reasonable small-scale roadway improvements such as traffic signal improvements, turn restrictions, turn lanes, and short distance local road improvements. TSM does not include major construction.

Travel Demand: The counted or projected volume of traffic that is or will be utilizing a roadway in a specified time period (i.e., 24-hours, peak periods, etc.).

Travel Forecasting: The process by which demographic information (population and employment) and land use projections are used to determine potential future vehicle trips on a given transportation network.

Under Clearance: The vertical distance from the surface of a roadway to the bottom of a bridge deck crossing over that roadway.

Underground Storage Tank Site (UST): Sites containing one or more underground storage tanks (USTs) or those found to show evidence of an existing or removed tank during background research or site visits. Depending on the type, age, and condition of the UST and associated underground piping, sites of this type may present a risk for soil and/or groundwater contamination. If the UST is documented as leaking or shows visible signs of leakage at ground level, it is referred to as a Leaking Underground Storage Tank (LUST).

Unique Farmlands: The Natural Resources Conservation Service has defined unique farmlands as "land other than prime farmland that is used for the production of specific high value food and fiber crops. These lands have a special combination of factors needed to economically produce sustained high quality yields of a specific crop when treated and managed according to modern farm methods. The special factors that make the land unique include soil quality, growing season, temperature, humidity, elevation, moisture supply, or other conditions such as nearness to market that favor growth of a specific crop. Moisture supply is in the form of stored moisture, precipitation, or a developed irrigation system."

United States Army Corps of Engineers (USACE): The federal agency responsible for review of all water crossings of navigable streams. The USACE also serves in an advisory role on wetland impacts of Michigan highway projects.

United States Department of Agriculture (USDA): The federal agency responsible for review of any prime and unique farmland impacts.

United States Environmental Protection Agency (EPA): A federal agency that is charged with protecting the natural resources of the country.

United States Fish and Wildlife Service (USFWS): The federal agency responsible for review of the impacts on any federally listed threatened and endangered species along with other game and non-game species. The USFWS also serves as an advisory agency for many other environmental issues including wetland and habitat impacts.

Upland: An area that is not classified as a wetland.

Urban Cross-Section: A roadway facility characterized by enclosed drainage, meaning that storm water is conveyed away from the paved roadway using curbs, gutters, catch-basins and storm sewers. (The opposite is a Rural Cross-Section, where water is conveyed away from the roadway using swales, slopes, etc.) Urban divided freeway cross-sections have a median barrier wall separating opposing lanes of traffic.

Weaving: The crossing of two or more traffic streams traveling in the same direction along a length of a highway, without the aid of traffic control devices except for guide signs. An example of a weave would be a freeway where an on-ramp is closely followed by an off-ramp. Traffic wishing to exit the freeway needs to travel from the right lane to the off-ramp. In the same area, traffic wishing to enter the freeway needs to travel from the on-ramp to the right travel lane. The segment of roadway where both streams of traffic conflict with each other is a weave.

Wetland: Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support plants typically adapted for life in saturated soil conditions. The term "wetland" encompasses many different types of plant communities, and is dependent on the duration and depth of inundation. These different types can include fens, bogs, wet meadows, wooded wetlands, scrub-shrub wetlands, open water wetlands, etc. A "wetland complex" describes a contiguous area composed of more than one type of wetland. An area that is <u>not</u> classified as a wetland is called "upland."

Wetland Delineation: The process used to determine the jurisdictional boundaries of a wetland. Wetland delineations are a function of the soils, hydrology and vegetation observed.

Wetland Mitigation: Avoidance, minimization, and compensation for the loss of functional values associated with wetlands impacted by an activity. The most common types of compensation include wetland restoration (reestablishing some or all of the values associated with wetland where wetlands have been drained), and wetland creation (establishing new wetland in an upland or drained area).

CHAPTER 10

LIST OF ACRONYMS

Acronym	Meaning
AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
APE	Area of Potential Effect
AQCR	Air Quality Control Region
AQI	Air Quality Index
AST	Above Ground Storage Tanks
ASTM	American Society for Testing and Materials
BEA	Baseline Environmental Assessment
BMP	Best Management Practices
BWBA	Blue Water Bridge Authority
CAAA	Clean Air Act Amendments
CBP	Customs and Border Protection
CBSA	Canada Border Services Agency
CCRA	Canada Customs and Revenue Agency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability
CO	Carbon Monoxide
CORRACTS	Corrective Action Facilities

Acronym	Meaning
CSO	Combined Sewer Overflow
CSS	Context Sensitive Solutions
CVPC	Commercial Vehicle Processing Center
DEIS	Draft Environmental Impact Statement
DHV	Design Hour Volume
EA	Environmental Assessment
EIS	Environmental Impact Statement
EM	Emergent Wetland
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FAST	Free and Secure Trade
FDA	Food and Drug Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIA	Family Independence Agency
FIRM	Flood Insurance Rate Maps
FO	Forested Wetland
FONSI	Finding of No Significant Impacts
FPPA	Farmland Protection Policy Act

Acronym	Meaning
FQI	Floristic Quality Index
GIS	Geographic Information System
GRIT	Gamma Ray Inspection Technology
GSA	General Services Administration
HCS	Highway Capacity Software
INS	Immigration and Naturalization Services
KLD	KLD Associates, Inc.
LESA	Land Evaluation Site Assessment
LOS	Level of Service
LQG	Large Quantity Generator
LRP	Long Range Plan
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund Act
MDA	Michigan Department of Agriculture
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
MDEQ-RRD	Michigan Department of Environmental Quality-Remediation and Redevelopment Division
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
MOE	Measure of Effectiveness

Acronym	Meaning
MOT	Maintenance of Traffic
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
MSE	Mechanically Stabilized Earth
NAAQS	National Ambient Air Quality Standards
NAFTA	North American Free Trade Agreement
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resource Conservation Service
NREPA	Natural Resources Environmental Protection Act
NRHP	National Register of Historic Places
O_3	Ozone
OW	Open Water Wetland
PA	Practical Alternative
Pb	Lead
PM	Particulate Matter
PPB	Parts per Billion

Acronym	Meaning
PPM	Parts per Million
PSI	Pollutant Standards Index
PSP	Public/Semi-Private
RCRA	Resource Conservation and Recovery Act
RCRIS	Federal Resource Conservation and Recovery Information System
REC	Recognized Environmental Condition
ROW	Right-of-Way
SB	Sear Brown, Inc.
SCCOTS	St. Clair County Transportation Study
SEMCOG	Southeast Michigan Council of Governments
SHPO	State Historic Preservation Office
SME	Soils and Materials Engineers, Inc.
SO_2	Sulfur Dioxide
SQG	Small Quantity Generator
SS	Scrub/Shrub Wetland
TA	Technical Advisory
TIP	Transportation Improvement Program
TSD	Treatment Storage and Disposal
TSM	Transportation System Management
USACE	United States Army Corps of Engineers

Acronym	Meaning
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
US	United States
VAU	Visual Assessment Units
WCR	Wetland and Coastal Resources, Inc.
WHMD	Waste and Hazardous Materials Division

CHAPTER 11

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Consultant Disclosure Statement

Wilbur Smith Associates, Inc. (WSA) has no interest, financial or otherwise, in the preparation of the Blue Water Bridge engineering analysis and Draft Environmental Impact Statement other than compensation for the services performed and the general enhancement of WSA's professional reputation. The team of professionals, which WSA assembled to conduct field studies and analyses, was selected based solely upon their qualifications. To the best of WSA's knowledge, no person or firm contributing to the preparation of this document has any interest in the findings or outcome of the process.

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