ENVIRONMENTAL ASSESSMENT/ PROGRAMMATIC SECTION 4(f) EVALUATION

for

the Proposed Improvements of I-196 from east of US-131 to the I-196/I96 junction; I-96 from west of Leonard Street to west of Cascade Road, and M-37/M-44 (East Beltline) from south of M-21 to north of the Knapp Street Intersection in the City of Grand Rapids and Grand Rapids Township, Kent County, Michigan

MDOT
Michigan Department of Transportation

Prepared by the:

MICHIGAN DEPARTMENT OF TRANSPORTATION

In cooperation with the

U.S. DEPARTMENT OF TRANSPORTATION
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 on the project can be considered and taken into account during the decision-making process. The cost of publishing 100 copies of this document at $27 per copy is $2700, and the document has been printed in accordance with *Michigan Executive Directive 1991-6*

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APPROVED:

11/04/05
Date

for the Federal Highway Administration

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PREFACE

The National Environmental Policy Act (NEPA) of 1969 requires that the social, economic, and natural environmental impacts of any proposed action of the federal government be analyzed for decision-making and public information purposes. There are three classes of action. Class I Actions, which are those that may significantly affect the environment, require the preparation of an Environmental Impact Statement (EIS). Class II Actions (categorical exclusions) are those that do not individually or cumulatively have a significant effect on the environment and do not require the preparation of an EIS or an Environmental Assessment (EA). Class III Actions are those for which the significance of impacts is not clearly established. Therefore, Class III Actions require the preparation of an EA to determine the significance of impacts and the appropriate environmental document to be prepared - either an EIS or a Finding of No Significant Impact (FONSI).

This document is an EA for the proposed improvements to the I-196, I-96 and M-37/M-44 (East Beltline) roadway systems located in the city of Grand Rapids and Grand Rapids Township, Kent County, Michigan. It describes and analyzes the no build and other alternatives, and the measures taken to minimize harm to the project area. It will be distributed to the public and to various federal, state, and local agencies for review and comment. A public hearing on this document will be held to discuss the proposed project in relation to the information disclosed in this EA. If review and comment by the public and interested agencies support the determination of "no significant impact", this EA will be forwarded to the Federal Highway Administration (FHWA) with a recommendation that a FONSI be issued. If it is determined that the preferred alternative will have significant impacts that cannot be mitigated, the preparation of an EIS will be required.

This document also contains a Programmatic Section 4(f) Evaluation for the proposed improvements. Section 4(f) of the Department of Transportation Act requires that an evaluation be prepared when the proposed action may have an adverse effect on a property eligible for or listed on the National Register of Historic Places or may impact publicly owned land from a park, recreation area, or wildlife/waterfowl refuge of national, state or local significance. The proposed project will impact a non-motorized recreational trail. This evaluation must determine that there is no prudent and feasible alternative that avoids the 4(f) impact, and that all possible measures to minimize harm have been taken, before the project may proceed.

This document was prepared by the Michigan Department of Transportation (MDOT), in cooperation with the Federal Highway Administration (FHWA). The study team includes representatives from the following areas within the Michigan Department of Transportation: Design, Project Planning, Real Estate, Construction and Technology, Traffic and Safety, and the Grand Region. Information contained in this Environmental Assessment was also furnished by other federal and state agencies, local units of government, public interest groups, and individual citizens.

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PROPOSED PROJECT

1.1 DESCRIPTION OF PURPOSE AND NEED FOR THE PROPOSED PROJECT

Proposed Project Area
The project area includes three segments: I -196 from US-131 to I-96; I-96 from west of Leonard Street to west of Cascade Road; and M-37/M-44 (East Beltline) from M-21 (Fulton Street) through the Knapp Street intersection, in the Grand Rapids Metropolitan Area. Refer to Figure 1.1 for an overview of the project area. These corridors provide primary east/west freeway access between the eastern metro area and downtown Grand Rapids, as well as connections to Holland and I-94 via I-196, and Muskegon and Lansing via I-96.

Project Area Description
This Environmental Assessment (EA) describes the various capacity and geometric improvement options proposed by the Michigan Department of Transportation (MDOT) to I-196, I-96, M-44 and M-37 as well as improving several interchanges within the project area. These proposed improvements are being developed so that they can be coordinated with pavement and bridge reconstruction and rehabilitation projects planned over the next decade, to minimize traffic disruption and user costs.

The existing I-196 segment of the project area is an urban four lane freeway which crosses the Grand River and consists of three local interchanges as well as a junction with I-96. This limited access freeway is the primary east/west route for traffic serving the downtown Grand Rapids area as well as providing east/west access across the metro area interchanging with I-96 and US-131. I-196 ultimately connects with I-94 near Benton Harbor and serves as the primary route between Grand Rapids, Holland and Chicago.

Currently, the I-96 segment in the project area is a four lane freeway (with six lanes between the I-196 Junction, and M-21 interchange). This segment consists of three interchanges in addition to its connection with the termini of the I-96 freeway. The I-196/I-96 and the I-96/M-21 interchanges currently do not include ramps for all directions. The I-96 freeway provides local access for traffic in the northeastern area of Grand Rapids as well as through traffic connecting Muskegon and Lake Michigan with Lansing and Detroit.

The M-44/M-37 (East Beltline) segment of the project is a four lane divided major arterial with controlled access and at-grade intersections. It provides local north/south access to I-96 within the project area on the eastern side of the Grand Rapids metro area, and serves as a state trunkline connecting various communities between Battle Creek and Traverse City.

I-196/I-96 and M-37/M-44 Project Location

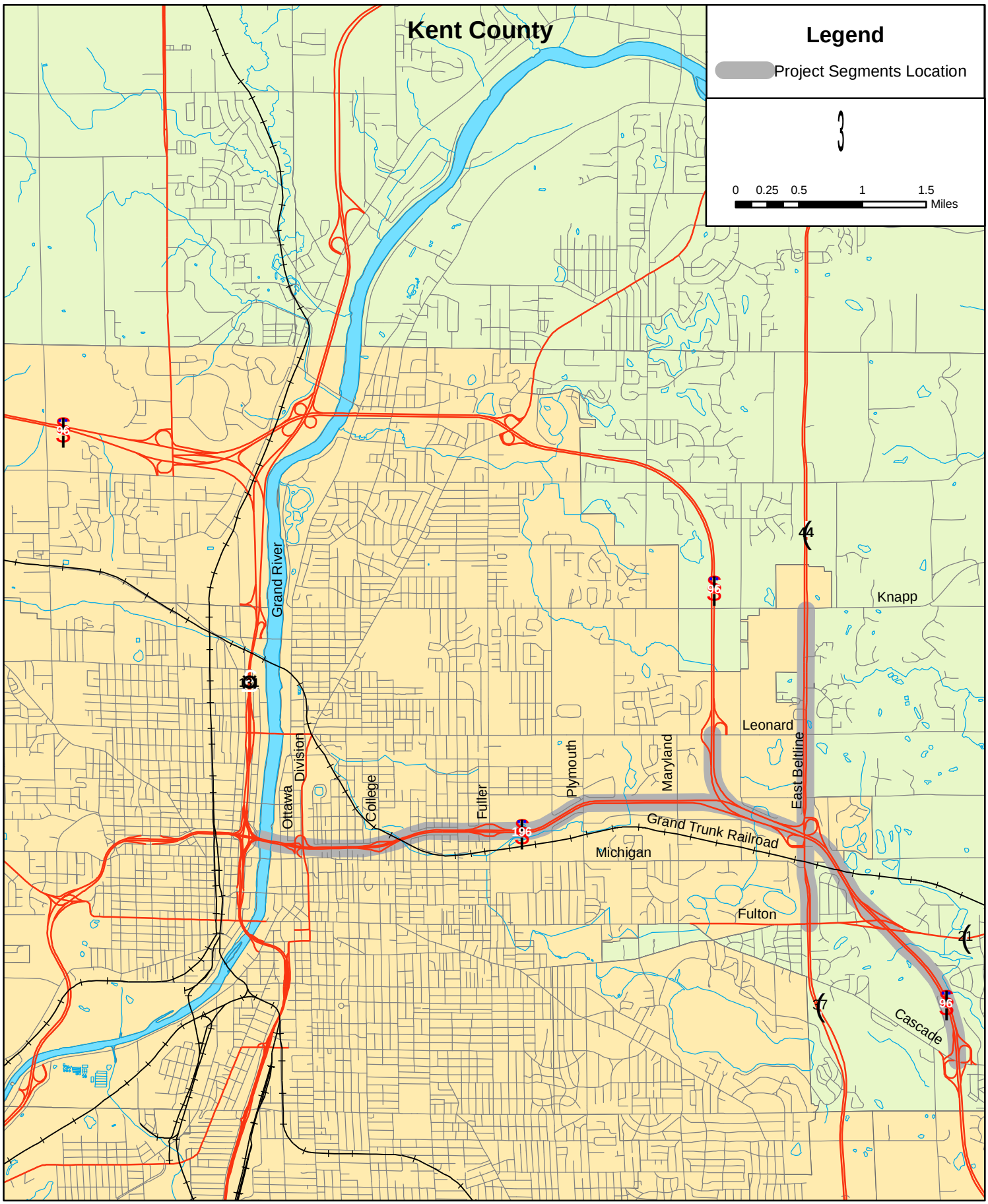

Figure 1.1

Purpose of the Proposed Project

The purpose of the proposed improvements to the I-196/I-96 freeway system and M-37/M-44 (East Beltline) is to enhance mobility to the area by increasing capacity, improving access, and enhancing traffic safety. This will be accomplished by upgrading this corridor to conform to current American Association of State Highway and Transportation Officials (AASHTO) design criteria for roadways and bridges. The proposed project will improve traffic flow, mobility, and safety for the users of the system, as well as extend the service life of the highway infrastructure. These improvements will help maintain the efficiency of an important link in the Michigan Interstate System and one that is vital to the economy of the Grand Rapids area. Specific objectives of the proposed project include the following:

- Improve freeway access within the Grand Rapids metro area, and in downtown Grand Rapids, including the developing Life Sciences Corridor, entertainment centers, colleges and universities.
- Replace and rehabilitate deteriorating pavement and bridges.
- Relieve congestion, improve traffic flow, and enhance safety on the I-196/I-96 freeway corridor, trunkline interchanges (M-21/M-44/M-37), the East Beltline, and the connecting surface streets.
- Improve freeway system linkages, and surface street and highway connections.
- Update and modernize the freeway system through modifications which would address current AASHTO design criteria and guidelines for traffic weave lengths, shoulder widths, road and bridge geometrics, and interchange enhancements.
- Enhance mobility within the study area, while minimizing negative environmental, cultural, economic, social and adjacent property impacts.

Need for the Proposed Project

The segments of I-196 and I-96 in the project area were constructed in the 1960s. The M-37/M-44 (East Beltline) segment was reconstructed and widened in the 1970's and 1980's and connects directly to I-96. The service life for many of these facilities has been exceeded and improvements are needed. While appropriate design techniques were used when they were built, the subject freeways are no longer adequate to meet today's transportation needs. In addition, residential and commercial growth in the project area has caused increased traffic demands that now require additional highway capacity to improve traffic flow and safety for the motorists. Factors directly affecting the need for this project include the following:

- Increased traffic congestion and travel delays in the corridor due to employment and population growth in the Grand Rapids metro area.
- Existing geometric deficiencies and deteriorated pavement and bridge conditions.
- Traffic flow problems due to conflicting traffic weaving over several lanes of traffic at the I-196/I-96/ East Beltline interchange area.
- Partial interchanges limit access and mobility at the I-196/I-96 junction and I-96/ M-21 interchanges.
- Inadequate roadway, bridge and shoulder width.
- Traffic flow and safety issues in the project area including: surface street intersection congestion, difficult freeway merge/weave conditions, interchange ramp and freeway mainline traffic congestion, delays, and increased crash rates.

- Traffic congestion, delays, and freeway access problems, especially during peak hours and major events that are associated with downtown redevelopment activities.
- Medical facility access problems and delays due to congestion on the freeway and interchange ramps.

1.2 PROJECT HISTORY AND BACKGROUND

Project History

In the late 1990's MDOT Grand Region began to make plans for major rehabilitation and reconstruction projects along the subject corridor, based on facility age and condition issues. Concurrently, an on-going evaluation and assessment of traffic flow, congestion and safety issues along the freeways in the Grand Rapids area was undertaken to begin developing long-term plans for the system. After replacing the US-131 S-Curve structure in downtown Grand Rapids in 2000, MDOT began to assess needs and develop freeway modernization strategies for the metro area. In June of 2003 MDOT completed the *Conceptual Long Range Master Plan for I-196 and I-96* report that sought to analyze the existing conditions of the structures, pavement and travel conditions and make recommendations that would meet today's needs as well as provide for future growth that was already occurring along the corridor. The report was developed with input from local communities including the Grand Valley Metropolitan Council (GVMC), and the FHWA. GVMC is the Metropolitan Planning Organization (MPO) for the Grand Rapids area.

The report identified various geometric and operational issues, and found that additional capacity was needed to meet the current and future travel needs of the area. Additionally, the report identified the need to address deteriorating roadway segments and bridges, as indicated in the Purpose and Need section of this EA. The plan also recognized the advantages of coordinating capacity and geometric improvements with on-going road and bridge rehabilitation and reconstruction projects. The result of this report was the development of a long-term plan for mainline and interchange improvements that is practical, affordable, and able to be phased for construction in a logical order. The plan also identified preliminary costs and social/environmental impacts. This plan was presented to, and discussed with, the MPO staff and committees. Based on these findings, the decision was made to begin the EA process in 2004.

Traffic and Capacity

The project area currently carries average daily traffic between 50,000 vehicles on M-37/M-44 (East Beltline) south of I-96 and 104,000 vehicles on I-96 between I-196 and the East Beltline. (See Figure 1.2 in the Figures Section) Future traffic volumes were forecasted using the Grand Rapids MPO model sub-set of the MDOT Statewide Model coupled with a review of historical growth in the project area. More detailed existing traffic analysis is available in the *I-196/I/96/M-37/M-44 Traffic Analysis Technical Report* which is available upon request.

The project area provides statewide connections between I-96, US-131 and I-94 as well

as commuter traffic destined for the Grand Rapids central business district and suburban offices in Grand Rapids Township. Traffic congestion occurs in both directions in both the morning and evening peak periods, due to large employment centers throughout the corridor. Commercial traffic varies from six percent on I-196 and M-44/M-37, to eight percent on I-96 in the project area.

Purpose and Need issues related to traffic flow include congestion relief, safety enhancement, freeway access improvement, and enhancement of mobility in the area. A description of the existing traffic flow conditions within the project area, see Figure 1.3 in the Figures Section, includes the following issues related to the Purpose and Need:

- Mainline congestion and unacceptable level of service (LOS), as defined in Appendix A on the I-196 freeway mainline between College Avenue and the Grand River.
- Traffic back-ups from the Ionia, Ottawa, College, and Fuller Avenue interchange ramps onto the I-196 freeway.
- Congested weaving and merging traffic conditions at the I-96/I-196/M-44/M-37 junction areas.
- Partial interchanges or lack of access to M-21 (Fulton Street), I-196 at I-96 freeway junction, and I-196 at US-131BR (Division Avenue)/Ionia Avenue.
- Congested weaving and merging conditions on I-96, between M-21 and Cascade Road.
- Congestion on most interchanges in the project area.
- Existing and projected capacity issues on the East Beltline (M-44/M-37).
- Additional future congestion forecasted within the project area.

Appendix A (Traffic Analysis) provides a description of existing LOS, as well as comparison of traffic conditions between the future Build and No-Build Alternatives. More detailed capacity and LOS analysis for both existing and future traffic is included in Appendix A and the *I-196/I/96/M-37/M-44 Traffic Analysis Technical Report*, available upon request.

Safety

Several segments along I-196, I-96 and the East Beltline (M-37/M-44) have higher than average level of crashes for similar type facilities within the state (four lane freeways and surface highways). In addition to the human and economic losses that result from these crashes, traffic flow is significantly disrupted. Much of the congestion in urban areas is do to traffic incidents which are predominately traffic crashes. Traffic congestion and safety issues are indicated as factors affecting the need for this project in the Purpose and Need section.

The higher-than-average crash rate on I-196 between Ottawa Avenue and College Avenue is partly attributed to the heavy traffic volumes on the segment and peak-hour traffic congestion. Also, the four percent uphill grade on eastbound I-196 on this segment reduces travel speed and capacity, particularly for large trucks, which contributes to rear-end crashes. The higher-than-average crash rate on westbound I-196

between College Avenue and Fuller Avenue is partly attributed to the heavy traffic volumes associated with peak-hour traffic congestion. High levels of rear-end crashes are common on congested freeways.

The higher-than-average crash rate on eastbound I-96 between Leonard Street and I-196 can be attributed to the curvature of this segment, the high number of lane changes associated with the subsequent merge with I-196, and the weave movement needed to exit at M-44. In addition, a higher-than-average crash rate on the East Beltline between M-21 and I-96 is also congestion related. Several interchange ramp termini also have congestion related higher-than-average crash rate.

Relieving congestion, enhancing safety, and improving traffic flow are primary objectives in the project Purpose and Need section of this EA. Various congestion relief and traffic flow counter measures are incorporated into the Preferred Alternative to reduce the potential for crashes in high-crash locations and segments. Counter measures include, but are not limited to the following: weave/merge lanes to increase ramp/freeway merging capacity; additional through capacity to reduce congestion and unexpected traffic back-ups; increased ramp and turning lane storage to separate stopped traffic from through traffic on surface streets and highways; and improved traffic signal operations at interchanges to enhance traffic flow. A more detailed crash analysis is included in Appendix B (Traffic Crash Analysis).

Geometric Design

The I-196 and I-96 freeway systems were designed in the 1960's, and have a number of components that do not meet current AASHTO design guidelines and/or criteria. These include vertical and horizontal clearances under bridges, sight distances on vertical curves, super elevation rates and geometrics on horizontal curves, acceleration and deceleration lane lengths at ramps, shoulder widths and curb and gutter adjacent to freeway travel lanes. These facilities were constructed based on the design guidelines at that time. However, these facilities are 40 years old and the current design guidelines have since changed. Moreover, these bridges are reaching the point where they are in need of major rehabilitation and repair. These facilities continue to deteriorate at an accelerated rate due to increased use and traffic volumes, and will continue to do so without improvements.

As indicated in the Purpose and Need section of the EA, the Preferred Alternative includes making improvements to the existing roadway, bridges and ramps to address age and condition issues, as well as address current and future access, capacity, safety, and traffic flow issues. The roadway and bridges will be designed to meet current AASHTO design criteria during the subsequent design phases for individual projects. Current and future typical cross-sections for the corridor are included in Appendix C (I-196/1-96 and M-37/M-44 Project Maps and Cross Sections).

Bridge Conditions

There are 29 bridges within the project limits. Many of the superstructures are constructed of steel that requires routine maintenance due to weather conditions and the

use of corrosive de-icing materials. The bridges also have shoulders, capacity, vertical and horizontal clearances, etc. that are not consistent with current AASHTO design criteria. Based on age and deterioration of various bridge components, many bridges within the project area are reaching the end of their service life. Several are already planned for major rehabilitation and/or replacement.

Because bridges have a longer service life than the connecting roadway segments, the Preferred Alternative will allow MDOT to improve bridges to address future capacity needs, as well as replace and repair the worn out components. The bridges will be constructed to current AASHTO design criteria and will be aligned to accommodate future roadway widening as needed. This strategy will help to minimize user inconvenience, and allow for more cost effective use of public funds. Improving deteriorated bridges and providing for future capacity needs are also factors in the project Purpose and Need.

1.3 ALTERNATIVES CONSIDERED

No Build
This alternative involves taking no action to improve and add capacity to the I-196, I-96 or M-37/M-44 (East Beltline) segments that were identified in Section 1.1. It includes only routine maintenance, repair, and preservation of the existing system. Routine maintenance and preservation of the roadway and bridges in the project area will not correct all of the geometric and capacity deficiencies identified, nor will it address current AASHTO design criteria. Selection of the no build alternative will have potential negative consequences on the bridges including weight restrictions and structural failures. This alternative will not address the issues presented in the project Purpose and Need. It is the base condition used for comparison with the other alternatives.

Build Alternative – Capacity and Geometric Improvements
This alternative involves adding capacity, improving freeway access, relieving congestion, improving traffic operations and enhancing safety on the I-196/I-96 freeway corridors, the East Beltline, trunk line interchanges (M-21/M-44/M-37, and the I-196/I-96 junction), and the connecting surface streets and highways within the project area. MDOT is proposing to replace and rehabilitate deteriorating pavement and bridges within this corridor along with the improvements identified herein. Capacity improvements are needed to enhance current traffic flow, enhance safety and accommodate future needs, as indicted in the Purpose and Need for the project.

MDOT is proposing the following actions:

- Construct additional weave/merge lanes on I-196 between Ottawa/Ionia Avenues and College Avenue interchanges and between College Avenue and Fuller Avenue interchanges.
- Construct an additional travel lane on I-196 between the Grand River and I-96 junction, and on I-96 between Leonard Street and Cascade Road.
- Separate weave and merge traffic by constructing freeway

collector/distributor routes, adding travel lanes, and/or auxiliary lanes on I-96 from Leonard Street through the I-196 junction, M-44 (East Beltline), M-21 (Fulton Street), and Cascade Road interchange area.

- Construct additional ramps at I-196/Ottawa Avenue, I-96/M-21 and I-196/I-96 interchanges.
- Construct additional travel lanes and intersection improvements (turning lane improvements, signal modifications, etc.) on the East Beltline (M-37/M-44) between Knapp Street and M-21.
- Joint city of Grand Rapids and MDOT improvements on connecting cross-streets and interchanges are also proposed, including Fuller and College Avenue approaches, Division (US-131BR)/Ionia Avenues boulevard proposals, and new off ramp to north bound Division Avenue.

The location and the type of improvements being proposed for the corridor are described in Figure 1.4. More detailed project maps and cross sections can be found in Appendix C.

MDOT is also proposing to rehabilitate, replace and widen, or conduct preventative maintenance on 29 structures along the I-196 corridor. These structures will be designed to accommodate future freeway mainline widening, as indicated in this EA, and will be designed to meet current AASHTO design criteria. The location of the 29 structures and the proposed improvements for each of the structures are shown in Figure 1.4.

By making improvements to the existing corridor along with planned rehabilitation and reconstruction projects, user inconvenience is minimized, construction costs are reduced, minimal right-of-way (ROW) is required, and impacts to the social and natural environment are minimized. The phasing plan can be found in Section 1.4 and Figure 1.4 in the Figures Section.

Alternatives Considered and Dismissed

MDOT considered other alternatives to address the existing deficiencies along I-196, I-96 and M-37/M-44 Corridors and connecting streets. MDOT considered replacing and rehabilitating the deteriorating pavement and bridges without reconstructing and/or improving the roadway. However, after reviewing the 2003 *Conceptual Long Range Master Plan for I-196 and I-96* findings, it was determined that the roadway and bridge systems needed to be improved to address the current and projected traffic demand, planned growth, and downtown redevelopment within the project area. Because improvements are needed to enhance current traffic flow, enhance safety and accommodate future needs, as indicted in the Purpose and Need for the project, the option to replace and rehabilitate the deteriorating pavement and bridges without improvements was dismissed.

Limited Transportation System Management (TSM) improvements were also considered. These include improvements such as adding turning lanes at ramp termini and surface street/highway intersections, extending on/off ramps, etc. TSM options can provide some short-term relief for traffic and safety issues at specific locations. However, TSM options

will not address the existing and projected safety, capacity, and traffic flow issues identified in the project Purpose and Need. TSM options were therefore dismissed as a stand alone alternative. Some TSM elements are included with the Preferred Alternative.

Multi-Modal options were considered during the EA process. The Interurban Transit Partnership of Grand Rapids is in the process of completing a major transit investment study (GT2-Great Transit/Grand Tomorrow). The GT2 study has identified two potential routes and mode choices. The two potential routes are located generally along surface streets east and south of downtown Grand Rapids. The GT2 options still being considered do not directly affect the I-196/I-96 and East Beltline corridors in this EA. The general conclusion of previous MPO travel-demand modeling indicates that transit will not attract the ridership necessary to eliminate the need for freeway capacity improvements. This is based on population density, trip length, travel times, etc. in the Grand Rapids area. The GT2 alternatives will address travel on surface streets and provide enhanced transit service closer to neighborhoods in the study area, as well as contribute to the overall mobility and economic vitality of the metro area. Multi-Modal options were therefore dismissed as a stand alone alternative. Some Multi-Modal elements can be enhanced with the Preferred Alternative, such as: pedestrian access over improved bridges across the freeway, expanding carpool lots adjacent to the freeway, and future express bus service utilizing the added freeway capacity.

Some realignment or relocation of the freeway mainline was considered in some areas. However, due to severe impact on adjacent property, social, environmental and economic impacts, realignment and/or relocation of the freeway segments was dismissed.

1.4 Preferred Alternative and Phasing Plan

The Build Alternative (Capacity and Geometric Improvements) as described in Section 1.3 is the Preferred Alternative. It includes replacing deteriorating bridges and roadway segments, as well as capacity and geometric improvements along I-196, I-96, and the East Beltline (M-37/M-44). This alternative will address existing facility condition and traffic safety issues, as well as provide for future capacity and mobility needs in the Grand Rapids area. The improvements proposed in the Build Alternative will address the current and future issues identified in the project Purpose and Need more effectively than the other options considered.

Construction of these improvements will be phased over a 20 year time-frame as indicated in the GVMC MPO Long Range Transportation Plan. Some bridge rehabilitation and replacement projects on I-196 and I-96 will begin in 2006, and will be constructed to accommodate the long-term capacity needs for the freeway corridors. Major roadway capacity improvements will be phased in over time based on statewide needs, priorities, and funding levels. In general, the following schedule is proposed, based on the MPO LRTP amendment and air quality conformity analysis:

- **2006 to 2009**: Rehabilitation, replacement, and widening of several bridges on I-96 and I-196; pavement rehabilitation and maintenance

activities.

- **2010 to 2015**: Rehabilitation and reconstruction of the I-196 freeway segments between US-131 (Grand River) and Fuller Avenue, and between Fuller Avenue and the I-196/I-96 junction. Weave/merge lanes will be added between Ionia/Ottawa Avenues and College Avenue, and College and Fuller Avenues. Some ramp and bridge improvements will also be included in these areas based on conditions and need.

- **2016 to 2025**: On-going rehabilitation of the roadways and bridges within the project area, including widening bridges as needed to accommodate future mainline capacity improvements. Some minor TSM type improvements may be implemented to address traffic safety issues based on need.
- **2026 to 2030**: Remaining road and bridge reconstruction and capacity improvements will be implemented as described herein, during this time-frame. This includes additional travel lanes on I-196, I-96, the East Beltline, local streets, and connecting interchange improvements.

The total project cost for all improvements included in the Preferred Alternative is $375,000,000. The project costs are discussed in Section 4 of this EA.

SECTION 1

PROPOSED PROJECT

1.1 DESCRIPTION OF PURPOSE AND NEED FOR THE PROPOSED PROJECT

Proposed Project Area
The project area includes three segments: I -196 from US-131 to I-96; I-96 from west of Leonard Street to west of Cascade Road; and M-37/M-44 (East Beltline) from M-21 (Fulton Street) through the Knapp Street intersection, in the Grand Rapids Metropolitan Area. Refer to Figure 1.1 for an overview of the project area. These corridors provide primary east/west freeway access between the eastern metro area and downtown Grand Rapids, as well as connections to Holland and I-94 via I-196, and Muskegon and Lansing via I-96.

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I-196/I-96 and M-37/M-44 Project Location

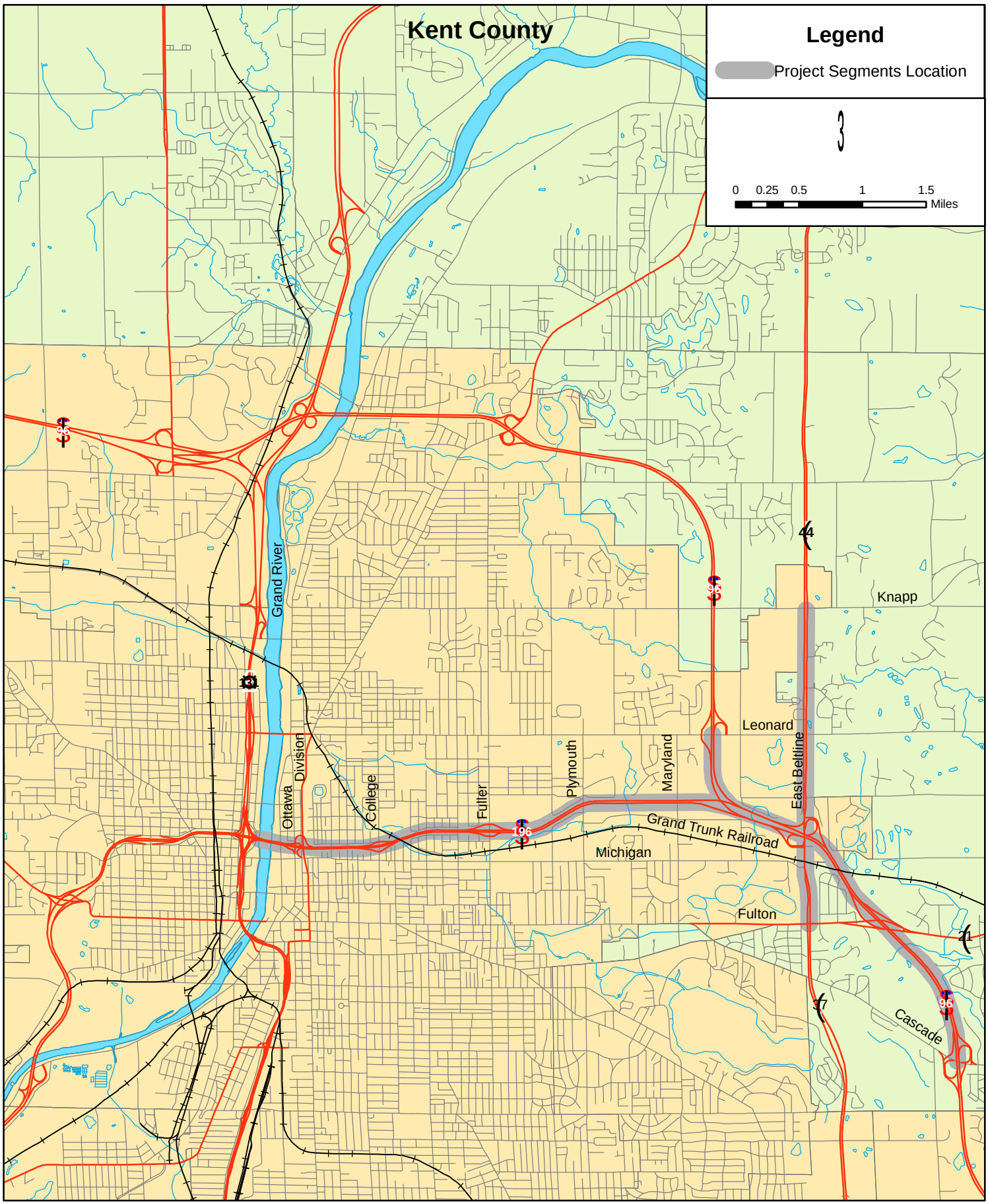

Figure 1.1

Purpose of the Proposed Project

The purpose of the proposed improvements to the I-196/I-96 freeway system and M-37/M-44 (East Beltline) is to enhance mobility to the area by increasing capacity, improving access, and enhancing traffic safety. This will be accomplished by upgrading this corridor to conform to current American Association of State Highway and Transportation Officials (AASHTO) design criteria for roadways and bridges. The proposed project will improve traffic flow, mobility, and safety for the users of the system, as well as extend the service life of the highway infrastructure. These improvements will help maintain the efficiency of an important link in the Michigan Interstate System and one that is vital to the economy of the Grand Rapids area. Specific objectives of the proposed project include the following:

- Improve freeway access within the Grand Rapids metro area, and in downtown Grand Rapids, including the developing Life Sciences Corridor, entertainment centers, colleges and universities.
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- Improve freeway system linkages, and surface street and highway connections.
- Update and modernize the freeway system through modifications which would address current AASHTO design criteria and guidelines for traffic weave lengths, shoulder widths, road and bridge geometrics, and interchange enhancements.
- Enhance mobility within the study area, while minimizing negative environmental, cultural, economic, social and adjacent property impacts.

Need for the Proposed Project

The segments of I-196 and I-96 in the project area were constructed in the 1960s. The M-37/M-44 (East Beltline) segment was reconstructed and widened in the 1970's and 1980's and connects directly to I-96. The service life for many of these facilities has been exceeded and improvements are needed. While appropriate design techniques were used when they were built, the subject freeways are no longer adequate to meet today's transportation needs. In addition, residential and commercial growth in the project area has caused increased traffic demands that now require additional highway capacity to improve traffic flow and safety for the motorists. Factors directly affecting the need for this project include the following:

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- Existing geometric deficiencies and deteriorated pavement and bridge conditions.
- Traffic flow problems due to conflicting traffic weaving over several lanes of traffic at the I-196/I-96/ East Beltline interchange area.
- Partial interchanges limit access and mobility at the I-196/I-96 junction and I-96/ M-21 interchanges.
- Inadequate roadway, bridge and shoulder width.
- Traffic flow and safety issues in the project area including: surface street intersection congestion, difficult freeway merge/weave conditions, interchange ramp and freeway mainline traffic congestion, delays, and increased crash rates.

- Traffic congestion, delays, and freeway access problems, especially during peak hours and major events that are associated with downtown redevelopment activities.
- Medical facility access problems and delays due to congestion on the freeway and interchange ramps.

1.2 PROJECT HISTORY AND BACKGROUND

Project History

In the late 1990's MDOT Grand Region began to make plans for major rehabilitation and reconstruction projects along the subject corridor, based on facility age and condition issues. Concurrently, an on-going evaluation and assessment of traffic flow, congestion and safety issues along the freeways in the Grand Rapids area was undertaken to begin developing long-term plans for the system. After replacing the US-131 S-Curve structure in downtown Grand Rapids in 2000, MDOT began to assess needs and develop freeway modernization strategies for the metro area. In June of 2003 MDOT completed the *Conceptual Long Range Master Plan for I-196 and I-96* report that sought to analyze the existing conditions of the structures, pavement and travel conditions and make recommendations that would meet today's needs as well as provide for future growth that was already occurring along the corridor. The report was developed with input from local communities including the Grand Valley Metropolitan Council (GVMC), and the FHWA. GVMC is the Metropolitan Planning Organization (MPO) for the Grand Rapids area.

The report identified various geometric and operational issues, and found that additional capacity was needed to meet the current and future travel needs of the area. Additionally, the report identified the need to address deteriorating roadway segments and bridges, as indicated in the Purpose and Need section of this EA. The plan also recognized the advantages of coordinating capacity and geometric improvements with on-going road and bridge rehabilitation and reconstruction projects. The result of this report was the development of a long-term plan for mainline and interchange improvements that is practical, affordable, and able to be phased for construction in a logical order. The plan also identified preliminary costs and social/environmental impacts. This plan was presented to, and discussed with, the MPO staff and committees. Based on these findings, the decision was made to begin the EA process in 2004.

Traffic and Capacity

The project area currently carries average daily traffic between 50,000 vehicles on M-37/M-44 (East Beltline) south of I-96 and 104,000 vehicles on I-96 between I-196 and the East Beltline. (See Figure 1.2 in the Figures Section) Future traffic volumes were forecasted using the Grand Rapids MPO model sub-set of the MDOT Statewide Model coupled with a review of historical growth in the project area. More detailed existing traffic analysis is available in the *I-196/I/96/M-37/M-44 Traffic Analysis Technical Report* which is available upon request.

The project area provides statewide connections between I-96, US-131 and I-94 as well

as commuter traffic destined for the Grand Rapids central business district and suburban offices in Grand Rapids Township. Traffic congestion occurs in both directions in both the morning and evening peak periods, due to large employment centers throughout the corridor. Commercial traffic varies from six percent on I-196 and M-44/M-37, to eight percent on I-96 in the project area.

Purpose and Need issues related to traffic flow include congestion relief, safety enhancement, freeway access improvement, and enhancement of mobility in the area. A description of the existing traffic flow conditions within the project area, see Figure 1.3 in the Figures Section, includes the following issues related to the Purpose and Need:

- Mainline congestion and unacceptable level of service (LOS), as defined in Appendix A on the I-196 freeway mainline between College Avenue and the Grand River.
- Traffic back-ups from the Ionia, Ottawa, College, and Fuller Avenue interchange ramps onto the I-196 freeway.
- Congested weaving and merging traffic conditions at the I-96/I-196/M-44/M-37 junction areas.
- Partial interchanges or lack of access to M-21 (Fulton Street), I-196 at I-96 freeway junction, and I-196 at US-131BR (Division Avenue)/Ionia Avenue.
- Congested weaving and merging conditions on I-96, between M-21 and Cascade Road.
- Congestion on most interchanges in the project area.
- Existing and projected capacity issues on the East Beltline (M-44/M-37).
- Additional future congestion forecasted within the project area.

Appendix A (Traffic Analysis) provides a description of existing LOS, as well as comparison of traffic conditions between the future Build and No-Build Alternatives. More detailed capacity and LOS analysis for both existing and future traffic is included in Appendix A and the *I-196/I/96/M-37/M-44 Traffic Analysis Technical Report*, available upon request.

Safety

Several segments along I-196, I-96 and the East Beltline (M-37/M-44) have higher than average level of crashes for similar type facilities within the state (four lane freeways and surface highways). In addition to the human and economic losses that result from these crashes, traffic flow is significantly disrupted. Much of the congestion in urban areas is do to traffic incidents which are predominately traffic crashes. Traffic congestion and safety issues are indicated as factors affecting the need for this project in the Purpose and Need section.

The higher-than-average crash rate on I-196 between Ottawa Avenue and College Avenue is partly attributed to the heavy traffic volumes on the segment and peak-hour traffic congestion. Also, the four percent uphill grade on eastbound I-196 on this segment reduces travel speed and capacity, particularly for large trucks, which contributes to rear-end crashes. The higher-than-average crash rate on westbound I-196

between College Avenue and Fuller Avenue is partly attributed to the heavy traffic volumes associated with peak-hour traffic congestion. High levels of rear-end crashes are common on congested freeways.

The higher-than-average crash rate on eastbound I-96 between Leonard Street and I-196 can be attributed to the curvature of this segment, the high number of lane changes associated with the subsequent merge with I-196, and the weave movement needed to exit at M-44. In addition, a higher-than-average crash rate on the East Beltline between M-21 and I-96 is also congestion related. Several interchange ramp termini also have congestion related higher-than-average crash rate.

Relieving congestion, enhancing safety, and improving traffic flow are primary objectives in the project Purpose and Need section of this EA. Various congestion relief and traffic flow counter measures are incorporated into the Preferred Alternative to reduce the potential for crashes in high-crash locations and segments. Counter measures include, but are not limited to the following: weave/merge lanes to increase ramp/freeway merging capacity; additional through capacity to reduce congestion and unexpected traffic back-ups; increased ramp and turning lane storage to separate stopped traffic from through traffic on surface streets and highways; and improved traffic signal operations at interchanges to enhance traffic flow. A more detailed crash analysis is included in Appendix B (Traffic Crash Analysis).

Geometric Design

The I-196 and I-96 freeway systems were designed in the 1960's, and have a number of components that do not meet current AASHTO design guidelines and/or criteria. These include vertical and horizontal clearances under bridges, sight distances on vertical curves, super elevation rates and geometrics on horizontal curves, acceleration and deceleration lane lengths at ramps, shoulder widths and curb and gutter adjacent to freeway travel lanes. These facilities were constructed based on the design guidelines at that time. However, these facilities are 40 years old and the current design guidelines have since changed. Moreover, these bridges are reaching the point where they are in need of major rehabilitation and repair. These facilities continue to deteriorate at an accelerated rate due to increased use and traffic volumes, and will continue to do so without improvements.

As indicated in the Purpose and Need section of the EA, the Preferred Alternative includes making improvements to the existing roadway, bridges and ramps to address age and condition issues, as well as address current and future access, capacity, safety, and traffic flow issues. The roadway and bridges will be designed to meet current AASHTO design criteria during the subsequent design phases for individual projects. Current and future typical cross-sections for the corridor are included in Appendix C (I-196/1-96 and M-37/M-44 Project Maps and Cross Sections).

Bridge Conditions

There are 29 bridges within the project limits. Many of the superstructures are constructed of steel that requires routine maintenance due to weather conditions and the

use of corrosive de-icing materials. The bridges also have shoulders, capacity, vertical and horizontal clearances, etc. that are not consistent with current AASHTO design criteria. Based on age and deterioration of various bridge components, many bridges within the project area are reaching the end of their service life. Several are already planned for major rehabilitation and/or replacement.

Because bridges have a longer service life than the connecting roadway segments, the Preferred Alternative will allow MDOT to improve bridges to address future capacity needs, as well as replace and repair the worn out components. The bridges will be constructed to current AASHTO design criteria and will be aligned to accommodate future roadway widening as needed. This strategy will help to minimize user inconvenience, and allow for more cost effective use of public funds. Improving deteriorated bridges and providing for future capacity needs are also factors in the project Purpose and Need.

1.3 ALTERNATIVES CONSIDERED

No Build
This alternative involves taking no action to improve and add capacity to the I-196, I-96 or M-37/M-44 (East Beltline) segments that were identified in Section 1.1. It includes only routine maintenance, repair, and preservation of the existing system. Routine maintenance and preservation of the roadway and bridges in the project area will not correct all of the geometric and capacity deficiencies identified, nor will it address current AASHTO design criteria. Selection of the no build alternative will have potential negative consequences on the bridges including weight restrictions and structural failures. This alternative will not address the issues presented in the project Purpose and Need. It is the base condition used for comparison with the other alternatives.

Build Alternative – Capacity and Geometric Improvements
This alternative involves adding capacity, improving freeway access, relieving congestion, improving traffic operations and enhancing safety on the I-196/I-96 freeway corridors, the East Beltline, trunk line interchanges (M-21/M-44/M-37, and the I-196/I-96 junction), and the connecting surface streets and highways within the project area. MDOT is proposing to replace and rehabilitate deteriorating pavement and bridges within this corridor along with the improvements identified herein. Capacity improvements are needed to enhance current traffic flow, enhance safety and accommodate future needs, as indicted in the Purpose and Need for the project.

MDOT is proposing the following actions:

- Construct additional weave/merge lanes on I-196 between Ottawa/Ionia Avenues and College Avenue interchanges and between College Avenue and Fuller Avenue interchanges.
- Construct an additional travel lane on I-196 between the Grand River and I-96 junction, and on I-96 between Leonard Street and Cascade Road.
- Separate weave and merge traffic by constructing freeway

collector/distributor routes, adding travel lanes, and/or auxiliary lanes on I-96 from Leonard Street through the I-196 junction, M-44 (East Beltline), M-21 (Fulton Street), and Cascade Road interchange area.

- Construct additional ramps at I-196/Ottawa Avenue, I-96/M-21 and I-196/I-96 interchanges.
- Construct additional travel lanes and intersection improvements (turning lane improvements, signal modifications, etc.) on the East Beltline (M-37/M-44) between Knapp Street and M-21.
- Joint city of Grand Rapids and MDOT improvements on connecting cross-streets and interchanges are also proposed, including Fuller and College Avenue approaches, Division (US-131BR)/Ionia Avenues boulevard proposals, and new off ramp to north bound Division Avenue.

The location and the type of improvements being proposed for the corridor are described in Figure 1.4. More detailed project maps and cross sections can be found in Appendix C.

MDOT is also proposing to rehabilitate, replace and widen, or conduct preventative maintenance on 29 structures along the I-196 corridor. These structures will be designed to accommodate future freeway mainline widening, as indicated in this EA, and will be designed to meet current AASHTO design criteria. The location of the 29 structures and the proposed improvements for each of the structures are shown in Figure 1.4.

By making improvements to the existing corridor along with planned rehabilitation and reconstruction projects, user inconvenience is minimized, construction costs are reduced, minimal right-of-way (ROW) is required, and impacts to the social and natural environment are minimized. The phasing plan can be found in Section 1.4 and Figure 1.4 in the Figures Section.

Alternatives Considered and Dismissed

MDOT considered other alternatives to address the existing deficiencies along I-196, I-96 and M-37/M-44 Corridors and connecting streets. MDOT considered replacing and rehabilitating the deteriorating pavement and bridges without reconstructing and/or improving the roadway. However, after reviewing the 2003 *Conceptual Long Range Master Plan for I-196 and I-96* findings, it was determined that the roadway and bridge systems needed to be improved to address the current and projected traffic demand, planned growth, and downtown redevelopment within the project area. Because improvements are needed to enhance current traffic flow, enhance safety and accommodate future needs, as indicted in the Purpose and Need for the project, the option to replace and rehabilitate the deteriorating pavement and bridges without improvements was dismissed.

Limited Transportation System Management (TSM) improvements were also considered. These include improvements such as adding turning lanes at ramp termini and surface street/highway intersections, extending on/off ramps, etc. TSM options can provide some short-term relief for traffic and safety issues at specific locations. However, TSM options

will not address the existing and projected safety, capacity, and traffic flow issues identified in the project Purpose and Need. TSM options were therefore dismissed as a stand alone alternative. Some TSM elements are included with the Preferred Alternative.

Multi-Modal options were considered during the EA process. The Interurban Transit Partnership of Grand Rapids is in the process of completing a major transit investment study (GT2-Great Transit/Grand Tomorrow). The GT2 study has identified two potential routes and mode choices. The two potential routes are located generally along surface streets east and south of downtown Grand Rapids. The GT2 options still being considered do not directly affect the I-196/I-96 and East Beltline corridors in this EA. The general conclusion of previous MPO travel-demand modeling indicates that transit will not attract the ridership necessary to eliminate the need for freeway capacity improvements. This is based on population density, trip length, travel times, etc. in the Grand Rapids area. The GT2 alternatives will address travel on surface streets and provide enhanced transit service closer to neighborhoods in the study area, as well as contribute to the overall mobility and economic vitality of the metro area. Multi-Modal options were therefore dismissed as a stand alone alternative. Some Multi-Modal elements can be enhanced with the Preferred Alternative, such as: pedestrian access over improved bridges across the freeway, expanding carpool lots adjacent to the freeway, and future express bus service utilizing the added freeway capacity.

Some realignment or relocation of the freeway mainline was considered in some areas. However, due to severe impact on adjacent property, social, environmental and economic impacts, realignment and/or relocation of the freeway segments was dismissed.

1.4 Preferred Alternative and Phasing Plan

The Build Alternative (Capacity and Geometric Improvements) as described in Section 1.3 is the Preferred Alternative. It includes replacing deteriorating bridges and roadway segments, as well as capacity and geometric improvements along I-196, I-96, and the East Beltline (M-37/M-44). This alternative will address existing facility condition and traffic safety issues, as well as provide for future capacity and mobility needs in the Grand Rapids area. The improvements proposed in the Build Alternative will address the current and future issues identified in the project Purpose and Need more effectively than the other options considered.

Construction of these improvements will be phased over a 20 year time-frame as indicated in the GVMC MPO Long Range Transportation Plan. Some bridge rehabilitation and replacement projects on I-196 and I-96 will begin in 2006, and will be constructed to accommodate the long-term capacity needs for the freeway corridors. Major roadway capacity improvements will be phased in over time based on statewide needs, priorities, and funding levels. In general, the following schedule is proposed, based on the MPO LRTP amendment and air quality conformity analysis:

- **2006 to 2009**: Rehabilitation, replacement, and widening of several bridges on I-96 and I-196; pavement rehabilitation and maintenance

activities.

- **2010 to 2015**: Rehabilitation and reconstruction of the I-196 freeway segments between US-131 (Grand River) and Fuller Avenue, and between Fuller Avenue and the I-196/I-96 junction. Weave/merge lanes will be added between Ionia/Ottawa Avenues and College Avenue, and College and Fuller Avenues. Some ramp and bridge improvements will also be included in these areas based on conditions and need.

- **2016 to 2025**: On-going rehabilitation of the roadways and bridges within the project area, including widening bridges as needed to accommodate future mainline capacity improvements. Some minor TSM type improvements may be implemented to address traffic safety issues based on need.
- **2026 to 2030**: Remaining road and bridge reconstruction and capacity improvements will be implemented as described herein, during this time-frame. This includes additional travel lanes on I-196, I-96, the East Beltline, local streets, and connecting interchange improvements.

The total project cost for all improvements included in the Preferred Alternative is $375,000,000. The project costs are discussed in Section 4 of this EA.

SECTION 2

AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MEASURES TO MITIGATE IMPACTS DURING CONSTRUCTION

The majority of this project will be constructed within MDOT's existing ROW; therefore, the proposed project will have minimal social, economic, or environmental impacts. As with all proposed projects, MDOT conducted a review (visual inspections, literature searches, database queries, etc.) of potential impacts. Based on these reviews, it was determined that there were no potential adverse impacts to visual resources. The impacts that had a reasonable possibility for individual or cumulative significant impacts have been analyzed. The results of this analysis and potential measures to minimize short-term impacts during construction are disclosed in this section.

2.1 RIGHT-OF-WAY IMPACTS

The objective of the Preferred Alternative is to make improvements to the I-196/I-96 freeway system and connecting interchanges within the existing state-owned ROW wherever possible, and to minimize adjacent property impacts. However, in order to complete the proposed improvements, some limited ROW acquisition will be required for this project. MDOT is proposing to acquire ROW at College Avenue, Fuller Avenue, M-21(Fulton Street), and along I-96 South of Leonard Street. For location of the existing and proposed ROW, see Figures C-1 through C-8 in Appendix C. Proposed new ROW areas are depicted in red in the area between the existing and proposed ROW lines. A conceptual stage relocation plan can be found in Appendix D (Conceptual Stage Relocation Plan). The following are the anticipated ROW impacts:

I-196 and College Avenue Interchange. This interchange will require additional ROW within all four quadrants of the interchange.

- A small apartment building located in the northwest quadrant will require a minor taking to accommodate a sidewalk and right turn lane. ROW acquisition will not involve buildings or structures or existing parking spaces. The only impacts identified are for green space.
- A larger apartment complex is located at the northeast quadrant, and a minor strip taking is necessary to accommodate sidewalk improvements. MDOT will avoid any significant impacts to the apartment complex.
- In the southwest quadrant additional ROW to accommodate a sidewalk is necessary. A large parking area serves an office building and the ROW impact will be minimal without effecting any existing buildings and structures.
- In the southeast quadrant, two existing businesses are in close proximity to the existing ROW. They are former residential dwellings converted to commercial/office use. It is currently anticipated that the sidewalk adjacent to these two properties will be tapering to a maximum of approximately six to eight feet closer to the existing buildings at the eastbound on-ramp terminus. Due to the properties proximity to the existing roadway and their raised elevation, even

minor changes to the existing sidewalk could result in total acquisition of one or both of these properties. The final details of this particular area will be reviewed during the design phase to determine the impacts to these properties.

I-196 and Fuller Avenue Interchange. This interchange will require additional ROW in three quadrants of the interchange. There are no ROW impacts in the northwest quadrant of the interchange.

- The Kent County medical complex and State Police lab are located in the northeast quadrant. Both are set back far enough from Fuller Avenue; however, a strip of ROW will be needed from these two parcels to accommodate the lane shift on Fuller Avenue for the wider bridge. ROW acquisition involves unused green space in front of these two facilities, and does not impact any buildings or structures.
- The Paulstra CRC corporate office and its Grand Rapids plant are located in the southeast quadrant of the interchange. An acquisition to accommodate the widening of the road as well as a right turn lane will be required which will eliminate eleven (11) parking spaces from a parking lot adjacent to Fuller Avenue. MDOT will minimize the effects of the road widening on this property during the design phase and will mitigate any lost parking. Access will be maintained for truck and employee traffic entering the plant during construction.
- The southwest quadrant contains the Elbow Room bar/grille and parking lot. A minor ROW taking to accommodate sidewalk relocation will result. No parking spaces will be acquired.

I-96 and M-21 (Fulton Street) Interchange: A new I-96 westbound off-ramp and new I-96 eastbound on-ramp will be added. Additional ROW impacts are located in the southeast quadrant of the interchange. A single family residential property will be acquired as a total take. The parcel extends from M-21 to the I-96 ROW.

I-196 at I-96 Interchange: The I-96 freeway will be widened from the current seven lanes to nine lanes, with the collector/distributor roads and weave/merge lanes adjacent to the freeway mainline to provide interchange access between Leonard Street and Cascade Road. New ramps will also be added at the I-96/I-196 junction. The Leonard Street Bridge will be widened to five lanes. ROW impacts are located on the east side of I-96 between M-44 and Leonard Street. ROW acquisition is anticipated to be a narrow strip of less than two acres. The property is owned by Spectrum Health. Most of the area to be acquired is vacant land. Impacts to an existing parking area for an existing clinic will be minimal.

Mitigation

All ROW will be acquired in accordance and compliance with Act 31, Michigan P.A. 970; Act 227, Michigan P.A. 1972; Act 85, Michigan P.A. 1980, as amended; and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. MDOT will inform individuals, businesses and non-profit organizations of any project impacts to their property. Every effort will be made through

relocation assistance to lessen the impact when it occurs.

2.2 INDIRECT AND CUMULATIVE IMPACTS

Since the proposed project involves improving the existing freeway mostly within the existing ROW, any indirect (secondary) impacts would only be likely at the interchange improvement areas or along the East Beltline segment. As the area is urban and mostly developed, redevelopment of existing commercial, industrial and residential areas are more likely since new development possibilities are very limited. The future land use and zoning maps generally retain the same designations as the existing maps. Therefore, no change in land uses, with the possible exception of density of residential development, would be anticipated from any post-construction redevelopment activities.

The increase in impervious surface and associated increase in runoff is also an anticipated indirect impact. See the Water Quality discussion in Section 2.16. Temporary impacts to the linear park along the Grand River and the detour during construction are discussed in Section 6, Programmatic Section 4 (f) Evaluation.

The Grand Rapids metropolitan area has grown dramatically due to the influence of many major developments over the years. Some past and present projects that have contributed to growth in this metro area include: Grand Valley State University downtown campus, DeVos Place Convention Center, the Van Andel Arena and Museum, the Gerald Ford Presidential Library and Museum, Van Andel Institute, Spectrum Health Hospital and other area hospitals and medical facilities along the Life Sciences Corridor, Kent County government offices, the reconstructed S-curve, M-44, M-45 and the new Southbelt freeway (M-6), the new I-96/36th Street interchange, Meijer Botanical Gardens, numerous colleges, public and private schools, Gerald R. Ford International Airport, the Steelcase Industrial Complex, the Rivertown Crossing and other area malls, the John Ball Zoo, and Millennium Park. Other proposed highway projects required to accommodate on-going growth and development include improvements on US-131 between Ann Street and West River Drive, US-131 reconstruction from West River Drive to Rockford, the I-196 at Chicago Drive (Baldwin Street) interchange modification EA, and the Grand Rapids Major Transit Investment Study (GT2).

Compared to the No Build Alternative, the preferred alternative will contribute to the continued success of the Grand Rapids metropolitan area, including the redevelopment of the core downtown area of Grand Rapids. The No Build Alternative would result in continuing decline of the roadway and bridges serving the area, traffic operations, safety issues, as well as increased congestion and maintenance on the existing freeway system. These negative impacts along with the related travel delays would likely contribute to the decline of the area economy.

2.3 LAND USE

The existing land uses adjacent to the I-196/I-96 freeway system and the East Beltline segments within the study area include commercial, residential, and industrial uses.

There is limited land available for additional development in the project area. The existing zoning reflects these uses. The future land use plans and future zoning maps for Grand Rapids and Grand Rapids Township continue the same patterns of development. The proposed improvements to the roadway and bridges are consistent with these plans. The majority of ROW that is needed for this project is zoned commercial and will be converted to transportation land use as a result of the proposed improvements.

2.4 SOCIAL IMPACTS

The proposed project will not cause any long-term negative impacts on low-income, minority, ethnic, elderly or handicapped groups, or on area schools, churches or emergency services. No neighborhoods within the project area will be permanently separated from community facilities or services. Temporary impacts to a non-motorized trail (which is discussed in Section 6 Programmatic Section 4(f) Evaluation) and existing sidewalks, along with traffic disruptions will occur during construction. Access for motorists, non-motorized users and emergency vehicles will be maintained during construction.

MDOT will coordinate with local officials in providing updated information to assist all motorists including emergency vehicles and school buses in selecting the best route to use during construction.

2.5 ENVIRONMENTAL JUSTICE

The purpose of Executive Order 12898 on Federal Actions to Address Environmental Justice in Minority and Low-income Populations is to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations. The proposed improvements will not cause disproportionately high and adverse human health or environmental effects on minority and low-income populations.

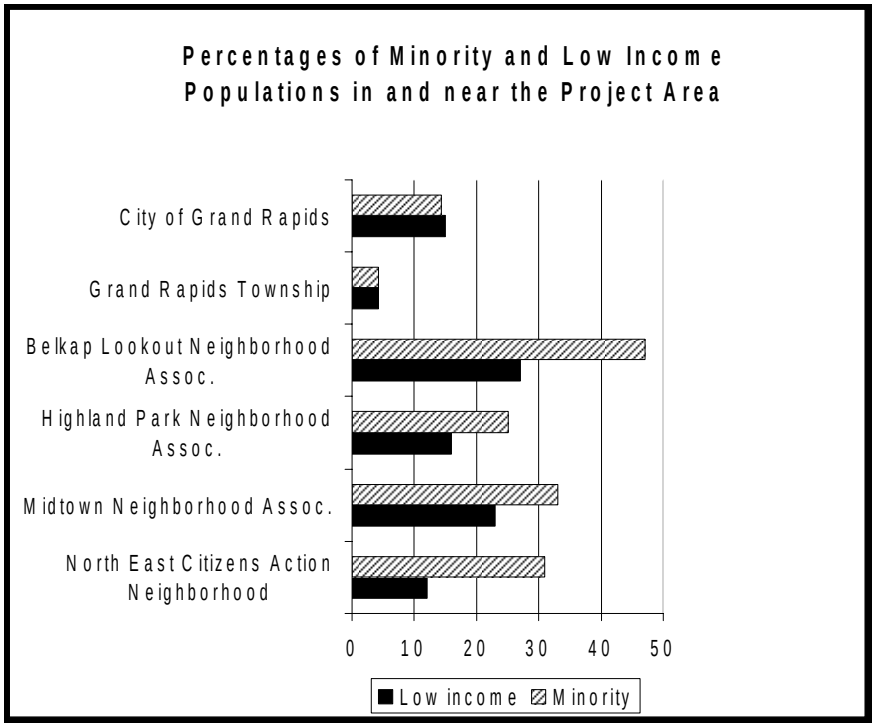
An analysis of the U.S. Census data for 2000 along with field reviews of the project area determined the presence of minority and low-incomes populations within the project area (see Figure 2.1). The minority population in the city of Grand Rapids and Grand Rapids Township is 14.3 percent and 4.2 percent respectively; while the percentage of individuals below the poverty level is 15.0 percent and 4.2 percent respectively. However, the four neighborhoods that are adjacent to the project area have a higher minority population; and three of the neighborhoods have a higher percentage of individuals below the poverty level. The four neighborhoods include the Belknap Lookout Neighborhood Association, Highland Park Neighborhood Association, Midtown Neighborhood Association, and the North East Citizens Action Neighborhood. The minority populations in these four neighborhoods ranged from 25 percent in the Highland Neighborhood to 47 percent in the Belknap Neighborhood. The percentage of individuals who are below the poverty level in these four neighborhoods range from 12 percent in the North East Citizens Action Neighborhood to 27 percent in the Belknap Neighborhood.

Although there will be temporary impacts such as delays in travel times during construction, the proposed improvements will provide for a safer freeway system by alleviating congestion, and improving traffic flow, and providing better access to local roads.

MDOT has held several meetings with local officials and an informational meeting for the public to solicit input from potentially affected stakeholders and property owners. A public hearing will be held after the Environmental Assessment has been approved by FHWA for public review and comments.

The proposed project will not displace or cause disproportionately high and adverse impact on minority or low-income populations within the project area. However, a continuing effort will be made to identify any additional impacts that may have a disproportionately high and adverse effect on minority and low-income population during subsequent phases of this project. If additional impacts are identified, every effort will be made to actively involve the impacted groups in the project development process.

Figure 2.1



2.6 MAINTAINING TRAFFIC

During the proposed improvements to the I-196, I-96 and M-37/M-44 (East Beltline) freeway system, MDOT has developed a plan to maintain at least one lane of traffic in each direction. However, there may be short periods when MDOT may need to detour traffic onto local streets, and/or other state highways during various stages of

construction. Updates on construction progress will be available to the public at http://www.michigan.gov/mdot/0,1607,7-151-9621_11058_32151--,00.html.

A component of the Maintaining Traffic Plan (MTP) will be the development and implementation of a Motorist Information Plan (MIP). The MIP will include electronic message signs along I-196, I-96, and M-37/M-44 (East Beltline) informing motorists that travel lanes have been reduced to one lane in each direction and that alternative routes are available. The message signs will also inform motorists and non-motorists users that local access to residences and businesses within the project area is being maintained during construction.

Final MTP's will be developed in coordination with the city of Grand Rapids and other local agencies during subsequent project design phases. At that point, costs, schedules, user impacts, and more detailed options will be evaluated.

2.7 CULTURAL RESOURCES

Historic Resources. MDOT consulted with the State Historic Preservation Office (SHPO) to determine an Area of Potential Effect (APE) for above-ground historic resources. The APE included all proposed intersection work and road improvements depicted on the *Conceptual Long Range Master Plan for I-196 and I-96* within the project area. MDOT conducted a survey of all structures within the APE and focused on buildings and bridges older than 50 years to determine if any might be eligible for listing on the National Register of Historic Places.

According to the National Register criteria, a building must be at least 50 years or older and retain integrity of location, design, setting, materials, workmanship, feeling, and association. Furthermore, at least one of the following additional criteria must be met: A) association with a significant event; B) association with the lives of significant persons; C) embody the distinctive characteristics of a type, period or method of construction, or represent the work of a master; or D) have yielded or may be likely to yield information important in history or prehistory.

The survey, which was accepted by the SHPO, identified three National Register-eligible properties within the APE. The former Ionia Avenue Mission Hall at 737 Ionia Avenue, NW, 523 College Avenue, and 529 College Avenue are all identified on Figures 2.2 and 2.3. The latter two buildings are not individually eligible for listing, but are contributing residences within the potential Belknap-Lookout Historic District.

The Ionia Avenue Mission Hall served an important role in the surrounding Coldbrook residential neighborhood through the 1960s when the majority of the homes were replaced by industrial buildings. After the Mission Hall was constructed in late 1923 or early 1924 by the Coldbrook Christian Reformed Church, the building was used for a variety of community activities like children's sewing and drawing lessons, Sunday School classes, and even as a welfare station during the Great Depression in the 1930s. Today the Mission Hall stands as one of the earliest intact examples of this building type associated with the Christian Reformed Church in Grand Rapids.

Figure 2.2 Former Ionia Avenue Mission Hall—views of front façade and north elevation.

Figure 2.3 View of 523 College Avenue (left) and 529 College Avenue (right).

The Belknap-Lookout Historic District is an area roughly bounded by Division Avenue to the west, Leonard Street to the north, College Avenue to the east, and Michigan Street to the south. This neighborhood is a mixture of single-family residences and some duplexes built between 1870 and 1920 with the Coit School as its centerpiece. The two residences at 523 and 529 College Avenue are located at the extreme southeastern corner of the potential District. These two residences, because they are the closest to the College Avenue intersection, were reviewed in the MDOT survey. Although neither home meets the National Register-criteria on an individual basis, both houses do contribute to the larger potential District. Each residence remains a good example of working-class housing built in the 1880s during the first wave of construction in the neighborhood.

The SHPO was provided with information about the anticipated impacts of the Project on the Ionia Avenue Mission Hall and the potential Belknap-Lookout Historic District. The new configuration of Ionia and Division Avenues near the Mission Hall will not alter the existing relationship between the building and the street itself. Likewise, design options considered for the College Avenue intersection do not alter the area near 523 and 529 College Avenue. Therefore, according to a letter from the SHPO dated March 11, 2005 and included in the Appendix E (Early Coordination Letters and Responses), the project will have no adverse effect on the identified historic properties.

Archaeological Resources. During the initial review of this undertaking, the potential for encountering both historic and prehistoric archaeological resources was assessed and determined to be moderate to low. Therefore, following review of the APE, and in consultation with the SHPO, it was determined that one location at 3840 Fulton Street, S.E., Grand Rapids, required an on-site survey to assess its archaeological potential. The subsequent archaeological survey and site evaluation was performed by MDOT archaeologists. As a result of this study, one new site was located and its eligibility was assessed for listing in the NRHP. The site had Native American prehistoric components and historic components. Following review of the study's findings, and in consultation with the SHPO, it was determined that site is not NRHP-eligible (SHPO letter, December 17, 2004 can be found in Appendix E). Therefore, for archaeological resources, there are no historic properties affected by this undertaking.

The project team issued an early coordination letter July 19, 2004 to all federally-recognized Tribes, and one state-recognized Tribe, to seek input and to request identification of any areas of concern regarding the scope of work for the undertaking. There were no responses from any Tribe identifying issues related to the undertaking and no requests to engage in government-to-government Consultation. Since then, neither archaeological nor historic above-ground surveys have revealed any information necessitating or requiring Agency/State/Tribal governmental consultations. Therefore, as pertains to this undertaking and the EA, the federal and state requirements for Native American Consultation have been fully executed and are complete.

2.8 AIR QUALITY

Under the direction of the Clean Air Act (CAA) as amended in 1990, the U. S. Environmental Protection Agency (EPA) has established health-based National Ambient Air Quality Standards (NAAQS) for six pollutants. These six "criteria" pollutants are lead (Pb), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter (PM_{10}, 10-micron and less, and $PM_{2.5}$, 2.5 micron and less).

Transportation air quality analysis consists of two parts: confirmation of conformity to the NAAQS, and microscale or "hot-spot" analysis for carbon monoxide (CO) dispersion. The EPA determines the conformity status for designated areas based upon air pollutant monitors' data readings over a period of time. A region that is not in conformity with the NAAQS for a specific pollutant is designated to be in "non-attainment" for that pollutant.

The I-196/I-96 and M-37/M-44 corridor is located entirely within Kent County. On June 15, 2004, the EPA designated Kent County to be in non-attainment for 8-hour ozone. An area comes into non-attainment for the 8-hour ozone standard when the 3-year average of the annual daily 8-hour average at each monitor exceeds the NAAQS of 0.08 ppm (parts per million). The area is in attainment for all other NAAQS designated pollutants.

Ozone is a regional pollutant created through a chemical reaction with a mix of volatile organic compounds (VOC), nitrogen oxides (NO_x), and sunlight. Its effects are addressed by including it in the GVMC MPO Long Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP) in compliance with the CAA and Federal Regulations 40 CFR 51 and 93. The GVMC is the MPO that includes Grand Rapids, Kent County and the eastern part of Ottawa County. One of their responsibilities is to carry out all transportation related planning activities for its designated area and to ensure that the transportation project adheres to the Final Conformity Rule for air quality so that such activities would not:

- Cause or contribute to any new violation of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or any required interim emission reduction or other milestones in any area.

The Air Quality conformity analysis for the Preferred Alternative in this EA was completed using the MPO travel demand model (sub-set of the statewide model) and the MOBILE6.2 emissions model, and it was determined that the project conforms to the CAA Final Conformity Rule. It was subsequently approved by the MPO on October 6, 2005. The MPO LRTP amendment for the Preferred Alternative was also approved by the MPO on October 6, 2005. These actions are currently being processed through the FHWA, Federal Transit Administration, and the United States EPA as required. Committed phases of the project are currently in the fiscal year 2006-2008 MPO TIP.

A microscale or "hot-spot" dispersion analysis was done for CO impacts. CO is a localized pollutant in that the negative health impacts quickly dissipate over distance.

The analysis focuses on areas close to the roadway where an unhealthy buildup of CO can occur and have an impact on human activities such as walking and biking. Intersections are typically targeted for analysis because lengthy traffic queuing can increase CO concentrations to unhealthy levels. Dispersion analysis takes into account meteorological factors such as wind direction to determine the point of highest CO concentration around a chosen roadway or intersection.

Microscale analysis was done by selecting the worst-case conditions where the most congested traffic volumes and roads may produce high concentrations of CO, based on meteorological conditions and the configuration of the roadway. The identification of the worst-case conditions is based on the level of service (LOS) and the total traffic volumes in the area. LOS is ranked from A to F where LOS A represents free flow operations and LOS F represents lanes of vehicles barely moving. A microscale analysis is required by 40 CFR 93.123 in areas where LOS D is predicted. 40 CFR 93.123 also states that the top three worst-case areas can be modeled to represent the project's CO impacts.

The intersection analyzed based on highest LOS and traffic volumes are:

- M-44/Leonard Street
- I-96 at M-37/M-44
- I-196/Fuller Avenue (both North and South)

A microscale analysis for CO was done for existing, 2030 no-build, and 2030 build scenarios. Motor vehicle emission factors for CO were obtained from the EPA approved MOBILE6.2 emission modeling software. The CO emission data was input into EPA approved CAL3QHC dispersion modeling software to determine concentrations around the selected intersections. Points or receptor locations were placed around the intersections and along the roadway where queuing will happen (see Figures 2.4, 2.5, and 2.6 for locations in the Figures Section). The following is data put in CAL3QHC for meteorological conditions and input parameters:

- Stability Class: D (stable atmosphere)
- Wind Speed: 1m/s (2.2 mph)
- Wind Direction: 10° increments, then refined to 1° increments
- Mixing Height: 1000m (3281 ft)
- Surface Roughness: 108 cm (3.54 ft)
- Saturation Flow Rate: 1800 vehicles/hour

Background concentrations were added to the results of the CAL3QHC to determine the total impact of CO. Background concentration is defined as the concentration of a pollutant at a point that is the result of emissions outside the local vicinity; the concentration at the upwind edge of the local sources. Background concentrations of 4.7 parts per million (ppm) for the 1-hour standard and 3.1 ppm for the 8-hour were used for this analysis. Following MDOT guidance, these data were obtained as the maximum second highest concentrations measured at the Grand Rapids (Monroe Avenue) monitor in Kent County between 2001 and 2003.

The maximum concentrations of the CO modeling results are illustrated in Table 2.1. The 8-hour CO concentrations were calculated by applying a persistence factor of 0.7 to the predicted 1-hour concentrations in accordance with MDOT and EPA guidelines. The full list of receptors and their maximum modeled concentrations are presented in the *Air Quality Analysis Technical Report* which is available for review upon request.

The maximum CO concentrations for the 2030 No Build scenario are 9.1 ppm for the 1-hour averaging period and 6.2 ppm for the 8-hour averaging period. The maximum CO concentrations for the 2030 Build scenario are 9.9 ppm for the 1-hour averaging period and 6.7 ppm for the 8-hour averaging period. All maximum CO concentrations occurred at Receptor 1, the northeast quadrant of the M-44/Leaonard Street intersection. Based on these results, the planned improvements to I-196/I-96 and M-37/M-44 are not expected to cause or contribute to a violation of NAAQS for CO.

TABLE 2.1 CO MICROSCALE ANALYSIS MAXIMUM CONCENTRATIONS

INTERSECTIONS	1-HOUR (ppm)			8-HOUR (ppm)		
	Existing	No Build	Build	Existing	No Build	Build
M-44/ Leonard St.	9.7	7.7	7.8	6.6	5.2	5.3
EB I-96 Ramps/M-37	12.2	9.1	9.9	8.4	6.2	6.7
I-196/Fuller Ave	10.7	8.5	8.2	7.3	5.8	5.6

Source: I-196/I-96 & M-37/M-44 Environmental Assessment Air Quality Analysis, URS, January 27, 2005. ppm = parts per million - NAAQS for CO: 1-hour = 35 ppm, 8-hour = 9.0ppm

The construction phase of the proposed project has the potential to impact local ambient air quality by generating fugitive dust through activities such as demolition and materials handling. Construction contractors will comply with all federal, state, and local laws, regulations and rules governing the control of air pollution during construction of the I-196/I-96 and M-37/M-44 project. Dust will be controlled during construction to avoid detrimental impacts to the safety, health and welfare, or comfort of any person, or damage to any property or business by such methods as ground watering and careful control of stockpiles of raw materials. There will be no open burning of waste materials.

Analysis Summary

Results from the CAL3QHC dispersion modeling analysis indicates that the proposed changes to the I-196/I-96 & M-37/M-44 corridor could be built and operated such that traffic CO emission levels at the nearby intersections would not cause an exceedance of the CO NAAQS. The impact of one intersection on another is minimal. Based on these model runs, both the one-hour and eight-hour modeled concentrations at the three worst-case signalized intersections would be well below the NAAQS for CO and all areas would be considered to be in compliance.

As previously discussed, the air quality conformity analysis and LRTP amendment were recently approved by the Grand Rapids MPO. Federal action on the plan amendment and air quality conformity finding will be included with the FONSI issued for this project.

The detailed examination of the existing air quality conditions, regulatory requirements, methodologies used to conduct the analysis and the results are presented in *Air Quality Analysis Technical Report* which is available for review upon request.

2.9 NOISE

Noise is defined as unwanted or annoying sound. Sound levels are measured and expressed in decibels (dB). The decibel scale is logarithmic and expresses the ratio of the sound pressure unit being measured to a standard reference level. Most sound heard in the environment does not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The intensities of each frequency add to generate sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound according to a weighting system, which reflects that human hearing is less sensitive at low frequencies and at extremely high frequencies than at the mid-range frequencies. This is called "A" weighting, and the decibel level measured is called A-weighted sound level (dBA). "A" weighting most closely represents the response of the human ear to sound. In practice, the level of a noise source is measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from various sources, including relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of traffic noise, a statistical noise descriptor called the $L_{eq(h)}$ (equivalent hourly sound level) is commonly used. $L_{eq(1h)}$ describes a noise sensitive receiver's cumulative exposure from all noise-producing events over a one-hour period. Noise sensitive receivers are locations that may be subject to interference from noise. They often include picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.

Federal regulation 23 CFR Part 772 establishes Noise Abatement Criteria (NAC) for various land uses, dividing activities into five categories. MDOT has adopted these activity categories and NAC. The five categories are shown in Table 2.2.

Table 2.2 Noise Abatement Criteria (NAC)

Activity Category	NAC, $L_{eq(1h)}$ dBA	Description of Activity Category
A	57 (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 area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches libraries, hospitals, and auditoriums

Source: Code of Federal Regulations: Title 23 part 772

MDOT policy considers there to be noise impacts if the traffic noise approaches or exceeds the NAC standard which for Category B is 67 dBA, or if there is an increase of 10 dBA over the existing sound levels. MDOT considered 66 dBA to be an impact for Category B properties.

A noise analysis was done following procedures established in 23 CFR Part 772, FHWA's *Highway Traffic Noise Analysis and Abatement Policy* (June 1995), and MDOT's *Procedures and Rules for Implementation of State Transportation Commission Policy 10136 – Noise Abatement* (MDOT, 2003). FHWA's software traffic noise model (TNM2.5) was used to determine existing (2004) and predict future (2030) noise levels.

In order to evaluate the potential for sound level impact for the study area, noise sensitive areas (NSA) were identified throughout the study area. The NSAs were identified based on the FHWA criteria and include single family residences, a hospital, schools, recreation areas and one private golf course. For this project, twenty-seven NSAs have been identified throughout the study area. The locations of the NSAs can be seen in Figure 2.7 in the Figures Section.

Measurement of the ambient noise levels is required to establish the basis of impact analysis. One-hour noise measurements were conducted between September 20 and 23, 2004. These sites were selected to provide representative sound levels for each NAS in the study area. One-hour noise measurements were performed and classified vehicle counts were collected for calibration of the traffic noise model, FHWA approved TNM2.5. The Complete Noise Receptor Monitoring Profiles, which include descriptions,

site sketches, weather data, and classified vehicle counts for each noise-monitoring site, are presented in the *I-196/I-96 and M-37/M-44 Highway Noise Analysis Technical Report*. This noise report is available for review upon request.

A total of 193 receptors were included to provide complete coverage of the NSAs in the study area. See Appendix F (Comparison of Existing and Predicted Noise Levels) for the existing and projected noise levels by receptor. The receiver locations provide a full representation of the study area and the NSAs. Existing measured noise levels ranged from a low of 50.0 dBA at Receiver 20-01 in NSA 20 to a high of 72.7 dBA at Receiver 9-M18 in NSA 9. Predicted noise levels were modeled using FHWA's TNM2.5. This model takes into account traffic volumes, vehicle types, vehicle speeds, roadway locations, screening provided by buildings, terrain features, and noise sensitive receiver locations to calculate future traffic generated noise levels. Predicted levels ranged from a low of 45.7 dBA at Receiver 22-03 in NSA 22 to a high of 75.4 dBA at Receiver 1-M01 in NSA 1. Figure 2.8 illustrates the general locations of the monitored and modeled receptor sites, and indicates which receptors would be impacted. Figure 2.8 can be found in the Figures Section.

There are no receivers impacted by a substantial increase of 10 dBA or more. However, the analysis predicts that 17 NSAs will have noise levels equal to or greater than the 66 dBA for the future year (2030) scenario. Table 2.3 lists the impacted noise sensitive areas (NSA), and the corresponding receivers.

Table 2.3
IMPACTED NOISE SENSITIVE AREAS

Noise Sensitive Areas	Community	Receiver Impacted	Number of Impacted Dwelling Units
1	North of I-196, residences between Coit and Lafayette Avenues	1-M03	10 Residences
2	South of I-196, residences along Benson Avenue	2-M05, 2-01	5 Residences
3	Apartment buildings and park north of I-196 between College and Grand Avenues	3-01, 3M07, 3-03, 3-04	8 Apartment units 10 Dwelling units representing the park
4	South of I-196, residences between railroad and Diamond Avenue	4-M09, 4-M10	8 Residences on western side 6 Residences on eastern side
5	North of I-196, residences between Grand and Diamond Avenues	5-M08, 5-M13	12 Residences on western side 18 Residences on eastern side
8	North of I-196, Hospital and Jail between Fuller and Ball Avenues	8-02	Kent County Jail Complex
9	North of I-196, townhouses between Ball and Plymouth Avenues	9-M17, 9-M18, 9-01, 9-02	24 Townhouse units
10	North of I-196, townhouses in northeast quadrant of Plymouth Avenue with I-196	10-M19, 10-M20, 10-01	26 Townhouse units
12	Residences in southwest quadrant of I-96 and Leonard Street	12-M21	1 Commercial property
14	Residences in northwest quadrant of I-96 and Leonard Street	14-02	3 Residences
16	Commercial and residences in northeast quadrant of I-96 and I-196 interchange	16-01	1 Commercial property
17	Residences in northeast quadrant of I-96 and East Beltline Avenue	17-01	1 Residences
18	Residences in southwest of I-96 between railroad and M-21 (Fulton St.)	18-05, 18-06	6 Residences
21	Cascade Country Club	21-M45	Private golf course
23	Residences west of M-37 (East Beltline) between M-21 (Fulton St.) and Cascade Road	23-03, 23-04	6 Residences
25	Church and Cornerstone University, west of M-44 (East Beltline) and south of Leonard St.	25-M37, 25-01	10 Dwelling units representing Cornerstone University
27	Residences west of M-44 (East Beltline) and north of Leonard St.	27-01, 27-04, 27-05	12 Multi-family units

MDOT policy requires all impacted properties to be examined for possible noise abatement. The typical MDOT method for noise abatement is the construction of a noise barrier or wall. The noise wall must meet the standards of feasibility and reasonability before construction would be considered. Feasibility is an engineering requirement looking at construction, safety and maintenance issues and the capability to obtain the required 5 dBA reduction in traffic noise impacts. Reasonability focuses on the economic aspects such as cost effectiveness in constructing the wall and financial agreements with local jurisdictions with regard to maintenance, land use policy, and funding participation. MDOT has calculated the cost to build a typical concrete noise wall to be about $500 per linear foot ($23.77 per square foot for above ground wall structure plus $219.60 per linear foot for foundation). This cost is compared to MDOT's designated cost per benefiting unit of $35,696 (2005 dollars). The total cost of the noise wall construction must be below the per benefit dwelling unit cost to be considered reasonable. TNM2.5 has the capability to calculate the cost per benefit dwelling unit and was used to determine the reasonability.

Ten locations were considered to be feasible for noise walls. Table 2.4 below details the costs of construction compared to the per benefit dwelling unit cost.

TABLE 2.4 PROPOSED NOISE ABATEMENT AND COST PER BENEFITED DWELLING UNIT

Noise Sensitive Area	Approximate Length (ft)	Height (ft)	Area (ft^2)	Cost	Benefited Dwelling Units	Cost Per Benefited Dwelling Unit
1	576	20	11,522	$400,382	10	$40,038
2 and 4 west	1392	16-20	24,195	$880,835	13	$67,756
3 and 5 west	1966	16-20	34,523	$1,252,297	30	$41,743
4 east	672	16-20	12,672	$448,802	6	$74,800
5 east	1199	16	19,191	$719,779	18	$39,987
9	1296	24	31,093	$1,023,579	24	$42,649
10	1680	16	26,872	$1,007,567	26	$38,753
17	390	14	5,465	$215,640	1	$215,640
18	920	12-18	14,723	$552,032	6	$92,005
27	200	18	3,602	$338,109	4	$84,527
	300	20	6,001			

Source: I-196/I-96 & M-37/M-44 Environmental Assessment Highway Noise Analysis (URS, January 25, 2005)

All of the noise walls proposed have a per benefited dwelling unit cost above MDOT's designated per benefited dwelling unit cost of $35,696 (2005 dollars). No NSA meets the criteria for feasibility and reasonability. Therefore, mitigation is not recommended for further consideration for any of the impacted NSA's.

Analysis Summary

Twenty-seven NSA's have been identified throughout the study area based on the proposed improvements for I-196/I-96 and M-37/ M-44. The NSA's include single-

family residences, schools, hospitals, and one privately owned golf course. The FHWA TNM analysis indicates that 17 NSAs will have noise levels equal to or greater than 66 dBA for the future year (2030) scenario. No modeled receptors experienced a substantial increase of 10 dBA or more.

Mitigation measures were considered for each of the impacted areas, and noise abatement walls were considered where feasible and reasonable. Noise abatement is considered feasible and reasonable if the wall is buildable, can reduce traffic noise levels by 5 dBA or more, and the estimated cost per residence is at or below $35,696 (2005 dollars). For each of the 17 NSAs impacted, none received a cost per benefited residence below the MDOT criteria of $35,696 (2005 dollars). Therefore, mitigation is not recommended for further consideration for any of the impacted NSA's. If local government or private funding becomes available for noise abatement, MDOT will re-evaluate noise mitigation for this project.

The detailed traffic noise analysis information, TNM tables, and more details on the noise impacts on the NSAs are found in *I-196/I-96 & M-37/M-44 Environmental Assessment Highway Noise Analysis Technical Report* which is available upon request for review.

2.10 FARMLAND

Based on a review of the land use and zoning maps, site inspections, and coordination with the city of Grand Rapids and Grand Rapids Township, there are no parcels currently zoned for agriculture or forestry and no active farmlands are present within the project area. Therefore, no additional coordination with United States Department of Agriculture (USDA)/ Natural Resources Conservation Service (NRCS) will be required under the Federal Farmland Protection Policy Act (FPPA).

The Part 361 of Michigan Public Act 451, Natural Resources and Environmental Protection Act of 1994 (previously known as PA 116), database was reviewed, and it was determined that no parcels enrolled under the State of Michigan Farmland and Open Space Preservation Program will be impacted by this project.

Kent County has a Purchase of Development Rights (PDR) program for preserving farmlands. It is a voluntary program that compensates owners of agricultural properties for their willingness to accept a permanent deed restriction on their land that limits future development of the land for non-agricultural purposes. No properties within the study limits are in the PDR program or in the areas targeted for agricultural preservation.

2.11 CONTAMINATED SITES

A Project Area Contamination Survey (PACS) was performed by the MDOT. The PACS included a review of Michigan Department of Environmental Quality files, interviews and two site visits. The proposed construction of I-196 through Grand Rapids and extending over the Grand River will be mostly within the existing ROW. Elevated portions of the freeway pose no significant contamination issues from adjacent property.

At the Fuller Avenue interchange, I-196 is at or below existing grade. The north side of this area is residential and poses minimal risk from contamination. The south side and east of Fuller Avenue is an industrial area where contamination may exist. If any excavation activities occur on Fuller Avenue or the east bound entrance ramp a re-evaluation of the contaminated sites section should be made when preliminary plans are completed to determine if any testing is necessary in this area. There is also the possibility of contamination near interchanges if excavation activities occur beyond the interchange ramps. Overpass bridges may also contribute to possible lead contamination in the soils around the bridges. At the southwest corner of East Beltline (M-44) and Leonard Street there is an Amoco gasoline station that is a known site of contamination for leaking gasoline tanks. There are monitoring wells within the existing ROW that will need to be removed and abandoned properly.

Mitigation

When preliminary plans are completed additional review may be needed in the areas where ROW will be purchased. Overpass bridges will be evaluated for lead if any construction or excavation will occur on, near or under the bridges. If any excavation activities occur on Fuller Avenue or the eastbound entrance ramp to I-196, a re-evaluation of the contaminated sites section should be made when preliminary plans are completed to determine if testing is necessary in this area. Interchanges will need to be evaluated when preliminary plans are completed. If any excavation activities occur beyond the interchange ramps it may be necessary to conduct testing to determine if any contamination exists within MDOT ROW. Monitoring wells within the existing ROW will need to be properly abandoned and removed. An evaluation may be needed for new utility cuts through contaminated areas. Additional testing may also be needed, especially on the sites that have been identified as having potential impact on the project. The testing should be able to determine if contamination exists and the concentration of any contaminates in the soil and groundwater. If no testing is conducted, miscellaneous pay items will be included for contaminated soil removal and disposal. All contaminated material will be disposed of properly.

River bottom sediments that will be excavated for the widening of the Grand River bridge piers will be tested prior to construction. This testing will determine contamination and the required disposal methods to be used.

A Risk Management Plan may need to be developed which includes a Worker Health and Safety Plan if contamination is found within the limits of excavation.

2.12 ENDANGERED AND THREATENED SPECIES

Endangered and threatened species are officially protected by the State of Michigan's Natural Resources and Environmental Protection Act, Act 451 of the Public Acts of 1994, Part 365; and the Federal Endangered Species Act of 1973, as amended. An endangered species (E) under the Acts is defined as in danger of extinction throughout all or a significant portion if its range. A threatened species (T) under the Acts is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Special Concern (SC) species are not afforded legal

protection under the Michigan Act but are of concern because of declining or relict populations within Michigan, or are species for which more information is needed. A candidate species is a species for which the U.S. Fish and Wildlife Service (USFWS) has sufficient information on their biological status to propose them as threatened or endangered under the Federal Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

A review of the USFWS 2005, Threatened and Endangered Species System for Michigan shows 13 animal species listed. The USFWS response letter (See Appendix E) indicates that none of these listed species is present within Kent County. This project was also checked against the Michigan Department of Natural Resources (MDNR) Michigan Natural Features Inventory (MNFI) database for the presence of state listed endangered and threatened species. (See Appendix E for MDNR letter). There are no federal or state listed threatened or endangered species, or any species proposed for listing, known to be present at the project site based upon database searches and field inspections. An historical occurrence of the Special Concern species Eastern Box Turtle (*Terrapene carolina carolina*) near the project location has been identified, though no turtles have been found during site surveys.

2.13 FISHERIES AND WILDLIFE

The reach of the Grand River crossed by the I-196 bridge is classified by the MDNR as a warm water stream. Characteristic species of game fish include Largemouth Bass, Smallmouth Bass, Channel Catfish, and Northern Pike, along with Steelhead. Historical changes made to the stream bed in the form of dredging and stream bank stabilization by the use of seawalls have eliminated spawning and nursery areas associated with shallow, vegetated waters. Fish use in the project area is limited to passage upstream and downstream by use of fish ladders.

Observations of wildlife revealed no use of the bridge structure, including under the bridge, for breeding by any animal species. Use of the river for active foraging by waterbirds (waterfowl, herons, grebes, and gulls) was not observed on any site visit in the immediate vicinity of the bridge. No amphibian, reptile, or mammal species were observed in the immediate vicinity of the bridge structure. Wildlife cover and food resources are limited near the bridge and those terrestrial species observed are characteristic of urban environments (Rock Pigeon, *Columbia livia*; Chimney Swift, *Chaetura pelagica*; European Starling (*Sturnus vulgaris)*, and House Sparrow, *Passer domesticus*).

Wildlife species were surveyed within 0.1 mile of the project ROW on eight dates during 2004 and 2005. A total of 37 vertebrate species were identified during these surveys, and an additional 10 species were encountered while conducting other project related work. Use of the existing ROW was observed for a small subset of these species- European Starling (*Sturnus vulgaris*), American Robin (*Turdus migratorius*), Red-tailed Hawk (*Buteo jamaicensis*), Meadow Vole (*Microtus pennsylvanicus*), Woodchuck (*Marmota monax*), and Green Frog (*Rana calmitans*). Animals associated with areas to be impacted by alternation of existing cover types at the locations of the new ramps will be impacted

directly by the loss of nesting or denning sites and foraging opportunities. None of the species observed within the project area represent uncommon or rare species with limited distributions within the state or region with the exception of one observation of a pair of Peregrine Falcons (*Falco peregrinus*) perched on a building along
the Grand River south of the I-196 bridge crossing. No significant impacts to wildlife and fisheries resources will occur.

Mitigation
No work shall be performed in the Grand River from March 1 through May 1 and September 15 through November 30 during peak spawning periods. Construction can occur during these times if done within a cofferdam to isolate the construction activities from the water.

2.14 STREAM CROSSINGS

Stream and drain crossings within the project limits have been evaluated and recommendations made for the proper sizing of culverts to meet regulatory requirements (I-196/I-96 & M-37/M-44 Environmental Assessment, Highway Drainage Analysis Report, URS-January 27, 2005). The culvert sizing recommendations once carried through to construction will not create any adverse impacts due to backwater effects. Refer to Figure 2.9 in the Figures Section for a map of stream crossing locations. A summary of existing and proposed culvert dimensions is available in Table 2.5 below. These recommendations will be carried forward through the design process to address these concerns. Enclosure of about 70 feet of unnamed stream will occur within the I-96/I-196 interchange by use of culverts under the proposed new ramps. The inclusion of Detention Pond D within the interchange will also impact the stream at this location. Additional study and detailed design plans to be undertaken during a later phase of the project will provide more accurate estimates of possible impacts and their location.

Table 2.5 Summary of Major Stream Crossings Within the Project Limits

No.	Name of Watercourse	Drainage Area Reference No.*	Existing Dimensions	Proposed Dimensions
1	Forest Hills Office Pk. Dr.	N.A.	36" x 24"	48"
2	Unnamed Drain	48	29" x 42"	48"
3	Interchange Drain	43	48"	54"
4	Coldbrook Drain N. #2 A	42	48"	48"
5	Coldbrook Drain N. #2 B	41	24"	24"
6	Coldbrook Drain N. #2 C	41	72"	72"
7	Coldbrook Drain N. #2 D	40	48"	48"
8	Coldbrook Drain	N.A.	72" x 108"	72" x 108
9	Grand River	N.A.	N.A.	N.A.

* Taken from I-196/I-96 & M-37/M-44 Environmental Assessment Highway Drainage Analysis, January 27, 2005

2.15 FLOOD PLAINS/HYDRAULICS

The I-196/I-96 & M-37/M-44 EA *Highway Drainage Analysis Report* states that the proposed bridge expansion will have no significant permanent impact to the Grand River floodplain. The proposed project will require encroachment into the base floodplain of the Grand River based upon evaluation of Federal Emergency Management Agency/Flood Insurance Rate (FEMA/FIRM) maps. The city of Grand Rapids has identified an additional area near the study area as "Flood Prone". This identification has no relationship to floodplains as established by FEMA, but does serve to identify an area that has a history of short-term flooding problems.

Short-term impacts to the floodway will take place during construction of the bridge, and the extension (approximately 21 feet on each side) of the piers. Hydraulic modeling of the impacts based upon two construction methods were analyzed, one based on the use of barge supported equipment and the other using cofferdam with causeway access from the nearest shoreline based upon closure of half of the river at time. The depth of water directly adjacent to the bridge effectively eliminated use of a barge to carry material and

equipment heavy enough to lift these materials to the height required for construction and was therefore eliminated as a viable construction method. The use of a combination of cofferdam and causeway was selected as the most feasible and cost effective method of construction.

During design, a construction staging plan will be prepared to identify location, installation and removal stages. This staging plan will help minimize potential impacts to the floodplain, and will be implemented during the time in which the cofferdam and causeway are in place. The final design and elevation of the cofferdam and causeway will be completed by MDOT, and will be subject to review by MDOT and MDEQ prior to the permit application.

Long-term impacts to the Grand River are not expected to occur as the provision of the additional pier length to support the expanded bridge will not result in harmful interference at the 100-year base flood elevation.

The proposed project would not support incompatible floodplain development because it does not support development within the floodplain or alter existing access to the floodplain. The proposed project will maintain local and regional access to existing commercial and recreational facilities and is consistent with zoning and land use plans of the city of Grand Rapids.

The MDEQ effectively mandates that no change in flood stage should take place on adjacent properties. Given that the new structure will have a decrease of 0.12 feet in 100 Year flood elevation from the existing condition, no mitigation is anticipated based upon results obtained from the hydraulics model.

2.16 WATER QUALITY

Watershed Description

The project area is within the lower Grand River watershed. The lower Grand River watershed includes all of the subwatersheds in the Grand River drainage west of and including the Thornapple and Flat River watersheds. It is approximately 3,020 square miles within ten counties. Land use in the watershed is dominated by agricultural land usage and the Environmental Protection Agency (EPA) has categorized the riparian habitat of the lower Grand River as 25 – 50% forested. Urban land use within the watershed is concentrated in the major metropolitan area of Grand Rapids.

Watershed Issues

The lower Grand River watershed includes one of the larger population and industrial centers in the State of Michigan; therefore there have been significant effects from human activity that have adversely impacted the watershed. Historically, the Grand Rapids area was known for large-scale metal finishing and plating industries that contributed significant amounts of heavy metals to the environment. Contaminated river bottom sediment has been identified throughout most of the main body of the Grand River (*U.S. EPA Preliminary Investigation of the Extent of Sediment Contamination in the Lower Grand River*).

Pursuant to the requirements of Section 303(d) of the Federal Clean Water Act, the MDEQ has listed 16 water bodies within the lower Grand River watershed as nonattaining. The Grand River has been listed for exceedances of fecal coliform values that exceed total body contact criteria. Primary sources of fecal coliform contamination include sanitary sewer overflows during heavy rain events and failing septic systems. The Coldbrook Drain, Heinkels Drain and several unnamed tributaries to the Grand River are within the project work area but are not listed by MDEQ as having impairments.

Project Impacts - Soil erosion and sedimentation control during construction
Accelerated sedimentation caused by highway construction will be controlled before it enters a water body or leaves the highway ROW 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 on design plans to prevent erosion and sedimentation. The MDOT has on file with MDEQ an approved operating erosion and sedimentation control program which ensures compliance with Part 91, Soil Erosion and Sedimentation Control of Act 451, as amended. The MDOT has been designated an "Authorized Public Agency" by the MDEQ and is self-regulated in its efforts to comply with Part 91. However, the MDEQ may inspect and enforce soil erosion and sedimentation control practices during construction to ensure that the MDOT and the contractor are in compliance with Part 91 and the acceptable erosion and sedimentation control program.

MDOT has developed a series of standard erosion control items to be included on design plans to prevent erosion and sedimentation. The design plans will describe the erosion controls and their locations. The following is a partial listing of general soil erosion and sedimentation control measures to be carried out in accordance with permit requirements.

- No work will be done in the Grand River channel during periods of seasonally-high water, except as necessary to prevent erosion.
- Road fill side slopes, ditches, and other raw areas draining directly into the Grand River (or other watercourses), 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.
- 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.
- The contractor shall have the capability of performing seeding and mulching at locations within 150 feet of any stream or drain within 24 hours of being directed to perform such work by the Project Engineer.

- 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.
- The contractor is responsible for preventing the tracking of material onto local roads and streets. If material is tracked onto roads or streets, it shall be removed.

Project Impacts - Post Construction

The project will create new impervious area which will result in an increased rate of run off and potentially increase pollutant contributions from sedimentation and other pollutants associated with roadways. Where feasible, drainage from the roads, approaches and bridges will be routed overland through vegetation or directed to detention basins. The use of detention and vegetated swales is expected to mitigate potential adverse water quality impacts associated with storm water runoff for most drainage within the project area with the exception of the drainage area between US-131 and Grand Rapids Eastern (GRE) Railroad bridges. Detention and treatment via overland flow is not feasible for the drainage area between US-131 and the GRE Railroad due to the existing land use. In-line detention will be evaluated and implemented where feasible within this drainage area to mitigate adverse water quality impacts, and when in-line detention is not feasible erosive flow rates will be mitigated by appropriate outfall stabilization.

The use of detention ponds has the potential to increase the temperature of storm water being discharged to the Grand River. However, temperature is not believed to be a pollutant of concern because the Grand River watershed is a warm water fishery and temperature standards for warm water fisheries are lowest for the months of December through March when minimal discharges will be occurring from the detention ponds. Furthermore, water that is discharged from the detention ponds will be cooled before reaching the Grand River as it is routed through subsurface storm sewers and vegetated swales. Temperature impacts are not expected for the drainage area between US-131 and Benson Avenue due to the planned below-ground drainage system.

Recommended mitigation for post construction water quality impacts includes maximizing use of vegetated swales for drainage conveyance; use of above ground/in-line detention and addressing all disturbed groundwater wells and sanitary sewer lines in accordance with local ordinances and community health department requirements.

2.17 WETLANDS AND WOODLANDS

Wetlands

Review of the U.S. Geological Survey East Grand Rapids topographical map and National Wetland Inventory (NWI) map was undertaken to identify known wetlands within the project area. This information was field verified, wetland boundaries were flagged, and the flagging was picked up by survey for inclusion on project base maps. The NWI map indicated no wetland at the I-196 Grand River bridge site or the I-96/M-21 ramp location. Unavoidable impacts to wetlands by the project will occur at several

locations. Approximately 1.21 acres of Palustrine Emergent Scrub-Shrub wetland and 0.29 acres of Palustrine Emergent wetland will be impacted at the I-196/I-96 interchange by the provision of new ramps. About 0.63 acres of Forested/Scrub-Shrub wetland will be filled for a new exit ramp to be located at westbound I-96 at M-21 (Fulton Street), and 0.05 acres of Palustrine Emergent Scrub-Shrub wetland will be impacted along the I-96 Mainline. Total unavoidable wetland impacts are estimated at 2.13 acres. For location of the impacted wetlands, refer to Appendix C. The following table (Table 2.6) summarizes the impacts.

Table 2.6 - Summary of Wetland Impacts

LOCATION	TOTAL WETLAND IMPACTS* (ACRES)	Palustrine Emergent** (ACRES)	Palustrine Emergent Shrub Scrub ** (ACRES)	Palustrine Forested Shrub Scrub** (ACRES)
I-96/I-196-Ramp A+B	1.45	0.29	1.16	None
I-96 Mainline	0.05	None	0.05	None
WB I-96/M-21	0.63	None	None	0.63
Total:	2.13	0.29	1.21	0.63

- Wetland impacts within project boundaries

**Cowardin, Lewis, V. Carter, F. Golet, and E. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States.

Woodlands

Mature, closed canopy Beech-Maple woods are located at the I-196/I-196 interchange. The woodland has been fragmented in the past by construction of the existing roadway, with a 0.79 acre area remaining in the median of I-96 and two fragments immediately to the west that are 2.05 and 0.21 acres in size. Direct impacts to these woodlands will result in the removal of all woodland within the median and loss of 1.65 acres (73%) of woodland west of the existing roadway for construction of proposed ramps A and B. For location of woodland areas, see Appendix C.

2.18 WETLAND MITIGATION

Wetland Mitigation Requirements
Wetland mitigation for unavoidable impacts is required through Part 303 (Wetland Protection) of Act 451, NREPA, and Section 404 of the Federal Clean Water Act. In Michigan, federal wetland regulatory authority has been delegated to the State, and the extent to which wetland mitigation is required for a project is dictated through the wetland permit process administered by MDEQ. The United States Army Corp of Engineers (USACOE) retains authority over United States Waters, including navigable rivers and adjacent wetlands. A permit will be required by MDEQ for impacts to wetlands associated with the Preferred Alternative for this project (see Section 2.17 for a detailed discussion of wetlands impacted).

Approximately 2.13 acres of wetland will be impacted by the construction of the Preferred Alternative for this project. The wetland types impacted include 0.63 acres of palustrine forested (PFO) and 1.50 acres of palustrine emergent (PEM) wetland (wetland classification based on Cowardin et al. 1979).

MDEQ requires wetland impacts to be mitigated at an acreage ratio of 2 to 1 for forested wetlands and 1.5 to 1 for emergent wetlands (MDEQ 2003). Based on these ratios this project will require 1.26 acres of forested and 2.25 acres of emergent wetland mitigation. Ratios for areas of exceptionally high quality or low quality may be adjusted on an individual basis upon review by the resource agencies during permitting.

Wetland Functions and Values
A wetland functions and values assessment using the Highway Methodology (USACOE 1995) was conducted to document the primary functions of the wetlands impacted by this project. The primary functions of the wetlands that would be impacted by the Preferred Alternative are floodflow alteration, wildlife habitat, and sediment and toxicant retention. The function and value assessment also provides data for determining the wetland mitigation goals and functions that will need to be incorporated into the mitigation plans to compensate for unavoidable wetland impacts.

Wetland Mitigation Sites
Based on MDOT's criteria for determining feasible wetland mitigation sites, the following site characteristics were determined to be important for the wetland mitigation sites proposed for the I-196/I-96 and M-37/M-44 project:

- Proposed mitigation sites should not be heavily wooded or existing wetlands,
- Mitigation should be in-kind and preferably within the same watershed as the impacts. It is also preferred that mitigation be accomplished in areas that were formerly wetlands, such as disturbed areas along the Grand River,
- Utilize prior converted historical wetland areas or land with a water table near the surface if feasible,
- The number of proposed wetland mitigation sites should be minimized while providing the full amount of required mitigation,

- Wetland mitigation sites should be compatible with adjacent land uses (e.g., not in a subdivision), and;
- The number of landowners at each site should be at a minimum.

Based on these criteria, a search has been conducted for potential wetland mitigation sites within the Grand River watershed and adjacent areas. Because the wetlands that would be impacted by this project are within the Grand River watershed, potential wetland mitigation sites within the Grand River floodplain were given priority. Sites within the floodplain are most likely to replicate the primary function, floodflow alteration, of the impacted wetlands. Wetland restoration of prior converted cropland was also given priority in the site selection process. “Prior converted cropland" is defined by the NRCS as, “wetlands that have been drained, dredged, filled, leveled, or otherwise manipulated, for agricultural use, before December 23, 1985, to the extent that they no longer exhibit important wetland values.” Specifically, prior converted cropland is inundated for no more than 14 consecutive days during the growing Season. Creation of new wetlands by deep excavation was considered less desirable due to the uncertainty of existing groundwater and the potential excavation and hauling cost. In addition, all lands designated as Part 361 of Public Act 451, previously known as PA116 (Farmland and Open space Preservation Program), were excluded from the site selection process.

Letters were sent to the owners of potential wetland mitigation sites requesting consideration that portions of their properties be used for mitigation purposes. Only properties for which favorable written responses have been received from property owners were further examined for use as mitigation sites. The written responses received are legally non-binding and indicate only voluntary, tentative landowner participation.

Potential wetland mitigation sites were preliminarily identified from aerial photographs of the study area. Soil survey maps were also consulted regarding the presence of hydric soils or soils with hydric inclusions, which generally have been identified as hydric, poorly drained or very poorly drained in the Ottawa County Soil Survey. Sites located adjacent to large drains and other waterways were considered particularly suited to wetland mitigation. Also considered were the wetland mitigation design goals determined by the wetland function and value assessment, and best professional judgment. The wetland mitigation sites were cross-referenced with historical wetland maps to determine whether restoration of drained or otherwise altered wetlands is feasible.

The primary factor to ensure successful wetland mitigation is the presence or provision of adequate hydrology to support the wetland system. Both surface water and groundwater were considered as hydrological sources for the potential mitigation sites. Wetland mitigation sites without adequate water are unlikely to be successful, while it is often feasible to manage excess water. Therefore, only sites where it is believed that sufficient surface water can be delivered or where adequate groundwater exists are being considered for mitigation. Redundancy of hydrology (a combination of surface water and groundwater) will be provided where possible.

Based on this search, three potential wetland mitigation sites were identified (See Figure

2.10 in the Figures Section). Of these three potential wetland mitigation sites, the Fish Farm property was selected as the preferred site for several reasons and is discussed below in more detail.

Site #1 - Fish Farm Wetland Mitigation Site
This site is located adjacent to the floodplain on the south side of the Grand River in Robinson Township of Ottawa County (T7N, R15W), see Figure 2.11. The site was formerly a sand and gravel mining operation and was more recently an active fish-rearing farm. For the most part, the site is flat with groundwater within 1 to 2 feet of the surface. A small portion, 0.3 acres of the 11 acre property is existing wetlands within the Grand River floodplain. Preliminary field studies indicate that this site has the potential for the creation of seven acres of wetland and could be used as a wetland mitigation bank site.

Field investigations revealed coarse sand and gravel down to the groundwater elevation, located two feet below the surface. The mapped soil for the site primarily consists of poorly drained to very poorly drained hydric Glendora Sandy Loam (Gl). The upland southern edge of the site is mapped as Rubicon Sand (RsF).

Although the site is relatively small, it has a high probability for success due to the availability of groundwater near the surface and its proximity to the Grand River floodplain. Topsoil may need to be brought into the site, however, to provide a suitable planting medium.

Because this site is within the floodplain of the Grand River, this site has a high probability of replicating the floodflow alteration and sediment and toxicant retention functions of the impacted wetlands. The presence of existing wetlands adjacent to the site also increases its potential wildlife habitat value.

This site was available, and was purchased by MDOT. MDEQ has visited this site and given MDOT preliminary approval to use this site as a banking site. Conceptual design plans will be developed in 2005 and MDOT plans on constructing the site in 2006. When constructed, credits from this site may be used to mitigate for wetland impacts associated with the Preferred Alternative of the I-196/I-96 and M-37/M-44 Project.

Wetland Mitigation and Monitoring Plan
MDOT will commit to establishing a protection and management plan in the form of a deed restriction or conservation easement for the wetland mitigation areas. As required under Section 303, of the P.A. 451 of 1994, MDOT will prepare and submit a comprehensive mitigation and monitoring plan to document the development of the mitigation sites. The mitigation and monitoring plan will follow the technical guidance provided by MDEQ (2003) and will specifically address mitigation goals and objectives, performance standards, monitoring procedures and long-term protection (i.e. conservation easement) of the mitigation site. Minimally, the design will incorporate the following;

- Sites will be designed with buffers,

- Sites will be built before road and bridge construction begin (if feasible),
- No net loss of forested wetlands, and;
- Forested wetlands will provide wildlife habitat.

The mitigation plan will be submitted during the permit process to insure compliance with the current standards.

2.19 PERMITS

A permit under Part 31 (Floodplains) and Part 301 (Inland Lakes and Streams) of Public Act 451 of the 1994 NREPA, is required for work to be conducted below the ordinary high water mark of the Grand River and at stream crossings within the project limits. A permit under Sec. 10 and Sec. 404 from the Army Corps of Engineers will not be required as this reach is not within their jurisdiction and will fall under MDEQ permitting authority. A permit under Part 303 of Public Act 451 of NREPA, Wetland Protection will be needed for wetland impacts at the I-196/I-96 interchange and I-96/M-21 exit ramp.

A permit for impacts to Coldbrook Creek, Heukels, and Robinhood county drains from the MDEQ, and the Office of the Drain Commissioner of Kent County will also be needed.

2.20 MEASURES TO MINIMIZE IMPACTS DURING CONSTRUCTION

The goal of mitigative measures is to preserve, to the greatest extent possible, existing neighborhoods, land use, and resources, while improving transportation. Although some adverse impacts are unavoidable, MDOT through the project development, design, environmental, and construction processes, takes precautions to protect as many social and environmental systems as possible. Specific project mitigation items can be found in the Project Mitigation Summary "Green Sheet" located at the end of this section.

Construction activities which include the general mitigation measures listed below are those contained in the 2003 Michigan Standard Specifications for Construction. These measures include:

1. The contractor shall locate all active underground utilities prior to starting work, and shall conduct his operations in such a manner as to ensure that those utilities not requiring relocation will not be disturbed. Relocated utilities may be temporarily interrupted for short time periods.

2. Accelerated sedimentation caused by highway construction will be controlled before it enters a water body or leaves the highway ROW by the placement of temporary or permanent soil erosions and sedimentation control measures. MDOT has developed a series of standard erosion control items to be included on design plans to prevent erosion and sedimentation. The design plans will describe the erosion controls and

their locations.

3. All regulations of the MDEQ governing disposal of solid wastes must be complied with. When surplus or unsuitable material is to be disposed of outside the ROW, the contractor shall obtain and file with MDOT written permission from the owner of the property on which the material is to be placed. No surplus or unsuitable material is to be permanently disposed of in any public or private wetland area, watercourse, or floodplain area. In addition, no surplus or unsuitable material is to be temporarily disposed of in any public or private wetland area, watercourse, or floodplain area without prior approval (and permit) by the appropriate resource agencies and the Federal Highway Administration..

4. Disruption of traffic in the construction area will be minimized to the greatest 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 I-196/I-96 and M-37/M-44 to the extent possible.

5. Construction noise will be minimized by measures such as requiring construction equipment to 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. All local noise ordinances will be adhered to unless otherwise granted exception by the responsible municipality.

6. If nests of migratory birds are present under the bridges, the provisions of the Migratory Bird Treaty regarding nest removal will be followed.

7. A Project Area Contamination Survey (PACS) was conducted to determine if any known or potential sites of environmental contamination exist that could affect the project's design, cost, or schedule. The PACS will cover existing ROW, proposed fee ROW, proposed grading permits, and proposed easements. The PACS process involves an office review of information, a site investigation, and a written report of the findings. Common hazardous/contaminated sites found could include leaking underground fuel storage tanks from former or existing gas stations, former landfills, adjacent industrial or commercial operations, and asbestos lined utility pipes or structure components.

8. All portable bituminous and concrete plants and crushers must meet the requirements for the rules of Part 55 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. .

Design plans will be reviewed by MDOT prior to contract letting in order to incorporate any additional social, economic, or environmental protection items. The construction site will be reviewed to ensure that the mitigation measures proposed are carried out, and to determine if additional protection is required. More mitigation measures may be developed if additional impacts are identified. Specific mitigation items will be included on the design plans and permit applications.

The final mitigation package will be reviewed by MDOT representatives, in cooperation with concerned state, federal, and local agencies. Some changes in the early mitigation concepts discussed in this document may be required when design begins or when in-depth soil borings are taken and analyzed. 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.

Project Mitigation Summary "Green Sheet" For the Preferred Alternative

October 21, 2005

Environmental Assessment
Programmatic Section 4(f) Evaluation

Proposed Improvements of I-196, I-96 and M-37/M-44 (East Beltline) in the City of Grand Rapids and Grand Rapids Township, Kent County, Michigan

I. Social and Economic Environment

a. *Relocations* - Adequate replacements are available for the two businesses and one residence that will be total takes for this project. Minor strips of ROW are also needed at several businesses and residences to accommodate turn lanes and sidewalk improvements. The minor loss of parking at several businesses will be reviewed during design to minimize or mitigate the impact. Acquisition assistance and advisory services will be provided by MDOT in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended; and Act 87, Michigan P.A. 1980, as amended.

b. *Maintaining Traffic* - MDOT will maintain one lane of traffic in each direction on trunkline roads but may have to detour traffic onto local roads for short periods of time. A Motorist Information Plan (electronic message signs) will be developed and implemented during construction to identify lane closures and and alternative 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

c. *Pedestrian/Bicyclists* - Non-motorized trails along both sides of the Grand River will be temporarily closed during the Grand River bridge replacement. MDOT will provide detour signing for pedestrians and non-motorized vehicles during construction and access to the remainder of the trail will be maintained. When construction on the bridges has been completed, the trails will be restored to their original condition or better. During construction, the parking of vehicles or storage of equipment and materials on any public recreational property is prohibited.

II. Natural Environment

a. *Stream Crossing/Lakes/Streams* - Construction access to the Grand River piers will be provided b staging Plan will be prepared and reviewed with MDEQ and other Resource Agencies prior to the Act 451, Part 31 (Floodplains) and Part 301 (Inland Lakes and streams) permit application. The plan will include soil erosion/sedimentation controls including dewatering operations, temporary causeway/access pad design along with installation/removal phasing and stream navigation requirements (signing and lighting).

b. *Wetlands* - Approximately 2.13 acres (0.63 acres of palustrine forested and 1.50 acres of palustrine emergent) of wetlands will be impacted by construction of the Preferred Alternative. Using the 2 to 1 mitigation ratio for forested and 1.5 to 1 ratio for emergent, this project will require a total of 3.51 acres (1.26 acres of forested wetland and 2.25 acres of emergent) of wetland mitigation. The mitigation site selected is the fish farm site adjacent to the floodplain on the south side of the Grand River in Robinson Township in Ottawa County. The wetland mitigation and monitoring plan will be included in the Act 451, Part 303 permit to be obtained from the MDEQ.

c. *Floodplains* - The preliminary hydraulic analysis indicates the new Grand River structure will decrease the 100-year flood stage by 0.12 feet compared to the existing structure. The proposed stream and drain culvert modifications will be reviewed during design to verify hydraulic capacity.

d. *Threatened/Endangered Species* - At the project pre-construction meeting, written identification materials/guidance will be provided indicating steps to be taken should a Eastern Box Turtle be discovered.

III. Cultural Environment

a. *Historic Resource* - The SHPO has determined that the proposed work will have no adverse effect on historic properties. If design changes occur in the vicinity of the historic properties, the MDOT Historian must review the changes and coordinate with SHPO and FHWA.

IV. Hazardous/Contaminated Materials

a. ***Project Contamination*** **-** A Project Area Contamination Survey (PACS) was performed for this project. Potential areas of concern have been identified and additional review (and testing if required) will occur during the design phase when slope-stake lines and construction limits are determined.

b. *River Sediment Contamination* - River bottom sediments to be excavated for the pier widening in the Grand River will be tested prior to construction to determine potential contamination and required disposal methods.

c. *Contamination Exposure* - A Workers Health and Safety Plan will be prepared if any asbestos, lead, or other contamination is identified.

V. Construction

a. *Construction Access Pads or Work Areas* - Cofferdams and causeways will be constructed in the Grand River to facilitate the widening of the piers. All protection items included in the Construction Staging Plan will be followed.

b. *Construction Permits* - Permits under Act 451, Parts 31, 301, and 303, are required from the MDEQ for this project. Coverage under the National Pollutant Discharge Elimination System (NPDES), which is administered by MDEQ, is also required.

c. *Time Restrictions* - Based on the most current available data, no work in the Grand River will be allowed between March 1 and May 1 and also from September 15 to November 30, to protect fish spawning. Work may occur during these times if it is done within an enclosed cofferdam to isolate the construction activity from the water.

SECTION 3 - PUBLIC AND AGENCY INVOLVEMENT

3.1 PUBLIC INVOLVEMENT

A public hearing will be conducted on the proposed project after the EA/4(f) document is distributed for federal, state local and public review. The hearing will allow citizens and local agencies an opportunity to review and provide comments on specific aspects of the project. A copy of the EA/4(f) document will be available at local agencies for review before the public hearing date. A well publicized public information meeting was held on August 19, 2004 at the Grand Rapids Township Hall. The meeting was attended by over 60 people. A public web-site (http://www.michigan.gov/mdot/0,1607,7-151-9621_11058_32151--,00.html) is also available for public review and comment on the project.

3.2 LOCAL AGENCY PARTICIPATION

The Michigan Department of Transportation, Federal Highway Administration, and several local agencies including: city of Grand Rapids, Grand Rapids Township, GVMC (Grand Rapids MPO), and the Kent County Road Commission have participated in several stakeholder meetings over the last year. The purpose of these meetings was to allow the local units of government an opportunity to review the proposed improvements being proposed for the various interstates within the Grand Rapids Metropolitan Area.

Other meetings were held with other various stakeholders and the public. Stakeholder meetings were held with other organizations in the Grand Rapids area. Various community organizations and private interests participated in these meetings. Additional opportunity for agency involvement/comment is available through the Grand Rapids MPO monthly committee meetings.

The following are meetings held during the Environmental Assessment process:

2004/2005: MDOT has been actively involved with The Grand Rapid's (Grand Rapids Interurban Transit Partnership) major transit investment study; Great Transit Grand Tomorrows (GT2). GT2's effort to bring about future transit investment in the Grand Rapids area involved extensive data collection and analysis which complimented the work done for this EA. The MTI study process included discussions of project plans and the EA process with staff and committees. Current alternatives being considered in the transit study process do not directly affect the Preferred Alternative in this EA.

August 17, 2004: Stakeholder meeting, Grand Region Office

August 19, 2004: Public Information meeting, Grand Rapids Township

Fall 2004: Discussions and presentation to MPO staff and committees on the EA process.

January, 19, 2005: Grand Rapids Staff, Project Overview

March 8, 2005: Presentation to City of Grand Rapids City Commission

April 12, 2005: Grand Rapids Area Chamber of Commerce's Public Policy Committee and Neighborhood Business Specialist Program.

April 28, 2005: Presentation to City of Grand Rapids Planning Commission. (Follow-up correspondence was sent to Commission Chairperson in response to inquires raised during the presentation.)

May – October, 2005: Several meetings with city of Grand Rapids staff and developers regarding Michigan Street Hill Development, Life Science Corridor, Spectrum Health, and Van Andel Institute plans near I-196 in downtown Grand Rapids.

July 2005: Initial presentations to MPO committees for their Long Range Transportation Plan amendment process.

August 10, 2005: MPO Transportation Plan amendment public meeting at Grand Rapids Township Hall. MPO Transportation Plan amendment, including air quality conformity finding for the project, was approved by GVMC on October 6, 2005.

Other contacts:

2005 - Right Place Program meetings regarding downtown redevelopment projects

2004 - Field meeting with Resource Agencies

2004/2005 - Several meetings with city of Grand Rapids and developers regarding site redevelopment plans at I-96/M-44/M-37 interchange, plans include expansion of the MDOT carpool lot on this site.

2003/2004 - Spectrum Health representatives regarding ROW and site plan coordination at the I-196/I-96/Leonard St. interchange area.

2001 to 2003 – Several meetings with FHWA staff, local agencies, MPO staff and committees during development of the *Conceptual Long Range Master Plan for I-196 and I-96.*

SECTION 4 - PROJECT COSTS

4.1 PROJECT COSTS

The estimated cost (2005 dollars) for constructing the proposed project is approximately $375 million dollars, which includes preliminary engineering, final design, ROW, construction engineering, roadway construction and bridge construction. The following Table (4.1) shows the cost for each of the segments which include road and bridge costs as well as local road improvement costs.

Table 4.1
I-196 & I-96 Freeway Study Cost Summary by Segment

Segment	Road & Bridge ($millions)	Local Road* ($millions)	Total Cost ($millions)
I-196: East of US-131 to Fuller Ave.	$137	$3	$140
I-196: Fuller Ave. to I-96/I-196 Jct.	$47	$3	$50
I-96: North of Leonard St. to Cascade Rd.	$165	$0	$165
East Beltline (M-44/M-37) : Knapp St. to Fulton St./M-21	$15	$5	$20
Total	$364	$11	$375

*Local road modifications recommended by this study will be funded with city/county transportation funds.
Note: The above costs include ROW acquisition, design, contingency and all construction costs. Federal, state and local cost participation will be based upon federal regulations, state laws, and MDOT policies and procedures.

SECTION 5 - CONCLUSION

5.1 CONCLUSION

The MDOT has reviewed this project for potential impacts on the human and natural environments. Based on the information in this Environmental Assessment, field reviews, and coordination with other agencies and the public, it is anticipated that this project will have no long-term significant negative impacts on the natural or human environment within the project area.

SECTION 6

PROGRAMMATIC SECTION 4(f) EVALUATION

6.1 INTRODUCTION

This project is being processed as approval under the U.S. Department of Transportation, Federal Highway Administration's (FHWA) Programmatic Section 4(f) Evaluation published in the August 22, 1983 Federal Register.

Section 4(f) of the 1966 Department of Transportation Act specifies that publicly-owned land from a park, recreational area, or wildlife and waterfowl refuge of national, state or local significance, or any land from a historic site of national, state or local significance, may not be used for transportation projects unless: 1) there is no feasible and prudent alternative; and 2) proposed projects include all possible planning to minimize harm.

Section 6(f) of the Land and Water Conservation Fund Act (L&WCF), as amended, ensures that property acquired or developed with L&WCF assistance shall not be converted to other than public outdoor recreation uses with out the approval of the Secretary of the U.S. Department of Interior. However, no lands within the proposed project have been acquired or developed with L&WCF assistance and the purchase of ROW is not necessary from any public recreational property. Thus, Section 6(f) documentation is not required.

This Section 4(f) Evaluation discusses the proposed project, its potential impact to a Section 4(f) property, avoidance alternatives and measures to minimize harm. Based on the following evaluation, a preliminary determination has been made by the Division Administrator that the proposed action will temporarily impact a Section 4(f) resource, that all alternatives have been fully evaluated, and that measures will be taken to minimize the impacts to the Section 4(f) land. Upon consideration of comments received from resource agencies and the public concerning the proposed action, the FHWA will either apply the Section 4(f) Evaluation and document the project files or prepare a separate Final Section 4(f) Evaluation for processing under the procedures set forth in FHWA regulations 23 CFR 771.135.

6.2 PROPOSED ACTION

The MDOT is proposing various capacity and geometric improvements to I-196, I-96 and M-37/M-44, as well as improving several interchanges within the project area. The proposed improvements will be coordinated with bridge rehabilitation and replacement projects planned over the next decade, to minimize traffic disruption and user costs.

The existing I-196 segment of the project area is an urban four lane freeway, which crosses the Grand River, and consists of three local interchanges as well as a junction with I-96. This limited access freeway is the primary east/west route for traffic serving

the downtown Grand Rapids area as well as providing east/west access across the metro area interchanging with I-96 and US-131.

I-196 ultimately connects with I-94 near Benton Harbor and serves as the primary route between Grand Rapids, Holland, and Chicago. MDOT is proposing to improve the freeway by providing a third through lane in each direction with interchange modifications at Ionia/Ottawa Avenues, College Avenue and Fuller Avenue, and auxiliary lanes between identified on/off ramps. MDOT is also proposing to replace several bridges within the project corridor, including the structures over the Grand River and the Grand Rapids Eastern Railroad.

Currently, the I-96 segment in the project area is a four lane freeway (with six lanes between the I-196 Junction, the East Beltline and M-21 interchanges), and consists of 3 interchanges in addition to its connection with the termini of the I-196 freeway. It provides local access for traffic in the northeastern area of Grand Rapids as well as through traffic connecting Muskegon and Lake Michigan with Lansing and Detroit. MDOT is proposing to widen the freeway to provide a third through lane in each direction, interchange modifications at the I-96/Leonard Street interchange, and additional ramps at the I-96/M-21 partial interchange. In addition, an important component within the project area will be the construction of two additional ramps to complete all movements at the I-196/I-96 partial interchange, as well as collector/distributor roads and auxiliary lanes to improve traffic operations in the I-196/I-96/East Beltline interchange area.

The M-37/M-44 (East Beltline) segment of the project is a four lane divided major arterial with controlled access and at-grade intersections. It provides local north/south access to I-96 within the project area on the eastern side of the Grand Rapids metro area, and serves as a state trunkline connecting various communities between Battle Creek and Traverse City. MDOT is proposing to add lanes in both directions as well as several modifications to the existing indirect left-turns, direct left/right turns, and adjacent cross streets.

6.3 SECTION 4(f) FACILITIES

The city of Grand Rapids has numerous parks that are connected by existing trails (walkways). The various trails and parks are shown in Figure 6.1. Within the project area, there are three Section 4(f) facilities that are described below.

Grand River Walkway

The Grand River Walkway, owned by the city of Grand Rapids, is located on the east side of the Grand River between Michigan Street and the Sixth Street Bridge Park (see Figure 6.2). The beautifully landscaped paved walkway was constructed in 1999 and is used by hundreds of people daily for walking, cycling, jogging, biking, and in-line skating. Additional amenities include a viewing platform of the Grand River, fishing from the walkway and access to the Grand River for fishing. The lighted Grand River Walkway also offers bench seating for relaxing and people watching. The walkway

provides convenient access to downtown, connecting parking areas, shopping, businesses, public parks, and other points of interest.

Figure 6.2 - Grand River Walkway

West Side Riverwalk

The West Side Riverwalk, owned by the City of Grand Rapids, is located on the west side of the Grand River between Fish Ladder Park and Bridge Street (see Figure 6.3). Constructed in 2000, the paved and lighted riverwalk is used by hundreds of people daily for walking, cycling, jogging, biking, in-line skating, and fishing. The West Side Riverwalk also offers amenities such as bench seating for relaxing and people watching. The walkway provides convenient access to downtown, connecting businesses, public parks, and other points of interest.

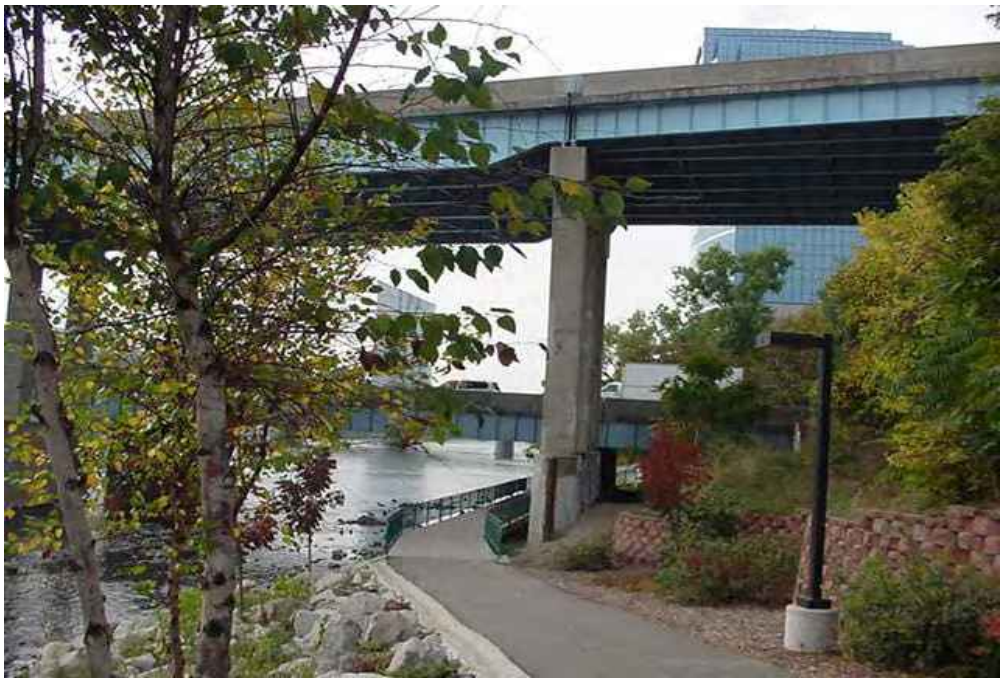


Figure 6.3 - West Side River Walkway

Highland Park

Highland Park is owned by the city of Grand Rapids, located off of College Ave is bordered on the south side by the Grand Rapids Eastern Railroad and Frontage Road. This 27.76 acre park is utilized for various activities from soccer to dog walking.

6.4 IMPACTS ON THE SECTION 4(f) FACILITY

This project will not permanently affect the Grand River Walkway or the West Side Riverwalk, which are located beneath the I-196 bridges over the Grand River. However, to safely complete the replacement of the I-196 bridges over the Grand River, these trails will need to be temporarily closed at the construction zone. During construction, MDOT in cooperation with the city of Grand Rapids, will provide a signed, designated non-motorized detour route to accommodate pedestrians. The designated pedestrian detour route will be determined in cooperation with the city of Grand Rapids prior to construction.

Highland Park is located adjacent to the I-196 bridge replacement over the Grand Rapids Eastern Railroad. Although the park is adjacent to planned construction activities, no additional ROW will be required from the park and no impacts are anticipated.

6.5 AVOIDANCE ALTERNATIVES

The proposed project cannot be completed without temporarily impacting the recreational trails. The Grand River Walkway and the West Side Riverwalk lie perpendicular to the I-196 bridges over the Grand River, therefore, the Section 4(f) property cannot be avoided unless a no build alternative is chosen. Because the no build alternative is not an option, the trails must be temporarily detoured.

6.6 MEASURES TO MINIMIZE HARM

Several steps have been taken to limit the impact to the Grand River Walkway and the West Side Riverwalk. The construction area will be limited only to the area needed to upgrade the I-196 bridges over the Grand River. The area will be fenced, and signs will be installed to alert pedestrians to choose an alternate route while the I-196 structures are under construction. Access to the remainder of the trail will be maintained; when construction on the bridges has been completed, the trails will be restored to their original condition or better.

Additionally, during the various stages of construction, the contractors will be instructed that parking any vehicles or storing any materials on public recreational property is prohibited.

6.7 COORDINATION

Coordination with the owner of the Section 4(f) properties is required as part of the environmental review. To comply with this requirement, MDOT corresponded with the City of Grand Rapids (owner of the properties). Comments have been incorporated into the document. (See Coordination Letter in Appendix E).

MDOT has notified the MDNR of the proposed project in regards to a Section 6(f) impact. According to the MDNR, no Land and Water Conservation Funds were used on the Grand River Walkway or the West Side Riverwalk. No land conversion is needed for this project.

6.8 CONCLUSION

Based upon the above considerations, there is no feasible and prudent alternative to the use of the Grand River Walkway and West Side Riverwalk. The proposed action includes all possible planning to minimize harm to the trails resulting from such use.

APPENDIX A

TRAFFIC ANALYSIS

TRAFFIC ANALYSIS

This appendix provides a summary of existing traffic and capacity conditions, and a comparative analysis of design-year (2030) traffic operations for the No Build and proposed Build Alternatives. Additional existing and future traffic and capacity analysis for existing and forecasted traffic are included in the I-*196/I-96 and M-37/M-44 EA Traffic Analysis* Technical Report which is available upon request. Listed below is a list of the capacity improvements along the I-196, I-96 and M-37/M-44 (East Beltline) corridors that are included in the Build Alternative.

Proposed Capacity Improvements

I-196

- Construct a third through lane in each direction between US-131 and I-96.
- Construct auxiliary weave-merge lanes in each direction between Ionia Avenue/Ottawa Avenue and College Avenue interchanges.
- Construct auxiliary weave-merge lanes in each direction between College Avenue and Fuller Avenue interchanges.
- Construct a ramp from westbound I-196 to northbound US-131BR (Division Avenue).
- Convert existing Division Avenue to one-way northbound between I-196 and Mason Street. Convert existing Ionia Avenue to one-way southbound between Mason Street and I-196.
- Eliminate Hastings Street from the existing north ramp terminal intersection of the I-196/College Avenue interchange.
- Construct additional laneage and storage at the College Avenue and Fuller Avenue interchanges.

I-96

- Construct a third through lane in each direction between M-44 and Cascade Road.
- Construct an eastbound I-196 to westbound I-96 fly-over ramp.
- Construct a eastbound I-96 to westbound I-196 ramp.
- Construct collector-distributor road on eastbound I-96 between I-196 and M-44.
- Construct collector-distributor road on westbound I-96 between M-44 and Leonard Street.
- Reconstruct the eastbound I-96 on-ramp from Leonard Street and construct additional laneage and storage at the I-96/Leonard Street interchange.
- Construct an auxiliary weave-merge lane on eastbound I-96 between M-44 and M-21.
- Widen the existing eastbound I-96 off-ramp to M-21 and provide access to eastbound M-21.
- Construct an eastbound I-96 on-ramp from M-21.
- Construct a westbound I-96 off-ramp to M-21.
- Construct a two-lane on-ramp from Cascade Road to westbound I-96.

M-37/M-44 (East Beltline)

- Construct a third through lane in each direction from north of Knapp Street to M-21.
- Increase capacity and storage of the directional median crossovers at Leonard Street and Knapp Street.
- Improve turning lane capacity at various locations along the corridor.

Traffic Analysis-Base Year (2004) Traffic

Conventional analysis of basic freeway segments, ramp-freeway ramps, weave sections, signalized intersections and unsignalized intersections involves the determination of a "Level of Service" (LOS). Levels of Service range from "A" to "F", similar to an alphabetic grading system, with each level describing a different set of operational characteristics. LOS "A" describes operational performance under light traffic volumes and minimal delay. LOS "F" describes a high degree of congestion with extensive delays and queuing. LOS "D" is commonly considered to be acceptable for peak-hour traffic operations in urbanized areas.

Freeway Segments-Base Year

The existing (2004) peak-hour Levels of Service for the I-196 and I-96 basic freeway segments are depicted in **Table 1**. Capacity analysis worksheets for all existing (2004) basic freeway segment analyses are available on request.

TABLE 1
EXISTING (2004) PEAK-HOUR LEVELS OF SERVICE
BASIC FREEWAY SEGMENTS

Free-way	Segment	AM-Peak Hour				PM-Peak Hour			
		Eastbound		Westbound		Eastbound		Westbound	
		Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
I-196	Ionia to College	**4410**	**F**	**3610**	**E**	**4150**	**F**	**3980**	**F**
I-196	College to Fuller	**3860**	**E**	**3770**	**E**	**3880**	**F**	**3760**	**E**
I-196	Fuller to I-96	3210	D	3020	C	3310	D	3340	D
I-96	North of Leonard	3010	C	1530	B	1520	B	3140	D
I-96	Leonard to I-196	2780	C	1410	B	1550	B	2730	C
I-96	I-196 to M-44	Weave Analysis. See Table 2-4.							
I-96	M-44 to M-21	5110	D	3730	C	4050	C	5210	D
I-96	M-21 to Cascade	**4240**	**F**	2490	C	3100	D	**4350**	**F**

Source: URS Corporation, November 2004

As noted above, there are numerous basic freeway segments (shaded areas) which operate at unacceptable Levels of Service. These results reveal the need for additional freeway capacity on I-96 and I-196.

Ramp-Freeway Junctions-Base Year

The existing (2004) peak-hour Levels of Service for the I-196 and I-96 ramp-freeway junctions are depicted in **Table 2**. Some ramps cannot be analyzed by the methods of the *2000 Highway Capacity Manual* because some ramps do not create merge or diverge conditions, but rather involve adding or dropping a freeway lane or creating a weave section. Capacity analysis worksheets for all existing (2004) ramp-freeway junction are available on request.

As shown in **Table 2**, there are numerous ramp-freeway junctions (shaded areas) which operate at unacceptable Levels of Service. Some of the ramps have low volumes, but the merge and/or diverge influence areas have dense volumes of traffic due to the high volumes of traffic on the freeway. These results reveal the need for additional freeway capacity on I-96 and I-196.

TABLE 2
EXISTING (2004) PEAK-HOUR LEVELS OF SERVICE
RAMP-FREEWAY JUNCTIONS

Ramp Location	AM-Peak Hour		PM-Peak Hour	
	Ramp Volume	LOS	Ramp Volume	LOS
Eastbound On-Ramps				
Ionia Avenue On-ramp to EB I-196	**190**	**F**	**680**	**F**
College Avenue On-ramp to EB I-196	**290**	**E**	**460**	**E**
Fuller Avenue On-ramp to EB I-196	250	D	330	D
Leonard Street On-ramp to EB I-96	360	C	280	B
M-44 On-ramp to EB I-96	450	D	400	C
Westbound On-Ramps				
Ionia Avenue On-ramp to WB I-196	280	Add-lane	920	Add-lane
College Avenue On-ramp to WB I-196	720	D	**620**	**F**
Fuller Avenue On-ramp to WB I-196	**1030**	**E**	**1000**	**E**
Leonard Street On-ramp to WB I-96	240	B	650	D
SB M-44 On-ramp to WB I-96	630	Weave	610	Weave
NB M-44 On-ramp to WB I-96	600	C	920	D
M-21 On-ramp to WB I-96	1240	Add-lane	860	Add-lane
Cascade Road On-ramp to WB I-96	1000	C	**1630**	**F**
Eastbound Off-Ramps				
EB I-196 Off-ramp to Ottawa Avenue	420	Drop-lane	230	Drop-lane
EB I-196 Off-ramp to College Avenue	**840**	**F**	**730**	**F**
EB I-196 Off-ramp to Fuller Avenue	**900**	**E**	**900**	**E**
EB I-96 Off-ramp to Leonard Street	590	D	250	B
EB I-96 Off-ramp to M-44	1330	Weave	1210	Weave
EB I-96 Off-ramp to M-21	870	Drop-lane	950	Drop-lane
EB I-96 Off-ramp to WB Cascade Rd	**830**	**F**	420	D
Westbound Off-Ramps				
WB I-196 Off-ramp to Ottawa Avenue	1050	D	**270**	**F**
WB I-196 Off-ramp to College Avenue	**880**	**E**	**400**	**E**
WB I-196 Off-ramp to Fuller Avenue	280	D	580	D
WB I-96 Off-ramp to Leonard Street	120	B	240	C
WB I-96 Off-ramp to M-44	530	C	670	D

Add-Lane: Ramp lane creates an add-on lane and cannot be analyzed by methods of HCM. Drop-Lane: Freeway lane is dropped at off-ramp and cannot be analyzed by methods of HCM. Weave: Ramp is part of a weave segment. See Table 4.

Weave Sections-Base Year

The existing (2004) peak-hour Levels of Service for the two weave sections in the project limits are depicted in **Table 3.** Each weave section operates at Level of Service "E" or "F" in at least one of the peak hours. The weave analyses results are indicative of the bottleneck conditions created by these weave sections during peak hours. Movement-by-movement Levels of Service are shown in the ***I-196/I-96 and M-37/M-44 EA Traffic Analysis*** **Technical Report.** Capacity analysis worksheets for all existing (2004) weave section analyses are available on request.

TABLE 3
EXISTING (2004) PEAK-HOUR LEVELS OF SERVICE
WEAVE SECTIONS

Freeway	Section	Length (feet)	Peak	V a-c	V a-d	V b-c	V b-d	LOS
EB I-96	I-196 to M-44 (Type C Weave)	900	**AM**	**2380**	**400**	**2280**	**930**	**E**
			PM	1320	230	2330	980	D
WB I-96	M-44 to I-196 (Type B Weave)	1400	AM	2640	1160	380	250	D
			PM	**2970**	**2490**	**370**	**240**	**F**
EB I-96	M-44 to M-21	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.						
WB I-96	M-21 to M-44	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.						

V a-c = Freeway-to-freeway volume (mainline through); V a-d = Freeway to Ramp
V b-c = Ramp to Freeway; V b-d = Ramp to Ramp

Signalized Intersections-Base Year

The existing (2004) peak-hour Levels of Service for the signalized intersections within the project limits are depicted in **Table 4**. Movement-by-movement Levels of Service are shown in the *I-196/I-96/M-44 Technical Report*. Capacity analysis worksheets for all existing (2004) signalized intersection analyses are available on request.

TABLE 4
EXISTING (2004) PEAK-HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS

Signalized Intersection	AM-Peak Hour		PM-Peak Hour	
	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)
Ottawa Avenue / Michigan Street	C	23.9	C	34.1
Ionia Avenue / Michigan Street	**E**	**62.9**	**F**	**82.2**
EB I-196 / College Avenue	B	18.8	C	30.5
WB I-196 / College Avenue	D	48.9	C	30.5
EB I-196 / Fuller Avenue	C	29.1	**F**	**83.2**
WB I-196 / Fuller Avenue	D	51.2	D	53.4
EB I-96 / Leonard Street	B	16.9	B	12.9
M-44 / M-21	**E**	**61.3**	**E**	**60.1**
M-44 / Michigan Street	D	40.9	C	26.3
M-44 / EB I-96	C	23.7	**E**	**62.5**
M-44 / WB I-96	B	18.1	D	41.9
M-44 / Leonard Street	D	40.4	**E**	**71.3**
M-44 / Knapp Street	**E**	**77.6**	D	41.0

Source: URS Corporation, November 2004

As shown in **Table 4** on the previous page, six of the thirteen signalized intersections in the study area operate at an unacceptable Level of Service during at least one of the two existing (2004) peak hours.

It should be noted that the Levels of Service depicted at the College Avenue and Fuller Avenue interchanges are worse than shown in **Table 4**. The *Highway Capacity Software* is limited in its ability to analyze congestion, and *the results do not account for the fact that the left-turn movements entering the freeway at those locations back up into the adjacent intersection.*

Each of the M-44 signals which simultaneously stop northbound and southbound traffic (M-21, EB I-96 off-ramp, Leonard Street, and Knapp Street) operate at Level of Service "E" of "F", indicating the need for additional capacity along East Beltline Avenue.

Comparison of Build Alternative and No-Build Alternative

Basic Freeway Segments

A comparison of the results of the various capacity analyses (basic freeway segments, ramp/junction and signalized intersections) is presented in the following tables for the Build and the No-Build Alternatives. Future traffic volumes were forecasted using the Grand Rapids MPO model sub-set of the MDOT Statewide Model coupled with a review of historical growth in the project area.

Major differences between the alternatives include increased traffic induced by the additional capacity provided in the Build Alternative. In addition, traffic volumes on I-96 west of the I-196 junction are greater under the Build Alternative due to the redistribution of trips and attraction of new trips associated with construction of the proposed new, eastbound I-96 to westbound I-196 and eastbound I-196 to westbound 1-96, freeway-to-freeway ramps at the I-96/I-196 interchange. This additional traffic is caused by travel pattern changes for both freeway to freeway and freeway interchange access routes. Freeway trip length, especially for the Plainfield Avenue, Leonard Street, and Fuller Avenue interchanges, will be shortened by using the new freeway to freeway ramps. As a result, some trips currently using US-131 to access I-196 interchanges, are projected to use I-96 to access I-196 via the new ramps when completed. As shown in **Tables 5 and 6**, the Build Alternative operates at an acceptable Level of Service for the freeway segments in the project area.

TABLE 5
DESIGN YEAR (2030) MORNING PEAK-HOUR LEVELS OF SERVICE
BASIC FREEWAY SEGMENTS
NO-BUILD AND BUILD ALTERNATIVE COMPARISON

Free way	Segment	2030 No Build				2030 Build Alternative			
		Eastbound		Westbound		Eastbound		Westbound	
		Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
I-196	Ionia to College	**5440**	**F**	**4460**	**F**	Weave Analysis. See Table 4			
I-196	College to Fuller	**4760**	**F**	**4660**	**F**	5130	D	5120	D
I-196	Fuller to I-96	**3970**	**E**	**3740**	**E**	4580	C	4430	C
I-96	M-44 to M-21	**6440**	**F**	4710	D	6930	C	4930	C
I-96	M-21 to Cascade	**5340**	**F**	3140	D	5990	C	3590	B

Source: URS Corporation, November 2004

TABLE 6
DESIGN YEAR (2030) EVENING PEAK-HOUR LEVELS OF SERVICE
BASIC FREEWAY SEGMENTS
NO-BUILD AND BUILD ALTERNATIVE COMPARISON

Freeway	Segment	2030 No Build				2030 Build Alternative			
		Eastbound		Westbound		Eastbound		Westbound	
		Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
I-196	Ionia to College	**5130**	**F**	**4900**	**F**	Weave Analysis. See Table 4			
I-196	College to Fuller	**4800**	**F**	**4630**	**F**	5180	D	5090	D
I-196	Fuller to I-96	**4090**	**E**	**4120**	**E**	4710	D	4840	D
I-96	M-44 to M-21	4960	D	**6570**	**F**	5400	B	6880	D
I-96	M-21 to Cascade	**3760**	**E**	**5480**	**F**	4360	B	6110	C

Source: URS Corporation, November 2004

Ramp Freeway Junctions

As shown in **Table 7**, some ramps cannot be analyzed by methods of the *2000 Highway Capacity Manual* because some ramps do not create merge or diverge conditions but involve adding or dropping a freeway lane or creating a weave section. The Build Alternative operates at an acceptable Level of Service during design year (2030) peak hours.

TABLE 7
DESIGN YEAR (2030) PEAK-HOUR LEVELS OF SERVICE
RAMP-FREEWAY JUNCTIONS
NO-BUILD AND BUILD ALTERNATIVE COMPARISON

Ramp Location	AM-Peak Hour		PM-Peak Hour	
	No Build	Build	No Build	Build
Eastbound On-Ramps				
Ionia Avenue On-ramp to EB I-196	**F**	Weave	**F**	Weave
College Avenue On-ramp to EB I-196	**F**	Add-lane	**F**	Add-lane
Fuller Avenue On-ramp to EB I-196	**E**	D	**F**	D
Leonard Street On-ramp to EB I-96	D	Add lane	B	Add lane
M-44 On-ramp to EB I-96	**F**	Add lane	D	Add lane
M-21 On Ramp to EB I-96	N/A	Add lane	N/A	Add lane
Westbound On-Ramps				
Ionia Avenue On-ramp to WB I-196	Add-lane	Add lane	Add-lane	Add lane
College Avenue On-ramp to WB I-196	**F**	Weave	**F**	Weave
Fuller Avenue On-ramp to WB I-196	**F**	Add lane	**F**	Add lane
SB M-44 On-ramp to WB I-96	Weave	Weave	Weave	Weave
NB M-44 On-ramp to WB I-96	D	Weave	**F**	Weave
M-21 On-ramp to WB I-96	Add-lane	Add lane	Add-lane	Add lane
Cascade Road On-ramp to WB I-96	D	Add lane	**F**	Add lane
Eastbound Off-Ramps				
EB I-196 Off-ramp to Ottawa Avenue	Drop-lane	Drop-lane	Drop-lane	Drop-lane
EB I-196 Off-ramp to College Avenue	**F**	Weave	**F**	Weave
EB I-196 Off-ramp to Fuller Avenue	**F**	Drop-lane	**F**	Drop-lane
EB I-96 Off-ramp to M-44	N/A	Drop-lane	N/A	Drop-lane
EB I-96 Off-ramp to M-44	Weave	Drop-lane	Weave	Drop-lane
EB I-96 Off-ramp to M-21	Drop-lane	Drop-lane	Drop-lane	Drop-lane
EB I-96 Off-ramp to WB Cascade Rd	**F**	Drop-lane	**E**	Drop-lane
Westbound Off-Ramps				
WB I-196 Off-ramp to Ottawa Avenue	**F**	Weave	**F**	Weave
WB I-196 Off-ramp to College Avenue	**F**	Drop-lane	**F**	Drop-lane
WB I-196 Off-ramp to Fuller Avenue	**E**	D	**F**	D
WB I-96 Off-ramp to Leonard Street	B	Weave	D	Weave
WB I-96 Off-ramp to M-44	D	C	**F**	D
WB I-96 Off-ramp to M-21	N/A	Drop-lane	N/A	Drop-lane

Add-Lane: Ramp lane creates an add-on lane and cannot be analyzed by methods of HCM.
Drop-Lane: Freeway lane is dropped at off-ramp and cannot be analyzed by methods of HCM.
Weave: Ramp is part of a weave segment. See Table 4. Source: URS Corporation, November 2004

Weaving Sections

The proposed improvements of the Build Alternative create two new weave sections—along I-196 (in each direction) between the Ottawa Avenue and College Avenue interchanges. The improvements eliminate the existing weave along eastbound I-96 between I-196 and M-44. The existing weave along westbound I-96 between M-44 and I-196 still exists in the Build Alternative, but the volumes within the weave are reduced as I-96 "through" traffic is eliminated from the weave. **Table 8** shows each weave section operates at an acceptable Level of Service under design year (2030) peak hour traffic volumes for the Build Alternative.

TABLE 8
DESIGN YEAR (2030) PEAK-HOUR LEVELS OF SERVICE
RAMP-FREEWAY JUNCTIONS
NO-BUILD AND BUILD ALTERNATIVE COMPARISON

Freeway	Section		No Build	Build
EB I-196	Ionia to College	AM	N/A	D
		PM		D
WB I-196	College to Ionia	AM	N/A	D
		PM		D
EB I-196	College to Fuller	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.		
WB I-196	Fuller to College	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.		
EB I-196	I-196 to M-44	AM	**F**	N/A
		PM	**F**	
WB I-96	M-44 to I-196	AM	**E**	C
		PM	**F**	C
EB I-96	M-44 to M-21	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.		
WB I-96	M-21 to M-44	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.		
EB I-96	M-21 to Cascade	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.		
WB I-96	Cascade to M-21	Weave length greater than HCM weave boundaries. Analyzed as freeway segment.		

Signalized Intersections

The comparison of signalized intersection capacities and levels of services shown in **Tables 9** and **10** confirm that all signalized intersections in the project area operate at an acceptable LOS under the Build Alternative. More detailed information on turning movements for existing, Build and No Build Alternatives are provided in the **I-*196/I-96 and M-37/M-44 EA Traffic Analysis* Technical Report.**

TABLE 9

DESIGN YEAR (2030) MORNING PEAK-HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS
NO-BUILD AND BUILD ALTERNATIVE COMPARISON

Signalized Intersection	No-Build		Build Alternative	
	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)
Ottawa Avenue / Michigan Street	C	34.0	C	30.7
Ionia Avenue / Michigan Street	**F**	**82.2**	D	48.0
EB I-196 / College Avenue	C	22.2	D	41.7
WB I-196 / College Avenue	**F**	**99.6**	C	20.6
EB I-196 / Fuller Avenue	**F**	**131.3**	C	28.1
WB I-196 / Fuller Avenue	**F**	**105.1**	C	26.1
EB I-96 / Leonard Street	C	29.5	C	21.3
WB I-96 / Leonard Street			D	43.8
M-44 / M-21	**F**	**164.6**	D	52.9
M-44 / Michigan Street	**F**	**168.2**	B	16.5
M-44 / EB I-96	**F**	**80.9**	D	47.0
M-44 / WB I-96	D	50.3	D	53.2
M-44 / Leonard Street	**F**	**141.6**	D	48.7
M-44 / Knapp Street	**F**	**192.5**	C	27.4

Note: Movement-by-movement LOS values are depicted on Figures 3-1a, 3-1b, 3-2a, 3-2b, 4-16a, 4-16b, 4-16c, 4-17a, 4-17b, and 4-17c.

Source: URS Corporation, November 2004

TABLE 10
DESIGN YEAR (2030) AFTERNOON PEAK-HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS
NO-BUILD AND BUILD ALTERNATIVE COMPARISON

Signalized Intersection	No Build		Build Alternative	
	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)
Ottawa Avenue / Michigan Street	C	32.9	C	30.7
Ionia Avenue / Michigan Street	**F**	**124.4**	D	48.0
EB I-196 / College Avenue	D	54.7	D	41.7
WB I-196 / College Avenue	**E**	**61.8**	C	20.6
EB I-196 / Fuller Avenue	**F**	**148.0**	C	28.1
WB I-196 / Fuller Avenue	**F**	**117.0**	C	26.1
EB I-96 / Leonard Street	B	16.4	C	21.3
WB I-96 / Leonard Street			D	43.8
M-44 / M-21	**F**	**269.3**	D	52.9
M-44 / Michigan Street	**F**	**172.9**	B	16.5
M-44 / EB I-96	**F**	**212.0**	D	47.0
M-44 / WB I-96	**F**	**181.1**	D	53.2
M-44 / Leonard Street	**F**	**257.9**	D	48.7
M-44 / Knapp Street	**F**	**95.5**	C	27.4

Note: Movement-by-movement LOS values are depicted on Figures 3-1a, 3-1b, 3-2a, 3-2b, 4-16a, 4-16b, 4-16c, 4-17a, 4-17b, and 4-17c.

Source: URS Corporation, November 2004

Signalized Intersections-Base Year

The existing (2004) peak-hour Levels of Service for the signalized intersections within the project limits are depicted in **Table 4**. Movement-by-movement Levels of Service are shown in the *I-196/I-96/M-44 Technical Report*. Capacity analysis worksheets for all existing (2004) signalized intersection analyses are available on request.

TABLE 4
EXISTING (2004) PEAK-HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS

Signalized Intersection	AM-Peak Hour		PM-Peak Hour	
	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)
Ottawa Avenue / Michigan Street	C	23.9	C	34.1
Ionia Avenue / Michigan Street	**E**	**62.9**	**F**	**82.2**
EB I-196 / College Avenue	B	18.8	C	30.5
WB I-196 / College Avenue	D	48.9	C	30.5
EB I-196 / Fuller Avenue	C	29.1	**F**	**83.2**
WB I-196 / Fuller Avenue	D	51.2	D	53.4
EB I-96 / Leonard Street	B	16.9	B	12.9
M-44 / M-21	**E**	**61.3**	**E**	**60.1**
M-44 / Michigan Street	D	40.9	C	26.3
M-44 / EB I-96	C	23.7	**E**	**62.5**
M-44 / WB I-96	B	18.1	D	41.9
M-44 / Leonard Street	D	40.4	**E**	**71.3**
M-44 / Knapp Street	**E**	**77.6**	D	41.0

Source: URS Corporation, November 2004

As shown in **Table 4** on the previous page, six of the thirteen signalized intersections in the study area operate at an unacceptable Level of Service during at least one of the two existing (2004) peak hours.

It should be noted that the Levels of Service depicted at the College Avenue and Fuller Avenue interchanges are worse than shown in **Table 4**. The *Highway Capacity Software* is limited in its ability to analyze congestion, and *the results do not account for the fact that the left-turn movements entering the freeway at those locations back up into the adjacent intersection.*

Each of the M-44 signals which simultaneously stop northbound and southbound traffic (M-21, EB I-96 off-ramp, Leonard Street, and Knapp Street) operate at Level of Service "E" of "F", indicating the need for additional capacity along East Beltline Avenue.

APPENDIX B

TRAFFIC CRASH ANALYSIS

TRAFFIC CRASH ANALYSIS

Crash statistics were provided by MDOT for the most recent five-year span (1999-2003). Crash data was provided for freeway segments, ramps, and ramp terminals on I-196 and I-96 and the boulevard segment of M-44/M-37.

I-196 and I-96

Freeway Segment Crash Analysis

A crash analysis was completed for each freeway segment along I-196 and I-96 in the study area. The total number of crashes by freeway segment, a breakdown of crashes by type, and an overall crash rate for each freeway segment is depicted in Table B-1.

As shown in Table B-1, 1,525 crashes occurred within the study area freeways from 1999 to 2003. A total of 327 (21%) of these crashes resulted in injuries. There were three reported fatalities during the five-year period. A double fatality occurred on westbound I-196 between Ottawa Avenue and US-131—a rear-end crash which occurred at dusk just east of the I-196 westbound on-ramp from Ionia Avenue. One fatality involved a pedestrian and occurred on eastbound I-196 between US-131 and Ottawa Avenue. The pedestrian fatality occurred at night in the vicinity of the diverge point of the I-196 eastbound off-ramp to Ottawa Avenue.

Freeway segments that experienced higher than average crash rates as compared to statewide averages are shaded in Table B-1. Three segments on I-196 and one segment on I-96 experience higher than average crash rates compared to other similar facilities in the state from 1999-2003. These segments are on I-196 between Ottawa Avenue and College Avenue (both eastbound and westbound segments), westbound I-196 between College Avenue and Fuller Avenue, and eastbound I-96 between Leonard Street and I-196.

The higher-than-average crash rate on I-196 between Ottawa Avenue and College Avenue are partly attributed to the heavy traffic volumes on the segment and peak-hour traffic congestion. Both eastbound and westbound at this segment had a high level of Rear-End crashes – 65% eastbound and 81% westbound. High levels of rear-end crashes are common on congested freeways. Also, the 4% uphill grade on eastbound I-196 on this segment reduces travel speed and capacity, particularly for large trucks, which creates rear-end crashes.

The higher-than-average rate on westbound I-196 between College Avenue and Fuller Avenue are partly attributed to the heavy traffic volumes associated with peak-hour traffic congestion. The segment had a very high level of rear-end crashes (87%). High levels of rear-end crashes are common on congested freeways.

The higher-than-average crash rate on eastbound I-96 between Leonard Street and I-196 can be attributed to the curvature of this segment, the high number of lane changes associated with the subsequent merge with I-196, and the weave movement needed to exit at M-44.

TABLE B-1
CRASH ANALYSIS SUMMARY (1999-2003)
I-196 AND I-96 FREEWAY SEGMENTS

Freeway	Section		Type of Crash						Crash Rate*
			Total	Rear--End	Side-Swipe	Fixed Object	Angle	Other	
I-196 (1)	US-131 to Ottawa Avenue	EB	118	75	19	14	2	8	364
		WB	70	38	10	10	0	12	181
I-196 2-Lane	Ottawa Avenue to College Avenue	EB	153	100	22	18	1	12	**262**
		WB	141	114	8	6	0	13	**297**
I-196 2-Lane	College Avenue to Fuller Avenue	EB	79	54	9	4	0	12	132
		WB	212	185	10	3	0	14	**311**
I-196 2-Lane	Fuller Avenue to I-96	EB	138	67	23	22	5	21	117
		WB	133	53	14	36	4	26	113
I-96 2-Lane	Leonard Street to I-196	EB	45	6	4	13	0	22	**221**
		WB	32	4	6	4	2	16	181
I-96 (1)	I-196 to M-44	EB	126	58	22	17	3	26	293
		WB	106	34	23	15	8	26	218
I-96 3-Lane	M-44 to M-21	EB	97	29	14	17	6	31	175
		WB	75	14	22	11	1	27	130
TOTALS:			1525	831	206	190	32	266	
Percent:			100%	55%	14%	12%	2%	17%	

* - Per 100 million vehicle miles traveled

Notes: 1. The statewide average crash rate is 206 crashes per 100 million VMT for 4-lane divided, limited-access urban highways.
2. The statewide average crash rate is 438 crashes per 100 million VMT for 6-lane divided, limited-access urban highways.

(1) 4-Lane Eastbound, 3-Lane Westbound

Source: Michigan Department of Transportation, November 2004

Freeway Crash Countermeasures

Various countermeasures are incorporated into the Build Alternative which will decrease the potential for traffic crashes for the high-crash segments listed in TableB-1 and for the entire study area. These countermeasures include: Construction of additional freeway capacity to minimize congestion and unexpected traffic back-ups; construction of weave-merge lanes between Ottawa Avenue and College Avenue and between College Avenue and Fuller Avenue to increase ramp-freeway merge capacity; and construction of collector-distributor roads on I-96 between I-196 and M-44 to eliminate weave movements.

Additional countermeasures which could be erected prior to full build-out include: Construction of a "choice" lane at the eastbound I-96 exit to M-44, providing the outside through lane the choice of staying on I-96 or exiting at M-44. A choice lane would reduce the number of lane changes required by an eastbound I-96 motorist who desires to exit at M-44. Only one lane change would be required if a "choice" lane were constructed, whereas this maneuver currently requires a two-lane change.

Erection of a permanent variable message sign on westbound I-196 at Plymouth Avenue warning of traffic backups ahead at Fuller Avenue or College Avenue. Static signing on eastbound I-196 warning motorists of SLOW TRUCKS climbing the hill between Ottawa Avenue and College Avenue.

Ramp Crash Analysis

A crash analysis was completed for each ramp along I-196 and I-96 in the study area. The total number of crashes by ramp and a breakdown of crashes by type are depicted in Table B-2.

As shown in Table B-2, 109 crashes occurred on study area ramps from 1999 to 2003. A total of 28 (26%) of these crashes resulted in injuries. There were two reported fatalities on study area ramps in the five-year period. One fatality involved a one-vehicle rollover crash on the westbound I-96 loop exit ramp to Leonard Street. The other fatality involved a one-vehicle rollover crash on the eastbound I-96 off ramp at the merge point with eastbound M-21.

The majority of ramps (14 of 23 ramps) averaged less than one crash per year. MDOT does not compute crash rates for freeway ramps. Total crashes over the five-year period ranged from zero crashes at three ramps to 12 crashes at both the I-196 westbound Ionia Avenue on-ramp and the I-96 eastbound M-21 off-ramp.

TABLE B-2
CRASH ANAYLSIS SUMMARY (1999-2003)
I-196 AND I-96 RAMPS

Interchange	Ramp Type	Total	Rear-End	Side-swipe	Fixed Object	Angle	Other	Crashes per Year
Ottawa Avenue/ I-196	EB Off - Slip	2	2	0	0	0	0	0.4
	WB Off - Loop	10	2	1	2	2	3	2.0
Ionia Avenue/ I-196	EB On - Loop	0	0	0	0	0	0	0.0
	WB On - Slip	12	0	1	6	2	3	2.4
College Avenue/ I-196	EB Off - Slip	2	1	0	0	0	1	0.4
	EB On - Slip	4	3	0	0	0	1	0.8
	WB Off - Slip	2	0	0	0	0	2	0.4
	WB On - Slip	0	0	0	0	0	0	0.0
Fuller Avenue/ I-196	EB Off - Slip	1	1	0	0	0	0	0.2
	EB On - Slip	3	1	0	1	1	0	0.6
	WB Off - Slip	2	0	0	1	0	1	0.4
	WB On - Slip	0	0	0	0	0	0	0.0
Leonard Street/ I-96	EB Off - Slip	2	2	0	0	0	0	0.4
	EB On - Slip	1	0	0	0	1	0	0.2
	WB Off - Loop	10	0	0	3	0	7	2.0
	WB On - Slip	9	0	2	2	0	5	1.8
M-44/I-96	EB Off - Slip	9	4	0	2	0	3	1.8
	EB On - Loop	3	1	0	0	1	1	0.6
	WB Off - Slip	4	2	0	1	0	1	0.8
	SB>WB On - Slip	3	1	0	1	0	1	0.6
	NB>WB On - Loop	8	3	1	2	0	2	1.6
M-21/I-96	EB Off - Slip	12	1	0	5	0	6	2.4
	WB On - Slip	10	2	0	1	0	7	2.0
TOTALS:		109	26	5	27	7	44	
Percent:		100%	24%	5%	25%	6%	40%	

* - Per 100 million vehicle miles traveled Source: Michigan Department of Transportation, November 2004

Ramp Crash Countermeasures

Various countermeasures are incorporated into the Build Alternative which will decrease the potential for traffic crashes on the freeway ramps in the study area. These countermeasures include: Increased storage for off-ramp approaches; Lengthening of acceleration and deceleration lanes where possible; and Improved signage and attenuation for all ramp movements which require a significant decrease in speed in order to navigate the ramp (westbound I-196 at Ottawa Avenue and westbound I-96 at Leonard Street).

Ramp Terminal Crash Analysis

A crash analysis was completed for each ramp terminal intersection at the I-96 and I-196 interchanges within the study area. The total number of crashes per intersection by year, the average number of crashes per intersection, and the crash rate for each intersection is depicted in Table B-3.

As shown in Table B-3, the Ottawa Avenue/Michigan Street intersection has by far the highest crash rate (4.84 crashes per MEV), more than double the next highest rate. This ramp terminal has an unusual design with two off ramps and one local street merging only 300 feet before the signal with a resultant five-lane southbound approach at the intersection. Turn restrictions are posted for some movements at the intersection: "No Left Turn" for eastbound off-ramp traffic and "No Right Turn" for westbound off-ramp traffic. A total of 150 of the 272 crashes (55%) are on the southbound approach to the intersection. A review of crash types indicates that primarily two types of crashes occur on the southbound leg: angle crashes (41% of total) and side-swipe crashes (39%). These types of crashes are common at intersections like the Ottawa Avenue/Michigan Street intersection, where a high number of merges and lane changes occur.

While no average intersection crash rate statistics are compiled in West Michigan, the intersection crash rates were compared to average rates compiled by the Southeast Michigan Council of Governments (SEMCOG)—the local Metropolitan Planning Organization overseeing transportation decisions in the seven counties comprising the Detroit metropolitan area.

SEMCOG computes an average crash rate of 1.4 crashes per million-entering vehicles (MEV) at urban signalized intersections with an ADT of 20,000 to 30,000 vehicles per day, and an average crash rate of 1.2 crashes per MEV for signalized intersections with an ADT of greater than 30,000 vehicles per day. The average crash rate for unsignalized intersections with an ADT of 20,000 to 30,000 vehicles per day is 0.5 crashes per MEV. Assuming these average crash rates apply to West Michigan, Table B-3 reveals that six of the eight signalized ramp terminal intersections exceed the average rate and each of the unsignalized ramp terminal intersections exceed the average rate.

TABLE B-3
CRASH ANAYLSIS SUMMARY (1999-2003)
RAMP TERMINAL INTERSECTIONS

Intersection	Traffic Control	Number of Crashes							Crash Rate (per MEV*)
		1999	2000	2001	2002	2003	Total	Average (crashes/yr)	
Ottawa Ave / Michigan St	Signal	48	66	54	58	46	272	54.4	**4.84**
Ionia Ave / Michigan St	Signal	37	42	29	25	18	151	24.2	**2.49**
EB I-196 / College Ave	Signal	12	7	10	22	3	54	10.8	1.16
WB I-196 / College Ave	Signal	12	10	12	15	16	65	13.0	**1.54**
EB I-196 / Fuller Ave	Signal	28	21	27	18	9	103	20.6	**1.78**
WB I-196 / Fuller Ave	Signal	10	6	9	12	1	38	7.6	0.62
EB I-96 / Leonard St	Stop Sign (1)	6	9	3	5	n/a	23	5.8	**0.73**
WB I-96 / Leonard St	Stop Sign	4	3	3	7	12	29	5.8	**0.66**
EB I-96 / M-44	Signal	25	36	20	36	26	143	28.6	**1.51**
WB I-96 / M-44	Signal	19	13	17	21	19	89	17.8	**1.97**

* MEV = million entering vehicles Source: Michigan Department of Transportation, November 2004
(1) Unsignalized intersection from 1999 through 2002. This ramp terminal became signalized in 2003 and experienced 10 crashes that year.

Ramp Terminal Intersection Countermeasures

Various countermeasures are incorporated into the Build Alternative which will decrease the potential for traffic crashes at ramp-terminal intersections in the study area. These countermeasures include: Increased storage for off-ramp and surface street turn bays; Optimized traffic signal timing, including incorporation of all-red clearance phases; Turn prohibitions for turn movements with limited sight distance, and Improved lane definition through pavement markings.

East Beltline

Crash data for the East Beltline was also analyzed from approximately 300 feet south of M-21 to 300 feet north of Knapp Street. During the period from 1999 to 2003 there were 1,119 crashes resulting in 371 injuries and two fatalities (see Table B-4). Both fatalities occurred in 1999 just south of the Knapp Street intersection.

The segment from I-96 south to south of M-21 displayed a much higher crash rate than the statewide average for the same type of roadway, as shaded on Table B-4. This higher-than-average crash rate is also most likely due to heavy traffic volumes on the segment and peak hour congestion. The majority of crashes were rear-end crashes (65%), which is a common indicator of heavy congestion.

TABLE B-4
CRASH ANAYLSIS SUMMARY (1999-2003)
M-37 / M-44

	Total	**Rear--End**	**Side-Swipe**	**Fixed Object**	**Angle**	**Other**	
S of M-21 to I-96	412	286	29	12	35	50	**743**
I-96 to N of Knapp	707	445	56	19	106	81	428
TOTAL	1119	731	85	31	141	131	
Percent	100%	65%	7%	3%	13%	12%	

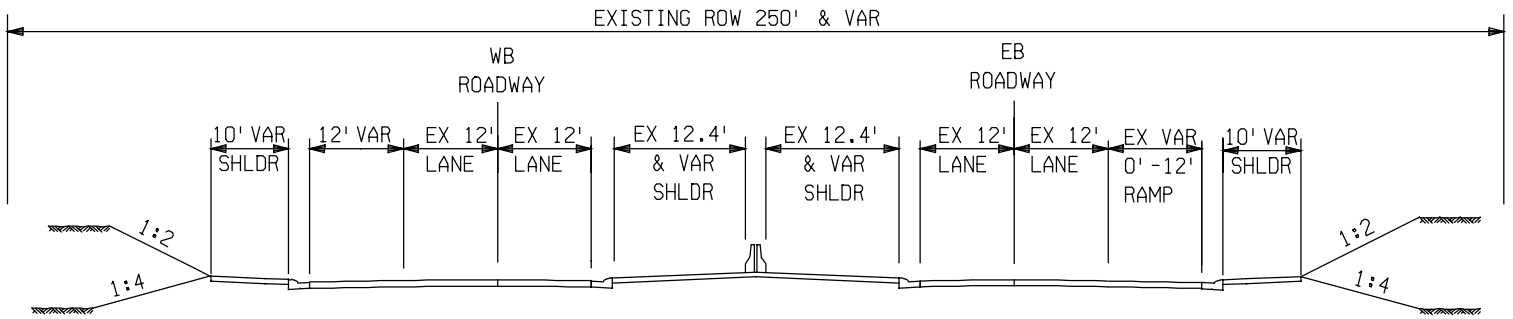
* - Per 100 million vehicle miles traveled

Notes: 1. The statewide average crash rate is 206 crashes per 100 million VMT for 4-lane divided, limited-access urban highways. 2. The statewide average crash rate is 438 crashes per 100 million VMT for 6-lane divided, limited-access urban highways. 3. The statewide average crash rate is 450 crashes per 100 million VMT for 4-lane divided urban free-access trunkline. (1) 4-Lane Eastbound, 3-Lane Westbound Source: Michigan Department of Transportation, November 2004

M-37/M-44 Crash Countermeasures

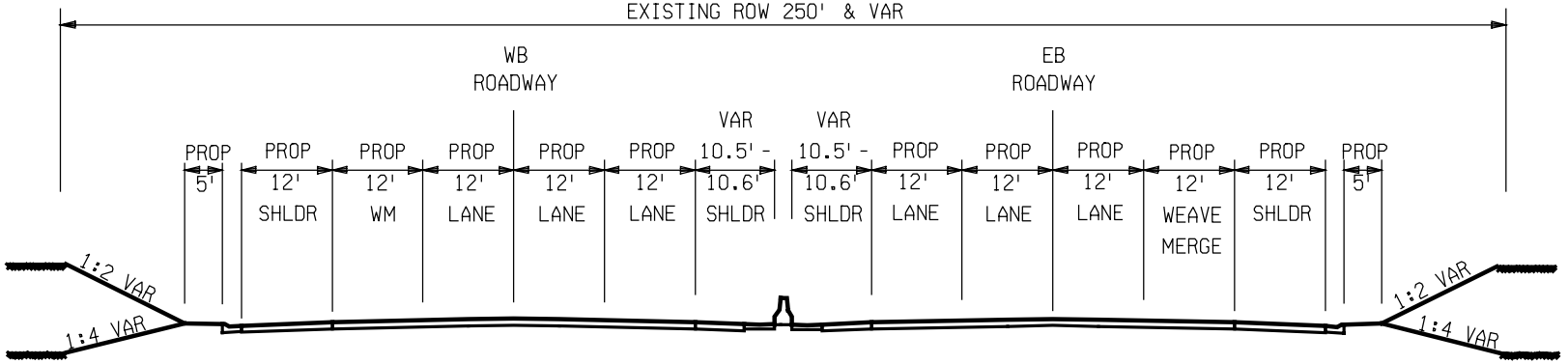
There are several countermeasures incorporated into the Build Alternative which should help to reduce congestion and increase traffic flow on M-37/M-44 (East Beltline). These countermeasures include:

1. Construction of additional (third) through lane to help reduce congestion.
2. Construction of additional left turn lane at select crossover locations.
3. Construction of right turn lanes at select driveway and cross-street locations.



EXISTING I-196 URBAN TYPICAL

US-131 TO FULLER AVE



PROPOSED I-196 URBAN TYPICAL

US-131 TO FULLER AVE

MDOT
Michigan Department of Transportation

STATE PROJ. NO. 48564
FEDERAL NO.

MICHIGAN DEPARTMENT OF TRANSPORTATION / I-196 / I-96
ENVIRONMENTAL ASSESSMENT

PREFERRED ALTERNATIVE
E BD & W BD I-196 URBAN TYPICAL

EXHIBIT C-9

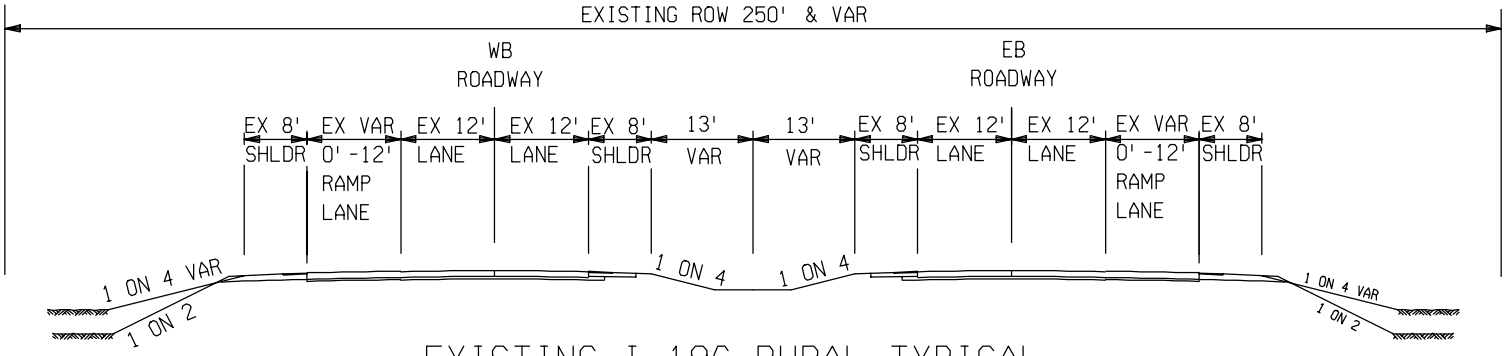
MDOT
Michigan Department of Transportation

STATE PROJ. NO. 48564
FEDERAL NO.

MICHIGAN DEPARTMENT OF TRANSPORTATION / I-196 / I-96
ENVIRONMENTAL ASSESSMENT

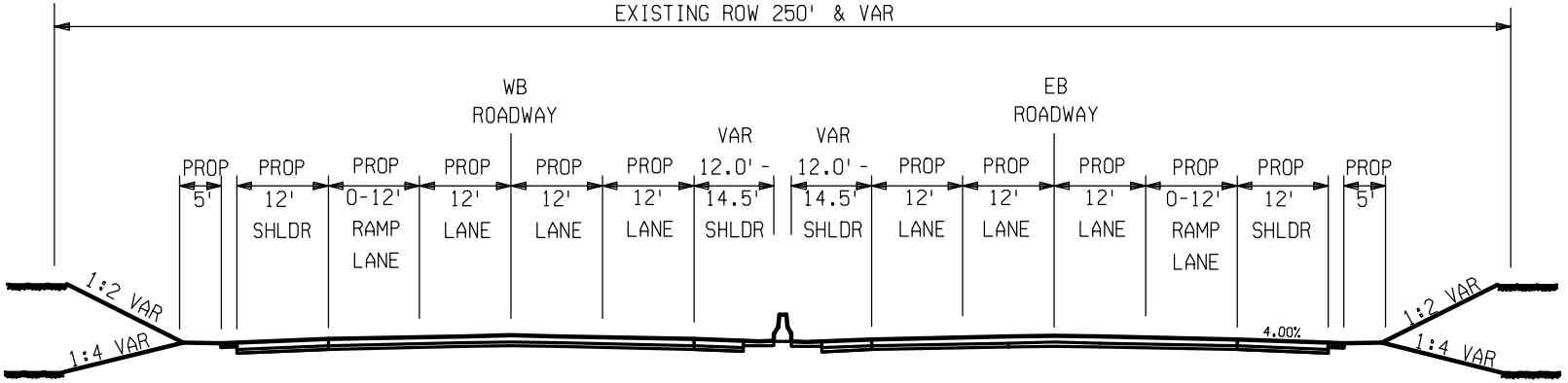
PREFERRED ALTERNATIVE
E BD & W BD I-196 RURAL TYPICAL

EXHIBIT C-10



EXISTING I-196 RURAL TYPICAL

FULLER AVE TO I-96



PROPOSED I-196 RURAL TYPICAL

FULLER AVE TO I-96

MDOT
Michigan Department of Transportation

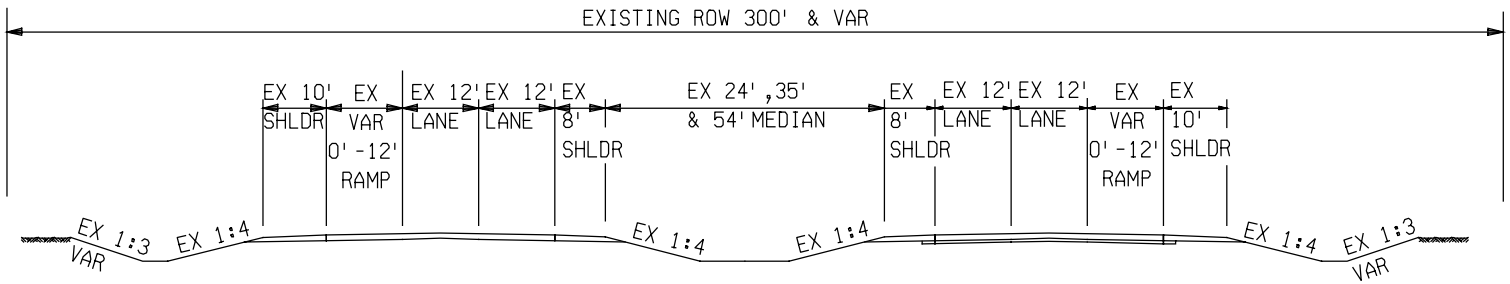
STATE PROJ. NO. 48564

FEDERAL NO.

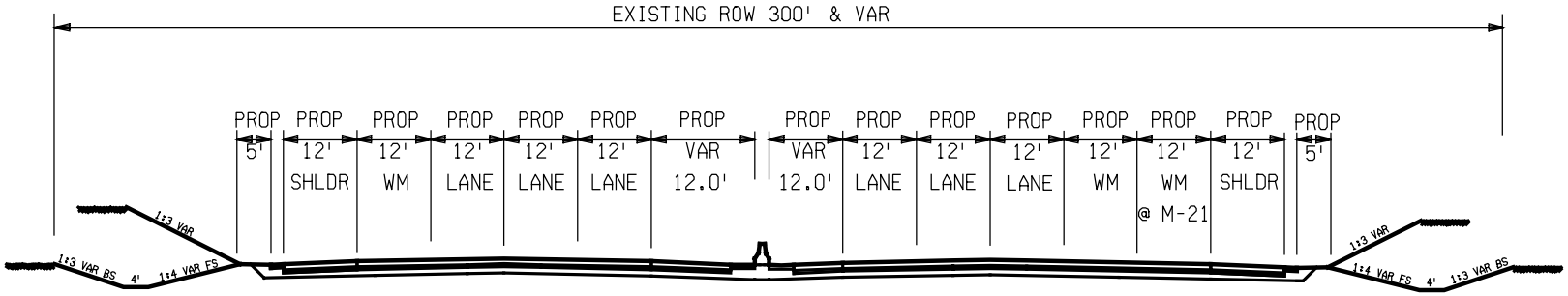
MICHIGAN DEPARTMENT OF TRANSPORTATION / I-196 / I-96
ENVIRONMENTAL ASSESSMENT

PREFERRED ALTERNATIVE
E BD & W BD I-96 TYPICAL

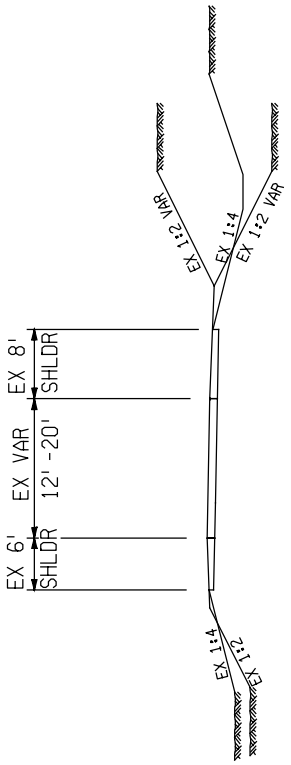
EXHIBIT C-11



EXISTING I-96 TYPICAL

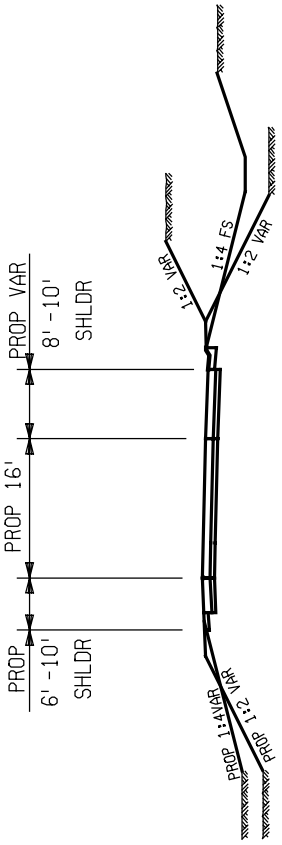


PROPOSED I-96 TYPICAL



EXISTING RAMP TYPICAL

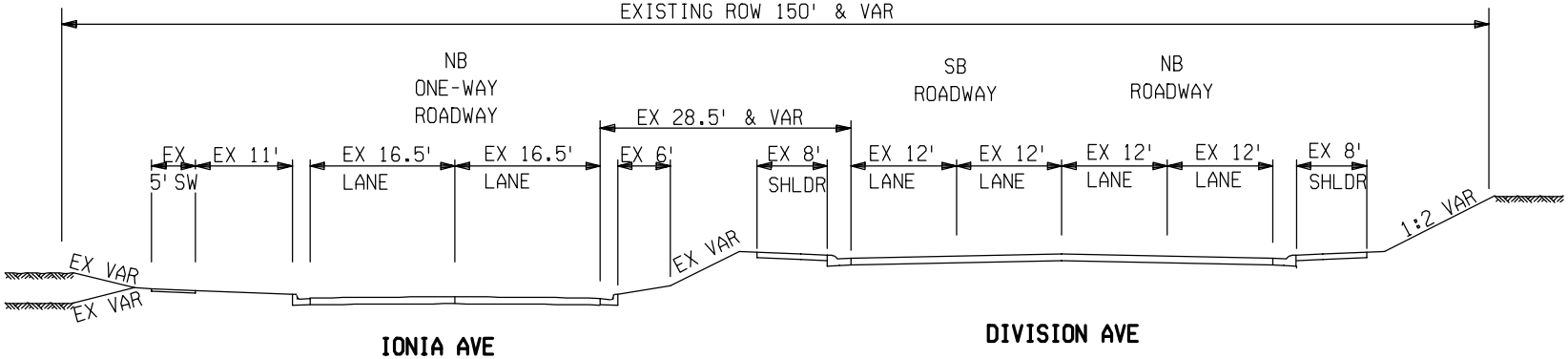
ALL RAMPS LOOKING UP STATION



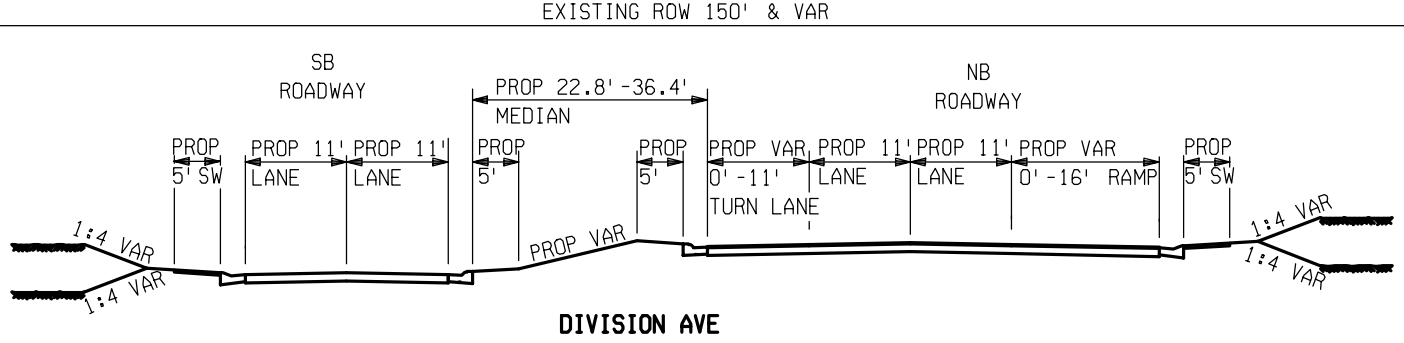
PROPOSED RAMP TYPICAL

ALL RAMPS LOOKING UP STATION

MDOT Michigan Department of Transportation	STATE PROJ. NO. 48564	MICHIGAN DEPARTMENT OF TRANSPORTATION / I-196 / I-96 ENVIRONMENTAL ASSESSMENT	
	FEDERAL NO.	**PREFERRED ALTERNATIVE RAMP TYPICAL**	EXHIBIT C-12



EXISTING IONIA AND DIVISION AVENUE TYPICAL



PROPOSED IONIA AND DIVISION AVENUE TYPICAL

EXISTING ROADWAYS WILL BE CONVERTED TO A SINGLE BOULEVARD SECTION

MDOT
Michigan Department of Transportation

STATE PROJ. NO. 48564
FEDERAL NO.

MICHIGAN DEPARTMENT OF TRANSPORTATION / I-196 / I-96
ENVIRONMENTAL ASSESSMENT

PREFERRED ALTERNATIVE
IONIA & DIVISION AVENUE TYPICAL

EXHIBIT C-13

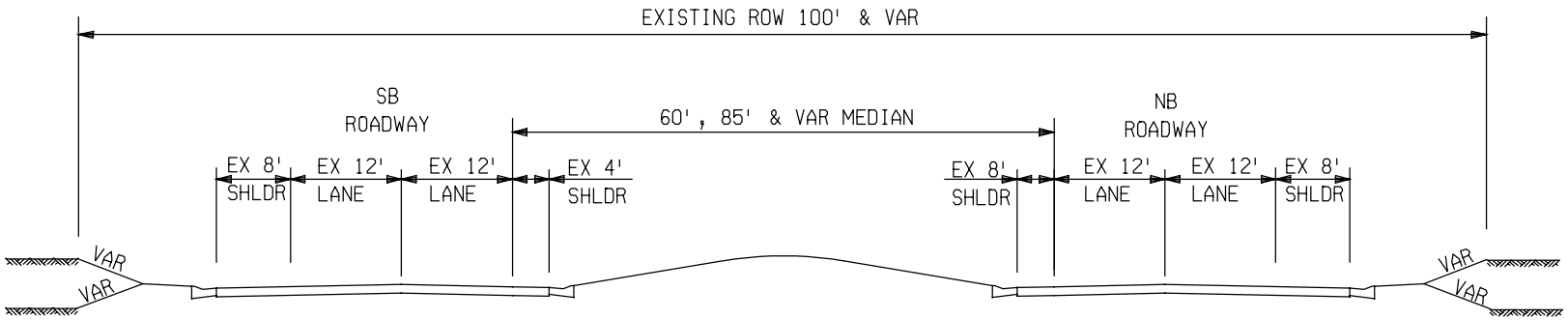
MDOT
Michigan Department of Transportation

STATE PROJ. NO. 48564
FEDERAL NO.

MICHIGAN DEPARTMENT OF TRANSPORTATION / I-196 / I-96
ENVIRONMENTAL ASSESSMENT

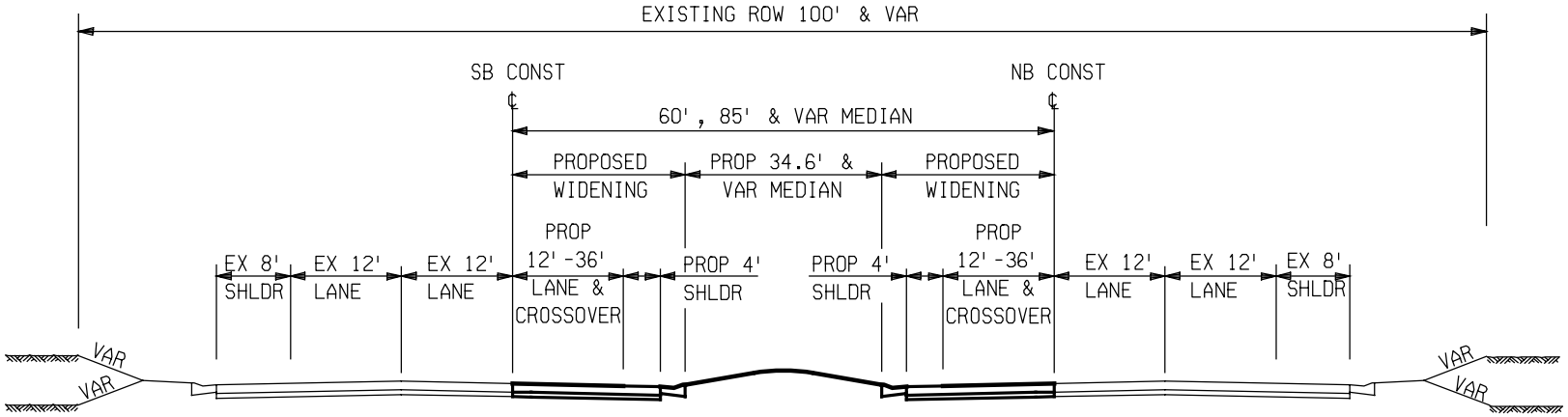
PREFERRED ALTERNATIVE
BELTLINE TYPICAL

EXHIBIT C-14



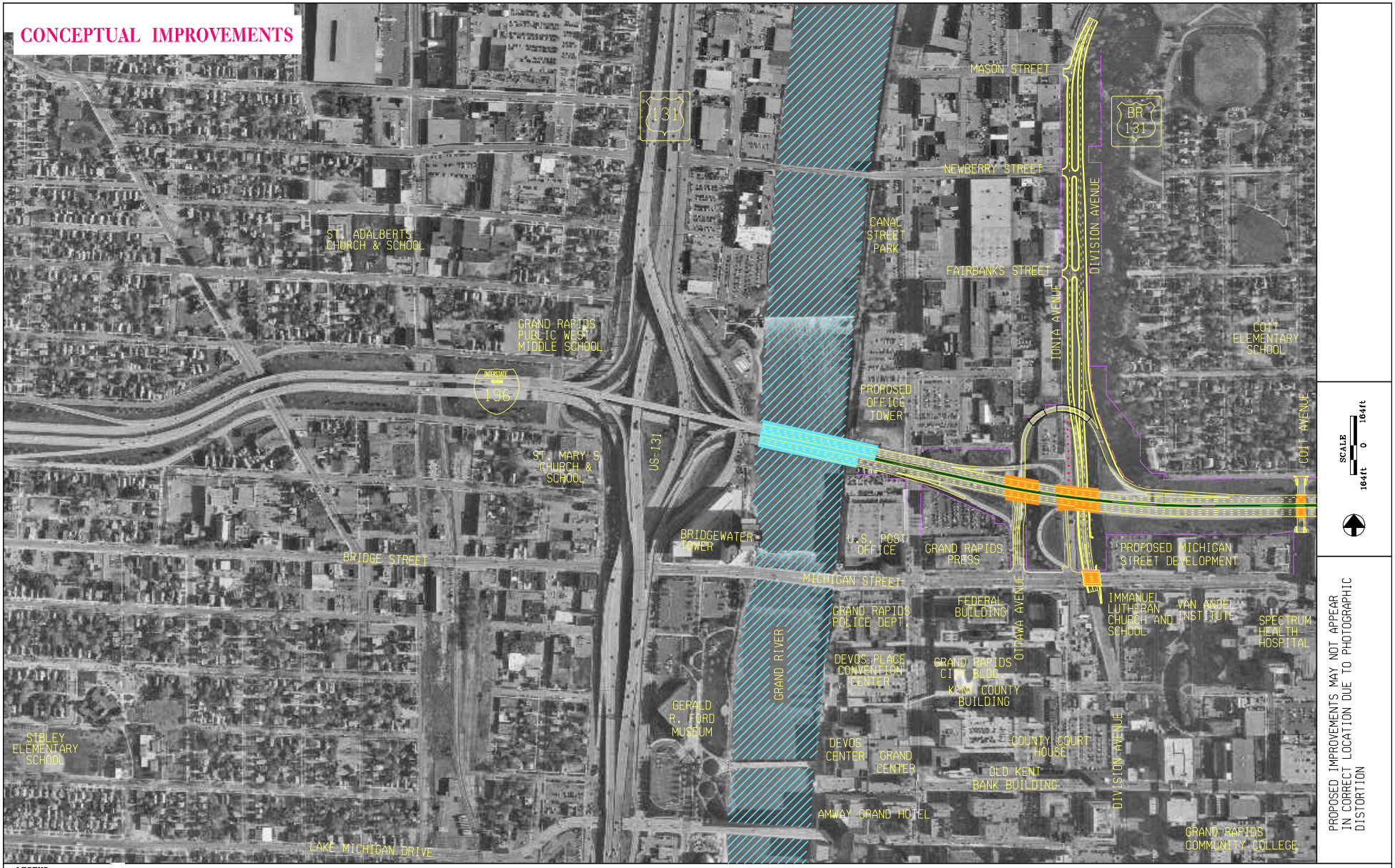
EXISTING BELTLINE TYPICAL

M-21 TO KNAPP STREET



PROPOSED BELTLINE TYPICAL

M-21 TO KNAPP STREET



MDOT
Michigan Department of Transportation

Figure C–1

I–196 / US–131 / Ionia–Division Boulevard

Figure C–2

I–196 / College / Fuller Avenues

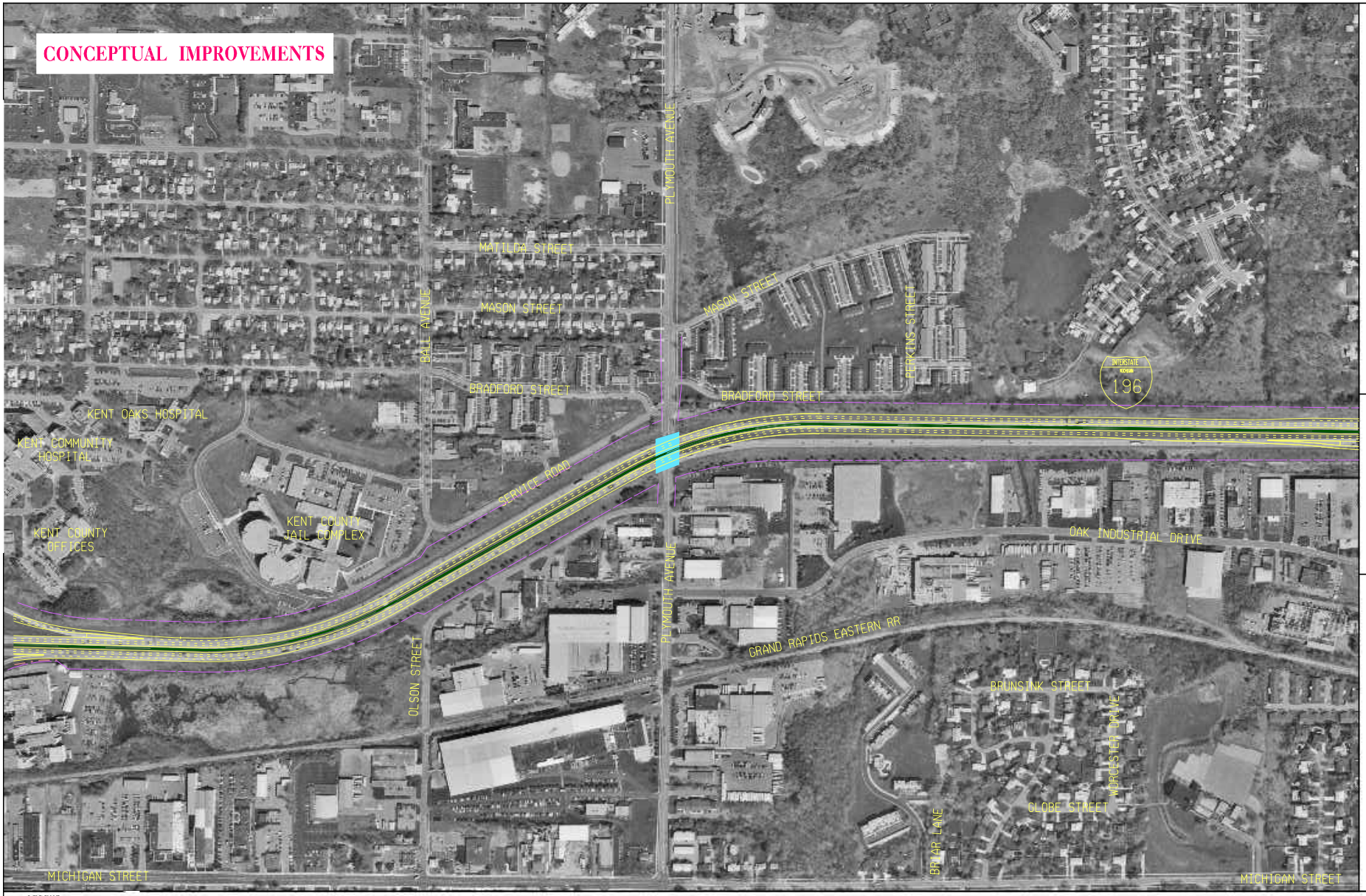


Figure C–3
I–196 / Plymouth Avenue

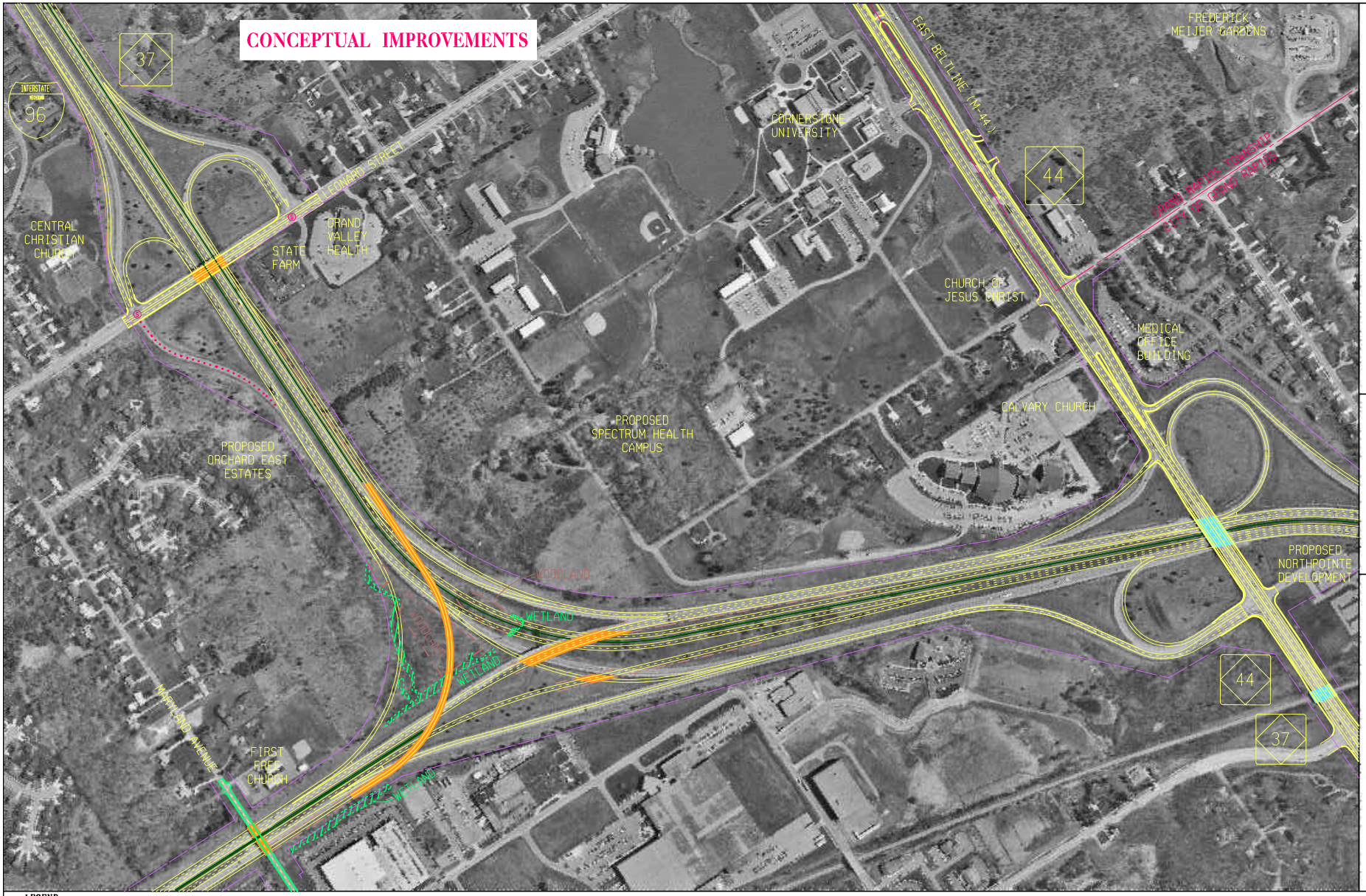


Figure C–4

I–196 / I–96/ Leonard Street / East Beltline

Figure C–5
I–96 / M–21 (Fulton Street)

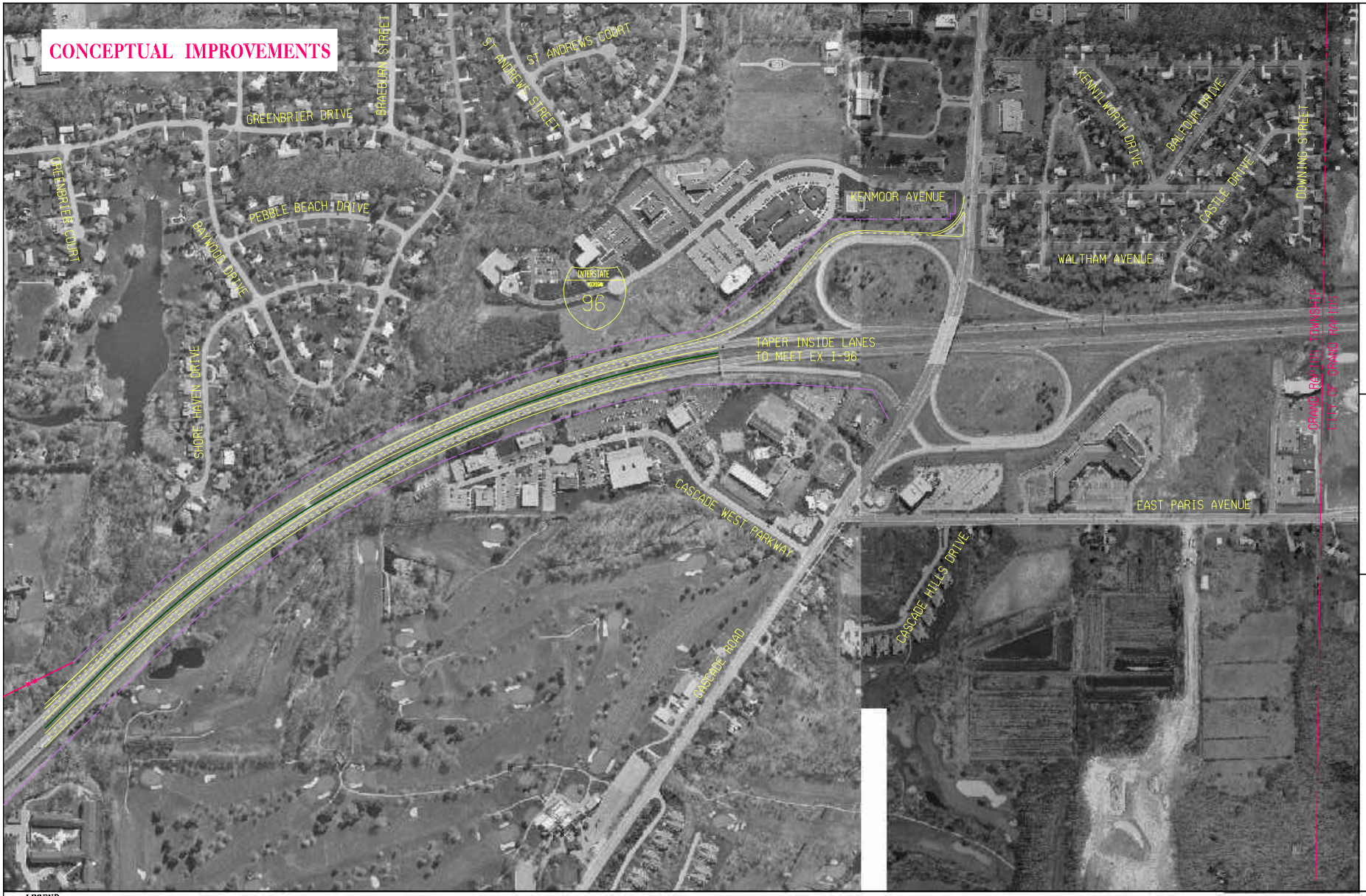


Figure C–6
I–96 / Cascade Road

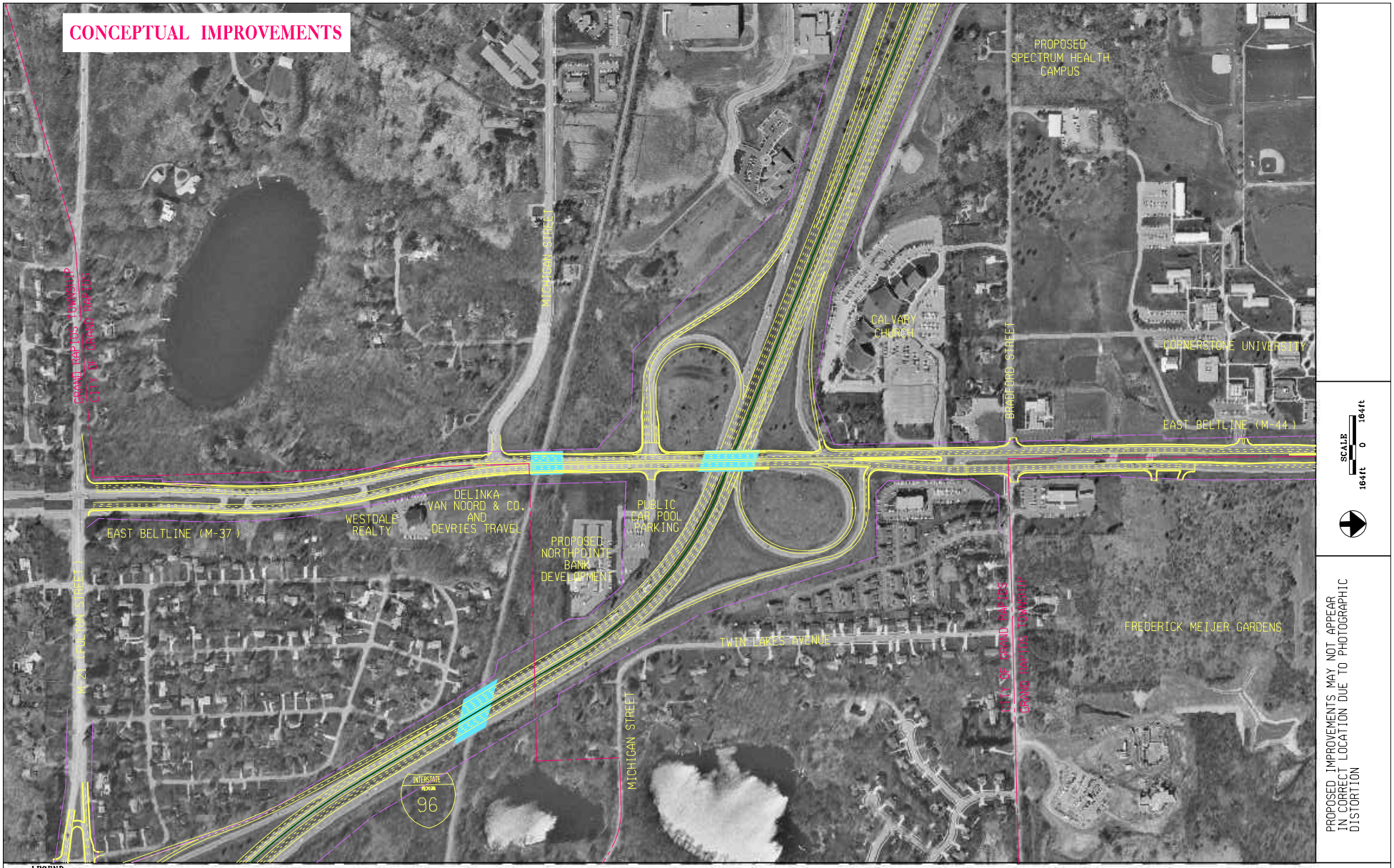


Figure C–7

M–37 / M–44 (East Beltline) / M–21 (Fulton Street) / I–96

Figure C–8
M–44 (East Beltline)

APPENDIX D

CONCEPTUAL STAGE RELOCATION PLAN

Michigan Department of Transportation
Real Estate Division
Conceptual Stage Relocation Plan
I-196 Corridor
Control Section: 41027, Job Number: 48564-0

October 12, 2005

GENERAL AREA AND PROJECT INFORMATION

The proposed project consists of three segments: I-196 from US-131 to I-96; I-96 from east of Leonard Street to east of Cascade Road; and M-37/M-44 (East Beltline) through the Knapp Street Intersection, with all three segments located in the City of Grand Rapids or the Grand Rapids Township, Kent County, Michigan. The purpose of the project is to widen I-196 from two lanes to three lanes and to adjust the bridges over the freeway to accommodate the widening.

DISPLACEMENTS

No Build Alternative: 0 Displacements
Construct Alternative: 1 Residential Displacement

DISPLACEMENT EFFECTS AND ANALYSIS:

Property acquired for this project will be purchased in segments or phases, providing for the efficient and complete relocation of all eligible displaced residents, businesses and nonprofit organizations impacted by the project. Completing the project in phases will allow an adequate period of time for the relocation process and ensure the availability of a sufficient number or replacement properties in the local area for all eligible displacees.

Residential: The project may cause the displacement of approximately 1 residential unit. A study of the housing market in the project area indicates a sufficient number of replacement homes and rentals will be available throughout the relocation process. It is anticipated that the local residential real estate market will have the capacity to absorb the residential displacements impacted by this project.

ASSURANCES:

The acquiring agency will offer assistance to all eligible residents, businesses, farms, and nonprofit organizations impacted by the project, including persons acquiring special services and assistance. The agency's relocation program will provide such services in accordance with Act 31, Michigan P.A. 1970; Act 227, Michigan P.A. 1972; Act 87, Michigan P.A. 1980 as amended, and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. The acquiring agency's relocation program is realistic and will provide for the orderly, timely, and efficient relocation of all eligible displaced persons in compliance with state and federal guidelines.

APPENDIX E

EARLY COORDINATION LETTERS

JENNIFER GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF HISTORY, ARTS AND LIBRARIES
LANSING

DR. WILLIAM ANDERSON
DIRECTOR

December 17, 2004

ABDELMOEZ ABDALLA
FEDERAL HIGHWAY ADMINISTRATION
315 W ALLEGAN STREET
ROOM 207
LANSING MI 48933

RE: ER05-111 I-196 / I-96 Corridor, Grand Rapids, Kent County (FHWA)

Dear Mr. Abdalla:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed and accept the Environmental Assessment (EA) for the above-cited undertaking at the location noted above.

In addition we have reviewed the report, *Reconnaissance and Intensive Level Survey of Above-Ground Resources,* prepared by Sigrid Bergland, and we concur with the conclusions of the report that the properties at 523 and 529 College, NE, appear national register-eligible as contributing resources within a national register-eligible neighborhood area preliminarily named the Belknap-Lookout Historic District that was defined in the course of survey work in the 1980s. Inspections by SHPO staff in recent years have confirmed the conclusion that this area still meets the national register criteria.

We also concur with the report's conclusion that the former Ionia Avenue Mission Hall at 737 Ionia, NW, appears to meet the national register criteria.

No other buildings and structures, including the portions of I-96 and I-196 and any engineering features related to them, within the project area appear eligible for the national register.

We have also reviewed the report, *Phase I Archaeological Survey of 3840 Fulton St., SE, Grand Rapids,* prepared by David Ruggles, and we concur with its conclusions that site #20KT298 does not appear to meet the criteria for listing in the National Register of Historic Places.

The State Historic Preservation Office (SHPO) is not the office of record for this **undertaking**. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking. If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

If you have any questions, please contact Martha MacFarlane Faes, Environmental Review Coordinator, at (517) 335-2721 or by email at ER@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Martha MacFarlane Faes
Environmental Review Coordinator

for Brian D. Conway
State Historic Preservation Officer

MMF:DLA:ROC:bgg

copy: Sigrid Bergland, MDOT
David Ruggles, MDOT

STATE OF MICHIGAN
JENNIFER GRANHOLM
GOVERNOR

DEPARTMENT OF HISTORY, ARTS AND LIBRARIES
LANSING

DR. WILLIAM ANDERSON
DIRECTOR

March 11, 2005

ABDELMOEZ ABDALLA
FEDERAL HIGHWAY ADMINISTRATION
315 W ALLEGAN STREET
ROOM 207
LANSING MI 48933

RE: ER05-111 I-196 / I-96 Corridor, Grand Rapids, Kent County (FHWA)

Dear Mr. Abdalla:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that the effects of the proposed undertaking do not meet the criteria of adverse effect [36 CFR § 800.5(a)(1)]. Therefore, the project will have **no adverse effect** [36 CFR § 800.5(b)] on the Ionia Avenue Mission Hall and on the potential Belknap-Lookout Historic District, which appear to meet the criteria for listing in the National Register of Historic Places.

The views of the public are essential to informed decision making in the Section 106 process. Federal Agency Officials or their delegated authorities must plan to involve the public in a manner that reflects the nature and complexity of the undertaking, its effects on historic properties and other provisions per 36 CFR § 800.2(d). We remind you that Federal Agency Officials or their delegated authorities are required to consult with the appropriate Indian tribe and/or Tribal Historic Preservation Officer (THPO) when the undertaking may occur on or affect any historic properties on tribal lands. **In all cases**, whether the project occurs on tribal lands or not, Federal Agency Officials or their delegated authorities are also required to make a reasonable and good faith effort to identify any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the area of potential effects and invite them to be consulting parties per 36 CFR § 800.2(c).

This letter evidences the FHWA's compliance with 36 CFR § 800.4 "Identification of historic properties" and 36 CFR § 800.5 "Assessment of adverse effects", and the fulfillment of the FHWA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.5(c) "Consulting party review".

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking. If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

If you have any questions, please contact Martha MacFarlane Faes, Environmental Review Coordinator, at (517) 335-2721 or by email at ER@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Brian D. Conway
State Historic Preservation Officer

BDC:ROC:bgg

copy: Sigrid Bergland, MDOT

STATE OF MICHIGAN
JENNIFER M. GRANHOLM
GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LANSING

REBECCA A. HUMPHRIES
DIRECTOR

August 12, 2004

Ms. Margaret M. Barondess
Michigan Department of Transportation
Project Planning Division
P.O. Box 30050
Lansing, Michigan 48909

Dear Ms. Barondess:

Proposed I-196 Road Improvements

The location of the proposed project was checked against known localities for rare species and unique natural features, which are recorded in a statewide database. This continuously updated database is a comprehensive source of information on Michigan's endangered, threatened and special concern species, exemplary natural communities and other unique natural features. Records in the database indicate that a qualified observer has documented the presence of special natural features at a site. The absence of records may mean that a site has not been surveyed. Records may not always be up-to-date. In some cases, the only way to obtain a definitive statement on the presence of rare species is to have a competent biologist perform a field survey. Projects that are submitted to the Department of Environmental Quality are routinely checked for such features regardless if they are on public or private land.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, ...fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Department of Natural Resources, Wildlife Division. *Responsibility to protect endangered and threatened species is not limited to the list below. Other species may be present that have not been recorded in the database.*

The presence of threatened or endangered species does not preclude activities or development, but may require alterations in the project plan. Special concern species are not protected under endangered species legislation, but recommendations regarding their protection may be provided. Protection of special concern species will help prevent them from declining to the point of being listed as threatened or endangered in the future.

The following is a summary of the results for the project in Kent County, (your Figures 12, 13, 14, 15, 16, 20, & 21).

The following list includes special features that are known to occur on or near the site(s) and may be impacted by the project:

common name	status	scientific name
Eastern box turtle	**State special concern**	***Terrapene carolina carolina***

The special concern **eastern box turtle** *(Terrapene carolina carolina)* has been known to occur in T7N R11W, Section 16, north of I-196 (in your Figure 14). The Eastern box turtle is Michigan's only truly terrestrial turtle. This species typically inhabits open woodlands, often near water, but may wander into thickets, meadows, grassy dunes, and gardens. They will soak at the edges of ponds or streams in hot weather but avoid deep water and swim poorly. Most box turtles remain in a rather small home range (often less than 5 acres) for most of their lives. Nesting takes place in June, with eggs being buried in an open, often elevated location. Incubation requires from 75 to 90 days. Management recommendations

include protection of forests. Loss of wooded habitat to various human uses is the most serious threat to the species, but many box turtles are killed on roads or collected as pets each year. As a species of special concern, the eastern box turtle is not protected under state or federal endangered species legislation, but it is becoming rare throughout its range and it is protected under the authority of the Department of Natural Resources Director's Order, Regulations on the Take of Reptiles and Amphibians, dated October 12, 2001 (section 324 of PA 451).

Thank you for your advance coordination in addressing the protection of Michigan's natural resource heritage. If you have further questions, please call me at 517-373-1263.

Sincerely,

Lori A. Sargent

Lori G. Sargent
Endangered Species Specialist
Wildlife Division

LGS:MEH:pmg
cc: Ms. Mindy Koch, DNR

United States Department of the Interior

FISH AND WILDLIFE SERVICE
East Lansing Field Office (ES)
2651 Coolidge Road, Suite 101
East Lansing, Michigan 48823-6316

IN REPLY REFER TO:

March 25, 2005

Ms. Lori Noblet
Environmental Section
Project Planning Division
Michigan Department of Transportation
P.O. Box 30050
Lansing, Michigan 48909

Re: Request for Early Coordination Comments for the Environmental Assessment for the Proposed I-196/96 Improvement Project in Kent County, Michigan

Dear Ms. Noblet:

We are responding to your request for additional information and/or clarification for the Environmental Assessment (EA) of the proposed I-196/96 Improvement Project in Kent County, Michigan. You have indicated the Michigan Department of Transportation (MDOT) in cooperation with the Federal Highway Administration is preparing an EA for the proposed improvement of I-196 from just east of US-131 to the I-96 junction; I-96 from west of Cascade Road to west of Leonard Street; and M-37/M-44 (East Beltline) south of M-21 to north of the Knapp Street intersection in the city of Grand Rapids and Grand Rapid Township, Kent County, Michigan. These comments are prepared under the authority of the Fish and Wildlife Coordination Act and are consistent with section 7 of the Endangered Species Act (Act) of 1973, as amended.

Endangered Species Act Comments

As indicated during our on-site review of the project area conducted on August 31, 2004, our files do not indicate the presence of any federally endangered, threatened, or proposed species, or designated or proposed critical habitat, in the action area. If the project requires modification, or new information becomes available that suggests species listed or proposed for listing may be present and/or affected, you should initiate consultation with us as required by section 7 of the Act.

Since threatened and endangered species data changes continuously, we recommend you contact this office for an updated Federal list of the species occurring in the project area every six months during the remaining planning and building period.

Fish and Wildlife Coordination Act Comments

During the course of the field review, a limited number of potential wetland areas were identified in the project area. We recommend MDOT avoid and minimize potential impacts to the extent possible during project construction. We understand the proposed project is to include replacement of the existing bridge over the Grand River. We recommend MDOT include provisions for the collection and retention of bridge deck runoff in future bridge design and construction.

If, in the future, the proposed work requires a Michigan Department of Environmental Quality permit, our office would have review responsibilities. In the review of these permit applications, we may provide additional comments and/or recommendations depending upon whether specific construction practices may impact public trust fish and wildlife resources of concern.
We appreciate the opportunity to review the document. Please refer any questions directly to Jack Dingledine of this office at (517) 351-6320 or the above address.

Sincerely,

Craig A. Czarnecki
Field Supervisor

g: admin/archives/mar05/I196_96ImprovementProject.jvd.doc

PARKS AND
RECREATION
DEPARTMENT

CITY OF GRAND RAPIDS

June 27, 2005

Ms. Ann M. Lawrie
Bureau of Transportation Planning
Michigan Department of Transportation
425 W. Ottawa Street
P.O. BOX 30050
Lansing, Michigan 48909

Dear Ms. Lawrie:

The City of Grand Rapids supports the efforts of MDOT to reconstruct and widen the I-196 bridges over the Grand River.

Representatives from the MDOT have spoken with me (Director of Parks & Recreation) regarding the proposed construction of reconstruction and widening the I-196 bridges over the Grand River in the City of Grand Rapids, Kent County. The proposed work will involve the closure of the two trails during bridge construction. MDOT will detour pedestrian traffic during construction and provide pedestrian detour signing. MDOT will also restore the trails to their original condition when construction has been completed. The proposed work will not permanently affect the use or activities of the City of Grand Rapids trails.

The City of Grand Rapids appreciates the coordination efforts made on behalf of your department. If I can be of further assistance, please feel free to contact me at (616) 456-4234.

Sincerely,

Jay D. Steffen
Director of Parks & Recreation

JDS/krc
cc: Kurt Kimball
Victor Vasquez
Eric DeLong
Bill Cole
Rick DeVries
Tom Zelinski
Maryanne McIntyre
Darlene O'Neal

APPENDIX F

COMPARISON OF EXISTING AND PREDICTED NOISE LEVELS

TABLE 2 COMPARISON OF EXISTING AND PREDICTED NOISE LEVELS

Noise Sensitive Area	Receiver	Existing Noise Level (decibels)	2030 Projected Noise Level (decibels)
1	1-M01	73.7	75.4
	1-M02	51.2	53.9
	1-M03	69.2	72.0
	1-M04	61.4	62.3
	1-01	49.9	52.0
	1-02	57.1	59.8
	1-03	60.4	63.1
	1-04	58.1	59.9
	1-05	62.6	64.0
	1-06	55.9	57.9
	1-07	56.8	58.3
	1-08	56.3	57.2
2	2-M05	65.7	67.4
	2-01	63.8	65.6
	2-02	56.2	58.3
3	3-M06	58.6	60.3
	3-M07	66.2	67.9
	3-01	65.2	67.8
	3-02	59.2	62.9
	3-03	63.7	67.5
	3-04	63.4	66.0
4	4-M09	67.6	70.6
	4-M10	65.2	67.4
	4-01	55.8	58.8
	4-02	51.8	54.6
	4-03	56.9	59.3
	4-04	54.8	56.4
5	5-M08	69.1	73.0
	5-M13	67.8	70.6
	5-01	51.7	54.3
	5-02	46.9	49.5
	5-03	46.0	48.9
	5-04	50.6	53.4
	5-05	47.1	49.2
	5-06	52.0	53.6
6	6-M14	63.7	65.3
	6-M15	60.0	61.8
	6-01	57.3	59.1
	6-02	57.7	59.8
	6-03	50.8	52.4
	6-04	54.2	55.0
7	7-M11	57.0	59.5
	7-M12	57.6	59.4
	7-01	50.5	52.1
	7-02	57.2	59.4
8	8-M16	70.3	72.0
	8-01	55.3	56.5
	8-02	63.3	65.5
9	9-M17	64.6	66.3
	9-M18	72.7	74.0
	9-01	64.1	66.4
	9-02	64.5	66.6

TABLE 2 (cont.) COMPARISON OF EXISTING AND PREDICTED NOISE LEVELS

Noise Sensitive Area	Receiver	Existing Noise Level (decibels)	2030 Projected Noise Level (decibels)
10	10-M19	64.5	66.4
	10-M20	71.0	72.7
	10-01	64.8	66.7
	10-02	56.2	58.2
	10-03	55.8	57.9
11	11-M22	57.9	57.8
	11-M23	46.8	49.0
	11-M24	57.1	59.6
	11-01	55.5	57.4
	11-02	50.0	51.7
	11-03	46.3	48.0
	11-04	52.6	51.8
	11-05	51.5	51.0
12	12-M21	68.2	71.2
	12-M29	58.7	60.6
	12-M30	60.8	60.6
	12-01	57.0	59.8
	12-02	53.5	55.6
	12-03	49.1	53.2
	12-04	55.1	62.0
	12-05	56.8	61.9
	12-06	56.6	59.0
	12-07	55.2	58.2
	12-08	53.6	57.3
	12-09	51.9	54.5
	12-10	52.1	53.8
	12-11	52.8	54.3
	12-12	53.7	53.7
	12-13	54.5	55.1
	12-14	56.9	58.8
	12-15	61.1	62.8
	12-16	56.6	56.5
	12-17	54.0	54.3
	12-18	51.8	52.7
	12-19	58.5	58.8
	12-20	62.0	62.0
13	13-M25	56.1	56.3
	13-M26	64.9	64.9
	13-M27	60.5	62.3
	13-01	59.5	48.6
	13-02	58.8	55.3
	13-03	53.8	53.6
	13-04	56.6	56.9
	13-05	63.6	63.4
	13-06	61.5	62.4
	13-07	52.6	52.0
	13-08	53.5	53.5
	13-09	51.7	50.8
	13-10	62.7	61.6
	13-11	50.3	49.4

TABLE 2 (cont.) COMPARISON OF EXISTING AND PREDICTED NOISE LEVELS

Noise Sensitive Area	Receiver	Existing Noise Level (decibels)	2030 Projected Noise Level (decibels)
14	14-M28	52.9	54.7
	14-01	61.9	63.8
	14-02	68.1	68.9
	14-03	52.3	53.6
	14-04	52.5	53.3
	14-05	55.2	55.4
	14-06	54.0	55.2
	14-07	49.9	51.1
	14-08	52.3	53.4
15	15-M32	56.3	59.0
	15-01	56.2	58.0
	15-02	58.5	62.5
	15-03	55.5	58.1
	15-04	55.7	56.7
	15-05	54.5	54.2
	15-06	64.9	65.3
	15-07	63.3	63.5
	15-08	63.2	63.4
	15-09	51.3	51.9
16	16-M35	61.2	65.2
	16-01	67.0	69.5
	16-02	58.8	62.1
	16-03	56.4	58.7
	16-04	58.7	59.2
17	17-M33	54.5	55.5
	17-M34	60.9	63.8
	17-M36	63.5	63.9
	17-01	64.1	66.5
	17-02	53.3	55.8
	17-03	47.2	50.4
	17-04	56.5	58.6
	17-05	58.8	59.9
	17-06	58.0	58.3
	17-07	56.9	57.7
	17-08	55.1	56.0
	17-09	55.6	56.0
	17-10	55.4	56.2
	17-11	62.2	62.3
	17-12	51.6	52.5
	17-13	59.1	59.3
	17-14	55.0	55.5
18	18-M40	61.8	60.2
	18-M41	63.5	61.3
	18-M42	59.9	61.1
	18-01	62.5	61.9
	18-02	55.4	60.6
	18-03	60.1	59.9
	18-04	59.5	55.6
	18-05	69.9	70.1
	18-06	68.5	68.0
	18-07	63.5	63.5
	18-08	59.1	55.8
	18-09	54.4	59.5
	18-10	57.0	57.8
	18-11	65.8	59.6
	18-12	57.7	58.0
	18-13	60.9	62.1

TABLE 2 (cont.) COMPARISON OF EXISTING AND PREDICTED NOISE LEVELS

Noise Sensitive Area	Receiver	Existing Noise Level (decibels)	2030 Projected Noise Level (decibels)
	18-14	66.4	63.2
	18-15	62.5	63.2
19	19-M44	66.3	65.3
	19-01	59.4	56.2
	19-02	58.6	58.6
	19-03	60.3	60.3
	19-04	62.7	62.7
	19-05	65.4	65.4
20	20-01	50.0	50.4
	20-02	52.7	52.9
	20-03	44.9	45.6
21	21-M45	65.6	67.4
	21-01	59.8	61.1
22	22-M46	53.4	56.0
	22-M47	61.8	63.5
	22-01	45.2	46.8
	22-02	49.6	51.5
	22-03	43.6	45.7
	22-04	45.5	47.5
	22-05	58.1	60.2
	22-06	49.8	51.3
	22-07	54.7	56.7
	22-08	51.5	52.4
	22-09	59.1	59.8
23	23-01	64.7	64.7
	23-02	57.5	57.4
	23-03	68.3	68.3
	23-04	65.6	65.6
24	24-M43	62.2	62.3
	24-01	52.5	52.6
	24-02	57.9	58.1
25	25-M37	66.2	67.3
	25-01	68.3	69.4
	25-02	63.2	62.5
26	26-M38	59.7	60.5
	26-01	53.7	53.9
27	27-M39	63.4	65.3
	27-01	64.6	66.3
	27-02	53.6	55.8
	27-03	56.5	58.8
	27-04	66.1	67.9
	27-05	68.3	69.9

FIGURES

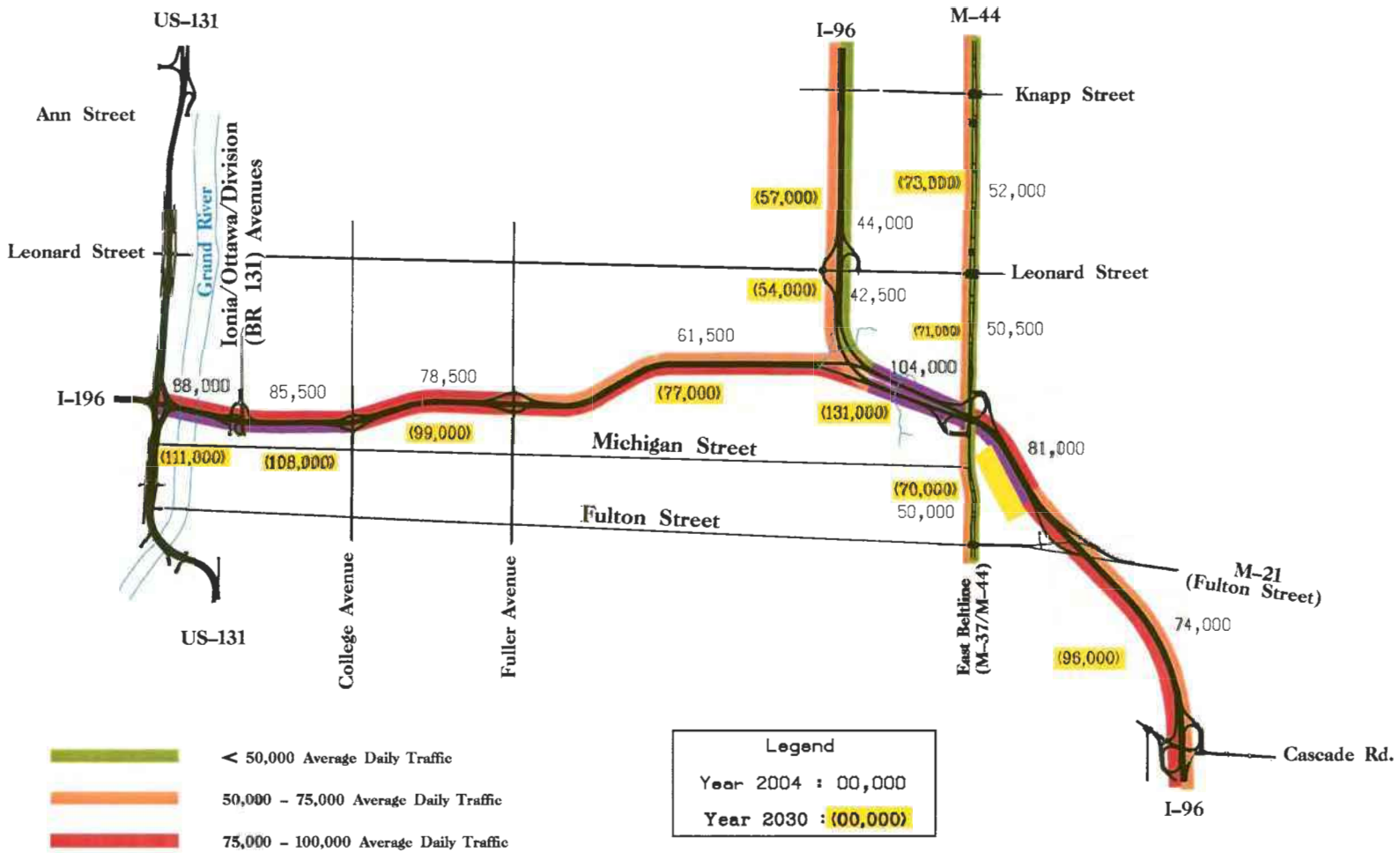


Figure 1.2

Existing and Future (2030) Average Daily Traffic

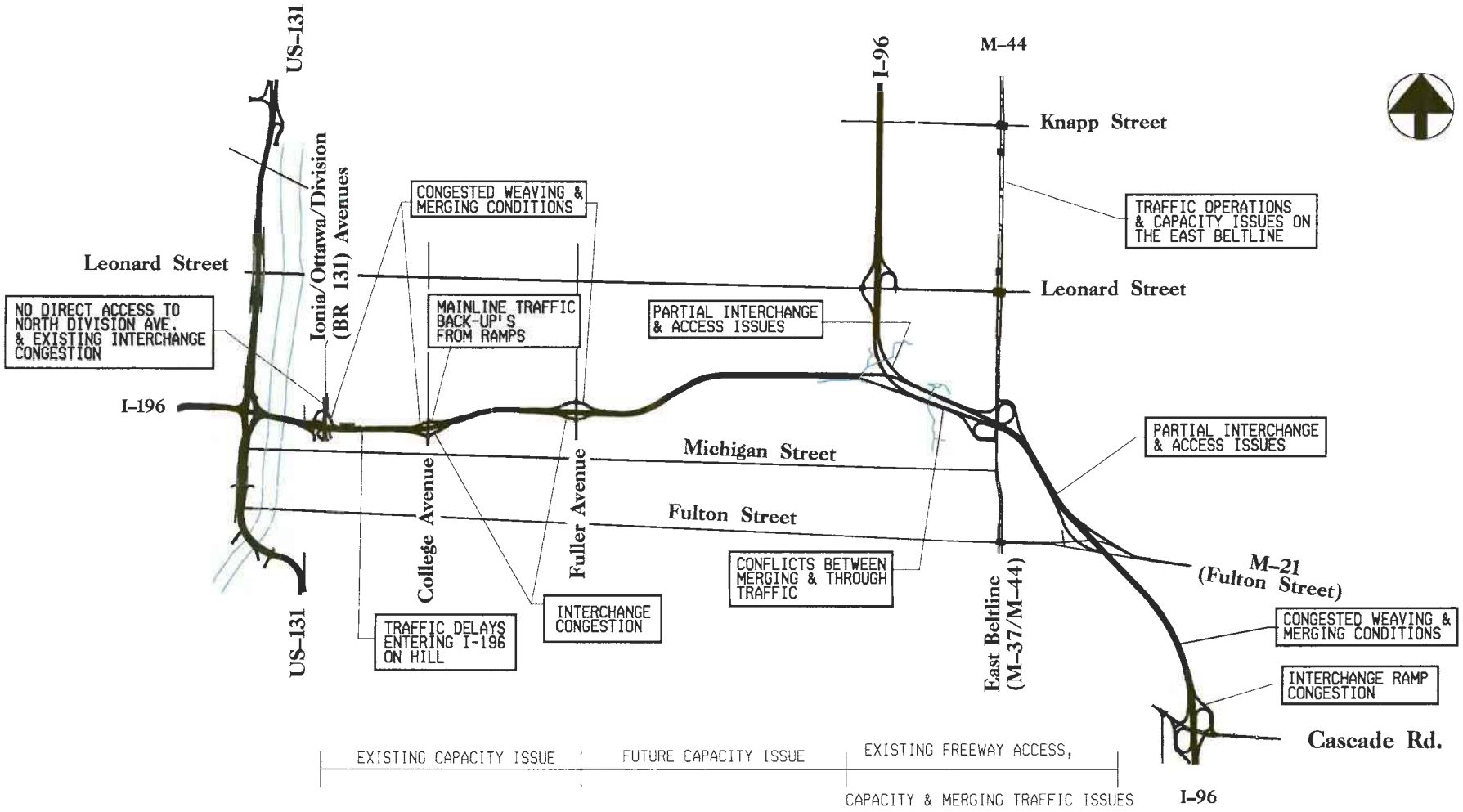


Figure 1.3

Existing Traffic Flow Conditions

I-196/I-96 EA CORRIDOR STUDY

FIGURE 1.4
Proposed Improvements and Phasing Plan

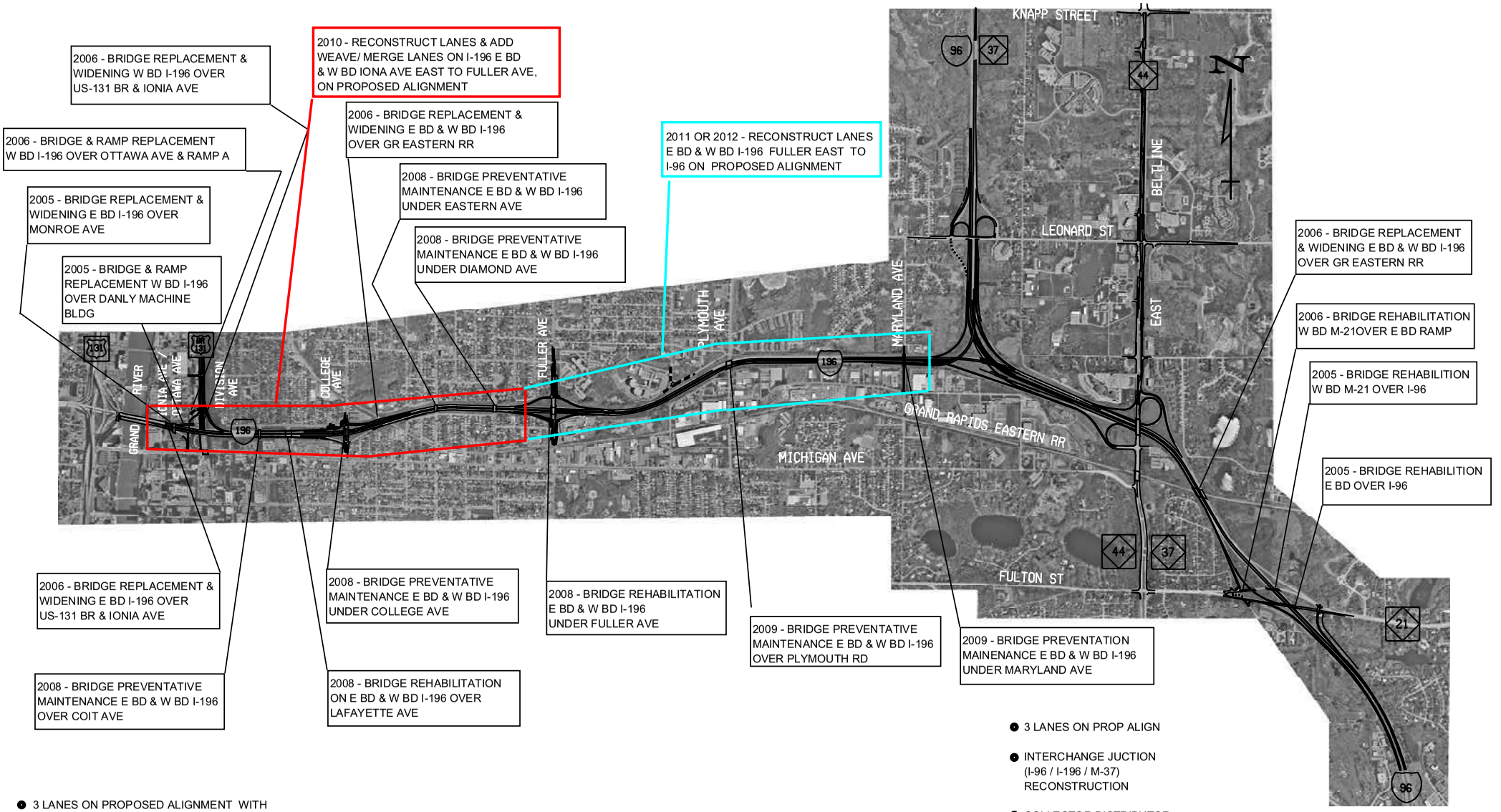


FIGURE 2.4

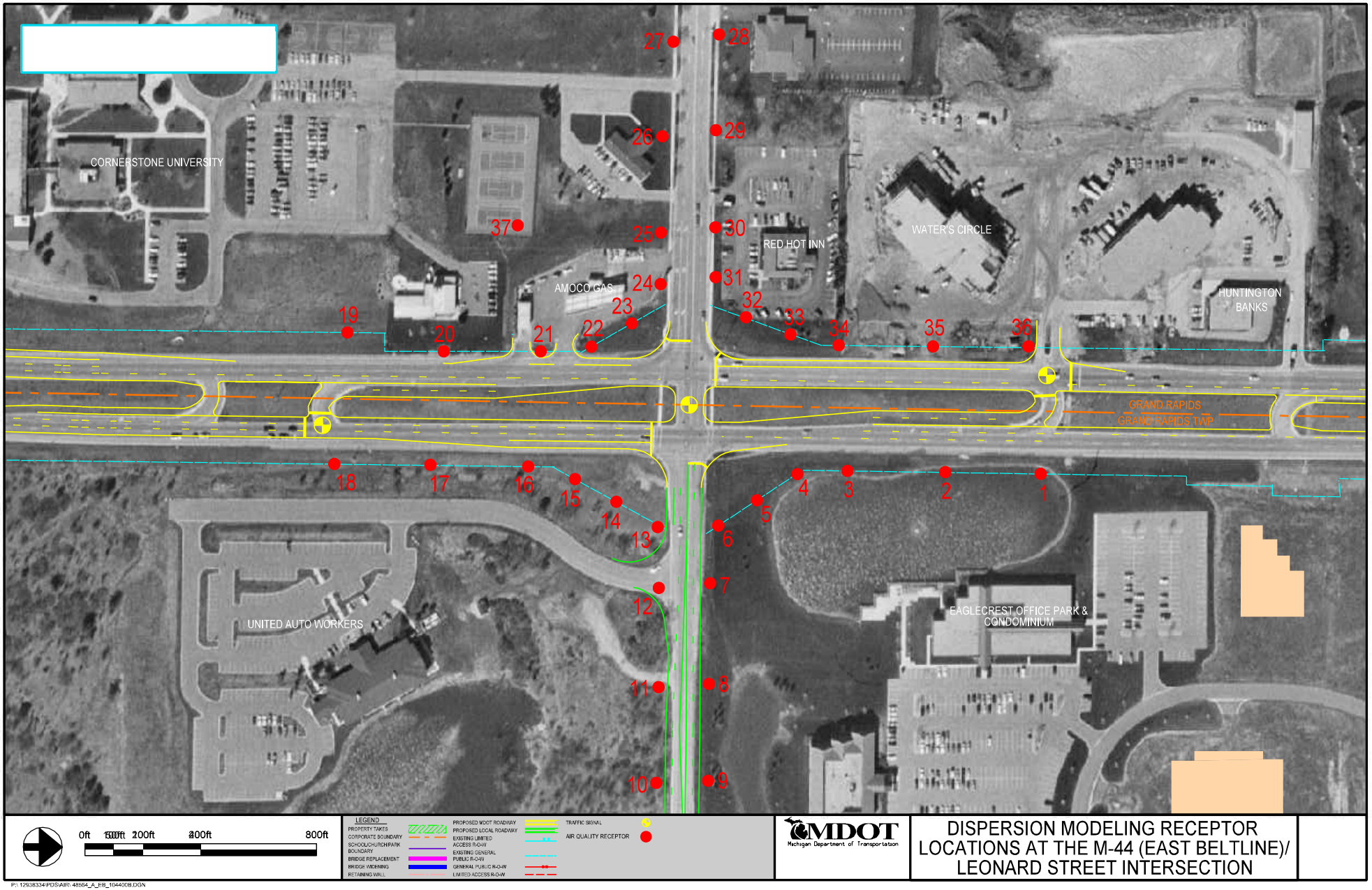

CORNERSTONE UNIVERSITY
AMOCO GAS
RED HOT INN
WATER'S CIRCLE
HUNTINGTON BANKS
GRAND RAPIDS
GRAND RAPIDS TWP
UNITED AUTO WORKERS
EAGLECREST OFFICE PARK & CONDOMINIUM
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
0ft
200ft
400ft
800ft
LEGEND
PROPERTY TAKES
CORPORATE BOUNDARY
SCHOOL/CHURCH/PARK BOUNDARY
BRIDGE REPLACEMENT
BRIDGE WIDENING
RETAINING WALL
PROPOSED MDOT ROADWAY
PROPOSED LOCAL ROADWAY
EXISTING LIMITED ACCESS R-O-W
EXISTING GENERAL PUBLIC R-O-W
GENERAL PUBLIC R-O-W
LIMITED ACCESS R-O-W
TRAFFIC SIGNAL
AIR QUALITY RECEPTOR
MDOT
Michigan Department of Transportation
DISPERSION MODELING RECEPTOR LOCATIONS AT THE M-44 (EAST BELTLINE)/ LEONARD STREET INTERSECTION
P:\ 12938334\PDS\AIR\ 48564_A_EB_1044008.DGN

FIGURE 2.5

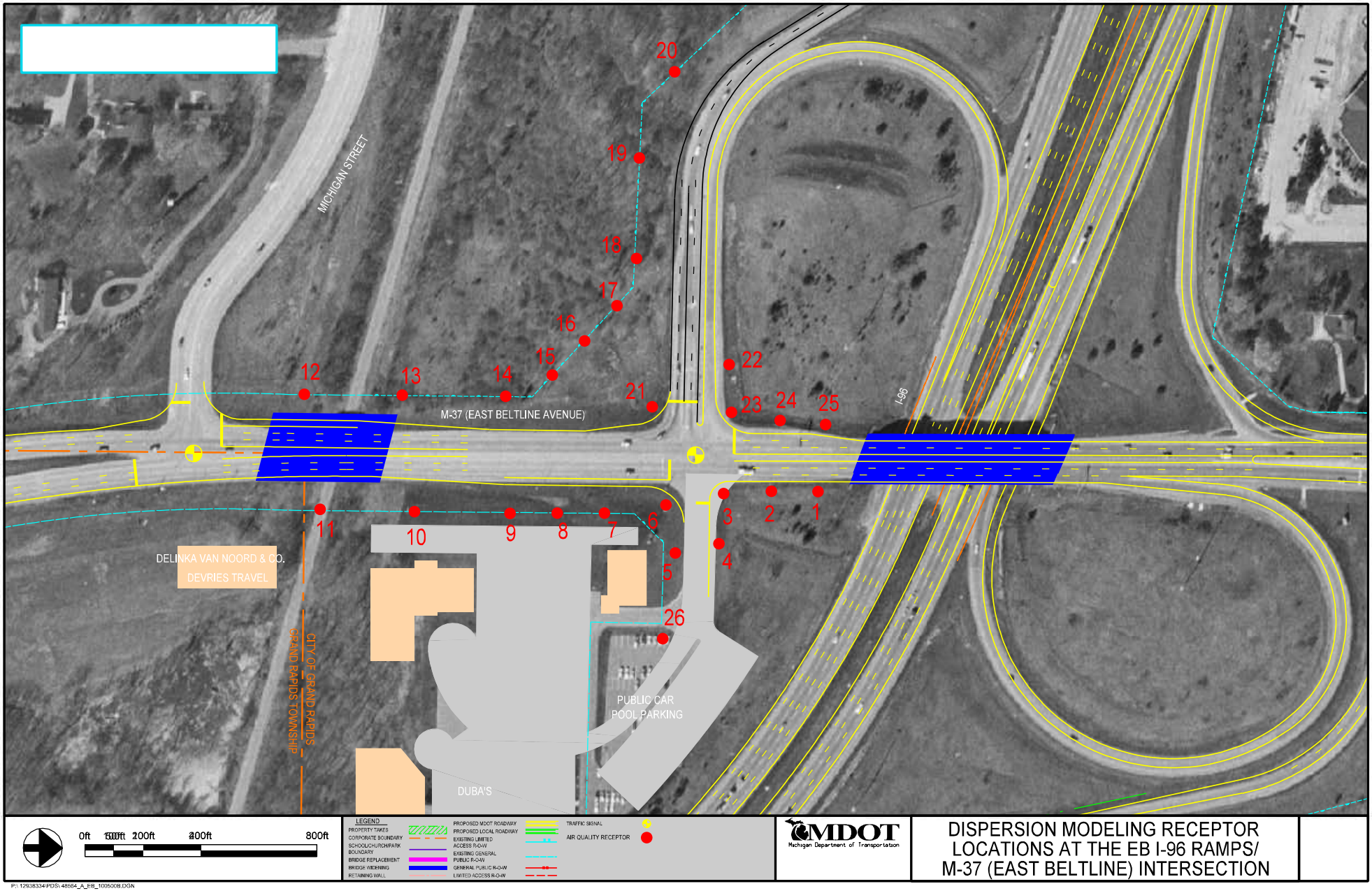


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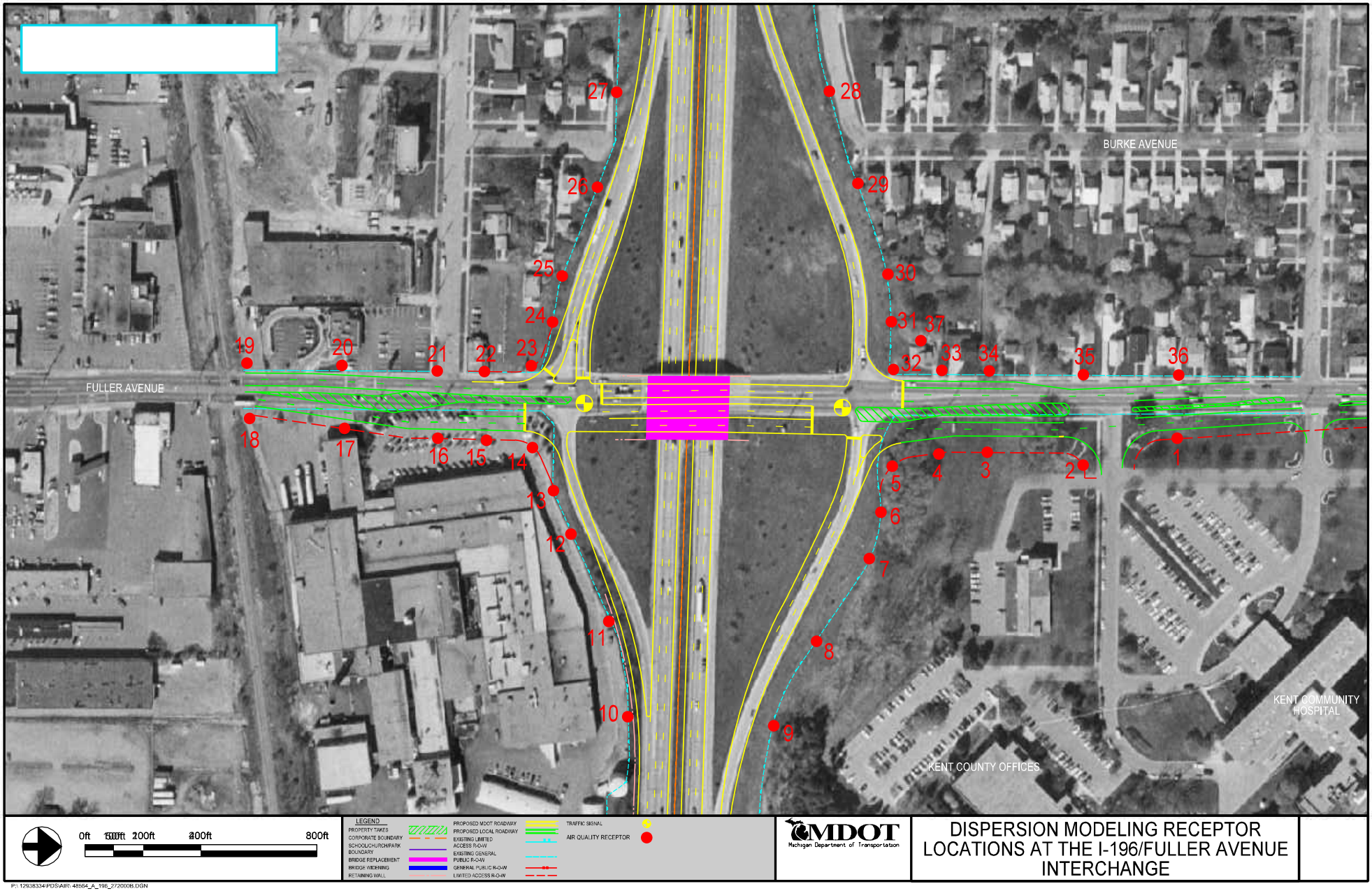
FIGURE 2.6


BURKE AVENUE
FULLER AVENUE
KENT COMMUNITY HOSPITAL
KENT COUNTY OFFICES
1
2
3
4
5
6
7
8
9
10
11
12
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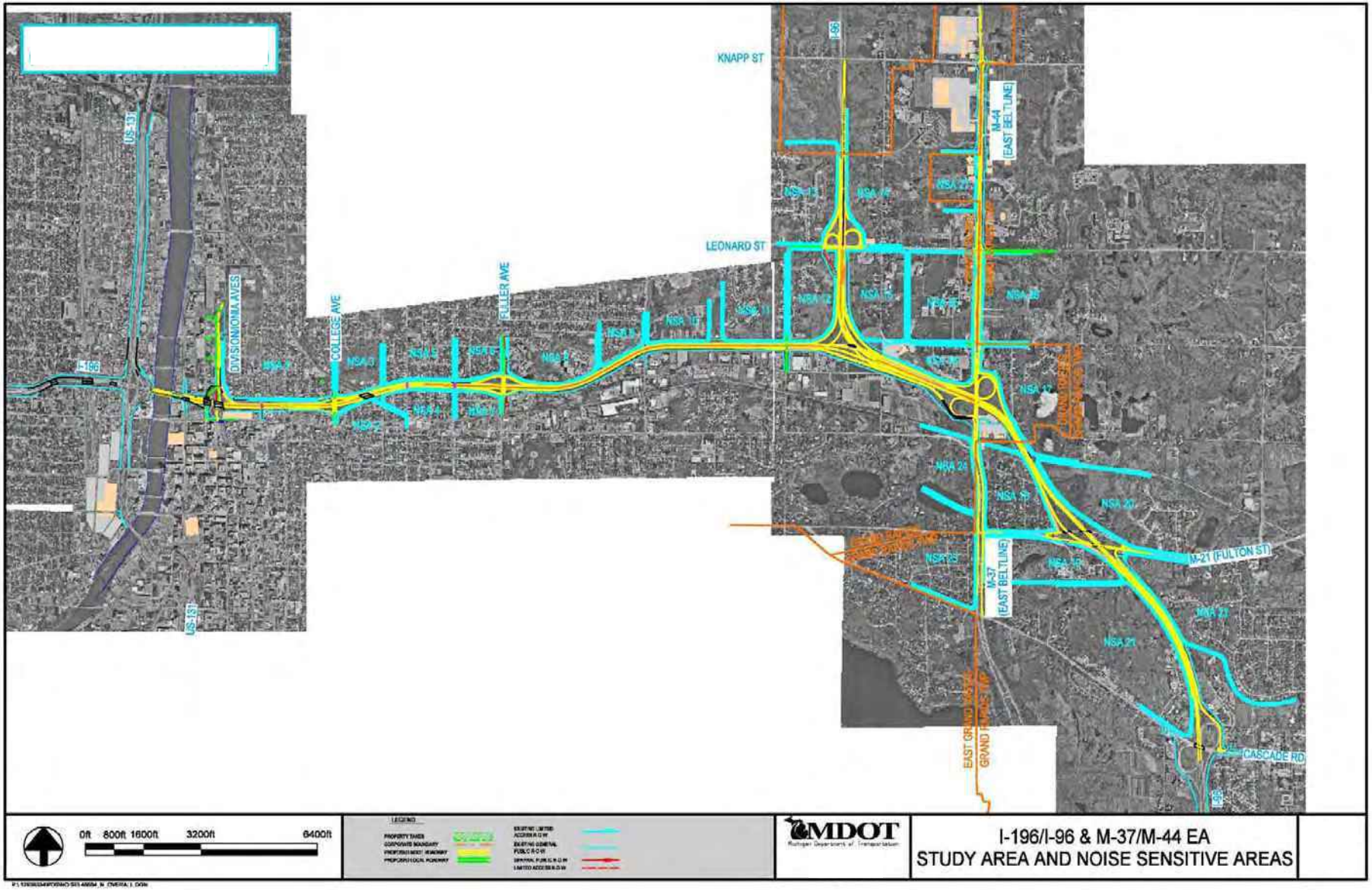
0ft
200ft
400ft
800ft
LEGEND
PROPERTY TAKES
CORPORATE BOUNDARY
SCHOOL/CHURCH/PARK BOUNDARY
BRIDGE REPLACEMENT
BRIDGE WIDENING
RETAINING WALL
PROPOSED MDOT ROADWAY
PROPOSED LOCAL ROADWAY
EXISTING LIMITED ACCESS R-O-W
EXISTING GENERAL PUBLIC R-O-W
GENERAL PUBLIC R-O-W
LIMITED ACCESS R-O-W
TRAFFIC SIGNAL
AIR QUALITY RECEPTOR
MDOT
Michigan Department of Transportation
DISPERSION MODELING RECEPTOR LOCATIONS AT THE I-196/FULLER AVENUE INTERCHANGE
P:\ 12938334\PDS\AIR\ 48564_A_196_272000B.DGN


KNAPP ST
LEONARD ST
I-96
M-44 (EAST BELTLINE)
M-37 (EAST BELTLINE)
M-21 (FULTON ST)
CASCADE RD
EAST GRAND RIVER AVE
GRAND RIVER AVE
US-131
I-196
DIVISION/IONIA AVES
COLLEGE AVE
FULLER AVE
0ft 800ft 1600ft 3200ft 6400ft
LEGEND
MDOT
I-196/I-96 & M-37/M-44 EA
STUDY AREA AND NOISE SENSITIVE AREAS

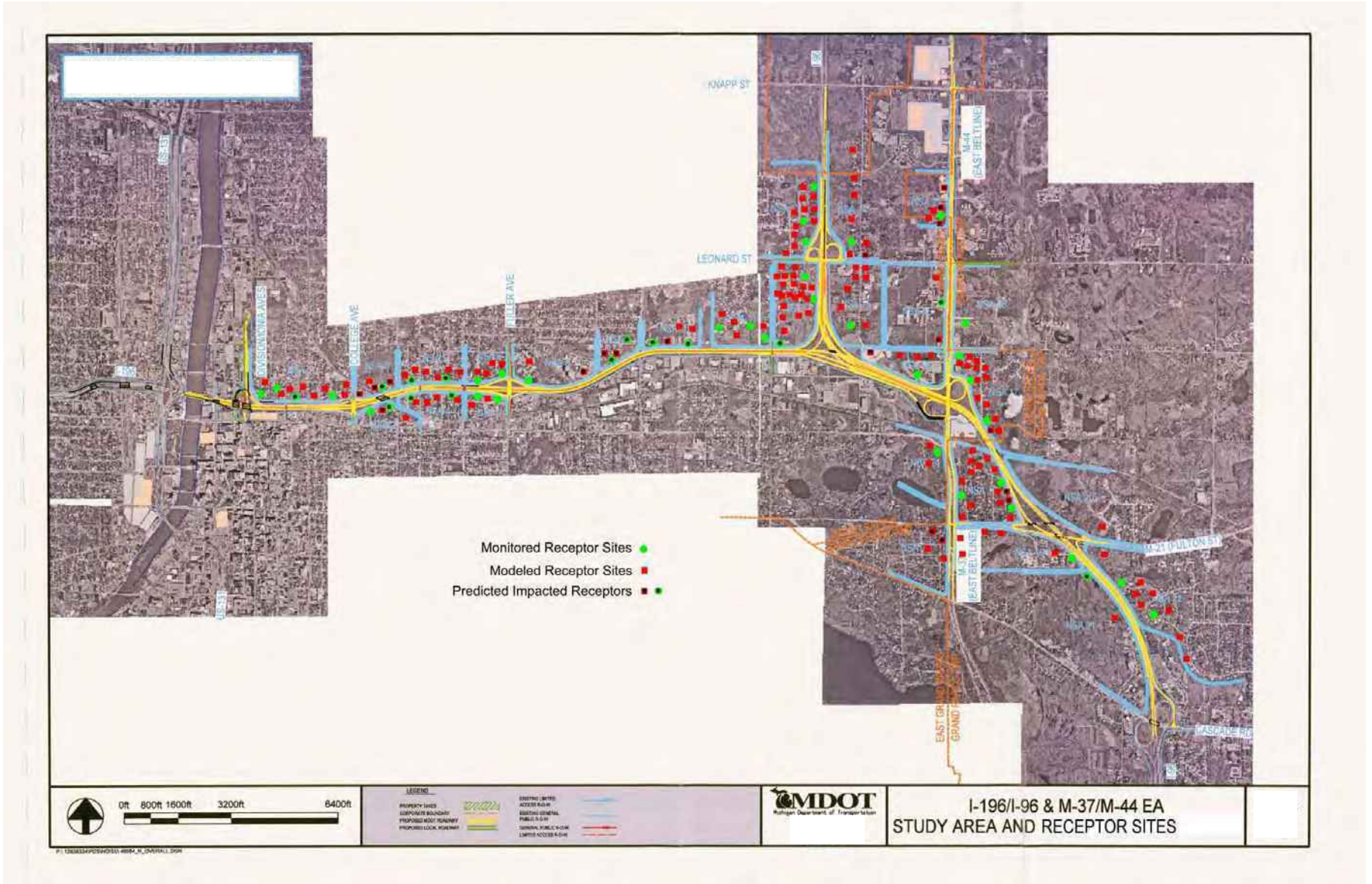
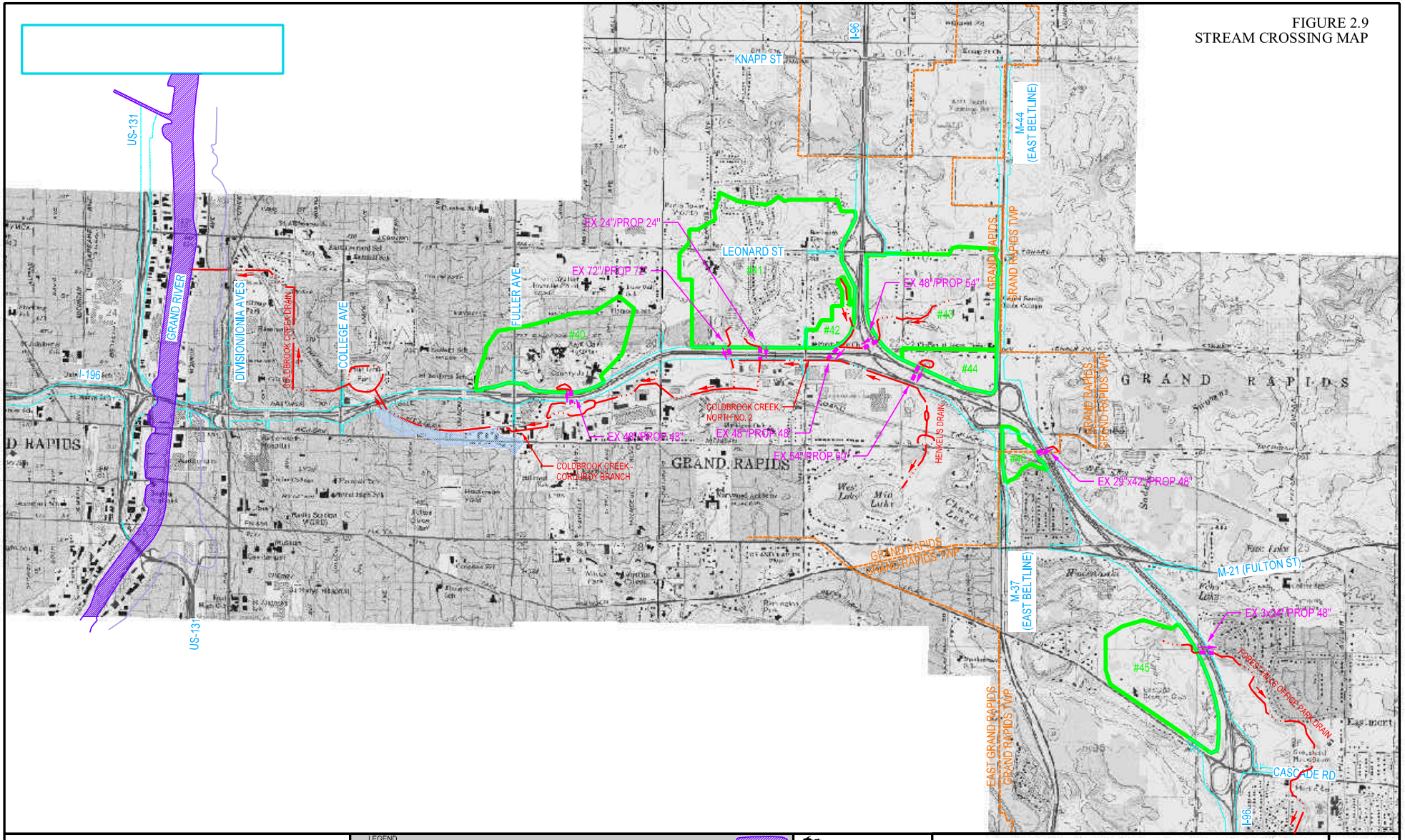

KNAPP ST
LEONARD ST
M-44 EAST BELTLINE
DIVISION AVE
FULLER AVE
Monitored Receptor Sites
Modeled Receptor Sites
Predicted Impacted Receptors
0ft 800ft 1600ft 3200ft 6400ft
LEGEND
MDOT
Michigan Department of Transportation
I-196/I-96 & M-37/M-44 EA
STUDY AREA AND RECEPTOR SITES

FIGURE 2.9
STREAM CROSSING MAP



0ft 800ft 1600ft 3200ft 6400ft

LEGEND

CORPORATE BOUNDARY
EXISTING LIMITED ACCESS R-O-W
EXISTING GENERAL PUBLIC R-O-W
WATERWAYS
DRAINAGE AREAS
MAJOR CULVERTS
100 YEAR FLOODPLAINS
500 YEAR FLOODPLAINS
KENT COUNTY DETENTION PONDS
CITY OF GRAND RAPIDS "FLOOD-PRONE" AREAS

MDOT Michigan Department of Transportation
URS

FLOODPLAINS, WATERWAYS, AND MAJOR CULVERTS WITH DRAINAGE AREAS

P:\ 12938334\PDS\DRAINAGE\ 48564_D_EXISTING.DGN