



US-12 Improvement Study Environmental Assessment and Section 4(f) Evaluation



City of Saline to Munger Road
Pittsfield Charter Township
Washtenaw County, Michigan

prepared by the
Michigan Department of Transportation
in cooperation with the
U.S. Department of Transportation
Federal Highway Administration



OCTOBER 2003

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**ENVIRONMENTAL ASSESSMENT /
SECTION 4(f) EVALUATION**

for

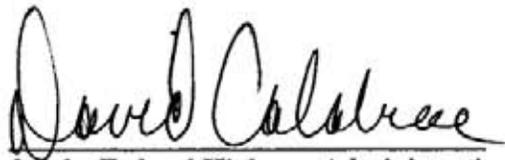
**US-12 Improvement Study
City of Saline to Munger Road
Charter Township of Pittsfield
Washtenaw County, Michigan**

**Prepared
by the**

**MICHIGAN DEPARTMENT OF TRANSPORTATION
in cooperation with the
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED:

10/22/03
Date


for the Federal Highway Administration

For additional information concerning the proposed project, or this document, contact:

Ms. Cindy Vigue
Area Engineer
Federal Highway Administration
315 West Allegan Street, Rm 207
Lansing, MI 48933
Phone: (517) 702-1832

Ms. Margaret Barondess
Manager Environmental Section
Michigan Department of Transportation
425 W. Ottawa Street
Lansing, MI 48909
Phone: (517) 335-2621

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 actions:

- Class I Actions – those actions that may significantly affect the environment and require the preparation of an Environmental Impact Statement (EIS).
- Class II Actions (categorical exclusions) – those actions that do not individually or cumulatively have a significant effect on the environment and do not require the preparation of an EIS nor an Environmental Assessment (EA).
- Class III Actions – those actions for which the significance of impacts is not clearly established and require the preparation of an EA to determine the significance of impacts of the proposed action and the appropriate environmental document to be prepared. The outcome of an EA is one of two environmental documents, either an EIS or a Finding of No Significant Impact (FONSI).

This document is an Environmental Assessment (EA) for the proposed roadway improvements of US-12, from the City of Saline to Munger Road in Pittsfield Township. This EA describes and analyzes a No-Build Alternative and one major improvement or Build Alternative (the Preferred Alternative). For any impacts to resources that are identified, this EA proposes measures to minimize harm to those resources in the study area. The EA will be distributed to the public and to various federal, state, and local agencies for review and comment. A public hearing on this document will then be held. If public and agency review and comment support the determination of "no significant impact", the EA will be forwarded to the Federal Highway Administration (FHWA) with a recommendation that a FONSI be prepared. If it is determined that the Preferred Alternative will have significant impacts that cannot be mitigated, an EIS will be prepared. A subsequent public hearing on the EIS will then be held.

The EA for the US-12 Improvement Study is divided into six main sections:

1. Proposed Project
2. Alternatives Evaluated
3. Affected Environment, Potential Impacts, and Measures to Mitigate Impacts During Construction
4. Section 4(f) Evaluation
5. Agency Coordination and Public Involvement
6. Project Costs

Section 1 defines the study area, describes the project history, and outlines the overall study goals, purpose and specific needs for the proposed roadway improvements. In Section 2, the various alternatives for implementing these proposed improvements are discussed, beginning with the range of alternatives evaluated and ending with a description of the Preferred Alternative. Section 3 describes the environmental, social, and economic resources potentially affected by the Preferred Alternative, the potential environmental impacts of its implementation

and the measures to mitigate impacts during construction. Section 4 includes a Section 4(f) Evaluation, and Section 5 discusses agency coordination and public involvement efforts conducted during the study. Section 6 details the estimated construction costs of the Preferred Alternative.

This document was prepared by the Environmental Section of the Michigan Department of Transportation (MDOT), in cooperation with the Federal Highway Administration (FHWA) and other members of the US-12 study team. The study team includes representatives from the following divisions within the Michigan Department of Transportation: Design, Project Planning, Real Estate, Construction and Technology, Traffic and Safety, and the University Region. Information contained in this Environmental Assessment was also furnished by other federal and state agencies, local units of government, public interest groups, and individual citizens.

US-12 IMPROVEMENT STUDY
Environmental Assessment and
Section 4(f) Evaluation

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5. Social, Economic and Land Use Technical Report
 - Study Area Demographic Profile:
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 - Environmental Justice Technical Memorandum
6. Evaluation of Above-Ground Cultural Resources, Reconstruction of US-12, August 2002
7. Air Quality Analysis Technical Report
8. Noise Analysis Technical Report
9. 2002 US-12 Project Contamination Survey
10. Public Involvement Technical Report
 - Public Involvement
 - Public Meeting Summaries
 - Stakeholder Meeting Summaries
 - Newsletters

Section One

PROPOSED PROJECT

1.1 INTRODUCTION

This Environmental Assessment/Section 4(f) Evaluation describes the proposed improvements to 6.5 miles of US-12 from City of Saline, easterly to Munger Road, Pittsfield Township, in Washtenaw County, Michigan (see Figure 1.1). During the US-12 Improvement Study, several Illustrative Alternatives, or major improvement alternatives, were proposed and evaluated. During the evaluation, the relative merits and desirability of each alternative were assessed according to specific criteria, in order to determine which alternatives best met the study purpose and need. After this screening process, several Illustrative Alternatives were eliminated from further consideration. The remaining alternatives, known as Practical Alternatives, were again evaluated according to established criteria. The Preferred Alternative was then selected.

From the inception of the study, interested parties from study area communities have participated in a variety of activities designed to inform residents, public officials, business and property owners, and other stakeholders about the study. Various public involvement activities were used to receive their input regarding the alternatives being considered, and potential environmental impacts. These activities included stakeholder meetings, public meetings, newsletters, a study web site, and a toll-free telephone information line.

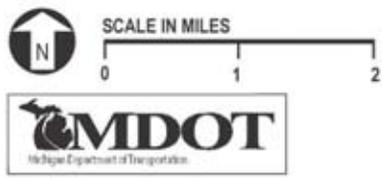
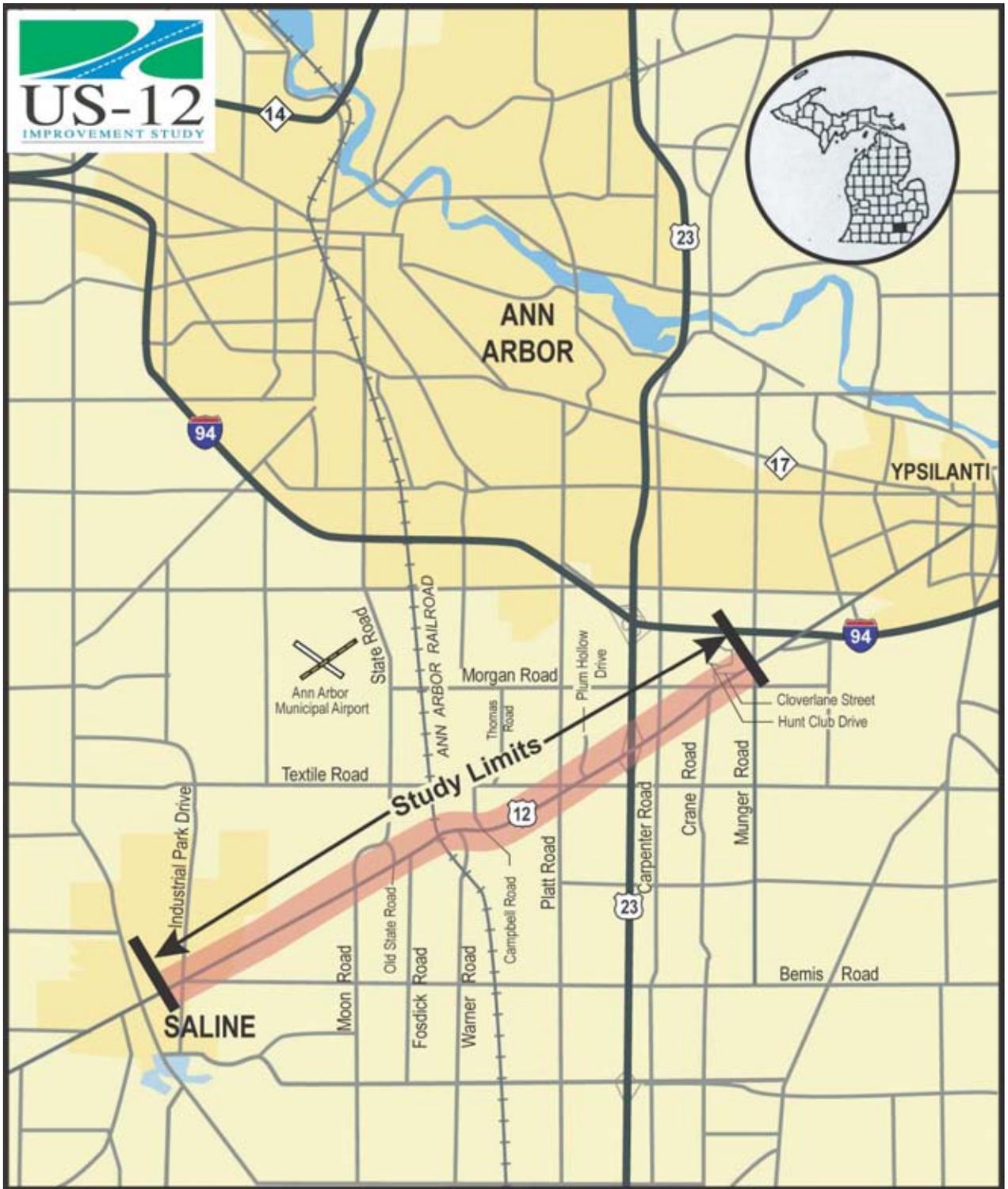
Based on public and regulatory agency input, several key social, economic, and environmental (SEE) concerns were identified and examined in detail during the US-12 Improvement Study. The key issues helped guide the development of the Practical Alternatives and the selection of the Preferred Alternative. The Preferred Alternative was then further refined while considering input from the Michigan Department of Transportation (MDOT) and public comments.

1.2 PROJECT DESCRIPTION

The proposed project includes major roadway improvements to US-12 from the City of Saline (near the entrance to the Visteon manufacturing plant) to Munger Road (near I-94).

Location and Existing Roadway Description

The US-12 Improvement study area is located along US-12, a regional arterial in Pittsfield Township and the City of Saline, Washtenaw County, Michigan, within the Ann Arbor/Ypsilanti metropolitan area (see Figure 1.1). The study area includes a 6.5 mile-long segment of US-12 from the City of Saline to Munger Road near Interstate 94 (I-94). Through the study area, US-12 runs in a southwesterly/northeasterly direction, providing a direct link between Saline and Ypsilanti.



STUDY LOCATION
FIGURE 1.1

US-12, commonly known as Michigan Avenue, is generally considered a two-lane undivided roadway with either gravel or paved shoulders. However, in recent years several multi-lane improvements have been made at several high-traffic-volume intersections, such as US-12 at Industrial Park Drive and at Carpenter Road. About 40 percent of the roadway study area is now multi-lane, including left- and right-turn lanes and passing lanes. Existing US-12 roadway cross sections are shown in Figure 1.2.

Setting

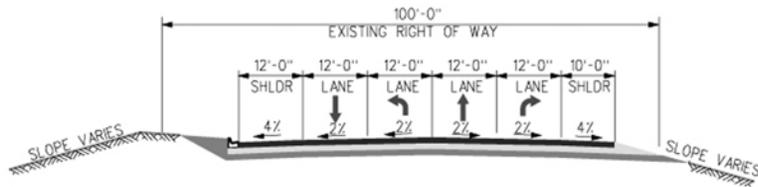
The city limits of Ann Arbor are approximately two and one-half miles north of the center of the study area, and the city limits of Ypsilanti are about two miles from the eastern terminus of the study area. US-23, a major north-south U.S. highway, has an interchange with US-12 near the eastern terminus of the study area. About two miles east of that interchange, US-12 has an interchange with I-94 (see Figure 1.1). Primary land use adjacent to the US-12 roadway is a combination of commercial, municipal, institutional, industrial, agricultural, and residential (both multi-family and single-family).

Study Background

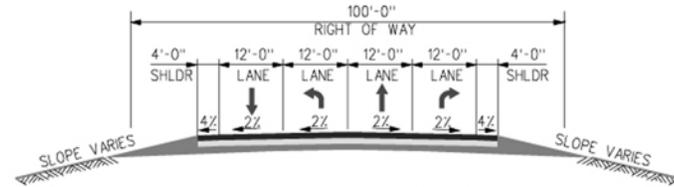
Improvements to the US-12 roadway have been considered for many years. Increased development in Pittsfield Township during the last two decades has been accompanied by increases in traffic congestion and crash frequency along US-12. As early as May 1987, local residents met with township and state officials to discuss issues regarding US-12. One of their primary concerns was the potential hazard of making left turns into and out of residential driveways and subdivisions. Since then, minor improvements have been made to partially remedy the left-turn problem, with additional improvements focused on traffic flow. These included widening US-12 at major intersections such as Industrial Park Drive and State Road/Moon Road; traffic signal changes; and a new signal installation at the US-23 interchange. The growing need for additional travel capacity on US-12 between Saline and I-94 was recognized during the 1990s as well.

In 1991, MDOT initiated an engineering and environmental study to select a recommended alternative for proposed improvements to the US-12 study area. At that time, Parsons Transportation Group, Inc. (PTG) was retained by MDOT to prepare an Environmental Impact Statement (EIS) for improvements to US-12 between the eastern city limits of Saline and Munger Road. The purpose of the EIS study was to evaluate the widening of US-12 to either a four-lane urban boulevard or a five-lane urban arterial, along with a reconfiguration of the US-12/US-23 interchange.

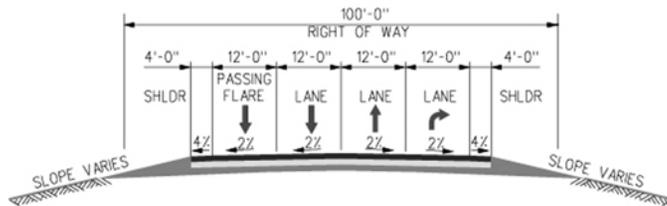
During the early preliminary engineering and environmental study, several design alternatives were proposed to address the need to improve US-12. Design alternatives eliminated from further study included a rural five-lane arterial and a rural boulevard, primarily because these alternatives would require much more right-of-way than the urban alternatives. A full cloverleaf interchange alternative at US-12/US-23 was also eliminated due to the amount of land required to construct it, and the impact it would have on wetlands. This study also concluded that the Transit/Transportation Demand Management (TDM) and Transportation Systems Management (TSM) alternatives could not, by themselves, serve the



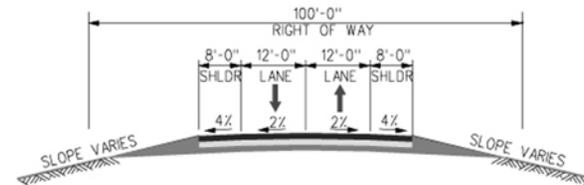
EXISTING CROSS SECTION
US-12 AT STATE & MOON ROAD



EXISTING CROSS SECTION
US-12 AT PLATT ROAD



EXISTING CROSS SECTION
US-12 AT FOSDICK ROAD



EXISTING CROSS SECTION
US-12 AT CAMPBELL ROAD

Not to Scale



EXISTING US-12
ROADWAY CROSS SECTIONS

Figure 1.2

projected transportation demand along US-12, and therefore these alternatives were eliminated from further consideration.

Due to state funding limitations, US-12 studies ended in 1994 before the DEIS was issued for review and comment by regulatory agencies and the public. No recommended solution was brought forth at that time.

In 1999, MDOT commissioned PTG to conduct the *US-12 Improvement Project: Feasibility Study of Five-Lane Alternative* to determine the feasibility of improving the US-12 roadway from two lanes (one travel lane in each direction) to five lanes (two travel lanes in each direction with a center left-turn lane) throughout the study limits. The study concluded that it was feasible to construct a five-lane roadway in the US-12 study area.

The US-12 Improvement Study represents the combined efforts of several federal, state, and local agencies. The Michigan Department of Transportation (MDOT) coordinates the planning and construction of roadway projects that fall under the State of Michigan's jurisdiction. As specified in the Transportation Equity Act for the 21st Century (TEA-21), MDOT's Bureau of Transportation Planning has the responsibility for developing multi-modal statewide and regional system plans for highways.

The Federal Highway Administration (FHWA), although not responsible for planning specific state and local projects, has established certain requirements that must be satisfied for a project to be considered for federal funding. All federally funded highway projects must receive FHWA approval at various stages of the planning process.

According to federal regulations, the Southeast Michigan Council of Governments (SEMCOG) is the designated Metropolitan Planning Organization (MPO) for the Ann Arbor/Ypsilanti area. However, for 30 years the federally mandated urban transportation planning process has occurred at two levels in the study area:

- SEMCOG is a seven-county region of southeast Michigan consisting of regional agencies and governmental units. SEMCOG conducts transportation planning and maintains the federal eligibility of communities and transportation providers within the entire region.
- Washtenaw Area Transportation Study (WATS) is a group of federal, state, and local officials responsible for promoting and coordinating the urban transportation planning process. WATS coordinates and prioritizes transportation improvement projects and provides technical assistance to Washtenaw County-area cities, villages, and townships in implementing the area transportation plan.

A Memorandum of Understanding (MOU) and a Pass-Through of Funds Agreement now exist between SEMCOG and WATS. As a result, WATS functions as an independent sub-study within SEMCOG.

1.3 PURPOSE FOR PROPOSED ACTION AND REGIONAL CONTEXT

Purpose Of The Study

The purpose of the US-12 Improvement Study is to determine how existing and projected travel demand on US-12, from Saline to Munger Road near I-94, may be accommodated. The purpose is also to develop improvement alternatives to improve roadway continuity, increase travel capacity, reduce crashes, and provide viable access to existing and planned business, government and residential land uses.

The five major goals of the US-12 Improvement Study are listed below:

- *Transportation* – To improve mobility and travel capacity in the study area.
- *Engineering Design* – To provide a safe, efficient transportation system that meets MDOT design standards.
- *Socioeconomic* – To maximize the benefits of planned economic development and minimize the potential impacts on the area's community resources, including neighborhoods, parklands, farmland, and community facilities and services.
- *Environmental* – To minimize the potential adverse impacts on the natural and built environment, including biological resources, water resources, ecosystems, and historic properties.
- *Land Use* – To provide a transportation facility that is compatible with existing and planned land uses within the US-12 study area.

Existing Transportation Facilities

Roadways

US-12 is mainly a two-lane and multi-lane roadway that widens to five lanes at both ends of the study limits. The existing right-of-way is predominantly 100 feet wide, ranging from 83 feet to 250 feet. Ten streets intersect US-12 in the study area, half of which are unpaved. Eight of these cross streets are north-south roadways, including State Road/Moon Road, Platt Road, and Carpenter Road, all of which are arterial roadways. The remaining two cross streets, Textile Road and Morgan Road, are minor east-west collector roadways.

Most of the roads in the study area are two-lane facilities. Some improvements have been made at several of the high-traffic-volume intersections, including Industrial Park Drive, State Road/Moon Road, Platt Road, and Carpenter Road.

I-94 is a major east-west interstate highway extending from Port Huron, Michigan west to Billings, Montana. Aside from US-12, this highway provides the only crossing of US-23 between Bemis Road and Ellsworth Road, a distance of four miles. US-12 has an interchange with I-94 southwest of Ypsilanti.

US-23, which has an interchange with US-12, is a major north-south highway leading to Ann Arbor. It extends from northern Michigan to Florida.

Other Modes of Transportation

Local public bus transportation in Washtenaw County is provided by the Ann Arbor Transportation Authority (AATA). Currently, there are no bus routes operating along US-12 or crossing US-12 in the study area.

Three airports currently serve the study area: Detroit Metropolitan Wayne County Airport (approximately 15 miles from the eastern study limits), Willow Run Airport (approximately 10 miles from the eastern study limits), and the Ann Arbor Municipal Airport (about two miles north of the US-12 study area).

One train line, the Ann Arbor Railroad, runs through the study area. It is used solely to transport freight.

Regional Growth and Development

According to the Washtenaw Area Transportation Study (WATS) 2020 *Long Range Transportation Plan* for Washtenaw County, Washtenaw County is expected to continue to experience a rapid rate of growth and development. Such growth is occurring especially in the urbanized townships near the cities of Ann Arbor, Ypsilanti, and Saline, such as Pittsfield Township. The pace and pattern of rural residential development, compounded by the general trend toward increased number of daily trips per household, are challenging the ability of local transportation agencies to address travel demands and system deficiencies.

Compatibility with Land Use and Transportation Plans

WATS prepared a 2025 *Long Range Transportation Plan* update for Washtenaw County that has been incorporated into the Southeast Michigan Council of Governments (SEMCOG) 2025 *Regional Transportation Plan*. In these documents the proposed widening of US-12 between Saline's eastern city limits and Munger Road, with interchange improvements, was recognized as a 2025 Proposed Linear Project. (A linear project, as defined by WATS, is a project that does not involve just an intersection or a bridge (such projects are commonly known as spot projects). Prior Long Range Plans dating back to the 1990s have also recognized the need to widen US-12. Improvements to US-12 are included in the current SEMCOG 2025 *Regional Transportation Plan*.

The 2002 *Pittsfield Charter Township Comprehensive Plan* acknowledges that MDOT is currently studying US-12 to determine the best alternative to provide additional traffic capacity. The plan recommends that additional right-of-way acquisition be increased to a maximum of 150 feet, and that the roadway be widened to a maximum of four driving lanes with a landscaped median. The plan also notes that turn lanes at major intersections and a continuous left-turn lane should be provided in segments where traffic congestion and

driveway density is greatest and/or in areas where a four-lane cross section would not operate efficiently or safely.

The *2002 Pittsfield Charter Township Comprehensive Plan* identifies two planning sub-areas in the US-12 study area: (1) Michigan Avenue/US-23 interchange sub-area, and (2) State Road/Moon Road/Michigan Avenue sub-area. These planning sub-areas were created to establish specific development guidelines for these two locations along US-12.

MDOT, Pittsfield Township and the City of Saline have recently worked together to prepare an Access Management Plan (AMP) for the US-12 study area from I-94 west through Saline. The US-12 study area is contained in the AMP. The purpose of the AMP is to recommend ways to improve traffic operations and safety along US-12 by controlling the number of access points via combining, eliminating, or offsetting existing driveways while still adequately serving businesses located along US-12. In addition, locations along US-12 that would benefit from the construction of center left-turn lanes, medians, and service drives are included in the AMP.

MDOT studies have found that the number and location of driveways greatly influence how a roadway functions. Reducing the number of driveways, improving driveway spacing and providing other geometric improvements (e.g., exclusive turn lanes) US-12 would improve traffic flow and reduce the number of crashes. Both Pittsfield Township and the City of Saline have adopted the AMP as part of their *Comprehensive Plan*.

1.4 NEED FOR PROPOSED ACTION

Through the use of a travel demand model developed for the area, WATS and SEMCOG developed 2025 traffic projections for the Ann Arbor-Ypsilanti metropolitan area, which included the study area. By the year 2025, traffic along US-12 is projected to substantially increase. This increase would result in greater traffic congestion and lower levels of service on US-12 and many of the adjacent cross streets. Crashes are likely to increase due to several factors, including greater traffic density, increased starting and stopping due to this congestion, and a reduction in the number of acceptable gaps available for vehicles attempting to access US-12 from cross streets and driveways.

The need for US-12 improvements is based on four elements: (1) system continuity, (2) system capacity, (3) roadway safety, and (4) study area growth and economic development.

System Continuity

The study area contains the only two-lane segment of US-12 between Saline and Detroit. Beyond the study area to the east and west, US-12 becomes a five-lane roadway. Also, there are no parallel roadways to US-12 providing alternate routes, due in part to the diagonal southwest-northeast orientation of US-12. East-west roadways such as Bemis Road, Textile Road, and Morgan Road do exist in the study area; however, portions of these roadways are either unpaved, non-continuous, and/or not convenient enough to provide direct access to US-23 or I-94. That is, in most cases, drivers could not use these east-west roadways to avoid US-12; they would still need to use a portion of US-12 to reach their destination.

System Capacity

In July 2003, the *US-12 Improvement Study: Traffic Analysis Report* was prepared. This report was updated in July 2003. The following discussion reflects the findings of that report.

Existing Traffic Volumes

To assess existing traffic conditions and determine the amount of daily traffic in the study corridor, the latest available 24-hour traffic counts were obtained from MDOT at key locations along the study corridor. New counts were performed at locations where recent data was not available. Figure 1.3 illustrates the most recent 24-hour volumes at different locations along US-12:

- Industrial Park Drive
- State Road/Moon Road
- Platt Road
- Textile Road (North and South)
- Carpenter Road
- Crane Road
- Munger Road/Cloverlane Street
- Four ramps at the US-12/US-23 interchange
- Platt Road and Textile Road

Three peak hours of the day were identified: 7:15 a.m. to 8:15 a.m., 11:30 a.m. to 12:30 p.m., and 4:45 p.m. to 5:45 p.m.

US-12 carries a relatively large volume of traffic for a two-lane facility. According to National Cooperative Highway Research Program (NCHRP) Report 330, *Effective Utilization of Street Width on Urban Arterials* (August 1990), two-lane roadways can generally accommodate 5,000 to 7,000 vehicles per day (vpd) at acceptable levels of service. Facilities without closely spaced signals or commercial development (or both) may provide adequate service on streets with traffic volumes up to 15,000 vpd. However, more typically, two-lane facilities above the 5,000 to 7,000 vpd level experience peak hour congestion and/or increased accidents that suggest the need to upgrade the facility with a multilane design alternative (such as a five-lane facility). Current US-12 traffic volumes vary between 23,000 and 32,000 vpd. Hence, as a two-lane roadway, US-12 is currently over capacity.

Level of Service Analysis

Each critical intersection defined for this study was analyzed according to the methods in the *2000 Highway Capacity Manual* in order to determine the Level of Service (LOS) of the intersection. The analysis was performed for both existing (2001) and future (2025) conditions. Levels of Service, which are based on factors such as number and types of lanes, signal timing, traffic volumes and pedestrian activity, are expressed in a range from A through F. LOS A represents the highest level of service and lowest delay, and LOS F the lowest level of service and highest delay. MDOT policy for this study requires roads to be designed to an acceptable LOS D. Tables 1.1 and 1.2 show the LOS criteria for unsignalized and signalized intersections, respectively.



US-12

IMPROVEMENT STUDY

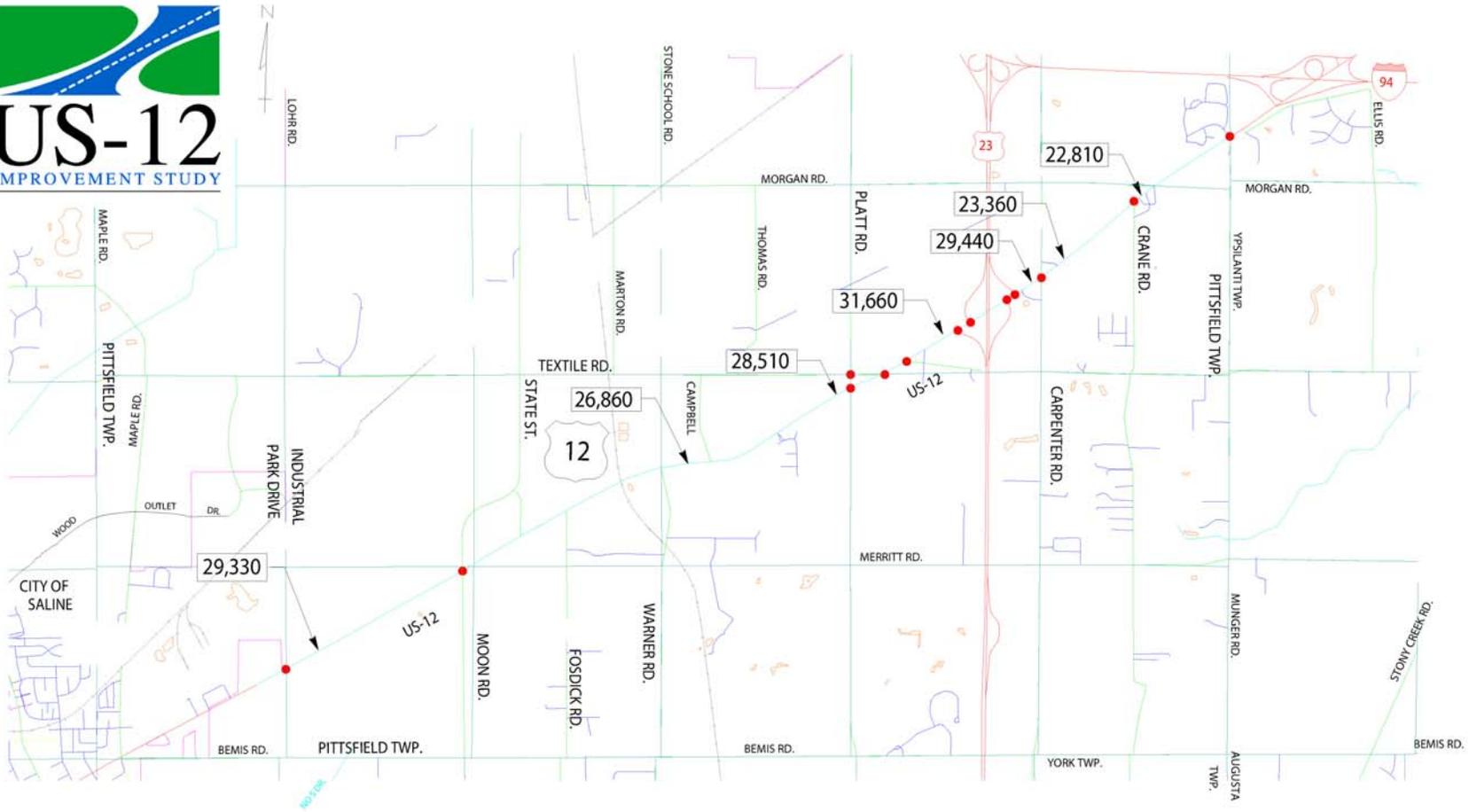


Table 1.1
Level of Service Criteria For Unsignalized Intersections

Level of Service	Delay/Vehicle (seconds)	Description
A	< 10.0	Little or no delay, very low main street traffic.
B	10.1 to 15.0	Short traffic delays, many acceptable gaps.
C	15.1 to 25.0	Average traffic delays, frequent gaps still occur.
D	25.1 to 35.0	Long traffic delays, limited number of acceptable gaps.
E	35.1 to 50.0	Very long traffic delays, very small number of acceptable gaps.
F	> 50.0	Extreme traffic delays, virtually no acceptable gaps in traffic.

Source: Transportation Research Board (TRB), 2000 Highway Capacity Manual

Note: Capacity analyses for two-way stop controlled intersections provide the LOS for the critical movement only.

Table 1.2
Level of Service Criteria for Signalized Intersections

Level of Service	Delay/Vehicle (seconds)	Description
A	< 10.0	Most vehicles do not stop at all.
B	10.1 to 20.0	Some vehicles stop.
C	20.1 to 35.0	The number of vehicles stopping is significant, although many pass through without stopping.
D	35.1 to 55.0	Many vehicles stop. Individual cycle failures are noticeable.
E	55.1 to 80.0	Considered to be the limit of acceptable delay. Individual cycle failures are frequent.
F	> 80.0	Unacceptable delay.

Source: Transportation Research Board (TRB), 2000 Highway Capacity Manual

Capacity analyses were conducted for existing conditions at key intersections along the study corridor. The existing capacity analyses were performed using September 2001 intersection turning movement counts as detailed in the July 2003 *Traffic Analysis Report* and the existing intersection lane configurations. Results of these analyses, which are summarized in Table 1.3, indicate that several of the intersections are operating at unacceptable overall LOS. For example, the signalized intersection of State/Moon currently operates at LOS E during the p.m. peak hour and the unsignalized intersection of Munger/Clover operates at LOS F during both the a.m. and p.m. peak hours. Peak hour is defined as the time of the highest volume of vehicular traffic during the day. Peak hours for US-12 are 7:15 a.m. – 8:15 a.m. for the morning peak hour, 11:30 a.m. – 12:30 a.m. for midday, and 4:45 p.m. – 5:45 p.m. for the afternoon peak hour.

It should be noted that although an intersection may show an acceptable overall LOS, individual movements often fail at LOS E or F. For example, at the intersection of Platt Road and US-12, although the intersection is operating at overall LOS C during the a.m. peak hour, the southbound left-turn movement is operating at LOS F and the northbound through and right-turn movements are operating at LOS E.

As traffic volumes on US-12 grow, it is expected that the delays shown in Table 1.3 for these intersections will increase, with a corresponding deterioration in LOS.

Table 1.3
Level of Service Analysis – 2001 Existing Conditions

Intersection	A.M. Peak Hour		Midday Peak Hour		P.M. Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
Industrial Park Drive	13.5	B	11.8	B	23.4	C
State Road/Moon Road	38.2	D ⁽¹⁾	22.3	C	68.5	E
Platt Road	33.0	C ⁽¹⁾	16.8	B	34.6	C ⁽¹⁾
Textile Road (North) ⁽²⁾	54.7	F	32.3	D	86.2	F
Textile Road (South) ⁽²⁾	60.8	F	30.7	D	61.6	F
US-23 SB On-Ramp ⁽²⁾	10.8	B	9.7	A	11.5	B
US-23 SB Off-Ramp	29.3	C ⁽¹⁾	17.5	B	60.7	E
US-23 NB On/Off-Ramp	37.3	D ⁽¹⁾	15.9	B	31.8	C ⁽¹⁾
Carpenter Road	47.8	D ⁽¹⁾	32.9	C	42.7	D
Crane Road ⁽²⁾	47.6	E	21.6	C	33.1	D
Munger Road/Cloverlane Street ⁽²⁾	>400.0	F	28.9	D	242.2	F

Note: Delay is measured in seconds per vehicle.

1. Although overall LOS is LOS D or better, there are individual movements operating at LOS E or F.

2. Unsignalized Intersection – The delay and LOS reported for unsignalized intersections are for the critical movement only.

Origin-Destination Study

An origin and destination study was completed for the US-12 study area in September 2001. The purpose of the study was to determine the primary users of US-12 (passenger cars versus trucks) and their origins and destinations within the corridor. The origin/destination study is further discussed in the February 2002 *US-12 Improvement Study from Saline to Munger Road: Origin/Destination Video License Plate Study*. The main conclusions of this study were as follows:

- The percentage of truck traffic in the corridor, 7%, is comparable if not less than similar facilities. According to the Federal Highway Administration (FHWA) publication *Vehicle Volume Distribution by Classifications*, July 1997, nationally, rural arterials typically carry about 12% trucks while urban arterials carry about 10% trucks.
- Of the traffic entering the corridor, less than 10% pass through the study area, i.e., 90% of the traffic on US-12 has an origin and/or destination within the study area.
- Of the traffic entering from Saline, a high of 7% of cars and 16% of trucks exit to northbound US-23, 1% of cars and 2% of trucks exit to southbound US-23 and 2% of cars and 5% of trucks exit the east end of the study area.
- Of traffic entering from the east end, a high of 3% of cars and 2% of trucks exit to northbound US-23, 3% of cars and 2% of trucks exit to southbound US-23 and 2% of cars and 6% of trucks exit the west end of the study area.
- Of traffic entering the study area from northbound US-23, a high of 1% of cars and 6% of trucks exit toward Saline and a high of 7% of cars and 5% of trucks exit toward the east end of the study area.
- Of traffic entering the study area from southbound US-23, a high of 5% of cars and 5% of trucks exit toward Saline and a high of less than 1% of cars and less than 1% of trucks exit toward the east end of the study area.
- US-12 serves more to connect land use activities within the study area than to connect to the balance of the region.

Based upon the study results, US-12 is currently carrying a normal or below normal amount of truck traffic as compared with similar facilities nationwide. Also, a majority of the traffic that uses this portion of US-12 has an origin or destination within the study area.

Future Traffic Volumes

The year 2025 was selected as the analysis horizon year. Average daily traffic (ADT) volumes for 2025, and a.m., midday and p.m. intersection peak-hour traffic volumes for the study area, were provided by MDOT. The traffic volumes were based on SEMCOG's 2025 traffic model and September 2001 turning movement counts. The SEMCOG model takes into

consideration factors such as future socioeconomic data, future land-use plans, and future proposed road improvements. Future traffic volumes are projected to vary between 34,000 and 52,000 vpd. Figure 1.4 illustrates the projected 2025 twenty-four-hour traffic volumes.

Level of Service Analysis

Each study intersection was evaluated with the 2025 traffic volumes assuming US-12 would remain as a two-lane roadway with the same intersection lane configurations that exist today. Table 1.4 presents the capacity analysis results. According to these results, if no improvements are made to study area intersections, most of the intersections are expected to operate unacceptably at LOS E or LOS F with the projected volumes for 2025.

It should be noted that in some cases – for example, for the US-12/US-23 interchange ramps – the capacity analysis results for 2025 show a similar or better level of service than under existing conditions. This is due to the methodology of the SEMCOG 2025 model. Since the model assumed that in 2025, US-12 would remain as a two-lane roadway, the model projected that less traffic would use the US-23 ramps, likely seeking alternate routes to avoid congestion on US-12.

**Table 1.4
Level of Service Analysis
2025, Existing US-12 Lane Configuration**

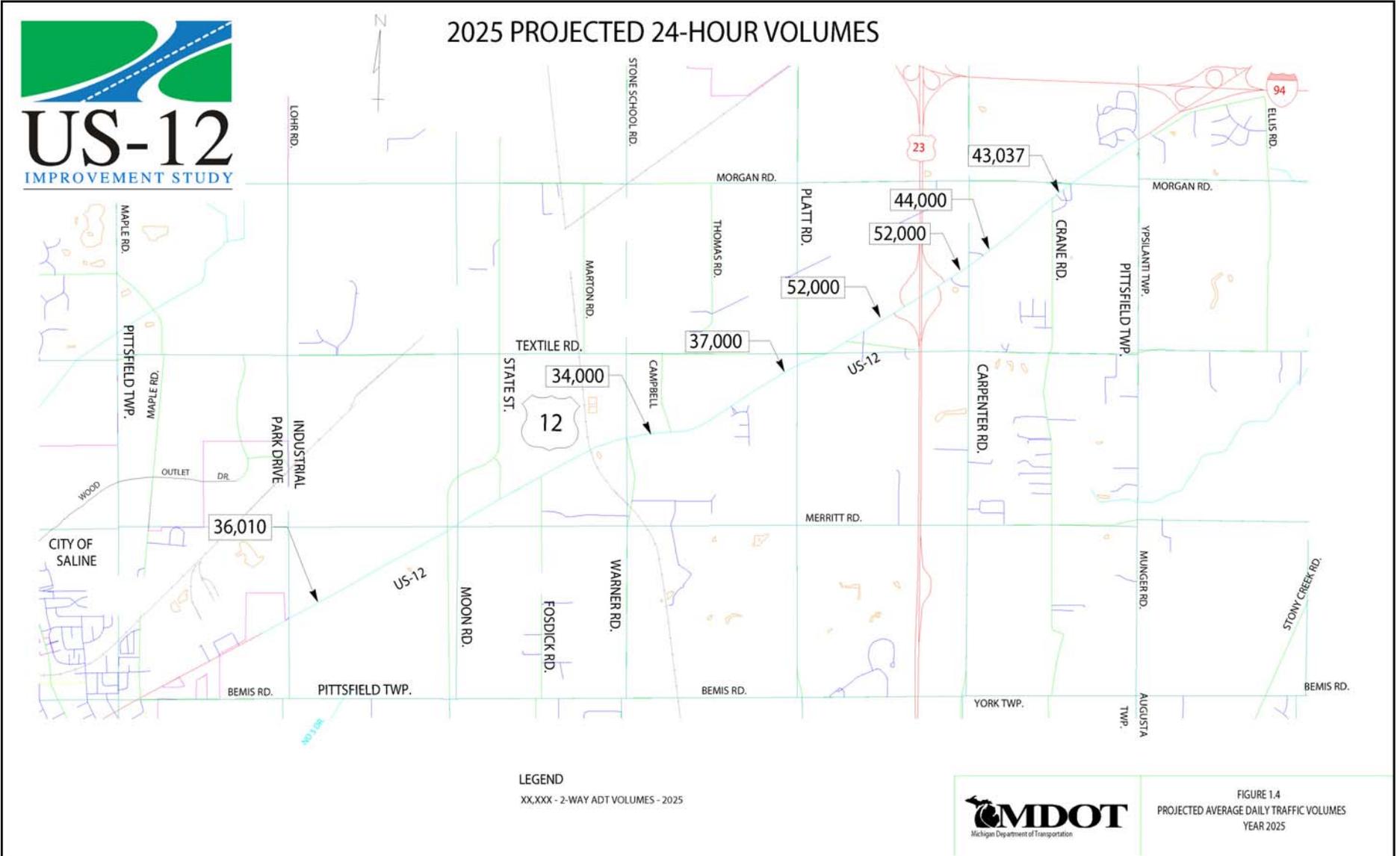
Intersection	A.M. Peak Hour		Midday Peak Hour		P.M. Peak Hour	
	Delay.⁽¹⁾	LOS.⁽²⁾	Delay	LOS	Delay	LOS
Industrial Park Drive	9.9	A	14.2	B	27.9	C
State St./Moon Rd.	258.0	F	57.9	E	120.0	F
Platt Rd.	33.7	C	27.7	C	65.8	E
Textile Rd. (North) ⁽³⁾	100.1	F	43.2	E	89.6	F
Textile Rd. (South) ⁽³⁾	46.3	E	42.6	E	118.1	F
US-23 SB On-Ramp ⁽³⁾	12.1	B	10.6	B	11.6	B
US-23 SB Off-Ramp	39.6	D	18.7	B	39.2	D
US-23 NB On/Off Ramp	26.0	C	31.3	C	28.1	C
Carpenter Rd.	34.3	C	38.8	D	48.3	D
Crane Rd. ⁽³⁾	50.9	F	42.7	E	96.5	F
Munger Rd/Cloverlane Street ⁽³⁾	267.5	F	51.4	F	730.2	F

Note: The delay and LOS reported for unsignalized intersections are for the critical movement only.

1. Delay - Average stopped delay per vehicle in seconds.

2. LOS - Level of Service.

3. Unsignalized intersection.



Roadway Safety

MDOT conducted a safety review and crash analysis for a 48-month period, (January 1, 1996 through December 31, 1999) between Industrial Park Drive and Munger Road on US-12. Crash rates were computed for various segments in this area. The crash rates were then compared to regionwide and statewide crash rates for a roadway fitting the characteristics of the study portion of US-12 (two-lane, undivided, rural, free access). The crash rates were measured as crashes per 100 million vehicle-miles of travel (100 mvm). Table 1.5 presents the results of the crash analysis.

Table 1.5
Crash Analysis Results, 1996 to 1999

Segment	Length (miles)	No. of Crashes	Crash Rate (No. of Crashes/ 100 million vehicle-miles traveled)
Industrial- State/Moon	1.440	174	353.35
State/Moon-Textile	2.460	216	269.64
Textile-Carpenter	1.019	185	519.70
Carpenter-Munger	1.250	195	560.30

The 1999 MDOT University Region average crash rate for a similar roadway facility is 255.9. (The University Region consists of a ten-county area in south-central Michigan.) The 1999 statewide average crash rate for a similar roadway facility is 276.3. As seen in Table 1.5, the crash rates for the US-12 segments all exceed the region wide and statewide average crash rates with the exception of the State Road/Moon Road-Textile Road segment, which falls slightly below the statewide average.

From 1996 to 1999, there were a total of 882 crashes, with 280 total number of injuries and one fatality. (Note: The 882 crashes do not equal the total number of crashes shown in Table 1.5 due to peripheral crashes that occurred slightly outside either end segment of the US-12 study area, but were deemed important enough to include in this discussion.) According to the most recent year of crash data (1999), a total of 267 crashes occurred in 1999, 55 of which involved injuries and one, a fatality (a pedestrian). The intersection of US-12 and Carpenter Road appeared on MDOT's current high-crash list (2000) due to the occurrence of 31 driveway-related crashes in 1999.

According to NCHRP Report 330, the advantages of a multi-lane roadway over a two-lane roadway are discussed as follows:

- Provides additional lanes to increase capacity for through traffic movement;
- Reduces delay to through vehicles caused by left-turning vehicles;
- Reduces frequency of rear-end and angle crashes associated with left-turn maneuvers;
- Provides spatial separation between opposing lanes to reduce head-on crashes; and
- Increases operational flexibility.

The improved operations and geometry inherent in a multi-lane versus a two-lane facility create a safer roadway. Studies have shown that the implementation of multi-lane roadways have reduced crash rates by 19 to 35 percent.

Growth and Economic Development

In the study area, US-12 accommodates various land uses. The Visteon plant (formerly the Ford Motor Company facility), located at the western end of the study area, is a major traffic generator and the largest employer in the study area, employing approximately 2,500 people working in three shifts per day. In addition, at Industrial Park Drive, a light industrial/business center has been recently developed, along with a large grocery store. Weekend traffic can be heavy due to recreational activities such as events at the Michigan International Speedway and the Irish Hills west of the study area. US-12 also links many residential and commercial developments near and along the route. Moreover, planned subdivisions adjacent to the study area are rapidly developing. US-12 roadway improvements are needed to accommodate existing and planned economic growth and development.

Population and Employment Projections

Pittsfield Township has experienced and continues to experience extensive residential, industrial, and commercial development. This is mirrored by a continuing rapid increase in both population and employment in the Township. Table 1.6 presents the future growth in population and employment for Pittsfield Township as projected by SEMCOG in its 2030 Regional Development Forecast (RDF) for Southeast Michigan.

**Table 1.6
Pittsfield Township Projected Growth**

Year	2000	2005	2010	2015	2020	2025
Total Population	29,801	35,400	41,044	47,156	52,918	58,621
Total Employment	18,481	20,990	22,691	24,924	26,416	27,647

Source: SEMCOG, 2030 Regional Development Forecast for Southeast Michigan

Based on the data given in Table 1.6, SEMCOG has projected a 97 percent population increase in Pittsfield Township between 2000 and 2025. Employment in the study area is expected to increase by 50 percent between 2000 and 2025 due to existing and planned industrial and commercial projects in the Township. As a comparison, over the same time period Washtenaw County's population is projected to increase by 33 percent, while its employment is projected to increase by 23 percent.

Housing and Commercial Development Projections

The increase of available housing in Pittsfield Township is consistent with the rapid population growth. According to the *2002 Pittsfield Charter Township Comprehensive Plan*, there was a 112.8% increase in housing units from 1980-2000 and a 58.3% increase from 1990-2000. The Plan also states that the number of households in the township is expected to outpace projected population increases. This may be related to the trend of decreasing household size. Residential building permits issued for Pittsfield Township has been fairly constant from 1991-2001, with single-family/detached condos the leading type of structure being built (SEMCOG, 2003). The annual average of residential building permits from the periods 1991-1995, 1996-2000, and 2001, are 359, 590 and 418 respectfully. Permits for multi-family/apartment structures has steadily captured a larger percentage of the total since 1991.

Pittsfield Township is expecting an average demand of 10 acres of commercial land per year (or 200 acres by 2010). New office development is expected to be low. Industrial use is expected to be higher and require 680 acres by 2010; the Township has approximately 1,450 acres of undeveloped land with potential for industrial use.

In the US-12 study area, there are 736 existing single-family residences and 698 single-family residences planned within the next three to five years. The residential subdivisions and apartment/condominium complexes that are located within a short distance of US-12 and traveling from west to east are listed below:

- Rolling Hills single-family subdivision, on the north side of US-12 includes approximately 24 units.
- Country Creek Estates includes approximately 34 units along the south side of US-12, just east of the US-12 intersection with State Road/Moon Road.
- Hunter's Ridge large lot estate subdivision, located along Fosdick Road, includes approximately 70 units.
- Warner Creek subdivision, located along the south side of US-12, includes approximately 318 units.
- Rolling Meadows subdivision is located along the south side of US-12, and includes approximately 56 units.
- Hickory Grove Estates single-family subdivision is located along the north side of US-12 with approximately 53 units.

- The Arbor Ridge subdivision is located along the north side of US-12 near the US-12/Morgan Road intersection and includes approximately 56 units.
- The Hickory Pointe single-family subdivision is located east of Crane Road and south of US-12 and it includes approximately 125 units.
- Arbor Glen Apartments has 220 units and is located on the north side of US-12 immediately east of Hickory Grove Estates.
- Hunt Club Apartments has 440 units and is located on the north side of US-12, adjacent to and east of the Arbor Ridge subdivision.
- The Pines of Cloverland has 582 units and is located on the north side of US-12, adjacent to and east of Hunt Club Apartments.

In addition to the aforementioned existing housing complex and subdivisions, the following housing developments are either already approved or currently under review by Pittsfield Township include:

- Harwood Farms, a single-family subdivision with 150 units on the south side of US-12 east of Warner Road.
- Pittsfield Glen, a subdivision with 120 single-family units and 60 multi-family units north of Textile Road and west of Platt Road.
- Rosewood, a condominium complex with 348 attached condominium units located south of US-12 off of Platt Road
- Wellsley Gardens, a single-family subdivision with 428 units currently under construction immediately east of Arbor Glen Apartments
- Longleaf, a condominium complex with 10 single-family units located on the south side of US-12 across from the Hunt Club and Pines apartments.

A number of commercial/industrial developments are proposed or under construction, which could greatly increase traffic on US-12. These projects are categorized by Washtenaw County as speculative (under discussion), proposed (presented before one or more local boards/commissions), or under construction in the study area. Traveling from west to east, these new developments are discussed below:

- A 35,000 square foot retail complex comprised of five stores is under construction on the eastern side of the City of Saline.
- Commerce Park Centre, a 31,560 square foot retail building, is under construction on Industrial Park Drive in Saline.
- A 64,000 square foot industrial research facility is speculative on South Industrial Drive in Saline.

- A 106,824 square foot office center is proposed just north of the corner of Morgan Road and State Road.
- Three new buildings totaling 122,850 square feet are proposed or speculative in the State Road Business Park, located along State Road between Textile Road and the Ann Arbor Railroad.
- The Valley Ranch Business Park includes a number of potential projects and some that are under construction. The Valley Ranch Business Park is located along the southwestern boundary of the City of Ann Arbor, near the intersection of I-94 and Ann Arbor-Saline Road.
- A 72,000-square-foot industrial research building and a 48,500-square-foot office building are proposed in the vicinity of Textile Road and East State Road.

The US-12 roadway improvements are needed to accommodate the substantial existing and planned economic growth and development.