

**FINAL ENVIRONMENTAL IMPACT
STATEMENT AND FINAL
SECTION 4(f) EVALUATION**

**M-15 from I-75 to I-69
Oakland and Genesee Counties**



Prepared by

Michigan Department of Transportation

In Cooperation with

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

October 29, 2010

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 that direct agencies to provide the public and other agencies an opportunity to review and comment on proposed projects and alternatives so that potential impacts of the project can be considered and taken into account during the decision-making process. This FEIS has been prepared by MDOT, with the assistance of a team of consultants led by The Corradino Group. The Corradino Group states that it has no financial or other interest in the outcome of the project, other than its professional reputation.

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Proposed Reconstruction of M-15 from I-75 to I-69 Oakland and Genesee Counties, Michigan

FINAL ENVIRONMENTAL IMPACT STATEMENT & FINAL SECTION 4(f) EVALUATION

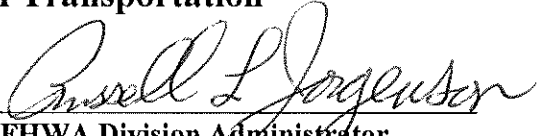
Submitted Pursuant to 42 U.S.C. 4332 (2)(c) and 49 U.S.C. 303

By The

**U.S. Department of Transportation
Federal Highway Administration
and**

Michigan Department of Transportation

April 4, 2011
Date of Approval


FHWA Division Administrator

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This Final Environmental Impact Statement and Section 4(f) Evaluation describe the social, economic, and natural environmental impacts associated with proposed improvements to 20 miles of M-15 between I-75 and I-69 in Oakland and Genesee counties. This document includes a summary of the planning basis and of the impacts associated with the proposed project and the process involved in determining the Technically and Environmentally Preferred Alternative (TEPA). *Although the information contained in this document and the following comments are based on the selection of the TEPA, the No-Build Alternative with Transportation System Management (TSM) is being chosen as the Recommended Alternative. Please see the Forward to this document for a more detailed explanation on the selection of the No-Build Alternative and how it pertains to future actions.* Mitigation measures are also included. A Section 4(f) Evaluation is included because of adverse effects on historic resources. The estimated cost of the proposed project is \$133,000,000 in year 2000 dollars. Thirty-eight residential displacements and 40 commercial displacements are anticipated. The estimate of direct wetlands effects is 12.5 acres.

Comments on this Final Environmental Impact Statement are due 30 days after the date of the publication of the Notice of Availability in the Federal Register and should be sent to: Mr. Robert H. Parsons, Michigan Department of Transportation, PO Box 30050, Lansing, Michigan 48909.

FORWARD

The Michigan Department of Transportation intends to close out the Final Environmental Impact Statement (FEIS) for M-15 between I-75 and I-69 in Oakland and Genesee Counties with the selection of the “No-Build” Alternative with Transportation System Management (TSM) operational improvements. While the FEIS does identify a Technically and Environmentally Preferred Alternative (TEPA), the decision to move forward with the No-Build Alternative is being made due to a lack of available funding to fiscally constrain the TEPA in Southeast Michigan Council of Governments (SEMCOG) Long Range Plan. MDOT has already implemented numerous TSM projects along this corridor and will continue to implement TSM type improvements such as pavement rehabilitation projects, safety improvement projects, intersection operation projects, and signalization upgrades along the corridor as funds become available. These future TSM improvements will be cleared environmentally as separate actions.

The local jurisdictions along the M-15 corridor plan to use the FEIS and the TEPA as a planning tool, to help them make future transportation and land use decisions in a manner which would not preclude future capacity improvements along the M-15 corridor. Since the TEPA was broken into logical termini or usable sections, each section could be cleared with a Categorical Exclusion (CE) or an Environmental Assessment (EA) if money for improvements is identified in the future. Since these proposed future actions will require new analysis when environmental clearance is sought, most sections of this document have not been updated with current information. All information will be reviewed and updated when individual project clearance is sought.

The project history is as follows:

- 1991 MDOT began studying the corridor for need of improvements. The “Northern Oakland County Corridor Study” was completed, but limited to Oakland County.
- 1995 DOT completed a “Preliminary Project Statement” that called for repaving the entire corridor and widening M-15 in Oakland County to 5 lanes. The M-15 Task Force was developed at this time.
- 1997 The Task Force petitioned the U.S. Congress to provide funds for improving M-15. M-15 was listed as a “high priority project” in Section 1602 of the 1998 Transportation Equity Act for the 21st Century. The act provided \$500,000 in funding for the operational improvements on M-15 from I-75 north to the Oakland/Genesee County line.
- 2002 The Draft EIS was prepared and signed on January 22. The DEIS identified a Preferred Alternative
- 2002 The Final EIS was drafted, but was never signed due to lack of funds being available to complete the project.
- 2003 - The M-15 Task force has continued to meet with stakeholder groups and operational and safety improvements have been made when the funds have been available.
- 2010 Re-evaluation of DEIS approved and signed by FHWA.

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 are those that may significantly affect the environment and 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. 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 a Final Environmental Impact Statement for the proposed improvement of M-15 from I-75 in Oakland County to I-69 in Genesee County in Michigan. It presents the Technically and Environmentally Preferred Alternative and the measures taken to minimize harm to the project area, and addresses the comments received during the public hearing process. No substantial changes to the TEPA presented at the public hearing have resulted from comments received. Additional mitigation has been identified.

The DEIS for this project was approved and signed on January 22, 2002. The Public Hearings were held February 26 & 27, 2002 in Goodrich and Ortonville, respectively. Further information regarding public involvement can be found in Section 7 of this document. This FEIS will be distributed to federal, state and local agencies, private organizations, and all members of the public making substantive comments on the DEIS. Following the comment period on the FEIS, it will be forwarded to the Federal Highway Administration (FHWA) with a recommendation that a Record of Decision (ROD) be issued. The ROD will act as Location/Design Approval, allowing the project to move forward to the design stage when funding is identified. As mentioned in the Forward, any future actions would require additional environmental review. After design come the right-of-way acquisition and construction phases. No funding has been identified past this environmental / planning phase.

Because of adverse effects on historic resources, this document also serves as coordination documentation under Section 106 of the National Historic Preservation Act of 1966, as amended, and as the Final Section 4(f) Evaluation, under Section 4(f) of the Department of Transportation Act of 1966, which also protects historic resources. The proposed action has been determined to have an adverse effect on properties that meet the criteria for listing on the National Register of Historic Places. A Memorandum of Agreement under Section 106 is also included in this document.

This document was prepared by a consultant working with the Michigan Department of Transportation (MDOT), in cooperation with FHWA. There were representatives from the following divisions within MDOT: Design, Project Planning, Real Estate, Construction and Technology, Traffic and Safety, and the Metro and Bay Regions. Information was also furnished by other federal and state agencies, local units of government, public interest groups, an Advisory Committee of stakeholders and interested local groups, and individual citizens.

This Final EIS may be reviewed at the MDOT's Lansing office at 425 West Ottawa Street (third floor), 48909; the Metro Region office at 18101 W. Nine Mile Road, Southfield, Michigan 48075; or, the Bay Region office at 55 E. Morley Drive, Saginaw, Michigan 48601. It is also available at the Brandon Township Public Library, 304 South Street, Ortonville, Michigan 48462; and, the offices of the Village of Goodrich at 7338 S. State Street, Goodrich, Michigan 48438. Technical documents referred to in this Environmental Impact Statement that support the decision-making process that led to the Technically and Environmentally Preferred Alternative are available at the same locations. Summaries are also available. The Final EIS and summaries are also available at MDOT's Transportation Service Centers at 800 Vanguard Drive, Pontiac, MI 48341 and 9495 E. Potter Road, Davison, Michigan 48423.

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SECTION 1 SUMMARY

1.1 Description of the Proposed Project

The purpose of the proposed project is to provide increased capacity and safety on M-15 between I-75 and I-69. Need has been generated by rapid growth in Oakland and Genesee counties, reflecting rapid economic expansion. M-15 needs four through travel lanes for the entirety of the corridor, to serve existing and projected travel demand and provide a safe road for the expanding corridor population.

The M-15 project area begins at I-75 in Oakland County and extends 20 miles north to I-69 in Genesee County (Figure 1-1). The Villages of Ortonville and Goodrich adjoin M-15. In each case most of the historic village center is off-line on an intersecting county primary road. The proposed project is to reconstruct M-15 to two through travel lanes in each direction. An extensive analysis, including six rounds of public meetings and a public hearing, led to a Technically and Environmentally Preferred Alternative (TEPA) that is a mix of narrow boulevard, very narrow boulevard, and five-lane construction. Ramp modifications are recommended at I-75, but no changes are proposed at I-69. No substantial changes to the Preferred Alternative, as identified in the Draft Environmental Impact Statement (DEIS), presented at the public hearing have resulted from comments received. Additional mitigation has been identified. Although the document identifies a TEPA, for reasons discussed in the **Forward** of this document, the No Build alternative with TSM will be the selected alternative.

M-15 is a two lane rural highway with narrow shoulders and ditch drainage for most of its length. From Hubbard Road south to I-75 additional lanes are provided for right and left turns. From Cranberry Lake Road south two through lanes are provided in each direction to match the cross section of the bridge over I-75. The right-of-way through much of the corridor is 120 feet. The most notable exception is through Goodrich, where the right-of-way is only 66 feet.

Historically, the M-15 corridor has been a low-density rural corridor with development focused around the communities of Ortonville in Oakland County (2000 population 1535) and Goodrich in Genesee County (2000 population 1353) (Table 1-1). Out migration from the population centers of Detroit and Flint and a very high rate of growth in Oakland County have resulted in increased residential development in the study area. Lack of alternative local roads has focused much of the travel to this development on the state trunkline, M-15. Regional planning agencies such as the Southeast Michigan Council of Governments (SEMCOG), the Oakland County Planning and Economic Development Services Division, the Genesee County Metropolitan Planning Commission, the planning units of Independence, Brandon, Groveland, Atlas and Davison townships (the first three are in Oakland County, the latter two in Genesee County), and the Villages of Ortonville and Goodrich forecast that development will continue at varying rates. Table 1-1 shows growth rates over the last decade.

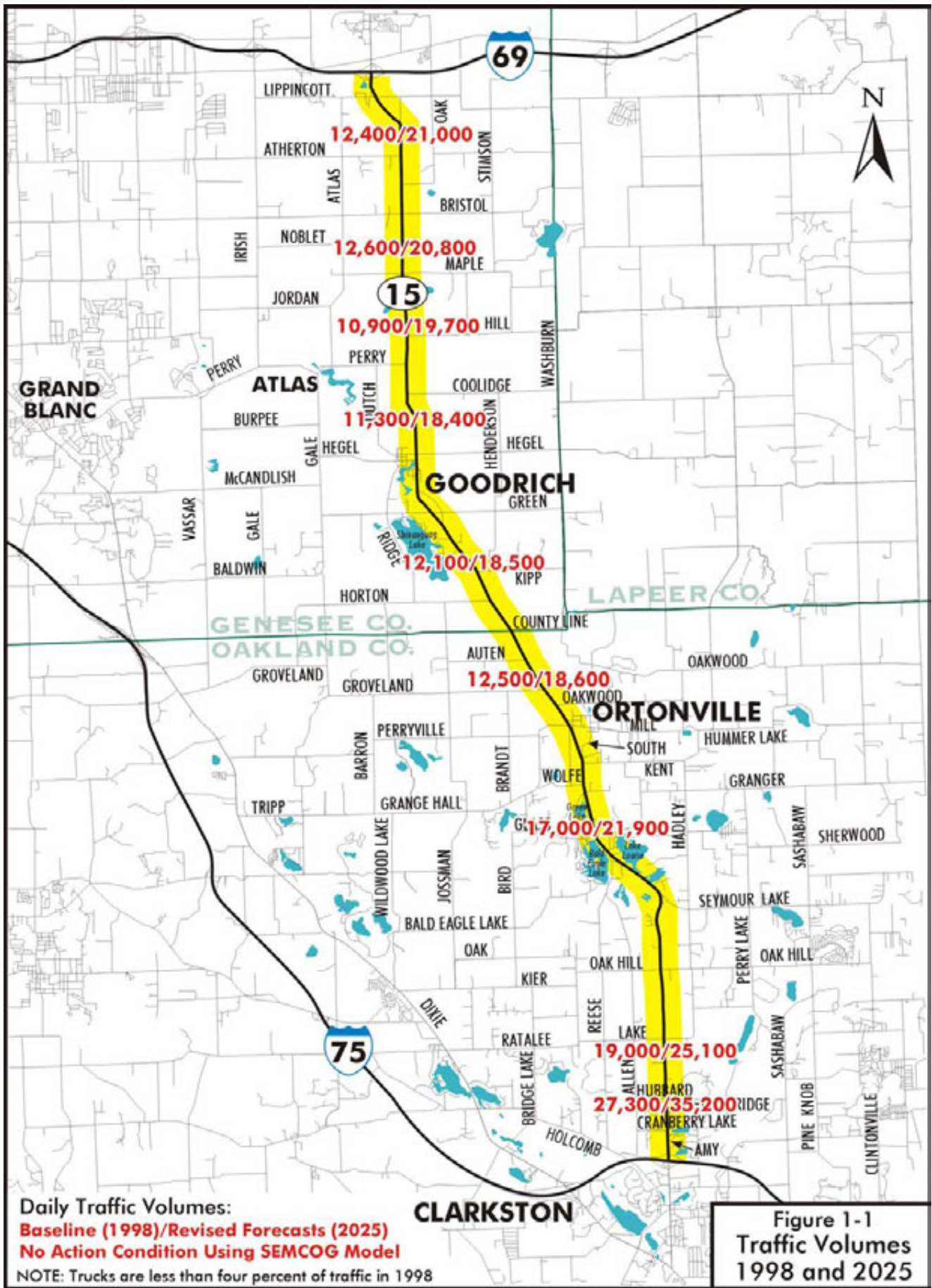


Figure 1-1
 Traffic Volumes
 1998 and 2025

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**Table 1-1
Corridor Population Growth**

Townships	1990	2000	% Growth
Independence	23717	32581	37%
Brandon	12051	14765	23%
Groveland	4705	6150	31%
Atlas	5551	7257	31%
Davison	14685	17722	21%
TOTAL	60709	78475	29%
Villages			
Ortonville	1252	1535	23%
Goodrich	916	1353	48%

Source: US Census

Note: Ortonville and Goodrich are included in the township totals.

The slowest growing area, Davison Township, had a population increase of almost 21 percent. The fastest growing area, Goodrich, grew by almost 48 percent. Overall, the townships along the corridor grew 29 percent.

M-15 is carrying increasing volumes of traffic. A Traffic Report¹ found a need for four through travel lanes throughout the corridor in the design year of 2025 (see Appendix A). Generally a two-lane road can carry up to about 14,400 vehicles a day in a semi-rural setting with two intersections per mile (Table 1-2). This volume reflects a Level of Service (LOS) of C, which FHWA considers desirable in rural settings. Absolute capacity is about 15,600 vehicles a day. (Note that a LOS of A represents free-flow conditions and LOS F reflects a breakdown of traffic flow.) Figure 1-1 shows that existing volumes already exceed LOS D in the southern section of the corridor and the forecast of future volumes demonstrates the need for four through lanes. A four-lane divided road can carry over 30,000 vehicles a day at LOS C, while a five-lane section will carry slightly fewer. The Technically and Environmentally Preferred Alternative will operate at LOS C or better over its entire length in 2025.

**Table 1-2
General Annual Daily Capacity in Areas Transitioning into Urbanized Areas**
(Interrupted Flow with >0.00 to 1.99 signalized intersection per mile)

Lane Condition	Level of Service				
	A	B	C	D	E
2 Undivided	N/A	10,000	14,400	15,600	15,600
4 Divided	N/A	22,000	30,500	32,800	32,800
6 Divided	N/A	33,500	46,000	49,200	49,200

Source: Florida Department of Transportation

Note: D and E capacity is the same, as it is controlled by intersection capacity.

¹ "Traffic Report, M-15—I-75 to I-69," The Corradino Group, November 2001.

1.2 Alternatives and Selection of the Technically and Environmentally Preferred Alternative

Several improvement alternatives were analyzed for this project, as were the No-Build Alternative and a Mass Transit Alternative. The three “build alternatives” were: 1) Low Cost Improvements / Transportation Systems Management; 2) New Alignments; and, 3) M-15 Reconstruction. These alternatives were developed from the public involvement process. Documentation of the alternatives analysis process is found in three technical memoranda prepared for the study². The Technically and Environmentally Preferred Alternative is M-15 reconstruction to a combination of five-lane and boulevard cross sections.

1.2.1 No-Build Alternative (Recommended Alternative)

The No-Build Alternative, has been chosen as the Recommended Alternative, would consist of continued regular maintenance of M-15. Additionally, it will also include some of the improvements mentioned below in Section 1.2.2. The four-lane section of M-15 through Goodrich was re-stripped in 1999 as a safety project from four lanes to three (center turn-lane configuration) with some curb added. M-15 was repaved in Genesee County in 1999 and in Oakland County in 2000. Minor improvements to shoulders and guard rails occurred at these times. Traffic signals have also been added as congestion has increased. The Recommended Alternative would continue this pattern of maintenance and minor adjustments. It would not require the acquisition of additional right-of-way. Unacceptable levels of traffic service would result if traffic volumes continuing to increase.

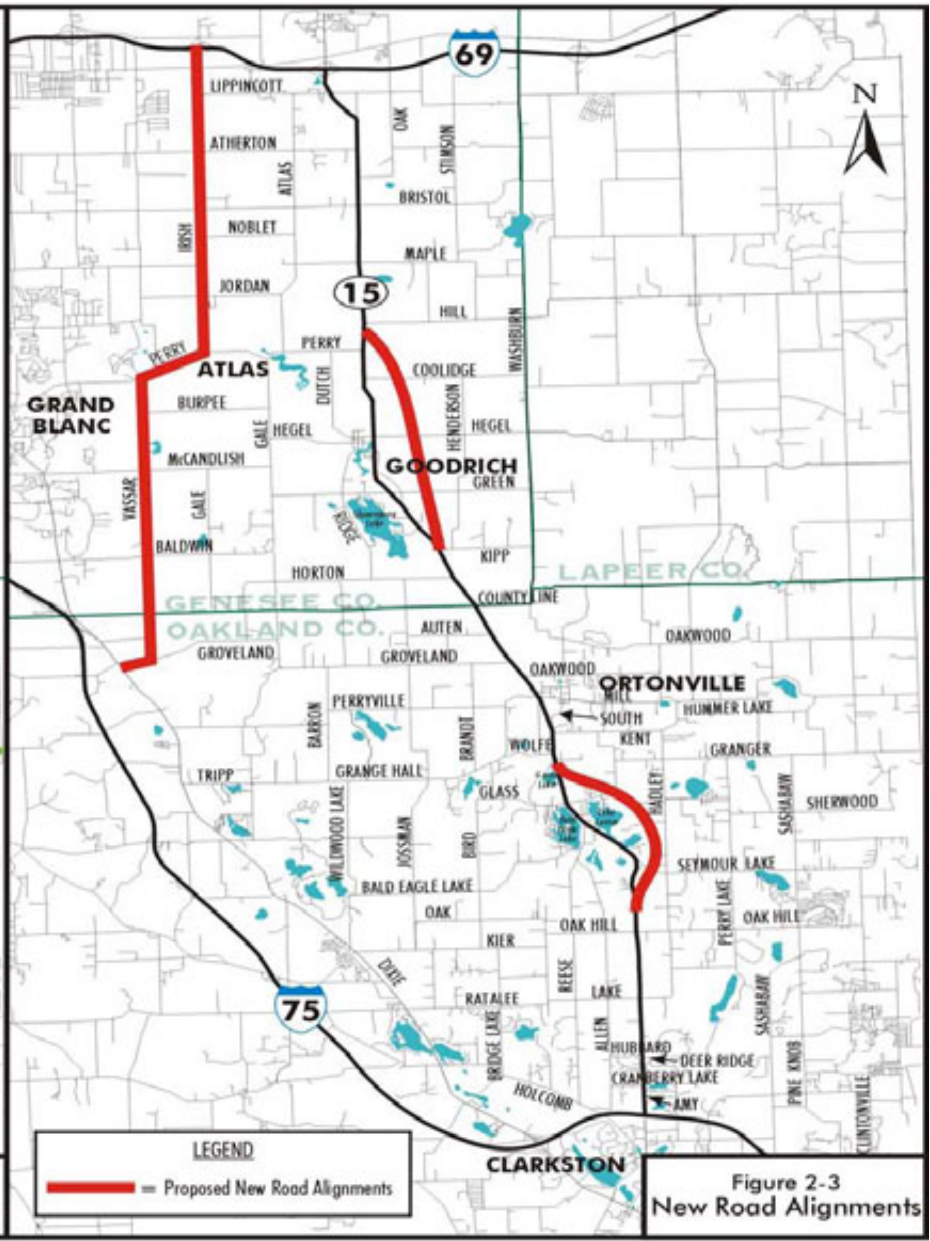
1.2.2 Low-Cost Improvements / Transportation Systems Management

This alternative called for paving of gravel roads to provide alternative routes to M-15, upgrading intersections along M-15, improving incident management, improving access control, and encouraging reduced trips (Figure 1-2). Travel analysis found it did not meet the purpose and need for the project. Even with all the proposed measures in place, projected traffic volumes showed a need of four through-travel lanes along the entire length of M-15.

1.2.3 New Alignments

These options considered improving Irish Road (west of and parallel to M-15 in the north section of the corridor) and constructing bypasses of the Village of Goodrich or the Glass Road / Seymour Lake area (Figure 1-3). Traffic modeling found these potential alternative routings, tested separately, would not divert sufficient traffic from M-15 to meet the purpose and need of the project. The testing included variations of the land use development scenario used in the travel model for the area. One variation reallocated land use in the corridor based on local government input so that development is shifted north towards I-69 from Oakland County. Another land use scenario reduced the growth in Atlas Township by 75 percent. Under both scenarios the demand on M-15 for four lanes remained. Therefore, none of these alternatives could meet the project purpose and need.

² “Technical Memorandum No. 1, Study Area Conditions & Illustrative Alternatives” The Corradino Group, August 2000. “Technical Memorandum No. 2, Evaluation of Illustrative Alternatives” The Corradino Group, October 2000. “Technical Memorandum No. 3, Evaluation of Practical Alternatives” The Corradino Group, March 2001.



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1.2.4 M-15 Reconstruction

Because traffic forecasts show four through travel lanes are required to meet travel demand, the “super-2” and three-lane options were discarded. Given the need for turning movements through the length of the corridor, little application of a four-lane road was found, compared to a five-lane section, which allows for turn movements at all required locations. A narrow boulevard with a typical cross section of 172 feet was found to have merit from traffic and safety standpoints, while still allowing turns as required. A wide boulevard, by comparison, was found to have substantially more impacts than the narrow boulevard, as its proposed right-of-way was about 30 feet wider. The wide boulevard was dropped from further consideration when the narrow boulevard was found to be equal from a traffic standpoint and acceptable from a design standpoint.

1.2.5 Alternatives Eliminated from Further Study

Even under the best-case scenario the Mass Transit, Low-Cost / TSM alternatives could not reduce or divert travel demand to the point that two lanes for through travel in each direction were not needed. Therefore, they were eliminated because they are not practical alternatives.

The bypass alternatives and the Irish Road option did not divert sufficient travel from M-15 to reduce the need for four through travel lanes. Therefore, they were eliminated because they are not practical options.

Super-2 and three-lane alternatives could not meet the project purpose and need of four through travel lanes and therefore eliminated. The full-width or “wide” boulevard was more intrusive and caused more impacts than the “narrow” boulevard, so the latter was favored and the former eliminated because it is not a practical option.

1.2.6 Selection of Technically and Environmentally Preferred Alternative

The narrow boulevard and five-lane sections were considered practical alternatives and were evaluated further on a sector-by-sector basis (Table 1-3). (Note that information in Table 1-3 reflects then current – Spring 2001 – information, which was later refined.) Generally, the narrow boulevard was found most attractive, especially from the standpoint of safety and aesthetics (Figure 1-4). A “very narrow” boulevard concept was developed as a variation of the five-lane cross section. Where there is no need for turns, the center turn lane can become a very narrow median with no curb cuts, meaning no turns are allowed. This preserves most of the aesthetics and safety advantages of the boulevard, while requiring less right-of-way. The presence of wetlands means there are few driveways, so the very narrow boulevard could be used to minimize right-of-way acquisition.

The evaluation process involved the public, which scored the evaluation measures and participated in the discussion of evaluation results. The full evaluation process that led from illustrative alternatives, to practical alternatives, to a preferred alternative presented at the public hearing is documented in the three technical memoranda cited previously. During this evaluation process, it was determined that segments A2 and E should be broken down into shorter segments to refine the cross section types. Also, a one-way pair through Goodrich was eliminated from further consideration because of planned development. The concept of the very narrow boulevard matured and was more closely defined for application in the developed segment north of Cranberry Lake Road and in a section with wetlands and a historic site north of Ortonville. The information in Table 1-3 was adjusted for the new segments. The result was the Preferred Alternative carried to the public hearing.

**Table 1-3
Evaluation Data
Practical Alternatives to Widening M-15**

Sector	Sector A				Sector B								Sector C											
	A2 - 3.64 miles				B1 - 2.14 miles				B2 - 1.25 miles				B3 - 1.25 miles				C1 - 1.70 miles				C2 - 0.59 miles			
	S of Lippincott to Hill				Hill to N of Hegel				N of Hegel to Green (Goodrich)				Green to Kipp				Kipp to Auten				Auten to Groveland			
Improvement	Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		One-way Pair ¹		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Very Narrow Blvd.	
Factor	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.
1. Displacements																								
Homes	3	0.8	46	12.6	0	0.0	7	3.3	3	2.4	3	2.4	0	0.0	0	0.0	1	0.6	5	2.9	0	0.0	1	1.7
Businesses	2	0.5	4	1.1	0	0.0	0	0.0	11	8.8	10	8.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Vacant DU Lots ²	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	2.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2. Histories (Properties Directly Affected)																								
Maybe Nat. Reg.	1	--	1	--	0	--	0	--	1	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
3. Wetlands (acres)																								
Highest value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.16	1.45	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	2.66	1.57	2.66
Medium value	0.74	0.20	1.22	0.34	0.02	0.01	0.04	0.02	0.01	0.01	0.38	0.30	0.01	0.01	0.03	0.02	0.05	0.03	0.10	0.06	0.00	0.00	0.00	0.00
Lowest value	2.28	0.63	4.71	1.29	0.16	0.07	0.31	0.14	0.07	0.06	0.14	0.11	0.07	0.06	0.14	0.11	0.03	0.02	0.08	0.05	0.00	0.00	0.00	0.00
Total (acres)	3.02	0.83	5.93	1.63	0.18	0.08	0.35	0.16	1.53	1.22	1.97	1.58	0.08	0.06	0.17	0.14	0.08	0.05	0.18	0.11	1.57	2.66	1.57	2.66
4. Community Cohesion																								
High/Medium/Low	Medium		Medium		Medium		Medium		High		Medium to High		Medium		Medium		Medium		Medium		Medium		Medium	
5. Construction Cost																								
(Millions of 2001 \$)	\$13.20	\$3.63	\$14.66	\$4.03	\$7.28	\$3.40	\$7.37	\$3.44	\$4.57	\$3.66	\$6.46	\$5.17	\$4.18	\$3.34	\$4.40	\$3.52	\$5.06	\$2.98	\$5.11	\$3.01	\$2.52	\$4.27	\$2.58	\$4.37
6 Roadway Safety																								
Total Crashes Year 2025	167	45.9	75	20.6	86	40.2	39	18.2	54	43.2	24	19.2	54	43.2	24	19.2	76	44.7	34	20.0	26	44.1	12	20.3

Source: The Corradino Group

Note that information in Table 1-3 reflects then current – Spring 2001 – information, which was later refined.

¹In Goodrich (Sector B2) a one-way pair would be developed.

²The number of platted but "unbuilt" residential lots that may be required. DU means dwelling unit.

Table 1-3 (continued)
Evaluation Data
Practical Alternatives to Widening M-15

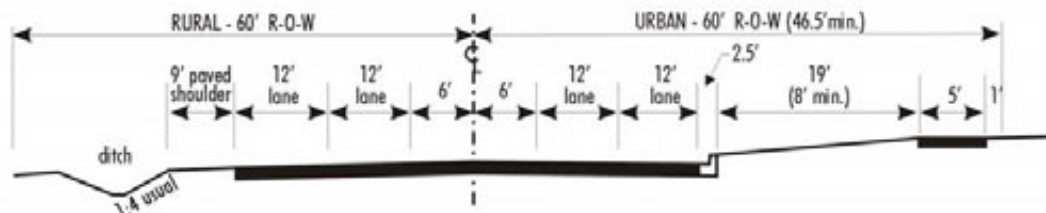
Sector	Sector D				Sector E				Sector F								Total			
	D - 1.80 miles				E - 3.79 miles				F1 – 2.20 miles				F2 - 1.25 miles				20.27 miles			
Improvement	Groveland to Wolfe (Ortonville)				Wolfe to Oak Hill				Oak Hill to N of Hubbard				N of Hubbard to I-75				I-69 to I-75			
	Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.	
Factor	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.
1. Displacements																				
Homes	0	0.0	4	2.8	0	0.0	10	2.6	1	0.5	8	3.6	1	0.8	1	0.8	9	0.4	86	4.2
Businesses	3	1.7	16	8.9	6	1.6	22	5.8	0	0.0	1	0.5	0	0.0	0	0.0	22	1.1	55	2.7
Vacant DU Lot ²	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.1
2. Histories (Properties Directly Affected)																				
Maybe Nat. Reg.	2	--	2	--	0	--	1	--	0	--	0	--	1	--	1	--	5	--	5	--
3. Wetlands (acres)																				
Highest value	0.53	0.29	1.03	0.57	2.22	0.59	4.02	1.06	0.62	0.28	1.01	0.46	0.00	0.00	0.00	0.00	6.39	0.32	9.08	0.45
Medium value	0.80	0.44	1.55	0.86	0.96	0.25	1.50	0.40	0.04	0.02	0.09	0.04	0.00	0.00	0.00	0.00	2.63	0.13	4.91	0.24
Lowest value	0.17	0.09	0.23	0.13	0.76	0.20	2.24	0.59	0.00	0.00	0.06	0.03	0.00	0.00	0.00	0.00	3.54	0.18	7.91	0.39
Total (acres)	1.50	0.83	2.81	1.56	3.94	1.04	7.76	2.05	0.66	0.30	1.16	0.53	0.00	0.00	0.00	0.00	12.56	0.62	21.90	1.08
4. Community Cohesion																				
High/Medium/Low	Medium		Medium		Medium		Medium		Medium		Medium		Medium		Medium		NA		NA	
5. Construction Cost																				
(Millions of 2001 dollars)	\$6.56	\$3.64	\$7.21	\$4.01	\$13.96	\$3.68	\$18.87	\$4.98	\$8.28	\$3.76	\$9.53	\$4.33	\$3.70	\$2.96	\$4.82	\$3.86	\$69.31	\$3.53	\$81.01	\$4.11
6 Roadway Safety																				
Total Crashes Year 2025	89	49.44	40	22.2	204	53.8	92	24.3	119	54.1	53	24.1	95	76.0	43	34.4	1002.0	49.4	468.0	23.1

Source: The Corradino Group

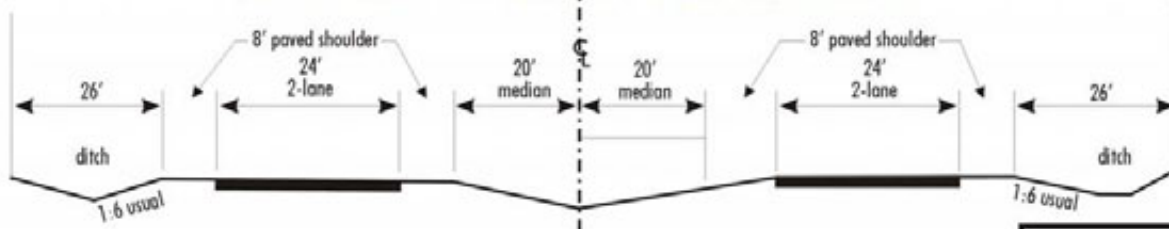
Note that information in Table 1-3 reflects then current – Spring 2001 – information, which was later refined.

¹In Goodrich (Sector B2) a one-way pair would be developed.

²The number of platted but "unbuilt" residential lots that may be required. DU means dwelling unit.



TYPICAL RURAL/URBAN 5-LANE, 93'-120' R-O-W



TYPICAL NARROW BOULEVARD, 172' R-O-W

Figure 1-4
Road Types

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The key to development of the Preferred Alternative presented at the public hearing was the rigorous evaluation process that examined the corridor on a sector-by-sector basis. Due to the extent of historic and wetland resources, these resources were identified at an early stage; so optional alignments and cross sections could be evaluated with the goal of avoiding and minimizing these resources at the outset.

Comments received during the circulation of the DEIS have not resulted in any changes in the advantages of the Preferred Alternative as presented at the public hearing. Thus, that alternative is now considered the Technically and Environmentally Preferred Alternative (Figure 1-5).

The Technically and Environmentally Preferred Alternative incorporates the strengths of each cross section to maximize safety and traffic flow, while minimizing impacts to wetlands and historic resources. It is a blend of five-lane road, narrow boulevard, and very narrow boulevard. The Engineering Report³ for the project shows the existing roadway and Technically and Environmentally Preferred Alternative, including the proposed right-of-way plotted on an aerial photograph (see Appendix B).

1.3 Impacts

The following is a summary of the impacts associated with the No-Build, Recommended Alternative and the Technically and Environmentally Preferred Alternative (Table 1-4). A more detailed description of impacts is found in Section 4. Proposed mitigation measures are found in Section 5.

1.3.1 Traffic and Safety

The proposed project will substantially improve traffic flow over the Recommended Alternative. The entire length of the corridor will operate at a Level of Service (LOS) of C or better in the design year (2025), if the Technically and Environmentally Preferred Alternative is implemented, compared to breakdown conditions in the south end of the corridor with the Recommended Alternative. The Technically and Environmentally Preferred Alternative would be expected to reduce the number of total crashes in 2025 by about 60 (or about 10 %), when compared to the Recommended Alternative. Additional crash data can be found in **Section 2.2.5**.

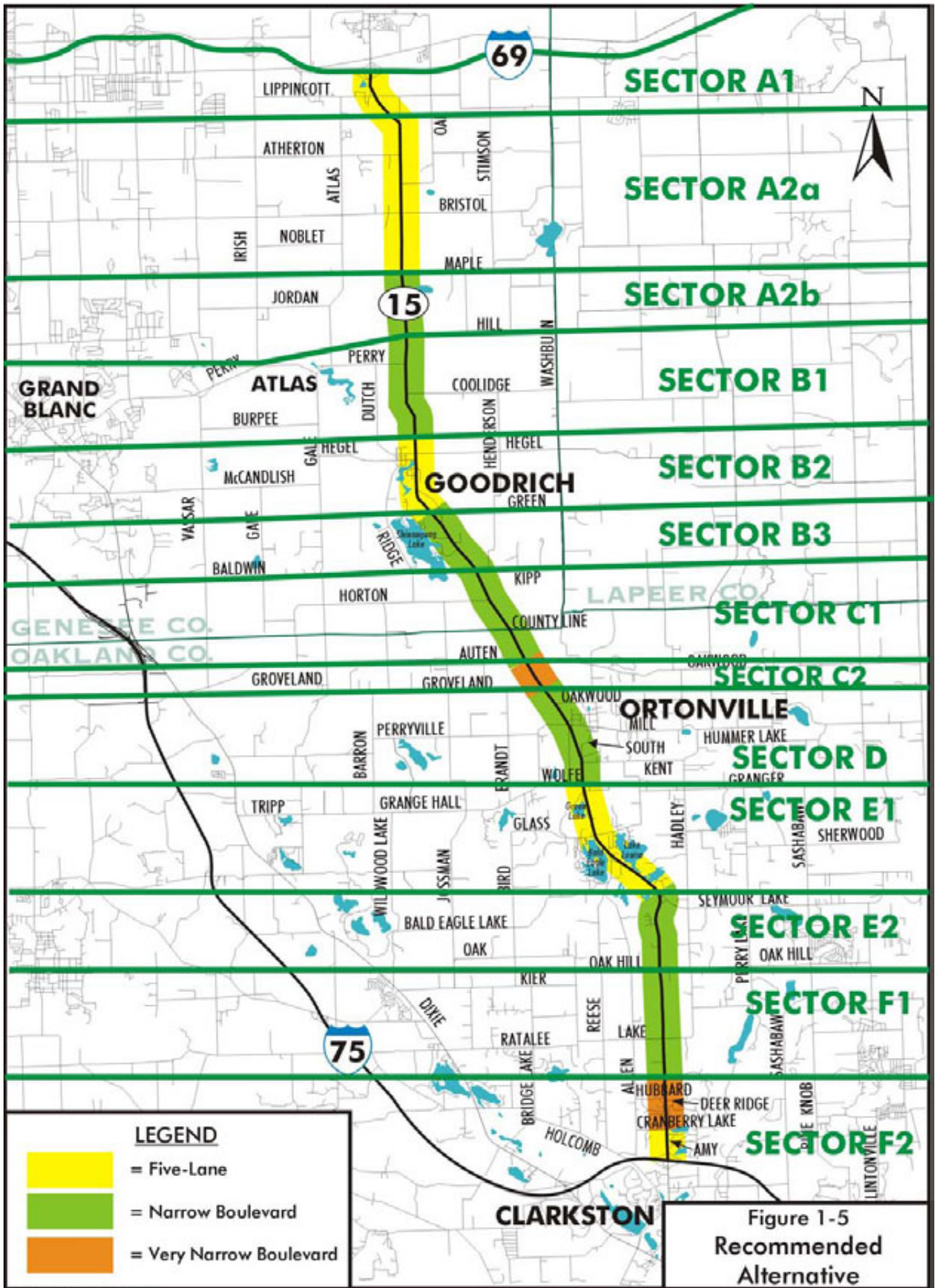
1.3.2 Relocations, Community Cohesion, Environmental Justice, Land Use, and Farmland

The proposed project is expected to require the relocation of 38 dwelling units (all single-family residences) and 40 businesses that provide about 200 jobs. Adequate relocation housing and commercial space is available in the corridor.

Increased traffic will make it more difficult to cross the road, which is detrimental to community cohesion, if no action is taken. Providing a boulevard section in key locations such as in Independence Township and in Ortonville responds to community desires expressed during the course of the study to develop a road that supports community cohesion, by providing opportunities for landscaping, village identification, and an intermediate dwell space for those crossing the road.

A review of data on low-income and minority populations finds the project would not result in disproportionately high and/or adverse human health or environmental effects on minority or low-income populations.

³ "Preliminary Engineering Report," Orchard, Hiltz and McCliment, March 2003.



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**Table 1-4
Summary of Impacts for the TEPA**

Impact Category	Expected Impact
Traffic and Safety	M-15 will improve to at least Level of Service C. Safety will improve.
Relocations	38 single-family residences, 40 businesses, 200 employees.
Community Cohesion	Existing high speed, two-lane rural road acts as barrier. Five-lane sections will continue this. Boulevard sections offer community enhancement and a mid-road refuge for pedestrians and bicyclists.
Environmental Justice	No disproportionately high and adverse human health or environmental effects on minority or low-income populations.
Land Use	Consistent with planning documents. Several documents emphasize improved access and management control.
Farmland/Act 451, Part 361 Land	3 acres of active farmland needed. No prime or unique farmlands. No Act 451, Part 361 lands.
Economics	Added capacity responds to growth. Tax base losses from right-of-way acquisition represent 0.014 % of the property taxes collected in townships and villages in corridor.
Air Quality	Project will reduce idle emissions and improve traffic flow. No violations of the National Ambient Air Quality Standard for carbon monoxide. Computer modeling of conformity is necessary after project inclusion in SEMCOG's and Genesee County Metropolitan Planning Commission's long-range plans.
Noise	175 dwelling units exposed to 66 dBA or more (residential criterion), compared to 145 with No-Build. No mitigation is reasonable because of either front yard exposure and/or low density of homes affected.
Surface Water Impacts	1 lake crossing, 2 pond crossings, 5 perennial stream crossings (3 crossings are cold-water streams), 6 intermittent stream crossings, 3 county drain crossings. Increased stormwater flow to surface waters. Relocation of 320 feet of Duck Creek, a cold-water stream.
Wetlands	5.34 acres of Palustrine Forested, 7.11 acres of other wetland types. Total 12.45 acres of impact. 18.1 acres of mitigation under Section 303. Any mitigation under Section 301 at permit stage.
Threatened/Endangered Species	1 state threatened and 3 state special concern species found. Empty valves (shells) of a special concern mussel found. Habitat of Eastern massasauga rattlesnake present at wetland mitigation site.
Cultural Resources	12 potential <i>National Register</i> eligible sites affected. Adverse effects on several sites, requiring Section 4(f) Evaluation and Memorandum of Agreement. Phase II analysis required at one archaeological site.
Parks/Recreation	No contiguous parks. M-15 is Michigan's first Heritage Recreational Route.
Visual Conditions	Mix of five-lane and boulevard cross sections in response to local desire for aesthetic road.
Contaminated Sites	31 sites total are recommended for further testing, including: 1 dump; 7 sites potentially affected by hazardous material handling; and, 23 underground storage tank sites.
Soils	Organic soils and wetlands pose greatest challenge. This is a manageable situation.
Utility Systems	Relocation of sewer line on west side of M-15 north of Bristol Road. No effect on high-tension electric line.
Indirect and Cumulative	Project responds to growth (29 % in 1990s). Construction in advance of growth can accelerate the rate of growth. Construction after most growth will help restore quality of life. Future resource impacts from development are subject to local, state, and federal laws and regulations.
Energy	Energy used during construction. Fuel savings from improved traffic flow upon opening.
Project Cost	2001 Cost 2009 Cost
Right-of-way	\$ 35.0 million x 7% = \$54.6 million
Construction	\$ 78.4 million x 7% = \$122.3 million
Design & Management	\$ 19.6 million x 3.5% = \$25.1 million
Total	\$ 133.0 million = \$202 million in 2009 dollars

Source: The Corradino Group

Rapid growth in Oakland County puts continued pressure on communities and townships in the corridor that have grown very rapidly in the last decade (Table 1-1). Undeveloped land, in most cases already zoned for low-density residential use will continue to develop with or without the project. The proposed improvements are consistent with local and regional land use planning.

Approximately three acres of active farmland would be needed by the project. No prime and unique farmlands would be taken, nor any land enrolled in the P.A. 233 program.

1.3.3 Economics

Economic activity in the project area is generated by a variety of market sectors including retail trade, services, education, and public administration. The corridor has been subject to rapid development. This trend is expected to continue.

M-15 provides access to land suitable for residential development, which has contributed to today's congestion and continued predictions of population and traffic growth. Adding capacity to M-15 is a response to the growth that has already occurred and the growth predicted by the local political jurisdictions in the corridor.

Property acquisition will result in a reduction in real property tax revenues of about \$362,000, based on the right-of-way cost estimate. This represents only 0.014 percent of the property taxes collected by the townships and villages in the corridor. The largest effect would be on Ortonville, which has a relatively small tax base and the least amount of undeveloped property. The increase in State Equalized Value of township and village properties over the coming years will outweigh potential losses. Adequate opportunities exist for most of the relocated businesses and residents to relocate within the corridor, minimizing potential tax losses.

1.3.4 Air Quality

Air quality will improve, as there will be less idling and smoother traffic flow. A test of carbon monoxide (CO) concentrations at the busiest intersection in the M-15 corridor where humans might be present found the ambient air quality standard would not be violated under either build or no build conditions. Approval of the Final EIS for this project requires that the project be added to the long-range plans of the Southeast Michigan Council of Governments (SEMCOG) and the Genesee County Metropolitan Planning Commission after a determination of air quality conformity.

1.3.5 Noise

It is forecast that the Technically and Environmentally Preferred Alternative will expose 175 dwelling units to noise of 66 dBA or higher (the threshold for determining the residential properties impacted), compared to 145 with the Recommended Alternative. No mitigation is reasonable because noise-mitigating walls are not effective when placed in the front of homes with gaps created for driveways and/or the density of housing is low.

1.3.6 Ecological Resources

Approximately 12.45 acres of wetlands would be directly affected (some is already roadway right-of-way), requiring replacement through agreement with the Michigan Department of Environmental Quality (MDEQ) and the U.S. Army Corps of Engineers (see Section 5.12 for a discussion of mitigation). The Recommended Alternative would continue existing effects on

wetlands, unabated. Additional impacts due to increased traffic volumes are also likely under the Recommended Alternative. Locations of wetlands, historic sites, potentially contaminated sites, and sites reviewed in the threatened and endangered species inventory are presented in Figure 1-6 and Table 1-5.

The project was in compliance with Executive Order 11990, "Protection of Wetlands" based on the selection of the TEPA. If future actions take place the impacts will be re-evaluated again and there is assurance that all practicable measures to minimize harm to wetlands that may result from such use.

Surface water quality will be protected by erosion control and stormwater management during construction and after. The Recommended, No-Build Alternative would not change existing drainage patterns or flow.

Best management practices for stormwater, especially in the form of grass swales, will be used by MDOT to reduce pollutant loadings in receiving waters, increase recharge to groundwater by infiltration, and minimize increased peak flows brought by the increase in impervious surface. In boulevard sections the depressed grass median can serve these purposes. In curb and gutter sections adjacent to wetlands the stormwater can be carried to grass swales or areas of sheet flow over grass. Previous analysis by MDOT has found use of grass swales to be an effective measure to reduce pollutant loadings in stormwater.⁴

The Technically and Environmentally Preferred Alternative will increase stormwater flow to receiving streams, including two cold-water streams, Duck Creek and Kearsley Creek. Approximately 320 feet of Duck Creek south of Ortonville will be relocated.

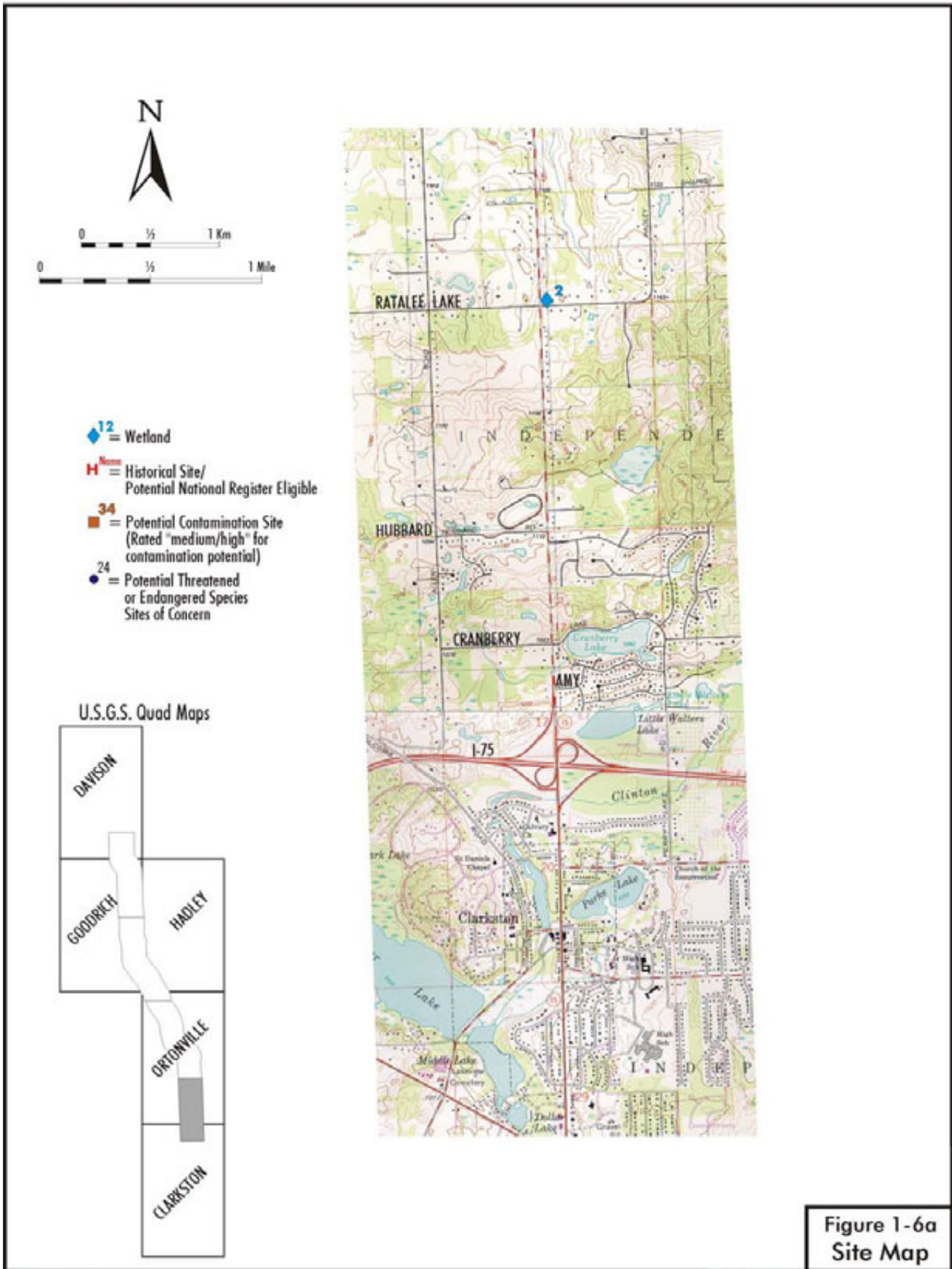
No known federal threatened and endangered species will be affected. Potential habitat for the Eastern massasauga rattlesnake (a candidate for federal listing) may be present at the mitigation site east of M-15, north of Oakwood Road. One state-listed threatened species, the spotted turtle, and three state-listed species of special concern (Wahoo plant, Red mulberry tree, and Blandings turtle) were found during plant and wildlife surveys. Habitat for eight other state-listed species is present, however, none of these species were observed during the surveys. Kearsley Creek and Duck Creek are designated coldwater trout streams and are the only creeks in the Flint River watershed that support brown trout and native mottled sculpin. Two empty valves of a slippershell mussel (*Alasmidonta viridis*), a specie of special concern, were found in Duck Creek south of Ortonville.

1.3.7 Cultural Resources and Parkland

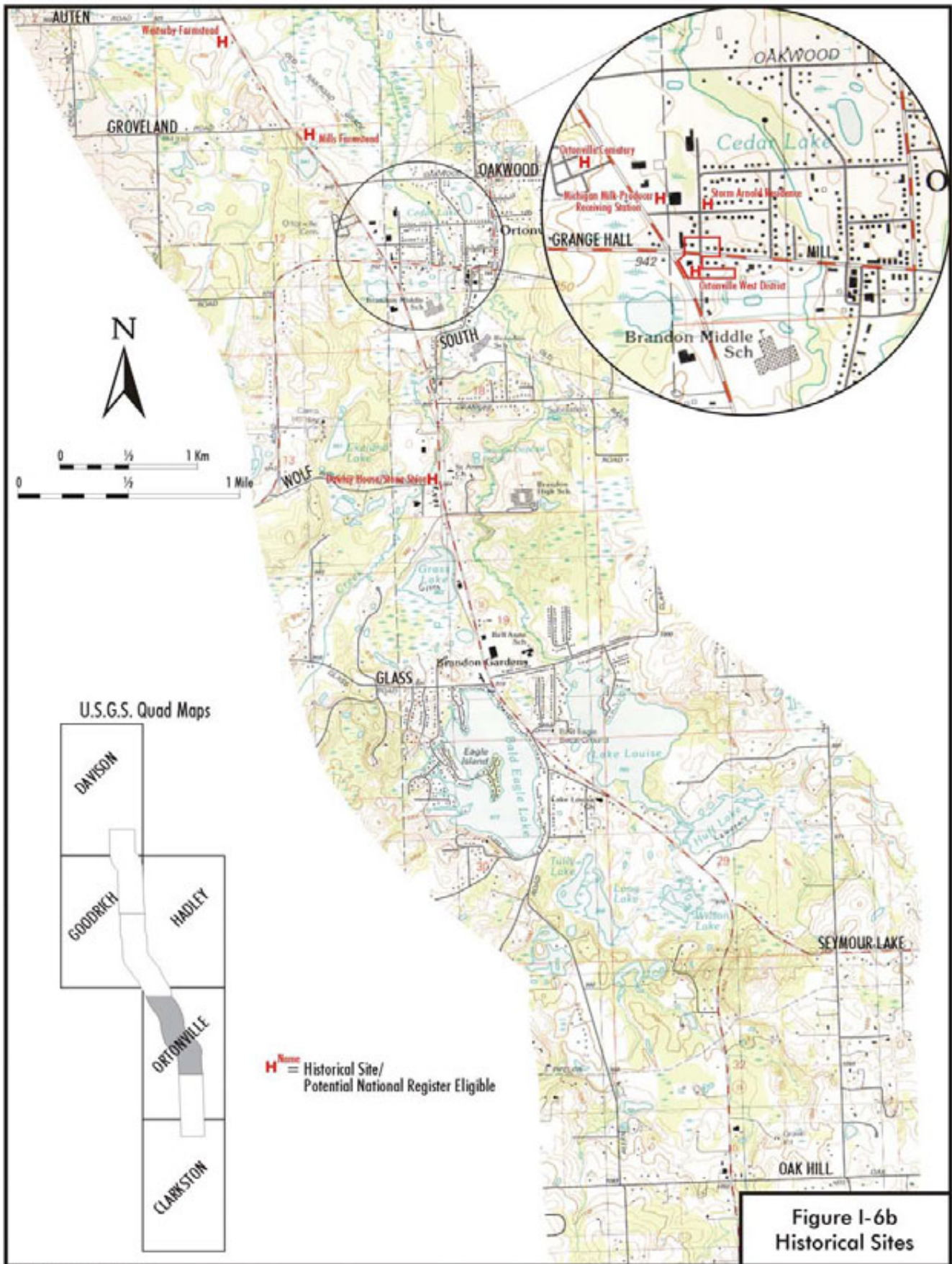
The project would have adverse effects on several sites that are considered potentially eligible for the *National Register of Historic Places*, requiring a Memorandum of Agreement (MOA) with the State Historic Preservation Officer (SHPO) (Appendix L). Phase II analysis will be required at one archaeological site. The impacts result from the taking of strips of land from sites for right-of-way. Mitigation will take the form of preparation of photographic documentation and historical overviews of the historic properties and landscaping in accordance with the MOA. The analysis and MOA are in compliance with Section 106 of the National Historic Preservation Act of 1966.

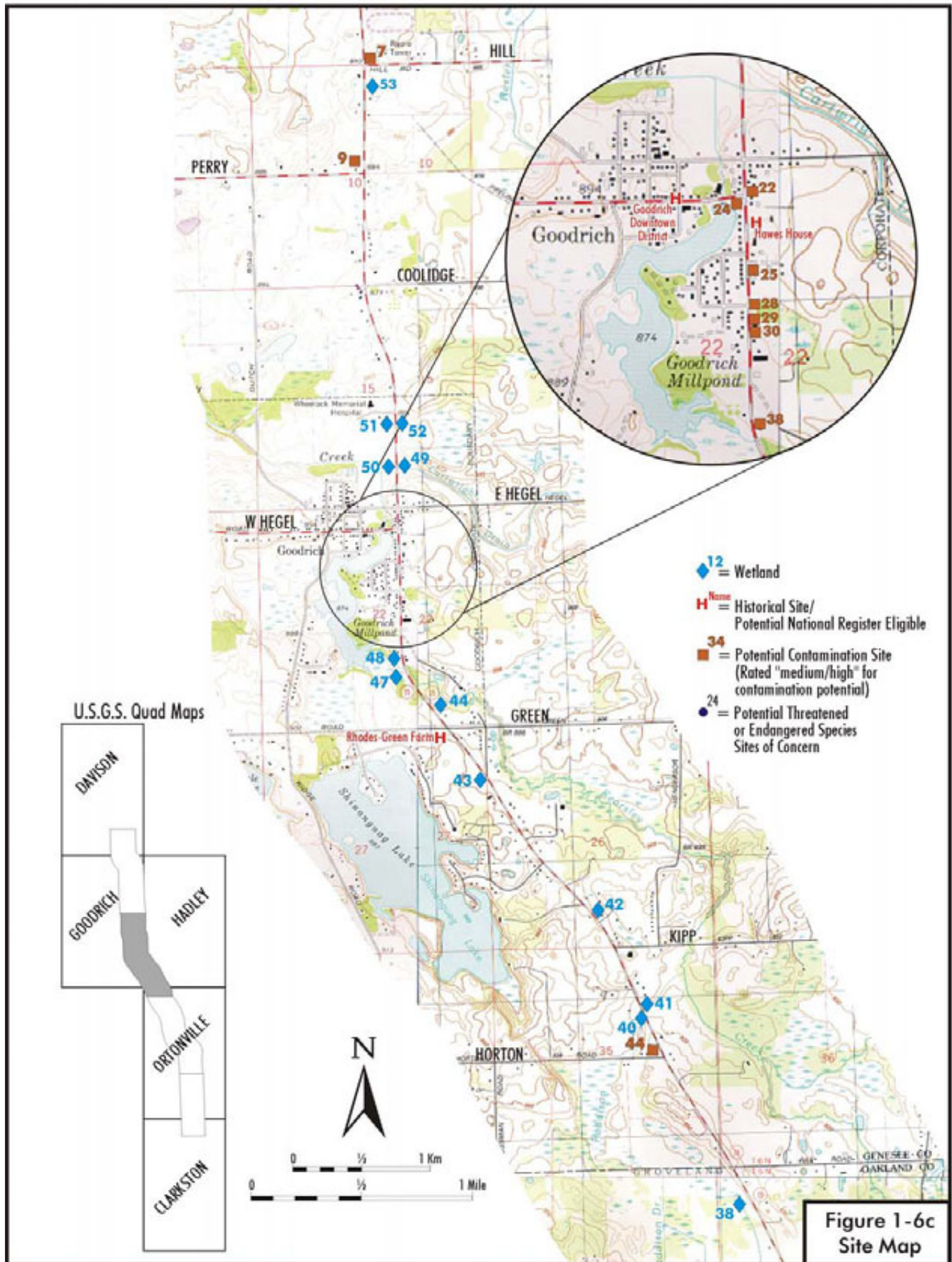
No parks will be affected.

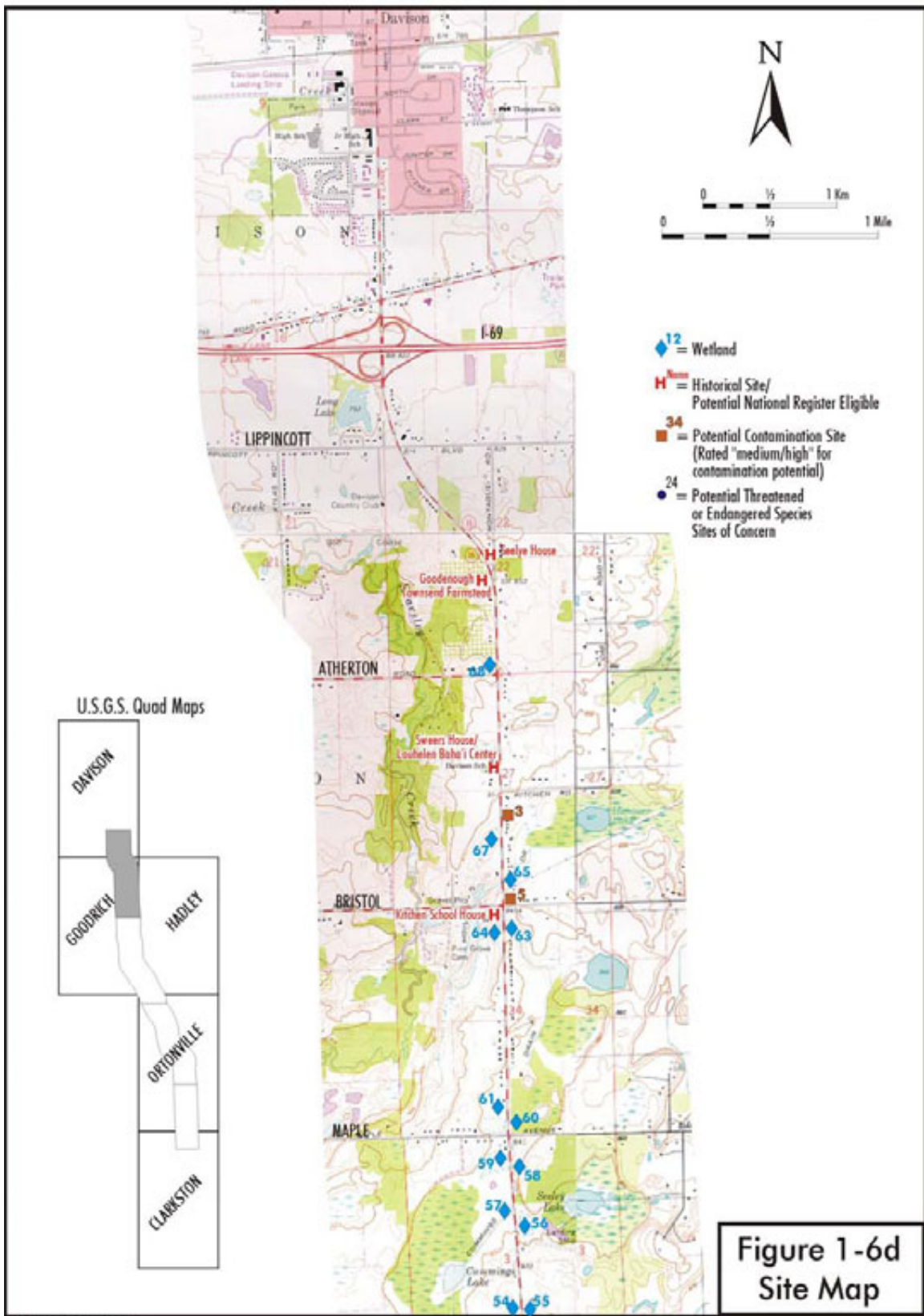
⁴ "Highway Stormwater Runoff Study," CH2MHill, April 1998.



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**Table 1-5a
Wetland Sites Shown on Figure 1-6**

Wetland ID	Figure Number	Priority ¹ Class	Roadway Type	Wetland Community Classification	Percent of Total Wetland Acreage Affected ²	Total Acres Impact	Percent PFO or Lake Fringe	Lake Fringe or PFO Impact (Acres)	POW/PSS/PEM Impact (Acres)	Description
W68	1-6d	3	5-lane	PEM	.01	0.01	0	0.00	0.01	Cattail, elm, aster; organic muck soils with some recent mineral soil deposition
W67	1-6d	2	5-lane	PEM	2.0	0.16	0	0.00	0.16	Cattail, few elm, lake fringe; gray mineral soils with bright mottles
W65	1-6d	3	5-lane	PEM	0.0	0.01	0	0.00	0.01	Hoyle Drain; cattail, boxelder, reed canary grass, blue vervain, duck weed; organic muck soils
W64	1-6d	3	5-lane	PEM	0.0	0.005	0	0.00	0.005	Hoyle Drain; cattail, boxelder, reed canary grass, blue vervain, duck weed; organic muck soils
W63	1-6d	2	5-lane	PFO/PEM	6.9	0.08	88	0.07	0.01	Cummings Drain, floodplain, Carex sp., inundated, loamy grayish soil with bright mottles, mineral sediment, some muck soils on east side
W61	1-6d	3	5-lane	PEM/PSS	7.3	0.33	0	0.00	0.33	Cattails, phragmites, elm, elder, gray dogwood; organic soils
W60	1-6d	1	5-lane	PFO	4.1	0.52	100	0.52	0.00	Cummings Drain, ash, cottonwood, silver maple; organic soils
W59	1-6d	3	Narrow blvd	PEM/PSS	100.0	0.15	0	0.00	0.15	Drain w/cattails, dogwood; organic muck soils
W58	1-6d	3	Narrow blvd	PFO	0.3	0.42	100	0.42	0.00	Cummings Drain, silver maple, cottonwood; organic muck soils
W57	1-6d	2	Narrow blvd	POF/PSS	0.1	0.21	10	0.02	0.19	Drain with cattails, willows, ash; mucky sands
W56	1-6d	3	Narrow blvd	PFO/PEM/PSS	0.2	0.22	5	0.01	0.21	Cattail, dogwood, willow; grayish mineral soils with bright mottles

Note: footnotes at end of table.

**Table 1-5a
Wetland Sites Shown on Figure 1-6 (Continued)**

Wetland ID	Figure Number	Priority ¹ Class	Roadway Type	Wetland Community Classification	Percent of Total Wetland Acreage Affected ²	Total Acres Impact	Percent PFO or Lake Fringe	Lake Fringe or PFO Impact (Acres)	POW/PSS/PEM Impact (Acres)	Description
W55	1-6d	2	Narrow blvd	PFO/PEM	18.2	0.20	90	0.18	0.02	Green ash, elm, 6" watermarks, buttressed roots, organic muck soils
W54	1- 6d	2	Narrow blvd	PFO/PEM	54.2	0.13	30	0.05	0.08	Elm, reed canary grass; grayish loam soils with bright mottles
W53	1- 6c	3	Narrow blvd	PFO/PEM	9.1	0.11	10	0.01	0.10	Cattails; organic muck soils.
W52	1- 6c	3	Narrow blvd	PFO/PEM	45.0	0.19	28	0.05	0.14	Cottonwood, ash, phragmites, reed canary grass, typha; mucky loam soils
W51	1- 6c	3	Narrow blvd	PEM	0.1	0.02	0	0.00	0.02	Open water and reed canary grass associated with drain; grayish loamy soils with bright mottles
W50	1- 6c	2	Narrow blvd	PEM	0.1	0.01	0	0.00	0.01	Reed canary grass, Cartwright Drain; inundation
W49	1- 6c	2	Narrow blvd	PEM	2.2	0.01	0	0.00	0.02	Reed canary grass, Cartwright Drain; inundation
W48	1- 6c	1	5-lane	PFO/PEM/PSS	0.5	0.50	0	0.05	0.45	Cattails, sedges, red osier dogwood, black ash; organic muck soils, inundation, saturation
W47	1- 6c	1	5-lane	PFO/PEM	0.3	0.30	60	0.18	0.12	Green ash, elm, water marks, buttressed roots, reed canary grass, organic muck soils
W44	1- 6c	1	5-lane	PFO/ROW ³	0.7	0.65	100	0.66	0.07	Elm, ash, cottonwood, skunk cabbage; associated with Kearsley Creek; muck soils
W43	1- 6c	2	Narrow blvd	PFO/PSS	3.3	0.03	33	0.01	0.01	Silver maple, cottonwood, cattails; organic muck soils
W42	1- 6c	3	Narrow blvd	PEM	37.5	0.06	0	0.00	0.06	Cattails; mucky sands

Note: footnotes at end of table.

**Table 1-5a
Wetland Sites Shown on Figure 1-6 (Continued)**

Wetland ID	Figure Number	Priority ¹ Class	Roadway Type	Wetland Community Classification	Percent of Total Wetland Acreage Affected ²	Total Acres Impact	Percent PFO or Lake Fringe	Lake Fringe or PFO Impact (Acres)	POW/PSS/PEM Impact (Acres)	Description
W41	1- 6c	3	Narrow blvd	PEM	6.7	0.01	0	0.00	0.01	Reed canary grass, tussock sedge; inundated (Paddison Drain)
W40	1- 6c	3	Narrow blvd	PEM	5.3	0.01	0	0.00	0.01	Reed canary grass, tussock sedge; inundated (Paddison Drain)
W38	1- 6c	2	Narrow blvd	PEM/PSS	3.0	0.10	0	0.00	0.10	Reed canary grass, Grey dogwood, Spiraea alba; mucky loam (85% PEM)
W37	1- 6b	1	Very narrow blvd	PEM	2.4	0.34	0	0.00	0.34	Includes "fen" species: pitcher plants, shrubby cinquefoil, spiraea, cattails; mucky peat soil
W36c	1- 6b	1	Very narrow blvd	PEM	0.3	0.45	0	0.00	0.45	Includes "fen" species; northern half is reed canary grass/sedge meadow; southern half is fen with shrubby cinquefoil, twig rush; muck soils
W36b	1- 6b	1	Very narrow blvd	PEM/PSS	0.3	0.47	0	0.00	0.47	PEM/PSS with fen species; shrubby cinquefoil, twig rush, spirea, tamarack; muck soil
W36a	1- 6b	1	Very narrow blvd	PFO/PEM/PSS	4.8	0.54	21	0.11	0.43	Mixed community of green ash, willow, reed canary grass, sedges, red osier dogwood
W35	1- 6b	3	Very narrow blvd	PEM/POW	100.0	0.16	0	0.00	0.16	70% PEM: cattails, reed canary grass; mucky sand soils; 30% POW
W34	1-6b	2	Very narrow blvd	LOW/LEM ³	9.1	0.73	0	0.04	0.69	Reed canary grass; inundated

Note: footnotes at end of table.

**Table 1-5a
Wetland Sites Shown on Figure 1-6 (Continued)**

Wetland ID	Figure Number	Priority ¹ Class	Roadway Type	Wetland Community Classification	Percent of Total Wetland Acreage Affected ²	Total Acres Impact	Percent PFO or Lake Fringe	Lake Fringe or PFO Impact (Acres)	POW/PSS/PEM Impact (Acres)	Description
W33	1-6b	3	Narrow blvd	PEM/POW	0.3	0.09	0	0.00	0.09	West side: Typha, Salix, Sambucus canadensis; East side next to school soccer field: POW, sensitive fern, reed canary grass, cattails; mucky sands, inundated
W32	1-6b	2	Narrow blvd	PEM	5.2	0.13	0	0.00	0.13	Reed canary grass, cattail; organic soils
W31	1-6b	2	Narrow blvd	PEM/PSS	0.5	0.27	0	0.00	0.27	Red osier dogwood, willow, cattail, sedges, organic soil
W30	1-6b	1	Narrow blvd	ROW ³	0.4	0.12	0	0.00	0.12	Duck Creek with little or no wetland fringe
W29	1-6b	1	Narrow blvd	REM/ROW ³	0.8	0.37	0	0.00	0.37	Sedges, cattail wetland with Duck Creek; organic soils; inundated
W27	1-6b	1	Narrow blvd	PFO/PSS/REM/ROW ³	2.5	0.19	5	0.01	0.18	Wetlands with Duck Creek; 65% cattail REM; 30% red osier dogwood PSS; 5%PFO with ash, cottonwood; organic soils
W26	1-6b	1	Narrow blvd	PFO/PSS/REM/ROW ³	18.7	0.43	10	0.04	0.39	Reed canary grass, dogwood, ash wetland associated with Duck Creek
W25	1-6b	2	Narrow blvd	ROW ³	22.5	0.45	0	0.00	0.45	Duck Creek (channelized) no wetland fringe
W24	1-6b	2	5-lane	PFO	0.1	0.10	100	0.10	0.00	Boxelder, ash, cottonwood, reed canary grass; mucky sand soils; Green Lake-lake-fringing wetland
W12	1-6b	3	5-lane	PEM	7.4	0.90	0	0.00	0.90	Cattails, giant reed; organic soils
W10.5	1-6b	3	Narrow blvd	PEM	57.1	0.08	0	0.00	0.08	Cattails; organic soils
W10	1-6b	3	Narrow blvd	PEM	51.4	0.72	0	0.00	0.72	Cattails; organic soils

Note: footnotes at end of table.

**Table 1-5a
Wetland Sites Shown on Figure 1-6 (Continued)**

Wetland ID	Figure Number	Priority ¹ Class	Roadway Type	Wetland Community Classification	Percent of Total Wetland Acreage Affected ²	Total Acres Impact	Percent PFO or Lake Fringe	Lake Fringe or PFO Impact (Acres)	POW/PSS/PEM Impact (Acres)	Description
W9	1-6b	3	Narrow blvd	PFO	100.0	0.05	100	0.05	0.00	Cottonwood, silver maple
W8	1-6b	2	Narrow blvd	PEM	0.8	0.25	0	0.00	0.25	Cattail; mucky sand soils
W7	1-6b	2	Narrow blvd	PEM	0.2	0.15	0	0.00	0.15	Cattail; mucky sand soils
W5	1-6b	2	Narrow blvd	PEM/PSS	7.4	0.26	0	0.00	0.26	Dogwood, reed canary grass; mucky sand soils
W4	1-6b	1	Narrow blvd	PFO	95.0	0.19	0	0.19	0.00	Black willow, silver maple green ash; grayish loam soils with bright mottles
W3	1-6b	1	Narrow blvd	PFO/PSS	17.4	0.47	80	0.37	0.09	Cottonwood, silver maple, 20% PSS (dogwood); grayish loam soils with bright mottles
W2	1-a	3	Narrow blvd	PFO/PEM	2.0	0.02	40	0.01	0.01	Elms, turf grasses; grayish loam soil with bright mottles
Total					0.8	12.45		3.16	9.29	

Source: Tilton and Associates

¹Priority classes applied to this project were: 1, highest quality; 2, medium quality; and 3, lowest quality.

²For wetlands contiguous to the project, the percent of acreage that is impacted by the project.

³Mitigation for Lacustrine and Riverine Open Water (LOW and ROW) may be required during permitting.

P – Palustrine L – Lacustrine R - Riverine
EM – Emergent SS – Shrub-Scrub FO – Forested
OW – Open-Water

Note: All wetland impacts will be mitigated because of the use of federal funds (E.O. 11990).

**Table 1-5b
Potential National Register Historical and Archaeological Sites Shown on Figure 1-6**

Site Name	Location	Description	Effect
Dawley Residence / Stone Store	850 Ortonville West side M-15 north of Wolfe Road	Former residence, now gift shop with stone pillars in existing right-of-way, circa 1916	New right-of-way would be about 40' into yard for wider road.
Ortonville West District	Mill Street, clustered at Narrin Street	Queen Anne style house built on George Narrin's land	New right-of-way will demolish 46 Mill Street garage.
Michigan Milk Producers Receiving Station	126 N Ortonville Road. East side M-15 N of Myron Street	Example of small Art Moderne style industrial facility	New right-of-way line would be about 10' from building.
Ortonville Cemetery	West side M-15 south of Oak Wood Road	Cemetery, circa 1840-1940	Existing pavement edge would be maintained. No effect on historic portion of cemetery.
Mills Farmstead	610 N Ortonville Road. East side M-15 at Groveland Road	Circa 1860 well preserved farm	Existing right-of-way line maintained.
J. Westerby Farmstead	1215 N Ortonville Road	Example of popular trend in fieldstone cladding, circa 1880	Existing right-of-way line maintained.
Rhodes-Green Farm Historic District	10448 Green Road. West side M-15	Association with an early settler and agriculture, circa 1860/1881	New right-of-way would be about 20' to 30' into yard for wider road.
Henry Hawes Residence Historic District	8083 State Street. East side M-15 in Goodrich	Italianate architectural example, circa 1870	New right-of-way would be about 30' into front yard, including two large trees.
Kitchen School House	4010 State Road on SW corner M-15 and Bristol	Early school, circa 1870	Existing right-of-way line maintained.
Freeman Sweets Residence / Louhelen Baha'i Center	3208 State Road. West side M-15 north of Bristol Road	House circa 1885. Retreat founded in 1931 as Baha'i faith school and center	Existing right-of-way line maintained, but trees may be removed.
Goodenough Townsend Residence	2430 State Road	Example of residential Gabled-Ell architecture, circa 1875	New right-of-way would be 20'+ into front yard with smaller trees likely removed, but larger yard trees remaining.
Seelye House	2224 Montague backing up to M-15	Example of residential brick Gabled-Ell architecture, circa 1875	New right-of-way would be about 30' into back yard.
20OK480	East side M-15 south of Oak Hill Road	Archaeological remains of farmstead	Phase II testing required to determine National Register eligibility. New right-of-way would extend over much of site.

Source: Commonwealth Cultural Resources Group

**Table 1-5c
Potential Contamination Sites Shown on Figure 1-6**

SID No.	Site Name (Former Name or Use)	Address or Location	City	Records/ Observations						ROW W or A	Contamination Potential Rating	Comment	
				CERCLIS/NPL	MI Contam. Sites	LUST	UST	RCRIS (Haz. Waste)	AST				Other ¹
3	Zips Party Store (Zirnhelms County Market)	3355 S State Rd	Davison			X-c	X				W	M/H	Gas Station
5	Vacant Garage, NE corner of Bristol Rd & M-15	Bristol Rd/M-15	Davison							X	W	M/H	Old Gas Station
7	Last Chance Party Store	5545 S State Rd	Davison						X	X	W	M/H	Old Gas Station
9	Burton Industries	6202 S State Rd	Goodrich					X			W	M/H	Haz Materials
22	Church & Sons Auto Center (Kellys Auto Repair)	8039 S State Rd	Goodrich			X-c	X	X	X		W	M/H	Gas Station
24	Quick-Sav Food Stores	10318 Hegel Rd	Goodrich				X	X			W	M/H	Gas Station
25	Vacant Lot, SE corner of Hawes & M-15	Hawes/M-15	Goodrich							X	W	M/H	Old Gas Station
28	Morts Barber Shop/Goodrich Cleaners	8191-93 State Rd	Goodrich							X	W	M/H	Old Gas Station
29	Town Pride Carpet	8217 State Rd	Goodrich							X	W	M/H	Old Gas Station
30	Goodrich Car Care (Oakhill Auto Restoration)	8221-23 S State Rd	Goodrich			X-o	X	X			W	M/H	Old Gas Station
38	Nu View Auto Glass/Car Wash	8355 State Rd	Goodrich			X-c	X	X			W	M/H	Old Gas Station
44	Vacant Commercial Bldg	Horton Rd & M-15	Goodrich							X	W	M/H	Old Gas Station
48	Recovery Systems Int. (Allflo Products)	160 N Ortonville Rd	Ortonville					X			W	L	Haz Materials
49	Engineering Tube Specialties (former dairy)	Ortonville Rd	Ortonville							X	W	M/H	Haz Materials
51	Rite Aid (Waterlock Solvents)	1 Mill Street	Ortonville					X			W	M/H	Old Dry Cleaners
52	Ace Hardware (Waterlock Solvents)	4 N Ortonville Rd.	Ortonville							X	W	M/H	Old Dry Cleaners
53	Marathon Station (CMS/Boron)	15 N Ortonville Rd.	Ortonville			X-o	X	X		X	W	M/H	Gas Station

Source: The Corradino Group

Notes: ¹Other potential contamination sites identified by reconnaissance and/or interviews.

LUST - Leaking underground storage tank; X-c = Closed case; X-o = Open case.

UST - Underground storage tank AST - Aboveground storage tank

CERCLIS – Comprehensive Environmental Response, Compensation and Liability Information System

RCRIS – Resource Conservation and Recovery Information System

W = Within Right-of-Way, A = Adjacent to Right-of-Way.

**Table 1-5c
Potential Contamination Sites Shown on Figure 1-6 (Continued)**

SID No.	Site Name (Former Name or Use)	Address or Location	City	Records/ Observations						ROW W or A	Contamination Potential Rating	Comment	
				CERCLIS/NPL	MI Contam. Sites	LUST	UST	RCRIS (Haz. Waste)	AST				Other ¹
54	Closed Garage (Futura Collision)	12 M-15	Ortonville					X		X	W	M/H	Haz Mat/Old Gas Sta.
55	Little Caesars (former gas station)	11 S Ortonville Rd	Ortonville					X		X	W	M/H	Old Gas Station
64	Vacant Commercial Bldg (Bell Auto Parts)	384 Ortonville Rd	Ortonville							X	W	M/H	Haz Materials
70	Country Countertops	490 S Ortonville Rd	Ortonville								W	M/H	Old Gas Station
71	Clark Station	495 S Ortonville Rd	Ortonville				X	X		X	W	M/H	Gas Station
73	Brandon Tire & Auto Center	595 S Ortonville Rd	Ortonville					X			W	M/H	Haz Materials
81	Forster Auto Wash	880 S Ortonville Rd	Ortonville							X	W	M/H	Old Gas Station
83	James Lumber Co. (Brandon Building Center, Oxford Lumber)	910 S Ortonville Rd	Ortonville				X				W	M/H	Old UST Site
91	J & F Collision, Inc.	1342 S Ortonville Rd	Ortonville					X		X	W	M/H	Haz Materials
97	Eagle Point Shopping Center (former gas station)	1764-76 S Ortonville Rd	Ortonville							X	W	M/H	Old Gas Station
101	Alderman Animal Hospital (former gas station)	2140 S Ortonville Rd	Ortonville				X				W	M/H	Old Gas Station
106	Former Dump (near Solley's Appliances)	S Ortonville Rd	Clarkston							X	W	M/H	Old Dump
108	Oakhill Auto Parts/MVA Contr/City Press	3960-80 S Ortonville Rd	Clarkston					X		X	W	M/H	Haz Materials
110	And I Do (Oakhill Auto Restoration)	3994 S Ortonville Rd	Ortonville					X		X	W	M/H	Haz Materials
124	Mill Street Residential Wells	Mill Street	Ortonville		X						W	M/H	GW Contamination

Source: The Corradino Group

**Table 1-5d
Potential Threatened or Endangered Species Sites Shown on Figure 1-6**

Site #	Avoided/Affected	Species	Listing Status
Site 25	Site avoided	Wahoo	State special concern
Site 28	Site affected	Wahoo	State special concern
Site 34	Site avoided	Red mulberry	State special concern
Site 40	Site avoided	Blanding's turtle	State special concern
Sites 47 & 48	Site affected, but turtle habitat avoided	Spotted turtle	State threatened

Source: V3 Consultants

1.3.8 Visual Conditions

The dominant visual characteristic of the corridor is large-lot residential uses punctuated by lakes and wetlands, and in Genesee County, rural landscapes, both natural and manmade (farmlands). Commercial strip development occurs near Ortonville and at the north and south ends of Goodrich. Commercial/office uses dominate the visual scene near Lippincott Road in Davison Township.

When improvements to M-15 were proposed in the early 1990s in the form of a five-lane road, Independence and Brandon Township expressed a desire for a more aesthetically pleasing road – a boulevard. The aesthetic attributes of the boulevard have been recognized to integrate better with the character of the corridor and so, the Technically and Environmentally Preferred Alternative mixes five-lane and boulevard cross sections. The narrow boulevard or very narrow boulevard will be constructed in designated segments within the project limits to minimize adverse impacts on wetlands and other natural resources.

1.3.9 Hazardous Materials

Although further testing for hazardous materials is recommended at a number of sites, no substantial problems with contaminated materials are anticipated.

1.3.10 Soils and Utilities

Organic soils, especially in wetland areas, will require special construction techniques.

Reconstruction of M-15 at the north end of the corridor could affect sections of a sewer line along the west right-of-way line north at Bristol Road. A high-tension electrical line north of County Line Road would not be affected as the towers are well outside the right-of-way. Other effects on utilities would be consistent with normal utility relocation for roadway projects.

1.3.11 Indirect and Cumulative Impacts

Interviews in a number of communities in the corridor revealed a strong interest in controlling growth in the area. In addition, the communities in the corridor have all passed resolutions endorsing an access management strategy. MDOT will assist these communities to identify and implement appropriate access management techniques. The successful implementation of an access management strategy can both preserve the functionality of the existing roadway and the Technically and Environmentally Preferred Alternative in the face of continued growth.

The general trend has been to zone residential areas for large lot development. The lack of sewers has historically limited the density of development, including commercial and industrial uses.

The townships in the corridor have not pursued paving local and county roads as travel alternatives to M-15 (Independence Township and, to a lesser extent, Davison Township are exceptions). Consequently, M-15 has been and continues to be the focus of growth and travel in the corridor. Tremendous growth in the employment base in Oakland County and a general movement to the outer limits of both Oakland and Genesee counties has resulted in a market for much residential development in the corridor, as evidenced by the population growth data shown in Table 1-1.

Widening M-15 addresses a need already in evidence. There is no indication that land use policies will limit growth to a level that the need for four lanes of through travel on M-15 is eliminated. Growth has and will occur whether or not M-15 is reconstructed. Reconstruction of M-15 keeps roadway development in step with overall development.

If nothing were done to improve M-15, growth will continue to occur as individuals develop their properties, consistent with local zoning. The population of the townships in the project area grew 29 percent over the last ten years with no improvement to M-15. Continued growth will lead to breakdown conditions on M-15 and the entire corridor will be over capacity during peak periods. The successful implementation of an access management strategy will not prevent breakdown conditions from occurring on M-15, but it might delay their onset.

Increased traffic will be detrimental to community cohesion, if no action is taken. Improving M-15 will improve air quality by reducing congestion, lessening idling, and smoothing traffic flow.

If nothing were done, crashes will increase at a faster rate than if the project were built, and, it is estimated that there will be 707 crashes in 2025. It is estimated with the Technically and Environmentally Preferred Alternative, M-15 will experience 644 crashes in 2025. Successful implementation of an access management strategy, if it were to occur, may lead to reductions in crashes under both the Recommended and the Technically and Environmentally Preferred Alternative. The number of crashes that are likely to be avoided/prevented by an access management strategy is highly dependent on the elements of the strategy adopted and cannot be properly estimated until after the strategy has been developed.

In conclusion, no significant indirect or cumulative impacts are foreseen if M-15 were widened, based on regional and local land use and infrastructure plans, and a comprehensive evaluation of alternatives to widening M-15. This is expected even if shifts in growth were to occur. However, local jurisdictions must continue to enforce their vision of future land uses to prove that assessment to be accurate. Future resource impacts from development are subject to local, state, and federal laws and regulations.

A review of trends in: the economy, including the auto industry; population shifts away from the core of Detroit, especially during the 1970s; the decline in farming and the rollover in land use to residential; the implementation of wetland protection; and, other factors, finds that development along M-15 reflects a complex mix of forces, such that the widening of M-15 is not anticipated to have a significant cumulative effect. Indirect and cumulative resources are discussed in detail in Section 4.18.

1.3.12 Energy

Fuel savings to motorists should be realized with the implementation of the TEPA in the long term due to improved traffic flow. Motorists will also be able to maintain more constant traveling speeds, adding to their fuel savings.

1.3.13 Cost

The estimated cost of construction for the TEPA is \$ 78.4 million and the right-of-way cost is \$ 35.0 million. Adding design and construction management costs, the result is a total project cost estimated at \$133.0 million in year 2000 dollars.

1.4 Areas of Controversy

The principle areas of controversy, apart from typical issues arising out of right-of-way needs, are road widening through the Village of Goodrich and Atlas Township (see Section 7.4 and letters and resolutions in Appendix C), use of wetlands, and impacts to resources potentially eligible for the *National Register of Historic Places*. MDOT will continue to work with the Village of Goodrich and Atlas Township to find a less intrusive solution in that part of the corridor.

1.5 Permits

Proposed construction activities will involve the need for permits in several areas. Impacts on bodies of water such as lakes, streams, drains, and wetlands will require permits under federal and state law:

Federal

- Executive Order 11990
- Clean Water Act of 1977, as amended: Section 401, state Water Quality Certification; Section 402(p), National Pollutant Discharge Elimination System, stormwater permit; and, Section 404, related to dredge and fill.

Federal Executive Order 11990 states that when federal funds are used on a project, impacts to any wetland (regardless of size) will require that there be no practicable alternative to impacts on that wetland. This “finding” is made in Section 1.3.6.

Section 401 of the Clean Water Act of 1977, as amended, requires certification from the state’s water quality agency (MDEQ) to ensure that the discharge of dredged or fill material complies with the provisions of the Federal Water Pollution Control Act.

Section 402(p) of the Clean Water Act and subsequent regulation under 40 CFR 122.26 requires a National Pollutant Discharge Elimination System Storm Water discharge permit for construction projects that involve land clearing of five acres or greater. Permit application requirements include: 1) a location map and description of the nature of the construction activity; 2) location of the proposed discharge; 3) total area of the site and area to be disturbed; 4) an estimate of the runoff coefficient of the site and the increase in impervious area after construction is complete; and, 5) the nature of the fill. The intent of these requirements is to reduce impacts on water quality during and after construction.

Section 404 of the Clean Water Act requires a permit from the MDEQ (acting for the U.S. Army Corps of Engineers) for the excavation and discharge of dredged and/or fill material in "waters of the United States," including wetlands. Section 401 water quality certification from MDEQ is required prior to the issuance of the Section 404 permit.

State – Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended:

- Part 31, Water Resource Protection
- Part 301, Inland Lakes and Streams
- Part 303, 1979 Goemaere-Anderson Wetland Protection Act
- Part 365, 1974 Endangered Species Protection.

Parts 31 and 301 of Michigan Act 451 are administered by the MDEQ. A Part 31 permit (which is reviewed and issued with the Part 301 application) is needed to place fill material within any part of a floodplain with a drainage area of two square miles or more. A Part 301 permit is required for any work below the ordinary high-water mark of any inland lake, stream or drain, including the placement of any permanent or temporary river or stream structure.

A Part 303 wetland permit is required for any wetland disturbance, permanent, as well as temporary. The Part 303 permit is reviewed and issued with the Part 301 permit. A Part 303 permit is required before placement of a bituminous or concrete proportioning plant in any wetland area. The project engineer should have on file any agreements between the contractor and property owner, and a copy of the wetland permit, prior to the installation of any proportioning plants or placement of any fill in a private or public wetland.

A Part 365 Endangered Species Permit is required from the MDNR Wildlife Division for any activity that may impact a state-listed threatened or endangered fish, plant, or animal species. No endangered or threatened species were found; however, if any are identified during project implementation, all activity in the immediate area would cease. Coordination with the U.S. Fish and Wildlife Service would be initiated as required by Section 7 of the Endangered Species Act of 1973, and appropriate state and federal permits would be sought.

All bituminous and Portland Cement concrete proportioning plants and crushers must meet the requirements of the rules of the MDEQ. For any portable bituminous or concrete plant or crusher, the contractor must apply for a permit-to-install or general permit. This permit should be applied for a minimum of 30 calendar days before plant installation with an active MDEQ permit (or 60 calendar days for plants not previously permitted in Michigan).

Final mitigation measures proposed in areas requiring the above permits will be developed in consultation with the appropriate agencies, and will be included in the permit application for implementing the project.

1.6 Unresolved Issues

As indicated in Section 7, Atlas Township and the Village of Goodrich have expressed opposition to the project. In response to coordination by MDOT, the Village of Goodrich withdrew its opposition, and Atlas Township has agreed to continue working with MDOT. MDOT will continue to work with the Village of Goodrich and Atlas Township to find a less intrusive solution in that part of the corridor. The first step will be an Access Management Study.

1.7 Project Status

This project is included in appropriate planning documents as listed below:

- MDOT's State Long Range Plan 2000-2025 – listed for study to gain clearance for the 20-mile section between I-75 and I-69
- MDOT's Five-Year Road and Bridge Program – listed as a study
- SEMCOG's 2025 Regional Transportation Plan – listed as a study
- Flint Genesee County 2025 Long-Range Transportation Plan – identified for study throughout its length in Genesee County.

The project will likely be staged such that construction can begin at either end.

As a separate project that was completed in the summer of 2003, enhancements near Ortonville in the form of pedestrian bridges, streetlights, trees, sidewalk ramps and landscaped islands. This work was completed in conjunction with MDOT's Heritage Recreational Route Program.

It is not anticipated that construction of the Technically and Environmentally Preferred Alternative will occur due to funding constraints. While the project would improve capacity along M-15 between I-75 and I-69. It is one of a number of capacity improvement projects statewide that have been deferred, as MDOT is dedicated to a "preserve first" philosophy. This philosophy is to improve the existing infrastructure, and the goal is to restore 95 percent of Michigan's freeways and 85 percent of its non-freeways to a "good" condition by 2007. Deferred projects will be added to the Five-Year Program on a priority basis, based on available funding, when MDOT can meet and sustain the condition goal and when addition revenues are available.

As time goes on, MDOT will adhere to the applicable rules with respect to reviews and reassessments of this document. In the meantime, completing this document well in advance of construction provides necessary planning guidance to the communities in the corridor.

Further, wetland mitigation sites have been identified for this project. If the need for wetland mitigation is necessary based on future actions, MDOT will re-evaluate the impacts and follow our standard practices for replacement and mitigation.

When planning for the project began in 1994, an M-15 Task Force of local officials formed. That Task Force continues to meet. MDOT will continue to work with the Task Force to identify and correct, where possible, operational problems as they develop. This includes, but is not limited to traffic signals, turn lanes, access management implementation, and other intersection improvements. A corridor access management study was completed in 2004. Its purpose is to prolong the functional capability of the existing roadway, and to ensure that the improved operation of the Technically and Environmentally Preferred Alternative is not seriously degraded by additional growth in the corridor after it is constructed.

MDOT continues to work with the corridor communities to find new approaches to traffic management and new technologies for traffic handling to further reduce the expected impacts of the Technically and Environmentally Preferred Alternative. Where such measures are identified, they will be reported on in the next periodic review of this document.

1.7.1 Air Quality Conformity

The following describes how air quality conformity requirements will be met for the M-15 widening project in Genesee and Oakland counties in Michigan.

The Federal Highway Administration issued a memorandum to its Division Administrators May 20, 2003, clarifying that a FEIS may be signed prior to its inclusion on a conforming Transportation Plan and Transportation Improvement Plan. It recognizes that the signing of the ROD is the decision point allowing a project to move to design.

Under the metropolitan planning requirement of Titles 23 and 49 U.S.C., projects cannot be approved, funded, advanced through the planning process, or implemented unless they are in a fiscally constrained and “conforming” transportation plan(s) and transportation improvement program(s) (TIP). In Genesee County, the Genesee County Metropolitan Alliance is the designated Metropolitan Planning Organization (MPO). The Genesee County Metropolitan Planning Commission (GCMPC) provides staff and technical resources to the MPO in developing the transportation plan and TIP and the demonstration of air quality conformity. In Southeast Michigan, SEMCOG is responsible for development of the transportation plan and TIP and the demonstration of air quality conformity.

Conformity is an analytical process required under the Clean Air Act to ensure that projects do not contribute to violations of air quality standards or delay meeting the standards. The following paragraphs document the pertinent consultation and information that support the reasonable assurance that all transportation conformity requirements will be met for the proposed widening of M-15 in Oakland and Genesee counties.

Assurance That All Transportation Conformity Requirements Will Be Met

As the M-15 project falls into two counties and two planning regions, conformity determinations must be made in two regions.

GPMPC and SEMCOG worked with state and federal officials to develop the State Implementation Plan (SIP) for air quality. The SIP establishes “budgets” for air pollution sources, such as mobile sources, i.e., vehicles. The motor vehicle “emissions budget” included in the SIP represents the highest level (ceiling) of highway vehicle emissions allowed from all projects included in the 20-year regional transportation plan (RTP) and TIP, while demonstrating attainment of the air quality standards.

Ordinarily, a project is tested for air quality conformity when it is added to the RTP and TIP, but when projects cannot be added to the RTP and TIP due to fiscal constraints, the conformity analysis is deferred. In Genesee County, the staff of the GPMPC developed the 2025 Flint Genesee County Long Range Transportation Plan that was approved by the MPO. SEMCOG has analyzed future transportation needs, revenues, and priorities for the 2030 RTP it expects to complete by October 2004. In Southeast Michigan, a need of \$70 billion has been identified, but only \$40 billion in revenues. In both Genesee and Oakland counties, as projects are prioritized, some must be deferred until funding is identified.

The Policy Board of SEMCOG makes the conformity determination on its RTP and TIP. FHWA then makes an independent review and conformity determination. The analytical basis for the determination is use of an approved computer model that includes the entire RTP network, and comparing the emission burden of relevant pollutants to the emissions budget. This modeling

takes into account the age of the vehicle fleet and its mix of vehicle types. It also takes into account anticipated growth.

In Genesee County, the Genesee County Metropolitan Alliance makes the conformity determination on its RTP and TIP. FHWA then makes its independent review and conformity determination. An analytic base with an approved computer transportation model of the long range plan network, with Genesee County vehicle fleet mix and vehicle types and growth is used.

Procedural Steps That Remain

The approved modeling process is in place for each county. All that remains once project funding is identified is to make the model runs, and compare the results to the SIP budget in each location. Then, the project can be added to the respective Transportation Plans and TIPs, following the defined process for doing so at each MPO, including public involvement. At SEMCOG, projects are introduced to the Transportation Advisory Council. They then move to the Executive Committee, then finally to the General Assembly. There are public involvement opportunities throughout this process. In Genesee County staff development of the Transportation Plan was followed by public workshops, interaction among the transportation agencies, a public hearing and action by the Genesee County Metropolitan Alliance. Actions to amend the Plan undergo a similar process.

Hot-Spot Analysis

As an attainment/maintenance area for carbon monoxide, a hot-spot analysis is required. The results of this analysis for the M-15 project are summarized in Section 4.7 of this FEIS, and are fully documented in an Air Quality Technical Report. No further quantitative analysis is necessary, and no mitigation is required.

Conclusion

The conformity determinations for this project will be made after the FEIS is signed, but before the ROD is signed. No further action will be taken on the project until the ROD is signed.

SECTION 2

PURPOSE AND NEED FOR ACTION

This section defines the purpose of the proposed action, including a brief history of activity related to the corridor, then goes on to explain in greater detail the need for the project in terms of growth in the area, current road conditions, the role of M-15 in the regional transportation system, travel demand and roadway capacity, and safety conditions.

2.1 Purpose of the Proposed Action

The purpose of the proposed project is to provide increased capacity and safety on M-15 between I-75 and I-69. Need has been generated by rapid growth in Oakland and Genesee counties, reflecting rapid economic expansion. M-15 needs four through travel lanes for the entirety of the corridor, to serve existing and projected travel demand and provide a safe road for the expanding corridor population.

2.1.1 Project Background

While the information below does describe how this study for potential improvements got its start; the **Forward** to this document discusses why the decision to switch from the selection of the TEPA to the No-Build Alternative was made and the funding issues that predicated that decision.

M-15 has been repeatedly studied and identified as a corridor in need of improvement. In 1991, the “Northern Oakland County Corridor Study”⁵ called for widening M-15 in Oakland County. (The study was limited to Oakland County.)

In 1995, MDOT completed a “Preliminary Project Statement” that called for repaving the entire corridor and widening M-15 in Oakland County to five lanes (with consideration of a boulevard). Safety analysis performed at that time concluded that the crash experience reflected a roadway with capacity and turning movement deficiencies. It also found the need for vertical alignment improvements, improved drainage, bridge repair, improvements to side slopes and sight distances, and reconstruction of the entire roadbed.

At the time of the “Preliminary Project Statement,” interest grew and approximately 200 citizens attended a public meeting (September 1994) to provide their input on the need to improve M-15. An M-15 Task Force of local officials was also formed at that time. In 1997, the Task Force petitioned the U.S. Congress to provide funds for improving M-15. M-15 was listed as a “high priority project” in Section 1602 of the 1998 Transportation Equity Act for the 21st Century. That act provided \$500,000 for environmental studies to establish a recommended course of action for long-term improvements on M-15 between I-75 and the Oakland/Genesee County line.

2.2 Need for the Proposed Action

The project need is driven by the growth, predominantly residential, in this area with convenient freeway access to job markets in Oakland County and, to a lesser extent, Genesee County.

⁵ “Northern Oakland County Corridor Study,” The Corradino Group, 1991.

2.2.1 Land Use and Growth

The rapid growth in the area was noted in Table 1-1. A substantial amount of vacant residential land will gradually fill in at rates determined by local authorities and the availability of sewers and water. A consequence of growth is increased congestion. For a two-lane rural highway, this means reduced opportunity to pass slower-moving traffic and less safety in doing so. Those entering M-15 from cross roads and driveways must accept shorter gaps in traffic and wait longer for such gaps. Similarly, those turning left from M-15 must also accept shorter gaps and meanwhile slow through traffic. The result is a pattern of lower traffic service, decreasing safety and a decreasing quality of life. The inability to get onto M-15 was a concern of many citizens noted at a number of the public meetings held for the project.

The Village of Goodrich in its “State Road/M-15 Corridor Plan,” the draft of which is dated April 1999, noted the village should act to improve access management along the corridor in the village. Brandon Township and the Village of Ortonville have requested that capacity and other operational improvements be made to M-15.

2.2.2 Current Road Conditions

M-15 is classified as a rural minor arterial. It is not part of the National Highway System, but is part of the Surface Transportation Program. Most of the roadway is two 12-foot lanes with eight-foot to ten-foot shoulders within 120 feet of right-of-way. Excluding Ortonville and Goodrich, 22 percent of M-15 has passing sight restrictions. The 0.6-mile section of M-15 through Goodrich has 44 feet of driving surface in 66 feet of right-of-way. That portion of M-15 was re-striped in 1999 from four lanes to three (center turn-lane configuration) with some curb added. M-15 was repaved in Genesee County in 1999 and in Oakland County in 2000. Minor improvements to shoulders and guard rails occurred at these times. Traffic signals have been added as congestion has increased. Despite the excellent surface and shoulder conditions brought by the recent paving, the condition of the roadway base is uneven. Sufficiency ratings for 1999, prorated for subsection lengths, show a mix of conditions from excellent to poor:

- Surface 25 of a possible 25 points (excellent structural condition)
- Base 8 of a possible 15 points (poor structural condition)
- Capacity 5 of a possible 30 points (heavy congestion)
- Crashes 13 of a possible 30 points (above normal range)
- Overall Condition 51 of a possible 100 sufficiency points

2.2.3 Transportation System Linkages

M-15 originates at Dixie Highway (US 24), south of the study area. From Dixie Highway to I-75, M-15 is Clarkston’s main street. From I-75 north, it serves travel north to Davison, Vassar, and Bay City. The presence of I-75, however, makes the interstate the preferred route. M-15 is competitive from a regional standpoint only north to Davison, unless one lives along M-15. For most travelers, any trip further north and accessible to I-75 would be made on I-75.

The closest parallel state roads to M-15 are M-54, 7 miles to the west, and M-24, 10 miles to the east. Dixie Highway and I-75 offer alternative travel paths that also serve regional trips. But, M-15 is the only paved, continuous road between I-75 and I-69 apart from M-54 and M-24, so it collects most of the trips reaching the interstate system for those who live closer to M-15 than to M-54 and M-24.

Although M-15 is a state trunkline, it serves primarily local traffic. Because of the population growth in the area, M-15 has a new functionality as a daily commuter route for that population. Those living along M-15 use M-15 to get to I-75 and, particularly, to employment sites to the south.

Travel modeling indicates less than 30 percent of M-15 traffic is through travel. This means that less than 30 percent of traffic using M-15 travels all the way between I-69 and I-75.

Truck percentages are low for a trunkline route - less than five percent.

2.2.4 Traffic and Level of Service

A Traffic Report⁶ found a need for four through travel lanes throughout the corridor in the design year of 2025 (Appendix A). Generally a two-lane road can carry about 14,400 vehicles a day in a semi-rural setting with two intersections per mile (Table 1-2). This volume reflects a Level of Service (LOS) of C. Absolute capacity is about 15,600 vehicles a day. (Note that a LOS of A represents free-flow conditions and LOS F reflects a breakdown of traffic flow.) Figure 1-1 shows that existing volumes already exceed LOS D in the southern section of the corridor and the forecast of future volumes demonstrates the need for four through lanes. A four-lane divided road will carry over 30,000 vehicles a day at LOS C, while a five-lane section will carry slightly fewer. The proposed project will operate at LOS C or better.

The Level of Service at intersections for existing conditions and future build and no-build conditions is presented on Table 2-1. That analysis is guided by turning movement counts made during the winter of 2000/01. Those counts were expanded to 2025 based on growth factors derived from computer simulations of M-15 traffic in 2025.

Twenty-eight intersections along M-15 were examined in the traffic analysis. Currently, nine intersections are operating lower than LOS C. None of these is presently signalized. If M-15 were not widened, six of these intersections would appear to warrant a traffic signal by 2025. But, even if these signals were installed, 15 of the 28 intersections would operate in 2025 lower than LOS C, with 12 at LOS E or F. However, if M-15 were widened, no intersection would operate lower than LOS C.

2.2.5 Crashes

An analysis of crashes by MDOT from 1989 to 1993 found the leading crash type in Oakland and Genesee counties to be rear-end collisions. More recent data provided by the Traffic Improvement Association of Oakland County indicate that this pattern has continued. Rear-end collisions result from one vehicle following too close to another in congested traffic. While there are numerous crashes on the corridor, the nature of the majority of the crashes are not severe; nor are they a result of sight distance or curvature deficiencies. The probable causes include congestion along with vehicles following too close and inattentive or distracted drivers. Data for Michigan indicate two-lane roads have a total crash rate of 541 crashes per hundred million vehicle miles, compared to 323 for four-lane divided roads and 717 for a five-lane road. It is estimated that the Technically and Environmentally Preferred Alternative would experience 644 total crashes in the year 2025 compared to 707 with no project. The median of the boulevard section reduces the potential for head-on collisions by separating opposing traffic and reduces the number of conflict points. Safety benefits will accrue from the time the project opens to traffic.

⁶ "Traffic Report, M-15—I-75 to I-69," The Corradino Group, November 2001.

**Table 2-1
Signalization and Level of Service**

Cross Road	M-15 Build Condition	Existing Traffic Control	Future Traffic Control	Level of Service		
				Existing 2000	No-Build 2025	Build 2025
Lippincott	Five-lane	Signal	Signal	B	C	A
Atherton	Five-lane	None	Signal	F	A ¹	A
Bristol	Five-lane	Flasher	Signal	F	D	A
Maple	Five-lane	None	None	C	F	B
Hill	Boulevard	None	Signal	C	B ¹	C
Perry	Boulevard	None	Signal	C	B ¹	B
Coolidge	Boulevard	None	None	C	E	B
East Hegel	Five-lane	Flasher	Signal	D	B ¹	A
West Hegel	Five-lane	Signal	Signal	B	C	A
Green	Five-lane	None	None	D	F	A
Kipp	Boulevard	None	None	B	C	B
County Line	Boulevard	None	None	C	D	B
Groveland	Boulevard	None	None	B	D	B
Oakwood	Boulevard	None	Signal	F	C ¹	B
Mill/Grange Hall	Boulevard	Signal	Signal	B	B	B
South	Boulevard	Signal	Signal	B	C	A
Granger/Kent	Boulevard	Signal	Signal	A	B	A
Wolfe	Boulevard	None	None	C	E	B
Brandon H. S. Entrance	Boulevard	Signal	Signal	A	B	B
Glass	Five-lane	Signal	Signal	B	F	A
Seymour Lake	Five-lane	Signal	Signal	C	E	C
Oak Hill	Boulevard	None	None	F	F	C
Hadley/Ratalee Lake	Boulevard	None	None	F	F	B
Hubbard	Boulevard	Signal	Signal	B	E	B
Deer Ridge	Boulevard	Signal	Signal	C	E	B
Berry Point	Boulevard	None	None	E	F	A
Cranberry Lake	Five-lane	Signal	Signal	B	B	A
Amy	Five-lane	None	None	F	F	B

Source: The Corradino Group

¹Note: In several instances, signals will be warranted and likely implemented, even under the Recommended, No-Build Alternative, improving the level of service, compared to existing conditions. If signals were not installed, noted locations would all be at LOS F.

2.2.6 Conclusion

M-15 is experiencing congestion that is gradually working its way north from Oakland to Genesee counties. Delays are increasing and safety is deteriorating as this happens. Under the Recommended Alternative, all portions of the corridor will experience traffic much greater than a rural two-lane road can handle at LOS E with many intersections at breakdown conditions. With the Technically and Environmentally Preferred Alternative, M-15 will operate at LOS C or better over its entire length in the design year 2025. Other alternatives examined would not meet the project's purpose and need of increased capacity and safety in response to rapid economic growth within the corridor.

SECTION 3 ALTERNATIVES

This section describes how the alternatives were developed and the process that led to a Technically and Environmentally Preferred Alternative. Please see the **Forward** of this document for further details on the selection of the TEPA and the Recommended Alternative.

3.1 Alternatives Development

During the course of the analysis supporting this document, Illustrative and Practical Alternatives that addressed the project purpose and need were developed and evaluated in cooperation with a Steering Committee and an Advisory Committee that were established for this study. Technical documentation has been prepared that addresses engineering, relocations, traffic, air quality, noise, hazardous materials, cultural resources, wetlands, and threatened/endangered resources. A detailed technical memorandum on each of these areas is available under separate cover and summarized in the appendices of this Final EIS.

A series of public meetings were held to solicit the views of the public, aid in alternatives development, inform them of the results of the ongoing analysis, and gain their participation in the decision-making process. These meetings and their focus are listed below. Comment forms were available at all meetings and the public was asked to submit comments on the forms or later via telephone, fax, or email.

1. June 7 & 8, 2000 – Kickoff meeting to introduce the project, discuss the schedule, and solicit initial ideas regarding solutions.
2. August 24, 2000 – Display of information on Illustrative Alternatives and traffic projections.
3. October 25, 2000 – Presentation of the results of the evaluation of the Illustrative Alternatives.
4. November 15, 2000 – Meeting devoted to historic resources to inform citizens about study process, make them aware of known resources, and solicit their comments.
5. January 24, 2001 – Display of information on the Practical Alternatives and historic resources.
6. April 3 & 4, 2001 - Presentation of the results of the evaluation of the Practical Alternatives and the consultant's Preferred Alternative, including historic resources.
7. April 15 & 16, 2003 – Presentation of the conclusions made after the Public Hearing

Meetings were also held with a variety of area stakeholders, including elected officials, schools and emergency service agencies, planning agencies, business owners, churches, and others who expressed an interest in meeting in a small group setting. Also, “scoping” meetings were held September 20, 2000 in Lansing and Ortonville to inform regulatory agencies and those with special interest or review authority of: 1) the need for the project; 2) the potential alternatives under consideration; and, 3) the kinds and magnitudes of project impacts. This information was presented in a “Scoping Document”⁷ that was distributed to all those invited. The scoping meetings were also designed to gain insight into the concerns of the agencies and their input regarding avoidance and mitigation. Information related to scoping is in the DEIS. Annual multi-agency meetings sponsored by MDOT (covering many MDOT projects) were attended in November of 2000, 2001 and 2002. The M-15 project was presented at those meetings.

⁷ “Scoping Document,” The Corradino Group, September 2000.

3.2 Alternatives Eliminated from Further Study

The process embodied in the above-mentioned meetings allowed all reasonable and prudent alternatives to be considered. Analysis indicated those that clearly did not address the project purpose and need. They were then eliminated from future consideration. For example, even if many new travelers were attracted to transit so that five percent of all trips were made by bus (there is no fixed-route transit in the study corridor today⁸), the project need remains four through travel lanes on M-15. Therefore, a Mass Transit Alternative is not a practical alternative. Three illustrative alternatives, plus the No-Build Alternative were developed. The three “build alternatives” were: 1) Low Cost Improvements / Transportation Systems Management; 2) New Alignments; and, 3) M-15 Reconstruction. These alternatives were presented in Technical Memorandum No. 1 (August 2000) and evaluated in Technical Memorandum No. 2 (October 2000).

In Technical Memorandum No.1,⁹ the Low-Cost/TSM Illustrative Alternative (Alternatives 1, 4, 5, & 6) called for: 1) paving many gravel roads to provide alternative routes to M-15; 2) upgrading intersections along M-15; 3) improving incident management; 4) improving access control; and, 5) encouraging reduced trip-making (Figure 3-1). Travel analysis found it did not meet the purpose and need for the project. Even with all the proposed measures in place, projected traffic volumes showed a need of four through-travel lanes along the entire length of M-15 (Table 3-1).

The second Illustrative Alternative considered improving Irish Road (west of and parallel to M-15 in the north section of the corridor) and constructing bypasses of the Village of Goodrich or the Glass Road / Seymour Lake area (Alternatives 2, 2A, 2B, and 2C) (Figure 3-2). Traffic modeling found these potential alternative routings, tested separately, would not divert sufficient traffic from M-15 to meet the purpose and need of the project. The testing included variations of the land use development scenario used in the travel models for the area. This was done using a computer model called the Simplified Land Use Allocation Model (SLAM). SLAM uses forecasts of a number of land use variables to assess how shifts in expected growth (not additional growth) can cause changes in travel. Additional information on the SLAM can be found in **Section 4.18.3** of this document. One variation reallocated land use in the corridor so that development shifted from Oakland County north towards I-69. Another land use scenario reduced the expected growth in Atlas Township by 75 percent. Under both scenarios the demand on M-15 for four lanes remained (Alternative 2A plus SLAM, Alternative 5 and Alternative 6).

The third Illustrative Alternative explored design options for M-15 (Alternative 3). Because traffic forecasts show four through travel lanes are required to meet travel demand, the “super-2” and three-lane options were discarded. A “super-2” highway is a concept wherein additional passing opportunities are available to the motorist by providing paved shoulders on either side. This allows slower moving vehicles to move over allowing faster moving vehicles to pass. It can also be described as a two-lane road where a third passing lane is added in certain areas to provide for safe passing. Given the need for turning movements through the length of the corridor, little application of a four-lane road was found, compared to a five-lane section, which allows for turn movements at all required locations. A narrow boulevard was found to have merit from traffic and safety standpoints, while still allowing turns as required. A wide boulevard, by comparison, was found to have substantially more impacts than the narrow boulevard and was dropped from further consideration when it was determined that the narrow boulevard was equal from a traffic standpoint and acceptable from a design standpoint.

⁸ In some portions of Oakland County SMART provides service, but no service is available in Brandon and Independence Townships. In Genesee County dial-a-ride service is provided.

⁹ “Technical Memorandum No. 1,” The Corradino Group, August 2000.

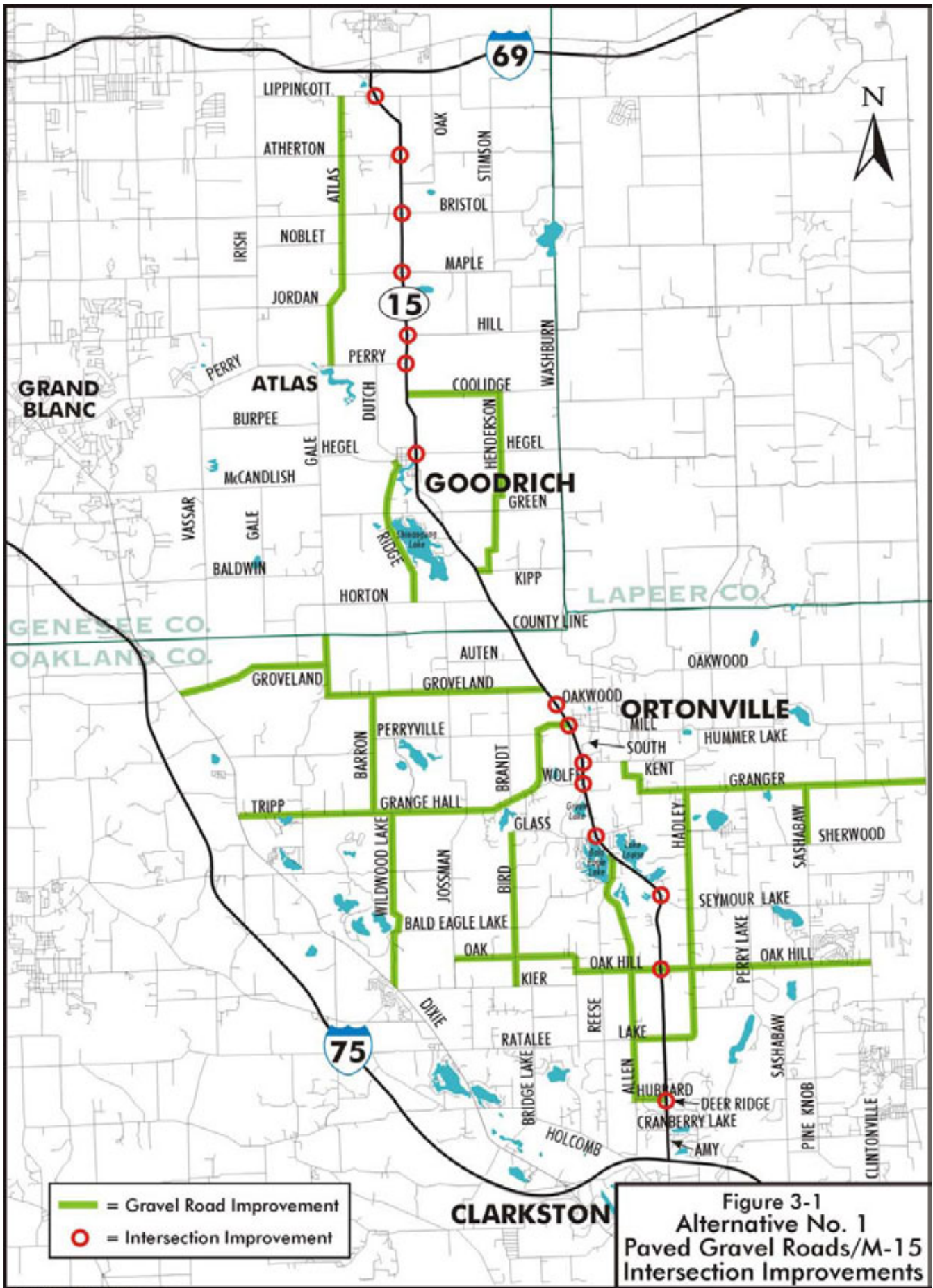


Figure 3-1
 Alternative No. 1
 Paved Gravel Roads/M-15
 Intersection Improvements

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**Table 3-1
2025 Traffic Projections**

Location	1998 Existing	2025 Scenarios									
		No-Build	Alt. No. 1	Alt. No. 2A	Alt. No. 2A plus SLAM	Alt. No. 2B	Alt. No. 2C	(TEPA) Alt. No. 3	Alt. No. 4 ¹	Alt. No. 5 ¹	Alt. No. 6 ¹
I-69	12,400	21,000	21,700	19,800	21,100	21,000	21,000	21,800	19,000	19,300	17,400
Atherton Road	12,600	20,800	20,800	18,500	18,000	20,800	20,800	21,400	19,400	19,600	18,300
Maple Road	10,900	19,700	19,300	16,400	16,300	19,700	19,700	20,100	18,900	18,900	18,100
Perry Road	11,300	18,400	18,000	13,000	12,800	14,900	18,400	18,800	17,700	17,600	16,900
Hegel Road	12,100	18,500	18,300	15,800	14,400	15,000	18,500	20,200	17,500	18,000	17,000
Horton Road	12,500	18,600	18,600	18,600	16,000	18,600	18,600	20,700	17,300	18,400	17,100
Groveland Road	17,000	21,900	21,900	21,900	18,600	21,900	17,000	22,900	21,200	21,700	21,100
Seymour Lake Road	19,000	25,100	25,100	25,100	21,100	25,100	25,100	25,100	25,100	25,000	25,000
Rattalee Lake Road	27,300	35,200	35,100	35,200	29,500	35,200	35,200	35,200	35,200	35,100	35,100
I-75											

Source: The Corradino Group

Alternative 1.....TSM Improvements plus pave local roads

Alternative 2A.....Improve Irish Road

Alternative 2A plus SLAM.Improve Irish Road plus Land Use Reallocation proposed by the Simplified Land Allocation Model

Alternative 2B.....Build Goodrich Bypass

Alternative 2C.....Build Lake Louise Bypass

Alternative 3.....Widen M-15 to four lanes for through travel

Alternative 4.....Pave Hadley Road from Rattalee Lake to Sawmill Lake Roads

Alternative 5.....No-Build, plus limit 1995-2025 trip growth in Atlas Township to 25 percent

Alternative 6.....Alternative 4 and 5

Note: All values shown in **bold** exceed roadway capacity

¹Alternative analyzed late in the study in response to public input.

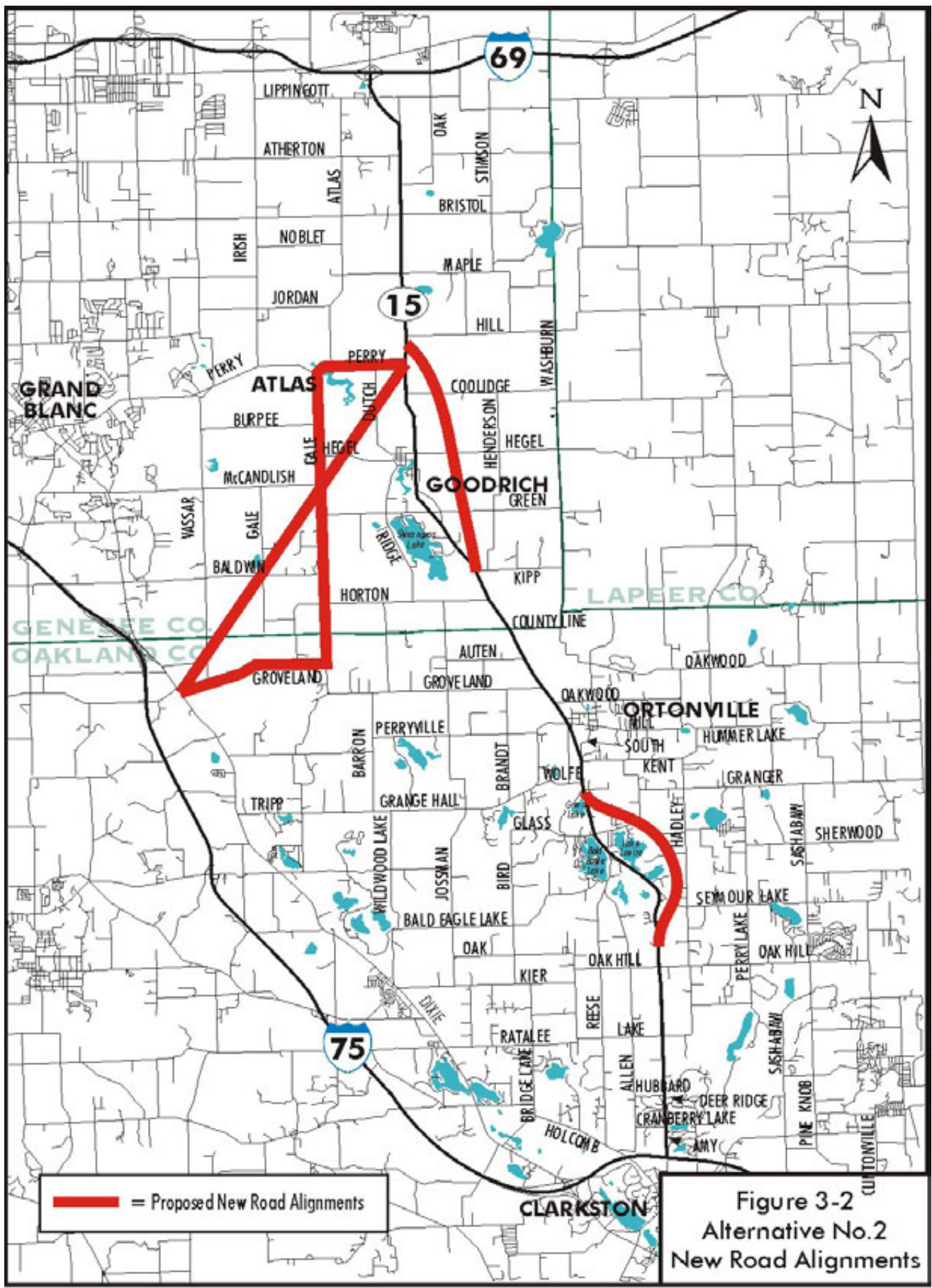
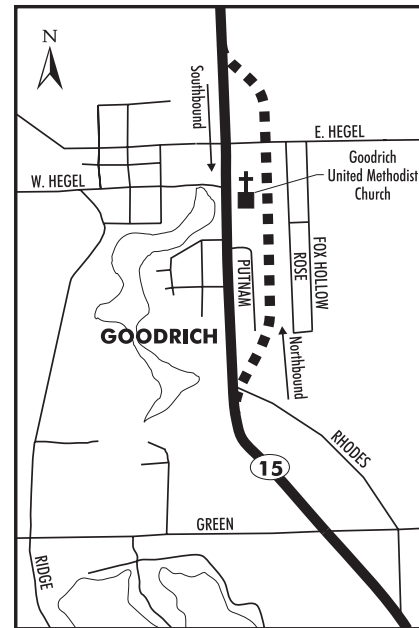


Figure 3-2
Alternative No.2
New Road Alignments

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**Figure 3-3
One-way Pair Concept - Goodrich**



Technical Memorandum No. 2¹⁰ described the impacts of each of the alternatives and the evaluation process used to advance to Practical Alternatives. Citizens were asked to weight a number of evaluation factors. Each alternative was then scored against these weighted factors. In the end, the No-Build Alternative together with two build alternatives, a five-lane road and narrow boulevard were advanced as Practical Alternatives. Both the five-lane and narrow boulevard could not be built through the Village of Goodrich without substantial impacts. The opportunity to create a one-way pair through the Village was proposed and studied as a way to lessen anticipated impacts. This one-way pair concept in Goodrich was advanced as a Practical Alternative (Figure 3-3).

In Technical Memorandum No. 3,¹¹ the Practical Alternatives were subjected to in-depth engineering and environmental analyses. Again citizen-weighted evaluation factors (Table 3-2) were used in conjunction with scoring of each alternative's performance by a consultant team of 14 professional engineers and planners. The alternatives were compared on a sector-by-sector basis to allow a more detailed comparison of their advantages and disadvantages (see Figure 3-4 and Table 3-3 which follow this page). Using the information in Table 3-3, each individual scored the performance of each link, for each alternative, for each impact category. (Note that information in Table 1-3 reflects then current – Spring 2001 – information, which was later refined.) Scoring could range from 0 to 100, with scores above 50 indicating a relative positive effect. These scores were then aggregated and the appropriate weighting (Table 3-2, using the citizen values) was applied for each impact category. Scores for all impact categories were then summed to determine the final score for each alternative for each segment (Table 3-4). Sector A1 was not evaluated because extending the existing five-lane road from I-69 to south of Lippincott Road is part of each alternative.

**Table 3-2
Evaluation Factors Percentage
Weighting and Ranking (x)**

Evaluation Factor	Citizens	Consultant
Displacements	18.82% (2)	18.97% (2)
Historics	16.49% (4)	16.98% (4)
Wetlands	16.30% (5)	17.17% (3)
Community Cohesion	17.33% (3)	16.43% (5)
Construction Cost	12.13% (6)	9.48% (6)
Roadway Safety	18.93% (1)	20.97% (1)
	100.00%	100.00%

Source: The Corradino Group

The narrow boulevard was favored over a five-lane cross section through much of the length of the corridor because it would provide a safer road and be less divisive to the local communities.

¹⁰ “Technical Memorandum No. 2,” The Corradino Group, October 2000.

¹¹ “Technical Memorandum No. 3,” The Corradino Group, March 2001.

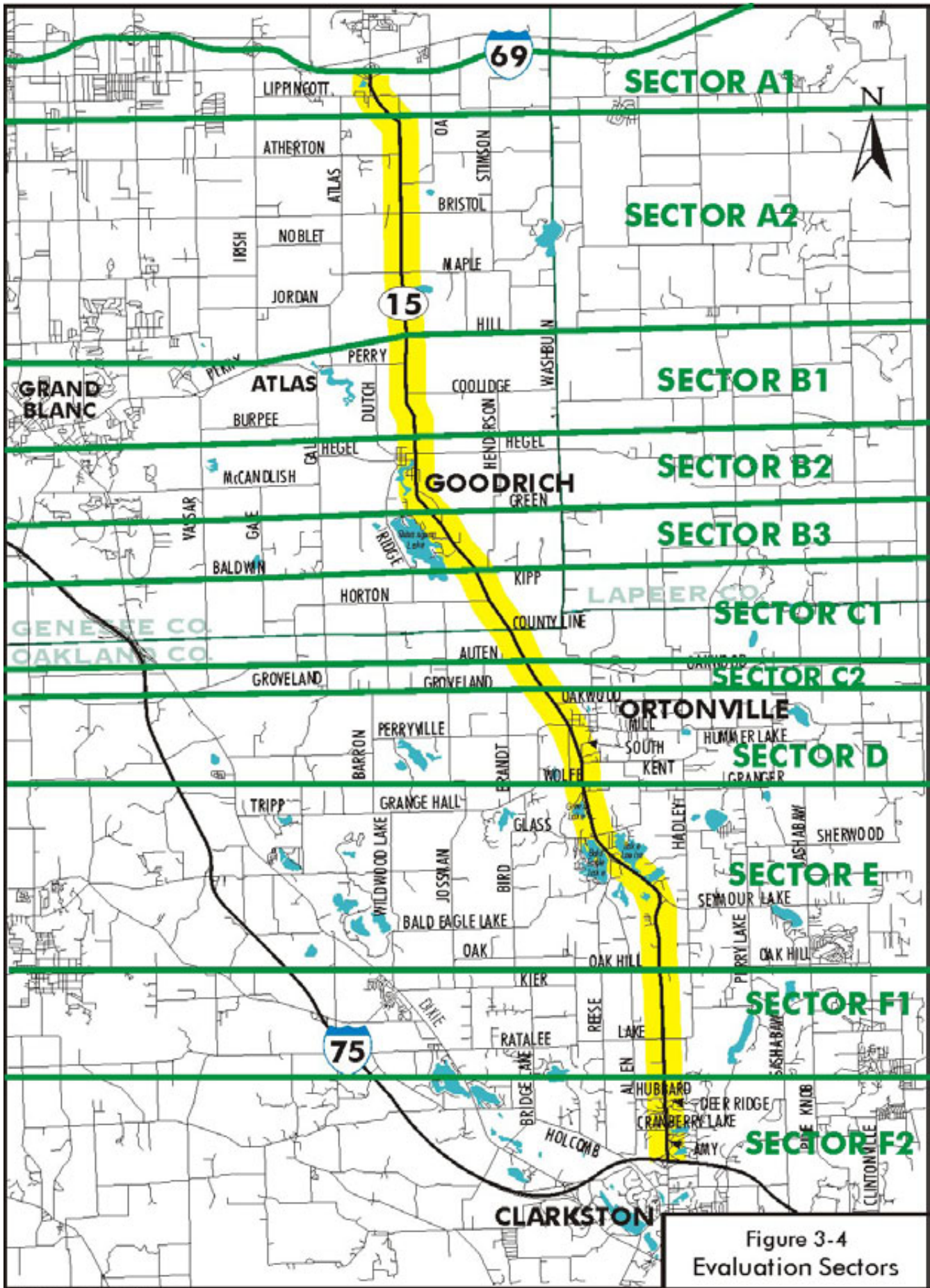


Figure 3-4
Evaluation Sectors

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**Table 3-3
Evaluation Data
Practical Alternatives to Widening M-15**

Sector	Sector A				Sector B								Sector C											
	A2 - 3.64 miles				B1 - 2.14 miles				B2 - 1.25 miles				B3 - 1.25 miles				C1 - 1.70 miles				C2 - 0.59 miles			
	S of Lippincott to Hill				Hill to N of Hegel				N of Hegel to Green (Goodrich)				Green to Kipp				Kipp to Auten				Auten to Groveland			
Improvement	Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		One-way Pair ¹		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Very Narrow Blvd.	
Factor	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.
1. Displacements																								
Homes	3	0.8	46	12.6	0	0.0	7	3.3	3	2.4	3	2.4	0	0.0	0	0.0	1	0.6	5	2.9	0	0.0	1	1.7
Businesses	2	0.5	4	1.1	0	0.0	0	0.0	11	8.8	10	8.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Vacant DU Lots ²	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	2.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2. Historics (Properties Directly Affected)																								
Maybe Nat. Reg.	1	--	1	--	0	--	0	--	1	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--
3. Wetlands (acres)																								
Highest value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.16	1.45	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	2.66	1.57	2.66
Medium value	0.74	0.20	1.22	0.34	0.02	0.01	0.04	0.02	0.01	0.01	0.38	0.30	0.01	0.01	0.03	0.02	0.05	0.03	0.10	0.06	0.00	0.00	0.00	0.00
Lowest value	2.28	0.63	4.71	1.29	0.16	0.07	0.31	0.14	0.07	0.06	0.14	0.11	0.07	0.06	0.14	0.11	0.03	0.02	0.08	0.05	0.00	0.00	0.00	0.00
Total (acres)	3.02	0.83	5.93	1.63	0.18	0.08	0.35	0.16	1.53	1.22	1.97	1.58	0.08	0.06	0.17	0.14	0.08	0.05	0.18	0.11	1.57	2.66	1.57	2.66
4. Community Cohesion																								
High/Medium/Low	Medium		Medium		Medium		Medium		High		Medium to High		Medium		Medium		Medium		Medium		Medium		Medium	
5. Construction Cost																								
(Millions of 2001 \$)	\$13.20	\$3.63	\$14.66	\$4.03	\$7.28	\$3.40	\$7.37	\$3.44	\$4.57	\$3.66	\$6.46	\$5.17	\$4.18	\$3.34	\$4.40	\$3.52	\$5.06	\$2.98	\$5.11	\$3.01	\$2.52	\$4.27	\$2.58	\$4.37
6 Roadway Safety																								
Total Crashes Year 2025	167	45.9	75	20.6	86	40.2	39	18.2	54	43.2	24	19.2	54	43.2	24	19.2	76	44.7	34	20.0	26	44.1	12	20.3

Source: The Corradino Group

Note that information in Table 1-3 reflects then current – Spring 2001 – information, which was later refined.

¹In Goodrich (Sector B2) a one-way pair would be developed.

²The number of platted but "unbuilt" residential lots that may be required. . DU means dwelling unit.

Table 3-3 (continued)
Evaluation Data
Practical Alternatives to Widening M-15

Sector	Sector D				Sector E				Sector F								Total			
	D - 1.80 miles				E - 3.79 miles				F1 - 2.20 miles				F2 - 1.25 miles				20.27 miles			
	Groveland to Wolfe (Ortonville)				Wolfe to Oak Hill				Oak Hill to N of Hubbard				N of Hubbard to I-75				I-69 to I-75			
Improvement Factor	Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.		Five-Lane		Narrow Blvd.	
	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.	#	Per Mi.
1. Displacements																				
Homes	0	0.0	4	2.8	0	0.0	10	2.6	1	0.5	8	3.6	1	0.8	1	0.8	9	0.4	86	4.2
Businesses	3	1.7	16	8.9	6	1.6	22	5.8	0	0.0	1	0.5	0	0.0	0	0.0	22	1.1	55	2.7
Vacant DU Lots ²	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.1
2. Historics (Properties Directly Affected)																				
Maybe Nat. Reg.	2	--	2	--	0	--	1	--	0	--	0	--	1	--	1	--	5	--	5	--
3. Wetlands (acres)																				
Highest value	0.53	0.29	1.03	0.57	2.22	0.59	4.02	1.06	0.62	0.28	1.01	0.46	0.00	0.00	0.00	0.00	6.39	0.32	9.08	0.45
Medium value	0.80	0.44	1.55	0.86	0.96	0.25	1.50	0.40	0.04	0.02	0.09	0.04	0.00	0.00	0.00	0.00	2.63	0.13	4.91	0.24
Lowest value	0.17	0.09	0.23	0.13	0.76	0.20	2.24	0.59	0.00	0.00	0.06	0.03	0.00	0.00	0.00	0.00	3.54	0.18	7.91	0.39
Total (acres)	1.50	0.83	2.81	1.56	3.94	1.04	7.76	2.05	0.66	0.30	1.16	0.53	0.00	0.00	0.00	0.00	12.56	0.62	21.90	1.08
4. Community Cohesion																				
High/Medium/Low	Medium		Medium		Medium		Medium		Medium		Medium		Medium		Medium		NA		NA	
5. Construction Cost																				
(Millions of 2001 dollars)	\$6.56	\$3.64	\$7.21	\$4.01	\$13.96	\$3.68	\$18.87	\$4.98	\$8.28	\$3.76	\$9.53	\$4.33	\$3.70	\$2.96	\$4.82	\$3.86	\$69.31	\$3.53	\$81.01	\$4.11
6 Roadway Safety																				
Total Crashes Year 2025	89	49.44	40	22.2	204	53.8	92	24.3	119	54.1	53	24.1	95	76.0	43	34.4	1002.0	49.4	468.0	23.1

Source: The Corradino Group

Note that information in Table 1-3 reflects then current – Spring 2001 – information, which was later refined.

¹In Goodrich (Sector B2) a one-way pair would be developed.

²The number of platted but "unbuilt" residential lots that may be required. DU means dwelling unit.

**Table 3-4
Practical Alternative Scoring Results**

Description	Sector	Five-Lane	Narrow Boulevard
I-69 to S of Lippincott	A1	NA	NA
S of Lippincott to Hill	A2	66.73	64.91
Hill to N of Hegel	B1	74.78	78.82
N of Hegel to Green (Goodrich)	B2	58.53	70.59¹
Green to Kipp	B3	74.89	81.69
Kipp to Auten	C1	74.40	79.90
Auten to Groveland	C2	67.60	72.88
Groveland to Wolfe (Ortonville)	D	63.37	66.74
Wolfe to Oak Hill	E	66.10	63.57
Oak Hill to N of Hubbard	F1	69.73	73.02
N of Hubbard to I-75	F2	65.83	72.72

Source: The Corradino Group

¹Scoring for the narrow boulevard in Goodrich reflected the one-way pair configuration.

These attributes were offset by poorer characteristics in terms of displacements and wetlands effects (due to its wider cross-section). An example is the Ortonville area (Sector D) where the scoring was close. Here a number of businesses may require relocation with a narrow boulevard, but there are two complex intersections (M-15/Mill/Narrin and M-15/South/Kent), plus heavy school and school bus activity that make safety a primary consideration. The evaluation data and scoring process pointed to the need for greater refinement, which allowed the Technically and Environmentally Preferred Alternative to be developed. These refinements are discussed in the next section.

3.3 No-Build Alternative (Recommended Alternative) With Transportation Systems Management (TSM)

As mentioned in the Forward to this document the MDOT will be selecting the “No-Build” Alternative with Transportation Systems Management (TSM) operational improvements as the Recommended Alternative. While the FEIS does identify the Technically and Environmentally Preferred Alternative (TEPA), the decision to move forward with the No-Build Alternative is being made due to a lack of available funding to fiscally constrain the TEPA in Southeast Michigan Council of Governments (SEMCOG) Long Range Plan.

TSM is a strategy aimed at improving the overall performance of the transportation network without resorting to large-scale, expensive capital improvements. TSM integrates techniques from across disciplines to increase safety, efficiency and capacity for all modes in the transportation system.

The goal of TSM is to encourage and promote the safe and efficient management and operation of integrated, intermodal surface transportation systems to serve the mobility needs of people and freight and foster economic growth and development. Some examples of TSM actions include: Improved or innovative roadway designs, improved signage or signal arrangement, access

management, safety and capacity analysis, transit assessments, targeted traffic enforcement, incident response plans, and intelligent transportation systems. Future TSM improvements will be cleared environmentally as separate actions as funding and need arises.

3.4 Technically and Environmentally Preferred Alternative

The Technically and Environmentally Preferred Alternative combines five-lane and boulevard sections to provide four through travel lanes over the 20-mile length of the corridor.

The cross section of any road should not change frequently. Frequent changes in road cross sections slow or impede effective movement of traffic. Thus, the following description reflects an effort to provide narrow boulevard sections of reasonable length, with five-lane road construction in locations where constraining circumstances, such as existing development, wetlands, and historic resources do not favor boulevard construction. In addition, where access is less critical, a “very narrow boulevard” is proposed to make the road as narrow as possible, while preserving some of the safety and aesthetic benefits of the boulevard. From north to south, the following mix of roadway types was proposed as the Preferred Alternative (Figure 1-5):

- I-69 to Maple – Five-lane, with a transition to narrow boulevard north of Maple Road.
- Maple to north side of Goodrich – Narrow Boulevard, with a transition to five-lane road north of East Hegel.
- North side of Goodrich to Green – Five-lane, with a transition to narrow boulevard south of Green.
- Green to south of Auten – Narrow Boulevard.
- South of Auten to south of Groveland – Very Narrow Boulevard (this area includes a high-quality wetland and historic site) with transitions placed as needed. With little access needed on either side of the road, due to the presence of wetlands, a narrow, unbroken median is possible.
- South of Groveland to Brandon High School access road (south of Wolfe) – Narrow Boulevard, with transition to a five-lane section south of the school access road.
- Brandon High School access road to Seymour Lake Road – Five-lane, with transition to narrow boulevard north of Seymour Lake Road.
- Seymour Lake Road to Hubbard Road – Narrow Boulevard, with transition to very narrow boulevard just north of Hubbard Road.
- Hubbard Road to Cranberry Lake Road – Very Narrow Boulevard, with transition to five-lane road at Cranberry Lake Road.
- Cranberry Lake Road to I-75 – Five-lane with auxiliary lanes. A narrow boulevard configuration would necessitate additional right-of-way acquisition, so it was not chosen. And, access needs are such that a center turn lane configuration is the practical solution in this area.

The sector descriptions above varied from the scoring preferences in Table 3-4 in several locations, reflecting refinements that led to the Preferred Alternative, and ultimately the Technically and Environmentally Preferred Alternative:

- In Sector A2, the five-lane cross section was favored in the scoring. However, once past the heavy concentration of homes along M-15 north of Maple Road, there is no reason not to transition to a boulevard (Sector A2b). With the boulevard preferred for safety reasons, this change was made.

- In Sector B2, Goodrich, a one-way pair was favored in the scoring, but it presented some difficulties. It was originally developed to avoid impacts to historic resources along M-15, as preliminary research indicated a five-lane widening would displace a property potentially eligible for the National Register of Historic Places. Further research found the candidate building is likely not eligible, so a prime reason for the one-way pair was not substantiated. Also, the Goodrich United Methodist Church, in conjunction with a private developer, indicated plans to build a 100-unit senior residence center on land that the one-way pair would occupy. It was uncertain whether the one-way pair could be made compatible with the senior center and other church plans. Finally, there were wetlands at the south end of the one-way pair's northbound leg as well as platted subdivision lots. These lots have been developed since the original one-way pair analysis, interfering with one-way pair development. During the analysis, the one-way proposal generated considerable controversy. The combination of physical impediments and opposition make it impractical to pursue refinements of this approach.
- In Sector E, the five-lane cross section was favored in the scoring. But, as in Sector A2 there is a subsection of the sector where a narrow boulevard could be constructed with relatively minor impacts compared to the five-lane. This is the section south of Seymour Lake Road (Sector E2).
- In Sector F2, construction of a boulevard (which was favored in scoring) is a complicated issue. Independence Township favors construction of a boulevard and their master plan so indicates, but safety, access, and existing right-of-way must be considered. The proposed blend of boulevard and center turn lane construction is discussed below.

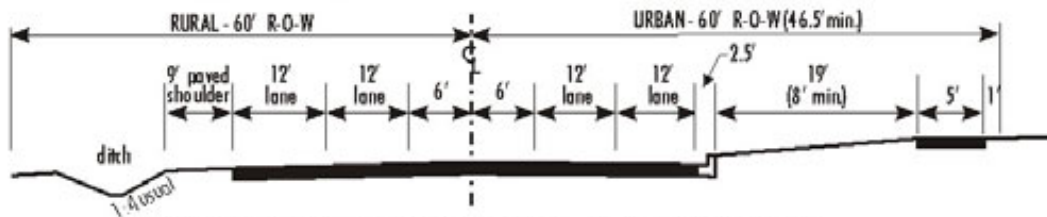
From Hubbard Road south, land use is essentially “built out,” with little new land available for development. Consequently, as the roadway type was considered in this area, maintaining existing right-of-way limits had priority. The question was, what kind of boulevard could be constructed in 120 feet of right-of-way?

The very narrow boulevard is the answer. It calls for narrowing the typical section to look like the five-lane, except with a grass median rather than a paved turn-lane in the middle. Very narrow boulevard construction can occur without conflict south to Cranberry Lake Road. Full intersections with left-turn lanes are required in this section because “Michigan” left turns (right turn from the side street, then a U-turn) cannot be accommodated in the 120 feet.

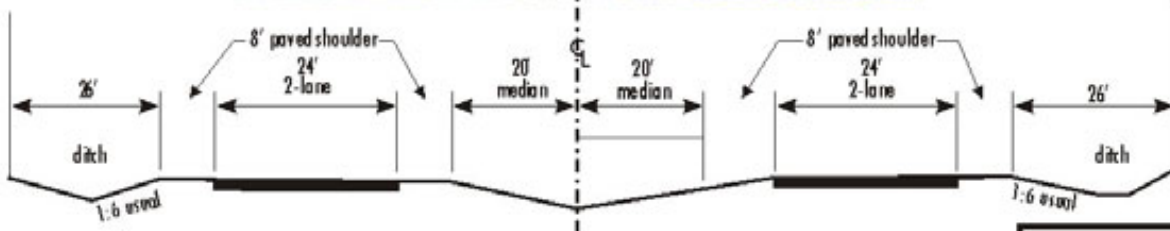
With or without the boulevard, left turns out of the gas station in the northeast quadrant of the interchange should not be allowed. Motorists will invariably attempt to reach the northbound interstate on-ramp. To do so would require crossing the throat of the ramp at a point past where the ramp separates from the lanes of M-15.

3.4.1 Typical Sections

The typical roadway sections are presented in Figure 3-5, which includes photos of representative examples of such roads. Most of the project will be of rural design with a paved shoulder and then a gentle slope (usually a ratio of 1:6) to a ditch. The typical section for a narrow boulevard



TYPICAL RURAL/URBAN 5-LANE, 93'-120' R-O-W



TYPICAL NARROW BOULEVARD, 172' R-O-W

Figure 3-5
Road Types

would require 172 feet of right-of-way. The very narrow boulevard would be very similar to the narrow boulevard, in **Figure 3-5**, only the center median width would be narrower and vary dependent upon available right-of-way. A ROW section of 120' with 60' for travel lanes on each side of a 30' median is what is proposed in the Engineering Report for this project. The five-lane road would require 120 feet of right-of-way. In developed areas, the drainage would be collected with a curb and gutter to minimize right-of-way acquisition. Travel lanes would normally be 12 feet. In some curb-and-gutter sections, a wide curb lane (lane closest to the curb) may substitute for a paved shoulder for use by bicycles. In more built-up areas, safety paths (sidewalks) would be provided, normally separated from the road by at least 8 feet. The median of the boulevard would generally be 40 feet wide and there would also be inside and outside shoulders. If there were no access needs (driveways and cross roads), the median would be narrowed wherever there are constraining circumstances, such as wetlands or historic resources, or simply existing development. This has been described as a "very narrow boulevard." Examples are the wetland area north of Groveland Road and the section between Hubbard and Cranberry Lake Roads. In addition to narrowing the median in wetland areas, the side-slopes will be modified to minimize wetland impacts. The five-lane road through Goodrich would be narrowed as much as possible in keeping with design standards. A 93-foot right-of-way is planned in this section. Lanes as narrow as 11 feet may be appropriate.

3.4.2 U-turn Channels and Loons

For preliminary engineering purposes, U-turn channels were placed at intervals of no more than 1000 feet in boulevard sections. Design guidelines call for actual spacing about ¼ mile apart. More detailed analysis will be required to determine final locations. U-turn channels support access management. Left turns from some side streets and driveways are not allowed. Instead drivers will turn right, then use the next U-turn channel to complete the "left" turn. Where the width of the median is inadequate for a U-turn by a large vehicle, a "loon" will be provided. The narrow boulevard is sufficiently wide (172 feet) to allow the U-turn, if the shoulder is used. Where the road is narrowed further, additional pavement would be required (a "loon"). At this planning stage, the design principle is that the median will only be narrowed where no driveway access is required; so, few loons are likely along the entire route. An access management study is scheduled for 2004. That study will provide a more definitive basis to identify loons.

3.4.3 Interchange at I-75

Improvements may be warranted over the long term at the M-15/I-75 interchange. In the morning peak, southbound traffic on M-15 trying to get onto southbound I-75 backs up to the intersections of Amy Drive and Cranberry Lake Road. Backups could be reduced by improving the taper of the southbound on-ramp from southbound M-15. Extending that ramp would also necessitate relocating the ramp from northbound M-15 to southbound I-75. It is noted that independent planning is underway for an additional travel lane on I-75 in each direction.

In the afternoon peak hour, traffic sometimes backs up onto I-75 at the northbound exit to M-15. Additional storage could be created on the off-ramp to M-15 by lengthening the ramp.

Adding or modifying interchanges on the Interstate system requires preparation of an Interchange Justification Study for approval by the Federal Highway Administration; however, the minor changes proposed here do not change the configurations of the interchanges and hence do not require such studies or approvals.