

**Proposed Rehabilitation
of
M-1 (Woodward Avenue)
&
M-102 (Eight Mile Road) Intersection

Environmental Assessment
&
Programmatic Section 4(f) Evaluation**

City of Ferndale, Oakland County
and
City of Detroit, Wayne County
Michigan

June 2004

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PREFACE

The National Environmental Policy Act (NEPA) of 1969 requires that the social, economic, and natural environmental impacts of a 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 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. 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 Finding of No Significant Impact (FONSI).

This document is an Environmental Assessment for the proposed rehabilitation of the intersection of M-1 (Woodward Avenue) and M-102 (Eight Mile Road) in the cities of Ferndale, Oakland County, and Detroit, Wayne County, Michigan. It describes and analyzes a preferred alternative 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. 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 prepared. 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 was prepared by the Michigan Department of Transportation (MDOT), in cooperation with the FHWA and other members of the project study team. The study team includes representatives from the following divisions within MDOT: Project Planning, Roadside Development, Oakland Transportation Service Center (TSC), Detroit TSC, and the Metro Region. Information was also furnished by other federal, state, and local agencies.

EXECUTIVE SUMMARY

This EA describes the proposed rehabilitation of the M-1 (Woodward Avenue) / M-102 (Eight Mile Road) intersection at the Oakland County/Wayne County border in the cities of Ferndale and Detroit, Michigan (Figure 1-1). MDOT is proposing to improve the existing intersection in order to provide a safe, efficient transportation system with adequate capacity to serve future vehicular traffic. Bridge repair work is required on the M-1 bridge over M-102, the northbound M-1 service drive over M-102 and the southbound M-1 service drive over M-102 (Figure 1-2).

A wide variety of alternatives were considered during this study. These alternatives included reconfiguring the intersection to two levels (remove third-level bridge), rehabilitating the intersection in its current three-level configuration, and the No Build Alternative. Several different intersection types were examined including direct left turns, indirect left turns and a modern roundabout. After careful consideration of public input as well as the benefits, negative impacts, and costs, a "Preferred" Alternative was selected.

The Preferred Alternative would retain the existing intersection configuration (Figure 1-5). The M-102 (east/west) through lanes would remain depressed beneath the intersection of the M-1 and M-102 service drives, while the M-1 (north/south) through lanes would remain elevated over the intersection of the M-1 and M-102 service drives. Turning movements for all directions would remain at the street level. This alternative would include repairs to the existing bridge structures, including aesthetic improvements, consistent with the project's purpose and need. The majority of the repair work would be done on the bridge decks and piers. No access changes would be required. The Preferred Alternative would cost approximately \$5.7 million (in year 2004 dollars).

The Preferred Alternative would not result in significant negative impacts. Temporary construction-related impacts would occur while the bridges and roadways are being rehabilitated. These would include temporary lane closures, traffic congestion, and increased noise and air impacts.

Throughout the course of the study, substantial public involvement and agency coordination has taken place. Input received from public and government agencies have been carefully considered and integrated into the study process.

It should be noted that the Governor's Fix it First/Preserve First Program protects Michigan's most vital transportation investments. The number one priority of the Fix it First/Preserve First Program is to be fiscally responsible and make sure existing roads and bridges are in the best possible condition. It requires a goal of having 90 percent of the existing roads and bridges in good condition that can be sustained. The identified Preferred Alternative is considered a part of this program.

It is anticipated that the Preferred Alternative would be constructed in 2005.

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SECTION 1 – PROPOSED PROJECT

1.1 Description of the Existing Intersection

This EA describes the proposed improvements to the M-1 (Woodward Avenue) / M-102 (Eight Mile Road) intersection at the Oakland County/Wayne County border in the cities of Ferndale and Detroit, Michigan (Figure 1-1). MDOT is proposing to improve the existing intersection in order to continue to provide a safe and efficient intersection for traffic. This EA is being prepared in accordance with NEPA which requires federal agencies to identify and consider the social, economic, and environmental (SEE) impacts of proposed actions as part of their decision-making process. This EA identifies recommended improvements for the intersection. No modifications to the M-102 underpass are considered as part of this project.

The existing intersection of M-1 and M-102 currently has three levels. The M-102 (east/west) through lanes are depressed beneath the intersection of the M-1 and M-102 service drives (second level), while the M-1 (north/south) through lanes are elevated (third level) over the intersection (Figure 1-2). At ground level, slip ramps to and from each major road form service drives that intersect, creating a system of four closely-spaced signalized intersections. The intersection contains three bridge structures that include the M-1 bridge over M-102 (third level), the northbound M-1 service drive over M-102 and the southbound M-1 service drive over M-102 (second level). A figure showing the existing typical cross section of M-1 on the third level overpass bridge structure is included as Figure 1-3.

M-1 is an eight-lane (four lanes in each direction) north-south boulevard approximately 27 miles in length, providing access between the cities of Detroit and Pontiac, Michigan. M-1 carries three through lanes in each direction over the three-level intersection, and each M-1 service drive has three through lanes. M-102 is an eight-lane (four lanes in each direction) east-west boulevard following the Oakland County/Wayne County border. M-102 spans a length of 21 miles from Grand River Avenue on the west to I-94 on the east. M-102 carries three lanes in each direction beneath the three-level intersection, and each M-102 service drive has three lanes. M-1 (Woodward Avenue) is designated as both a State Heritage Route and a National Scenic Byway.

The current intersection provides for the safe movement of traffic. A review of the crash data indicates that the overall intersection has a low number of crashes considering the relatively high volumes of traffic that pass through it. Also, crashes that have occurred are typically of low severity because the main through movements on M-1 and M-102 are both free from conflict with cross-road traffic. The crash frequencies for all of the intersections are at or below average for similar intersections, except for the eastbound M-102 approach which is above average. No fatalities were reported at the intersection during the three-year (1997-1999) period examined as noted in the M-1 at M-102 Traffic Analysis Report (The Corradino Group of Michigan, Inc. 2004) and previous studies (URS Corporation 2001).

In 2003, the average annual daily traffic (AADT) for M-1 north of M-102 was approximately 40,000 vehicles per day (VPD), while south of M-102 it was approximately 38,000 VPD. M-102

Figure 1-1 Study Area

Figure 1-2
Project Area

Figure 1-3
Typical Cross Section at
Existing M-1 Overpass Bridge

had approximately 56,000 VPD east of M-1 and 72,000 VPD west of M-1. These volumes have remained relatively stable over the last few years, and this general trend is expected to continue into the future. This intersection currently has good traffic operations (existing Level of Service (LOS) A and B), and an analysis of the year 2025 “No Build” scenario (the future situation that assumes projected population/economic growth but no improvements to the intersection) shows that traffic operations would continue to be acceptable with the current configuration.

The LOS concept provides the most widespread measure of traffic performance. Levels of service range from A (free flow, minimal delays) to LOS F (highly congested, heavy delays). Intermediate conditions are described by LOS B, LOS C, LOS D, and LOS E. In urban locations like the intersection of M-1 and M-102, LOS E is acceptable performance (level-of-service standard).

1.2 Purpose and Need for the Proposed Project

MDOT determined that the three bridge structures at the existing intersection are in need of repair. Bridge inspection reports prepared by MDOT support these conclusions (Appendix A). Work is required on the M-1 bridge over M-102, the northbound M-1 service drive over M-102 and the southbound M-1 service drive over M-102. Overall, the condition of the bridges range from “fair” to “poor”, with the greatest concerns being the decks and piers. The decks show signs of deterioration, including spalling (flaking of concrete) that seriously affects some of the structural components. The underside of the decks is also deteriorated with many cracks and spalls evident. The piers need some patching and repair. Seven beam end repairs will need to be repaired. The project will also include painting of the structures.

The purpose of the proposed project is to provide and maintain a safe, efficient transportation system with adequate capacity to serve future vehicular traffic. Continuity and connectivity are important characteristics of north-south travel in the area and allow for an efficient link between communities.

M-1 and M-102 serve as alternate routes during construction or incidents (e.g., crashes, bridge repairs, etc.) on I-75 and I-696, respectively. Both freeways have and continue to use M-1 and M-102 as alternate routes. Official detour routes are determined on a case-by-case basis by MDOT.

1.3 Background and Status of the Proposed Project

A rehabilitation (deck replacement) project was developed and reviewed for social, economic and environmental impacts, and it was cleared for environmental concerns after being classified as a Categorical Exclusion (CE) on July 9, 2002. However, since the clearance of this project and the completion of the design of the bridges, state and local officials requested that MDOT conduct an EA on this project that would include analysis of at least two alternatives: the rehabilitation of the existing M-1 third level bridge and the removal of the M-1 existing third-level bridge.

Federal regulations (23 CFR 771.117) note that projects which would normally qualify for environmental clearance using a CE cannot be cleared with this type of document if there is “substantial controversy on environmental grounds”. By preparing this document, MDOT is addressing concerns that have been expressed about the project. To ensure that residents, local officials, and other stakeholders have an opportunity to provide input, MDOT conducted an extensive public involvement program in preparing this EA.

1.4 Alternative Development and Evaluation Process

Alternatives were developed in a formal process by a combination of methods, including public input, application of engineering and planning principles, and environmental analyses. The four primary phases in the development and evaluation process included the identification and evaluation of conceptual alternatives, Illustrative Alternatives, Practical Alternatives, and the identification of a Preferred Alternative. The level of detail in the development of the alternatives and the evaluation effort increased in each phase.

Nine conceptual alternatives were developed with public and stakeholder input through meetings before the study began, and through comments submitted by e-mail and U.S. postal mail. Conceptual alternatives included all reasonable ideas that could offer some benefit at the intersection. However, the conceptual alternatives were not developed in detail. The concepts identified included the No Build Alternative, Single-Level Intersection (M-1 bridge and M-102 underpass removed), Rehabilitation of the Existing Bridges, Removal of the Third Level Bridge – Direct Left Turn Alternative, Removal of the Third-Level Bridge – Indirect Left Turn Alternative, Removal of the Third Level Bridge – Single-Point Urban Interchange (SPUI), Removal of the Third Level Bridge – Modern Roundabout, Mass Transit, and Transportation System Management (TSM). The single level intersection and modern roundabout were eliminated from further consideration due to traffic operations problems (lower LOS and increased congestion and delay), impacts (such as right-of-way (ROW) and high costs), and safety concerns (increased crashes and exposure to higher volumes of traffic).

Five conceptual alternatives were then carried forward as Illustrative Alternatives. They were developed in more detail including preliminary plan-view geometrics. The mass transit and TSM alternatives were carried forward as potential components to the other alternatives.

The Illustrative Alternatives (No Build, Rehabilitation of Existing Bridges, Removal of the Third Level Bridge – Indirect Left Turn, Removal of the Third Level Bridge –Direct Left Turn, and the Single Point Urban Interchange) were presented to MDOT staff, the Local Advisory Committee and to the public at a Public Information Meeting on January 15, 2004. The study team evaluated the alternatives by considering the feasibility, benefits, and impacts of each based on planning and engineering principles, environmental considerations and specific concerns raised the public and other stakeholders.

As a result of this process, two Illustrative Alternatives were eliminated from further consideration: the Removal of the Third Level Bridge - Direct Left Turn alternative and SPUI alternative. Both of these alternatives have a LOS with longer delays and a higher volume to capacity (v/c) ratios. The v/c ratio indicates the level of congestion on a roadway. The Removal

of the Third Level Bridge – Direct Left Turn Alternative was dismissed because it is anticipated to result in an increase in vehicle conflicts and potential crashes due to more exposure, negative impacts to historic structures of the intersection, and because the impacts are not justified by the expected benefits. The SPUI Alternative was dismissed because it is anticipated to result in safety concerns for pedestrians and bicyclists; negative impacts to ROW and historic structures; and that the impacts are not justified by the improvements.

Details regarding the conceptual and Illustrative Alternatives and their elimination from consideration are included in the *M-1 at M-102 Environmental Assessment Traffic Analysis Report* (The Corradino Group of Michigan, Inc., 2004).

1.5 Practical Alternatives

The three remaining Illustrative Alternatives were advanced for detailed study as Practical Alternatives. All of the improvements were designed in accordance with the *American Association of State Highway and Transportation Officials (AASHTO) Guidelines on Geometric Design of Highways and Streets* (2001) and the Michigan Department of Transportation's (MDOT) *Highway Design Standards*.

The Practical Alternatives included the No Build Alternative, the Rehabilitation of the Existing Bridges Alternative, and the Removal of the Third Level Bridge – Indirect Left Turn Alternative.

1.5.1 No Build Alternative

The No Build Alternative has been included as a Practical Alternative as required by NEPA. The No Build Alternative consists of continued regular maintenance. It includes the necessary repairs and required maintenance to make the intersection safe for use. The No Build Alternative does not include any significant aesthetic improvements at the intersection.

1.5.2 Rehabilitation of the Existing Bridges Alternative

This alternative would retain the existing intersection configuration. The M-102 (east/west) through lanes would remain depressed beneath the intersection of the M-1 and M-102 service drives, while the M-1 (north/south) through lanes would remain elevated over the intersection of the M-1 and M-102 service drives. Slip ramps to and from each route would create service drives intersecting at street (at-grade) level, creating a system of four closely-spaced signalized intersections. Turning movements for all directions would be made at the street level.

A figure showing the typical cross section of M-1 on the overpass bridge structure is included as Figure 1-4 and a figure showing the intersection layout is included as Figure 1-5.

This alternative would include repairs to the existing bridge structures with some patch and repair to the piers. Beam end replacements may also be needed. Seven beam ends will need to be repaired. However, the majority of the repair work would be done on the bridge decks and piers. A “partial width” construction process would likely be used for the service drives which are at-grade. This construction technique involves maintaining traffic

Figure 1-4
Proposed Typical Cross
Section at M-1 Overpass
Bridge

Figure 1-5
Rehabilitation Alternative

on one half of the roadway while the other half is being reconstructed. However, the M-1 overpass (third level) would require complete closure with traffic re-routed onto the service drive level during the closure. Alternative routes will be clearly marked and coordinated with the locals. It is anticipated that the detour would be in operation for less than six months. The maintenance of traffic plan will be finalized during the design phase of the project. No access changes would be included under the Rehabilitation Alternative. The estimated cost of this alternative is approximately \$5.7 million.

The Rehabilitation Alternative includes the addition of aesthetic improvements at the intersection. Improvements will include upgrades to railings, lighting elements (poles), and landscaping on the approaches. These elements would be an improvement over the existing condition and could provide additional opportunities for aesthetic treatments within the intersection area.

The Rehabilitation Alternative provides safety benefits by separating the major traffic movements from each other. Specifically, this alternative would keep the major through traffic movements (M-1 on the third level and M-102 using the underpass) separated from traffic making turns at grade on the service drives. This minimizes potential conflicts, especially considering the high volumes of traffic making the through movements. Another safety benefit of this alternative is that it controls the movement of pedestrian and bicycle traffic at the intersections through the use of traffic signals. This allows pedestrian and bicycle traffic to have a protected crossing, relatively short distances where they are exposed to traffic, and traffic volumes that are low for an urban intersection (lower volumes mean less conflicts and less crashes). These signals coordinate the safe and efficient movement of traffic, pedestrians and bicyclists at the intersection. Additionally, larger signs, new pavement markings, and push button activation could be added to the intersection to further improve pedestrian movements. The improvements will be finalized during the design phase of the project.

A conflict point is the location at which the paths of two vehicles meet. Reducing the number of conflict points at an intersection is considered a safety benefit assuming traffic volumes remain constant. The existing intersection has 40 conflict points associated with the four traffic signals at grade level. The number of conflict points would not be reduced by this alternative. However, only turning traffic would use these intersections. The safety characteristics of the intersection would remain constant. Because this alternative is the same configuration as the existing condition, it would not require drivers to adapt to a new intersection design or make other behavior modifications related to driving.

The Rehabilitation Alternative's traffic operations are shown in Tables 1-1 and 1-2. Both the existing and future predicted traffic conditions have a LOS of A or B. These levels of service mean that motorists experience minimal delays, backups are short, and traffic flows smoothly. As shown in Table 1-1, average delays at the service drive intersections in the year 2025 will range from 9.5 to 17.9 seconds. Additionally, through traffic on M-1 and M-102 would not experience any intersection delays. Considering this, the alternative results in little or no delays to motorists passing through the intersection.

Due to its close proximity to I-75 and the fact that M-1 is often used as an alternative route during construction or incidents (e.g., crashes, spills, etc.), the study evaluated each alternative's ability to accommodate traffic diverted from I-75. Table 1-2 shows that, on average, the Rehabilitation Alternative would have LOS B, even with I-75 traffic present. The intersection is also able to accommodate additional traffic as evidenced by an average V/C ratio of 0.52 with diverted I-75 traffic present. The V/C ratio is an indication of how much of the intersection capacity is being used by the traffic volumes that are present. As the V/C ratio increases to one, the roadway becomes highly congested with heavy delay.

Table 1-1. Rehabilitation Alternative - Existing and Future Traffic Operations

PROJECT INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	EXISTING (2003) DELAY*/LOS	FUTURE (2025) DELAY/LOS	EXISTING (2003) DELAY/LOS	FUTURE (2025) DELAY/LOS
WESTBOUND M-102 & SOUTHBOUND M-1	4.7 / A	12.8 / B	5.2 / A	9.5 / A
EASTBOUND M-102 & SOUTHBOUND M-1	13.8 / B	15.6 / B	8.5 / A	15.0 / B
EASTBOUND M-102 & NORTHBOUND M-1	6.4 / A	13.2 / B	6.6 / A	11.2 / B
WESTBOUND M-102 & NORTHBOUND M-1	8.8 / A	10.0 / B	5.9 / A	17.9 / B

Source: M-1 at M-102 Environmental Assessment Traffic Analysis Report, The Corradino Group of Michigan, Inc., 2004

* Delay is in seconds.

Table 1-2. Evaluation of Future (Year 2025) Traffic Operations, Volume to Capacity Ratio, and Conflict Points and Estimated Cost

CRITERION	REHABILITATION OF EXISTING BRIDGES	REMOVAL OF THE THIRD LEVEL BRIDGE – INDIRECT LEFT TURN
AVERAGE FUTURE TRAFFIC (2025) OPERATIONS	Avg. LOS B, Delay 13.2 sec. Avg. V/C 0.46	Avg. LOS B, Delay 15.9 sec. Avg. V/C 0.80
FUTURE TRAFFIC (2025) OPERATIONS WITH I-75 LANE CLOSURES	Avg. LOS B, Delay 16.3 sec. Avg. V/C 0.52	Avg. LOS C, Delay 35.0 sec. Avg. V/C 0.96
NUMBER OF VEHICLE CONFLICT POINTS	40	18
ESTIMATED COST	\$5.7 Million	\$5.9 Million

Source: M-1 at M-102 Environmental Assessment Traffic Analysis Report, The Corradino Group of Michigan, Inc., 2004

This alternative would retain the existing configuration and character of the original historic intersection. This is an important benefit because the historic intersection is eligible for the National Register of Historic Places (NRHP), largely due to its unique three-level design. Retaining this three-level design preserves this important cultural resource in the history of transportation development in Metropolitan Detroit. Additional information about this aspect of the existing intersection is found in Section 2 of this EA.

The Rehabilitation Alternative would not result in any increases in noise levels or air emissions relative to the existing configuration.

This alternative would retain the M-1 overpass (third level) which could obstruct some viewpoints and is considered a visual impact by some area residents. This alternative would not provide improved access to the parcels at the intersection corners.

1.5.3 Removal of the Third-Level Bridge – Indirect Left Turn Alternative

This alternative would remove the M-1 bridge over M-102 and provide indirect left turn movements which would allow for left turning. The roadway and intersections would be reconfigured so that M-1 traffic would be at-grade and would intersect the existing M-102 service drives (Figure 1-6). M-1 would be an eight lane boulevard over M-102 which would remain below grade. The existing M-1 service drive bridges (which are currently three lanes wide) would be widened to accommodate the additional fourth lane. The locations of the existing and proposed bridges are shown in Figure 1-6. In each direction of travel on M-1, a fourth lane would be added to the inside of the existing service drive bridges. A typical cross section for this alternative is shown in Figure 1-7. The estimated cost of this alternative is approximately \$5.9 million.

Traffic signals would be located at the indirect left turn median crossovers to accommodate turning movements. This alternative would include removal of the third level bridge, rehabilitation of the M-1 service drive bridges, and aesthetic improvements. The alternative is consistent with the project's purpose and need outlined in Section 1.2.

Removing the existing overpass would improve the aesthetic appearance of the intersection. The wide median would provide additional opportunities for aesthetic improvements. This would be an improvement over the existing condition. Because the alternative would remove the third level bridge, this overpass would no longer obstruct some viewpoints, and those who view the overpass as a negative visual element would perceive an improved situation.

This alternative would reduce the number of conflict points between vehicles from 40 (currently) to 18 (Table 1-2). This reduction is accomplished through the addition of indirect left (or "Michigan left") turns which require turning traffic to use median turnarounds away from the intersection. Even though this alternative would result in a reduction of conflict points, the diversion of the M-1 through traffic which used to pass unrestricted, now has to cross through a signalized intersection. This would likely result in a net increase in crashes due to the additional exposure of this demand through the intersection even if the crash rate remained the same. This alternative would also require changes to driver expectations and behavior as the intersection design would change.

Additionally, pedestrian and bicycle traffic would experience more difficulties with this alternative. A special pedestrian actuated crossing would be required to assure that all movements are protected at traffic signals, the number of crossings would be similar to the existing condition, and pedestrians would be exposed to higher traffic volumes and more total conflicts.

As shown in Table 1-3, the longest delay (25 sec. / LOS C) would occur at the newly created intersection where southbound M-1 traffic would be making indirect left turns (LOS C is considered acceptable in urban situations such as this with motorists experiencing tolerable

Figure 1-6
Removal of the Third Level
Bridge – Indirect Left Turn
Alternative

Figure 1-7
Typical Cross Section for
the Removal of the Third Level Bridge-
Indirect Left Turn Alternative

delays, backups, and traffic flow). All other intersections are predicted to operate at LOS A or B under existing traffic conditions (2003), and LOS A, B and C under the future traffic conditions (2025). This alternative would require through traffic on M-1 to travel through a new intersection.

In the event of a closure on I-75 (e.g., maintenance, emergency closure, etc.), this alternative would be able to accommodate the additional rerouted traffic. As shown on Table 1-2, Rerouted traffic would result in acceptable (LOS C) traffic operations at the intersection under the future predicted traffic conditions.

This alternative would not retain the existing configuration or character of the original historic intersection. This is an adverse impact because the historic intersection is eligible for the NRHP, largely due to its unique three-level design and its history in the development of transportation in Metropolitan Detroit. Additional information about this aspect of the intersection is found in Section 2 of this EA.

Table 1-3. Removal of the Third Level Bridge – Indirect Left Turn Alternative Traffic Operations

PROJECT INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	EXISTING (2003) DELAY/LOS	FUTURE (2025) DELAY/LOS	EXISTING (2003) DELAY/LOS	FUTURE (2025) DELAY/LOS
EASTBOUND M-102 & SOUTHBOUND M-1	9.6 / A	20.3 / C	11.5 / B	15.6 / B
WESTBOUND M-102 & NORTHBOUND M-1	11.2 / B	15.9 / B	12.9 / B	9.4 / A
SOUTHBOUND M-1 & NEW CROSSOVER	7.5 / A	25.0 / C	9.6 / A	23.9 / C
NORTHBOUND M-1 & NEW CROSSOVER	3.6 / A	9.2 / A	4.5 / A	7.7 / A

Source: M-1 at M-102 Environmental Assessment Traffic Analysis Report, The Corradino Group of Michigan, Inc., 2004

* Delay is in seconds.

This alternative would result in increased noise levels relative to the existing condition. The increased noise levels would cause noise “impacts” (as defined in MDOT and FHWA policies) at twelve receivers. It is not expected that this alternative would notably alter air emissions relative to the existing configuration. Additional information regarding the air and noise analysis can be found in the *Air Technical Report* (The Corradino Group of Michigan, Inc. 2004) and *Noise Technical Report* (DLZ 2004) prepared for this project.

Businesses located near the intersection maybe afforded improved visibility. In addition, this alternative would provide improved access to parcels near the intersection corners.

1.6 Selection of the Preferred Alternative

The study team evaluated the benefits and impacts of the Rehabilitation of Existing Bridges and Indirect Left Turn Alternatives considering environmental, engineering and planning criteria. The following bullets provide more information to support the selection of a Preferred Alternative.

- The existing intersection is eligible for inclusion on the NRHP and is protected by Section 106 of the National Historic Preservation Act and Section 4(f) of the Department of Transportation Act. The Removal of the Third Level Bridge - Indirect Left Turn Alternative would result in an adverse effect under Section 106 and would constitute a “use” under Section 4(f). Section 4(f) only allows use of such protected properties if there are no feasible or prudent alternatives to the use. For this project, the Rehabilitation Alternative is a feasible and prudent alternative. Therefore, Section 4(f) would preclude the selection of the Removal of the Third Level Bridge - Indirect Left Turn Alternative. For additional information on this determination please refer to Sections 2.15 and 2.16 of this EA. Correspondence from the Michigan State Historic Preservation Office (SHPO) is included in Appendix B of this EA.
- The Rehabilitation Alternative is safer than the Removal of the Third Level Bridge - Indirect Left Turn Alternative. The Indirect Left Turn Alternative would result in an increase in crash rates (relative to the existing condition and the Rehabilitation Alternative) because all M-1 through traffic would traverse the newly created signalized intersection and mix with turning traffic. Since traffic volumes influence crash rates to a greater extent than the number of conflict points, the reduced number of conflict points for the Indirect Left Turn Alternative would be more than offset by the increased traffic volumes experiencing conflicts. The Rehabilitation Alternative is also safer for pedestrians and bicyclists because it controls the movements of both motorized and pedestrian and bicycle traffic at the intersection through the use of traffic signals. In addition, pedestrians and bicyclists would be exposed to lower volumes of traffic.
- The Rehabilitation Alternative provides better traffic operations than the Indirect Left Turn Alternative. Both M-1 and M-102 are heavily utilized regional state trunk line roads. Due to their close proximity to I-75 and I-696, they serve as alternate routes during construction or incidents (e.g., crashes, chemical spills, etc.). The Rehabilitation Alternative has more capacity than the Indirect Left Turn Alternative as evidenced by the V/C ratios shown in Table 1-2.

Based on the evaluation of both Practical Alternatives, the Rehabilitation Alternative was selected as the Preferred Alternative. This selection was based on safety, historic impacts, traffic operations, incident management and impacts to the environment. The next section will present the expected impacts of the Preferred Alternative.